

Francis Drouillard, P.E.
Civil Engineer
License No. C 42040
2021 Shady Lane
Novato, CA 94945

Teresa Beddoe, Project Coordinator
County of Mendocino
Department of Planning and Building
790 South Franklin Street
Fort Bragg, CA 95437

Robert Merrill, District Manager
North Coast District Office
California Coastal Commission
710 E Street, Suite 200
Eureka, CA 95501

RE: CDP #55-2006, Gualala, Mendocino County
Bower Ltd. Trust, Bower Ltd. Partnership, agent Rau and
Associates
Bluff Top Concrete Block Retaining Wall Not Needed

October 19, 2007

Dear Ms. Beddoe and Mr. Merrill,

I am a civil engineer with 22 years experience in the design and construction of a variety of bridge types and other transportation structures. My designs have been built in the US and abroad, and include tunnels as well as various types of retaining structures. I am also a user of the Gualala Bluff Trail, the Gualala River and the Gualala Point Regional Park. I believe the currently proposed wall unnecessarily harms these valuable natural resources. Approving the wall as currently proposed will also set a precedent that allows bluff top armoring to acquire more usable land along the California coast.

For those reasons, I ask that you consider my comments regarding the need for the massive retaining wall proposed in CDP #55-2006.

STATED PROJECT GOALS AND NEEDS

The stated goals of the project are to improve site drainage and to protect the existing development on parcels APN 145-261-05 and APN 145-261-13.

The scope and size of the currently proposed concrete block wall cannot be justified by the stated goals alone.

UNSTATED PROJECT GOALS AND NEEDS

Clearly, there is an unstated goal on this project. By building the wall west of the daily bluff edge by as much as 17 feet, the applicant creates more usable space by creating an altered land form that is incompatible with Section 30235 of the Coastal Act.

The proposed concrete block wall can only be justified by considering the unstated goal of creating more usable land.

ELEVATION DISCREPANCY IN APPLICATION

Section 13 of the Coastal Development Permit Application Form states that the lowest point of the retaining wall is 45(+/-) feet above mean high tide. The plans, however, indicate a wall low point at Elevation 25 feet(+/-). There is also a note suggesting that a lower elevation may become necessary to key the proposed wall into sound rock. Because

of its importance regarding the size of the area of adverse impact, the applicant should resolve discrepancies between the application form and the plans related to the wall low point elevation.

SITE DRAINAGE

A retaining wall isn't necessary to achieve the stated goal of improved site drainage. Re-grading the site to better control surface runoff and installing an adequate storm water collection and discharge system are required to accomplish that goal. The presence of a wall, if any, should be considered in the drainage design, but it is somewhat misleading to present the wall as an essential part of site drainage improvements.

The proposed plans indicate a valley 10 to 15 feet east of the top of the proposed wall. This will result in unacceptable ponding within the bluff trail easement during winter rainy seasons.

CAUSE OF SITE DRAINAGE PROBLEMS

In his response to Tiffany Tauber dated October 13, 2006, Mr. Rau attributes site drainage problems to the Gualala Bluff Trail development approved under CDP 23-03. No analyses or other evidence was offered to support such a claim.

That claim seems less convincing when one considers that the Gualala Bluff Trail improvements consisted largely of soft landscaping, minor gravel spreading, placement of benches and positioning large rocks to create flower beds.

The applicant should provide an analysis to show how the adverse impacts of the Gualala Bluff Trail compare with those due to improper initial fill placement, inadequate maintenance and the lack of site drainage improvements that occurred prior to development of the bluff trail.

NO-BUILD ALTERNATIVE

The no-build option is not a realistic alternative at parcel APN 145-261-05 because Special Condition No. 1 of CDP No. 1-83-270-A1 requires the applicant is to maintain a timber retaining wall that protects the existing development as well as the public easement for the Gualala Bluff Trail.

The no-build option is a viable alternative at parcel APN 145-261-13. This is because the only development is the existing gravel parking lot and it is not threatened by bluff erosion. (It is threatened by fill erosion, which can be addressed without constructing a wall.) The 25-foot wide public easement for the Gualala Bluff Trail is not threatened because the easement moves with the daily bluff edge.

Note that the applicant can accommodate retreat of the bluff edge by incorporating a sufficient buffer zone between the bluff and any future development. Again, a wall isn't needed to improve site drainage since such improvements can be achieved with re-grading the site and improving the drainage collection and discharge system.

Since there is no need to protect the existing development or the Gualala Bluff Trail from bluff erosion, and the wall isn't necessary to improve site drainage, the wall is not necessary at this parcel to achieve the stated project goals.

ALTERNATIVE WALL LOCATION

The most significant alternative of the proposed wall to consider is its location in plan view. As currently proposed, it is 6 to 17 feet west of the daily bluff edge. The applicant could do more to respect the existing bluff trail easement and existing trail improvements.

Were the wall placed instead along the daily bluff edge, the applicant could achieve the stated project goals and better conform to the Coastal Act and the LCP.

There are other benefits of moving the wall to the east. The most significant is that as the wall moves east its foundation can be built higher uphill, the retained height can be lower, and the overall length of the wall can be reduced.

As the wall shifts more to the east and "climbs the cliff" it can be decreased in size, and that size reduction results in additional benefits. Those benefits include a shorter construction period, a savings in construction materials, lower construction costs and a significantly smaller area of adverse impact on the riparian environment below the proposed wall.

The applicant should explain why a wall alignment west of the 25-foot public easement and daily bluff edge is being proposed.

ALTERNATIVE EARTH RETAINING TYPES AND MATERIALS

Once the applicant considers alternative wall locations, a greater variety of earth retention types and materials become feasible.

Some of the earth retention alternatives the applicant should consider include (with no particular ranking implied):

Engineered fill

For much of the length along parcel APN 145-261-13, a retaining wall isn't necessary to protect the existing development or the Gualala Bluff Trail. If re-grading for drainage is required in those areas, alternatives such as cement-stabilized fill or fabric reinforced fill are feasible and cost effective.

Reinforced Concrete Grid With Rock and Soil Anchors

The large slide behind Surf Super on parcel APN 145-261-05 could be stabilized with a reinforced concrete grid built against the exposed slide face. Post-tensioned soil and rock anchors would be used to secure the grid to the cliff and fill, as well as to provide sufficient strength to resist live load surcharge and overturning and sliding forces due to earthquakes. The grid spaces would be backfilled with a soil designed to self-stabilize and encourage plant growth.

Since the existing retaining wall failure resulted in the loss of a portion of the Gualala Bluff Trail and the applicant had the responsibility to maintain that wall in part to protect the trail, the applicant should restore the trail. A half-bridge could be incorporated into the design the grid system to restore the trail. Such a half-bridge would be supported at the ends only along the western edge and along its full length on the eastern edge.

Reinforced Concrete Gravity Wall

This alternative is similar to the proposed concrete block gravity wall, but is built with cast-in-place concrete instead of precast concrete blocks. In the precast block wall alternative, achieving angle breaks and curves in the wall as seen in plan is difficult if not impossible. Incorporating angle breaks and curves into the wall is readily achieved with cast-in-place construction.

Reinforced Concrete Cantilevered Retaining Wall

This alternative utilizes the weight of the backfill and retaining wall to stabilize the wall and backfill and to resist surcharge and earthquake forces. Since it is cast-in-place construction, it can be built along alignments with curves and angle breaks. It is also possible to utilize concrete dyes and form liners to achieve surface colors and textures that better match the natural bluff top environment than plain concrete.

Reinforced Concrete Masonry Unit (CMU) Cantilevered Retaining Wall

Similar to the above wall type, but consisting of a cast-in-place reinforced concrete strip footing and a steel reinforced CMU block wall grouted solid. It too can be built along alignments with curves and angle breaks, and there are several surface colors and textures available that better match the natural bluff top environment than plain concrete block.

Mechanically-Stabilized Earth (MSE Wall)

Similar to the proposed wall type, but incorporates tie-backs into the engineered fill retained by the wall. With this alternative, the wall would be terraced to create planting areas for a "living" wall.

Timber Crib Wall

This type of earth retaining structure consists of stacked timbers to form a "crib" that is backfilled with drain rock or engineered fill. Retained heights of 40 feet can be readily achieved with modern timber crib walls. This wall type is highly suited for use at the large slide area behind Surf Super on parcel APN 145-261-05.

Not only will the timber crib wall type conform to Special Condition No. 1 of CDP No. 1-83-270-A1 -- which requires the applicant to maintain a wood wall to protect the existing development and the bluff trail -- it offers another opportunity to build a "living" wall that creates planting areas between timbers up the face of the wall.

Concrete Crib Wall

Similar to timber crib wall, but constructed of reinforced concrete beams instead pressure-treated timbers.

Existing Fill Strengthening and Densification

There are numerous methods available to strengthen and densify the existing fill in-situ. These methods include low-tech solutions such as temporarily piling dirt over the site to

specified height for a specified duration to consolidate the underlying soils and high-tech solutions such as grout injection to strengthen the soil.

Attached to this letter are several examples that illustrate the scope, scale and appearance for many of the earth retention alternatives described above.

The applicant should better explain why these alternatives were excluded from consideration on this project, as all of them are viable along significant portions of the project and all can be utilized to meet the stated project goals.

CONCLUSIONS

Based on the stated project goals and an assessment of the readily available earth-retention alternatives, the scope and scale of the proposed concrete block wall is not justified.

Parcel APN 145-261-05

The 25-foot wide public easement on this parcel is fixed. It does not shift as the bluff erodes. Special Condition No. 1 of CDP No. 1-83-270-A1 requires the applicant to maintain a wood retaining wall to protect the development approved under of CDP No. 1-83-270-A1 as well as the 25-foot wide public easement.

There are no feasible alternatives to an earth-retaining structure for repairing the slide at this location. However, there are numerous alternatives to the proposed wall type and location that meet the stated project goals, respect the public easement and better conform to the Coastal Act and the LCP.

Foremost among those alternatives is the timber crib wall. Such a wall is well suited for stabilizing the massive slide behind Surf Super. Such a wall type also conforms to Special Condition No. 1 of CDP No. 1-83-270-A1. A timber crib wall has the added benefit of enabling plant growth on the face of the wall.

A timber crib wall is a better solution than the concrete block wall proposed for this parcel.

Parcel APN 145-261-13

The 25-foot wide public easement on this parcel is movable and linked to the daily bluff edge. As the bluff erodes to the east, the easement shifts to the east by the same amount. As a result, no retaining structure of any kind is needed to protect the Gualala Bluff Trail easement on this parcel.

No existing development on the parcel is threatened by erosion of either the bluff. Existing development threatened by erosion of the improperly placed fill atop the bluff, namely the gravel parking lot, can be addressed without constructing a retaining wall. Furthermore, any future development can accommodate bluff erosion by incorporating a sufficient buffer zone between the development and the bluff.

The need for the proposed wall is not justified on this parcel.

Drainage improvements on both parcels are possible without constructing retaining walls. In regions where re-grading is necessary to improve

surface drainage, fabric-reinforced backfill or cement-stabilized fill may be used instead of low retaining walls.

RECOMMENDATIONS

Based on the stated project goals, the availability of more suitable alternatives, and the lack of need for the proposed concrete block retaining wall, **the project as currently proposed should be rejected.**

Furthermore, since there is a viable timber alternative to the proposed concrete block wall at parcel APN 145-261-05, **the proposed amendment to Special Condition No. 1 of CDP No. 1-83-270-A1 should be denied.**

Recommended revisions to the applicant's proposal include:

- 1) Aligning the westernmost edge of the top of any retaining structure on either parcel along the daily bluff edge.
- 2) Utilizing a timber crib wall at the slide area behind Surf Super.
- 3) Shifting the 25-foot wide easement eastward to accommodate the fill erosion/slides on parcel APN 145-261-13.
- 4) Revising the proposed surface grading so that any ponding that occurs during rainy season is along the easternmost border of the public easement for the Gualala Bluff Trail.
- 5) Maintaining, fully compensating or fully restoring any Gualala Bluff Trail enhancements and improvements affected by drainage improvements or retaining wall construction.

By implementing the above changes, the applicant will make this a successful project for all stakeholders.

Should you have any questions regarding the availability or suitability of the earth retention types mentioned in this letter, please do not hesitate to contact me at OPAC Consulting Engineers, 315 Bay Street, Second Floor, San Francisco, CA 94133, telephone (415)989-4551,x213 or by email at fdrouillard@opacengineers.com.

Sincerely Yours,

Francis Drouillard, PE
Civil Engineer C 042040

Attachments: TimberCribWall.pdf
ShotcreteGridSlopeStabilization.pdf
ConcreteCribWall.pdf
PTshotcreteGridSlopeStabilization.pdf