

Recommended Solution for Slope Problem within Round Hill Estates North

Committee Report (*draft*) – Nov 8, 2002

Updated with 12/02 erosion pictures and plant types – Jan 29, 2003

Members: Steve Lange, Paul Barker, Peter Wollman

Status

Erosion from slopes adjacent to roadways has existed since the roadway was cut into the hills during the original construction during the early 1980's. This situation is most noticeable and severe for lots 1, 2, 3, 4, 5 on the island on Biltmore Drive, and for lots 28, 29 and 30 on islands on Oakshire and to a lesser extent for lot 145 on Oakshire.

The cutting exposed a variety of soil conditions including aggregate rock and decomposed sandstone base with little or no surface soil leaving the slopes open for erosion. Covering of exposed drainage piping by cement sandbags in some cases has left an ugly piled up structure. Water erosion from improperly maintained irrigation at the top of the slope is evident in some locations. Past attempts at keeping the ongoing sloughing off the road has included digging away and removing the sloughed material at the curb. This action has further removed what little base was available, increasing the steepness of the slope, and allowing larger-scale slides to occur. Clearly, continued removal of sloughed material is not a long-term solution. The long-term outlook is that erosion will continue to occur until the slopes reach a neutral pitch where planting root adhesion equals the erosion force. This pitch, if allowed to naturally occur, unfortunately, may risk the foundation integrity of the homes at the top of the slopes.

The cuts into the hillsides for the roadbeds results in a slope too steep and too rocky for native vegetation to take hold in most cases. Since roots were not established to contain what remained of the soil, erosion through rain and wind have continued unabated and will accelerate until mitigation is put in place and well maintained.

Proposed Solution:

Two clear metrics for success were derived after examination of the problem, a pleasant, attractive appearance of the slopes and controlling future erosion and sloughing onto the roadbeds. The proposed solution, then, involves two components: First, the sloughing needs to be kept off the roadbed by means other than periodic cleaning by a retaining structure. Second, the slopes need to be covered with vegetation that will minimize future sloughing from erosion and minimize risk to foundations on the tops of the sloped lots.

Figure 1 illustrates a profile of our proposed solution. A retaining wall needs to be constructed along most of the slope areas identified to a maximum height of about 3 feet above the curb. Some slope areas may not need the retaining wall to be this high and should be evaluated as a function of the slope material and distance from the road. A variety of plant materials are suggested (See Appendix A.) for the different conditions associated with north, south, east, and west facing solar environments. The plantings should be mixed within an area to add interest and to ensure the hardy survive.

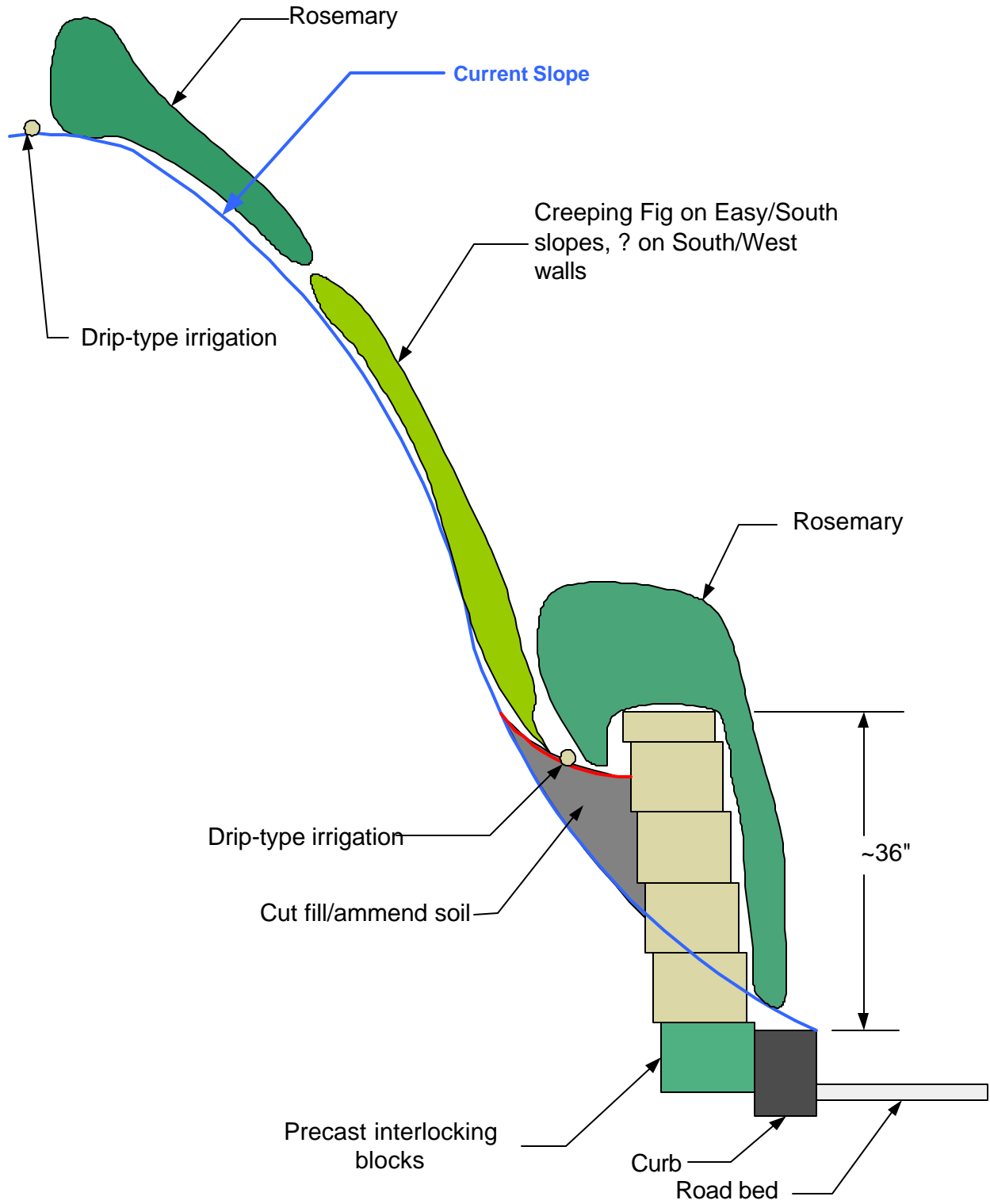


Figure 1 – Profile of slope solution.

The retaining wall material can, at a minimum, consist of the interlocking blocks now used for minimal retaining structures of low height. Assuming they are covered with well maintained Rosemary, their appearance would be acceptable. However, using the retaining blocks without any planting would create an appearance like figure 2, which is not a complete solution and quite ugly.



Figure 2. Interlocking retaining wall blocks without plantings.

In concurrence with trying to maintain a “first-class” appearance in our association, a premium wall material would be warranted as it is felt that even well-maintained Rosemary will allow one to see the underlying retaining wall. Figure 3 shows an example of a short retaining wall used in Round Hill Country Club. Examples of “first-class” retaining walls are everywhere with hundreds of flagstone or stone facing materials and brick/stone capping materials available.



Figure 3. A “first-class” retaining wall.

Erosion – December 2002

The winter storms of December have added to the erosion throughout the association and noticeable on the slope areas on lots 28, 29, and 30. The following pictures were taken in early January 2003 illustrating slope problems as well as recent erosion. The following map shows the location the pictures were taken on the aforementioned lots.

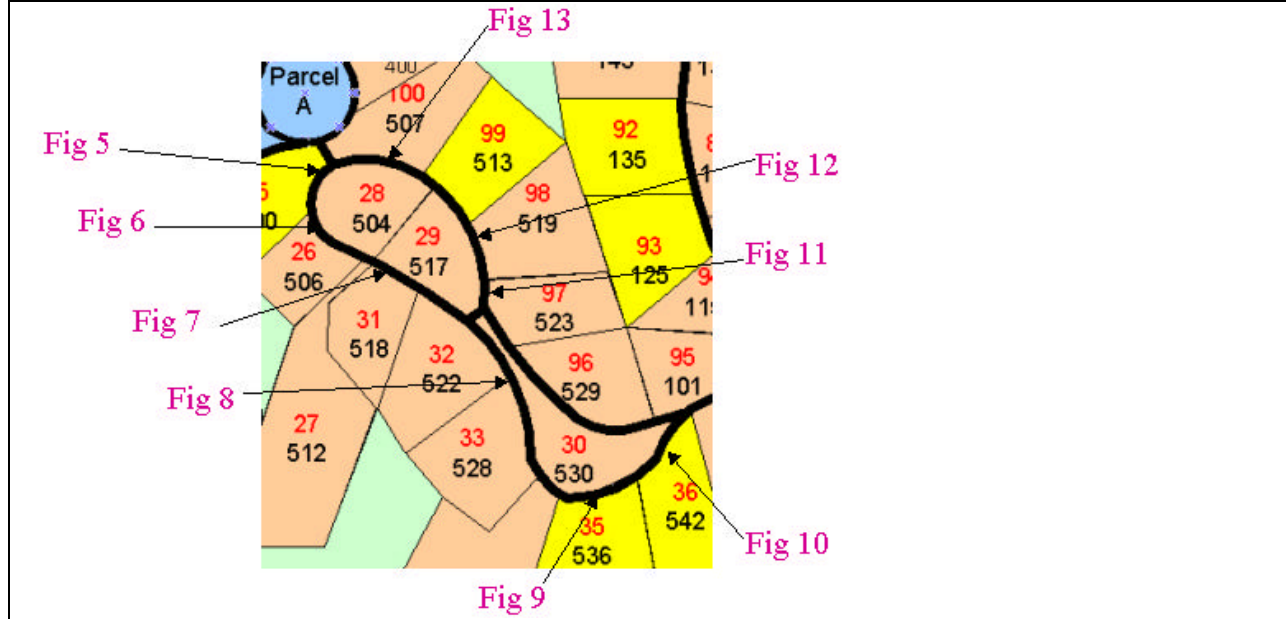


Figure 4. Location map of erosion photos.



Figure 5. Recent slide is starting to erode under foundation for concrete used to cover drainage pipe.



Figure 6. Slide overwhelming temporary straw pipe retaining structure. Erosion has left exposed rock with no soil remaining allowing erosion to start working on these materials.

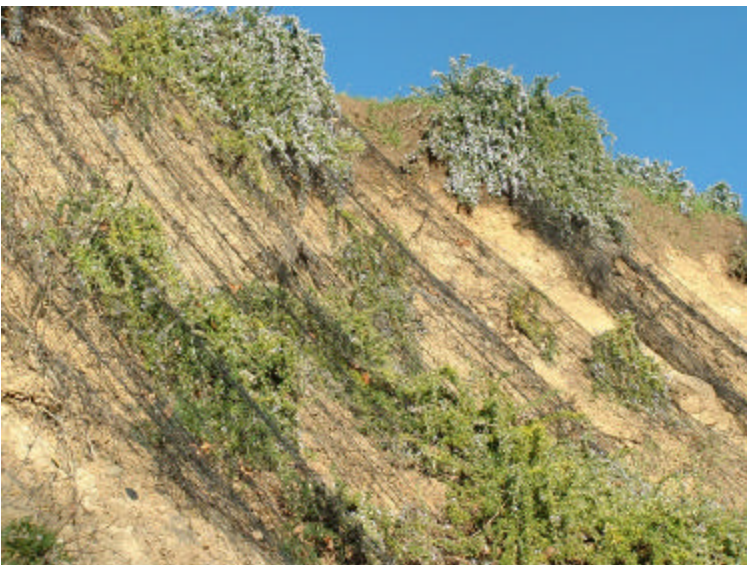


Figure 7. Attempts at erosion control with netting stretched down slope and rosemary planted. Erosion has removed soil under netting leaving it well above ground level and ineffective. Only a small percentage of the originally planted rosemary has survived.



Figure 8. Eroded soil from above is spilling over curb and onto roadway. Almost no vegetation roots are remaining to keep soil from further erosion.



Figure 9. Unattractive cement filled bags covering drainage pipe.



Figure 10. Exposed bedrock has been eroded and channeling is appearing due to runoff from above.



Figure 11. No erosion preventing vegetation roots have allowed ongoing damage to slope and starting to threaten foundation of structure above.



Figure 12. Successful mitigation of slope areas when pool installed on lot 29. Plantings of creeping Fig have started to cover retaining wall with rosemary and morning glory above is making an attractive looking hillside.

Figure 12. Recent slide taking bedrock out.



Figure 13. Nearby slide destroying pipe-covering cement filled bags.



Figure 13. One of the more attractive drainage pipes the residents must view on a daily basis.

Appendix A. Recommended plants for various sun conditions from Paul Niemuth – Landscape Architect Consultant.

Plants:

Plants will help hold the slope. The following list notes whether the plants prefer north, east, west, or south-facing exposure.

Vines to plant at the bottom	Exposure	Deciduous/	
		Evergreen	Flowers:
Euomyx fortunei 'Radicans' – Winter Creeper	N, S, E, W	E	No
Ficus pumila – Creeping Fig	N, E	E	No
Ipomea indica – Blue Dawn Flower	S, W	D	Yes, purple
Macfadyena unguis-cati – Cat's Claw Vine	S, W	E	Yes, yellow
Mascagnia lilacina – Lavender Orchid Vine	S, W	D	Yes, lavender
Parthenocissus quinquefolia – Virginia Creeper	N, S, E, W	D	No, fall color

Spillers to plant at the top	Exposure	Flowers:
Abelia grandiflora – Glossy Abelia	N, E	Yes, pink
Plumbago auriculata – Cape Plumbago	S, W, N, E	Yes, blue
Rosmarinus officinalis 'Prostrata' – Creeping Rosemary	S, W	Yes, blue
Sollya heterophylla – Australian Bluebell	N, E	Yes, blue