



SSM
Steep Slope Management

Description

Certain terrain features such as steep slopes can increase stormwater run-off and erosion. Slopes, when improperly developed, can significantly increase the amount and velocity of stormwater. This run-off can cause unexpected flooding, septic tank intrusion, severe erosion, and stream channel degradation. Such increases in velocity and volume also carry soil down the slopes and into streams causing siltation and damage to aquatic life and habitat.

Since the 1970s, the Chattanooga-Hamilton County Regional Planning Commission has remained consistent in recommending minimal development and encouraging recreation, wildlife, and forestry uses on slopes of 25% or greater. These 25% grades are referenced as “steep” and “unbuildable”, “unsuitable for development”, or “recommended for recreation and/or conservation” in many past and current plans. Although slope concerns have been cited repeatedly over the last few decades, the Chattanooga and area governments continues to wrestle with ways to minimize and responsibly manage development on steep slopes as growth pressures rise.

In 1999, the RPA facilitated a workgroup referred to as the Resource Management Task Force. This group was charged to describe, define, and prioritize areas most suitable for development and highlight sensitive areas in need of careful consideration and review prior to any development proposal. Of the sensitive areas, slopes with grades of 25% or greater, were defined as “steep” and described as “areas [that] pose severe limitations to development”. The report also detailed that “development in these areas could be detrimental to public welfare, health, and safety and development in these areas could negatively impact the scenic identity of the County”. This characterization was supported by the recently adopted countywide 2004 Hamilton County Natural Hazards Mitigation Plan, which acknowledged 25% or greater slopes as steep and vulnerable to landslide as well as being contributors to flash flooding. Additional documents such as the 2004 Tree Protection Resource Management Advisory Committee Final Report also support concerns for steep slopes by indicating that “special attention should be given to steep slopes” and that “erosion and aesthetic problems increase when irresponsible site clearing and land disturbance is combined with slope and hillside issues.”

Selection Criteria

In an attempt to better manage and protect steep slopes, RPA began researching policies for steep slope protection and steep slope development options. Following a regional peer city review, the Knoxville-Knox County Metropolitan Planning Organization’s “*Design Guidelines for Stream Bank Development and Water Quality Protection*” was found to be a simplified culmination of the differing BMPs across the southeast.

Design Considerations

Their BMPs recommend the following for steep slope protection:

- Minimize cut and fill for new development on steep slopes. Limit the steepness of cut and fill slopes to a maximum of 3:1 (33%).
- Limit development of slopes exceeding 25% grades to residential uses with a maximum density of one dwelling unit per two acres. Residential development on slopes between 16% and 25% is recommended at a maximum density of 1-3 dwelling units per acre (See Figure 1).
- Revegetate slopes as part of the development process.
- Respect natural contours so that new development follows natural contours and avoids swales or natural drainage areas as these areas are likely to be flooded and cause runoff to be displaced to other sites downstream (Figure 2).
- Locate roads in new development parallel to the contour of the land to minimize erosion and to reduce the runoff rate more effectively (Figure 3).

Limitations

The RPA has chosen this set of guidelines as a point from which discussion may be initiated. The RPA intends to recommend a steep slope evaluation within its upcoming *CompPlan 2030*. This review would be part of a larger Sensitive Areas Study slated for creation during 2005-2006 Work Program. Such a study is expected to engage appropriate stakeholders and agency representatives regarding reasonable development policies and principals. Staff of the RPA would develop an inventory of developed and undeveloped sensitive slope areas. In addition, the study's partners would assist in the creation of maps to identify focus areas for priority attention.

References

Olshansky, Robert B.. November 1996. American Planning Association. Planning for Hillside Development.

Chattanooga-Hamilton County Regional Planning Agency. Development Resource Center. Chattanooga, Tennessee. <http://www.chcrpa.org/>

Figure 1 Development on Slopes

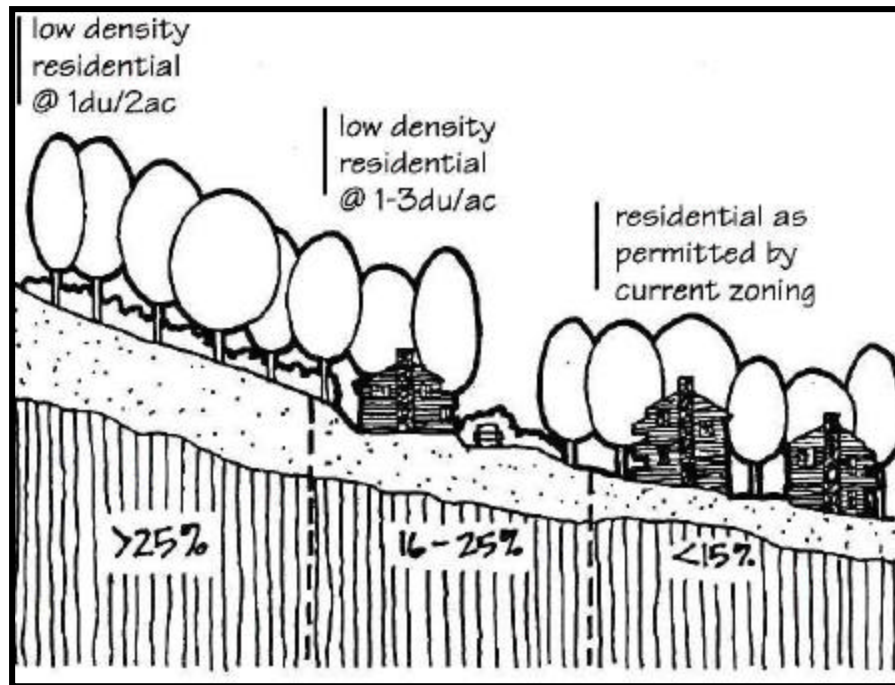


Figure 2 Avoid Swales and Natural Drainage Areas

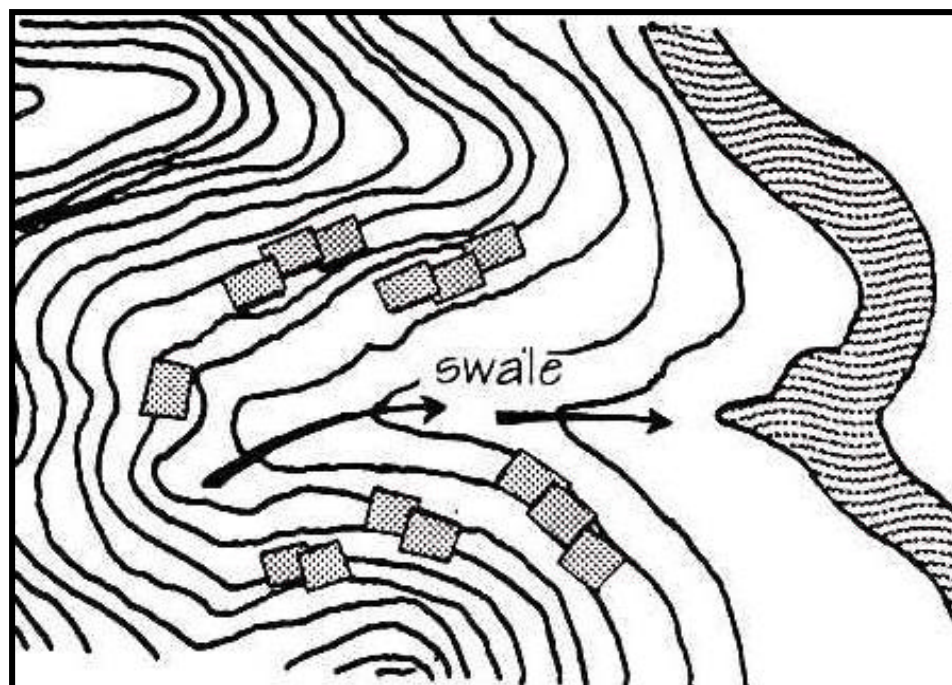


Figure 3 Develop Roads Parallel to Contours

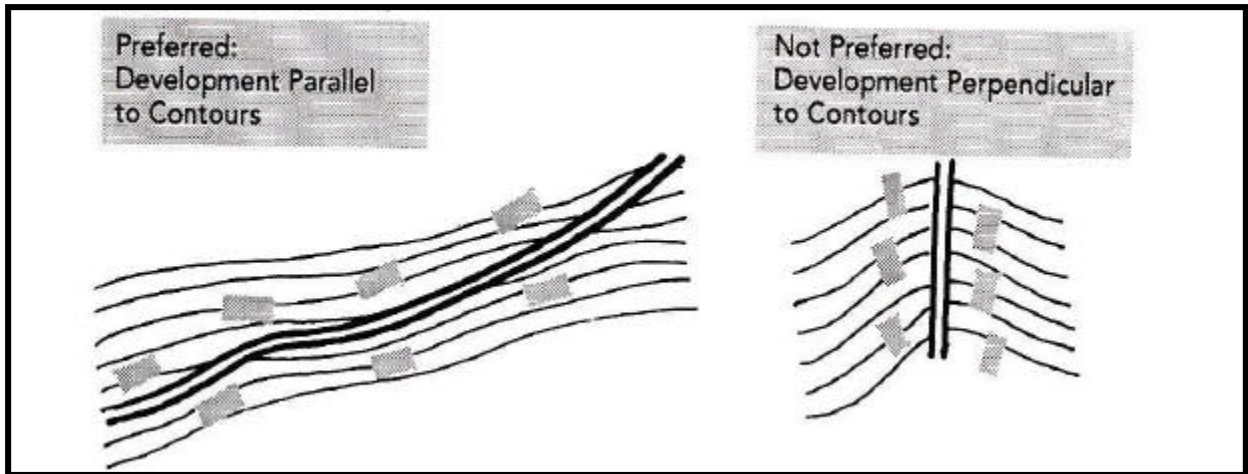


Photo 1 Steep Slope Management

