



RADWAY
DESIGN
ASSOCIATES
CHAPEL HILL, NC

Memorandum

To: Chapel Hill Town Manager
 From: Scott Radway, AICP
 Date: November 6, 2008
 Subject: Steep Slopes

1. Achieving important public objectives requires disturbance of steep slopes.
 2. The Comprehensive Plan intent of steep slope regulations is to prevent erosion. Aydan Court, with its design and stormwater management techniques, goes beyond Chapel Hill regulations for erosion control.
 3. Steep slope disturbance does not vary with a single-family subdivision and single-family development does not provide the additional stormwater protection of the Aydan Court proposal.
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The disturbance of steep slopes included in the Aydan Court plan is the result of creating a design that meets seven functional design requirements of governing bodies plus a recommendation of the Council and CDC at the concept plan review stage.

Site Entrance Alignment opposite Downing Creek Parkway to achieve:

- Requirement 1. Paired directional left turns (per DOT)
- Requirement 2. Emergency vehicle access to Aydan Court (per Town of Chapel Hill)
- Requirement 3. U-turns for eastbound NC 54 traffic (per DOT and Town of Chapel Hill)

Fifty-four percent (10,773 SF) of the land with 25% or greater slopes is located in the NC 54 embankment at the entry. Thirty percent (3,269 SF) of this land is disturbed to provide the required entrance drive to Aydan Court.

Internal Design Requirements achieved

- Requirement 4. An internal road pattern that provides full access to all sides of all buildings for fire protection equipment and personnel access. (per Town of Chapel Hill)
- Requirement 5. An internal road pattern that provides access for all municipal service vehicles including solid waste collection trucks. (per Town of Chapel Hill)
- Requirement 6. A roadway connection to the UNC at Chapel Hill Foundation Inc. property and eventually to Meadowmont. (per Town of Chapel Hill)
- Requirement 7. Gravity flow sanitary sewer service lines required by OWASA. (per OWA-SA)

Forty-six percent (9,232 SF) of the land with 25% or greater slopes is located inside the site. Of this area, 80% (7,443 SF) is disturbed to provide gravity flow sanitary sewer service within the site, the required roadway-connection to the UNC at Chapel Hill Foundation Inc. property, and full access for fire vehicles.

Residential Development with under-building parking:

Recommendation 1. To limit the amount of surface parking and provide for a medium density compact design, the buildings at Aydan Court have under building parking for both Townhomes and the Condominium Building, a suggestion made by both the CDC and Council during the concept plan review process. The Comprehensive Plan and LUMO regulations concerning steep slopes pre-date Council's, the Planning Board's and the CDC's more recent encouragement of structured parking for multi-family projects on steep slopes.

Steep slope disturbance to achieve this goal is 1,775 SF.

Internal steep slopes (excluding entry) are small and isolated, and erosion will be addressed with construction methods and Aydan Court's advanced stormwater management techniques, as permitted by Comprehensive Plan and LUMO.

It's important to recognize that the internal site steep slope areas are small and isolated as set forth in the following chart. Given the small size of these areas, disturbance to these areas will be easily addressed by the advanced stormwater management techniques we are using.

Extracting the steep slopes from the entry area, the remaining Aydan Court steep slopes comprise six small areas with slopes of 25% or more. All of these small areas are located within hillsides that from top to bottom all have slopes of less than 25%.

○ Area 1	513 SF	
○ Area 2	571 SF	
○ Area 3	1,286 SF	
○ Area 4	1,858 SF	
○ Area 5	2,301 SF	
○ <u>Area 6</u>	<u>2,703 SF</u>	
○ Total	9,232 SF	(<u>1/5th Acre = 4% of Aydan Court site</u>)

The elevation change between the top and bottom of these small areas is between 6 – 10 feet.

An 8-10 feet elevation change equals one story of height in single-family, townhome, or multi-family building. An 8-10 feet floor height allows a garage in a townhome or parking floor in a multi-family building to be placed below the living floors, thereby reducing the amount of surface parking needed.

LUMO - Steep Slope Development Regulations – Section 5.3.2

The LUMO regulations permit development on land with slopes greater than 25%.

- One-fourth of the land with slopes greater than 25% may be developed by-right.
- More than one-fourth of the land with slopes greater than 25% may be developed if approved by the Board of Adjustment or by the Town Council when it approves a Special Use Permit.
- The Special Use Permit process provides the Council and staff the opportunity to review in detail the stability of the geology and soils on a site and to review the building and engineering construction techniques proposed to reduce the effects of erosion and sediment downstream.

Comprehensive Plan - Steep Slopes

The principal intent of Comprehensive Plan steep slope regulations as set forth on page 78 is to reduce the effects of erosion and sediment on downstream lands and water bodies. Additionally, the comprehensive plan recognizes that steeply sloped land can be developed safely and responsibly with appropriate development methods and municipal oversight.

“Steep slopes combined with unstable soil conditions can play a role in environmental problems such as erosion, sedimentation of watercourses, and increased volume and velocity of stormwater runoff.”

It is the combination of unstable soil conditions and slope that create conditions leading to erosion, sediment, and other undesired conditions.

Aydan Court’s stormwater management plan will remove 97.5% of the Total Suspended Solids, well over the town’s requirement of 85%, and it proposes to use only food grade organic fertilizer with the type of nitrogen and phosphorous that does not damage plants downstream. The applicant’s programs do more than mitigate the potential effects of erosion and sediment on downstream lands and water bodies. Aydan Court will help restore the Impoundment to better health.

A single family R-1 subdivision will disturb virtually the same amount of steep slopes as the proposed Aydan Court without the addition stormwater protection offered by Aydan Court.

- A single-family plan has been prepared showing an entrance road and a connection to the UNC at Chapel Hill Foundation Inc. property.
- This plan permits gravity flow sanitary sewer as required by OWASA.
- The public roadway meets town standards and has sidewalks on both sides of the street.
- It has 18,000 SF of recreation area

Aydan Court Slopes

Table 1 shows the limited amount – 7.9% - of the total area of Aydan Court that has slopes of greater than 25%. As stated earlier, 54% of this area is in the NC 54 embankment and 46% of the area is internal to the site.

Aydan Court
Land by Slope Category in Square Feet

Slope Category	Within Gross Lot Area	Percent of Gross Lot Area
Slope less than 10%	78,271	30.8 %
Slopes 10-15%	71,208	28.0 %
Slopes 15% -25%	84,696	33.3 %
Slopes greater than 25%	20,005	7.9 %
Totals	254,180	100.0%