CORNERSTONE
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CONSULTING CIVIL ENGINEERS & LAND SURVEYORS

May 23, 2008 CEI Job No. 646-41-00

Ed Sinsay, Proj. Mgr., Land Development
c/o Tim Taylor
County of San Diego
Department of Planning and Land Use
5201 Ruffin Rd, Suite B
San Diego, CA. 92123-2960

RE: TM 5528, P06-101 – ATTACHMENT TO MODIFICATION TO DESIGN STANDARD REQUEST LETTER

Ed,

Reason for Requested Modification

The grade of the natural (pre-development) topography on the 144 acre site averages 0.3% to 0.5% in both north-south and east-west directions. In order to comply with the "receive and discharge" requirements for base flood flow and to avoid changes in flow or velocity of flood waters (as directed by the County Code of Regulatory Ordinances), it is necessary for interior street design to stay as close to natural grade as possible.[1]

Additionally, the existing perimeter (Circulation Element) roads (Palm Canyon Dr. & Borrego Valley Rd) are currently at longitudinal gradients of 0.5% & 0.6% respectively. Both of these existing CE roads are below minimum gradient. Street design of project requires interior streets to access both of these roads. It is necessary to stay as close to the existing grades of these roads as possible to make the connections safe (sight distance considerations) and comfortable for vehicle operators and achieve consistency in design with surrounding public roads.

Exhibits and Narrative of Possible Solutions Illustrating Why 1% Minimum Gradient will not work

Using "Saw-Tooth" Street Profile to Maintain 1% Gradient – Refer to Exhibit #1

Being held to the 1% minimum could require interior streets to be designed with a "saw-tooth" profile resulting in low points (sag conditions) along the profile. These low points would have to be drained of stormwater via underground conduits which the County has indicated in iteration letters as a drainage option to avoid. Drainage conduits silt up and clog in desert areas. Once these conduits clog, the potential for flooding exists. We have been directed by the County to avoid using conduits in all three of the client's Borrego Springs projects.

[1] Boyle Engineering, BORREGO VALLEY FLOOD MANAGEMENT REPORT. 1989.

Raise Northerly Portion of Site to Maintain 1% Gradient – Refer to Exhibit #2

An alternative to the "saw-tooth" street profile could be to raise the northerly portion of site (along Palm Canyon Drive) with imported fill material and match grade at the south portion of the project when the 1% minimum gradient is used (See Exhibit #2). This, of course would raise the north end of the project well above the adjacent properties (8-ft to 12-ft) and since the north edge of the project, which faces the on-coming base flood flow direction, would be elevated, flood waters would be diverted around the project thereby increasing the potential for causing damage to adjacent properties. We are required by the County to employ flood protection measures and avoid this specific situation.

Lower Southerly Portion of Site to Maintain 1% Gradient – Refer to Exhibit #3

Another alternative to the "saw-tooth" design would be to match grade at the northerly boundary of the project and, by using the 1% minimum gradient, lower the south portion of the project. This of course would create large sumps (ponding), 8-ft to12-ft deep, at the south end of the site that would divert or capture flood waters and storm water run-off. Again, the County will not accept projects that propose large open basins or open ponding situations and any measure that diverts flood flow and increases the potential for damage to adjacent properties. We are required by the County to receive and discharge flood waters in a manner similar to that which exists in the pre-development condition.

Summary

Obviously, raising or lowering either end of the site are not practical options and they are included here simply to help illustrate the reason for the request for a modification to County Design standards. The above paragraphs illustrate how impractical a 1% minimum longitudinal street gradient is on large development tracts in relatively flat desert areas. By allowing a design standard modification to lower the minimum gradient from 1% to 0.5% we can design interior street profiles to more closely match grade of existing terrain, convey flood waters through the site in a safe manner, as prescribed by the County, and design safe grade transitions at intersections with perimeter roads.

Sincerely,

CORNERSTONE ENGINEERING, INC.

Michael Shaver, PE
Project Manager

cc: Kristen Weirick, AMG
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