



MEMORANDUM

Planning & Development
Regional Flood Control District



DATE: March 15, 2007

TO: Deborah Marchbanks
Subdivision Coordination

FROM: Bill Zimmerman ^B
Division Manager

SUBJECT: Rocking K South Block Plat (TP)—P1207-006—1st RFCD Review

The Regional Flood Control District (RFCD) has reviewed the Tentative Block Plat and accompanying drainage report, received on February 5, 2007, for FEMA requirements, riparian, floodplain use permitting, rezoning conditions, waiver requests, public dedication decisions, and other special issues required by the Floodplain Management Ordinance. This submittal is **Denied** subject to resolution of the following comments:

Hydrology and Hydraulics Report

1. Section 4.2.1.1: The text states that 20 separate soil classifications lie within the Rocking K Ranch, yet it appears that only 14 are listed in Table 1. Please clarify.
2. The text uses the phrase, "a previous report" and/or "previous study" in unrelated sections throughout this document (i.e., Section 4.2.1.3 or 4.3.1). Because a variety of reports and studies are being used to support the analysis, it is unclear exactly what report is being referred at these locations. Please reference appropriately.
3. Section 4.2.: Please document when Pima County approved the use of the TSMS distribution for the hydrologic analysis as it is somewhat contradictory to what is being considered within the State Standards.
4. Section 4.2.1.1.2: Please provide the vegetation boundaries as they do not appear to be on the Off-site Existing Conditions Map. Note: Figure 1, which is the figure that this section references, is called out in the Table of Contents as the Location Map, though it is not labeled as such on the actual figure.
5. Section 4.2.1.3: The 8-point representative cross-section referenced for "the previous study" needs to be provided in some form within the report and appropriately referenced.
6. Section 4.2.1.1: Recent aerial photography demonstrates that the sections south of the parcel have all been developed so the off-site watersheds can not be assumed to be zero percent impervious as stated. In addition, much of the land in these sections has been platted in accordance with the current zoning. Upon completion, these platted parcels will not contain measures to detain or retain the exiting flows; therefore, the analysis of the off-site watersheds needs to account for this future increase in discharge. Also, current State law has allowed for the sale of State Land to fund education. Because the majority of the land south of the project is State Land and will be sold and developed most likely to the current zoning of suburban foothills, (again not requiring detention) the

off-site analysis needs to account for the increased runoff associated with this anticipated development. Please revise the hydrologic analysis accordingly.

7. Section 4.2.1.1.1: Please provide Page 107 from the Hydrology Manual for Engineering Design and Floodplain Management in the appendix to match what is stated in this section.
8. Section 4.2.1.1.1: Please provide a table that references the soil type, the vegetation type, to allow for the verification of the curve number used in the analysis.
9. Section 4.3.2.1: Please add the FEMA Zones to the On-site Existing Conditions Map to match what is stated in the text.
10. Section 4.3.3: If the CMG report was approved using the 6-hour storm event please provide a discussion as to why this analysis switched to a 3-hour storm. This can be addressed with Comment 3.
11. Section 5.0: Please provide the floodplain analysis using the post-construction discharges and incorporating the proposed culverts. Refine the floodplain and update the water surface elevations and present them on Developed Conditions Map. This analysis is required for a number of reasons:
 - 1) As demonstrated by the hydrologic analysis for developed conditions, the discharges will increase such that several of the watercourses that were not regulatory under existing conditions will be upon completion of the project (i.e., CP 31A and CP 112).
 - 2) The culverts will encroach into the floodplain, in some cases quite severely (i.e., Culvert 16). To ensure that the encroachment will not increase the post-construction water surface elevation beyond what is allowed by the Ordinance, this analysis is required.
 - 3) In contrast to what is stated in the report, several of the discharges do increase significantly due to proposed development and as a result the water surface elevation (i.e., CP 120) needs to be re-established.
 - 4) The developed water surface elevations will be used in the design of the individual blocks and will be used to establish the Finished Floor Elevations for the homes within the blocks. This information is often referenced from the block plat and needs to be presented at this time.
 - 5) The post-construction floodplain will be recorded on the Final Plat - not the pre-construction floodplain.
12. Section 5.0: How was the initial water surface elevation for Cross-section 100 established? Based on the FIRM Panel, it would appear that the flow conveyed in the Rincon Creek will influence this boundary condition. Please explain.
13. Section 7.0: Although the individual crossings may not be enough to require mitigation, the combination of all the crossings combined with the disturbance caused by the proposed sewer line as shown on the Tentative Plat, may exceed the overall amount of riparian disturbance allowed by Pima County. Therefore, a summary of disturbances needs to be provided as part of the analysis with the total disturbed area presented within this report to verify if a mitigation plan will be required.
14. Section 8.1: If the proposed roadways are considered major arterials they will need to be designed in accordance with the Pima County Roadway Design Standards. This analysis needs to demonstrate that a dry travel lane will be provided during the 10-year event and the runoff from the 100-year

event will not pond beyond the limits specified in the manual. Please revise the roadway design accordingly.

15. Section 8.1: It is understood that a profile for the roadway might not be available at the time of this submittal. Therefore, will a separate drainage report be submitted with the improvement plans to describe the drainage design for the major roadways presented on the block plat? If not, please state within the text how the drainage design for the roadway will be conveyed to PCRFD.
16. Section 8.1: The roadway design indicates that the only all-weather access for the entire project will be placed at CP 115. Should the at-grade crossing at CP 142 become flooded, a readily-available access route does not appear to be within reasonable proximity to the project. Please show the proposed Old Spanish Trail improvements to be constructed with the Valencia Road extension.
17. Section 8.1: The roadway alignment shown at CP 129 appears to fill in the existing low point for this watershed and would appear to prevent flow from crossing Old Spanish Trail. Please explain how the flow will be conveyed within this watershed and over Old Spanish Trail given this presented design.
18. Section 8.2: Please incorporate the proposed culverts into the HEC-RAS models where appropriate as the methodology used to preliminarily size the culverts does not account for the encroachment into the floodplain nor does it account for impacts of the downstream tailwater.
19. Section 8.2: Because of the major encroachment of the culverts into the floodplain, a sediment transport analysis is needed to demonstrate that the proposed culverts will have the capacity to convey the sediment load.
20. Section 8.2: A scour analysis will be required as part of the design of all the culverts and in particular the design the con-arches to establish the toe-down depth. When will this analysis be presented to Pima County Regional Flood Control District?
21. Section 8.2: The Manning's N for the bottom of the con-arches was set as 0.025. However the Manning's n for the main channel used in the HEC-RAS model was set at 0.055. Please revise or justify the use of the lower roughness as the con-arch will essentially span the main channel of the watercourse and therefore the two values should be somewhat equivalent.
22. Section 8.2: Please add the velocity of the flow exiting the culvert to Table 7. Note it appears that the flow velocity exiting Culvert 17 is excessive.
23. Section 8.2: The design criteria for Culvert 2 should be revisited. The design shows only one pipe at this location, yet three braids appear to be present at this location meaning that multiple pipes should be used. Note: The design discharge used is based on the runoff from the entire watershed, yet the crossing is at the upstream part of the watershed. Please revise accordingly.
24. Section 8.2: Realign Culvert 1 such that is in line with the overall flow direction and not just the low-flow thalweg as it appears that the flow is being directed toward the opposite bank.
25. Section 8.3: The report states that the erosion mitigation design will be submitted as part of the improvement plans. Does this mean a separate drainage report will be submitted as part of the Improvement Plans? If so, state as such within the report.

26. Section 8.4: The letter presented to MMLA back in October of 1997 stating that the project does not lie within a critical or balanced basin was based on the previous ordinance. The Floodplain Ordinance adopted in 2005 reclassified all the previously unclassified basins at balanced basins. As a result, the criteria for developing within a balanced basin will apply. Please revise the report and design accordingly.
27. Section 8.4: Percolation tests will be required as part of the design of the retention basins unless adequate positive drainage is provided. Please state that in the absence of a means of providing positive drainage, percolation tests will be performed.
28. Section 8.4: The report states that water harvesting may be placed within the functional open space. Does this imply that the water harvesting areas will be placed within the existing watercourses? Please clarify.
29. Section 8.4: Please remove the reference to the golf course. A golf course will not be constructed as part of Rocking K South.
30. Please review the discharges in the tables with discharges listed at the concentration points and revise as necessary as all of them are not consistent (e.g., CP 116, Sheet 4 of 4 – Developed Conditions).
31. On the Developed Conditions Map, the culvert crossing at Section CP 15 indicates that bank protection will be constructed. Please discuss within the report.
32. Please provide the Riparian Habitat on the On-site Existing and Developed Conditions Maps.
33. Please provide the limits Waters of the United States as approved by the Army Corps of Engineers on the On-site Existing and Developed Conditions Map.
34. Please provide a 404 Compliance Statement sealed by a professional engineer.
35. Please state how the project complies with the Section 404 of the Clean Water Act and state which Nationwide Permit is being used for this project. The area of disturbance for each roadway crossing and the proposed sewer alignment should be quantified and summarized in a table for ease of reference.
36. Please provide a table similar to that found within the Specific Plan that lists the proposed land uses, acreages within each block to assist in verifying the impervious cover and weighted runoff coefficient used in the hydrologic analysis.
37. Please provide a copy of the current FIRM Panel for this project
38. Please provide electronic versions of the HMS models and RAS Models to assist in the review.
39. Please provide all the pages for the flow distribution calculations found in Appendix 8.1.
40. A table listing the retention (and detention per Comment 28) requirements on a per block basis needs to be added to the Developed Conditions Map and the Tentative Plat to ensure that this requirement is met with the development of the blocks.

41. It would appear that the report contains two sets of map labeled Figure 2. Please revise to match what is stated in the Table of Contents.

Tentative Plat

1. Please dimension The Erosion Hazard Setback on the Tentative Plat.
2. Please provide the Waters of the United States on the Tentative Plat.
3. The culvert at C.P. 124 appears to be located inside the floodplain. Please revise such that is contained with the actual watercourse.
4. The alignment of the sewer listed as Line 1 to Line 10C is a concern to PCRFCFD in terms of impacts to the riparian habitat, Waters of the United States and scour, maintenance and access. This design needs to be presented and discussed at length with PCRFCFD, Development Services and Pima County Waste Water before it can be accepted as shown. Please note that if the stabilized surface as shown on Detail C on Sheet 4 is being proposed within the limits of the Water of the United States, it will be considered to be permanent disturbance. Will a separate drainage report be provided for the sewer design? If not how will the information regarding the design, (including the scour) be presented to Pima County Flood Control as a Floodplain Use Permit will be required prior to construction.
5. The proposed roadway cross-section does not comply with the one provided in the specific plan. The pathway in the specific plan is 10 feet, while the one presented is only eight feet. Please clarify.

Please call (520) 243-1800 if you need clarification of these comments.

BZ/CBR/sja

Atch: Riparian Review Comments

cc: Ann Moynihan, RFCFD Planning and Development Division
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