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## Memorandum

**To:** Stacy Nerger, Associate Planner

**Date:** January 5, 2018

**From:** Alex Mestdagh, P.E. Engineering Services Manager  
David Aden, P.E. Traffic Engineer  
Jacob James, P.E. Stormwater Manager  
Kurt Patrick, P.E. Stormwater Engineer  
Tyler Sandt, Development Review Engineer

**Cc:** Tom Williams, P.E. Director of Public Works and Engineering

**Subject:** Trails at Crowfoot Filing 1 Final Plat – Engineering 2<sup>nd</sup> Review

The Engineering Department has reviewed the documents submitted for Trails at Crowfoot Filing 1. The submittal consisted of the following documents:

<u>Document</u>	<u>Date Received</u>
Final Drainage Report	December 12, 2017
Drainage Maps	December 12, 2017
Cost Estimate	December 11, 2017
Final Plat	December 11, 2017
Landscape Plans	December 12, 2017
Construction Documents	December 12, 2017
Traffic Study	December 12, 2017

The site is located east of Crowfoot Valley Road, directly south of the Richlawn Hills subdivision. This filing plats the major roads on the west side of Bayou Gulch Road. Based on our review we have the following comments:

### Traffic and Roadway Review Comments

The following comments concern traffic, access, roadway design, and construction standard issues for the subject property. They are based upon our review of the submittal documents in accordance with the criteria presented in the Town of Parker’s Roadway Design and Construction Criteria Manual (RDCCM), as revised, July 2015. Additional regulatory and planning documents may have been utilized in the review, and are referenced in the comments where appropriate.

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### General Comments

1. Per previous comments, please provide all applicable federal 404 permits required for work within Lemon Gulch.

### Final Plat

2. Per previous review, please dedicate sidewalk easements over any sidewalk not within the right-of-way.

### Public Improvements Cost Estimate

3. Update the cost estimate with any changes to the plans.
4. Please clarify what the “Special Sign” line item corresponds to.

### Landscape Plans

5. Remove the Town’s engineering signature block from the cover sheet.

### Traffic Study

See Traffic Study comments on eTrakit.

### Construction Plans

6. The auxiliary lanes on Crowfoot Valley Road do not comply with CDOT access code. The required acceleration and deceleration lane lengths for a 50 MPH NR-B are 760 feet and 500 feet, respectively. A taper transition ratio of 15:1 is also required.
7. Please revise the crosswalks at Bayou Gulch and Scarlet Sage to be continental with 2’x10’ bars.
8. Add crosswalks to the north side of the Scarlet Sage Ln – Scarlet Sage Ave intersection, the north and south sides of the Scarlet Sage Street – Scarlet Sage Ave intersection, and the east side of the Shasta Daisy St – Scarlet Sage Ave intersection.
9. Please clarify how flows on the unbuilt portion of Bayou Gulch will be accommodated in the interim.

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10. Per previous review, include 2 and 100-year HGL's on all storm sewer profiles. Several profiles are missing the 100-year.
11. Show the RCP on the Bayou Gulch storm lateral (Sheet 65).
12. The triangular forebay in Pond A does not comply with Town criteria. However, the Town will accept the forebay if access can be provided per Figure 7.1 in the SDECM.
13. Revise the Pond A trickle channel to not have such an extreme turn near the initial surcharge area.
14. Please revise the forebays so that the wingwalls tie directly into the forebay walls and there is no wall between the baffles and the rest of the forebay.
15. Shift the east forebay in Pond B so that the eastern leg of the trickle channel does not change direction at such an extreme angle.
16. On the Outlet Structure and Initial Surcharge Plan, show the minimum 3.5" by 18" minimum opening in the standard bar grating as shown in Figure 7.5.
17. The slope on the outlet structure profile view is being shown as 3:1 or 4:1. Please revise to only show 4:1.
18. Label orifice hole elevations on X-Section B-B.
19. Show the pond slopes adjacent to the trickle channel as 4% minimum per Figure 7.3 in the SDECM.
20. Revise the riprap in the Pond B emergency spillway to be type M and adjust the depth accordingly.
21. Please consider revising the dimensions of the Pond B outlet structure to make compliance with Town's maximum grate size (3' x 4') more feasible. For example, the grating over the secondary chamber might be difficult since it's being shown as 4' x 4' and the maximum grate size is 3' x 4'.
22. The flows conveyed by the swale on the south end of the property, south of Rose Mallow Ave, should be collected by an area inlet and conveyed to the pond.
23. Please clarify the drainage patterns of the northern trail.
24. Access must be provided at the Pond A outfall.

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25. Access must be provided to the outlet structures at Ponds B and D.
26. Micropool appears to extend beyond the outlet structure into the trickle channel, the micropool WSE should be kept completely within the outlet structure.
27. Please note that handrails are not required on outlet structures unless deemed necessary by the engineer. Are handrails needed on all the outlet structures?
28. Dimensions on Section B-B are not the same as the plan view of the outlet structure.
29. Add details for all grating on the outlet structure. The close mesh grate doesn't appear to be the correct size for the structure. The close mesh grate also does not meet our coarse bar grate standards.
30. Ensure all grates are set into the walls flush with the top of the wall of the outlet structure instead of bolted to the top of the walls.
31. The emergency spillway protection needs to extend down to the bottom of the embankment, please show this on the plan view.
32. Show the cutoff wall location on the plan view of the pond.
33. Show the limits of, and clarify the material being used in the initial surcharge areas. Only Pond A should have a hard bottom
34. Show detail of trickle channel connection to initial surcharge area in Pond A.
35. It appears the Pond A outlet pipe is a box culvert, however, the drawings have some references to a circular pipe. Please clarify which is proposed and why a box is necessary rather than an equivalent sized pipe. The Town and District prefer circular pipe.
36. Add a concrete apron at the entrance to the 6'x6' RCBC under Crowfoot Road.
37. Show the proposed grade in the storm profile for North Pinery Parkway North Channel Outfall on page 67. Also show utilities in the profile such as the proposed water line.
38. Call out the toe wall on the FES for Wild Lupine Street Outfall profile on page 73. Also call out proposed riprap limits extended from FES to the drop structure edge eliminating the "gap" between the FES and the drop.

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39. All sculpted concrete drops need to be wider to accommodate adequately sized stilling basins. The proposed layout does not provide 2' of elevation containment around the entire stilling basin. The drop structure layout tables also do not appear to have correct elevations, for example point #12 shows an elevation of 6026.095 in the table, however, the grading suggests the elevation is between elevation 6027 and 6028. This appears to be the case for numerous points on every drop structure.
40. Call out staining and stamping as the concrete finish for all sculpted concrete drop structures.
41. Please provide length call outs for leading riprap and trailing riprap for sculpted concrete drop structures. There should be 8 feet of riprap upstream and 10 feet of riprap downstream per UDFCD Volume 2 Criteria.
42. Per UDFCD Volume 2 Criteria section 2.2.1, drop structures shall be located within tangential sections of drainageways. Please revisit drop 6 as it relates to UDFCD Criteria and look into placing the drop downstream at the entrance to the 6'x6' RCBC. This will also alleviate the need for an apron at the box culvert entrance as this will be stabilized with a sculpted concrete drop structure.

### **Stormwater Review Comments**

The following comments concern drainage, erosion and sediment control, and non-point source pollution control issues for the subject property. They are based upon our review of the submittal documents against the criteria presented in the Town of Parker's, *Storm Drainage and Environmental Criteria Manual (SDECM)*, as revised, February, 2014. Additional regulatory and planning documents were utilized in the review, and are referenced in the comments where appropriate.

### **Final Drainage Report**

43. Neither Town staff nor Urban Drainage could verify the detention pond calculations. Per previous review, it appears an outdated version of UD Detention is being used. The basin information can be filled out directly in the workbook and the developed hydrograph obtained from the CUHP/SWMMM model should be imported into UD-Detention. This methodology allows the user to calculate the 100-year volume with CUHP/SWMMM; while the workbook calculates historic flows and orifice sizing.
44. Clarify the emergency overflow path of Pond B.

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45. Update the drainage map and calculations to include the new cul-de-sac at the southwest edge of the property.
46. Please update the major basin lines to specify which areas are draining to Ponds C and D.
47. Delineate basins for all areas of the development that release flows from the site undetained and adjust the pond calculations per the compensatory storage requirements outlined in Section 7.2.4 of the SDECM.

#### Sediment and Erosion Control

48. Show silt fence or sediment control log down-gradient of all disturbance.
49. Show debris and trash control on all roadways, existing and proposed.
50. Add a note stating that sediment control BMPs may be necessary along lot lines during home construction.
51. Please show the TSBs on the initial plan, as we will require they be installed immediately after construction begins.
52. Final plan needs to show exactly which streets and sidewalks will be completely installed and which will be only rough graded.
53. Add a note stating that lot protection is required on all residential lots prior to issuing a certificate of occupancy.
54. Show erosion control blanket on both sides of the trickle channel in the detention ponds.
55. Show outlet structure protection in the detention ponds.
56. Show rough cut street control on all streets that will not be paved.
57. Show erosion control blanket on all slopes steeper than 4:1.

The submittal is not in general conformance with the Town of Parker's *Roadway Design and Construction Criteria Manual* and *Storm Drainage and Environmental Criteria Manual*. The submittal must be revised and re-submitted for review. All submittals should be through the Town Community Development Department, accompanied by a letter that responds to each comment herein. Direct submittals to the Engineering Department will not be accepted.

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An attempt has been made to identify all of the items that do not meet the Town of Parker's design criteria; however, it remains the developer's responsibility to ensure that all criteria are met.

If you have any questions regarding the comments please do not hesitate to contact the Engineering Department at (303) 840-9546.