LEE'S SUMMIT
MISSOURI

DEVELOPMENT SERVICES

Date: Tuesday, December 18, 2018

To:

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From: Gene Williams, P.E.
Senior Staff Engineer

Application Number:	PL2018209
Application Type:	Engineering Plan Review
Application Name:	Cobey Creek 1st Plat - Street, Stormwater, Master Drainage Plan, and Land Disturbance

The Development Services Department received plans for this project on November 21, 2018. We have completed our review and offer the following comments listed below.

- Resubmit three (3) full size sets of plans (no larger than 24"x36") folded to 8-½"x11", one (1) comment response letter, and one (1) digital copy following the electronic plan submittal guides as stated below.
- Revised plans will be reviewed within five (5) business days of the date received.

Engineering Review

1. It is recommended that the Master Drainage Plan be incorporated into a standalone Street, Stormwater, Master Drainage Plan, and Land Disturbance Plan. If, however, it is desired to make the Master Drainage Plan a standalone set of plans, then an index of sheets along with a cover sheet, vicinity map, and all other information required on a typical cover sheet should be included. In any case, the Master Drainage Plan must be constructed during the other subdivision improvements, and the Street and Stormwater plans shall not be approved until the Master Drainage Plan is also approved.

2. Sheet 3 of 4: The City requires a minimum of 2.0 feet from the 100 year water surface elevation, and any location of the lowest opening. It is not clear what procedure was used to develop the table on the bottom of this sheet, because two (2) random spot checks of Lots 8 and 10 showed errors. There may be addtional instances where the 2 foot rule is not met. It appears the MBOEs do not comply with the 2.0 foot requirement. To be clear on what we require, it is acceptable to call out an MBOE for each side of the lot, and provide a note on the Master Drainage Plan which allows for interpolation between the two MBOEs shown on the side lot lines. This allows for interpolation between the 100 year water surface elevation within the rear yard swale for varying water surface elevations. Please re-review this table, and revise as appropriate.

3. Sheet 3 of 4: The City does not recognize a "WU" (i.e., walkup) basement type. The City only recognizes a standard basement, a daylight basement, and a walkout basement. For purposes of walkout when used in context as shown, this would be considered a walkout basement.

4. Sheet 2 of 4: Note 7 and Note 8 are incorrect. The City requires a 2.0 foot freeboard rather than 1 foot freeboard shown on the notes. Please be aware that we will also require this be called out as 2.0 feet, not 2 feet.

5. The rear of Lots 140 to 150 are served by a swale, with no underground routing and conveyance of stormwater. It appears additional underground routing of stormwater is required. Although this was discussed during the Prleliminary Development Plan phase of this project, it was our understanding the drainage area discharging into this swale was less than 2.0 acres. It appears the drainage area shown on Sheet 17 of 33 is greater than 2.0 acres draining to this swale.

6. Grading shown on Sheet 3 of 33 is no longer needed in the southwest corner, to facilitate installation of the water main loop. Please see the water line plan comments for further information.

7. Will land disturbance take place prior to approval of these plans? The reason for this question is that the land disturbance plans were submitted as a standalone set. We usually recommend that the land disturbance plans be incorporated into the steet, stormwater, Master Drainage Plan, and land disturbance plan set, but this may or may not be necessary based on the answer to this question.

8. A stormwater pollution prevention plan (SWPPP) is required prior to approval of the plans.

9. Sheet 3 of 6 of the land disturbance plans: There are no details concerning the construction of an outlet structure for the temporary sediment basin. Detailed plans must be provided showing how this temporary sediment basin will be constructed, along with sufficient notes or plans showing how the sediment basin will be converted to a permanent detention facility after completion of the project.

10. In general, the land disturbance plan is seriously lacking in terms of function. Silt fence appears to be the primary method for erosion and sediment control as shown on Sheet 4 of 6, and the silt fence is not placed properly. In order for silt fence to have any chance of limiting the off-site migration of silt and sediment, it must be placed along contours, not parallel to contours as proposed. Substantial revisions to this plan are required.

11. It is recommended that alternative forms of erosion and sediment control be shown rather than relying solely on silt fence, and a temporary sediment basin which has no construction details.

12. Land Disturbance Plan General Comment: The plan appears incomplete and lacking in required detail, and lacking in terms of what items will be constructed by a contractor when performing erosion and

sediment control on this site.

13. Street and Stormwater Plans General Comment: All ADA-accessible ramps and ADA-accessible routes across intersections must be thoroughly detailed in the plans. The details shown on Sheets 19, 20, 21, 22, 23, 24, 25, 26 and 27 are insufficient for construction or review purposes. Please see the bullet point items included in Section 5304.8 (i.e., 11 bullet point items) for a complete list of required items necessary for the plans. When providing the required details, please be cognizant of the design requirements contained in Table LS-5 of Sectiion 5305. The City of Lee's Summit design standards are more stringent than shown in PROWAG, and in general, we require no more than a 1.5% cross-slope, and no more than a 7.5% running slope. Finally, "transitions" at the top of the ramp are called-out, but not desired or required unless there is a compelling reason.

14. Street and Stormwater Plan General Comment: All ADA-accessible ramps, and all sidewalks adjacent to common area tracts, and finally all sidewalks adjacent to unplatted property must be constructed during sudvision construction. Identify each of these items in a clear and concise way, so there is no confusion on where and when these improvements are made. The only sidewalk allowed to be constructed during the building permit process (i.e., during individual home construction), are sidewalks along platted lots. All other sidewalk and ADA-accessible ramps, and ADA-accessible routes across intersections where stop control is present must be constructed along with the improvements shown in these plans.

15. The 8 foot asphaltic concrete path shown along M-150 should be specified as a 6 inch thick KCMMB concrete sidewalk with a width of 10 feet.

16. Underdrains must be installed from inlet to inlet at all sag points on the roads. Please identify their location, and provide clear and concise notes, along with a reference to the details shown elsewhere in the plan set, for their construction.

17. No calculations were provided for the rip rap sizing or rip rap design. Please provide calculations showing how the rip rap was sized, and provide adequate notes in the plans specifying the size of rip rap, the dimensions of the rip rap, the thickness of the rip rap, the length of the rip rap, and the width of the rip rap. The calculations may be shown in the stormwater report, but the plans must show exactly what is being installed without requiring the contractor or inspector to perform any field calculations based on a generic table.

18. Sheet 13 of 33: Please indicate the future phase between the 2 temporary end sections will be installed during a future phase. Perhaps placing General Note 2 on the profile view?

19. Please review the plans, and grey-out any future phase activity, along with sufficient notes indicating what the greyed-out features represent.

20. Sheet 13 of 33: Please grey-out the future lots. It is confusing, and appears to show these lots being part of the 1st phase.

21. Sheet 31: Please remove these details. These are generic details, and since the plans must include site-specific details for ADA-accessible ramps, the details will contradict them. For future reference, these details are intended for retrofit projects, and provide the minimum standards for construction. The City has adopted more stringent standards discussed elsewhere in these comments, and therefore, the standard details must be removed.

22. An underdrain details was missing.

23. A trenching and backfill detail was missing.

24. A signage plan was missing from the plans. Standard details were also missing concerning signage.

25. The locations of all ADA-routes across intersections in a "stop-control" configuration was missing from the plans. Where an intersection is under stop control, or under yield control, no more than 1.5% cross-slope with a minimum width of 5 feet must be provided across the intersection at all ADA-accessible ramps. Details must be provided on the plans, along with updated profiles on the street plans to reflect these changes.

26. Where an ADA-accessible ramp is installed at an interseciton without stop control, then the cross-slope is limited to no more than 5.0% across the street. Mid-block crossings are limited to street grade.

27. It appears the underground storm lines were sized for the 10 year event, with the hydraulic grade line at the crown of the pipe. There appear to be instances where the 100 year event has no suitable overflow route, other than the street gutter. Will this be sufficient for all aspects of the drainage system? Are there situations where the 100 year event will cause structure flooding?

28. Sheet 28 of 33: Provide slope call-outs for the longitudinal (i.e., north/south), and the transverse (i.e., east/west) directions within the detention basin bottom.

29. Sheet 28 of 33: By design, it appears the basin will hold water since there is zero slope in the transverse (i.e., east/west) direction. This is not acceptable. A minimum 2.0% slope should be provided in any direction within the basin.

30. Sheet 28 of 33: Where is the emergency spillway? Why was it omitted from the plans? Please see specific requirements for the emergency spillway, including the requirement that the emergency spillway be designed to manage all events assuming the primary outlet works are 100% clogged, and zero available storage, with a minimum of 1.0 feet of freeboard from the lowest point of the dam top, to the highest water level in basin during this event.

31. Sheet 28 of 33: Are you really proposing to use a 48 inch PVC "standpipe" as your primary outlet structure? For a basin this size, this seems highly inappropriate. Typical materials for an important outlet structure managing a basin of this size would be reinforced concrete, with orifices or a perforated riser to manage the 40 hour extended detention requirements, along with suitable orifices and weirs to manage the attnenuation events. There appear to be no provisions for anti-clogging, and it is highly likely this outlet structure will topple-over during the first year of operation. It is also shown directly-connected to the 48 inch pipe, with no junction other than a tee.

32. The "Final Drainage Report - Phase 1" dated Dec. 11, 2018 contradicts the plans in the following ways: 1) a 475 foot long spillway is discussed, but not shown in the plans, 2) no calculations of the 90% mean annual event storm and associated volumes were presented in the report to support the smaller openings in the outlet structure to provide 40 hour extended detention, 3) no table of contents was presented in the report, including appendices, 4) detention basins on the south end of the project were shown in the report, with no discussion when these are to be constructed, and no indication on the plans when they will be constructed.

33. Detention Basin Design General Comments: The design shown on Sheet 28 of 33 is lacking in terms of detail, lack of an emergency spillway, and quality of materials. Please review and provide a re-design.

34. Stormwater Report: Should't the existing condition diagram "points of interest" match the "points of interest" shown on the proposed condition diagram? Also, the existing condition diagram is vague in terms of these points of interest, with no clear indication on the diagram where these points exist (i.e., labels are provided with no leader line or clear indication of where the point is located). Only a label is provided. The points of interest should coincide with the region of convergence between sheet flow and shallow concentrated flow.

35. Plans are provided in the stormwater report for the south detention basins, with no clear indication when these will be constructed.

36. A waiver to the Design and Construction Manual shall be required for the release rates specified in the report. In general, a waiver can only be granted in those instances on the "fringe" areas where the post-development peak flow rates are less than the pre-development peak flow rates. We typically grant these waivers when a 20% or more reduction in peak flows can be demonstrated. A specific form shall be provided to you following submission of a revised report.

37. One sheet is provided in the appendix for "Water Quality Event Extended Release". It is in the form of a graph of elevation, volume, and flow versus time, with no other information concerning the design of the orifices. The body of the report did not appear to discuss the 40 hour extended detention requirement, and how this would be achieved.

38. As indicated above, a revised stormwater study and detention study is required. A waiver is also required on a form provided by the City, but will need to be submitted when the revised stormwater report has been accepted. This revised report should be referenced in the waiver request, which shall be reviewed

by the City Engineer. A template form for this waiver shall be provided when a revised stormwater report has been submitted and accepted by the City.

39. Sheet 29 of 33: Surface asphaltic concrete type must be called-out. It should be either type 5 or 6. The base course shall be called-out as Type 5.

40. Sheet 29 of 33: All of the typical sections are incorrect. There are options showing biaxial grid, but the other option shown to the right shows no subgrade stabilization. It only shows compacted subgrade. Revise the typical sections to meet our standard. Also, where biaxial grid is used, either 10 inches or 12 inches of MoDOT Type 5 aggregate is required, not 7 inches, and not 6 inches. If using chemically-stabilized subgrade, then 6 inches MoDOT Type 5 is acceptable. Finally, a dimension call-out must be provided for the area one (1) foot beyond the back of curb. As shown, it is not clear.

41. Sheet 30 of 33: Curb and gutter replacement details should be removed from the plans. Where on this project will curb and gutter be removed and replaced? If none, please remove this detail.

42. Stationing must be provided on all typical street section views (i.e., from sta to sta). In addtion, why is CG-1 curb and gutter called-out when CG-2 is appropriate? Finally, there is an instance where the street near M-150 should be classified as a commercial collector, and the pavement design standards are different than residential street design. Provide a typical section view for this commercial collector, and provde a design which matches the requirements shown in Table LS-2 of Section 5200. The base course of asphalt and the chemically-stabilized subgrade requirements differ from the residential street standards for this segment of Cobey Creek Dr.

43. Please see the most recent update to Table LS-2. Although surface course thickness has not changed since the last revision, the base course has been increased for residential collector streets.

44. On the section views for the roadway, please indicate whether each segment is a residential local,residential collector street, or commercial collector street.

45. Sheet 28 of 33: Show the maximum water level in the detention basin for the nominal (i.e., unclogged, system functioning normally) event. Also, show the maximum water level for the 100% clogged, zero available storage event.

46. Please be aware that as-built Record Drawings of the detention basin shall be required prior to issuance of a Certificate of Substantial Completion.

47. Sheet 2 of 33: Provide revisions to the general layout sheet to reflect changes to the water main discussed in the water main plan comments.

48. Master Drainage Plan Comments: Corner elevations were missing. At a minimum, existing and proposed

corner elevations are required to the tenth of a foot.

49. Master Drainage Plan Comments: Contours should be labeled with elevations for not only the existing condition, but the proposed condition.

50. Master Drainage Plan and General Storm Comment: Addtional storm structures are required in the rear lots of along Riley Way and Carter Rd. Our general rule of thumb is no more than 4 upstream lots without installing an underground storm system to manage stormwater. The same comment applies to the lots on the west side of Corbin Dr. Finally, see previous comments about the lots on the east side of Corbin Dr. The same comment applies to these lots. Without an underground system, downstream lots will be subject to yard flooding.

51. Master Drainage Plan: Sheet 2 of 4 is missing street name labels.

52. Master Drainage Plan: The maximum water surface elevation within the basin must be shown for the nominal condition. Also, the clogged condition, zero available storage elevation must also be shown. This can be in the form of a note.

53. Master Drainage Plan: MBOEs must be called-out for all lots within the development. It appears several are missing. Please be aware of the previous comment which allows for the establishment of sideyard MBOEs, and subsequent interpolation between the two in the instance of a rear yard swale. Sufficient notes should be provided on the Master Drainage Plan which indicate to the plot plan reviewer, that interpolation is allowable if appropriate.

54. Master Drainage Plan: Swale typical section views are provided for only one (1) swale along the east end of the development. Is it appropriate to provide additional section views for the temporary swale shown? Also, it would appear additional overflow swales are necessary along the rear yards along Riley Way and Carter Rd., after installation of underground stormwater conveyance systems. Swale details should also be provided for these features.

55. The Roadway Segments Classified as a Commercial or Residential Collector: A minimum of 60 feet right of way is required for collector streets. Sidewalks are required on both sides of the collector, whether it is residential or commercial collector. Pavement width should be wider than shown, with a proposal from the engineer on the width. Typical widths for these collector streets have been from 36 to 40 feet back of curb to back of curb, but this should be confirmed with the City Traffic Engineer. Typical section views should also be provided for these segments, with pavement design details matching Table LS-2 in Section 5200 of the Design and Construction Manual. Finally, HDPE pipe is specifically prohibited in cross-pipe installation beneath collector streets. Please see Section 2602.2D(5) of the KCAPWA for this prohibition.

56. Other Detention Basin Comments: There is no provision or design for a sediment forebay. With the relatively flat slope on the bottom of this basin, it would appear that a sediment forebay could be designed with a minimum of effort.

57. Emergency Spillway Design and Placement: The location and discharge for the emergency spillway serving the dry detention basin must be placed in an area which will have no adverse impact on dowstream property owners.

58. Sheet 10 of 33: Is there a particular reason O1-D junction box and associated storm line is so deep? This will be a potential maintenance issue for the City. It is shown at a depth of 18 feet.

59. General Comment Related to the 60 inch HDPE Line at O1-D: It appears the calculations are very tight concerning the 10 year event. Given the fact that rainfall data has been recently updated with Atlas 14, wouldn't it be prudent to provide a better margin of error? As designed, the pipe is flowing at capacity for the 10 year event, with no allowance for error.

60. The same comment above would apply to Storm Line 15 and 16 shown on Sheet 16 of 33. There appears to be no margin for error, and it appears the old rainfall data was used.

Traffic Review

1. The sag vertical curve on Cobey Creek Drive, K=23.18, does not meet the minimum design standard.

2. The sag vertical curve on Aspen Drive, K=22.59, does not meet the minimum design standard.

3. Provide a signing plan and standard details.

In order to calculate the Engineering Plan Review and Inspection Fee, a sealed Engineer's Opinion of Probable Construction Costs shall accompany your final submittal copies. The itemized estimate (material and installation) shall be sufficiently broken down and shall include the following items, as applicable.

- Public infrastructure, both onsite and offsite.
- Private street construction, including parking lots and driveways.
- Sidewalks located within the right-of-way.
- ADA accessible ramps.
- Sanitary sewer manholes and piping between manholes, including private mains.
- Connection of the building sanitary sewer stub to the public main.
- Waterlines larger than 2 inches in diameter, valves, hydrants, and backflow preventer with vault, if outside the building.
- Stormwater piping greater than 6 inches in diameter, structures, and detention / retention facilities - public or private.
- Water quality features installed to meet the 40-hour extended duration detention requirements.
- Grading for detention / retention ponds.
- Grading to establish proper site drainage.
- Utility infrastructure adjustments to finished grade (i.e. manhole lids, water valves, etc.).
- Erosion and sediment control devices required for construction.
- Re-vegetation and other post-construction erosion and sediment control activities.

Electronic Plans for Resubmittal

All Planning application and developmrnt engineering plan resubmittals shall include an electronic copy of the documents as well as the required number of paper copies.

Electronic copies shall be provided in the following formats

- Plats – All plats shall be provided in multi-page Portable Document Format (PDF).
- Engineered Civil Plans – All engineered civil plans shall be provided in mulit-page Portable Document Format (PDF).
- Studies – Studies, such as stormwater and traffic, shall be provided in Portable Document Format (PDF).

Please contact me if you have any questions or comments.

Sincerely,

Original Signed

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Senior Staff Engineer
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cc: Development Engineering Project File