LEE'S SUMMIT
MISSOURI

DEVELOPMENT SERVICES

Date: Friday, April 12, 2019

To:

HG CONSULT, INC
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Fax #: <NO FAX NUMBER>

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

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

The Development Services Department received plans for this project on Mar. 29, 2019. 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 ten (10) business days of the date received.

Engineering Review

1. The Final Drainage Report - Phase 1 dated Mar. 29, 2019 (hereinafter referred to the drainage report) contained a discrepancy in the quoted flowline elevation of the 4x21 inch orifices in the north detention basin elevation when compared to the plans. The elevation called-out on the plans is 970.45 versus 970.30 in the report.

2. Why were the PondPack setup summaries missinig from the appendix? There must be summary sheets provided within the appendix which show the pond setup, such as the orifices used, the elevations of the orifices used, weirs used, weir elevations, timestep or time interval used, hydrograph used, the outlet pipe used including the diameter, length, etc.? The only information provided in the appendices were summaries of results, with no corresponding assumptions provided.

3. The north detention basin will be providing 40 hour extended detention. Please ensure that the 2-8 inch diameter orifices shown at the bottom of the structure were eliminated from the model run (i.e., removed from the routing procedure) during the routing calculations. According to the plans, these orifices are to be sealed-off after the skimmer is disconnected, and with such a large volume of stormwater, it appears this orifice was included in the routing calculations? We are concerned that 4x2 inch openings and 8x1 inch openings will be insufficient to act as a 40 hour extended detention basin for

such a large volume of stormwater (i.e., the basin would appear to act more like a week long extended basin, which is not the intent of the 40 hour extended detention requirement). The basin should be drained within 40 hours to ensure there is adequate storage volume for subsequent storm events.

4. Within the body of the drainage report, there is a very brief discussion of the orifices included in the outlet structure serving the north detention basin. However, there is no discussion of the weir at the top. There is only a statement that "the top of the risers were set at an elevation of 973.00". Was this included as part of the routing calculations in the form of a circular weir that also acts as an orifice? Is the 48 inch outlet pipe serving each outlet structure going to be sufficient to manage the 100 year peak flows? If so, where is this shown in the PondPack setup? There are concerns that these 48 inch RCP outlet pipes will be insufficient to manage the 100 year flows, which is a requirement of the Design and Construction Manual.

5. The drainage report briefly discusses the "Post-Development 100 year Spillway" in Section 8. Do you mean the emergency spillway? This section also states that 1 foot of freeboard is provided. What is the clogged condition/zero available storage 100 year water surface elevation, and where in the appendix is this found? We found a reference in the appendix under "PondPack Spillway Output", and are assuming this is the emergency spillway. If so, please make appropriate changes to the report. Finally, the emergency spillway does not appear to comply with TR-60. TR-60 requires that emergency spillways be located away from the dam. As designed, the emergency spillway IS the dam. TR-60 allows for the following: 1) dams with drainage areas less than 10 square miles may be served by an emergency spillway (i.e., specified as "auxiliary spillway" in TR-60) with a closed conduit, with a cross-sectional area of 20 square feet or more, with an inlet that "will not clog", an "elbow designed to facilitate the passage of trash and large enough to pass the routed freeboard hydrograph peak discharge without overtopping the dam". This design alternative appears to be the only way to provide a an emergency spillway for this basin. It will require a complete re-design of the outlet structures for the north detention basin.

6. The drainage report discusses rip rap design for the north detention basin outlet. Ater consulting internally with staff, additional measures must be designed and constructed for this discharge point. A stilling basin, or other structure to create a hydraulic jump at the discharge point is warranted given the sizing, and numerous field-tested designs are available from the Federal Highway Administration. This issue has been discussed with management, including the Department Director, who is seriously concerned about the potential for adverse impact to the adjacent property owner(s), as well as impact to the stream.

8. Section 11 of the drainage report discusses "various openings" in the outlet structure serving detention pond 3, with no sizing, elevations, or references within the appendix showing how this was set up in PondPack (see previous comments about the lack of the PondPack set up summaries that are normally supplied). In addition, this section states that the detention basins were "designed per APWA 5600 standards". However, according to Table 6.5 on Page 5 of the drainage report, it appears the allowables at this point will be exceeded by a high margin. According to Table 6.5, the allowable at EX1 is 15, 43, and 68 cfs for the 2, 10, and 100 year events respectively. Table 7.1 on the same page appears to show the post-development discharge at P1 to be 29, 59, and 85 cfs respectively for the 2, 10, and 100 year events. All of these are significantly higher than the allowables presented on Table 6.5.

9. Wet retention basins are subject to different design standards. In particular, the ponds are too shallow. Although the Design and Construction Manual states that four (4) feet is the minimum depth, the manual also requires a sedimentation allowance. It appears no allowance was given for sedimentation.

10. The drainage report discusses a waiver to the Design and Construction Manual for the freeboard requirement on the southern detention basin. What is the rationale for this waiver request? Are these basins mainly "cut" rather than a "dam" being constructed? It appears this is the case, and as such, no waiver would be required since there is no "dam". Please discuss within the report, and provide justification in the body of the report.

11. South Wet Retention Basins: Please discuss why emergency drawdown (i.e., drain, etc.) was omitted from the design. Please see above comment concerning "cut", and discuss why this may or may not be necessary based on your opinion.

12. Sheet 43 of 50: The south detention release structure section view should be revised to show the normal pool elevation upstream of the structure. As shown, it appears to be at ground level, not the normal pool elevation.

13. Sheet 43 of 50: How will 6x12 inch openings set at the normal pool elevation act to provide 40 hour extended detention? It would appear this will not provide 40 hour extended detention for the 1.37 inch event.

14. Sheet 43 of 50: Manholes are specified for the riser structures, but no details are provided. Where are the steel reinforcement details? Finally, the concrete base for the south outlet structure and the north outlet structure was missing the details for construction (e.g., similar to the details provided for the temporary PVC riser structure).

15. Will the outlet structures be in a region of pressure flow for the 100 year event? If so, an anti-vortex device must be installed as per TR-60.

16. The last "response to comments" letter (i.e., response #52) received on Mar. 29, 2019 states that "...water line plans have been resubmitted". We have not received the resubmittal for the water line plans. Also, we have not received a resubmittal on the sanitary sewer plans, which were apparently altered in response to the re-design?

17. Why is silt fence being used in the middle of the sedimentation basin? Wouldn't this prevent the basin from doing its job? It would also appear to create adverse impacts to adjacent property owners, by diverting sediment-laden stormwater to adjacent properties. The note states that it will also be used to "stabilize the slope". If slope stabilization is desired or necessary, then provide a different mechanism for this to occur without preventing sediment-laden stormwater from the entering the basin.

18. In the pre-clearing phase of erosion and sediment control, please add silt fencing along the south side, south of where the 3 drainage basins are going to be located. This needs to remain in-place and be maintained until final restoration.

19. Consistency should be maintained in the contour intervals shown for the sedimentation basin. Currently, there are 1' contours in some areas and 2' in others. The detention basin detail would appear to need 1 foot contours throughout. Also, the 978 contour along the berm on the east side of the basin stops, and branches off in two separate directions, which does not appear valid. Should the 978 contour continue around the pond and tie in on the NW side of the pond? Please clarify and adjust, because as shown, it does not appear to make sense.

20. It is impossible to read the existing contour elevation call-outs and slope percentages on sheets 36-39. Adjust line weights throughout the plan set to make the elevation call-outs legible.

Traffic Review

1. Revise all the end of road signage from Barricades w/Road Closed (a temporary traffic control device) to a typical end of road treatment using 4 evenly spaced object markers.

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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cc: Development Engineering Project File