

**Date:** Tuesday, April 13, 2021

**To:** HG CONSULT, INC  
Kevin Sterrett, P.E.  
9007 PINE ST  
LENEXA, KS 66220

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

**Application Number:** PL2018209

**Application Type:** Engineering Plan Review

**Application Name:** Cobey Creek 1st Plat - Street, Storm, and Master Drainage Plan As-Built  
Comments

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The Development Services Department received as-built drawings for this project on Apr. 6, 2021. We have completed our review and offer the following comments listed below.

### **Engineering Review**

1. MBOE tables for the lots along the entire length of the diversion berm do not appear realistic for home construction. For instance, if using the MBOE table for Lot 8, the driveway is going to be 25%+/-, and perhaps even higher when placing other openings such as egress wells, daylight basement windows, etc. This appears to be the case for all lots abutting the diversion berm. Recommend a re-evaluation of all MBOEs along the diversion berm.
2. Recommend re-evaluation and re-design of the diversion berm. If 2.0 feet of freeboard can be maintained between the 100 year WSE from off-site drainage area and the top of the diversion berm in all instances along the diversion berm, no MBOEs are needed for these lots unless adjacent to or affected by the 100% clogged condition zero available storage elevation within the north detention basin (lots 30 and 12?), or surcharging out of inlets during the 100 year event. Plot plans may be reviewed according to "good lot grading practice" in these instances, unless adjacent to the north detention basin or affected by surcharging as described above. A redundant emergency overflow swale would not be specifically required if the 100 year HGL in the 60 inch pipe does not surcharge out of the top of field inlets, unless desired by the engineer and developer. See comment #9 below for specific citation concerning emergency overflow route.
3. Recent field visit on Apr. 12, 2021 showed field inlet weirs in the rear of the lots along the emergency overflow swale. were installed higher than the emergency overflow swale by approximately 1.75 feet. What is the purpose of these weirs if stormwater cannot enter the structure?

4. There were 14 separate measurements on the as-builts obtained along the 730 foot long diversion berm. All were designed with a specific cross-sectional shape (i.e., trapezoidal with a 3 foot flat bottom). None of the as-built contours show a flat bottom channel, but rather, a v-bottom swale. Visual inspection confirmed the v-bottom swale.
5. Of the 14 separate measurements along the diversion berm, 8 of them showed low spots that were less than the 2.0 feet design height. The as-built has been marked-up and is attached showing their locations.
6. Recommend additional elevation shots along this critical drainage structure (i.e., the diversion berm draining a large off-site area). As shown, it appears they were collected at 50 foot intervals, which appears excessive for a critical structure such as a diversion berm. Without a functioning diversion berm with minimum elevations as designed, the potential for overtopping is high along with yard flooding or structure flooding concerns.
7. None of the diversion berm tops were constructed per plan. A 3 foot flat spot (i.e. with 2% slope from the c/l) on top of the berm was shown on the construction drawings, but a rounded top was provided as per the as-builts. Recent field visit confirmed the rounded top. This will affect the long-term integrity of the diversion berm.
8. Elevation shots were not provided on the extreme north portion of the diversion berm after it discharges to the receiving area beyond the last field inlet O1-B. Stormwater from the drainage area upstream of the diversion berm was specifically designed by the engineer to bypass the north detention basin, and the as-builts shall provide evidence this is occurring as planned. Recent site visit suggested the diversion berm was too low beyond O1-B, which would introduce stormwater into the basin which was not planned by the engineer, nor accounted for in the stormwater calculations.
9. It may be beneficial to re-evaluate your emergency overflow swale along the 60 inch pipe in terms of applicability to Section 5601.5.A.(3)(a). A spot check of your calculations of 100 year flow within the 60 inch pipe would suggest a misinterpretation on the part of the engineer concerning the requirements contained therein. The following excerpt is provided for reference: 5601.5.A.3 Overflow Systems: Overflow systems shall: a. Be designed to route downstream any amount of the 1% storm exceeding the in-system design capacity specified in Section 5601.8.
10. Recommend resubmittal of the Master Drainage Plan after a re-evaluation discussed in comments above.
11. The original as-built dated Feb. 19, 2021 was missing the backside of the north detention basin dam elevations and contours. The most recent as-built included this information. The backside of the dam was built steeper than the design slope of 3:1. Slopes from 2.2:1 in the most critical location (i.e., the highest point of the dam in terms of relief between the pre-existing ground elevation in the northeast corner, extending all the way around this area), to 2.7:1 over the other areas along the east backside of the north

detention basin are shown. Re-grading would appear warranted to eliminate dam failure concerns, along with a new as-built following completion of grading.

12. The City would consider your recommendation to raise the north basin outlet structure top weir elevation to achieve compliance with the 2, 10 and 100 year storm events (i.e., within 3% of the allowable release rate for the 2 year event, and below the allowable for the 10 and 100 year event as stated in the “As-Builts Storm Report” dated Apr. 6, 2021), as well as re-grading of the emergency spillway to achieve the required 0.5 feet of freeboard between the nominal 100 year WSE and the crest of the emergency spillway. However, this will require an analysis of the upstream storm line calculation table on Sheet 20 to account for the increased HGL within the detention basin. Two (2) storm lines near the discharge point (i.e., 60 inch and 48 inch HDPE) are flowing under outlet control for the majority of storm events, and changes to the WSE within the basin will have a significant effect on the HGL of the pipe. The 10 year event should be contained at or below the crown of the pipe(s) as shown on your approved design (unless waived by the City Engineer), with an overflow route established for the excess above and beyond the 10 year event that might surcharge out of the top of inlets up to and including the 100 year event. Please see Section 5601.5.A.(3)(a) of the KCAPWA manual (adopted by reference by City of Lee’s Summit) for the specific reference.
13. “As-Built Storm Report” dated Apr. 6, 2021 was missing the following items: 1) quantifiable analysis of the impacts to the designed water quality storage and release due to unapproved changes to the outlet structure during construction, and 2) quantifiable analysis of the freeboard requirements between the 100 year WSE (clogged/zero available storage) and the top of the dam (low point of top of dam) for the proposed condition with the 7 inch riser installed and spillway re-grading.
14. Recommend a meeting with engineer, contractor, and developer to discuss issues related to all of the above comments. Some of the comments above relate to construction issues (i.e., grading not completed per plan), while others relate to design issues discussed in the above comments.

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### **Electronic Plans for Resubmittal**

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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 and As-Builts– 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,

/s/ Gene Williams electronically signed Apr. 13, 2021

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cc: Development Engineering Project File