

**Date:** Wednesday, March 20, 2019

**To:**

HG CONSULT, INC

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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, Storm, MDP, and Land Disturbance

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The Development Services Department received plans for this project on Mar. 12, 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 five (5) business days of the date received.

**Engineering Review**

1. The SWPPP is incomplete. Please update so that it is in alignment with the plan set.
2. The plans show only one phase of land disturbance. Is this correct? Should it be separated into multiple phases? Where is the final restoration plan?
3. The legend is missing silt fence on sheet 37. There are line types that are identical on sheet 38 (silt line & diversion berm). Please clean up each legend and show a difference in linetypes.
4. Please provide KCAPWA standard details for all erosion and sediment control devices and measures used on this project.
5. The "Final Drainage Report - Phase 1" dated Mar. 7, 2019 (hereinafter referred to as the drainage study) is lacking a presentation within the discussion section, as well as the appendices showing the details concerning the orifice/weir configuration of the outlet structure(s). These details should specify the diameter of any orifices, and length of any weirs used in the outlet structure. As discussed in the report, only the orifices for the 40 hour extended detention are discussed.
6. The MARC manual requires either a perforated riser or v-notch weir in the case where the calculated

orifice diameter is less than 4 inches. It appears that four (4) x 2 inch orifices are proposed, which does not comply with MARC manual requirements.

7. Where in the drainage study are the MARC manual worksheets for calculation of the method to be used for 40 hour extended detention? Please include these worksheets in the revised report.
8. Discussion within the drainage report should match what is shown in the appendices concerning identification of each detention basin. There are references in the appendices to "detention pond", "pond 1", "pond 2", and "pond 3". Plan sheet 3 of 49 is vague, since it only refers to "south detention basins" (although it does refer to Sheet 31 later in the plan set). Please be specific in the discussion section concerning these features.
9. Is 40 hour extended detention within the "south detention basins" being ignored? If so, why? This would appear to contradict page 5 of the drainage study where it states "...the detention facility will release the water quality event over a 40 hour period".
10. Page 27 of the appendix presents the results of the "detention pond" (we are assuming the north detention basin). Please provide specific labels on this graph showing which detention basin this graph represents. Finally, it does not appear that 40 hour extended detention is being achieved as shown on the elevation versus time graph. Isn't this more like 34 hours?
11. The same comment above would apply to all graphs and tables shown in the appendix. Please clarify which table or graph corresponds to each basin (i.e., north detention basin, detention basin 1, etc.).
12. Sheet 39 and 42 appear to be duplicate sheets.
13. Sheet 39 (and 42): This sheet is insufficient for purposes of construction and inspection. While we feel this is a good first step, typical installations of this type utilize the manhole as a "protection element" (i.e., to protect an interior riser structure with weirs and orifices) from damage due to vandalism. We have typically seen weir slots provided in the manhole to allow entry of stormwater, but the actual control riser assembly being installed within the manhole.
14. Sheet 39 (and 42): Placement of filter fabric across the orifices as shown is not an adequate anti-clogging measure. If constructed in this manner, it is likely the basins will clog during the first significant storm event. There are numerous methods that are available for anti-clogging, but this is not one of them. Even if the filter fabric were never to experience clogging by fines and silts, the placement of a semi-permeable barrier across the orifices will have a significant impact on the routing calculations.
15. In accordance with TR-60, RCP should be specified for the outlet pipe past the riser. As shown, HDPE is specified.

16. Additional Comments Concerning the Outlet Structure: Not only a section view is needed, but also a plan view. Any grated tops should also include details concerning the grate type. All details necessary for construction and inspection are required.
17. Sheet 40 of 49: It is our understanding that Cobey Creek Dr. from M-150 to Gillette is classified as a "Commercial Local"? Please add this to the typical section view for "Commercial Local".
18. Sheet 46 of 49: Signage Plan is missing "end of road" locations and details for both ends of Gillette St., Jud Rd., Cobey Creek Ln, Corbin Dr., and Cobey Creek Dr. In addition, Cobey Creek Ln., and Jud Rd. were not labeled.
19. General Comment Concerning Sidewalk Construction: The plans are vague in terms of what sidewalks will be constructed during Phase 1. We could not identify any notation within the plans showing the locations where sidewalks and ADA-accessible ramps will be constructed. As shown, it appears all of the sidewalks will be constructed with the development. This is acceptable, but not necessarily required.
20. Sidewalks must be constructed along all platted tracts. It appears sidewalk construction must be included within Phase 1 along the north end of the future Corbin Dr., along Tract H. The same would apply to sidewalk along Tract D, along the future extension of Cobey Creek Dr.
21. It appears the emergency spillway for the north detention basin is approximately 550 feet in length. This appears excessive. The drainage study also discusses lining this emergency spillway with rip rap, which does not appear to be shown on the plans. The emergency spillway also appears to be shown extending along the eastern side of the north detention basin, and extending around the north side of the detention basin. Is this appropriate for an emergency spillway design? Will a large emergency spillway in terms of length jeopardize the integrity of the dam? It would appear this emergency spillway length represents around 40% of the perimeter of the dam.
23. Sheet 30 of 49: The 18 inch HDPE discharge pipe at the end of storm line 2 is shown with zero slope. How is this going to work?
24. Sheet 30 of 49: Rip rap is specified at the end of storm line 2 (i.e., the discharge point for the north detention basin). However, it is not called-out correctly in terms of sizing, filter fabric, approximate cubic yards (i.e., it specifies D50 size rip rap, width, length and depth). Please specify the D50 sizing so there is no confusion, interpretation, or additional information needed during construction. In general, the following notation is the minimum amount of information required for rip rap placement: "Install xx.x cubic yards (xxW by xx L by xxT) stone rip rap using a minimum xx inch stone. Place filter fabric prior to installation of rip rap."
25. Sheet 30 of 49: Rip rap notes, in accordance with the above comments, were missing for the other two (2) entry points on the south end of the detention basin.

26. Sheet 13 of 49: Our calculations show the rip rap at the north end of storm line 5 would be better suited with a 16 ft long, by 8 foot wide, by 1.5 foot thick layer of 12 inch rip rap over filter fabric. This would correspond to approximately 7 cubic yards. Please re-check your figures, and provide the minimum notation concerning the placement of this rip rap.
27. Sheet 1: The index of sheets appears to show Sheet 39 as corresponding to a "sedimentation pond detail". This sheet is actually a redundant detention basin outlet structure detail sheet.
28. Sheet 2 of 49: Sidewalks should be extended along all platted tracts (i.e., Tract D and Tract H) to the end of the future road extensions. Please see previous comments concerning this issue.
29. Sheet 2 of 49: The note at the bottom should be updated to reflect the curb and gutter type for Cobey Ln.
30. Sheet 2 of 49: Please consider naming each detention basin in accordance to the naming convention used in the revised drainage study. Please see previous comments related to the requirement that a revised drainage study be submitted.
31. Sheet 3 of 49: Please add a street name label for Jud Rd.
32. Sheet 4 of 49: Aspen Dr. is called-out on one of the notes. Please update since it does not appear Aspen Dr. is part of these plans.
33. Sheet 4 of 49: Do the MoDOT plans include the ADA-accessible ramp details at the intersection of M-150 and Cobey Creek Dr.? If not, these should be included in the MoDOT plans.
34. Sheet 5 of 49: Sidewalk should be shown extending along Tract D along the future extension of Cobey Creek Dr. It must be extended the entire length of Tract D.
35. Sheet 5 of 49: The street profile view of David Rd. does not appear to include the ADA-accessible route across the intersection. As shown, there is a constant 2.8% slope called-out, with no provision for the 1.5% cross-slope, 5 feet wide across the stop-controlled intersection.
36. Sheet 6 of 49: The ADA-accessible ramp on the northwest corner of Gillette St. is still shown without a receiver ramp (i.e., it is shown as a uni-directional ramp). This should be shown similar to the ADA-accessible ramp on the southwest side of Gillette St. to function as a receiver for pedestrian traffic.
37. Sheet 6 of 49: It does not appear the street profile view for Gillette St. shows the ADA-accessible route across Gillette St. near station 16+00. It appears 2.0% is called-out, but 1.5% is the maximum design cross-slope.

38. Sheet 7 of 49: Sidewalk must be constructed along Tract H, along the future extension of Corbin Dr.
39. Sheet 8 of 49: The ADA-accessible route across Carter Rd. does not appear to be shown on the profile view. It appears it shows 2.0% cross-slope, but the maximum design cross-slope for ADA-accessible routes across stop-controlled intersections is 1.5%.
40. Sheet 8 of 49: Ensure sufficient notes are provided to ensure the sidewalk is constructed along Tract E with the other subdivision improvements. As shown on the plans, ALL sidewalks must be constructed (i.e., we could find no notes specifying otherwise). However, this is not necessarily required. Please see previous comments concerning this issue. Only ADA-accessible ramps, and sidewalks along platted common areas must be constructed with the other subdivision improvements. If you desire to construct all the sidewalks, this is also acceptable, but not required.
41. Sheet 9 of 49: The street profile for Cobey Ln. does not appear to show the ADA-accessible route across the stop-controlled intersection. It appears to show 2.0% cross-slope at that location, rather than the maximum of 1.5% cross-slope.
42. Stormwater General Comment: Was the water surface elevation within the detention basin for the 10 year event taken into account for the calculation of the hydraulic grade line?
43. Sheet 21 of 49: If only installing the ADA-accessible ramps, where is the start and end of construction? The details are vague.
44. Sheet 21 of 49: Dimension call-outs are needed for: 1) the distance between the end of the tactile warning and the back of curb, 2) width of the ADA-accessible route across the intersection.
45. Sheet 21 of 49: a 2% maximum running slope is shown on typical section A-A. What does this represent? Within right of way, running slope is not limited to 2%. It is limited to the existing street grade.
46. Sheet 21 of 49: The northwest corner ramp is not shown with a receiver ramp to accept pedestrian traffic from the southwest corner. Why was this omitted?
47. Sheet 22, 23, 24, 25, 26, 27, 28, and 29 of 42: The same comments concerning dimensioning and Section A-A should be addressed on these sheets.
48. Sheet 30 of 49: A note shows a 500 foot spillway. We measured a distance which is considerably longer than 500 feet. The bigger question, however, is whether this is a good idea (i.e., to install an emergency spillway which covers a significant percentage of the available perimeter of the dam).

49. Sheet 33 of 49: The MBOE table should be relabeled as "Lot Corner Elevations and MBOEs", or equivalent language. These tables present more information than MBOEs, and as such, should be titled differently.
50. Sheet 34 of 49: The same comment above pertains to this sheet.
51. Sheet 33 and 34 of 49: The note concerning the construction of swales needs revision. All swales shown on the Master Drainage Plan should be constructed during Phase 1. The City will not allow for piecemeal construction of swales during the plot plan review process. This has created issues in the past, and does not follow the Design and Construction Manual.
52. Although these plans do not include the water line, the placement of the storm sewer in relation to the water line will create a potential issue. We had originally looked at the possibility of allowing the construction of an insulation layer around the pipe, provided the depth of cover was not too shallow. It appears there are instances where the cover is very shallow, and in at least one case, less than 2 feet of cover is provided for the water line. It is unclear why storm lines and/or sanitary sewer lines were placed so shallow as to prevent the installation of water lines to meet the 42 inch cover requirement in the three (3) shallow locations shown on the water line plans. We realize that there may be sanitary sewer conflicts, but our analysis shows that the sanitary sewer can be lowered to make room for the storm sewer lowering, and in at least one condition at curb inlet O5-A, it appears no other adjustment is needed other than lowering the storm lines/curb inlets/boxes. This appears to be the case for curb inlet 12-D, curb inlet O1-F, and curb inlet O5-A. A combination of lowering the storm line and lowering the sanitary sewer line should enable the placement of the water line to the required depth.
53. Concerning the above comment, we had originally stated that consideration would be given to allowing for substandard depth of cover over the water lines at selected locations contingent upon no other engineering solution being available. It appears there are other alternatives available to achieve compliance with the depth of cover rule. By far the biggest potential issue is the northernmost crossing, where the depth of cover is less than 2 feet, and the line is at a dead end, with no flow. This line will likely freeze.

## **Traffic Review**

1. End of road signage is needed at all stubs, and at the end of all road construction.
2. A speed limit sign was missing along Cobey Creek Dr., between M-150 and Gillette St.
3. At station 10+30 on Cobey Creek Dr., it appears the sag k value is too low. The minimum k value for a commercial local street is 30.

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**

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All Planning application and development 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 multi-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