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Franny Henty
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Dear Ms. Henty,

I am writing in response to your question regarding the finding of another blocked stormwater pipe in the vicinity of the proposed Central Park development by James Mazyck (see Figs. 1-2). This is an 18-inch stormwater pipe at the northwest corner of Flint Street and Central Park Road that is three-quarters full with mud and dead vegetation (see Figs. 1-2). No water was visible in the pipe as seen through the adjacent stormwater drain on Central Park Road (see Fig. 1). If the stormwater pipe were not blocked, presumably stormwater would flow southeastward through the pipe and under Central Park Road (see Fig. 2). A video of the blocked pipe was made on April 22, 2021, and is available online at this link:

<https://www.youtube.com/watch?v=htGCOtyAThA>.

I understand your question to be the following: Does the discovery of this additional blocked stormwater pipe affect the validity of either the Seamon-Whiteside or the AECOM stormwater models? In other words, do either the Seamon-Whiteside or the AECOM stormwater models include this pipe and assume that the pipe is unblocked?

For context, I would like to repeat two points that I have made in previous memos. The first point is that both the Seamon-Whiteside and the AECOM stormwater models assume that all stormwater pipes are in ideal condition, that is, free of any mud, debris, breakages, cracks, etc. This information was provided to me by Matt Fountain, Director of the Charleston Department of Stormwater Management, during our meeting on September 3, 2020. It is not necessary to make this assumption, even without a detailed knowledge of the condition of each pipe. For example, one could assume a typical condition for each pipe, for example, that each pipe is 90% free of mud and debris. It would be more typical to assume a range of conditions (100% free, 90% free, 80% free, etc.), so as to determine the sensitivity of the outputs of the stormwater models to the condition of the pipes. The Seamon-Whiteside and AECOM stormwater models used only one end member, that is, all pipes are 100% free of blockages. The second point is that the AECOM model is not independent of the Seamon-Whiteside model. The AECOM model was based upon the engineering drawings by the consultants for the various developers in the Central Park watershed, including the stormwater model by Seamon-Whiteside for the proposed



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Central Park development. In other words, the AECOM model was created under the assumption that the proposed Central Park development already existed.

The location of the blocked stormwater pipe was compared with the drawings labeled Pre-Development Drainage Map (see Figs. 3a-b) and Pre-Development Off-Site Basin Map (see Fig. 4) from the document by Seamon-Whiteside dated August 11, 2020, and entitled “Drainage Report for Central Park Cluster Development” (TMS# 340-03-00-007), and with the map of Area 3 Improvements (see Fig. 5) from the report by AECOM entitled “Technical Memorandum Subject: Evaluations and Recommendations for Central Park Project Area,” which is available at:

<https://www.charleston-sc.gov/DocumentCenter/View/27211/Central-Park-Tech-Memo---Compiled---Final---08072020?bidId=>

For comparison, note that Fig. 2 has a vertical north arrow, while the north arrows of Figs. 3a-b point to the upper left. Neither Fig. 4 nor Fig. 5 has a north arrow, although presumably Fig. 4 would have the same north arrow as Figs. 3a-b, while Fig. 5 would have a vertical north arrow (same as Fig. 2).

The blocked stormwater pipe is not shown on the stormwater infrastructure drawings for either the Seamon-Whiteside stormwater model (see Figs. 3a-b and 4) or the AECOM stormwater model (see Fig. 5). For that reason, the fact that the 18-inch stormwater pipe is currently blocked would not affect the output of either the Seamon-Whiteside or AECOM model because those models do not include that particular pipe, either blocked or unblocked. In fact, according to the drawings for the Seamon-Whiteside model (see Figs. 3a-b), the blocked stormwater pipe is outside of the pre-development drainage basins for the proposed Central Park development, so that the stormwater pipe should be irrelevant for drainage into or out of the site of the proposed development. Note that the drainage flow arrows in Fig. 3a point to the west (toward the lower left corner of the figure) and away from the location of the blocked pipe. It is not clear why the AECOM stormwater model, which covers a much greater area (see Fig. 5), does not include the blocked stormwater pipe, since, presumably, the pipe has not always been blocked and does not appear to be sealed or permanently blocked.

On the other hand, it is not clear why the Seamon-Whiteside model does not include the blocked stormwater pipe. The Pre-Development Drainage Map (see Figs. 3a-b) includes light gray surveyed contours that indicate stormwater flow to the ENE subparallel to Central Park Road and across the pre-development drainage basin boundary in the direction of the blocked stormwater pipe. Fig. 3a shows the contours without the drainage direction labeled, while Fig. 3b shows the drainage direction overlain on top of the contours. On that basis, the pre-development drainage basin boundary and the surveyed contours are inconsistent. In fact, the logic behind the



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construction of the pre-development drainage basin boundaries is not at all apparent, since the drainage basin boundaries ought to be parallel to the elevation contours, which is not the case anywhere on the drawing, neither for the light gray surveyed contours, nor the tan contours (based on Lidar measurements). This inconsistency between the elevation contours and the drainage basin boundaries and the lack of inclusion of the 18-inch stormwater pipe (blocked or not) draw into question the accuracy of the Seamon-Whiteside model, which has been discussed in previous memos.

The conclusions of this memo can be summarized as follows:

- 1) The stormwater models by Seamon-Whiteside and AECOM do not include the existence of the 18-inch stormwater pipe shown in Figs. 1-2. Therefore, their model outputs would not be changed in terms of whether the pipe is blocked or unblocked.
- 2) The fact that the AECOM model does not include the 18-inch stormwater pipe shown in Figs. 1-2 further emphasizes the lack of fieldwork that went into development of the model and its overreliance on engineering drawings created by consultants for developers.
- 3) The pre-development drainage basin boundaries in the Seamon-Whiteside model are inconsistent with both the surveyed contours and the contours based on Lidar measurements.
- 4) Based on the elevation contours, the 18-inch stormwater pipe shown in Figs. 1-2 ought to be within the pre-development drainage basin boundary.
- 5) The fact that the Seamon-Whiteside model did not include the 18-inch stormwater pipe shown in Figs. 1-2 further emphasizes the inaccuracy of the model.

Please let me know if I can help with anything else.

Best wishes,

Steven H. Emerman

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Figure 1. The left-hand photo shows a view to the southeast of an 18-inch stormwater pipe that is three-quarters blocked with mud and dead vegetation on the northwest corner of Flint Street and Central Park Road (see Fig. 2). The right-hand photo shows a view down the corresponding stormwater drain on Central Park Road that shows no water in the stormwater pipe. If the stormwater pipe were not blocked, presumably stormwater would flow to the southeast under Central Park Road (see Fig. 2). The left-hand and right-hand photos are stills from 0:16 and 0:34 of the video “Zeke just found another blocked pipe under Central Park Road” taken on April 22, 2021 and available online at <https://www.youtube.com/watch?v=htGCOtyAThA>.

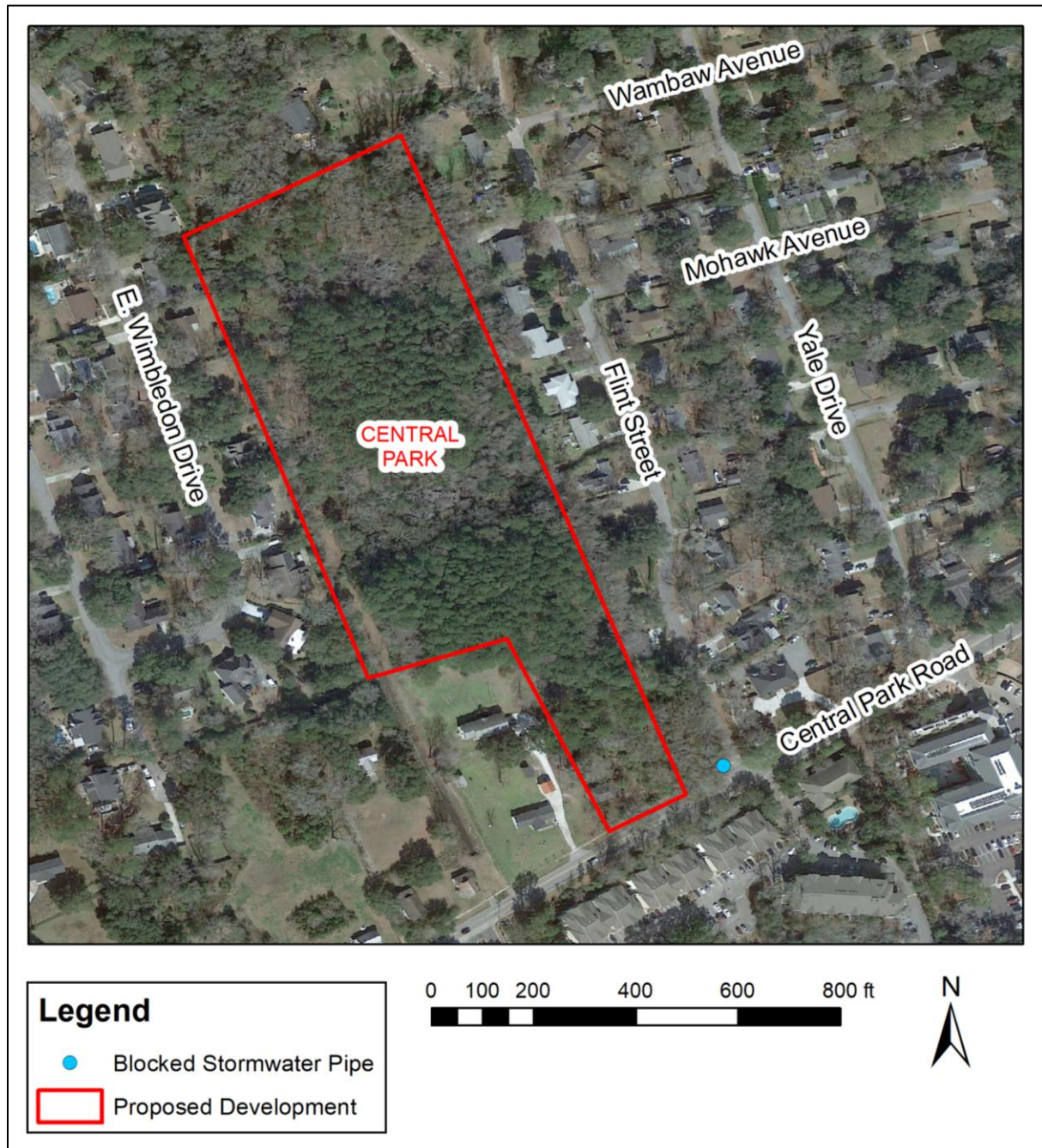


Figure 2. An 18-inch stormwater pipe on the northwest corner of Flint Street and Central Park Road is three-quarters blocked with mud and dead vegetation (see Fig. 1). If the stormwater pipe were not blocked, presumably stormwater would flow to the southeast under Central Park Road. Outline of proposed Central Park development from "Drainage Report for Central Park Cluster Development." Background is Google Earth image from January 28, 2021.

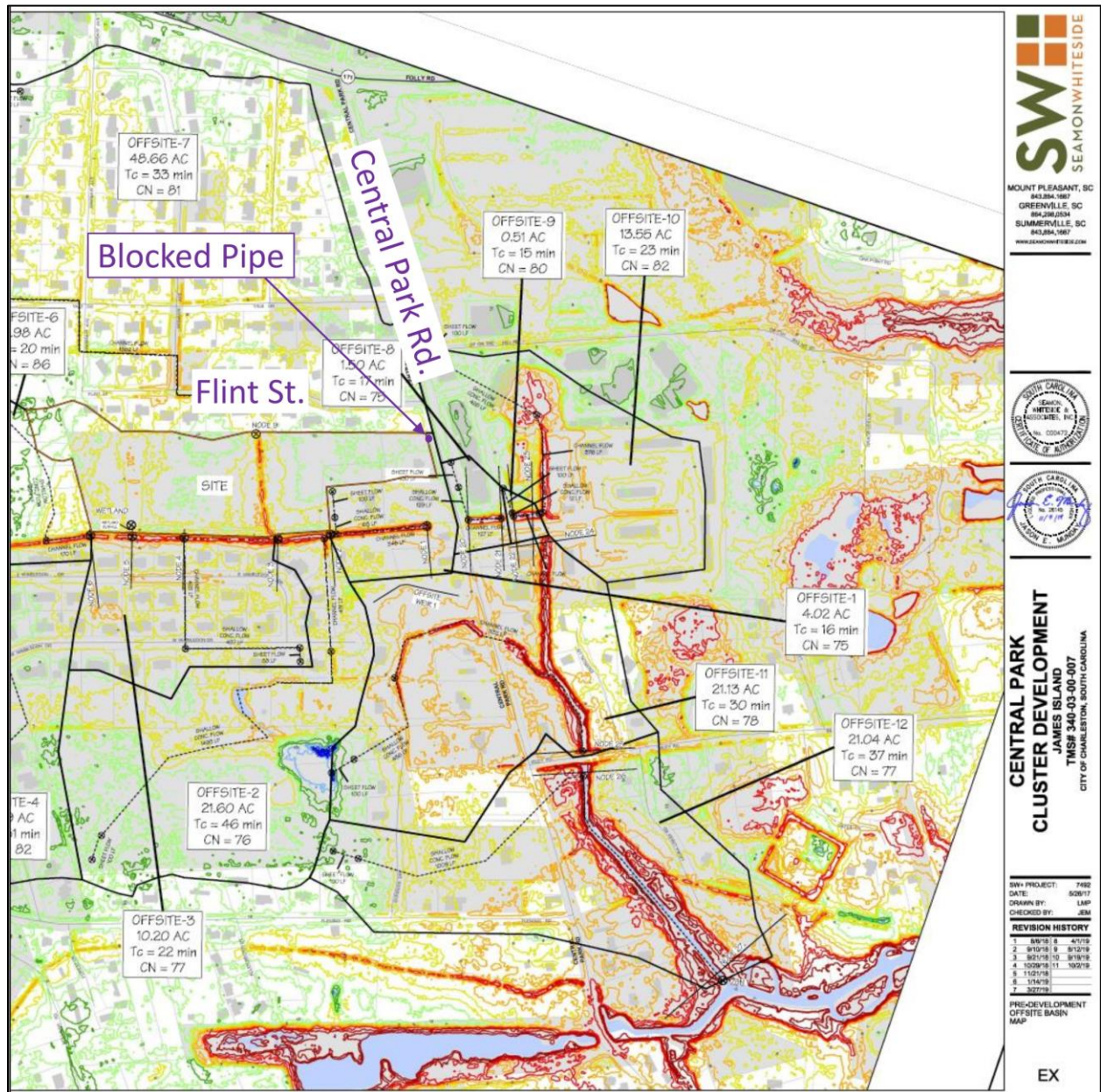


Figure 4. A portion of the Pre-Development Off-Site Basin Map from the document by Seamon-Whiteside entitled “Drainage Report for Central Park Cluster Development” does not show the blocked 18-inch stormwater pipe (see Figs. 1-2). All additional information on the map (street names and blocked pipe location) is in amethyst. The map does not include a legend, scale bar or north arrow. The north arrow should probably be the same as in Figs. 3a-b.

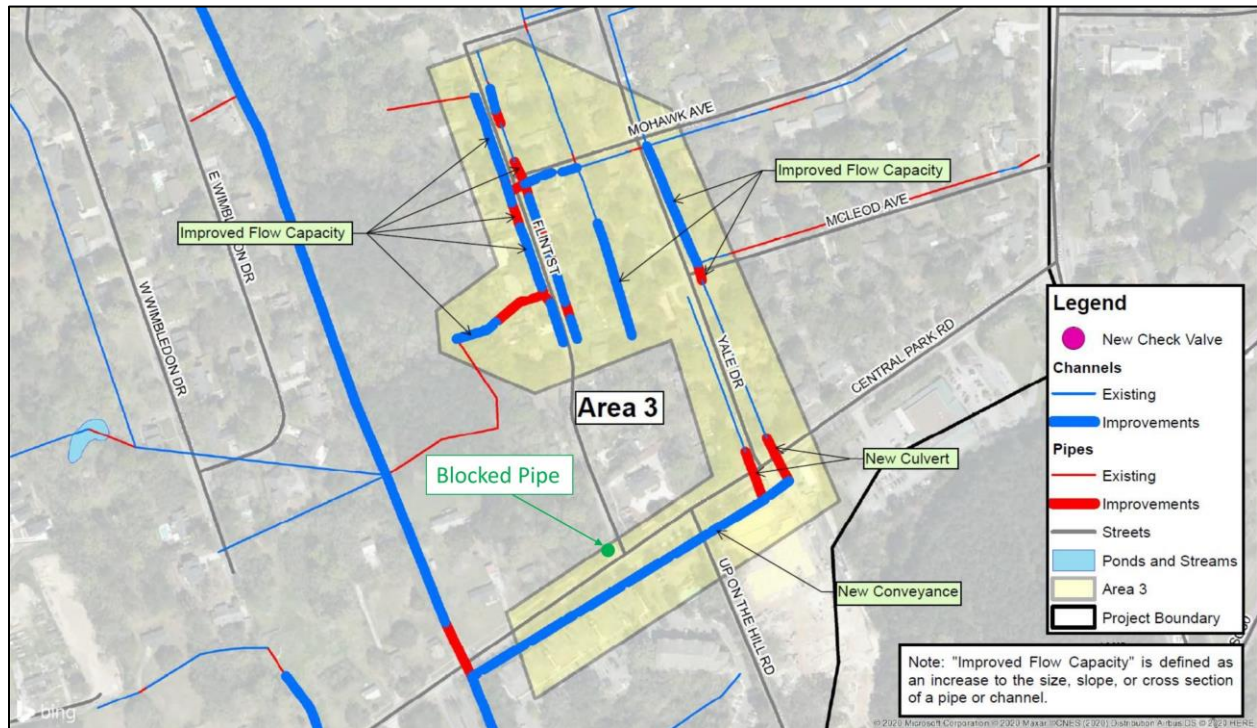


Figure 5. The AECOM stormwater model is described in the document entitled "Technical Memorandum Subject: Evaluations and Recommendations for Central Park Project Area," which is available at <https://www.charleston-sc.gov/DocumentCenter/View/27211/Central-Park-Tech-Memo---Compiled---Final---08072020?bidId=>

The map of recommended stormwater improvements shows the existing pipes, but not the blocked stormwater pipe at the northwest corner of Flint Street and Central Park Road (see Figs. 1-2). Additional information on the map (blocked pipe location) is in green. The north arrow should probably be vertical as in Fig. 2 and unlike Figs. 3a-b.