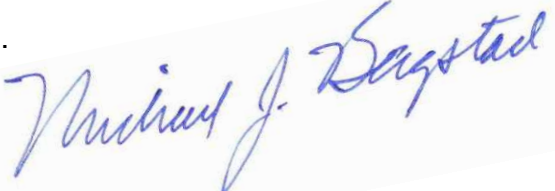


ZARINKELK ENGINEERING SERVICES, INC.
617 Caroline St. • Houston, Texas • 77002

MEMORANDUM

To: Dennis Todd Miller, P.E.
Watershed Coordinator

From: Michael Bagstad, P.E. 

Subject: Response to HCFCD Comments, 7/21/17
El Dorado Blvd., Precinct 2 (UPIN 17102MF0PM01)
Project No. 1706270091

Date Prepared: February 15, 2018

The following comments were received from HCFCD:

1. The report states the following, "The results of the analyses demonstrate that the existing system was designed in anticipation of the ultimate development of El Dorado Blvd. Additional storm water mitigation will not be required". Please provide information from the original report that confirms this consideration.

Discussion about the analyses of the existing storm drain systems in El Dorado have been removed from the report. The report now only addresses the impacts to Horsepen Bayou.

2. Per the report the project will have five outfalls. Only one of these outfalls will discharge into Horsepen Bayou, a HCFCD facility. The other four outlets will discharge into adjacent neighborhood systems. Please confirm in the report the El Dorado drainage improvements have been coordinated with the entities that maintain the adjacent storm sewer systems.

The City of Houston is the Flood Plain Administrator for this area. This report has been submitted to the City for their review of outfalls within their jurisdiction.

3. Storm water runoff increases should be mitigated on-site. Please include in the report detention tables for each outlet location.

The El Dorado outfall to Horsepen Bayou will not be increased in size with this project. All other outfalls are internal to the City.

4. Due to the different characteristics of roadway and land development projects, the impacts associated with roadway projects cannot be fully analyzed using typical land development techniques (i.e. site runoff curves, HEC-HMS). Please revise the analysis

to use the applicable criteria specified in Section 6.16 of the Harris County Flood Control District's Policy, Criteria, and Procedure Manual (PCPM).

The local issues regarding the El Dorado storm drain system have been removed from the report.

5. Please estimate T_c and changes in T_c using a true velocity based method. (Formulas that only use the drainage area to compute T_c are not acceptable.)

The local issues regarding the El Dorado storm drain system have been removed from the report.

6. Use the proposed roadway right-of-way as the drainage area for analyzing roadway impacts and sizing required mitigation volumes.

The local issues regarding the El Dorado storm drain system have been removed from the report.

7. HCFCD will require a submittal of a Letter of Map Revision to the Federal Emergency Management Agency upon completion of the project to document the proposed revisions to the effective hydraulic model.

Submittal documents for a Conditional Letter of Map Revision will be prepared and submitted to HCFCD once the drainage study is approved.

8. Please include a statement within the report of the engineer's conclusion that the proposed project will cause no adverse impact to the receiving streams for storm events up to and including the 1% chance exceedance event.

The statement will be added to the report. The proposed project will cause no adverse impact to the receiving streams for storm events up to and including the 1% chance exceedance event.

9. The report should identify the amount of fill that will be placed within the regulatory floodplain and demonstrate that it is adequately mitigated in accordance with local Floodplain Administrator's requirements.

The new bridge will have piers that take up space below the 100-year WSEL. In addition, concrete liner will be added beneath the bridge from the normal high water line up to the 100-year WSEL, and articulated block will be added below the normal high water line. These linings will also occupy space below the 100-year WSEL. The total floodplain storage lost below the 100-year WSEL due to these improvements is 514 CY (0.32 ac-ft). It is proposed that the channel cross section be shaped within this reach to provide the require additional storage volume. This will be reflected in the design plans.

10. Two HEC-RAS models have been provided; one is labeled 'Effective Model' and the other one is labeled 'Effective model with Proposed Bridge'. The analysis should not utilize individual models to analyze the existing and proposed conditions. The responsible engineer should utilize the plan feature within HEC-RAS to analyze all conditions within the same model.

Agreed. The model labeled Effective model with Proposed Bridge includes both the current effective model and the model with proposed bridge as plans within the one model. The model labeled Effective Model is the original model provided by the HCFCD and can be discarded for this purpose.

11. Cross sections between the 'Effective Model' and 'Effective model with Proposed Bridge' are not consistent.

Agreed. The cross sections in the effective model will be used in the model with the new proposed bridge.

Cc: Chip Taylor, P.E., PTP, FITE
Harris County Engineering Department