

# DAVIS & FLOYD


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## MEMORANDUM

December 10, 2018

**To:** Mayor John J. Tecklenburg  
City of Charleston

City Council  
City of Charleston

**From:** Michael V. Horton, PE, CFM, LEED-AP   
Chief Engineering Officer

**Subject:** Engineer's Response to Council Requests for Additional Program Information  
Spring/Fishburne US 17 Drainage Improvements Project  
D&F Job Number: 030295.00

Davis & Floyd (D&F) respectfully submits this program overview of the referenced project to support the project team in formally responding to requests for information identified during the 12/04/2018 session of Ways and Means Committee of Charleston City Council, at which time the proposed Division II, Phase 4, Pump Station Wet Well & Outfall construction contract with Conti Enterprises and proposed D&F Agreement Amendments Nos. 17 and 18 were included on the agenda for committee and later council approvals. Requests for information known to the Engineer and their respective answers are provided below for your consideration:

Q.1. What was the original scope and timeline of the project?

A.1. The original scope of the project was to provide substantial improvements to drainage, mobility, efficiency, emergency preparedness, and community livability within the Spring and Fishburne drainage basins. As the design and permitting of the project was completed (2009), there had been no funding secured or identified for construction. In preparing the project for a competitive TIGER Grant Application, the project was initially set to a highly accelerated and compressed schedule of under 3 years. Ultimately, after obtaining 3 grants that funded only portions of the work to be completed and the City having identified funding for the remainder, the project was split into a minimum of 5 construction phases with a funding stream and sequence of construction that produced a schedule that spanned from 2012 to 2020.

Q.2. What was the total estimated project cost?

A.2. In pursuit of project funding, the total project was estimated at \$154 million.

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Q.3. Has this project always been separated into four (4) divisions?

A.3. Yes. During the course of the project design (2009), four divisions of work were identified based upon the special nature of work associated with each: Division I – Tunnels & Shafts, Division II – Pump Station Wetwell and Outfall, Division III – Collection System, and Division IV – Pump Station.

Q.4. When was it decided to phase the project and why?

A.4. The initial TIGER Grant funding only a portion of the project required splitting the project up into multiple construction phases. Ultimately as a result of the order, type, and conditions of three grants awarded and as a result of specific project sequencing requirements, the project Divisions were reorganized into five construction phases in 2012:

- Phase 1, Division III – TIGER Surface Collection System
- Phase 2, Division III – Fed Match Surface Collection System
- Phase 3, Division I – Tunnels & Shafts
- Phase 4, Division II – Pump Station Wet Well and Outfall
- Phase 5, Division IV – Pump Station

Q.5. What was the original total estimated cost of the phased program?

A.5. As the phased program was comprised of a product of multiple grants having referenced a total project cost reported at \$154 million, this total cost was maintained with individual phases assigned costs based upon estimated construction, CEI, and contingencies in each (see additional detail below in Total Project Cost Estimated at \$154 million).

Q.6. What were the original total cost estimates for each of the five phases?

A.6. As the project was split into five phases in 2012, costs estimated for each respective phase were distributed as follows:

- \$08 million = PER / Engineering / Permitting
- \$14 million = Phase 1, Division III – TIGER Surface Collection System
- \$23 million = Phase 2, Division III – Fed Match Surface Collection System
- \$50 million = Phase 3, Division I – Tunnels & Shafts
- \$34 million = Phase 4, Division II – Pump Station Wet Well and Outfall
- \$25 million = Phase 5, Division IV – Pump Station

Q.7. What was the original estimated date of completion for the phased program?

A.7. 2020

Q.8. What is the current total estimated cost of the project and estimated date of completion?

A.8. In coordination with the City, it is our understanding that the total estimated cost of the project is currently \$197 million and is expected to be complete in 2023 (see additional detail below in Total Project Cost vs Original Estimate).

Q.9. Why has the completion date been extended?

A.9. Numerous factors across the two completed phases, the current work contracted for Phase 3, and the schedule currently in hand for Phase 4 as bid have together impacted the scheduled completion date represented today versus the original date of 2020. These have included construction delays prompted by various conditions, a need to avoid conflicts in work among multiple contractors on different phases occupying the same property, and extended construction durations beyond that originally forecasted following coordination with other project phases and preparations for bidding.

Q.10. What are the current completed and estimated costs for each of the five phases?

A.10. In coordination with the City, costs incurred or estimated for each respective phase are as follows:

\$7 million = PER, Design, and Permitting (Completed)  
\$14 million = Phase 1, Division III – TIGER Surface Collection System (Completed)  
\$32 million = Phase 2, Division III – Fed Match (Completed)  
\$43 million = Phase 3, Division I – Tunnels & Shafts (Under Contract / Estimated)  
\$65 million = Phase 4, Division II – Pump Station Wet Well & Outfall (Pending / Estimated)  
\$36 million = Phase 5, Division IV – Pump Station (Estimated)

Q.11. Is the project currently, as of Phase 3, still on budget?

A.11. In coordination with the City and with consideration of current construction contract value for Phase 3, the project is on track and within the current budget.

Q.12. Why was the original estimated cost of Phase 4 increased from \$34 million to an estimated \$65 million?

A.12. Increases in estimated cost were brought about by the following; project elements moved from Phase 5 to Phase 4; project enhancements; increased cost of construction; and cost escalation and contingency above that incorporated into original estimate (see additional detail below in Phase 4 Cost vs. Original Estimate).

Q.13. When did the City learn that the total cost of the Project was expected to be outside of the original estimate?

A.13. October 2018. D&F, while preparing a funding draw down schedule in support of SIB reporting updates, was requested by Public Service to expand such to include engineering, contingency, and other costs associated with the Project which reflected a total project cost above \$154 million.

Q.14. Why has the original estimated cost of Phase 5 increased from \$25 million to \$36 million?

A.14. Increases in estimated cost have been brought about by many of the same factors impacting costs for Phase 4, such as; miscellaneous project enhancements; increased cost of construction (ex. building code compliance); and cost escalation above that incorporated into original estimate and additional project contingency.

Q.15. Would the City realize substantial savings by re-scoping and / or re-bidding the Phase 4 construction package?

A.15. No. This opinion is founded upon conclusions of a value engineering exercise and evaluation of current low bid against estimate and others received (see additional detail below in *Evaluation of Bids and Recommendation for Awarding Phase 4 of Construction*).

Q.16. What would happen if the City did not move forward with Phase 4?

A.16. Improvements constructed under project Phases 1 & 2 will function only to their current level (marginal improvements with respect to drainage system performance and little to no benefit in controlling flooding within the basin), and there will be no connections to, use of, or any benefits gained for Phase 3 work as it is completed in 2020.

In addition to the above Q/A, D&F offers the following expanded details for your information and consideration with respect to the project history and background that we feel factors into the current project state and options before the City in moving the project forward:

Total Project Cost Estimated at \$154 million:

D&F prepared a cost for use in pursuing grant funding for the project as designed and permitted in 2009. As a project cost represented in the first grant pursued, USDOT TIGER, \$154 million included costs at that time having already been borne by the City for the study, design, and permitting in addition to \$146 million in estimated costs for funding the balance of the entire project, including construction, contingencies, and

CEI (inspection) services. As the competitive TIGER Grant evaluated projects on both readiness (aka 'shovel ready') and completion schedule for opportunities in accelerated spending and thereby improvements to the national and local economy, D&F generated the \$146 million construction estimate using costs commensurate of an accelerated schedule that was presented as part of the grant application.

When the TIGER Grant was awarded at \$10 million eligible for a portion of Division III work along the US17 corridor alone, a multi-phase program was conceived for further pursuit of additional outside funding in support of the project. Ultimately three other competitive grants were pursued; a second TIGER Grant and a FHWA Federal Match (50/50 Match) Program was pursued through SCDOT for funding eligible project components (drainage work within SCDOT right-of-way); and funding through the SC State Transportation Infrastructure Bank (STIB or SIB). The latter two were secured at a total value of \$100.5 million.

While the multi-phase project commanded a program schedule that stretched from the targeted accelerated TIGER approach (entire project in under 3 years through a single construction contract) to that of a 8-year program to be completed through a minimum five phases, the total estimate of \$154 million was maintained along with the cost estimated individually for each respective project phase totaling this amount. This was done with the expectation that the costs originally commensurate of an accelerated schedule and contingencies included in the 2012 estimate could cover anticipated inflation / construction cost escalation and other incidentals over the program duration.

Phase 4 Cost above Original Estimate:

As preparations for bidding and contracting Phase 4 for construction began, the City requested a Value Engineering exercise to explore opportunities for reducing project (phase) costs and revisiting the design delivered almost 10 years before for harnessing advancements in construction technology, materials, and equipment that would benefit the project. While limited opportunities for significant savings were identified through this exercise, D&F did work with the City to incorporate some enhancements above the original / baseline design in addition to moving several project elements from Phase 5 to Phase 4. These changes were collectively pursued to advance system operations (technology), reduce maintenance (serviceability), and improve reliability over the project design life (resiliency), including changes to adopt / accommodate the City's Flooding and Sea Level Rise Strategy.

Additional design was required to incorporate changes in building codes and account for as-built conditions with physical / structural project overlaps between Phase 3 work completed and Phase 4 work to be constructed. As a result of these changes, cost differences between the original \$34 million construction estimate for Phase 4 and the pre-bid estimate of \$49 million generally include increases that can be categorized as; elements moved from Phase 5 to Phase 4; project enhancements; increased cost of

construction (i.e. building code changes); and cost escalation above that incorporated into original estimate.

Evaluation of Bids and Recommendation for Awarding Phase 4 Construction:

The City received bids on September 20, 2018 and an evaluation of the bids performed by D&F lead to a recommendation for award. This recommendation was based upon an evaluation conducted that found the lowest, responsive, responsible bidder to be qualified, duly licensed, and fit for completing the work. This evaluation further compared all bids received and that of the pre-bid estimate to find that the low bid at \$51,933,757 to be within 4.8% and thereby deemed to be both a reasonable and competitive cost.

Proposal for Amendment No.17 for Additional Professional Services:

In preparing Phase 4 for bidding and construction and after being contracted to do so (Amendment No.15), D&F provided services outside of the amended scope. With the exception of work scoped and budgeted for Project Administration, work included within Amendment No.17 was performed at risk, and subject to the evaluation and approval of the City. Further, this work has not been invoiced nor paid by the City in advance of Amendment No.17 approval. While further detailed within our Proposal, the additional scope includes over 2,000 hours of engineering and generally includes: expanded and continuing support of the two mitigation projects required of the City for compliance of maintained and exercised environmental permits; value engineering; moving of Division IV (Phase 5) elements to Division II (Phase 4); miscellaneous project enhancements; design revisions and affiliated services. This amendment also establishes a budget forward to continue Project Administration in supporting the City's coordination of current and future phases of the project.

Total Project Cost vs. Original Estimate:

In comparing the total estimated project (program) cost estimated today at \$197 million to that of the original \$154 million estimate, differences generally include increases that can be categorized as; additional engineering; additions in project scope; project enhancements (ex. Flooding and Sea Level Rise Strategy); permitting compliance and environmental mitigation program; increased cost of construction (i.e. building code changes); other direct project costs; and cost escalation above that incorporated into original estimate. It should also be noted that some increases in project scope that have contributed toward the new estimate have been fully or partially funded without additional cost to the City (ex. over \$6.5 million in costs for utility relocations have been reimbursed by CWS).

D&F maintains that the Spring / Fishburne Project has and can continue progressing as a successful program. We are of the opinion that increases to the overall project cost and schedule have to date been within normally accepted ranges with respect to the project

duration, scale, type, and complexity. We are proud to support the City in this important drainage project, and remain at your service to assist you, City staff, and the entire project team in further responding to any questions, concerns, and other needs that require attention.

End of Memorandum