

## MEMORANDUM

**To: City of Smithville  
Bastrop County  
Smithville ISD**

**From: Tim Sanders, P.E., BEFCO Engineering, Inc.**



**Subject: City of Smithville / Bastrop County  
GLO CDBG-MIT MOD Project ~ SW Drainage Improvements**

The purpose of this memorandum is to provide a brief summary of the proposed City of Smithville / Bastrop County GLO CDBG-MIT MOD Southwest Drainage Improvements project and to address comments and concerns that have been brought forward regarding the improvements themselves and their potential impact.

### **Project Summary**

The proposed project consists of the construction of a new storm sewer, enlargement of existing drainage channels, and expansion of an existing detention pond (see attached 041825 Improvements Schematic.pdf) that serve a drainage area approximately 858 acres in size. Beginning on the downstream end of the proposed project in an existing drainage channel at a point located approximately 150 feet north of Webster Street and 300 feet west of State Highway 95, the existing channel will be enlarged and re-graded southward to Webster Street. The outlet of the proposed storm sewer will begin in the expanded/re-graded channel and extend southwest to the Webster Street right-of-way and then west to Harper Street. At Harper Street, the storm sewer will extend south approximately 780 linear feet where it will make a 90 degree turn and then extend eastward approximately 420 linear feet within the Bruner Street and SH 95 right-of-way to an existing detention pond located between SH 95 and Washington Street just north of Smithville High School. The existing detention pond between SH 95 and Washington Street will be deepened and expanded as necessary within the blue footprint shown on the exhibit but will not extend beyond these limits. The project will then continue eastward at Washington Street where the existing Washington Street drainage crossing will be removed and replaced. On the east side of Washington Street, the existing channel will be enlarged and regraded southeasterly approximately 300 linear feet to a pedestrian drainage crossing that will also be replaced. On the east side of the pedestrian drainage crossing, the existing channel will continue to be enlarged and re-graded approximately 1,850 linear feet southeast to Jones Street where the improvements will terminate on the upstream end of the proposed project. Construction of these improvements would provide greater stormwater conveyance to Gazley Creek and help mitigate the risk of flooding in the low-lying areas on the southwest side of Smithville.

### **Existing Conditions**

As mentioned above, the proposed improvements serve a drainage area that is approximately 858 acres in size. Attached is an exhibit (041825 Existing Conditions.pdf) that illustrates the limits of the drainage area (in green). However, this drainage area does not include stormwater runoff that overflows from the southeast out of the Willow Creek watershed. Overflow runoff from the Willow Creek watershed can vary depending on the storm event; however, as indicated on FEMA's Flood Insurance Rate Map (see

attached FEMA Flood Map.png) the floodplains of both Gazley Creek and Willow Creek merge during the 100-year storm event.

The attached “041825 Existing Conditions.pdf” exhibit also identifies the location, size, and flowlines of some of the existing drainage structures that provide conveyance. Per the exhibit, the entire area drains through the existing school detention pond located in the northwest corner of the school property. The primary outfall structure of the pond is 2 ~ 24-inch (24”) diameter pipes (approximate flowline elevation 309.7’) that outfall to an existing 5’ x 4’ concrete box culvert located under SH 95 (approximate flowline elevation 309.0’). This box culvert outflows into a ditch which then drains north to Gazley Creek. Upstream and draining directly into the existing detention pond are 3 ~ 8’ x 4’ box culverts under Washington Street that have an approximately flowline elevation of 312.8 feet. Upstream of the Washington Street crossing is an existing drainage channel followed by a pedestrian crossing to the baseball and softball fields. This crossing has 3 ~ 36” culverts with an approximate flowline elevation of 312.4’ and 10 ~ 18” culverts with an approximate flowline elevation of 314.3’. Upstream of the pedestrian crossing, the drainage channel continues to Jones Street which has 3 ~ 36” arch pipe culverts with an approximate flowline elevation of 312.0’. As illustrated with the various flowline elevations, it appears the flowline of some of the downstream structures are higher than flowlines of the upstream structures. As a result, stormwater runoff is partially blocked; and the capacity of some of the existing drainage structures are being under-utilized.

#### **How Will The Proposed Project Impact Existing Development?**

The proposed project would provide increased stormwater conveyance through the implementation of new and enlarged drainage structures that would be designed and installed with positive downstream slope. Attached is an exhibit (041825 Proposed Conditions.pdf) that shows a schematic / limits of the proposed improvements in blue. As mentioned on the previous page, the project would involve the installation of a new storm sewer from Gazley Creek to the school detention pond. Design / size of the storm sewer has not yet been finalized; but based on the improvements that are proposed and the grant budget that has been allocated, it is likely the storm sewer will be a minimum 5’ x 7’ box culvert. Further, the flowline of this box culvert where it enters the pond will likely be at an approximate elevation of 303.0’ or roughly 6.7 feet lower than the existing 24-inch (24”) pipes that comprise the outfall of the detention pond. With an additional outfall from the pond and increased pressure head due to a lower flowline out elevation, there will be a substantial increase in stormwater conveyance from the east side of SH 95 to Gazley Creek.

Besides the new storm sewer, the project will also involve the enlargement and re-grading of the existing drainage channel from the detention pond to Jones Street as well as replacement of the existing drainage structures at Washington Street and the pedestrian crossing. The attached exhibit (041825 Proposed Conditions.pdf) shows preliminary flowlines at these crossings (in blue) and in turn the enlarged channel. As illustrated, the proposed flowlines indicates a channel with both positive slope and a depth that is up to 6 feet – 8 feet deeper than what is existing depending on the location. Thus, there will be a substantial increase in stormwater conveyance from Jones Street to the detention pond.

#### **How Will The Proposed Project Impact Future Development?**

As stated above, the proposed project would provide greater stormwater conveyance from the east side of State Highway 95 to Gazley Creek. Further, as indicated above, flowlines of the proposed improvements would be significantly lower than what exists today providing greater flexibility in the future on site design for projects adjoining the improvements. First, lower flowlines mean there will be a greater likelihood one will be able to install storm sewer on future projects in order to drain a newly developed site. Second, any future development will likely require drainage mitigation to offset the impact of new

development (i.e. detention). Having a greater outfall depth with which to work allows for a deeper detention pond resulting in a reduced pond footprint and, in turn, more land to use for non-drainage mitigation purposes.

Lastly, as shown on the “041825 Proposed Conditions.pdf” exhibit, limits of the proposed project are shown in blue. At this time, no improvements are proposed beyond these limits. In the event the project would need to extend beyond these limits as detailed design progresses, BEFCO Engineering would not proceed any further without first consulting with the City, County, and any affected parties.

#### **What If There Are Objects Or Utilities That Interfere With The Proposed Improvements?**

In general, the project will be designed to avoid conflicts with existing objects or utilities. As such, the first option is usually to alter the design or re-route the improvements, if possible. However, there are instances where conflict is unavoidable, and existing objects or utilities may require relocation. In those cases, each circumstance is always unique; but typically, any costs associated with the design and/or relocation of a utility or object will be at the cost of the entity that is responsible for the proposed improvements and conflict.

#### **How Would The Improvements Affect Maintenance Of The Detention Pond And Ditches?**

The intention is to design any improvements within the detention pond or drainage ditches such that they can be lined with grass and easily be mowed and maintained. For side slopes, the typical, maximum allowable side slope that can be lined with grass without causing erosion or maintenance issues is 3 horizontal feet to 1 vertical foot (3H:1V). An example of this type of side slope is the City of Smithville’s 7<sup>th</sup> Street Detention Pond. Based on my conversation with City staff, it is my understanding the 7<sup>th</sup> Street Pond is typically mowed once a month with zero-turn riding lawn mowers without any issues. In the event circumstances would dictate that a steeper slope would be necessary, then it is likely the slopes would be lined with reinforced concrete pavement in lieu of grass. However, due to the substantial increase in cost of concrete compared to grass, this is usually not a consideration or is minimized as much as practically possible.

Additionally, it is the intention to design the improvements to where all runoff will drain off once the storm event is over and both the pond and ditches will dry out. There can be instances to where a “wet pond” (i.e. a pond that holds water) can be beneficial to design. However, at this time, that does not appear necessary for this project. Should that change, BEFCO Engineering would not proceed with that option without first consulting with the City, County, and any affected parties.

#### **Can Other Improvements Be Added To The Proposed Drainage Improvements Project?**

As this project is being paid for through grant funds from the General Land Office, both the City and County (recipients of the funds) are limited as to what the funds may be utilized for. Specifically, funds may only be used to help mitigate existing drainage issues. Thus, funds are allocated to pay for the proposed mitigation measure along with any other items that are both directly related to the mitigation measure and required to fully implement the measure. The funds cannot be used to mitigate future development or other items that are not directly tied to the mitigation measure itself.