CITY OF BRYAN
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ACTION FORM
BRYAN CITY COUNCIL

Meeting Date (?) 04/26/2016

Subject Matter* (?) City-wide 2-Dimensional Flooding Analysis Engineering Contract
This must match rolling agenda entry

Department of Origin* ENGINEERING DEVELOPMENT

Submitted By* W. Paul Kaspar

Type of Meeting* ○ BCD ○ Special ◉ Regular

Classification* ○ Public Hearing ◉ Consent ○ Statutory ○ Regular

Ordinance* ◉ None ○ First Read ○ Second Read ○ First & Only Read

Strategic Initiative* ☑ Public Safety ☐ Service ☐ Economic Development ☑ Infrastructure ☑ Quality of Life

Agenda Item Description* Consider awarding a professional services contract for Citywide 2 Dimensional Flooding Analysis to Lockwood, Andrews & Newnam (LAN), City Project Number 425-D1-1605, for the not to exceed amount of $69,630.00

Summary Statement *

The goal of the City-Wide 2D Flooding Analysis contract with LAN is to help the City of Bryan better understand flood risk throughout the city. To accomplish this goal requires an understanding of the limitations of the existing drainage systems that serve the City. A comprehensive city-wide 2 dimensional storm water model allows the City to understand flood risks at different return interval storms and understand how individual storm sewer systems can impact other systems via overland flow. This analysis approach heavily leverages the City's investment in high-quality GIS storm sewer and asset information in order to greatly reduce the modeling effort from a traditional analysis.

The City's floodplain maps were created and the City's storm sewer system designed using 1 dimensional storm water modeling programs and analyses. While these 1 dimensional programs are still valuable, the 2 dimensional modeling solves for stormwater flow in 2 dimensions giving a more realistic picture of how stormwater conveyance systems and flows over the topography of the land interact. This information will allow for rapid determination of areas in the City of Bryan that have flooding problems and allow staff to assess at what storm frequency those areas will be anticipated to flood, which results in better prioritizing flooding problem areas.

The City of Bryan invested hundreds of thousands of dollars in the early 2000's mapping the City's storm sewer system and creating a GIS layer that will be imported into this model. Additionally, detailed topographic information from the most recent aerial flyover will be used to create a 2 dimensional (2D) surface in the modeling software (Infoworks ICM). The simulation will "drape" various rainfall events over that 2D surface (1-, 2-, 10-, 25-, and 100-year storm frequencies) and route through storm water conveyance systems. The results from this simulation will be utilized in the development of the hydrologic and hydraulic parameters that will be used in the detailed analysis. Another key advantage of this 2D modeling is that it is dynamic rather than static, which more closely models real world conditions with regard to how the water moves and interacts with other areas of the city.

Key outputs from the model include various maps that will show structures at risk for flooding, major arterial flooding, flooded single points of access to neighborhoods, and areas where flood waters escape the public right-of-way and enter private property. These results will be beneficial in determining future capital improvement projects or smaller maintenance projects that may yield improvements to flooding conditions. Having the various storm events analyzed also will give staff the ability to determine some improvements that may help in more frequent occurring events but are not feasible to fund to improve the conditions during the more rare events. This information will assist in prioritization of projects to utilize limited funds for improvement to achieve the most "bang for the buck".

LAN was selected as a highly qualified engineering firm in the drainage area through the City's Request for Qualifications 15-053. LAN has provided this service for other municipalities and staff believes this analysis will be a valuable tool.

Staff Analysis & Recommendation *

Staff recommends awarding a professional services contract for City-wide 2 Dimensional Flooding Analysis to Lockwood, Andrews & Newnam (LAN), City Project Number 425-D1-1605, for the not to exceed amount of $69,630.00.

Options *

(In Suggested Order of Staff Preference)
1. Award the Professional Services Contract.
2. Do not award the Professional Services Contract and provide direction to staff.

Funding Source *

Drainage Fee – Fund 245 –$69,630.00

Attachments

LAN Citywide 2D Stormwater Analysis Contract.pdf 387.53KB

Please detail attachments and note attachments available for viewing in City Secretary's Office:
1. LAN Contract for City-wide 2D Flooding Analysis

Dept. Head Signature

Deputy City Manager Signature

City Manager Signature

City Attorney Signature