Scope of Work:
Christmas Wash Watershed
Infrastructure Evaluation
July 19, 2017

Project Purpose

The Pima County Regional Flood Control District (District) seeks a professional consulting engineer to inventory existing drainage (stormdrain, culvert, channels) infrastructure within the Christmas Wash Watershed, and the 'Kleindale Area' (identified in Pima Prospers) to provide floodplain maps and identify obvious constraints and potential modifications for future consideration to decrease flooding in the watershed. The inventory will be based upon available as-built plans, with some field verification.

1. Project Location and Description

The approximate limits of the Christmas Wash Watershed and the Kleindale Area, which lies on the eastern edge of the watershed, north of Fort Lowell Rd., are shown on Exhibit A. In total, the study area is approximately 3.9 square miles. Storm drains which lie outside of the watershed, shall be included if associated inlets and/or outlets affect the drainage in the study area.

2. Project Tasks

2.1.1. The Consultant shall collect, review and summarize as-built plans for existing structures (i.e., storm drains, culverts, channels) within the Christmas Wash Watershed and adjacent Kleindale Area. The District and City of Tucson will provide the as-built plans.

Additional data, if pertinent, shall be provided by the District and City such as: Tucson Stormwater Management Study (TSMS) discharge data, drainage complaints, floodplain use permits, elevation certificates, site reviews and violations, FEMA Flood Hazard data, Letters of Map Revisions and/or Amendments drainage reports, improvement plans, land use plans and development plans, historic flood data.

RFCD and City of Tucson will provide the consultant a GIS shape file of existing drainage complaints within the watershed.

The District will provide the most current PAG LiDAR dataset.

It is assumed that these data will be collected in digital form, but where digital data are not available; the consultant shall collect the data in paper form and scan in an appropriate digital format for future use.

2.1.2. The consultant will perform ground truthing for critical locations to determine whether infrastructure is functioning as designed.

2.1.3. A basin-wide two-dimensional hydrologic and hydraulic model will be generated utilizing FLO-2D. Detailed modeling of storm drains will be limited to critical systems, systems which impact flow leaving or entering the model domain, and systems which affect distribution of flows with local neighborhoods/ streets. FLO-2D modeling will determine the 1% - annual chance discharges, including more frequent return period events (20 %, 10% and 4% chance floods). FLO-2D will also be utilized to determine overbank flooding and/or distributary flow areas (for example street flows).

2.1.4. The Consultant will document base flood elevation changes for previously mapped floodplains (for example effective FEMA DFIRM study). The Consultant will develop existing condition floodplain mapping based on PAG LiDAR and FLO-2D results (depth and velocity) for the referenced return period events in task 3.1.3.

2.1.5. Based on the inventory and FLO-2D discharges, the Consultant will identify conveyance constraints (critical bottlenecks in the drainage infrastructure), and associated potential modifications to facilitate future consideration of potential infrastructure to alleviate flooding in the watershed; for the referenced return period events in task 3.1.3.

2.1.6. The Consultant will provide a map of FLO-2D discharge data, structure locations (with GIS attribute data of drainage infrastructure description, size and material) and problem area for the referenced return period events in task 3.1.3.

2.1.7. The Consultant will summarize the above analyses in reports as follows for all Draft and Final submittals: (2 CDs, 2 paper copies).

Existing Condition Report

The Consultant shall submit all items sealed by a registered civil engineer or surveyor in the State of Arizona, as appropriate. Upon receipt of the final submittal, the District shall review the final products for the accurate incorporation of all final comments. If incomplete and/or incorrect incorporation of comments is found, the original documents shall be returned to the Consultant for correction and resubmittal.

3. Participation

Pima County Regional Flood Control District (DISTRICT)

City of Tucson Department of Transportation

4. Project Administration

The Consultant shall attend a kick-off meeting with the District to submit the project schedule, which will include dates of all proposed submittals and review meetings. The Consultant shall bring key project members to the meeting to introduce them to the District staff that will be working on the project.

The Consultant shall meet monthly with the District's Project manager and project review team to discuss the overall project status and to discuss the District's review comments that will be provided to the Consultant at the meeting. Any problems shall be identified and discussed. The Consultant shall provide minutes of monthly project meetings.

The Consultant shall make site visits as necessary to become familiar with existing conditions in the study area.

5. Schedule

The consultant will complete all elements of the study within 240 days of NTP. Assuming a NTP by August 1, 2017, the study will be completed by approximately March 31, 2018. A detail schedule will be developed in conjunction with the Pima County Project Regional Flood Control District Project manager at the kick-off meeting.