

**CITY OF CASA GRANDE
DOWNTOWN STREETS RECONSTRUCTION DRAINAGE MASTER PLAN
DRAFT WORK PLAN**

PROJECT PURPOSE

The City of Casa Grande desires the completion of a master drainage plan for the historic downtown area. Existing studies are out of date, and recent improvement projects do not fully address flooding concerns. The drainage master plan will accurately define flooding conditions and formulate effective solutions that:

1. Alleviate flooding for the 2-10 year storm, and prevent structural flooding for a 100 year event;
2. Reduce or eliminate impacts to downtown development;
3. Has support from the City and other stakeholders; and,
4. Enhances historic downtown Casa Grande.

Task I: PROJECT MANAGEMENT & DATA COLLECTION

Task 1.1: Project Management

CONSULTANT shall coordinate with City staff throughout the course of the project. Said project management duties shall consist of typical phone call and email coordination, preparation of monthly invoices and progress reports, and maintaining project schedules. In addition, CONSULTANT will prepare agendas and meeting minutes for all coordination meetings.

***Deliverable:** Monthly invoices, progress reports, schedule, meeting agendas, meeting minutes*

Task 1.2: Meetings

CONSULTANT shall attend up to two (2) meetings with City staff at City of Casa Grande facilities. It is anticipated that the first meeting will be a project kick-off and site visit. The second meeting will be to discuss results of the study, and resolve any City comments.

Task 1.3: Data Collection

CONSULTANT shall obtain from City staff pertinent study data to include existing reports, as-built plans, topographic data in CAD or GIS format, aerial imagery, quarter section maps, and any available GIS layers. Data shall be used to plan the project approach and understand project parameters.

Assumptions: *City will provide 2' contour interval topography in CAD or GIS format for the entire study area and contributing watershed*

Task 1.4: Field Survey

CONSULTANT shall perform a topographic design survey along Main Street between Casa Grande Avenue and Maricopa Street, along 1st Street between Casa Grande Avenue and French Street, and along 2nd Street between Casa Grande Avenue and Pinal Avenue to supplement the 2-foot contour aerial mapping previously prepared by others for the project area, and to better delineate the above ground storm water flow along these streets. The supplemental topographic survey will consist of cross sections at approximately 50-foot intervals between back of curb to back of curb, including valley gutters and aprons along said streets.

A base map of the supplemental topographic design survey will be prepared in AutoCAD using City of Casa Grande layer standards. The basis of horizontal control shall be North American Datum 1983 (2011) as established by GPS methods. The basis of vertical control shall be a City of Casa Grande datum (NAVD88) using benchmarks in and/or adjacent to the project area.

Assumptions: *Field survey will not be required for hydraulic structures in the downtown study area as the City will provide as-built plans for these structures. Further, hydraulic structures outside of the downtown area, but within the overall contributing watershed will not be included in the field survey. Geometric data for these structures will be acquired from existing reports or through visual inspection. Any required additional topographic surveying needs can be negotiated with the City as an additional service. All hydraulic structures requiring field survey will be accessible directly from the ground surface or through manholes/cleanouts, subsurface utility explorations will not be required. Should the need for subsurface utility explorations be identified, services can be negotiated as an additional service.*

Deliverable: *Field notes and elevation data for streets listed*

Task II: Existing Conditions Hydrologic and Hydraulic Analyses

Task 2.1: Course Grid Hydrologic Model

CONSULTANT shall construct a 'hydrology' FLO-2D model, incorporating the entire contributing watershed. The model grid size shall be selected to best represent watershed conditions while considering model run times. It is anticipated that the model grid size will be larger than the downtown specific 'hydraulics' model discussed in Task 2.2. Hydrologic parameters shall be selected based on available City of Casa Grande and Pinal County guidance. If specific criteria are not available from the City or Pinal County, Maricopa County guidance will be used. NOAA Atlas 14 rainfall data will be used. The 'hydrology' model will be used to provide input hydrograph data for the downtown 'hydraulics' model at applicable locations. The CONSULTANT shall also use the 'hydrology' model to summarize hydraulic conditions (peak flow, peak velocity, depth, volume) at key locations for the 2-, 10-, and 100-year storm events. This data will be provided in the final report.

***Assumptions:** Models will be compiled for the 2-, 10-, and 100-year storm events, topographic data will be provided by the City*

***Deliverable:** Input and output FLO-2D files, GIS data layers for flow conditions, provided in appendix of the final report. Digital copies will be provided upon approval of final report.*

Task 2.2: Small Grid Hydraulics Model

CONSULTANT shall construct a 'hydraulics' FLO-2D model for the downtown project area. The model grid size shall be selected to best represent flow conditions while considering model run times. It is anticipated that the model grid size will be smaller than the 'hydrologic' model discussed in Task 2.1. Hydraulic and hydrologic parameters shall be selected based on available City of Casa Grande and Pinal County guidance. If specific criteria are not available from the City or Pinal County, Maricopa County guidance will be used. NOAA Atlas 14 rainfall data will be used. Urban components such as streets and buildings will be included in the model. Existing hydraulic structure will also be incorporated. The 'hydrology' model will be used to provide input hydrograph data at applicable locations. The CONSULTANT shall use the 'hydraulics' model to summarize hydraulic conditions (peak flow, peak velocity, depth, volume) at key locations for the 2-, 10-, and 100-year storm events, and to use this data to identify flood prone locations. The

model will also be used as the basis for evaluating the effectiveness of flood mitigation alternatives. Existing conditions model results will be provided in the final report.

Assumptions: *Models will be compiled for the 2-, 10-, and 100-year storm events, topographic data will be provided by the City*

Deliverable: *Input and output FLO-2D files, GIS data layers for flow conditions, provided in appendix of final report. Digital copies will be provided upon approval of final report.*

Task III: ALTERNATIVES EVALUATION AND ANALYSIS

Task 3.1: Engineering Analysis

CONSULTANT shall conduct engineering analysis of storm drain and basin combinations to eliminate flooding for storm events that range from 2- to 10-years at flood prone areas identified in Task 2.2. A maximum of three (3) alternative configurations shall be developed, of which one (1) alternative will fully and partially employs green infrastructure concepts. Each alternative will be coded into the existing conditions hydraulic models to evaluate the effectiveness of the developed solution in eliminating flooding for the 2- and 10-year storm. In addition, the alternatives shall be evaluated to determine the effectiveness in eliminating impacts to structures during the 100-year storm event.

Assumptions: *Alternatives will eliminate flooding at a minimum for the 2-year event. Alternatives may eliminate flooding for up to a 10-year or greater event, depending on cost and feasibility. Improvements as part of the alternatives will adhere to City standards.*

Deliverable: *Summary and schematic of three alternatives for incorporation into the final report, and for presentation during public meeting*

Task 3.2: Utilities Evaluation

As part of the engineering analysis for Task 3.1, CONSULTANT shall gather existing utility data from the City and Blue Stake. Potential utility conflicts shall be identified using existing data from the City and franchise utility providers as available.

Assumptions: *No new potholing utility survey data will be acquired*

Deliverables: *Summary of utility conflicts identified included in final report*

Task 3.4: Aesthetic and Environmental Evaluation (Landscape Architecture and LID Strategies)

See Logan Simpson Scope of Work under separate cover.

Task 3.6: Cost Analysis

CONSULTANT shall develop an engineer's opinion of probable cost for the recommended alternative. Cost estimate will include construction and material costs, along with any property acquisition costs required. Costs will be developed from locally derived and recent data where ever possible.

Deliverable: *Cost estimates for recommended alternative*

PHASE IV: RECOMMENDED CONCEPT PLAN

Task 4.1: Recommended Alternative

Based on factors such as cost, stakeholder feedback, public meeting results, and input from City staff and elected officials, CONSULTANT shall recommend a preferred alternative. CONSULTANT shall develop an evaluation criteria based on these factors, and rank the alternatives first through third. The recommended alternative will be presented to the City for concurrence.

Deliverable: *Recommended alternative description and criteria included in final report*

Task 4.2: Implementation Plan

Once the preferred alternative is agreed upon with City staff, CONSULTANT shall develop an implementation plan for the preferred alternative. The implementation plan will include logical project phasing with associated costs as applicable. The implementation plan will be informed by

the City's anticipated CIP and the Phase 3 plans for roadway improvements in the downtown area.

Deliverable: Implementation plan incorporated into the final report

Task 4.3: Draft and Final Report

CONSULTANT shall prepare project report documents in three phases. The first phase will be a draft report after the existing conditions modeling. This report will summarize the model results, and will be presented to the CITY prior to the Alternatives Analysis phase for review and comment. The second phase will be a draft report after alternatives analysis presenting the results of the alternatives development to the City for review and comment. The second phase draft report will be submitted prior to the public meeting. CONSULTANT shall prepare a final report incorporating all the findings of the project. The final report will include summaries of the existing conditions hydrologic and hydraulic modeling, determination of flood prone locations, engineering analysis for flood hazard mitigation alternatives, potential utility conflicts and constraints, right-of-way constraints, aesthetic and environmental considerations, green infrastructure concepts incorporated into the alternatives, description of the three chosen alternatives, cost analysis of the three alternatives, results from the public meeting, evaluation criteria for the preferred alternative, and implementation plan for the preferred alternative. A draft report will be submitted to the City for review. CONSULTANT shall address all City comments, and submit a final report with the completion of the project.

Assumption: All report deliverable will be submitted electronically

Deliverable: Draft and Final Reports