Ivins City Staff Report
City Council Meeting 7/21/16

Agenda Item: Approval of expenditure for engineering services to construct 2016 Storm Water Improvements Projects

Submitted by: Thomas J. Jorgensen, P.E., Assistant Public Works Director

Recommended City Council Action:
Approve expenditure of $122,161 for engineering services to construct 2016 Storm Water Improvements Projects plus an additional $15,000 for contingency for a total of $137,161

BACKGROUND:
Ivins City has several storm water related projects that were identified as high priority projects in the 2016 Storm Water Master Plan. The intent of this project is to complete as many of these high priority projects as we can with the available budget. The budget is coming from the $1.2 million bond for storm water improvements. The attached map shows the project locations identified in the master plan. Staff has submitted a request for proposals (RFP) for engineering services to several engineering firms. Additional details are identified in the attached RFP.

FINDINGS AND ANALYSIS:
The selection process was based on qualifications, with scoring based on criteria identified in the RFP. The rankings are summarized below:

	2016 Storm Water Improvements Projects Ranking
Bowen Collins & Associates	1
Alpha Engineering	2
Entellus	3
Wilson & Company	4

Staff has evaluated the proposals and determined Bowen Collins & Associates (BC&A) to be the most qualified. Staff has been in negotiations with BC&A regarding scope and compensation. Details regarding the negotiated scope and compensation has been attached for Council to review. It should be noted that a 30% preliminary design phase is planned to determine how many of the high priority projects we can feasibly construct with the proposed budget. Once it's determined how many of the projects can likely be funded, BC&A will continue final design on those projects. The design scope and fees reflect BC&A completing design for all the projects, but if some projects cannot be funded then the design scope and fees will be reduced to reflect the diminished scope.

Engineering services will be time and materials based and are included in this approval of expenditure action item, whereas the approval for expenditure for construction period services will be done at a later date. The construction period services fee is hourly, as needed, and the fee shown in the scope and fees attachment is a budgetary number provided during the negotiations phase. A contingency of $15,000 has been added to help account for unforeseen expenditures during final design phases.

SUPPORT MATERIALS:
- Request for Proposals
- BC&A Proposal
- BC&A Engineering Fee Estimate
- Storm Drain Improvements Map

FINANCIAL IMPACT:
The expense has been budgeted and will be paid for from the $1.2 million bond.
$137,161

Respectfully Submitted:

Thomas J. Jorgensen, P.E., Assistant Public Works Director

Content Review:

Dale Coulam, City Manager

Ivins City
Request for Proposals for

Engineering Services to Design Storm Water Improvement Projects

Ivins City, Utah is soliciting competitive sealed proposals from qualified engineers to provide services as outlined in the **SCOPE OF SERVICES SECTION** of this request.

I. Information:

This request for proposals (RFP) consists of three separate projects: 2016 Storm Drain Master Plan Improvements Projects, NRCS Debris Basin Rehabilitation Project, and NRCS Kayenta Debris Basin(s) Project.

Although this RFP includes a suggested scope of work for each project, the City is requesting if an item has been omitted by the City or if you feel an item would enhance or better the project, please include these types of items in your proposal. The City will be reviewing the proposals for innovative ideas, approaches to the work, and suggestions on additional work, which may be considered.

The City is requesting the consultant prepare a Technical Proposal for this work. Part of the Technical Proposal will be a section demonstrating the Consultant's qualifications. As a minimum, the Consultant will demonstrate past experience in storm drain design, dam rehab design, and debris basin dam design. The experience description will include the size of the project. Provide a contact name and phone number for each client. It may be possible that the City will award these projects to more than one consultant.

II. Background:

2016 Storm Drain Master Plan Improvement Projects

In 2016, a Storm Water Master Plan was prepared by Bowen Collins and Associates. This master plan identified and recommended several high priority facilities be constructed to help alleviate some of the storm water issues within the City. These facilities have been divided into 5 separate projects: P1, P3-P5, P6, P16, and P21. The following table outlines what each of the project entails.

Project	Pipe Length (ft)	Diameter (in)	Detention Basin (ac-ft)
P1	1230	24	2.7
P3-P5	3710	24, 30 & 36	1.8
P6	3270	24 & 30	N.A.
P16	670	36	N.A.
P21	1110	30	N.A.

It should be noted that these pipe lengths, pipe diameters, and detention basins sizes are preliminary and should be used for reference/planning purposes only. The master plan will be available on Ivins City's website for more information regarding the locations of the projects and other various details.

It should also be noted that the City has budgetary constraints and will likely not be able to design or have all these projects constructed, but will work with the Consultant to help decide priorities and phasing. It's anticipated that the consultant will also provide recommendations regarding how the budget can be stretched.

NRCS Debris Basin Rehabilitation Project

The NRCS, in cooperation with Ivins City, is working to rehabilitate Ivins Debris Basins 1-6. These basins are currently not meeting the NRCS and Utah dam Safety regulations and current engineering standards for a high hazard class dam. An Environmental Assessment (EA) and a Biological Assessment (BA) has already been prepared for this project. Each of the six basins require some or all of the following modifications: rock facing of the dam, crest grading, sediment removal, trash rack replacement, slip-lining principal spillway pipe, new auxiliary spillway, and rill erosion areas filled and compacted. Detailed descriptions and maps showing the proposed project action for each basin have already been prepared. Since the BA has already been approved according to these descriptions and maps, the design will be limited to the actions described therein. A copy of the EA and the BA will be made available by the City.

NRCS Kayenta Debris Basin(s) Project

In September of 2014, two major storm events caused severe flooding in the Coyote Gulch Wash, resulting in major property damage. The City requested assistance under the Emergency Watershed Program and has obtained assistance to help fund the project. It is the opinion of the City that either one large or two smaller basins would significantly help alleviate future flooding within this drainage basin. The project would generally consist of a hydrologic analysis to determine the required size of the basin(s), alternative analysis to determine the proper location of the basin(s), and preparing a final design for the basin and all appurtenances. Since this is an NRCS project, the specific scope of work requirements have been outlined in the Scope of Services section below.

The following information will be provided by the City:

- 2016 Storm Water Master Plan
- Environmental Assessment for the Rehabilitation of Ivins Debris Basins 1-6
- Biological Assessment for the Rehabilitation of Ivins Debris Basins 1-6
- 2006 Aerial Photogrammetry, 1" = 100', 2' contours
- 2012 LiDAR Aerial Topography, 1 meter point cloud and processed 2' contours
- March 2014 Aerial Photography by Pictometry, 3-inch pixels (2016 Pictometry Photography should be available by August)

III. Scope of Services:

The City has compiled an anticipated scope of work for the three projects, but once a consultant has been selected we will rely on the consultant to prepare a scope of work for these projects. Since a scope of work is not required for the proposal, the consultant should indicate their understanding of the work required through their experience on previous, similar projects.

2016 STORM DRAIN MASTER PLAN IMPROVEMENT PROJECTS

A. Project Schedule
    1. The City has proposed a timeline for the first phase of the project. The City is proposing 4 months (June-Sept) for engineering and final design, and 6 months (Oct-Mar) for construction.

B. Coordination Meetings
    1. The Consultant shall plan on a kickoff meeting and regular progress meetings to review project progress, to coordinate design efforts, to address issues that arise, and to keep the City informed.

C. Collect and Review Existing Information
    1. The Consultant shall be responsible to determine the information required to complete the project. The City will provide copies of relevant previous studies and planning information and digital copies of aerial photography.

D. Site and Utilities Investigation
    1. The Consultant shall be responsible for visiting the site and conducting investigations to identify existing utilities and other site information pertinent to the design.
    2. The Consultant shall be responsible for the design/topographic survey for the project.

E. Project Prioritization and Budgeting
    1. Work with the City to prioritize project and develop recommendations to maximize budget.

F. Hydrologic and Hydraulic Analysis
    1. The Consultant shall conduct a hydrologic and hydraulic analysis. This analysis shall be detailed enough that it can be used by the Consultant to size pipes, catch basins, detention basins, and other storm water infrastructure as part of the design. A hydrologic and a limited hydraulic analysis has already been conducted as part of the 2016 Master Plan, but the findings of that analysis shall only be used as a reference in the preparation of a more detailed analysis.
    2. The Consultant shall develop alternatives based on the hydrologic and hydraulic analysis that evaluate the size of the storm drain pipes pipe versus the size of the detention basin. The City should be consulted during this process to help make the decisions for the pipe sizes with respect to the detention sizes.

G. Storm Water Pollution Prevention Plan
    1. Prepare a storm water pollution prevention plan for the project.

H. Design Drawings
    1. The Consultant shall provide 60% and 100% design sets for review by the City. Review comments will be addressed in a final design drawing set.

I. Technical Specifications
    1. The Consultant shall provide technical specifications for the project for review at the 100% design stages. Review comments will be addressed in final technical specifications.

J. Contract Documents
    1. The Consultant shall prepare final bid documents for the project, including final design drawings, technical specifications, and standard City bid documents and contract conditions.

K. Construction Cost Estimate
    1. The Consultant shall prepare an engineer's opinion of probable cost for the construction of the project.

L. Easements and ROW Support
    1. The Consultant shall assist the City in preparing legal descriptions and easement deeds.

M. Permits
    1. The Consultant shall be responsible to identify and obtain all necessary permits to complete the project as outlined. Any permit directly associated with construction will be the responsibility of the construction contractor.

N. Bid Period Services
    1. The Consultant shall assist the City in preparing a bid advertisement for the project, providing bid documents, holding a pre-bid meeting, and providing any needed addenda during the bid period.
    2. The Consultant shall assist the City in evaluating the bids received for the project and recommending award of the project.

O. Pre-construction Meeting
    1. The Consultant shall prepare for and attend a pre-construction meeting with the City and the Contractor.

P. Construction Progress Meetings and Support Services
    1. The Consultant shall provide submittal review, response to Contractor Requests for Information, review of and make recommendations regarding change order requests, review of pay applications for the duration of the construction period, and conduct project closeout at completion of the work.
    2. The Consultant will prepare for and attend weekly construction progress meetings.

Q. Construction Inspection
    1. The Consultant shall provide a recommended number of hours of inspection services during construction of the project. The inspector will provide reports and photographic logs of construction as necessary. A public works inspector from Ivins City will be available daily to assist the consultant with the inspection services.

2. The Consultant shall provide a comprehensive inspection with the contractor and the City at substantial completion, final completion, and just prior to warranty expiration. Prepare and deliver to Ivins a written list of observed deficiencies.

R. Project Documentation
   1. The Consultant will use redlined drawings provided by the Contractor to develop as-built construction drawings for the project.
   2. The Consultant shall assist the City in closing out the project.

NRCS DEBRIS BASIN REHABILITATION PROJECT

A. Project Schedule
   1. The timeline for design of this project is flexible, anticipated construction to begin during the summer of 2017 or winter months of 2017-2018. The City anticipates that the design may need to be completed before the end of the 2016 calendar year.

B. Coordination Meetings
   1. The Consultant shall plan on a kickoff meeting and regular progress meetings to review project progress, to coordinate design efforts, to address issues that arise, and to keep the City informed.

C. Collect and Review Existing Information
   1. The Consultant shall be responsible to determine the information required to complete the project. The majority of the existing information will likely be gleaned from the Environmental Assessment and the Biological Assessment document prepared for the project. The City will provide copies of relevant previous studies and planning information and digital copies of aerial photography.

D. Site and Utilities Investigation
   1. The Consultant shall be responsible for visiting the site and conducting investigations to identify site information pertinent to the design.
   2. The Consultant shall be responsible for the design/topographic survey for the project, if required.

E. Design Analysis
   1. Perform the appropriate engineering analysis to provide a design that will meet the objections and criteria established for the project. The analysis shall address but is not limited to the following:
      i. Geology and Soil Mechanics Analysis
      ii. Hydrology/Hydraulics Analysis
      iii. Structural Analysis
      iv. Vegetative Considerations
      v. Safety Considerations
   2. Provide all supporting documentation of the engineering analysis performed to provide design, this includes but is not limited to surveys, computer model files, calculations and computations, sketches, etc.

F. Design Report

1. Summarize in narrative form the objectives, data, criteria, assumptions, procedures, and decisions used in the design. The design report shall address the topics in the following list, as appropriate.
2. Design summary - a concise statement of the history and status of design, previous reviews, disposition of applicable policy items, justification for departure from standards, receipt of waivers, etc.
3. Description of the job - a brief description of the major features, hazard classification, drainage area, storm frequencies, landscape resources, capacities, etc. It includes any variance from project plans.
4. Design objective - a brief, clear statement that may be a summary from a project plan. Differences identified from plans must be supported by proper approvals.
5. Basis for design - a listing of reference documents used in the design such as handbooks, codes, reports, studies, and criteria.
6. General basic data - includes hazard analyses, seismic assessment, and limiting conditions or restraints that may influence design, construction, or facility operation.
7. Location and layout - Documents considerations of site configuration or landscape conditions that had an effect.
8. Hydrology - The data, procedures, determination of spillway operation frequency, reservoir operational studies, and summary of precipitation depth, duration, and distribution. It properly describes the characteristics of the contributing watershed and provides the necessary basis for the hydraulic design.
9. Hydraulic design - Documents the shape and proportioning selected for selected features, adequacy of sediment and flood storage, adequacy of channel stability, and sediment transport considerations.
10. Embankment and foundation design - A summary of data, site conditions, assumptions, treatments selected, and design analysis used to:
    i. Make seepage analysis and design control measures.
    ii. Make stability analyses and determine material quality and quantity.
    iii. Make foundation design analyses.
    iv. Make embankment materials selections.
    v. Permit planning instrumentation systems.
    vi. Includes unique, or critical issues, or issues which have a significant impact on the function of the structure, or cost or duration of construction.
11. Structural design - Documents the assumptions, loading conditions, and design procedures used.
12. Environmental considerations – Summarize considerations given to features or practices to provide for conservation of visual, biological, and surface and ground water resources that may be affected by the planned measures, both during and after construction. Included features or practices used to meet criteria established in the FEIS.
13. Construction Drawings - Describes standard detail drawings or any use of previously prepared special drawings.
14. Specifications - Mentions use of special specifications and why they were needed. Explains special conditions or the need for special provisions in the construction contract.
15. Bid Schedule - Give the rationale for selection of lump sum or subsidiary items.
16. Cost Estimate - Explain the effects of the season, changes in size of contract

17. Construction Schedule - Explanation of any critical starting, delay, or completion dates.
18. Operation and Maintenance (O&M) - Explanation of conditions in which design assumptions depend on proper O&M and significant O&M activities are anticipated (for example, grasses in the emergency spillway to protect against erosion during flow). Items identified and evaluated during the design that are planned for replacement during the evaluation period must be noted and described.
19. Construction Review - A summary of those items, conditions, or features encountered during construction that require a field review by the designer, geologist, soil engineer, or other specialist to ensure that conditions anticipated during the design are verified and consistent with the design assumptions. Include the request for timely notification. Note whether a preconstruction conference is needed.
20. Authority - The name (with signature), title, and seal of the designer must appear on the title sheet of the design report along with this statement "To the best of my professional knowledge and judgment the design summarized by this report meets applicable NRCS standards." The consultant shall provide at the time of 50%, 90%, and 100% design submittal.

G. Construction Drawings
   1. Document the construction drawings to illustrate the work. Drawings shall contain the detail needed to:
      i. Access the site.
      ii. Ensure avoidance of both underground and above ground utilities.
      iii. Establish construction operations including material storage, staging areas, equipment storage, servicing areas, construction office, etc.
      iv. Layout and construct the work as specified.
   2. Ensure where the specifications include "as shown on the drawings" or similar language, the information is included on the drawings and the work illustrated on the drawings can be safely constructed as shown.
   3. Certify on the drawings that "to the best of my professional knowledge, judgment, and belief, these plans meet applicable NRCS standards." The above statement shall be included on the title sheet near the engineer's signature and seal. The Consultant shall provide at the time of 50%, 90%, and 100% design submittal.

H. Specifications
   1. Document the specifications to describe the work. To adequately describe the work, the specifications shall contain the detail needed to:
      i. Define the scope of the work.
      ii. Specify the materials to be incorporated into the work.
      iii. Specify all ancillary work such as foundation preparation, borrowing of earth materials, etc.
      iv. Specify tests and activities necessary to control the quality of the work.
      v. Describe the method of compensation for the work including, if applicable, items that are subsidiary as defined in NEH Part 642, Specifications for Construction Contracts.
   2. Ensure the information is consistent between the specifications and the drawings and between the specifications and the bid schedule.

3. Consultant shall use NRCS National Construction Specifications. Construction specification may be modified to be more restrictive based on the judgement of the Consultant, but may not be modified to reduce the requirements. The Consultant shall provide at the time of 50%, 90% and 100% design submittal.

I. Bid Schedule
   1. Consultant shall create the bid schedule that lists all bid items included in the specifications in a logical sequence commensurate with the work, the method of payment (i.e. lump sum or quantity basis) is consistent with that specified, and the units for bid items are consistent with the method of payment. Shall be provided at the time of 100% design submittal.

J. Cost Estimate
   1. The Consultant shall create a cost estimate and adjust for reasonableness of the values assigned to each bid item. The Consultant shall provide at the time 100% design submittal

K. Performance Schedule
   1. The Consultant shall prepare a construction performance schedule. The construction performance schedule shall give the estimated duration and sequence for activates necessary to construct the design. The Consultant shall provide at the time 100% design submittal.

L. Inspection/quality Assurance Plan (QA Plan)
   1. The Consultant shall create a QA plan and ensure that it is adequate to provide the construction oversight needed to ensure the desired construction quality is attained. The Consultant shall also ensure the plan contains provisions for timely notification of specialists such as the designer, geologist, soil mechanics engineer, or other specialist to ensure that conditions anticipated during design are verified and are consistent with the design assumptions.
   2. As part of the QA plan the contactor shall develop of sheet pile driving plan. The plan shall detail possible conditions encountered during pile driving the appropriate actions to follow. The Consultant shall provide at the time 100% design submittal.

M. Operation and Maintenance Plan (O&M plan)
   1. The Consultant shall prepare an Operation and Maintained Plan for the designed structure. The plan shall detail the actions that need to be performed for the structure to function as designed for the design life of the structure. The O&M plan must include but is not limited to the proper gate operations that will provide water to all users and meets the requirements established in the FEIS and associated documents. The O&M plan shall also include all maintenance actives such as trash and debris removal and repairs of gates, screens, and other appurtenances. The Consultant shall provide at the time 100% design submittal.

N. As-Built Drawings
   1. The Consultant will provide stamped as-built drawings at the end of the project. As-built drawings shall record the materials, dimensions, elevations, and construction methods used during construction. They shall specifically note revisions and

adjustments made during construction and document the process follow to approve these design changes.

O. Reference Materials

1. The following NRCS reference materials are available through the internet, except as otherwise noted, at http://directives.sc.egov.usda.gov/, http://www.nrcs.usda.gov/programs/watershed/NWSM.html, and http://www.economics.nrcs.usda.gov/technical/technotes/index.html. The Consultant shall obtain the reference through internet access unless otherwise noted. Non-NRCS documents will be obtained by the Consultant. The Consultant will identify other applicable reference documentation considered appropriate and applicable to the design. The basis for selecting and using such references in the design shall be included in the design report and references included in the report documentation submitted.

P. Bid Period and Construction Period Services

1. The Consultant shall assist the City in preparing a bid advertisement for the project, providing bid documents, holding a pre-bid meeting, and providing any needed addenda during the bid period.
3. The Consultant shall assist the City in evaluating the bids received for the project and recommending award of the project.
4. The Consultant shall prepare for and attend a pre-construction meeting with the City and the Contractor.
5. The Consultant shall provide submittal review, response to Contractor Requests for Information, review of and make recommendations regarding change order requests, review of pay applications for the duration of the construction period, and conduct project closeout at completion of the work.
6. The Consultant will prepare for and attend weekly construction progress meetings.
7. The Consultant shall plan on providing construction inspection. The inspector will provide reports and photographic logs of construction as necessary. A public works inspector from Ivins City will be available daily to assist the consultant with the inspection services.
8. The Consultant shall provide a comprehensive inspection with the contractor and the City at substantial completion, final completion, and just prior to warranty expiration. Prepare and deliver to Ivins a written list of observed deficiencies.
9. The Consultant will use redlined drawings provided by the Contractor to develop as-built construction drawings for the project.
10. The Consultant shall assist the City in closing out the project.

NRCS KAYENTA DEBRIS BASIN(S) PROJECT

A. Project Schedule
    1. The City has proposed a timeline for the project. The City is proposing 4 months (July-Oct) for engineering and final design, and 5 months (Nov-Mar) for construction. It will be incumbent upon the selected Consultant to propose a project schedule, including major milestones and deliverable dates.

B. Coordination Meetings
    1. The Consultant shall include a kickoff meeting and regular progress meetings to review project progress, to coordinate design efforts, to address issues that arise, and to keep the City informed.

C. Design Analysis
    1. Perform the appropriate engineering analysis to provide a design that will meet the objections and criteria established for the project. The analysis shall address but is not limited to the following:
        i. Geology and Soil Mechanics Analysis
        ii. Hydrology/Hydraulics Analysis
        iii. Structural Analysis
        iv. Vegetative Considerations
        v. Safety Considerations
    2. Provide all supporting documentation of the engineering analysis performed to provide design, this includes but is not limited to surveys, computer model files, calculations and computations, sketches, etc.

D. Design Report
    1. Summarize in narrative form the objectives, data, criteria, assumptions, procedures, and decisions used in the design. The design report shall address the topics in the following list, as appropriate.
    2. Design summary - a concise statement of the history and status of design, previous reviews, disposition of applicable policy items, justification for departure from standards, receipt of waivers, etc.
    3. Description of the job - a brief description of the major features, hazard classification, drainage area, storm frequencies, landscape resources, capacities, etc. It includes any variance from project plans.
    4. Design objective - a brief, clear statement that may be a summary from a project plan. Differences identified from plans must be supported by proper approvals.
    5. Basis for design - a listing of reference documents used in the design such as handbooks, codes, reports, studies, and criteria.
    6. General basic data - includes hazard analyses, seismic assessment, and limiting conditions or restraints that may influence design, construction, or facility operation.
    7. Location and layout - Documents considerations of site configuration or landscape conditions that had an effect.
    8. Hydrology - The data, procedures, determination of spillway operation frequency, reservoir operational studies, and summary of precipitation depth, duration, and

distribution. It properly describes the characteristics of the contributing watershed and provides the necessary basis for the hydraulic design.

9. Hydraulic design - Documents the shape and proportioning selected for selected features, adequacy of sediment and flood storage, adequacy of channel stability, and sediment transport considerations.
10. Embankment and foundation design - A summary of data, site conditions, assumptions, treatments selected, and design analysis used to:
    i. Make seepage analysis and design control measures.
    ii. Make stability analyses and determine material quality and quantity.
    iii. Make foundation design analyses.
    iv. Make embankment materials selections.
    v. Permit planning instrumentation systems.
    vi. Includes unique, or critical issues, or issues which have a significant impact on the function of the structure, or cost or duration of construction.
11. Structural design - Documents the assumptions, loading conditions, and design procedures used.
12. Environmental considerations – Summarize considerations given to features or practices to provide for conservation of visual, biological, and surface and ground water resources that may be affected by the planned measures, both during and after construction. Included features or practices used to meet criteria established in the FEIS.
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16. Cost Estimate - Explain the effects of the season, changes in size of contract
17. Construction Schedule - Explanation of any critical starting, delay, or completion dates.
18. Operation and Maintenance (O&M) - Explanation of conditions in which design assumptions depend on proper O&M and significant O&M activities are anticipated (for example, grasses in the emergency spillway to protect against erosion during flow). Items identified and evaluated during the design that are planned for replacement during the evaluation period must be noted and described.
19. Construction Review - A summary of those items, conditions, or features encountered during construction that require a field review by the designer, geologist, soil engineer, or other specialist to ensure that conditions anticipated during the design are verified and consistent with the design assumptions. Include the request for timely notification. Note whether a preconstruction conference is needed.
20. Authority - The name (with signature), title, and seal of the designer must appear on the title sheet of the design report along with this statement "To the best of my professional knowledge and judgment the design summarized by this report meets applicable NRCS standards." The consultant shall provide at the time of 50%, 90%, and 100% design submittal.

E. Construction Drawings
    1. Document the construction drawings to illustrate the work. Drawings shall contain the detail needed to:

i. Access the site.
ii. Ensure avoidance of both underground and above ground utilities.
iii. Establish construction operations including material storage, staging areas, equipment storage, servicing areas, construction office, etc.
iv. Layout and construct the work as specified.

2. Ensure where the specifications include "as shown on the drawings" or similar language, the information is included on the drawings and the work illustrated on the drawings can be safely constructed as shown.
3. Certify on the drawings that "to the best of my professional knowledge, judgment, and belief, these plans meet applicable NRCS standards." The above statement shall be included on the title sheet near the engineer's signature and seal. The Consultant shall provide at the time of 50%, 90%, and 100% design submittal.

F. Specifications
1. Document the specifications to describe the work. To adequately describe the work, the specifications shall contain the detail needed to:
i. Define the scope of the work.
ii. Specify the materials to be incorporated into the work.
iii. Specify all ancillary work such as foundation preparation, borrowing of earth materials, etc.
iv. Specify tests and activities necessary to control the quality of the work.
v. Describe the method of compensation for the work including, if applicable, items that are subsidiary as defined in NEH Part 642, Specifications for Construction Contracts.
2. Ensure the information is consistent between the specifications and the drawings and between the specifications and the bid schedule.
3. Consultant shall use NRCS National Construction Specifications. Construction specification may be modified to be more restrictive based on the judgement of the Consultant, but may not be modified to reduce the requirements. The Consultant shall provide at the time of 50%, 90% and 100% design submittal.

G. Bid Schedule
1. Consultant shall create the bid schedule that lists all bid items included in the specifications in a logical sequence commensurate with the work, the method of payment (i.e. lump sum or quantity basis) is consistent with that specified, and the units for bid items are consistent with the method of payment. Shall be provided at the time of 100% design submittal.

H. Cost Estimate
1. The Consultant shall create a cost estimate and adjust for reasonableness of the values assigned to each bid item. The Consultant shall provide at the time 100% design submittal

I. Performance Schedule
1. The Consultant shall prepare a construction performance schedule. The construction performance schedule shall give the estimated duration and sequence

for activates necessary to construct the design. The Consultant shall provide at the time 100% design submittal.

J. Inspection/quality Assurance Plan (QA Plan)
    1. The Consultant shall create a QA plan and ensure that it is adequate to provide the construction oversight needed to ensure the desired construction quality is attained. The Consultant shall also ensure the plan contains provisions for timely notification of specialists such as the designer, geologist, soil mechanics engineer, or other specialist to ensure that conditions anticipated during design are verified and are consistent with the design assumptions.
    2. As part of the QA plan the contactor shall develop of sheet pile driving plan. The plan shall detail possible conditions encountered during pile driving the appropriate actions to follow. The Consultant shall provide at the time 100% design submittal.

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    1. The Consultant shall prepare an Operation and Maintained Plan for the designed structure. The plan shall detail the actions that need to be performed for the structure to function as designed for the design life of the structure. The O&M plan must include but is not limited to the proper gate operations that will provide water to all users and meets the requirements established in the FEIS and associated documents. The O&M plan shall also include all maintenance actives such as trash and debris removal and repairs of gates, screens, and other appurtenances. The Consultant shall provide at the time 100% design submittal.

L. As-Built Drawings
    1. The Consultant will provide stamped as-built drawings at the end of the project. As-built drawings shall record the materials, dimensions, elevations, and construction methods used during construction. They shall specifically note revisions and adjustments made during construction and document the process follow to approve these design changes.

M. Reference Materials
    1. The following NRCS reference materials are available through the internet, except as otherwise noted, at http://directives.sc.egov.usda.gov/, http://www.nrcs.usda.gov/programs/watershed/NWSM.html, and http://www.economics.nrcs.usda.gov/technical/technotes/index.html. The Consultant shall obtain the reference through internet access unless otherwise noted. Non-NRCS documents will be obtained by the Consultant. The Consultant will identify other applicable reference documentation considered appropriate and applicable to the design. The basis for selecting and using such references in the design shall be included in the design report and references included in the report documentation submitted.

Q. Bid Period and Construction Period Services
    1. The Consultant shall assist the City in preparing a bid advertisement for the project, providing bid documents, holding a pre-bid meeting, and providing any needed addenda during the bid period.

2. The Consultant shall assist the City in evaluating the bids received for the project and recommending award of the project.
3. The Consultant shall prepare for and attend a pre-construction meeting with the City and the Contractor.
4. The Consultant shall provide submittal review, response to Contractor Requests for Information, review of and make recommendations regarding change order requests, review of pay applications for the duration of the construction period, and conduct project closeout at completion of the work.
5. The Consultant will prepare for and attend weekly construction progress meetings.
6. The Consultant shall plan on providing construction inspection. The inspector will provide reports and photographic logs of construction as necessary. A public works inspector from Ivins City will be available daily to assist the consultant with the inspection services.
7. The Consultant shall provide a comprehensive inspection with the contractor and the City at substantial completion, final completion, and just prior to warranty expiration. Prepare and deliver to Ivins a written list of observed deficiencies.
8. The Consultant will use redlined drawings provided by the Contractor to develop as-built construction drawings for the project.
9. The Consultant shall assist the City in closing out the project.

IV. Compensation for Services:

Ivins City intends to enter into a professional services contract with the Consultant that's chosen by the selection committee based on the selection process below. **The selection of the engineer or engineering firm will be based mainly on qualifications and other criteria as described in the selection process below.** Following the selection of a Consultant, the City and the Consultant will negotiate scope and compensation. If terms between the City and the Consultant regarding scope and/or compensation cannot be agreed upon, the City reserves the right to forgo negotiations with the selected Consultant and begin negotiations with the Consultant with the second highest point total from the selection process.

IV. Evaluation Criteria and Selection Process

Selection of the successful Engineer will be based upon a matrix giving a predetermined value to each of the submissions required in this section. The award of contract will go to the engineer receiving the most points based on the following:

A. Qualifications of the firm, project management and design teams, and key project personnel (40 POINTS AVAILABLE)
B. Design approach and methodology, understanding of work required, proposal presentation (30 POINTS AVAILABLE)
C. Past performance and references, communication skills, local knowledge and experience (30 POINTS AVAILABLE)

V. Proposal Format and Content

Proposals are to follow the format and are to contain information listed in this section. In order to be considered, proposals must address all the items listed in this section and adhere to page limitations.

TECHNICAL PROPOSAL FORMAT

A. Letter of transmittal introducing firm, the office location where the project team will be located, the firm's capabilities, and nature of proposal.
B. Project Team, Approach, and Project Understanding. Sub-contractors need to be listed in this section as well. (Two pages maximum for each project, 6 pages maximum total) If needed, complete resumes can be included as an appendix.
C. Firm Experience, Qualifications, and References (Two pages maximum for each project, 6 pages maximum total)
    1. List projects similar in size and complexity completed by firm (minimum two per project) (include projects that have been done for the NRCS).
    2. Provide names and telephone numbers for each of the projects listed.

The Technical proposal is to be submitted electronically, see the submittal requirements section for more information.

VII Submittal Requirements

Proposals are due on Wednesday, June 22st by 3:00 p.m.

The proposal should be submitted electronically in a PDF format to jchapman@ivins.com. Large files may be transmitted by including a link to an FTP site on the email. Hard copies will not be accepted.

Inquiries regarding the RFP should be directed to Chuck Gillette, P.E., Public Works Director or Tom Jorgensen, P.E., Assistant Public Works Director of Administration at (435) 634-0689, or by inquiry to the address above. The City reserves the right to award the contract to the highest ranked firm without further consideration or discussion. **The City reserves the right to reject any and all proposals received.** The City also reserves the right to waive any irregularity, informality, or technicality in the proposals in its best interest. If terms cannot be mutually agreed upon, The City will enter into negotiations with the secondary engineer/firm.

Bowen Collins
& Associates, Inc.
CONSULTING ENGINEERS

20 NORTH MAIN, SUITE 107 • ST. GEORGE, UTAH 84770
TEL: 435.656.3299 • FAX: 435.656.2190

June 22, 2016

Jennifer Chapman
Administrative Assistant – Parks & Public Works
Ivins City
55 North Main
Ivins, Utah 84738

Subject: Proposal to Provide Engineering Services for the Ivins City 2016 Storm Water Improvements Project

Dear Jennifer:

Bowen, Collins & Associates (BC&A) is pleased to submit for your consideration the enclosed proposal to provide engineering services for your 2016 Storm Water Improvements Project. The information presented in the attached proposal has been organized to provide the information listed in your Request for Proposal and to summarize our unique knowledge and experience of storm water and NRCS projects. We believe that our previous experience, particularly with the NRCS, will allow us to be most time and cost-efficient in providing the needed services. We can help stretch your available funds to construct projects that will provide the maximum benefit.

FIRM OVERVIEW

Firm Name:	Bowen Collins & Associates
Office Location:	St. George, Utah; Draper, Utah; and Boise, Idaho
Office Where Work Will be Completed:	St. George, Utah
Primary Contact:	Todd Olsen, P.E.
Telephone:	(435) 656-3299
Email:	tolsen@bowencollins.com
Years in Business:	18
Current Number of Employees:	65 (firm total)

We understand that these three projects will have challenges with technical issues, schedule requirements, and budgetary constraints. Our team can work with you to successfully navigate through these issues and challenges. The attached proposal identifies some project-specific key issues. In addition to addressing those issues, out team will work with you to address the additional key issues that are common to all three projects.

- **Our team has extensive local knowledge and a thorough understanding of NRCS project requirements.** These NRCS projects include hydrology, hydraulics, erosion mitigation, new channel construction, dams, detention/debris basins, diversion/regulating structures, and levees. Our previous experience has allowed us to gain a firm understanding of NRCS design standards and review requirements. We also thoroughly understand FEMA dam/debris basin criteria and requirements associated with developing

flood insurance rate maps; we developed your current maps for the State and FEMA. Our local knowledge, planning and design experience along with our experience in working with diverse stakeholders will allow our team to efficiently find the best and most cost-effective solutions on a fast-track schedule.

- **Our team has the proven abilities and resources to meet demanding schedules and budget constraints on complicated projects.** We have never gone over our contracted budget on an NRCS-funded project and we have always met required schedules. Our team has the resources, expertise, and availability to concurrently perform all three projects, which should be the most cost-effective way for these projects to be designed, because of the coordination required with common stakeholders. We are willing to commit to meet the budget and schedule that will be better defined in a final scope of work.
- **We will to design features that can be constructed within given budget constraints.** Before we begin the final design process, we will perform conceptual engineering and alternative analyses with construction cost estimates. In other similar projects, we have found that a new evaluation of the features to be constructed can result in some different concepts and approaches that can be more cost effective. We recently completed several EWP projects where we were able to develop more cost-effective ways to accomplish the purpose of the project than what was identified in the initial conceptual design process. Our extensive experience and knowledge of the area can help in finding ways to stretch your construction budgets.
- **Our team has good relationships with NRCS and State Dam Safety Personnel.** Our project team has excellent working relationships and a good professional reputation with staff at these agencies. We understand their requirements and we know how to work with them and how to accelerate review and approval times. This would be of great benefit to this project.

The BC&A team is very interested in working with the City and NRCS in planning, designing and constructing measures to mitigate flooding potential throughout the City. Our knowledge of the area, the resources of our firm, our expertise and experience with this type of work, and our approach in working closely with City personnel will allow us to efficiently and cost-effectively complete the work to accomplish your project objectives.

We hope to have the opportunity to work with you to make this a successful project. Please call if you have questions regarding any of the information presented in our proposal or if you need any additional information.

Sincerely,
Bowen Collins & Associates, Inc.

Todd Olsen

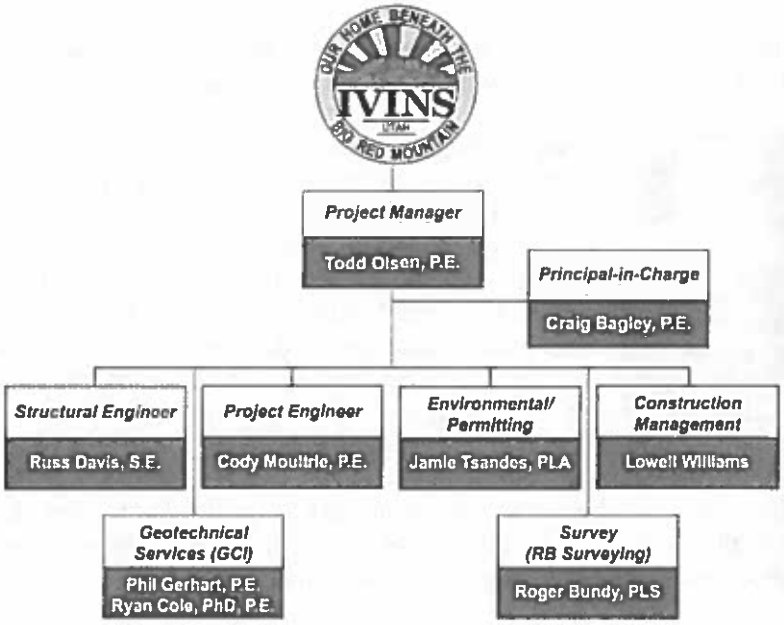
Todd Olsen, P.E.
Principal/Project Manager

Enc: Proposal

A. PROJECT TEAM AND APPROACH

PROJECT TEAM

Bowen Collins & Associates (BC&A) is a local engineering firm specializing in water resources, including storm water and flood control. The company was founded in 1997 and has grown to have a staff of 65 professionals. Technical expertise and responsive client service form the foundation of our company.



Engineering work for this project will be completed out of our St. George, Utah office and we will commit to keep each project team member available to spend adequate time on the project through its completion. Our proposed staff is very familiar with government agency requirements, particularly those associated with the Utah Division of Water Rights (UDWR) and the National Resource Conservation Service (NRCS). BC&A has assembled a team of highly qualified specialists to work with you on the critical project. To supplement our experience, we have teamed with Gerhart Cole, Inc. (GCI) to provide geotechnical expertise for the project. BC&A previously teamed with GCI to complete multiple dam design/rehabilitation projects and several NRCS-funded projects. Detailed resumes for the primary members of the project team are include in Appendix A for reference.

For consistency, efficiency, and simpler project management on the City's end, we propose to use the key staff identified in the figure above for all three projects listed in your RFP. These people will serve as leads for each aspect of the project. As mentioned above, we also have a large team of experts that can be utilized to supplement the experience and skills of our local staff.



Todd Olsen, P.E. – Project Manager. Mr. Olsen will serve as project manager on this project. He has experience in planning and design of water, storm drain, irrigation, and flood control facilities, particularly on NRCS-funded projects. Mr. Olsen is skilled and experienced in the design of storm water pipelines, debris basins, diversions, hydraulic structures, culvert/bridge crossings, and canal and pump station intake detention structures. His previous project experience includes:

- Bateman Pond Dam Replacement Project, West Jordan City, Utah
- Center Street Geneva Road Outfall, Provo City, Utah
- Falcon Way Storm Drain Project, Sandy City, Utah
- Indian Hills Storm Drain Project, St. George, Utah
- Midvale Storm Drain Improvements, Midvale City, Utah
- Washington Fields Trail & Drainage Corridor, St. George City, Utah
- Alpine EWP Project, Alpine City & NRCS
- Coal Creek Watershed Protection and Flood Prevention Project, Cedar City & NRCS
- Draper EWP Project, Draper City & NRCS

- Iron County EWP Project, Iron County & NRCS
- Weber EWP Project - Ogden Bay WMA Repair Project, Weber County & NRCS
- Weber EWP Project - Weber River Sediment Basin Project, Weber County & NRCS
- Weber EWP Project – Willard Canal Intake Structure Repair Project, Weber County, WBWCD, & NRCS

Each of these projects included planning, design, permitting, agency review, and construction management. Mr. Olsen is very familiar with the NRCS specifications, design, and construction requirements.



Craig R. Bagley, P.E., CFM (BC&A) – Principal in Charge. Mr. Bagley will serve as principal in charge, will provide senior review on this project. He will ensure that the proper personnel and resources are assigned to successfully complete the project. Mr. Bagley specializes in hydraulics and hydrology and is experienced in planning and designing water, wastewater, and storm water facilities. He has experience designing new dams, rehabilitating existing dam facilities, and performing detailed hydrologic and hydraulic evaluations of dam and dam related facilities. Many of the projects he has managed have required him to obtain permits from multiple federal and state agencies. He also has extensive experience completing planning, design, permitting, and construction services for NRCS-funded projects under multiple programs. Mr. Bagley has served as Project Manager on at least 12 NRCS EWP projects. Mr. Bagley has been involved in the hydraulic analysis, design, and construction of numerous water control and diversion structures. He has modeled and designed related project elements such as spillways, low-level outlet works on dams, outlet works on debris basins, concrete flumes, weirs, sluice gates, trash racks, screening devices, and pipelines.

He has completed many master planning studies for water, secondary water, storm drain, and sewer facilities for agencies across the State of Utah, many covering large service areas. He has extensive experience in designing sewer, water, and storm drain, flood control, and secondary water system improvements under varied conditions, including: large pipelines; diversion, regulating, and control structures; pump stations; buried reinforced concrete tanks; detention facilities; bridges; and sedimentation structures.



Cody Moultrie, P.E. - Project Engineer. Mr. Moultrie will serve as project engineer for this project. Mr. Moultrie has over 8 years of experience in planning, designing, and performing project management for various civil engineering projects throughout Utah, Nevada and Idaho. Mr. Moultrie has worked on projects which include floodplain mapping, flood control projects (including NRCS and EWP projects), design of storm drainage systems, design of diversion structures and other stream restoration methods, dam siting analysis, natural resources management planning, design of canals and drainage channels, construction management of storm drain projects, and a wide range of environmental and hydraulic studies. Mr. Moultrie has been heavily involved with the Bear River Project, which has involved a comparison of 40+ potential reservoir/dam sites, hydrologic analysis of drainage basins, analysis and design of spillways, pipeline hydraulics analysis, and development of numerous tools to aid in these various analyses. Many of these tools will be directly applicable to the various Ivins Detention Basin Projects. Mr. Moultrie has a variety of skills, including hydrologic and hydraulic modeling, floodplain delineation, flood frequency analysis, digital map making, site and grading plan design, environmental impact reports, time and budget management, effective communication with clients and contractors, database management, computer programming and technical writing. His experience in common computer applications includes AutoCAD, ArcGIS, spreadsheets and word processing, and a variety of hydrologic/hydraulic design software packages. Additional skills include Visual Basic and Python programming and surveying.



Phil C. Gerhart, P.E. (GCI) – Senior Geotechnical Engineer and Senior Review. Mr. Gerhart has been in responsible charge of all phases of geotechnical consultation from preliminary studies through final studies, analyses, design and project construction. His professional experience includes engineering consultation for foreign and domestic clients and managing large, multidisciplinary projects and small single discipline tasks. Projects he has managed include: geotechnical studies for dams, fossil fuel generating stations, large industrial-minerals processing plants, mine facilities, and multi-story office towers to light industrial and retail sales buildings. Other related types of projects include tunnels, water supply and treatment facilities, wastewater treatment plants, pipelines, transmission lines, bridges, large flexible culverts, railroads, highways, microwave and radar facilities. Mr. Gerhart has managed the investigations and designs for over 40 dams and retention structures. Representative high hazard dam studies have included liquefaction potential analyses, cyclic softening failure potential analyses, post liquefaction strength analyses, static and dynamic stability analyses (limit equilibrium and finite element), and post earthquake deformation analyses.



Ryan Thomas Cole, Ph.D., P.E. (GCI) – Lead Geotechnical Engineer. Mr. Cole has provided technical consulting services to both private and public sectors for over 15 years. Professional project experience includes: geotechnical aspects of dams, highways, slurry walls, canals, dikes, haul roads, trenchless technologies, large pump stations, large diameter pipelines, deep foundations (piles, drilled shafts, auger cast piles, and micropiles), landslides, lined ponds, transmission lines, cellular towers, deep excavations/shoring, dewatering, shoring (tiebacks and soil nails), and MSE walls. This experience includes: design-build, CM/GC, design-bid-build project delivery and work on multiple NRCS EWP projects. Ryan has taught graduate and undergraduate courses in geotechnical engineering at the University of Utah and Brigham Young University and has supported research efforts at both universities.



C. Russell Davis, P.E., S.E. - Structural Engineer. Mr. C. Russell Davis is a Utah-licensed structural engineer and serves as manager of BC&A's structural department. Mr. Davis has acted as both project manager and chief structural design engineer for buried concrete reservoirs, pumping stations, and associated vaults and miscellaneous structures. Mr. Davis was the structural engineer for diversion dam improvements for the City of Mesquite, Nevada on the Virgin River. Mr. Davis has both quantity and quality experience in handling structural design on difficult soil conditions seismic loadings under the most stringent design criteria. His resume covers multiple types of water structures, including irrigation diversion gate structures and channels of all kinds.



Jamie Tsandes - Landscape Architect/Environmental Permitting. Ms. Tsandes has 17 years of experience in landscape architecture and natural resource management, with an emphasis in environmental planning. She is a graduate of Utah State University in Landscape Architecture and Environmental Planning. Ms. Tsandes has extensive experience with both private and public sector projects and works closely with agencies such as the Utah Division of Wildlife Resources, U.S. Army Corps of Engineers, U.S. Fish and Wildlife, State of Utah Division of Water Rights and the Utah Department of Transportation. Her project experience includes managing stream and wetland restoration projects, environmental assessments, environmental permitting, and public relations. She has managed and overseen the environmental permitting efforts several EWP projects, and obtained the environmental permits for the Green River Pump Station Project on behalf of the Bureau of Reclamation and the Uintah Water Conservancy District.



Lowell Williams, A.A.S, Construction Manager/Inspector. Mr. Williams has over 25 years of experience as a construction manager, inspector and designer at BC&A. He has broad experience in water-related projects such as pipelines, pump stations, reservoirs, flood-control structures, irrigation facilities, and other water conveyance and transmission facilities. Mr. Williams has served as a field representative for the Utah Lake/Jordan River Management Program, the Landfill No. 5 for the Utah Test and Training Range, Hill Air Force Base, the MWDSLS Administration Building, the Keswick Road Pipeline Project for the JVWCD, the 2001 Pipelines Project for Sandy City, Utah, the 8600 South Storm Drain Project for Sandy City, Utah, the Jordan Aqueduct Reach 1 & 4 Capacity Enhancement Project for JVWCD and the West Regional Sewer Project for the City of Logan, Utah.

Roger Bundy, PLS – Project Surveyor. Mr. Bundy is a local survey with over 29 years of experience in the Washington County area. He has completed hundreds of boundary surveys in Utah, multiple ALTA/ACSM boundary surveys, hundreds of topographical surveys, and has managed multi-million dollar engineering project. Mr. Bundy is also the past chapter president and State Board Member of the Utah Council of Land Surveyors.

APPROACH AND PROJECT UNDERSTANDING

Your RFP outlined a detailed scope of work, with which we concur. This Section outlines our project understanding and general approach to each of the 3 projects you identified.

2016 Master Planned Storm Drain Projects

Project Understanding

BC&A recently completed a Storm Drain Master Plan for Ivins City. That master plan identified projects that are needed to mitigate drainage system deficiencies and to safely manage storm water runoff in areas throughout the city. Your RFP identifies 5 high-priority pipeline projects and 2 detention facility projects that the City staff would like to prioritize, phase, and ultimately design. More detailed hydrologic/hydraulic analyses and coordination with City staff will be required to more accurately define the design details of these projects. In addition, revised conceptual construction cost estimates will be updated and a careful evaluation of available funding for these projects will be performed to help City staff prioritize and phase projects such that they receive the largest benefit for the money spent. It is also our understanding that you want the selected facilities constructed by March 2017.

Based on our understanding of this project, our approach will include addressing the key issues identified below to make this project successful.

Key Project Issues

> "In theory there is no difference between theory and practice. In practice there is."
>
> *Yogi Berra, American Baseball Player*

Design Schedule and Coordination. To meet your proposed 4-month design schedule, we plan to have regular project progress/coordination meetings to review assignments and progress and make plans and schedule for future work. These regular meetings will help keep the project on schedule and on budget and will allow City staff to provide input regarding project elements and priorities in a timely manner.

Updating Master Planned Recommendations. Work associated with a master plan study is generally completed at a conceptual level. We propose to complete a more detailed level of hydrologic and hydraulic analyses than was performed during the master plan and to develop data that can be used for preliminary design. This will allow us to refine the sizes of needed pipelines and detention facilities, potentially evaluate other more cost-effective alternatives, develop more accurate construction cost estimates, and to prioritize needed improvements.

Designing Dual-Use Detention Facilities. We propose to work with City staff to design dual-use detention facilities, or detention facilities that can serve as parks or other public facilities most of the time.

Avoiding Dam Safety Review. If possible, we will design detention facilities where water is stored below the natural ground surface and not on an embankment to avoid the creation of addition regulated dam facilities.

Avoiding Existing Utilities. We propose to pothole existing critical buried utilities at the beginning of the design process so we can design needed improvements that will avoid those facilities, where possible. This will reduce the possibility of construction change orders associated with unknown buried utilities.

NRCS Debris Basin Rehabilitation Project

Project Understanding

The Ivins Debris Basins 1-6 were reportedly constructed in 1976 and 1977. These facilities were designed to provide flood control benefits for property in Ivins. However, recent studies have determined that these high-hazard dam structures do not meet minimum Utah Dam Safety Regulations or current NRCS design standards. In general, work needs to be done to restore design storage capacity, enlarge auxiliary spillways, repair erosion damage, and modify the outlet works and pipelines. It is also our understanding that a design variance must be obtained because the outlet pipe diameter is smaller than current standards generally allow. This project is eligible for funding under the NRCS Small Watershed Rehabilitation Program, which can fund up to 65 percent of construction costs as well as provide technical assistance for design. The other 35 percent of the construction cost must be funded through a local match (money or in-kind match). This project will require close coordination with personnel from NRCS and the Utah State Dam Safety Section of the Utah Division of Water Rights. It is our understanding that you would like the design of needed modifications completed by the end of the 2016 calendar year with anticipated construction to be completed in 2017 and 2018.

Based on our understanding of this project, our approach will include addressing the key issues identified below to make this project successful.

Key Project Issues

Design Schedule and Coordination with Review Agencies. To meet your proposed 4-month design schedule, we plan to have weekly project progress/coordination meetings/conference calls that include NRCS and State Dam Safety personnel to review assignments and progress and make plans and schedule for future work. These regular meetings will help keep the project on schedule and on budget and will allow all stakeholders to provide input regarding project elements and priorities in a timely manner. Regular coordination with the State and NRCS reviewers will also allow us to address design issues during the design phase, reduce review times, and streamline plan approvals.

Meeting Defined Environmental/Biological Requirements. An Environmental Assessment (EA) and a Biological Assessment (BA) have both been completed for this project. We will work to ensure that all design and construction work complies with the requirements of the Biological Opinion (BO), including items associated with the Desert Tortoise.

Utilizing Previous Engineering Analyses. A significant amount of engineering analysis was completed to develop design concepts as part of the EA. We will utilize the EA work and other relevant work to the extent that we can to minimize design time and budget.

Designing Outlet Modifications with Operation and Maintenance in Mind. We will work closely with the City, NRCS and State Dam Safety personnel to develop outlet structure modifications that are operation and maintenance friendly. We believe it is possible to improve upon the concepts presented in the EA.

NRCS Kayenta Debris Basin(s) Project

Project Understanding

In September 2014, runoff from two major storms caused severe flooding along Coyote Gulch Wash. The City requested, and has been approved to receive, technical and financial assistance through the NRCS Emergency Watershed Protection (EWP) Program to design and construct one or two needed debris basins to mitigate the risk of flood damage during future large storms. This project will require close coordination with the NRCS while an environmental assessment and biological opinion is prepared, close coordination with Utah State Dam Safety personnel, as well as City staff and other stakeholders. In order to meet mandated EWP schedules and guidelines, the project must be designed and constructed by March 2017. This will require NRCS and State Dam Safety a review and approvals, obtaining needed property rights for construction, and significant coordination so that reviews and approvals can be streamlined.

Based on our understanding of this project, our approach will include addressing the key issues identified below to make this project successful.

Key Project Issues

Schedule and Coordination. Most EWP Projects have a 220-day timeline to design and construct a project. Contract extensions can be obtained when warranted, but they are getting harder to obtain. The "E" in EWP stands for emergency, not eternal! We plan to have weekly project progress/coordination meetings/conference calls that include NRCS and State Dam Safety personnel to review assignments and progress and make plans and schedule for future work. Significant coordination will be required as geotechnical investigations, alternative site and design work, and work with the EA and the BA are performed concurrently. We will also need to identify all land, including construction staging areas that could be impacted by construction. These regular meetings will help keep the project on schedule and on budget and will allow all stakeholders to provide input regarding project elements and priorities in a timely manner. Regular coordination with the State and NRCS reviewers will also allow us to address design issues during the design phase, reduce review times, and streamline plan approvals. We may also evaluate alternative project delivery methods (i.e., CMGC), if needed, in an effort to meet the construction deadline imposed by the program. We recently completed the $7 million Green River/Tusher Diversion EWP project from start to finish in 10 months, so we know how to fast-track a project like this.

Regular Coordination with NRCS and State Dam Safety Personnel. We plan to include NRCS and State Dam Safety personnel in our weekly progress meetings/conference calls. This will allow us to obtain step-by-step buy in during the design process and will shorten review and approval times. This will be critical to obtaining the needed approvals prior to construction.

Careful Selection of Dam Site(s). The proposed new debris basin may be classified as a high hazard dam. Proper site selection will be critical to the design and safe operation of a flood control dam. We will work with GCI, NRCS and State Dam Safety staff to evaluate and select the best site(s) that will meet the purpose and needs associated with this project. We will also design the dam so that it can be cost-effectively constructed with local materials.

Defining Property Rights Issues Early. If the City does not own the property where the proposed debris basin(s) will be located, we will work with the City to obtain the needed property rights. This may include easements, written permission, or purchase of property. Often the property issues take longer to work out than the design details. We must begin early to address these issues, as NRCS cannot allow construction to begin without needed property rights.

B. FIRM EXPERIENCE, QUALIFICATIONS, AND REFERENCES

BC&A's core expertise includes the planning, study and design of dams, restoration of dams, river and open channel diversions, hydrologic and hydraulic modeling, pipelines, stream restoration, and environmental permitting. We employ a group that provides construction management services on large and challenging civil projects throughout the Intermountain West, with the most recent being a $120 million project. Our proposed staff is very familiar with government agency requirements, particularly those associated with UDWR, and the NRCS. *BC&A has extensive experience with large, complicated NRCS projects.*

The following sections highlight relevant project experience of the BC&A project team that relates to the three Ivins Storm Drain Projects: 1) 2016 Storm Drain Master Plan Improvement Projects, 2) NRCS Debris Basin Rehab, and 3) NRCS Kayenta Detention Basin.

2016 Storm Drain Master Plan Improvement Projects

BC&A has extensive experience designing storm water management projects, most of which include design and construction of large diameter reinforced concrete pipe and urban, dual-use detention facilities. For reference, Table 1 highlights numerous storm drain projects of similar size and complexity to the Ivins Storm Drain Projects that the BC&A project team has completed. A brief summary of two of these projects is included below. References for any projects listed in Table 1 can be made available by request.

Falcon Way Storm Drain
Sandy City Public Utilities, Utah
Contact: Dan Woodbury, (801) 201-2412



BC&A completed preliminary and final design and managed construction for the Sandy City Falcon Way Storm Water Project. The preliminary design phase of the project included an analysis of the existing Sandy Canal and Visser Ditch irrigation system on the existing storm water conveyance system along with recommendations to mitigate flooding within the project area. The project included mainline storm drain pipeline construction from 24-inch to 48-inch, including a 4' x 7' box culvert crossing of Highland Drive and associated manholes, catch basins, laterals, and new detention basin inlet and outlet structures. This project was constructed to increase inlet and drainage capacity within the drainage basin and also to improve inlet and outlet efficiency and operation and maintenance of the existing detention basins.

Indian Hills Storm Drain
St. George City Public Utilities, Utah
Contact: Jay Sandberg, (435) 627-4122

In July 2012, a cloudburst event caused significant flooding in developed areas along Indian Hills Drive, which is located in the Green Valley area of St. George. The City of St. George retained BC&A to evaluate the existing storm drain facilities along Indian Hills Drive, identify deficiencies in the storm drain system, and design a system that will help resolve those deficiencies. BC&A has completed the design for this project, with construction anticipated to occur during Summer 2016. This project consists of many storm water management improvements, including slope regrading and compaction, drainage ditch and check dams, riprap stabilization, 15" to 42" reinforced concrete pipelines and associated appurtenances, and modifications to detention basin outlet works and emergency spillway.

Table 1: Storm Drain Pipeline Project Experience

Project Name	Pipe Size (in)	Length (ft)	Project Description	Project Includes:			Team Members		
				NRCS Coordination	Detention Basin	Storm Drain Pipeline	Craig Bagley	Todd Olsen	Cody Moultrie
8000 SouthStorm Drain Project - Phase 1 and 2 Sandy City, Utah	15 - 48	11,197	Design and construction of storm drain lines, catch basins, water quality structures, manholes, and appurtenances associated with the storm drain pipelines.			X	X	X	
Quarry Bend Storm Drain Project Sandy City, Utah	48 - 72	1,390	Design and construction of large diversion structure, an irrigation regulating structure, a secondary irrigation pipeline, a large storm drain pipeline, a 25-ft drop structure, and a dual-use detention basin/park facility		X	X	X	X	
11400 South Storm Water Project Sandy City, Utah	15 - 42	5,425	Design and construction of storm drain mainlines, laterals and associates facilities, as well as improvements to the outlet works of detention basin		X	X	X	X	X
Falcon Way Storm Water Project Sandy City, Utah	15- 4'x7' BC	8,525	Design and construction of storm drain pipeline, manholes, catch basins, laterals and new detention basin inlet and outlet. Also includes crossing of Highland Drive with 4' x 7' box culvert.		X	X	X	X	X
Highland Drive Storm Water Project Sandy City, Utah	15 - 36	2,465	Design and construction of storm drain pipeline, manholes, catch basins, laterals and new detention basin inlet and outlet.		X	X	X	X	X
Southeast Quadrant Storm Water Project Sandy City, Utah	15 - 30	4,535	Design and construction of storm drain pipeline, manholes and laterals and new riprap channel for outfall to a detention basin		X	X	X	X	
Center Street/Geneva Road Outfall Provo, Utah	15 - 48	5,800	Design and construction of elliptical RCP storm drain pipeline and associated manholes, laterals and catch basins.			X	X	X	
3700 North Storm Drain Project Provo, Utah	15 - 48	2,200	Design of facilities to collect sediment and debris from Little Rock Canyon.			X	X	X	
Indian Hills Storm Drain Project Provo, Utah	15 - 48	9,400	Design and construction of storm drain pipeline and associated appurtenances including catch basins, manholes, cleanout boxes, and connecting the new pipelines to existing storm drain facilities			X	X	X	
Little Rock Canyon Storm Drain Provo, Utah	15 - 36	8,100	Design and construction of storm drain lines, catch basins, water quality structures, manholes, and appurtenances associated with the storm drain pipelines.			X	X	X	
Indian Hills Storm Drain Project St. George, Utah	15 - 42	2,600	Design and construction of storm drain pipeline and associated appurtenances, check dams, drainage channels and slope stabilization.			X	X	X	X

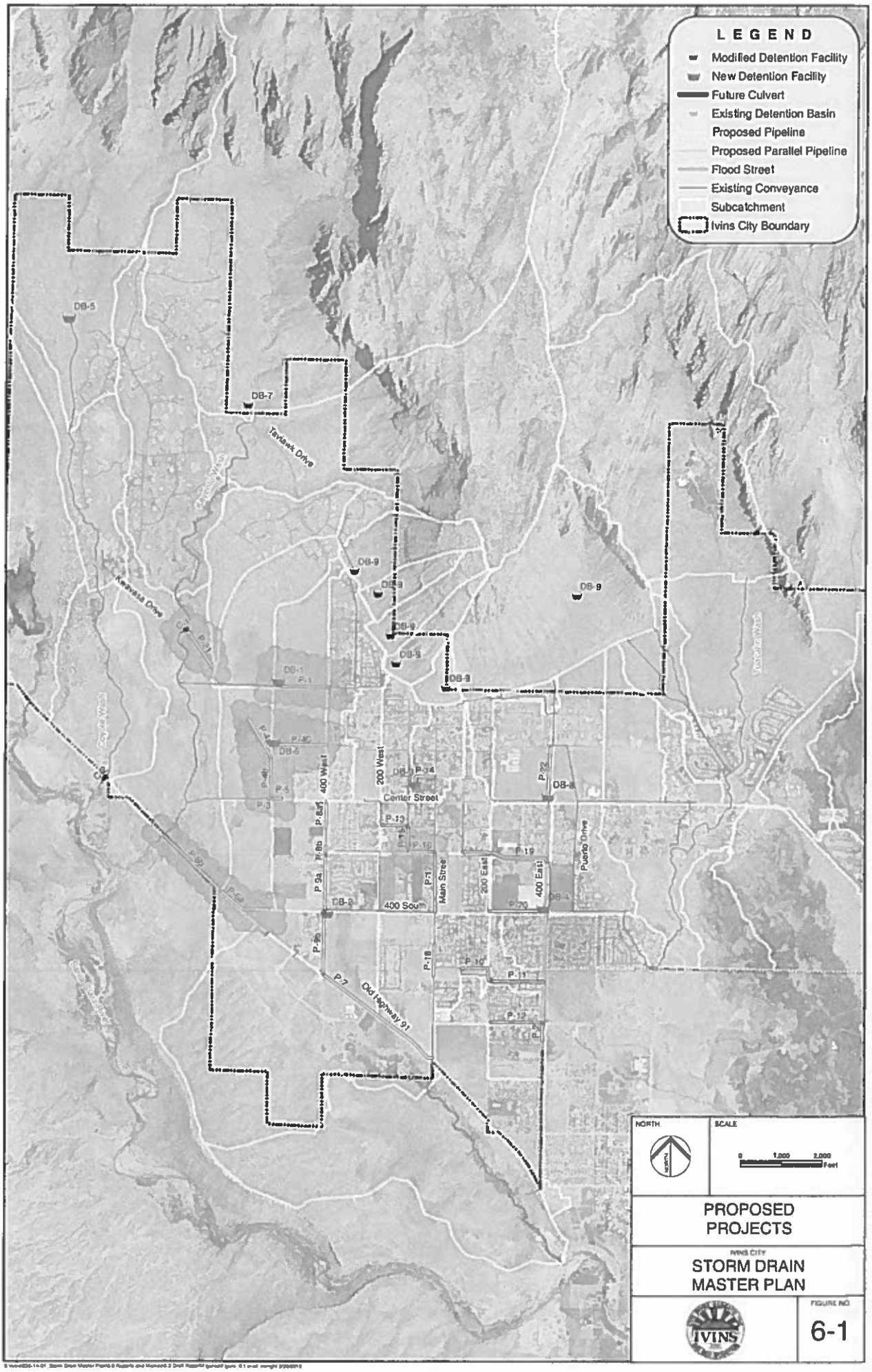
2016 Storm Drain Master Plan Improvements Project
Irvine City
Engineering Man-hours and Fee Estimate

Bowen Collins & Associates Inc

7/6/2016

		Office		Techs		Engineers							Subtotal Hours	Subtotal Labor	Subtotal Expenses	Expenses				Total Cost
	Labor Category	Account	Editor	Tech 3	Tech 4	Envirg	CM	Struct	Staff	PE	PM	PIC				Transport	Mileage	Materials	Survey	
	Staff	Buhler	Hebert	CAD	CAD	Tsandes	Williams	Davis	Wright	Moultrie	Olsen	Bagley				$ 7.00				
	Labor Rate	$54	$85	$95	$100	$115	$125	$150	$97	$115	$125	$185								
TASK 1 - ADMINISTRATION																				
ENGINEERING/DESIGN																				
B	Coordination Meetings	2								21	21	2	46	$ 5,478	$ 422	$ 322	$ 100			$ 5,900
C	Collect and Review Existing Information									10	4		14	$ 1,650	$ 98	$ 98				$ 1,748
D	Site and Utilities Investigation									12	4		16	$ 1,880	$ 10,857	$ 712	$ 20		$ 10,725	$ 12,737
E	Project Prioritization and Budgeting		3						3	18	6	1	29	$ 3,241	$ 203	$ 203				$ 3,444
F	Hydrologic and Hydraulic Analysis								20	6	4	2	32	$ 3,460	$ 224	$ 224				$ 3,684
G	Storm Water Pollution Prevention Plan									2			2	$ 230	$ 14	$ 14				$ 244
H	Design Drawings	2		120	130	70		52		130	80	15	579	$ 65,263	$ 4,113	$ 4,033	$ 80			$ 69,376
I	Technical Specifications	4	8			6		6		20	8	2	52	$ 5,708	$ 364	$ 364				$ 6,072
J	Contract Documents	4	8							10	2		24	$ 2,136	$ 168	$ 168				$ 2,304
K	Construction Cost Estimate									16	4	1	21	$ 2,505	$ 147	$ 147				$ 2,652
L	Easement and ROW Support										6		6	$ 750	$ 3,592	$ 42			$ 3,550	$ 4,342
M	Permits		1			16				4	2	1	24	$ 2,780	$ 168	$ 168				$ 2,948
	Engineering/Design Sub-Total	**12**	**20**	**120**	**130**	**92**	**0**	**58**	**23**	**347**	**119**	**24**	**846**	**$ 96,999**	**$ 20,376**	**$ 6,915**	**$ 180**	**$ -**	**$ 14,275**	**$ 118,469**
BID PERIOD/CONSTRUCTION																				
N	Bid Period Services				10					15	11		36	$ 4,100	$ 272	$ 252	$ 20			$ 4,372
O	Pre-Construction Meeting						3			3	3		8	$ 1,095	$ 83	$ 83	$ 20			$ 1,178
P	Construction Progress Meetings and Support Services									100	44		144	$ 17,000	$ 1,308	$ 1,008	$ 300			$ 18,308
Q	Construction Inspection						288						288	$ 36,000	$ 2,976	$ 2,016	$ 960			$ 38,976
R	Project Documentation				18		8				4		30	$ 3,300	$ 230	$ 210	$ 20			$ 3,530
	Bid/Construction Sub-Total	**0**	**0**	**0**	**28**	**0**	**299**	**0**	**0**	**118**	**62**	**0**	**507**	**$ 61,495**	**$ 4,869**	**$ 3,569**	**$ 1,320**	**$ -**	**$ -**	**$ 66,364**
ADDITIONAL TASK																				
1	Geotechnical Investigation									4	2		6	$ 710	$ 5,962	$ 42			$ 5,920	$ 6,672
	Additional Task Sub-Total	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**4**	**2**	**0**	**6**	**$ 710**	**$ 5,962**	**$ 42**	**$ -**	**$ -**	**$ 5,920**	**$ 6,672**
	TOTAL HOURS	**12**	**20**	**120**	**158**	**92**	**299**	**58**	**23**	**469**	**183**	**24**	**1360**							
	TOTAL COSTS	**$648**	**$1,700**	**$11,400**	**$15,800**	**$10,580**	**$37,375**	**$8,700**	**$2,231**	**$47,815**	**$22,875**	**$3,960**		**$ 167,306**	**$ 31,221**	**$ 9,526**	**$ 1,500**	**$ 3,940**	**$ 14,275**	**$ 229,323**

Expenses include:
Computer/Communications Charge at $7/labor hour
Mileage Charge at $0.75/mile
10% Markup on other project related expenses


LEGEND
Modified Detention Facility
New Detention Facility
Future Culvert
Existing Detention Basin
Proposed Pipeline
Proposed Parallel Pipeline
Flood Street
Existing Conveyance
Subcatchment
Irvine City Boundary
DB-5
DB-7
DB-9
DB-1
DB-2
DB-3
DB-4
Tayback Drive
Kenyata Drive
Center Street
400 South
Main Street
200 West
400 West
200 East
400 East
Puente Drive
Old Highway 91
P-1
P-2
P-3
P-5
P-7
P-9a
P-9b
P-10
P-11
P-12
P-13
P-14
P-15
P-16
P-18
P-19
P-20
P-21
P-22
NORTH
SCALE
0
1,000
2,000
Feet
PROPOSED PROJECTS
IRVINE CITY
STORM DRAIN MASTER PLAN
IRVINE
FIGURE NO.
6-1