

**REQUEST FOR STATEMENTS OF QUALIFICATIONS
FOR
DESIGN-BUILD SERVICES
FOR
SCADA INSTALLATION AND INTEGRATION**

Due Date: April 21, 2016

**Public Works Department
433 N. Virginia Street, Prescott, AZ 86301
Phone: (928) 777-1130 | TDD: (928) 777-1100 | Fax: (928) 771-5929**

**REQUEST FOR STATEMENTS OF QUALIFICATIONS FOR DESIGN-BUILD SERVICES
SCADA INSTALLATION AND INTEGRATION**

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REQUEST FOR STATEMENTS OF QUALIFICATIONS FOR DESIGN-BUILD SERVICES

SCADA INSTALLATION AND INTEGRATION

The City of Prescott, Arizona, Requests Statements of Qualifications (RSOQ) from Arizona licensed Contractors for complete Design-Build services for the SCADA Installation and Integration Project. Statements must be received **before 2:00 PM on Thursday, April 21, 2016**, at the City Clerk's Office, 201 S. Cortez Street, Prescott, Arizona 86303, at which time all statements will be publicly opened. Any statements received at or after 2:00 PM on the above stated date will be returned unopened.

Complete information packets are available at the office of the Public Works Director, 433 N. Virginia Street, Prescott, Arizona 86301 (Phone: (928) 777-1130; TDD: (928) 777-1100) or on the City's website at <http://www.prescott-az.gov/business/bids/>. The City reserves the right to reject any and all statements and assumes no liability for the cost of preparing a response to this request.

A mandatory Pre-Submittal Conference will be held in the Public Works conference room at 9:00 AM on April 5, 2016. Submittals will only be accepted from contractors in attendance as established on the sign-in sheet.

A handwritten signature in blue ink, reading "Candace Manibusan", is written over a solid black horizontal line.

Candace Manibusan, Contract Specialist
Published: 2TC March 27, 2016 and April 3, 2016

I. GENERAL INFORMATION

The City of Prescott (the “City”) invites qualified Firms/Contractors to submit a written Statement of Qualifications (SOQ) for performing Design-Build services relating to design review, value engineering and construction of the described project. To be eligible for consideration, Firms/Contractors must submit an SOQ demonstrating appropriate competence, qualifications, and relevant construction experience with this type of project.

A. DESCRIPTION OF WORK

The project goal is to update, centralize, standardize, construct where needed and integrate the SCADA, interface and communication system for sewer lift stations, water pump stations, and water storage facilities. The finish product shall utilize the same hardware, and software throughout the system.

B. SCOPE OF SERVICES

The Design-Builder will begin with the firm in a lead role for design phase services and will hold the construction contract with the City for construction of the project. Design phase services are anticipated to include structural, mechanical, electrical and related work. At some point prior to construction, the Design-Builder will assume the risk of delivering the project through a guaranteed maximum price.

The Design-Build contractor will be responsible for construction means and methods, and will be required to solicit bids from pre-qualified subcontractors to perform the work. The Design-Build contractor will not be required to self-perform portions of the work, but may competitively bid to do so. There will be no limit to the amount of self-performance allowed by the City.

Additional information is included in the attached Project Scoping Report.

C. USE OF DESIGN-BUILD PROCESS

The City intends to select one Design-Build contractor through a procurement process pursuant to ARS § 34-603 and wishes to employ the Design-Build project delivery process to encourage a creative value engineering approach through the interactive efforts of an experienced, highly motivated team. The Design-Build process is expected to foster a cooperative owner-designer-contractor effort to review completed design documents, to identify potential value engineering concepts and to complete construction of the project.

The City’s primary objective in utilizing the Design-Build approach for this project is to bring the best available construction experience and expertise together to work flexibly and cooperatively and meet the schedule and budget challenges presented by this project. The City will expect the following from the contractor:

- An accurate project delivery schedule,
- Ability to maintain delivery according to an approved schedule,
- Optimal use of available budget, and quality construction.

The City will encourage the development of creative options to maximize the value of the end product received.

II. STATEMENT OF QUALIFICATION REQUIREMENTS

Responses to this RSOQ must be in the form of a Statement of Qualifications (SOQ), as outlined in this RSOQ and as allowed by ARS § 34-603(c).

Wherever the word “Proposer” is used in this RSOQ, it shall mean each or any of the individuals, firms, partnerships, or corporations, submitting an SOQ for performance of the Design-Build services being sought by the City for this project.

A. GENERAL REQUIREMENTS

Interested firms are required to submit information relative to their qualifications, experience, project delivery approach, ability to meet the project’s goals and objectives, and other criteria as listed. All information must be provided as requested for all firm members and their key personnel to be assigned to this project.

DO NOT include any fees or pricing related to this project with the SOQ submittals. These items will not be considered at this time and failure to comply with this provision may result in the rejection of the submittal.

B. PROPRIETARY INFORMATION

All materials submitted in response to the solicitation, including samples, shall become the property of the City upon delivery to the City. Proposer shall clearly mark any proprietary information contained in its submittal with the words “Proprietary Information”. Proposer shall not mark any Solicitation Form as proprietary. Marking all or nearly all of a submittal as proprietary may result in rejection of the submittal.

Proposers should be aware that the City is required by law to make its records available for public inspection. The Proposer, by submission of materials marked proprietary, acknowledges and agrees that the City will have no obligation to advocate for non-disclosure in any form nor will the City assume any liability to the Proposer in the event that the City must legally disclose these materials

C. REQUESTS FOR INFORMATION

Proposers who desire clarification of the project, selection criteria or submittal requirements shall restrict their inquiries to written communications only. All communications (other than delivery of the SOQ as defined below) shall be addressed to the City’s Project Manager at the following:

Mr. Benjamin Burns
Capital Project Manager
City of Prescott – Department of Public Works
433 N. Virginia Street, Prescott, Arizona 86301
Phone: (928) 777-1130
Fax: (928) 771-5929
benjamin.burns@prescott-az.gov

Requests for information must be received by the Project Manager **by 5:00 PM on Thursday, April 14, 2016**. Responses or addenda will be issued **no later than 12:00 PM on Monday, April 18, 2016**.

D. PRE-SUBMITTAL CONFERENCE

A *mandatory* pre-submittal conference will be held in the Public Works Department conference room at 433 N. Virginia Street, Prescott, Arizona 86301 at **9:00 AM on Tuesday, April 5, 2016**. Submittals will only be accepted from firms/contractors in attendance as established on the sign-in sheet.

The purpose of this conference will be to clarify the contents of this RSOQ to prevent any misunderstanding of the City's intentions. Any doubts as to the requirements of the RSOQ, or any omission or discrepancy, should be presented to the City at this conference. The City will then determine the appropriate action necessary, if any, and issue a written addendum to the RSOQ. Oral statements or instruction will not constitute an addendum to this solicitation unless confirmed in writing by addenda.

E. SUBMITTAL REQUIREMENTS

Statements shall be submitted in seven (7) copies, and must conform to the attached Project Scoping Report dated March 22, 2016. The City reserves the right to reject any and all statements and assumes no liability for the cost of preparing a response to this request.

The SOQ shall address the evaluation criteria and be limited to no more than ten (10) pages, and shall at a minimum include the following:

- Location of the firm
- Names of the team members proposed for the project
- A list of similar projects in which the team has participated, and contact information
- A brief resume of each of the key team members describing their experience and background
- A summary of the current workload of key team members and list of their notable projects
- A list of all sub-consultants proposed to be utilized on the project and a description of their roles
- A tentative schedule for accomplishment of the project
- A statement of the submitting firm's understanding of the project purpose and scope, and a description of how the firm would approach, manage, and complete the project

Five (5) additional pages of appendices are allowed and may include graphs, charts, photos, or additional resumes. Proposers must submit with their proposal a signed copy of the Non-Collusion Affidavit, included as Attachment A, which is exclusive of the five page limitation.

The letter of transmittal shall not exceed two (2) pages and is exclusive of the ten page limitation for the SOQ and five page limitation for the appendices. This letter shall be on the Proposer's company letterhead and shall be signed by an individual(s) with authority to bind the Proposer contractually.

Within the submittal package, provide all contact information including company name, addresses, email/website addresses, phone and fax numbers, and name(s) of principals. List both Arizona professional and Arizona contractor licenses held, including license numbers and note whether licenses are held by the firm, individuals or sub-consultants.

F. DELIVERY OF SUBMITTALS

Sealed Statements of Qualifications must be received **before 2:00 PM on Thursday, April 21, 2016**, at the City Clerk’s Office, 201 S. Cortez Street, Prescott, Arizona 86303, at which time all submittals will be publicly opened.

Any submittals received at or after 2:00 PM on the above-stated date will be returned unopened. Proposers are solely responsible for the delivery of their submittals to the above location by the time and date specified. Electronic or facsimile submittals or modifications to submittals will not be considered.

The outside of the submittal envelope shall indicate the name and address of the respondent; shall be addressed to the City Clerk, City of Prescott, at the above address; and shall be clearly marked:

**RSOQ Submittal:
SCADA Installation and Integration**

G. MINIMUM TEAM QUALIFICATIONS

Design-Build Teams shall possess the minimum qualifications as described below:

1. AZ State Board of Engineers Registered
2. UL 508 Certified
3. K67 License
4. L 11 General License
5. Class A General License
6. “Rockwell” Integration Partner Certification
7. Five references/Five years Specific Utility Integration
8. Previous Citect specific project development required

III. EVALUATION CRITERIA

The SOQ shall display clearly and accurately the capability, knowledge, and ability of the contractor to meet the technical requirements of the RSOQ. Combinations of text and graphic material may be used at the Proposer’s discretion to appropriately communicate facts and qualifications. Overall quality of the SOQ evidencing interest in the project is a weighted criteria worth five (5) possible points.

A. PROJECT MANAGEMENT APPROACH

10 points possible

- Describe the firm/team’s approach to warranties, warranty follow-up, repairs and obtaining customer satisfaction.

B. EXPERIENCE AND QUALIFICATIONS OF FIRMS AND KEY PERSONNEL

25 points possible

- Identify the number of comparable projects completed within the past five (5) years where the firm and or team provided DESIGN-BUILD services (Arizona projects preferred).
- Describe/highlight the firm/team/key personnel's roles in a minimum of three of these projects.
- Describe how the three projects' budgets, schedule and complexity were addressed. Identify the resolution process on issues/differences that may arise with project stakeholders (i.e. consultant, City, franchise utilities, residents, etc.) during the performance of a DESIGN-BUILD contract.
- Provide a more in-depth discussion of the proposed project manager and project superintendent.

C. PROPOSED PROJECT APPROACH

30 points possible

Provide your firm's technical approach to critical success factors for this project, include the following items as part of your overall discussion:

- Involvement with design development and refinement.
- Planning, scheduling, estimating and managing construction, dispute resolution and safety management.
- Design review, cost and scope control, value engineering and working with a project's design engineer.
- Directly addressing all public concerns associated with the construction, demonstrate approach to minimizing disruptions.
- Describe your methodology and approach to the development of design solutions for this project.

D. VALUE ADDED KNOWLEDGE AND EXPERIENCE

30 points possible

The team hired by the City must be familiar with local community needs, standards, historical challenges, local codes and site conditions. Additionally, the team must be accessible to City staff and citizens (i.e. public meetings, outreach and relations) and provide such communications to the City during the design and construction phases of the project.

- Explain why your firm/team and project manager are particularly qualified to perform the required services in the Prescott area. Demonstrate the project manager's knowledge of local geography, climate, materials and City Codes.
- Demonstrate the firm/teams knowledge of SCADA Operating Systems, Interface, Communication Networks, Lift Station, Pump Station, and Tank sites, remote/wireless controls, and Citect SCADA systems.
- Provide a detailed discussion and identification of areas that will require special attention and/or innovative approaches.
- Specific experience of the project team with comparable well site development and rehabilitation, and water designs in municipalities within the State of Arizona.
- Hardware and Software knowledge specific to Citect and Rockwell systems.

IV. EVALUATION AND SELECTION PROCESS

To qualify for evaluation, the SOQ must have been submitted on time and must materially satisfy all requirements identified in this document. If in the judgment of the City, the SOQ does not conform to the format specified herein, or if any section is absent or significantly incomplete, the City reserves the right to reject the submittal. Furthermore, the City reserves the right to reject any or all Statements, to waive or decline to waive irregularities in any Statement, or to withhold the award for any reason it may determine.

A. OVERVIEW

This is a qualifications-based selection process as authorized by ARS § 34-603. The initial activity will involve an evaluation and scoring of each Proposer's qualifications and relevant experience, as indicated in its SOQ. Statements will be evaluated by a Review Committee appointed by the City for this project according to the criteria and weighting as indicated for each category. Following evaluation of the SOQs, a maximum of five (5) firms/teams may be invited to proceed in the selection process based upon the composite score of Review Committee members.

B. INTERVIEWS

If deemed necessary by the City, selected firms/teams may be required to participate in an interview. The Proposer shall be represented in the interview by the key personnel identified in the proposal. During the interview, candidate firms will be required to demonstrate their understanding and familiarity with the scope of work, location and other aspects of the project. It is highly recommended that selected firms visit the project site(s) prior to any interview.

Criteria and weighting for evaluation of the presentation-interview is as follows:

- Project understanding and understanding of the Design-Build process (20 points possible)
- Project approach and project manager qualifications (35 points possible)
- Approach to construction and the design process coordination for the SCADA Installation and Integration Project and specific project implementation (35 points possible)
- Experience and capabilities with communication within and outside of the stakeholders, including public meetings and community outreach (10 points possible)

Formal presentations are allowed as part of the interview process; however, the majority of the interview will be reserved and dedicated to the discussion of project specific criteria and response to questions from Review Committee members in attendance. Should interviews be elected by the City, a specific schedule and additional instructions for the interview will be provided to each firm selected for an interview.

The City reserves the right to proceed to Final Ranking based on the SOQs submitted without conducting interviews

C. FINAL RANKING AND CONTRACT NEGOTIATION

Following the interviews, if interviews are elected to be conducted by the City, the Review Committee shall rank the top three firms in order of preference to generate a Final List. The Review Committee members will individually evaluate the presentation-interviews of each of the candidate firm(s) and rank them according to the aforementioned criteria. The Review Committee will also consider information from the SOQs in their Final Ranking of firm(s). The Review Committee will then formulate a consensus ranking and notify each of the candidate firms of the final rankings.

Negotiations will commence with the highest ranked firm on the Final List in accordance with ARS § 34-603(E) and will proceed as set forth therein, or will terminate the solicitation. If the City is unable to negotiate a satisfactory agreement with the highest ranked firm, with terms and conditions the City determines to be fair and reasonable, negotiations with that firm will be formally terminated. The City will then undertake negotiations in the same manner with the next most qualified firm on the Final List, continuing in sequence. The Final List will remain in effect for a period of twelve (12) months from the date of issuance by the City. Should the City not reach agreement on the terms of the contract with any of the selected firm(s), the City reserves the right to reject all submittals and cancel the solicitation pursuant to ARS § 34-603(H).

If selected as a finalist for this project, the firm will be required to provide a statement from an A-minus rated or better Surety Company describing the firm's bonding capacity, commensurate with the project estimate.

For the successful candidate firm/team, the City will prepare an Agreement for Design-Build Services to be used in connection with the project. Approval of the Agreement by City Council will be required for award of a Contract for performance of the services described herein.

V. ATTACHMENTS

- A. NON-COLLUSION AFFIDAVIT FORM
- B. PROJECT SCOPING REPORT
- C. SCADA TECHNICAL MEMORANDUM NO. 1
- D. SAMPLE DESIGN-BUILD AGREEMENT
- E. DESIGN-BUILD GENERAL CONDITIONS

A. NON-COLLUSION AFFIDAVIT FORM

SCADA INSTALLATION AND INTEGRATION PROJECT

State of _____

County of _____

_____, affiant, the
(Name)

(Title) of

(Name of Company)

The person, corporation or company responsible for the accompanying Statement of Qualifications, having first been duly sworn, deposes and says:

That such Statement of Qualifications is genuine and not sham or collusive, nor made in the interest of or on behalf of any person not herein named, and that the Proposer has not directly or indirectly induced or solicited any other Proposer to put in a sham submittal, or any other person, firm or corporation to refrain from submitting, and that the Proposer has not in any manner sought by collusion to secure for itself an advantage over any other Proposer.

By: _____
Signature

Title

Subscribed and sworn to before me this _____ day of _____, 2016.

Signature of Notary Public

Commission Expires

B. PROJECT SCOPING REPORT

SCADA INSTALLATION AND INTEGRATION PROJECT



Project Scoping Report

3/22/2016

Project Description

Project Name: SCADA Installation and Integration Project CIP16-002
Project Type: Water/Wastewater
Project Budget No. 09556
Funding Sources: Water/Wastewater Fund

Project Schedule:

	<u>Begin</u>	<u>End</u>
PS&E	FY16	FY17
Construction	FY17	FY19

Project Team

Project Review Team:
Project Manager – Ben Burns
City Engineer – Charles Andrews
Utilities Manager – Craig Dotseth
Program Manager – Steve Orosz
Wastewater Operations – Scott Gregorio
Wastewater Operations – Jim Porter
Water Operations – Scott Ketchmark
Water Operations – Scott McClinton
Water Operations – Brady Bottoms

Goal Statement

The project goal is to update, centralize, standardize, construct where needed and integrate the SCADA, interface and communication system for sewer lift stations, water pump stations, and water storage facilities. The finish product shall utilize the same hardware, and software. Interface shall be standard throughout all systems and all systems shall be centralized for system monitoring from one location. There are approximately 120 total sites.

Project Description

SCADA SYSTEM STANDARDIZATION

General

The Supervisory Control and Data Acquisition (SCADA) system is a computer system that monitors and controls the facility-based processes. The SCADA system will consist of the following subsystems:

- SCADA based Human Machine Interface (HMI), which is the apparatus that presents process data to the human operator; and through this the human operator monitors and controls the process.
- A SCADA computer system, acquiring and storing data on the process from the programmable logic controllers (PLCs) and controlling the process by sending commands to the PLC.
- Communication infrastructure connecting the SCADA system to the PLCs.

Software

The COP has standardized its operating system to use the Vijeo Citect SCADA platform manufactured by Schneider Electric. The Vijeo Citect system supports several architectures that are available with the Citect system ranging from a single station stand-alone SCADA system, to a system with redundant servers with a network of static workstations, floating workstations, remote or local web clients, remote or local view only client. Depending on the required redundancy, number of workstation, monitoring and/or control capability, and security, the software and hardware necessary at each site must be made on a case-by-case basis.

SCADA RADIO FREQUENCY

General

In an effort to ensure the interoperability of plant and remote facility controls, a standardized approach will be established for all communicating sites throughout the COP water and sewer service area. Currently, there are only a few remote sites that have PLC/RTUs installed, which makes this an opportune time to establish the standard for hardware, software, and communications protocols for the remote and plant sites.

PLC Network

The PLC network shall consist of PLC-to-PLC communications only. In order to provide a reliable PLC network, a dedicated communication network shall be provided for control between PLCs. By providing a dedicated PLC network, the critical PLC-to-PLC communication will not be compromised by the bandwidth required from the SCADA and other plant networks. In the event that the SCADA network is lost, the PLC network will maintain process operations on the dedicated PLC network.

SCADA Network

The SCADA network shall consist of SCADA to SCADA and PLC to SCADA communications only. For major treatment facilities, there will be a primary and secondary SCADA server. In the event the primary SCADA server fails, the secondary SCADA server will take over without any interruption to the SCADA or PLC networks. Historical data for trending purposes shall be stored at the main SCADA historian server. Operations shall access the SCADA interface via laptops and workstations that will run the SCADA application software through Client licenses.

Project Limits - Existing Conditions:

- Project locations are City wide.
- Work must be coordinated with Water and Wastewater Operations. Utility coordination is needed for services to the airport. The project designer / contractor shall closely coordinate with the City of Prescott Water and Wastewater Superintendents.

Primary Technical/ Administrative Issues

Existing Utilities:

- Water and Sewer facilities. Coordination will also include City of Prescott IT Department and APS.
- Communications

Utility Relocation Issues:

- Locate all utilities. Coordination is needed up front for any utility upgrades as needed.

Design:

SCADA DESIGN

Sewer Lift Station Design

- The City will verify the existing SCADA Lift Station programs.

Water Pump Station Design

- The City will verify the existing SCADA water programs.

Radio/Communication Design and Recommendations

- Consultant to obtain all information from City of Prescott IT Department.

Water Storage Facilities

- The City will verify the existing SCADA water programs

Stakeholders:

- Water and Wastewater Operations Divisions.

Right-of-Way (R.O.W.) and Easements:

- All of the improvements will be within the City of Prescott properties.

Installation Issues:

- Several locations with restricted access and right-of-way.
- Access to and Operation of Water/Wastewater facilities during installation.
- Maintain site access 24/7.

Design Deliverables (To be negotiated)

1. **Project Kick-Off Meeting.** The Design Firm will be required to attend a kick-off meeting with City staff at a time and on a date amenable to both parties. At that meeting, the Engineer will be required to provide a detailed design schedule, a list of the team members who will be involved in the project, along with their phone numbers and e-mail addresses, an organizational chart showing the relationship of all of the team members and any submittals required contractually.
2. **Design Schedule.** The Design Firm will be required to submit a detailed schedule depicting all major tasks and primary submittal dates for approval by the City. Thereafter, the Engineer shall submit monthly project schedule updates in the same format and shall highlight and provide justification for any changes to the approved schedule.
3. **Preliminary Design Report and Preliminary Installation Cost Estimate.** Within 30 days of entering into a contract with the City of Prescott, the Design Firm will be required to provide a set of preliminary design plans, a preliminary design report with major infrastructure components sized and a preliminary cost estimate. An analysis of alternate design considerations shall be included in this submittal.
4. **Utility Review.** Concurrent with submittal to the City of the 30% design, the Engineer shall submit copies to the private utility companies (electric, cable, telephone, gas) for their comments and/or clearance letters. The Engineer will provide to the City copies of each of the transmittal letters to each of the utilities. If necessary, a meeting will be held between the Engineer and reviewing agencies to discuss the conceptual plan and construction scheduling. Based upon input from the 30% plans, the Engineer shall submit a revised design completion schedule.

In generating the specifications, the Engineer shall adhere to the City's boilerplate for Technical Specifications unless conditions require Special Provisions. ALL bid items shall be addressed in the Technical Specifications or Special Provisions. Items not required for the project shall be deleted from the text. Any proposed deviation(s) from the boilerplate shall be brought to the City's attention.

5. **Construction Pre-Bid Meeting.** The Design Firm shall attend the construction pre-bid meeting held by the City of Prescott to answer questions from prospective bidders. In the event an addendum is required, the Design Firm shall prepare the

necessary changes to the plans and specifications.

6. **Pre-Construction Meeting.** The Engineer shall attend the pre-construction meeting held by the City of Prescott to answer questions from the construction contractor. The Engineer shall be prepared to address any design questions presented by the contractor.
7. **Monthly Progress Meetings.** In addition to those meetings indicated above, the Design Team shall meet monthly with the City to discuss the project status and any pertinent issues.
8. **Meeting Minutes.** The Engineer shall be responsible for recording and preparing accurate minutes from all meetings involved with the project. A hard copy and disk of the minutes shall be submitted to the Public Works Department. The disk must be compatible with Microsoft Word.

Miscellaneous Other Deliverables

- Technical Design Reports
- O&M Manuals
- Other as may be required

Post-Design Construction Services

- Submittal / RFI reviews
- As-Built surveying and final mylar preparation; As-built certification
- Attending construction meetings as needed

Major Milestones

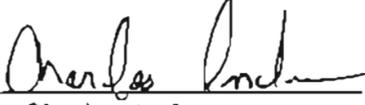
Advertise RSOQ	March 2016
Award Contract	May 2016
Preliminary Design Report Complete	July 2016
Begin Installation	July 2016
Installation Complete	October 2017
Project Close-out Complete	November 2017

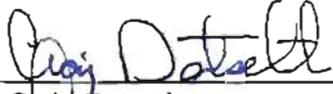
Miscellaneous Items

- None at this time

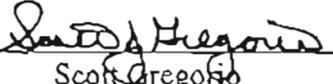
Approvals

Program Development Manager:  Date: 3-23-16
Steve Orosz

City Engineer:  Date: 3-24-16
Charles Andrews

Utilities Manager  Date: 3-24-16
Craig Dotseth

Water Operations Superintendent:  Date: 3-24-16
Scott Keichmark

Wastewater Operations Superintendent:  Date: 3-24-16
Scott Gregorio

City of Prescott

CIP Design Submittal Requirements

In order to maintain a consistent and effective review of the plans, it is important for the necessary information to be provided as follows:

1. Preliminary Water/Wastewater RTU design
1. Final detail sheets
2. Final construction notes
3. Final Specifications and Special Provisions
4. Total Estimated Quantities and Engineer's Estimate

Final P.S. &

1. Final Technical Specifications and Special Provisions
2. Final Total Estimates Quantities and Design Firms Estimate

Definitions

Conceptual: General design idea or plan based upon experience and judgment from other comparable work. cursory plan view illustrations; calculations not required.

Preliminary: Introductory, but reasonably accurate, design element or feature. General consistency with design standards. Plan view illustration. Rough calculations and notes.

Final: Complete and ultimate design element or feature. Full consistency with design requirements. Complete plans as applicable.

Alternative analysis: Study of all (at least two) viable options which satisfies a given transportation plan or design need. Analysis to include, but not limited to, comparisons of: safety, scope, cost, functionality, efficiency, compliance to standards and environmental effects.

C. SCADA TECHNICAL MEMORANDUM NO. 1

SCADA INSTALLATION AND INTEGRATION PROJECT

CITY OF PRESCOTT SCADA CONTROL SYSTEM STANDARDIZATION

TECHNICAL MEMORANDUM NO. 1 SCADA CONTROL SYSTEM STANDARDIZATION

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CONTROL SYSTEM STANDARDIZATION

1.0 INTRODUCTION

1.1 General

The City of Prescott (COP) water service area is located within the Prescott Active Management Area (AMA), established under the Arizona Groundwater Code of 1980. Prescott Valley, Chino Valley, the Yavapai Prescott Indian Tribe Reservation, and some surrounding areas of unincorporated Yavapai County comprise the remainder of the Prescott AMA.

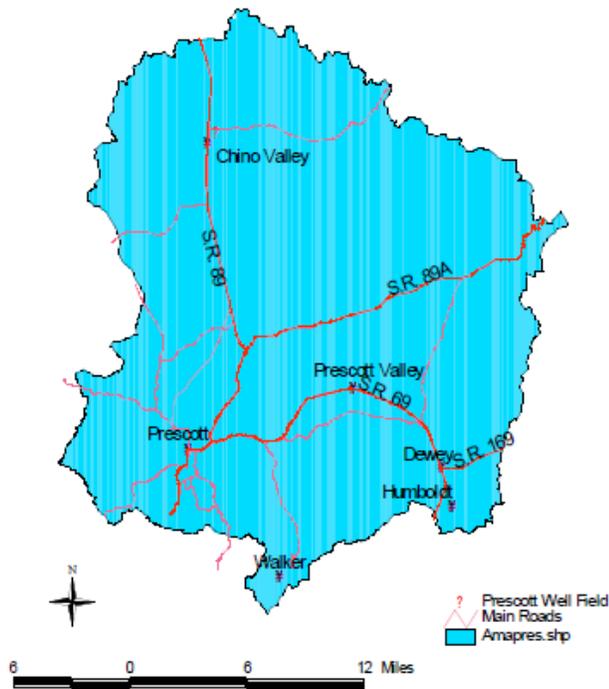


Figure 1.1 Prescott AMA

The COP water production and distribution facilities include the maintenance and operation of Twenty Seven water storage tanks and reservoirs, forty booster stations, more than 85 different pressure zones, and approximately 514 miles of water distribution pipelines.

The COP wastewater collection uses 64 lift stations, and more than 400 miles of mainline.

These facilities have been constructed over several years by different design firms, each with their own approach to control system design and philosophies. This approach has led to varied hardware and software platforms, programming styles, and graphics. This inconsistency has caused difficulty for operations and maintenance staff operating across all facilities. The goal of this SCADA document is to not only develop the basis for a utility-wide network linking the SCADA systems for all facilities, but also develop the guidelines and standards required for commonality between all control systems throughout the COP water service area. It is intended that this document be a living document that is updated over time to account for changes in the industry as well as COP control philosophies.

2.0 SCADA SYSTEM STANDARDIZATION

2.1 General

The Supervisory Control and Data Acquisition (SCADA) system is a computer system that monitors and controls the facility-based processes. The SCADA system will consist of the following subsystems:

- SCADA based Human Machine Interface (HMI), which is the apparatus that presents process data to the human operator; and through this the human operator monitors and controls the process.
- A SCADA computer system, acquiring and storing data on the process from the programmable logic controllers (PLCs) and controlling the process by sending commands to the PLC.
- Communication infrastructure connecting the SCADA system to the PLCs.

The COP has standardized on SCADA system hardware and software to allow for consistency throughout all the facilities.

2.2 Hardware

2.2.1 Servers

Server hardware will be utilized for the primary and redundant SCADA server as well as the historian server in place.

2.2.2 KVM Switch

A keyboard-video-mouse (KVM) switch shall be provided within the 19-inch rack to provide the means to switch control of the keyboard, monitor, and mouse between the rack-mounted SCADA servers and the SCADA historian server.

KVM switch manufacturer shall be Belkin; model shall be the most current version of OmniView PRO (or approved equal).

2.2.3 Network Attached Storage (NAS)

NAS hardware is similar to a traditional file server equipped with direct attached storage. The operating system and other software on the NAS unit provide only the functionality of data storage, data access and the management of these functionalities. NAS is used in place of the traditional tape backup or DVD backup systems for historical archiving. The NAS system shall be connected over the SCADA network. The NAS system will be located at a central location in a 19-inch network rack with air conditioning and power backup according to the COP IT department standards.

2.2.4 Workstations

Workstation hardware will be utilized for the distributed control and monitoring SCADA workstations located throughout facilities.

2.2.5 Workstation Monitors

Workstation monitors shall have a viewing area of 21.5 inches, aspect ratio of 16:9 and resolution of 1280 by 1024. Workstation monitor manufacturer shall be Dell, model shall be the most current version of UltraSharp (or approved equal).

2.2.6 Portable Workstations

Portable workstations will be utilized for control and monitoring of the SCADA system similar to any fixed workstation. Portable workstations can be utilized throughout the facility at a location where a SCADA Ethernet port exists. Typically, an Ethernet connection will be located at each PLC cabinet. Portable workstations come in two forms depending on desired use, industrial hardened or standard portable computer.

The standard laptop manufacturer shall be Dell; model shall be the most current version of Latitude (or approved equal). Standard portable computer shall be a portable computer with PC-architecture and a 10/100/1000 Base TX networking card. Monitor shall be 15 inches or greater with SXGA display.

The industrial hardened laptop manufacturer shall be the most current version of the Toughbook 31 (or approved equal). Industrial hardened portable computer shall be fully rugged with IP65 sealed all-weather design and MIL-STD-810G certification for protection against 6-foot drop, shock, vibration, rain, dust, sand, altitude, freeze/thaw, high/low temperature, humidity, and explosive atmosphere. Industrial hardened portable computer shall have 10/100/1000 Base TX networking card; and monitor shall be 13 inches or greater with SXGA display. Unit shall be capable of folding into a metal protected case with handle.

2.3 Software

The COP has standardized on the Vijeo Citect SCADA platform manufactured by Schneider Electric. The Vijeo Citect system supports several architectures that are available with the Citect system ranging from a single station stand-alone SCADA system to a system with

redundant servers with a network of static workstations, floating workstations, remote or local web clients, remote or local view only client. Depending on the required redundancy, number of workstation, monitoring and/or control capability, and security, the software and hardware necessary at each site must be made on a case-by-case basis. The following figures show some of the capabilities and configurations that are possible with the Citect system.



Figure 1.2 **Single Stand-Alone SCADA System**

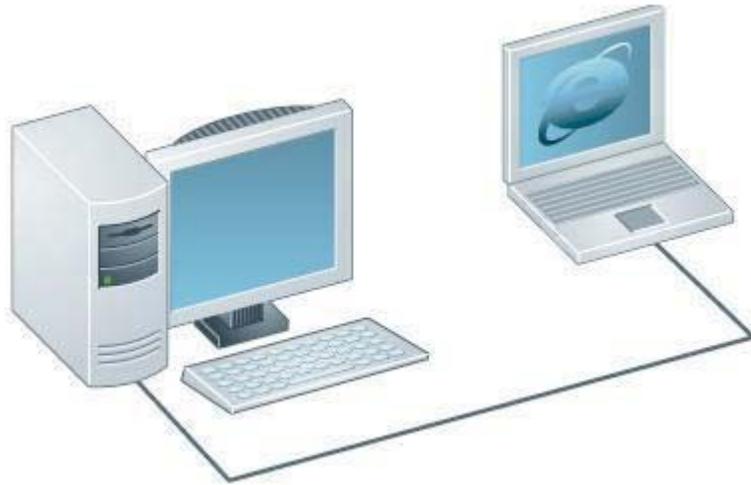


Figure 1.3 *Remote Server System with Remote Access via the Web*

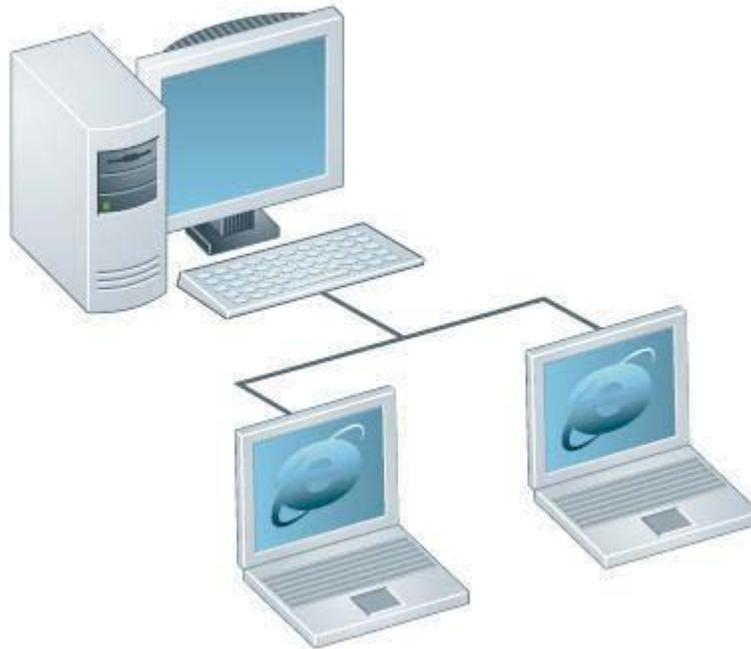


Figure 1.4 *Networked Server System with Remote Web Clients*

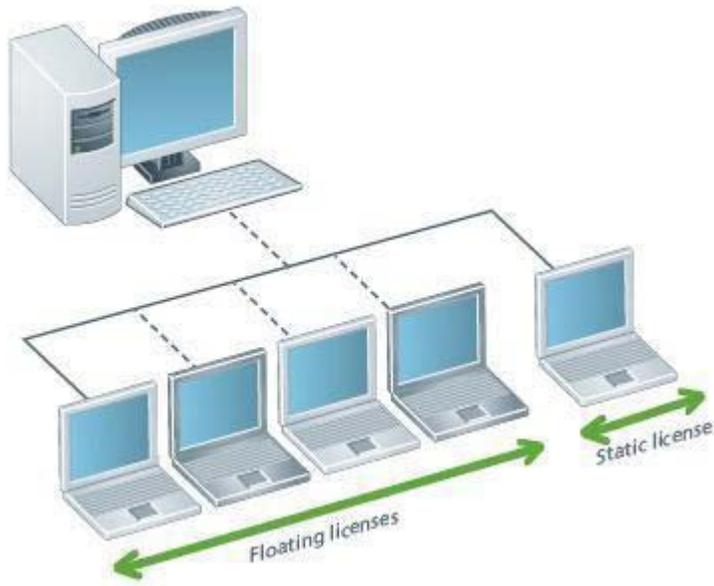


Figure 1.5 *Networked Server System with Floating and Static Access*

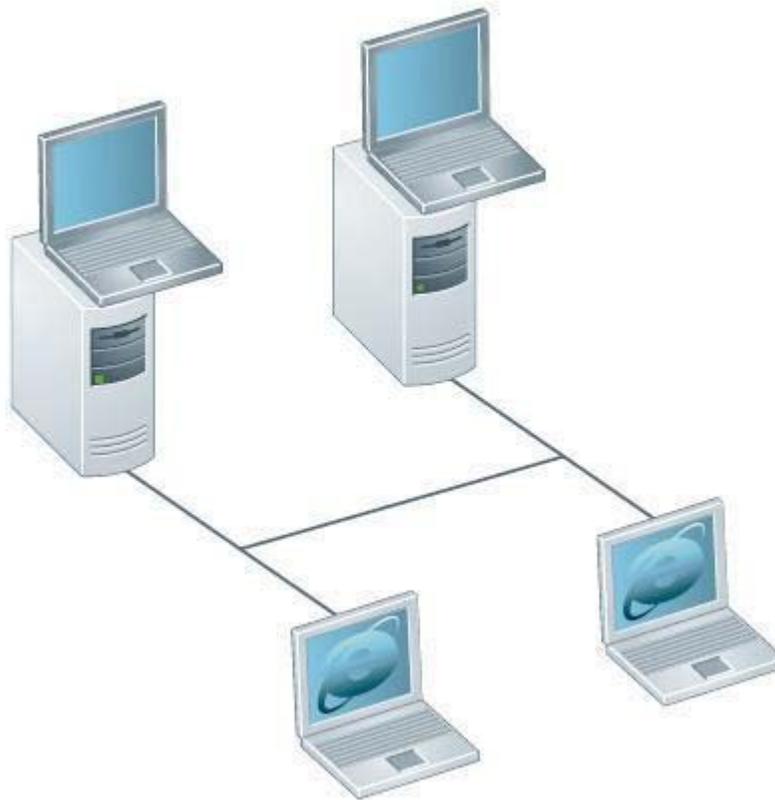


Figure 1.6 *Redundant Server with Server Control Clients and Web View Only Clients*

2.3.1 Server License

Major facilities and hubs shall utilize the full license redundant servers with Vijeo Citect Box key. Server licenses are purchased according to the number of points to be processed.

Point count will need to be established in design to ensure the correct license is purchased. An upgrade license can always be purchased to obtain more points as required. This upgrade could be a result of the addition of new remote facilities, upgrades to existing facilities, or changes to the amount of monitoring/control information desired.

2.3.2 Client License

There are four types of client licenses that Citect offers:

1. **Control Client:** Used by operators accessing the Vijeo Citect server via a local connection.
2. **View Only Client:** For users needing to view the Vijeo Citect application via a local connection, but not needing to control the system.
3. **Web Control Client:** Similar to the Control Client, but via a Web browser.
4. **Web View Only Client:** Similar to the View Only Client, but via a Web browser.

Client licenses can be further subdivided into their availability:

1. **Static Client License:** For operators needing access to the system at all times, irrespective of the number of connections already established by other clients. A static client license provides permanent access to the system, as it physically resides in the key plugged into the client PC.
2. **Floating Client License:** Users who occasionally need to use a client for operator tasks can purchase floating licenses. Connections will be allowed until the number of valid licenses is reached. Floating client licenses are stored on the key plugged into the server.
3. **Redundant Client Licenses:** Redundant client licenses are intended solely for the standby server in a redundant configuration. They are used to ensure that the client licenses purchased are all available.

These licenses can be utilized throughout the SCADA system design as required on a case-by-case basis. Typical uses of Client Licenses are shown by facility below.

Major facilities and hubs:

- Static Control Client for all fixed operations and programming workstations.
- Floating Control Client License for portable workstations.
- View Only Client for management and monitoring only machines where control is not required.

Remote sites, mobile operators' portable computers, and management facilities:

- Web Control Client for fixed or portable operations workstations.
- Web Control Client with security for management and monitoring machines where control is not required.

2.3.3 Vijeo Historian License

Vijeo Historian is the information management component of the Vijeo Citect SCADA system. The Vijeo Historian enables data transfer, storage, alarm management, and reporting capabilities from multiple, disparate systems. The Vijeo Historian utilizes Microsoft SQL Server as its embedded historical data store.

The Vijeo Historian Licenses are programmed on a USB key, which is plugged into the Vijeo Historian Server. The license is based on the number of points. Client access licenses

must be ordered for all client licenses that need to access data from the historian server.

Vijeo historian servers will typically be located at all major facilities and hubs.

2.3.4 Alarm Notification Software

Win-911 pro shall be utilized for alarm notification software. Win-911 will be connected to the Vijeo Citect alarm database via the OPC server. Alarms levels at the Vijeo Citect alarm database will be prioritized as low, medium, and high priority:

- Low priority alarm will display at the SCADA HMI and not required manual acknowledgement in order to clear.
- Medium priority alarms will display at the SCADA HMI and require manual acknowledgement in order to clear. Medium priority alarms will also sound an audible alarm at the facility.
- High priority alarms will display at the SCADA HMI and require manual acknowledgement. The alarm will also be passed to the Alarm Notification Software for concurrent dial out and text notification. High priority alarms will also sound an audible alarm at the facility.
- For redundancy purposes, the alarm notification system will be connected to a dedicated modem and phone line as a backup to the control network.

3.0 PLC SYSTEM STANDARDIZATION

3.1 General

All new PLCs provided for new facilities and upgrades to existing facilities should utilize the Allen-Bradley

Logix controllers and should be programmed using RSLogix 500 or 5000 programming software. The COP has standardized on PLC system hardware and software to allow for consistency throughout all the facilities.

3.2 Hardware

The Allen-Bradley Logix platform includes controllers that range from large to small.

Table 1.1 compares the three Logix platform controllers.

Table 1.1 Allen-Bradley Logix PLC Platform Comparison Technical Memorandum No. 1 - Control System Standardization City of Prescott			
Parameter	Allen-Bradley ControlLogix	Allen-Bradley CompactLogix	Allen-Bradley MicroLogix
Size	Large	Medium	Small
Product Maturity	Active	Active	Active
CPU Processor Speed			
CPU Memory (Volatile Memory)	750 KB to 32 MB	512 KB to 3 MB	1 to 14 KB
Non-Volatile Memory	Compact Flash card (Similar to old digital camera cards): 64 MB, 128 MB	Compact Flash card (Similar to old digital camera cards): 64 MB, 128 MB	
Remote I/O	Yes	Yes	No
Maximum I/O	128,000	30 I/O modules	540
Specialty I/O	Thermocouple, RTD, HART	Thermocouple, RTD	Thermocouple, RTD
Hot Standby	No	No	No
CPU Communications		ControlNet, EtherNet/IP, Serial	DeviceNet, DH485, Modbus, EtherNet/IP
Backplane Communications Modules	EtherNet/IP, ControlNet, DeviceNet, Data Highway Plus, Modbus, DH-485, Serial, Foundation Fieldbus	EtherNet/IP, ControlNet, DeviceNet, Modbus, DH-485	
Backplane Style	Rack Type (4, 7, 10, 13, 17 Slots)	Modular Type with built-in I/O. Expandable with Rail-mounted I/O modules	Modular Type with built-in I/O. Expandable with Rail-mounted I/O modules
Programming Software	RSLogix5000	RSLogix5000	RSLogix500
Programming Languages	LD, FBD, ST, SFC	LD, FBD, ST, SFC	Ladder Logic

Each PLC processor should be sized to support the required I/O plus 25+ percent spare I/O capacity for each type of I/O signal at every PLC. All spare I/O points shall be wired to field terminal blocks in the PLC cabinet. The PLC backplane shall include three spare backplane slots or 25 percent additional slots, whichever is greater. Provide a minimum of 50 percent spare program volatile memory. Communication ports should be provided to support the necessary networking requirements of the specific project. Provide a minimum of one Ethernet/IP port for connection to the process communications network as well as uploading and downloading of PLC application programs. Additional networking requirements are covered elsewhere in this document.



Figure 1.7 Allen-Bradley ControlLogix PLC



Figure 1.8 Allen-Bradley CompactLogix PLC

ControlLogix PLCs shall be used for complex control and large facility distributed PLC networks. Compact Logix PLCs shall be used for small remote locations such as lift stations and wells. Only one PLC type shall be utilized at a common facility.

The COP currently utilizes the MicroLogix platform for small remote locations. The COP will approve the use of MicroLogix controllers on a case-by-case basis at small remote locations. The MicroLogix platform uses the RSLogix500 programming software. This is different from the RSLogix5000 software utilized for the CompactLogix controllers. The COP currently supports both software packages to allow for the use of the ControlLogix, CompactLogix, and MicroLogix controllers.

The use of remote I/O racks is not the standard practice for the COP. If application of remote I/O is desired, it must be approved by the COP. Remote I/O shall be Allen-Bradley FlexIO.

3.3 Software

The COP has standardized on Allen-Bradley RSLogix 500 programming software for this project to allow for consistency throughout all the facilities.

Contractor shall utilize the tag and loop identifications as contained in the P&IDs for the project. The Contractor should inquire with the COP on every project to determine if a copy of the licensed RSLogix 500 programming software is required at the end of the project.

4.0 PLC BASED HUMAN MACHINE INTERFACE (HMI) SYSTEM STANDARDIZATION

4.1 General

For this document, Human Machine Interface or HMI is defined as a PLC-based operator interface device consisting of a graphic display with operator input functionality. The HMI is typically a flat panel type of display mounted on the front of a PLC enclosure.

All new HMIs provided for new facilities and upgrades to existing facilities should utilize the Allen-Bradley PanelView Plus and should be programmed using Factory Talk View machine edition programming software. The COP has standardized on an HMI system hardware and software to allow for consistency throughout all the facilities.

Human Machine Interfaces shall be provided in applications when operations or maintenance staff requires access to control, monitoring, functions, set points, equipment status, and alarms within the PLC. In general, an HMI shall be located on the face of all PLC enclosures located at major facilities and remote sites.

4.2 Hardware

COP has standardized on the use of PanelView 1000 + HMIs with 10-15 inch flat-panel color display with 1024 x 768 resolution and 18-bit graphics. Operator input shall be via touch screen. HMI shall utilize Ethernet IP communications port for connection to the PLC control network.

4.3 Software

The COP has standardized on Factory Talk programming software for all HMIs. Contractor shall utilize the tag and loop identifications as contained in the P&IDs for the project. The Contractor should inquire with the COP on every project to determine if a copy of the HMI software is required at the end of the project.

5.0 PLC CABINET DESIGN STANDARDIZATION

5.1 General

COP has standardized on a general PLC enclosure arrangement that is consistent with the industry for quality, functionality, and organization. The COP has standardized on a PLC cabinet layout to allow for consistency throughout all the facilities.

5.2 Hardware

5.2.1 Panel Enclosure

Enclosures located indoors in non-corrosive environments shall be NEMA 12, steel, dust tight with gasketed door. Enclosures located indoors in corrosive environments and outdoors shall be NEMA 4X with 316 stainless steel. Enclosure shall be manufactured by Hoffman Engineering or equal.

5.2.2 Circuit Breakers

Acceptable Manufacturers:

- Eaton/Cutler-Hammer
- Schneider Electric/Square D Company

5.2.3 Motor Starters

Acceptable Manufacturers:

- NEMA Starters and Contactors:
 - Eaton/Cutler Hammer
 - Schneider Electric/Square D
 - Allen Bradley

- Reduced Voltage Solid State Starters:
 - Eaton/Cutler-Hammer
 - Allen Bradley
 - Schneider Electric/Square D

5.2.4 Fuses and Fuse Holders

Acceptable Manufacturers:

- Bussman
- Littelfuse

5.2.5 Fuse Holders

Acceptable Manufacturers:

- Phoenix Contact
- Allen Bradley 1492-FB Series B

5.2.6 Thermal Management

Acceptable Manufacturers:

- Kooltronic Integrity Series 21 or approved equal.

5.2.7 Panel Meters

Acceptable Manufacturers:

- Precision Digital
- Yokogawa

5.2.8 Digital Process Indicators

Acceptable Manufacturers:

- Precision Digital
- Red Lion
- Action Instruments Visipak

5.2.9 Digital Bar Graph Meter

Acceptable Manufacturers:

- Ametek Dixson or approved equal.

5.2.10 Pilot Devices

Acceptable Manufacturers:

- Indoor/Outdoor Areas:
 - Allen Bradley Type 800T
 - Square D Class 9001 Type K
- Corrosive Areas:
 - Allen Bradley Type 800H
 - Square D Class 9001 Type SK
- Hazardous Areas:
 - Allen Bradley Type 800H
 - Square D Class 9001

5.2.11 Signal Isolators and Converters

Acceptable Manufacturers:

- Phoenix Contact MCR Series
- Allen Bradley

5.2.12 Relays

Acceptable Manufacturers:

- Phoenix Contact PLC Series
- Allen Bradley Type 700H Series
- Latching:
 - Square D Type 8501 Type K
 - IDEC TWTD
- Time Delay:
 - IDEC RTE Series
 - Allen Bradley Type 700 HR Series

5.2.13 Limit Switches

Acceptable Manufacturers:

- Allen Bradley 802
- Omron D4
- Eaton E47, E49, E50

5.2.14 Beacons

Acceptable Manufacturers:

- Federal Signal Corp Starfire Series
- Allen Bradley 855 B 10 Series

5.2.15 Terminal Blocks

Acceptable Manufacturers:

- Phoenix Contact UK5 Series
- Allen Bradley Series 1492

5.2.16 Surge Protection Devices (SPD)

Acceptable Manufacturers:

- Surge Protection:
 - Phoenix Contact Type SFP TVSS/Filter or equal.
- Data and Signal Protectors Panel Mounted:
 - Phoenix Contact Plugtrab Series or equal.
- Data and Signal Line Protectors Field Mounted:
 - Phoenix Contact Pipetrab or equal.

5.2.17 Power Supplies

Acceptable Manufacturers:

- Sola
- Phoenix Contact Quint Series

5.2.18 Uninterruptable Power Supplies (UPS)

All PLC cabinets shall be backed up with Uninterruptable Power Supplies (UPS) with minimum of 1-hour battery backup. Instrument power shall be provided from the battery backed up PLC cabinets.

5.2.19 Switches

Networking switches shall be dedicated to either the PLC network or the SCADA network. The use of Virtual LAN for the separate networks will not be acceptable. Switches shall be 100 Mbit with copper and fiber connections as required for the specific application.

Acceptable Manufacturer:

- Allen Bradley Stratix Series

5.3 Layout Requirements

Figure 1.9 shows the standard layout for PLC cabinets located at the remote sites. Note that not all components shown in the figure will be present in every PLC cabinet.

5.4 Security Requirements

A limit switch shall indicate when the PLC cabinet door is open. The open door shall create a priority 1 alarm. When the limit switch is activated meaning the door is open the PLC panel lights shall automatically turn on. When the limit switch is deactivated, meaning the door is closed the PLC panel lights shall automatically turn off.

5.5 Power Distribution

Figure 1.10 shows the standard power distribution scheme for PLC cabinets located at both base station facilities as well as remote sites. Note that not all components shown in the figure will be present in every PLC cabinet.

6.0 CONTROL STRATEGY STANDARDIZATION

6.1 General

In an effort to ensure the interoperability of plant and remote facility controls, the COP has standardized a control methodology for all controlled equipment. The control methodology should be followed unless otherwise directed and approved by the COP.

6.2 Typical Control Methodologies

6.2.1 Process Control Interface System (PCIS) Control

The PCIS system refers to the operator interface system consisting of both the HMI and the SCADA interface.

- A. Where indicated, provide HAND-OFF-AUTO and START-STOP selections in the PCIS, accessed from an HMI or SCADA for operators with sufficient security, to provide the following operating modes:
 - 1. PCIS AUTO: The normal, automatic control mode of the strategy, which allows full PLC control in response to process conditions and programmed sequences.
 - 2. PCIS HAND: Enables PCIS Manual control where control decisions are made by an operator through the PCIS START-STOP, OPEN/CLOSE, or other selections as indicated.
 - 3. PCIS OFF: Automated PCIS control is disabled and PLC calls for all associated equipment to stop and valves to close or go to their identified safe state.
 - 4. Program the PLC so that switching a strategy between AUTO and HAND (either direction) occurs with a smooth transition. Keep running or position status unchanged when control is switched to HAND until a change is requested using the operator selections (START, STOP, OPEN, CLOSE). Keep running and position status unchanged when control is switched to AUTO until the control logic determines a change is required.

6.2.2 Motor Control

- A. Provide a LCP at each motor. The LCP shall contain a LOCAL-OFF-REMOTE (LOR) selector switch, a START pushbutton, and a lockable STOP pushbutton.
- B. Monitor the device's (LOR) switch to determine when the PLC has control of the associated equipment:
 - 1. Display current REMOTE status on the SCADA and HMI screens.

- C. Monitor the device's running status from the starter auxiliary or run status input:
 - 1. Display the current status (running or stopped) on the SCADA and HMI screens.
 - 2. Use status to calculate total run time and daily run time, and to count total starts and daily starts.
 - 3. Provide time stamp for each start.
 - 4. For motors 200 HP and greater, provide software to prevent exceeding the manufacturer's recommended maximum starts per hour.

- D. When equipment control has been given to the PLC as reported by the LOCAL-OFF-REMOTE switch, allow selection of PCIS AUTO or PCIS HAND control modes based upon operator selection using the SCADA or HMI screens.

- E. Starting, stopping and running when the device LOR is in LOCAL:
 - 1. With the LOR switch in the LOCAL position, the motor is controlled by the START and STOP pushbuttons.
 - 2. With the LOR switch in the OFF position, the motor is prohibited from running.
 - 3. With the LOR switch in the REMOTE position, the motor is controlled remotely.

- F. Starting, stopping and running when the device LOR is in REMOTE:
 - 1. When the motor is expected to be running (PLC has issued a START or RUN due to process conditions or operator selection), LOR is in REMOTE, and the device is not reported to be running, start an operator adjustable "Control Activation" timer:
 - a. Provide "Control Activation" timers for each piece of controlled equipment:
 - 1) If the LOR and required running status do not change, and the PLC does not receive running status within the "Control Activation" time period:
De-activate the output.
Place the device in a "Failed" state.
Generate a "Failed to Respond" alarm.
 - 2. When the motor is not expected to be running (PLC has issued a STOP or removed the RUN output), LOR is in REMOTE, and the device is reported to be running, start the "Control Activation" timer:
 - a. If the LOR and required stopped status do not change, and the PLC does not lose the running status within the "Control Activation" time period:
 - 1) Keep the RUN output off or the STOP output on.
 - 2) Place the device in a "Failed" state.
 - 3) Generate a "Failed to Respond" alarm.
 - 3. Re-establish PLC control of a device in a "Failed" state only after an operator turns the device's LOR switch out of REMOTE, and back to REMOTE (i.e., REMOTE input to the PLC cycles off and back on).

- G. Where motor winding high temperature switches or RTD temperature elements are shown, generate an alarm when high temperature is sensed (contact opens or temperature above the high alarm setpoint), but do not stop the motor unless otherwise indicated.
- H. Simultaneous starts:
1. Prevent more than one motor-driven load 25 HP or larger in the same facility from starting concurrently:
 - a. When starting one load, inhibit start logic for all other such equipment until the load being started is up to speed (RVSS or VFD), or after a setpoint time delay (full-voltage starters and miscellaneous equipment).
 2. Use the same logic to prevent multiple large devices from starting concurrently on restoration of power after a power outage, whether operating on generator or utility power.
- I. Speed control:
1. Modulate speed on VFD-driven motors using jog and hold, or PID control algorithms to maintain process conditions as described in the specific loop descriptions.
 2. Operate speed control within a pre-defined range:
 - a. Minimum speed as determined by equipment manufacturer. The higher of:
 - 1) Minimum motor speed to maintain adequate cooling for the type of load driven (constant or variable torque).
 - 2) Minimum equipment speed, such as minimum speed to deliver flow or to deliver minimum flow for equipment cooling or lubrication.
 - b. Maximum speed 100 percent (60 Hz) or as identified by equipment manufacturer.
 3. Where multiple equipment may operate together to maintain the same process condition:
 - a. Provide an operator selection for starting sequence.
 - b. Start the first equipment at a preset starting speed.
 - c. When one or more equipment is running and the speed control algorithm reaches a preset "Start Next" speed value (initially 95 percent of speed range) through a preset time delay:
 - 1) Start the next available equipment at the preset starting speed.
 - 2) Ramp speed of previously running equipment down to a preset value based on the number of items running. Determine preset values for each condition based on equipment and system characteristics to provide approximately the same total flow or process condition with the new load running at the starting speed.
 - 3) Once the previously running equipment reaches the preset speed, resume the speed control algorithm for that equipment.
 - 4) Ramp the speed of the equipment that had just started until it reaches the speed of the previously running equipment.

- 5) Operate all equipment at the same speed following the output of the speed control algorithm.
- d. When two or more pieces of equipment are running, monitor for a “Stop Next” condition:
 - 1) Where flow rate is monitored, use a preset “Stop Next” flow rate for each possible number and combination of equipment:
 - a) Determine initial “Stop Next” speed based on the flow that can be provided with one fewer piece of equipment running at a speed slightly below the “Start Next” speed.
 - 2) When the “Stop Next” condition exists through a preset time delay:
 - a) Ramp speed of running equipment except for the equipment to be stopped up to a preset value based on the number of items running. Determine preset values for each condition based on equipment and system characteristics to provide approximately the same total flow or process condition with one fewer load running (typically slightly below the preset “Start Next” speed) while ramping speed of equipment to be stopped down to the preset minimum speed.
 - b) Stop the load once it reaches minimum speed.
 - c) Operate all remaining equipment at the same speed following the output of the speed control algorithm.

6.3 Local Disconnects

The COP has a written lock-out tag-out procedure in place and does not require the installation of local disconnects at process motors. As an exception, when a motor controller is supplied locally at the motor equipment, local disconnects are required. This requirement is dictated by the National Electric Code (NEC). Typical examples of equipment that fit this exception are valve actuators and HVAC package equipment like Air Handling Units.

7.0 FACILITY SCADA AND CONTROL COMMUNICATIONS NETWORKING STANDARDIZATION

7.1 General

In the PLC and SCADA, networks will utilize a fiber optic backbone for Ethernet/IP communication throughout the facility. Managed Ethernet switches shall be located in each PLC or network panel for both the SCADA and PLC network. A connection port shall be provided on the front of all PLC cabinets to allow connection to the SCADA network. Switches shall utilize the IEEE Rapid Spanning Tree Protocol (RSTP) for network routing and optimization. In the event of a network switch failure, RSTP will automatically determine the most efficient way to re-route network traffic in order to re-establish communication throughout the network.

7.2 Communication Philosophy

7.2.1 Vendor Control Panels

Vendor control panels (VCPs) are considered to be packaged control panels required to meet the hardware and software requirements of the COP. If VCPs requires the supply of a PLC and associated PLC cabinet, the vendor will be responsible for providing a PLC and PLC cabinet that conforms to the COP standards for hardware, software, network communications, and layout stated in this document.

VCPs shall provide the appropriate connections to communicate via Ethernet/IP over the PLC control network. Digital I/O registers associated with control and monitoring of VCPs shall be made available over the PLC control network for implementation into the SCADA system.

7.2.2 Electrical Distribution Equipment Communications

Power metering shall be provided for all major electrical distribution equipment. Power metering and control shall be communicated over the PLC network utilizing Ethernet IP. Major electrical equipment that requires power monitoring includes:

- Medium voltage switchgear mains and feeders
- Low voltage switchgear mains and feeder
- Variable Frequency Drives over 60 HP

Power metering data shall be displayed locally at the PLC panel HMI and at the SCADA interface screen associated with power monitoring. At a minimum, the following power monitoring data shall be provided:

- kVA
- kW

- kWh with reset button
- Current for Phases A, B, and C
- Voltage for Phases A, B, and C

7.2.3 Dual Isolated Networks for SCADA and PLC

Two dedicated networks shall be provided for the automated control system at AWRF. One network shall be dedicated to Programmable Logic Controller (PLC) communication. A second network shall be dedicated to the Supervisory Control And Data Acquisition (SCADA) communication. The SCADA and PLC network will be run in physically separate conduits at the AWRF.

7.2.3.1 *PLC Network*

The PLC network shall consist of PLC-to-PLC communications only. In order to provide a reliable PLC network, a dedicated communication network shall be provided for control between PLCs. By providing a dedicated PLC network, the critical PLC-to-PLC communication will not be compromised by the bandwidth required from the SCADA and other plant networks. In the event that the SCADA network is lost, the PLC network will maintain process operations on the dedicated PLC network.

7.2.3.2 *SCADA Network*

The SCADA network shall consist of SCADA to SCADA and PLC to SCADA communications only. For major treatment facilities, there will be a primary and secondary SCADA server. In the event the primary SCADA server fails, the secondary SCADA server will take over without any interruption to the SCADA or PLC networks. Historical data for trending purposes shall be stored at the main SCADA historian server. Operations shall access the SCADA interface via laptops and workstations that will run the SCADA application software through Client licenses.

7.3 Switches

In an effort to ensure the interoperability of base stations and remote facility controls, the COP has standardized on Ethernet switches.

7.3.1 Hardware

The COP has standardized on Allen-Bradley Stratix modular switch to allow for consistency throughout all the facilities.

7.3.2 Software – Protocol Utilization

Need input from COP.

8.0 SCADA RADIO FREQUENCY

8.1 General

In an effort to ensure the interoperability of plant and remote facility controls, a standardized approach will be established for all communicating sites throughout the COP water service area. Currently, there are only a few remote sites that have PLC/RTUs installed, which makes this an opportune time to establish the standard for hardware, software, and communications protocols for the remote and plant sites.

8.2 Design and Engineering

An RF design was engineered based on information gathered and field data was collected. RF line of sight and non line of site RF computer generated propagation models were generated. It was determined that with the terrain challenges and propagation needs, a multi-layered approach would be the best choice using licensed frequencies. A node and cluster type of architecture was determined to be the most efficient method of providing the RF coverage needed and provides for current capacity needs as well as future loading requirements. The cluster design allows for distributing the total RF load among multiple node sites thus overcoming current and future RF saturation of a single channel resource.

8.4.1 Node to Network Connectivity

Each node will be connected or backhauled into the current Public Safety IP network via a Point to multi point 4.9 licensed carrier grade radios. After testing three different manufacturers, it was determined that the Cambium PTP 400 radio was the most robust and best performer. This system will consist of Access Points arranged in a sector array located at current COP radio sites. The sector design will allow for directional coverage control and loading management. The nodes sites will require a client radio that will communicate to its respective sector access point. This configuration will allow for a higher bandwidth backhaul of data via this link. Each node will have the ability to collect and backhaul a large amount of information from multiple end points, which will include pump stations, tanks, and lift stations. The end points with each node cluster will communicate to each node via IP based UHF radio. UHF radios will allow for a greater propagation and terrain penetration that is needed due to remote locations of the COP's infrastructure.

8.4.2 End Point to Node Connectivity

Each end point (pump station, tank and lift station) will be connected wirelessly to its respective node. This will be accomplished with IP UHF radio. After testing different manufacturers, the CALAMP Viper SC radio was chosen as the best solution for this task. The propagation characteristics of UHF allows for reliable communications in non line of site applications. The Viper radios will allow for direct IP connectivity to the end point control PLC or RTU.

8.4.3 Point-to-Point Connectivity

Point-to-point connectivity was also planned and designed into the RF plan. This would allow for UHF IP connectivity in a point-to-point configuration such as tank level to pump station control. This could be utilized in poor propagation scenarios. Although the primary scope of the RF design is for SCADA connectivity back to the CITECT central, it was planned and allowed for the use of UHF point to point if needed on case-by-case basis. The use of UHF in cluster point-to-point communications will require careful planning and design if used.

8.4.4 IP Connectivity

It is worth noting that every effort should be made to insure a fluid IP network. To this end, it will be required to maintain the COP's IP integrity that has been set forth by the IT Director. As SCADA grows and is backhauled on COP's network, it is paramount to continue working with the IT Director to assure a solid network. Discussions have taken place with the IT Director and he is on board with assisting the SCADA system both now and in the future. The IP portion of the system needs to be included in the early planning stages of any new and retrofit project. As the SCADA network will traverse the Public Safety and Corporate networks, the respective divisions will be required to be part of the design and planning phases.

8.3 Cost Estimates

A preliminary cost estimate is presented in Table 1.2. The estimated cost takes into consideration the cost of installing a RTU cabinet, associated programming, radio communication path studies, radio and associated equipment, and estimated electrical installation cost. The following assumptions and exclusions should be taken into consideration when utilizing this cost spreadsheet:

- The cost presented for each site category is for a representative site.
- Each individual site will vary in the number of I/O, PLC cabinet size and associated components, radio studies required, and radio/communication components required.
- The addition of SCADA workstations was not included in the cost estimate.
- The addition of SCADA licenses was not included in the cost estimate.
- The addition of field instruments and their connection to the RTU cabinet was not included in the cost estimate.
- The addition of field control components, such as pump control panels and local displays, and their connection to the RTU cabinet was not included in the cost estimate.

8.4 Recommendations

It is recommended that COP follow a detailed RF plan when designing new additions or retrofits to the SCADA network. It is very important to maintain a RF connectivity plan, which will include propagation and frequency needs and coordination. It is also recommended that a single contact within the COP maintain and control the wireless

frequency use. The system was designed to support many end points that would include multiple divisions within the COP. It will be required to have all use of the wireless system to be coordinated in manner that will not cause self-generated interference and issues. It is understood that some projects will require some flexibility and special needs. This can be addressed on a case-by-case basis and the general scope of the plan allows for such flexibility. In summary, it is strongly recommend that a single point of contact coordinate all wireless use for SCADA in both Water and Waste Water. There are many facets and highly technical pieces to the pie and even a small detail can have a large effect on the whole network. A drawing outlining the Copper Basin Node and cluster is included with the assigned frequencies shown in Figure 1.11. This would be duplicated for each geographic cluster that is identified in the future. Additionally cut sheets have been provided in Appendix A for the Cambria Access Point as well as the Viper Radio.

Table 1.2 Estimated Cost For SCADA Implementation at Remote Facilities
Technical Memorandum No. 1 - Control System Standardization
City of Prescott

Facility Type	PLC		RTU Cabinet		Programming		Radio/ Antenna/ Path Study	Electrical Costs	Total
	Quantity	Unit Cost	Quantity	Unit Cost	I/O Quantity	Price	Price		
Sewer Lift Station	1		1		63				
Water Booster Pump Station	1		1		38				
Water Tanks	1		1		27				
Radio Node Sites (Assuming UHF Radio)	0	\$0	1		0	\$0			
Radio Access Point Site (Assuming 4 multi-points)	0	\$0	1		0	\$0			

City of Prescott SCADA Copper Basin Sector

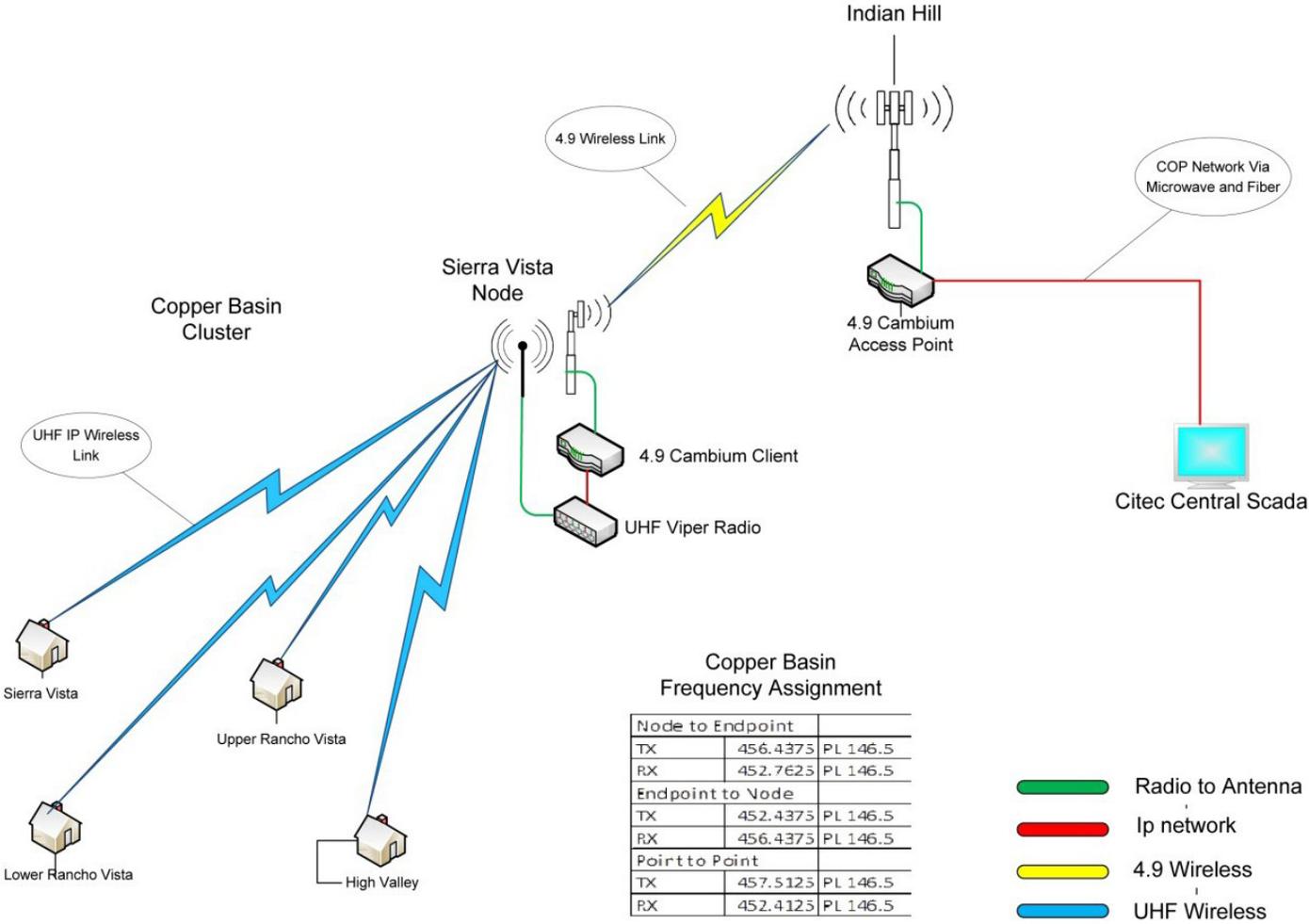


Figure 1.11 Copper Basin Node and Cluster Example Drawing

**Table 1.3 Facilities Spreadsheet - Sewer Lift Stations
 Technical Memorandum No. 1 - Control System Standardization
 City of Prescott**

Lift Station Number	Id	STATION	ADDRESS	PLC/RTU Tag	PLC Type (None/ControlLogix/CompactLogix/MicroLogix/RIO)	I/O Count (Total Physical I/O)	Citect Access Node (Y/N)	Security (Y/N)	Voice (Y/N)	LAN/Internet Access (Y/N)	Communication (UHF/4.9 GHz/COP Microwave/Fiber)	Node Location	Access Point Location	Antenna Height (ft)	Reference Drawing Number	POINT_X	POINT_Y
LS_7	9107	Prescott Lake Regional	1902 Willow Lake Rd													544287.40883300000	1308346.89990000000
LS_60	9160	Prescott Lakes Effluent	3127 N State Route 89													546926.84665900000	1307452.74720000000
LS_1	9100	Private Drive	1538 Private Dr													544148.40697700000	1315124.26848000000
LS_30	9130	Ranch #1	3602 Ranch Dr													554219.29543400000	1291182.71429000000
LS_32	9132	Ranch #2	121 Equestrian Wy													554200.60436200000	1290023.50379000000
LS_33	9133	Ranch #3	87 Murphey Wy													553114.62471300000	1288748.74820000000
LS_34	9177	Ranch #4	3136 Rainbow Ridge Dr													550640.05088700000	1286038.11780000000
LS_35	9135	Ranch #5	3170 Rainbow Ridge Dr													550614.56147900000	1284823.87498000000
LS_36	9136	Ranch #6	2908 Falling Star Cr													549214.36845400000	1288950.42705000000
LS_37	9137	Ranch #7	2659 Moonridge													546341.54873900000	1284617.64548000000
LS_21	9121	Reservation	71 E Merritt													536481.22745000000	1293885.33291000000
LS_8	9108	Shadow Valley	2420 Shadow Valley Ranch Rd													523772.87543800000	1304756.75180000000
LS_41	9141	Skyline	327 Skyline Dr													520807.65815500000	1287714.62699000000
LS_3	9103	South View #1	144 South Park Dr													526231.43390400000	1309056.01171000000
LS_4	9104	South View #2	3070 Pedregal Dr													529147.37630700000	1309903.37581000000
LS_45	9145	Thunderbird	622 Thunderbird Dr													524079.09239800000	1283130.12573000000
LS_52	9152	Timber Ridge #1	1758 Rolling Hill Dr													524121.28119800000	1280728.37469000000
LS_51	9151	Timber Ridge #2	1100 Ravens Crest													522698.82641300000	1279664.73770000000
LS_50	9150	Timber Ridge #3	1996 Blackhawk Cr													522293.12580400000	1280571.75184000000
LS_11	9111	Transfer Station	2802 Sundog Ranch Rd													547228.93894800000	1302358.24889000000
LS_22	9122	Wendy's	1871 Hwy 69													544412.75872100000	1292040.61739000000
LS_62	9189	Willow Creek	4705 Willow Creek Rd													539638.30546900000	1313634.95059000000
LS_6	9106	Willow Lake Estates	1619 Willow Lake Rd													542176.56390300000	1310088.49862000000
LS_5	9105	Willow Lake Regional	1095 Willow Lake Rd													539126.87481200000	1310182.75168000000
LS_25	9125	Yavapai Hills #1	5095 Cactus Pl													559892.19400000000	1294221.88485000000
LS_26	9126	Yavapai Hills #2	1148 Lois Dr													558442.68923000000	1295635.25061000000
LS_27	9127	Yavapai Hills #3	1230 Lois Dr													558429.87694200000	1296052.50194000000
LS_28	9128	Yavapai Hills #4	1336 Lois Dr													558425.87515000000	1296630.75064000000
LS_23	9123	Yavapai Hills #5	47 24 Budsage Ct													554685.87489100000	1292043.12414000000
LS_24	9124	Yavapai Hills #6	858 Flying U Ct													553703.33869800000	1295293.10354000000
LS_29	9129	Yavapai Hills #8	990 Studebaker Wy													558014.73505400000	1298050.15800000000
LS_63	9163	Yavapai Hills #9	4685 Sharp Shooter													557855.71195000000	1299126.46802000000

INFR_TYPE	NOTES	PLC/RTU Tag	PLC Type (None/ControlLogix/ CompactLogix/ MicroLogix/RIO)	I/O Count (Total Physical I/O)	Citect Access Node (Y/N)	Security (Y/N)	Voice (Y/N)	LAN/Internet Access (Y/N)	Communication (UHF/4.9 GHz/COP Microwave/Fiber)	Node Location	Access Point Location	Antenna Height (ft)	Reference Drawing Number	POINT_X	POINT_Y	Z-value
BPS_36	Airpark													552011.4	1330728	4963
BPS_1	Arrowhead Pump Station													522383.4	1301638	5616
BPS_37	Booster pump #1-Chino Boosters													538895.7	1364477	4730
BPS_39	Booster pump-Chino Boosters													538942.3	1364521	4726
BPS_38	Booster station-Chino Boosters													538917.2	1364613	4724
BPS_30	Boulders Granite Springs													529113.6	1299555	5524
BPS_2	Cedarwood													536430.5	1300075	5552
BPS_6	Christy Vista Hydro													529648.6	1279852	5884
AB_BPS	Eastwood-Abandoned													537986.9	1284992	5664
BPS_40	Foothills													535380.2	1284270	5668
BPS_22	Forest Trails													521552.8	1294966	5751
BPS_13	Frontier Village													545663.1	1292507	5500
BPS_24	Haisley													531200.1	1281275	5532
BPS_26	Hassayampa/Forest Mountain													519368.5	1284768	5970
BPS_27	High Valley													519195.7	1282049	5990
BPS_18	Intermediate													534367.1	1311690	5220
BPS_42	Iron Springs													526509.7	1297607	5440
BPS_8	Juniper													535053.9	1282312	5715
BPS_29	Longview													527563.4	1315407	5500
BPS_31	Mingus													529899.3	1300288	5549
BPS_4	Pioneer													531897.7	1286930	5469
BPS_12	Prescott Canyon													541078.6	1291353	5439
BPS_41	Prescott Lakes Parkway (PL)													547796.5	1297656	5292

**Table 1.5 Facilities Spreadsheet - Water Booster Pump Stations
 Technical Memorandum No. 1 - Control System Standardization
 City of Prescott**

INFR_TYPE	NOTES	PLC/RTU Tag	PLC Type (None/ControlLogix/ CompactLogix/ MicroLogix/RIO)	I/O Count (Total Physical I/O)	Citect Access Node (Y/N)	Security (Y/N)	Voice (Y/N)	LAN/Internet Access (Y/N)	Communication (UHF/4.9 GHz/COP Microwave/Fiber)	Node Location	Access Point Location	Antenna Height (ft)	Reference Drawing Number	POINT_X	POINT_Y	Z-value
BPS_7	Prescott Pines													529759.8	1281176	5664
BPS_11	Prescott Resort													541128.4	1291310	5440
BPS_3	Ranch #1													550326	1288077	5764
BPS_16	Ranch 2 & 3													548183.6	1284759	5988
BPS_17	Ranch 4													546538.8	1284015	6364
BPS_25	Rancho Vista Lower													520818.3	1282635	5736
BPS_5	Rancho Vista Upper													521362.9	1281292	5820
BPS_35	Robinson													539827.2	1288051	5520
BPS_34	Sierra Vista													525845	1283402	5614
BPS_21	Southview													528653.7	1309346	5472
BPS_23	Thumb Butte Lower													526592.8	1289801	5460
BPS_28	Thumb Butte Upper													520475.6	1288775	5844
BPS_43	Trailwalk													538456.8	1306441	5372
BPS_33	Village-Abandon 5-13													524149.1	1281773	5724
BPS_32	Virginia													535744	1286782	5476
BPS_19	Vista del Cerro													520871.8	1301072	5541
BPS_10	White Spar													532154.9	1284807	5392
BPS_14	Yavapai Hills Lower (1)													548355	1293056	5545
BPS_15	Yavapai Hills Upper (2)													554056.6	1294545	5880

Table 1.6 Facilities Spreadsheet - Water Tanks
Technical Memorandum No. 1 - Control System Standardization
City of Prescott

Water Tank Number	INFR_TYPE	NOTES	PLC/RTU Tag	PLC Type (None/ControlLogix/CompactLogix/MicroLogix/RIO)	I/O Count (Total Physical I/O)	Citect Access Node (Y/N)	Security (Y/N)	Voice (Y/N)	LAN/Internet Access (Y/N)	Communication (UHF/4.9 GHz/COP Microwave/Fiber)	Node Location	Access Point Location	Antenna Height (ft)	Reference Drawing Number	POINT_X	POINT_Y	Z-Value
WTK_30	TNK	Airpark													552117.43303200000	1330681.38440000000	5563
WTK_12	TNK	Cedarwood													536410.64927400000	1300108.03346000000	4730
WTK_3	TNK	Chino 5 Mill													539279.00000000000	1364613.00000000000	5860
WTK_13	TNK	Forest Trails													521503.31050800000	1295023.75058000000	4730
WTK_7	TNK	Frontier Village													545891.32409800000	1290540.47275000000	5868
WTK_16	TNK	Haisley													533294.06431100000	1280613.99799000000	4958
WTK_15	TNK	Indian Hills													527516.00000000000	1288867.00000000000	4912
WTK_5	TNK	Juniper													536394.62572200000	1282251.37399000000	5710
WTK_22	TNK	Longview													527522.31288100000	1315404.25056000000	6364
WTK_24	TNK	Mingus													530299.36811600000	1300963.73701000000	5884
WTK_25	TNK	North Reservoir													530026.00000000000	1300563.00000000000	5575
WTK_23	TNK	North Reservoir													530237.00000000000	1300412.00000000000	6050
WTK_11	TNK	Northwest Regional													527395.52529700000	1311176.13818000000	
WTK_8	TNK	Prescott Canyon													547550.06125200000	1294441.50008000000	5872
WTK_4	TNK	Prescott Pines													529641.50136300000	1279884.50039000000	5710
WTK_9	TNK	Ranch 1													549609.31296600000	1284187.25009000000	5762
WTK_10	TNK	Ranch 2													546579.56320300000	1283909.25047000000	
WTK_19	TNK	Rancho Vista Upper													519074.96823300000	1282050.87479000000	5786
WTK_1	TNK	Robinson Drive Tank													540606.18617400000	1285156.49886000000	5727
WTK_29	TNK	Sierra Vista-Abandon 5-13													525527.56087900000	1282507.75082000000	5563
WTK_28	TNK	South Reservoir													535585.00000000000	1285162.00000000000	5750
WTK_6	TNK	Southeast Regional													539200.77074800000	1281716.48144000000	5868
WTK_18	TNK	Tank Rd.-Abandon 5-13													521451.18890800000	1281618.12420000000	5840
WTK_21	TNK	Thumb Butte Lower													520500.31069900000	1288734.49822000000	6015
WTK_20	TNK	Thumb Butte Upper													520403.31332300000	1289563.49995000000	5828
WTK_17	TNK	Village-Abandon 5-13													538865.40665200000	1364476.70629000000	6076
WTK_2	TNK	Yavapai Hills East Region													539065.25868400000	1364509.41695000000	5555



PMP 400 Subscriber Module (4.9 GHz)

Proven, reliable, cost effective wireless broadband. Municipalities, counties and local governments need reliable, high-quality broadband connectivity with a low investment cost. Cambium Networks delivers Point-to-Multipoint (PMP) systems that are field proven and provide reliable, cost-effective connectivity for data, voice and video applications. The licensed PMP 49400 is particularly adept at serving difficult to reach locations.

Cambium Networks provides exceptional wireless broadband connectivity solutions. With more than 3 million modules deployed in thousands of networks around the world, Cambium solutions are proven to provide cost effective, reliable data, voice and video connectivity.

SPECIFICATIONS

PRODUCT	
MODEL NUMBER	4940SM, 4940SMC
SPECTRUM	
CHANNEL SPACING	Configurable on 0.5 MHz increments
FREQUENCY RANGE	4940-4990 MHz
CHANNEL WIDTH	10 MHz
INTERFACE	
PHYSICAL LAYER	OFDM 256 FFT
MAC (MEDIA ACCESS CONTROL) LAYER	Cambium Proprietary
ETHERNET INTERFACE	10/100BaseT, half/full duplex, rate auto negotiated (802.3 compliant)
PROTOCOLS USED	IPv4, UDP, TCP, IP, ICMP, Telnet, SNMP, HTTP, FTP, PPPoE
NETWORK MANAGEMENT	HTTP, Telnet, FTP, SNMPv2c (compatible with Prizm 3.2 or later and CNUT 3.1 and later)
PERFORMANCE	
ARQ	Yes
MODULATION LEVELS (ADAPTIVE)	1X: QPSK, 2X: 16-QAM, 3X: 64-QAM
LATENCY	5-7 msec roundtrip
FORWARD ERROR CORRECTION	3/4 Reed-Solomon block coding
GPS SYNCHRONIZATION	Yes
QUALITY OF SERVICE	DiffServ QoS
VLAN	802.1ad (DVLAN Q-in-Q), 802.1Q with 802.1p priority, dynamic port VID
MAX. AGGREGATE THROUGHPUT PER SECTOR (@10MHZ CHANNEL)	1X: 7 Mbps, 2X: 14 Mbps, 3X: 21Mbps
LINK BUDGET	
TRANSMIT POWER	-30 to +18 dBm (to EIRP limit by region) (1dBm interval)

SPECIFICATIONS

ANTENNA BEAM WIDTH	3dB antenna pattern: 15° azimuth, 15° elevation
ANTENNA GAIN	Integrated: 17 dBi Connectorized: Varies with antenna type: can operate with a selection of separately-purchased antennas; 50-ohm N-type (check local regulations prior to purchase)
MAXIMUM TRANSMIT POWER	18 dBm
EIRP	35 dBm (with integrated antenna)
TYPICAL LOS RANGE	up to 15 miles (24 km) at lowest modulation
SENSITIVITY (dBm typical)	1X: -89 dBm, 2X: -80 dBm, 3X: -71 dBm
PHYSICAL	
WIND LOADING	90 lbs.
MEAN TIME BETWEEN FAILURE	>10 years
ENVIRONMENTAL	IP55
TEMPERATURE	-40°C to +55°C (-40°F to +131°F)
WEIGHT	1.3 kg (2.8 lbs)
WIND SURVIVAL	118mi/hour (190km/hour)
DIMENSIONS (HxWxD)	34 x 21 x 11 cm (13.25" x 8.25" x 4.2")
MAXIMUM POWER CONSUMPTION	19W
INPUT VOLTAGE	24 to 59V
SECURITY	
ENCRYPTION	56-bit DES; 128-bit AES optional
CERTIFICATIONS	
FCC ID	ABZ89FT7631
INDUSTRY CANADA CERT	109W-4940

Viper SC™

Intelligent IP Router for Licensed Spectrum



VERSATILE, SECURE COMMUNICATIONS WITH MULTISPEED FUNCTIONALITY

Designed for the energy and utility segment as well as the water or wastewater industries, the CalAmp Viper SC is an intelligent, point-to-multipoint bridge or router for licensed narrowband spectrum holders. This robust communications IP router for VHF & 900 licensed networks features an internal web browser with a familiar interface for IT and network administrators to set up and view device information, configure network parameters and deploy unit upgrades from any location. Using a Software Defined Radio, Viper SC is programmable for 50, 25, 12.5 or 6.25 kHz channels.

FAST & RELIABLE

MultiSpeed operation allows each remote Viper SC to communicate to a Viper SC Base Station at the fastest speed supported by a given signal strength. MultiSpeed operation results in an adaptive network which is optimized for performance and reliability. Each Viper SC features single device store and forward and route redundancy for extended range and easy network expansion. With advanced diagnostic capabilities, over the air firmware upgrades, channel migration and RoHS compliance, you can bet your investment today is protected well into the future.

INTELLIGENT & SECURE

Featuring advanced QoS, the Viper SC allocated guaranteed RF bandwidth to critical, high-priority user-defined applications. Able to support multiple applications simultaneously, the Viper SC also boasts data prioritization for the ultimate in router intelligence. The Virtual Local Area Network (VLAN) routing capability of the Viper SC improves scalability, security and traffic-flow management. Versatile and scalable for the future, the Viper SC can be used as an IP router, terminal server, Ethernet bridge, access point or remote site.

CENTRALIZED MANAGEMENT

Viper SC can be managed via an intuitive webpage, SNMP, or telnet enabling remote management for every application. Viper's device management capabilities allow administrators to set-up and view device information, configure network parameters and deploy unit upgrades from any location. These remote management tools reduce the time and cost of maintaining network infrastructure while improving workforce efficiency for managing and monitoring industrial equipment in the field.



Experience The Advantage

- Advanced Multi-Level Modulation allows up to 128 kbps in a 50 KHz channel
- 1-10 Watts output Power, software selectable
- Multi - Hop store and forward routing to avoid obstructions and extend range
- FIPS 140-2 compliant providing AES 128/256 encryption, Radius authentication and Multiple VPNs
- Viper functions as an IP Bridge or IP Router
- Viper supports Terminal Services allowing IP to Serial Conversion
- QOS for simultaneous use of multiple applications and data transfer prioritization

VIPER SC SPECIFICATIONS

PRODUCT HIGHLIGHTS

- QoS
- Bridge and Router Modes
- Secure VPN Tunnels
- MultiSpeeds

CONNECTORS/INTERFACE

Ethernet	10 BaseT Auto-MDIX RJ-45
Serial COM 1, COM 2	RS-232 DB-9
Antenna	TNC Female (Tx/Rx), SMA Female (Rx)-Dual port models only

MECHANICAL

Dimensions	5.50 W x 2.125 H x 4.25" D, (13.97 x 5.40 x 10.8 cm)
Weight	2.4 lbs, 1.1 kg

ENVIRONMENTAL

Operating Temperature	-40° to +70° C, (-40° to +158° F)
Specified Temperature	-30° to +60° C, (-22° to +140° F)
Storage Temperature	-40° to +85° C, (-40° to +185° F)
Operating Humidity	5% to 95% Non-condensing RH

POWER

Tx Current	1.2-3.6A@10V; 0.6-1.8A@20V; 0.4-1.2A@30V
Rx Current	450mA@10V; 240mA@20V; 170mA@30V
Primary Power	10-30 VDC

STANDARDS & CERTIFICATIONS

- FCC
- IC
- UL

TRANSMITTER

Frequency Stability	1.0 ppm
Carrier Output Power	1-10 Watts (VHF/UHF), 1-8 Watts (900)
Duty Cycle	100% (Power Foldback for High Temps)
Output Impedance	50 Ω

FREQUENCY BANDS

	Frequency	Channel Bandwidth
VHF:	136-174 MHz	6.25/12.5/25/50kHz
200:	215-240 MHz	12.5/25/50kHz
UHF:	406.1-512 MHz	6.25/12.5/25/50kHz
900 (NPCS, MAS):	928-960 MHz	6.25/12.5/25/50kHz

Modes of Operation	Simplex, Half-Duplex
Modulation	2FSK, 4FSK, 8FSK, 16FSK

RECEIVER

VHF/UHF BER @ 1x10⁻⁶

6.25 kHz	-115@4 kbps; -106@8 kbps; -100@12 kbps
12.5 kHz	-116@8 kbps; -109@16 kbps; -102@24 kbps; -95@32 kbps
25 kHz	-114@16 kbps; -106@32 kbps; -100@48 kbps; -92@64 kbps
50 kHz	-111@32 kbps; -104@64 kbps; -97@96 kbps; -88@128 kbps

MAS BER @ 1x10⁻⁶

12.5 kHz	-112@8 kbps; -106@16 kbps; -99@24 kbps; -90@32 kbps
25 kHz	-111@16 kbps; -104@32 kbps; -97@48 kbps; -89@64 kbps
50 kHz	-108@32 kbps; -101@64 kbps; -94@96 kbps; -85@128

Adjacent Channel

(VHF/UHF)	45 dB@6.25 kHz; 60 dB@12.5 kHz; 70 dB@25 kHz; 75 dB@50 kHz
(MAS)	55 dB@12.5 kHz; 65 dB@25 kHz; 70 dB@50 kHz

About CalAmp

CalAmp (NASDAQ: CAMP) is a proven leader in providing wireless communications solutions to a broad array of vertical market applications and customers. CalAmp's extensive portfolio of intelligent communications devices, robust and scalable cloud service platform, and targeted software applications streamline otherwise complex machine-to-machine (M2M) deployments. These solutions enable customers to optimize their operations by collecting, monitoring and efficiently reporting business-critical data and desired intelligence from high-value remote assets. For more information, please visit www.calamp.com.

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D. SAMPLE DESIGN-BUILD AGREEMENT

SCADA INSTALLATION AND INTEGRATION PROJECT

DESIGN-BUILD CONTRACT

**** Project**

Contract No. **

THIS AGREEMENT, made and entered into this ** day of **, 20**, by and between ** of the city of **, county of **, state of **, hereinafter designated “Design-Builder”, and the City of Prescott, a municipal corporation, organized and existing under and by virtue of the laws of the State of Arizona, hereinafter designated “City”.

WITNESSETH: That the said Design-Builder, for and in consideration of the sum to be paid him by the said City, in the manner and at the time hereinafter provided, and of the other covenants and agreements herein contained, and under the penalties expressed in the bonds provided, hereby agrees for himself, his heirs, executors, administrators and successors, and assigns the following: (The following sections prescribe the services and responsibilities required for the proper execution and completion of the Work by the Design-Builder. They are not organized in any specific order and may pertain to all phases of the Work. The headings used in this Agreement, or any other Contract Documents, are for ease of reference only and shall not in any way be construed to limit or alter the meaning of any provision.)

ARTICLE I - SCOPE OF WORK

The Design-Builder shall furnish any and all labor, materials (other than those listed as supplied by the City), equipment, transportation, utilities, services and facilities required to perform all work for the Design-Build of the **** Project**, to completely and totally design and construct the same and install the material therein for the City, in a good and workmanlike and substantial manner and to the satisfaction of the City.

ARTICLE II - NON-EXCLUSIVE CONTRACT

Nothing in this Contract is to be construed as granting to the Design-Builder an exclusive right to perform any or all of the City’s requirements of the type contemplated hereunder.

ARTICLE III - PROFESSIONAL RESPONSIBILITY

City and Design-Builder commit at all times to cooperate fully with each other, and proceed on the basis of trust and in good faith, to permit each party to realize the benefits afforded under the Contract Documents.

The Design-Builder shall perform the work hereunder in accordance with the standards of care, skill, and diligence normally provided by a professional in the performance of such services with respect to work similar to that contemplated hereunder. In the event of the Design-Builder’s failure to observe and adhere to such standards, the Design-Builder shall, upon notice from authorized City staff, promptly re-perform the work at the Design-Builder’s sole expense.

A. PROFESSIONAL SERVICES

Design-Builder shall, consistent with applicable state licensing laws, provide qualified, licensed design

professionals employed by Design-Builder, or procured from qualified, independent licensed design consultants, the necessary Design Services, including architectural, engineering and other design professional services, for the preparation of the required drawings, specifications and other design submittals to permitted Design-Builder to complete the Work consistent with the Contract Documents. The Design-Builder's design professionals shall seal with an Arizona registered professional seal all plans, works and deliverables prepared by them for this Agreement as required by state law.

The Design-Builder shall provide services to the City in relation to the said Project as indicated in Exhibit A (Request for Statements of Qualification, Scope of Work, Task and Fee Estimate and Project Schedule) and as requested by the City. In addition to those services identified in Exhibit A, the Design-Builder shall also perform all subordinate tasks not specifically referenced but necessary to the full and effective performance of the tasks specifically referenced.

The standard care for all design professional services performed to execute the Work shall be the care and skill ordinarily used by members of the design profession practicing under similar conditions at the same time and locality of the Project. Notwithstanding the preceding sentence, if the parties agree upon specific performance standards for any aspect of the services, which standards are to be set forth in an exhibit to this Contract, the design professional services shall be performed to achieve such standards.

The Design-Builder shall be responsible for the completeness and accuracy of the plans, specifications, supporting data, and other work prepared or compiled under its obligation for the Project and shall correct, at its expense, all errors, omissions and negligent acts therein which may be discovered. Correction of errors, omissions and negligent acts discovered on the architectural or engineering plans and specifications shall be the responsibility of the Design-Builder. The cost of the design necessary to correct those errors attributable to the Design-Builder shall not be reimburseable costs to the Design-Builder. Any damage incurred by the City as a result of additional construction cost caused by such errors, omissions or negligent acts shall not be reimbursed to the Design-Builder to the extent that such errors, omissions and negligent acts fall below the standard of care and skill that a registered professional in Arizona would exercise under similar conditions. The fact that the City has accepted or approved the Design-Builder's product shall in no way relieve the Design-Builder of any of its responsibilities. The settlement of any complications or disputed expenses arising from a Design-Builder's adjustment shall be borne by the Design-Builder at his own expense.

B. DESIGN SERVICES

Design-Builder shall provide all interim design submissions and deliverables as prescribed by the City and as shown on the Project Schedule. The City shall review and approve the interim design submissions in a time that is consistent with the turnaround times set forth in the Design-Builder's City-approved Project Schedule. The Design-Builder shall provide drawings in AutoCAD format compatible with City technology.

The Project design must meet all applicable Maricopa Association of Governments (MAG) Uniform Standard Technical Specifications and Uniform Standard Details and Drawings, latest revision; the City of Prescott Supplement to MAG, latest revision; all City building and engineering standards; and shall include any general provisions provided by the City. The Project design criteria and specifications shall be in accordance with all codes, standards and requirements as adopted by ordinance. Variances from the standards and guidelines must be identified in writing by the Design-Builder and approved by the City. The Design-Builder shall identify conflicts between the design standards and guidelines and the requirements listed in the paragraph above and shall obtain concurrence with resolution of the conflict. The design standards and guidelines or approval of variances or resolution of conflicts shall not be deemed to transfer any design liability to the City.

The Design-Builder shall not specify any construction materials known to be hazardous or potentially hazardous, including asbestos, lead or any derivative thereof unless specifically approved in writing by the City.

The Design-Builder shall coordinate with private, public and City utilities regarding standard utility issues and incorporate pertinent information in the plans. The Design-Builder shall be responsible for scheduling, submitting to, obtaining approval and retrieving all required Construction Documents from the various required reviewing agencies. Design-Builder shall obtain all necessary permits, approvals and licenses required for the prosecution of the Work by any government or quasi-government entity having jurisdiction over the Project. Copies of these permits and notices must be provided to the City prior to starting the permitted activity. The City shall be responsible for providing fees related to City permits.

Design-Builder when requested by the City, will attend, make presentations and participate as may be appropriate in public agency and/or community meetings relative to the Project. Design-Builder will provide drawings, schedule diagrams, budget charts and other materials describing the Project, when their use is required or appropriate in any such meetings.

C. CONSTRUCTION SERVICES

The Design-Builder shall, except as provided otherwise in this Contract or any attached Bid, furnish all supervision, labor and materials, and obtain all licenses and permits required for performance of the work. Design-Builder shall perform all construction activities efficiently and with the requisite expertise, skill and competence to satisfy the requirements of the Contract Documents. Design-Builder shall at all times exercise complete and exclusive control over the means, methods, sequences and techniques of construction in accordance with the Maricopa Association of Governments (MAG) Uniform Standard Technical Specifications and Uniform Standard Details and Drawings, latest revision; the City of Prescott Supplement to MAG, latest revision; all City building and engineering standards; and any general provisions and/or conditions provided by the City

Design-Builder shall submit to the City, Construction Documents setting forth in detail drawings and specifications describing the requirements for construction. The Construction Documents shall be consistent with the latest set of interim design submissions, as such submissions may have been modified in a design review meeting.

After approval of Construction Documents and prior to the commencement of any construction, the City will schedule a pre-construction conference. The construction start date will be concurred with. After the meeting, a Notice to Proceed letter will be issued confirming the construction start date, duration of the construction and, if applicable, the Substantial Completion date.

ARTICLE IV - CONTRACT DOCUMENTS

The Request for Design-Build Qualifications, Plans, Specifications, Special Provisions, Addenda (if any), the Design-Build Proposal (as accepted by the Mayor and Council per the meeting minutes of **, 2016), this Contract, and any Performance Bonds, Payment Bonds, Certificates of Insurance, and Change Orders, are by this reference the Contract Documents and are made a part of the Contract to the same extent as if set forth herein in full.

ARTICLE V - TIME OF COMPLETION

Contract Time shall start with the Notice to Proceed (NTP) and end with Substantial Completion. The

City shall issue a NTP letter establishing the mutually agreed upon NTP date for this Agreement and design. Design-Builder hereby agrees to commence work on or before the tenth (10th) day after written notice to do so, and to fully complete the same within the established Contract Time after the date of the written notice to commence Work, subject to such extensions of time as are provided by the General Conditions and Contract Documents. The City will issue a Final Acceptance letter when the City finds the Work or identified portions of the Work to be finally complete.

The Project Schedule shall be established, updated and maintained throughout the Work as provided by the General Conditions and Contract Documents. The Project Schedule shall be revised as required by conditions and progress of the Work, but such revisions shall not relieve Design-Builder of its obligations to complete Work within the Contract Time(s), as such dates may be adjusted in accordance with the Contract Documents. Failure on the part of the Design-Builder to adhere to the Project Schedule may be the basis for termination of this Agreement by the City.

The activities making up the schedule shall be of sufficient detail to assure that adequate planning has been done for proper execution of the Work and such that it provides an appropriate basis for monitoring and evaluating the progress of the Work. The schedule shall show milestones, including milestones for City-furnished information, and shall include activities for City-furnished equipment and furniture when those activities are interrelated with the Design-Builder's activities.

The Design-Builder covenants and agrees at his own proper cost and expense, to do all work as aforesaid for the Design-Build of said improvements and to completely design and construct the same and install the material therein, as called for by the Contract Documents, free and clear of all claims, liens, and charges whatsoever, in the manner and under the conditions specified within the time, or times, stated in the Contract Documents.

ARTICLE VI – LIQUIDATED DAMAGES

All time limits stated in the Contract Documents are of the essence. Design-Builder understands that if Substantial Completion or Final Completion, as established for each, is not attained within the Contract Time as may be adjusted, City will suffer damages which are difficult to determine and accurately specify. Design-Builder agrees that if Substantial Completion or Final Completion, as established for each, is not attained within the Contract Time as may be adjusted, Design-Builder shall pay the City (to be determined separately for each Project per MAG Standard 108.9 Failure to Complete on Time) as liquidated damages, and not as a penalty, for each day that Substantial Completion or Final Completion extends beyond the date determined by the Contract Times as adjusted and further agrees that such amount is reasonable under the circumstances. In the case of such breach, the City shall deduct the agreed amount from the amount due the Design-Builder under the Contract Documents. In the event the remaining balance due the Design-Builder is insufficient to cover the full amount of assessed liquidated damages, then the Design-Builder or the surety on the bonds shall pay the difference due the City.

ARTICLE VII - PAYMENTS TO DESIGN-BUILDER

For and in consideration of the faithful performance of the work herein embraced as set forth in the Contract Documents, and in accordance with the directions of the City, the City agrees to pay the Design-Builder the amount earned, computed from actual quantities of work performed and accepted or materials furnished at the unit Design-Build price in the Design-Build Bid and to make such payment in accordance with applicable Arizona Revised Statutes, after final inspection and acceptance of the work.

Design-Builder shall be paid, pursuant to the provisions as set forth in the General Conditions and Contract Documents, the total agreed, plus any approved Contract Amendments, for the full and

satisfactory completion of all Work as set forth in the Project Specifications and Contract Documents. Retention shall be in accordance with A.R.S. § 34-221.

Prior to final payment to the Design-Builder, the City shall deduct therefrom any and all unpaid privilege, license and other taxes, fees and any and all other unpaid moneys due the City from the Design-Builder, and shall apply to those moneys to the appropriate account. Design-Builder shall provide to the City any information necessary to determine the total amount(s) due.

Fulfillment of the obligation of the City under this Agreement is conditioned upon the availability of funds appropriated or allocated for the performance of such obligations. If funds are not allocated and available for the continuance of this Agreement, this Agreement may be terminated by the City at the end of the period for which the funds are available. No liability shall accrue to the City in the event this provision is exercised, and the City shall not be obligated or liable for any future payments as a result of termination under this paragraph.

ARTICLE VIII - PAYMENTS TO SUBCONTRACTORS

The foregoing sum includes payment for any and all services to be rendered by Design-Builder or Subcontractors, which the Design-Builder may employ for this Contract. It is expressly agreed by and between the parties that the Design-Builder is solely responsible for any and all payment to other Professionals or Subcontractors retained by the Design-Builder.

The Design-Builder shall pay to his Subcontractors or material suppliers, and each Subcontractor shall pay to his Subcontractor or material supplier, within seven (7) days of receipt of each progress payment, unless otherwise agreed in writing by the parties, the respective amounts allowed the Design-Builder or Subcontractor on account of the work performed by his Subcontractors, to the extent of each such Subcontractor's interest therein, except that no Contract for Design-Build may materially alter the rights of any Contractor, Subcontractor or material supplier to receive prompt and timely payment as provided under ARS § 34-221(E). Such payments to Subcontractors or material suppliers shall be based on payments received pursuant to that Section. Any diversion by the Design-Builder or Subcontractor or payments for work performed on a Contract, or failure to reasonably account for the application or use of such payments, constitutes grounds for disciplinary action by the Registrar of Contractors. The Subcontractor or material supplier shall notify the Registrar of Contractors and the City in writing of any payment less than the amount or percentage approved for the class or item of work as set forth in that Section.

Nothing herein prevents the Design-Builder or Subcontractor, at the time of application and certification to the City or Design-Builder, from withholding such application and certification to the City or Design-Builder for payment to the Subcontractor or material supplier for (a) unsatisfactory job progress, (b) defective Design-Build work or materials not remedied, (c) disputed work or materials, (d) third-party claims filed or reasonable evidence that a claim will be filed, (e) failure of a Subcontractor to make timely payments for labor, (f) equipment and materials, (g) damage to the Design-Builder or another Subcontractor, (h) reasonable evidence that the Subcontract cannot be completed for the unpaid balance of the Subcontract sum, or (i) a reasonable amount for retention that does not exceed the actual percentage retained by the City.

ARTICLE IX - DAMAGES UPON DELAY

Negotiations between the City and the Design-Builder for the recovery of damages related to expenses incurred by the Design-Builder for a delay for which the City is responsible, which is unreasonable under the circumstances and which was not within the contemplation of the parties to the Contract, are provided

under this Contract. This Article shall not be construed to void any provision in the Contract which requires notice of delays, provides for arbitration or other procedure for settlement, or provides for liquidated damages.

ARTICLE X - INDEMNIFICATION AND HOLD HARMLESS

To the fullest extent permitted by law, the Design-Builder shall defend, indemnify and hold harmless the City, its departments and divisions, its agents, officers, officials and employees from and against all claims, damages, losses and expenses (including but not limited to attorney fees, court costs, and the cost of appellate proceedings), relating to, arising out of, or alleged to have resulted from the acts, errors, mistakes, omissions, work or services of the Design-Builder, its agents, employees or any tier of Design-Builder's Subcontractors in the performance of this Contract. Design-Builder's duty to defend, hold harmless and indemnify the City, its agents, officers, officials and employees shall arise in connection with any claim, damage, loss or expense that is attributable to bodily injury, sickness, disease, death, or injury to, impairment, or destruction of property including loss of use resulting there from, caused by Design-Builder's acts, errors, mistakes, omissions, work or services in the performance of this Contract including any employee of the Design-Builder, any tier of Design-Builder's Subcontractor or any other person for whose acts, errors, mistakes, omissions, work or services the Design-Builder may be legally liable.

The amount and type of insurance coverage requirements set forth herein will in no way be construed as limiting the scope of the indemnity in this paragraph.

ARTICLE XI- INSURANCE REQUIREMENTS

Design-Builder and Subcontractors shall procure and maintain until all of their obligations have been discharged, including any warranty periods under this Contract are satisfied, insurance against claims for injury to persons or damage to property which may arise from or in connection with the performance of the work hereunder by the Design-Builder, his agents, representatives, employees or Subcontractors.

The insurance requirements herein are minimum requirements for this Contract and in no way limit the indemnity covenants contained in this Contract.

The City in no way warrants that the minimum limits contained herein are sufficient to protect the Design-Builder from liabilities that might arise out of the performance of the work under this Contract by the Design-Builder, his agents, representatives, employees, or Subcontractors. Design-Builder is free to purchase such additional insurance as may be determined necessary.

The policies shall include, or be endorsed to include, the following provisions:

1. On insurance policies where the City of Prescott is named as an additional insured, the City of Prescott shall be an additional insured to the full limits of liability purchased by the Design-Builder even if those limits of liability are in excess of those required by this Contract.
2. The Design-Builder's insurance coverage shall be primary insurance and non-contributory with respect to all other available sources.

With the exception of a ten (10) day notice of cancellation for non-payment of premium, any changes material to compliance with this contract in the insurance policies above shall require a thirty (30) day written notice.

Insurance is to be placed with insurers with a current A.M. Best's rating of no less than A-VII, unless otherwise approved by the City of Prescott. General liability, automobile liability, and worker's compensation insurance is to be placed with an insurer admitted in the state in which operations are taking place.

Design-Builder shall furnish the City with certificates of insurance (ACORD form or equivalent approved by the City) as required by this Contract. The certificates for each insurance policy are to be signed by a person authorized by that insurer to bind coverage on its behalf.

All certificates and any required endorsements are to be received and approved by the City before work commences. Each insurance policy required by this Contract must be in effect at or prior to commencement of work under this Contract and remain in effect for the duration of the project and warranty period as set forth in Paragraph 3 of the "Design-Builder's Affidavit Regarding Settlement of Claims and Certification of Completion of Warranties". Failure to maintain the insurance policies as required by this Contract or to provide evidence of renewal is a material breach of contract.

All certificates required by this Contract shall be sent directly to the Public Works Department, 433 N. Virginia Street, Prescott, AZ 86301. The City project/contract number and project description shall be noted on the certificate of insurance. The City reserves the right to require complete, certified copies of all insurance policies required by this Contract at any time.

MAG Specifications, Sections 103.1 through 103.8, including: Unless otherwise specifically required by the Special Conditions, the minimum limits of public liability and property damage liability shall be as follows.

Design-Builder shall provide coverage with limits of liability not less than those stated below. An excess liability policy or umbrella liability policy may be used to meet the minimum liability requirements provided that the coverage is written on a following form basis.

Commercial General Liability – Occurrence Form –

Policy shall include bodily injury, property damage, broad form contractual liability and XCU coverage.

- General Aggregate \$ 3,000,000
- Products – Completed Operations Aggregate \$ 3,000,000
- Personal and Advertising Injury \$ 1,000,000
- Each Occurrence \$ 1,000,000
- Fire Legal Liability (Damage to Rented Premises) (if applicable) \$100,000

The policy shall be endorsed to include the following additional insured language:

"The Design-Builder agrees to endorse the City of Prescott as an Additional Insured on the Commercial General Liability with the following Additional Insured endorsement, or similar endorsement providing equal or broader Additional Insured coverage, the CG 2010 10 01 Additional Insured - Owners, Lessees, or Contractors, or CG2010 07 04 Additional Insured – Owners, Lessees, or Contractors – Scheduled Person or Organization endorsement in combination with the additional endorsement of GC2037 10 01 Additional Insured – Owners, Lessees, or Contractors – Completed Operations shall be required to provide back coverage for the Design-Builder's "your work" as defined in the policy and liability arising out of the products-completed operations hazard."

Business Automobile Liability: Bodily Injury and Property Damage for any owned, hired, and/or non-owned vehicles used in the performance of this Contract.

Combined Single Limit (CSL) \$1,000,000

The policy shall be endorsed to include the following additional insured language:

“The City of Prescott shall be named as additional insured with respect to liability arising out of the activities performed by or on behalf of the Design-Builder, involving automobiles, owned, leased, hired, or borrowed by the Design-Builder.”

Worker’s Compensation and Employer’s Liability

Workers’ Compensation	Statutory
Employer’s Liability	
Each Accident -	\$1,000,000
Disease – each employee -	\$1,000,000
Disease – policy limit -	\$1,000,000

Policy shall contain a waiver of subrogation against the City of Prescott for losses arising from work performed by or on behalf of the Design-Builder.

Professional Liability (Errors and Omissions Liability) – *if applicable*

Each Claim	\$ 1,000,000
Annual Aggregate	\$ 2,000,000

1. In the event that the professional liability insurance required by this Contract is written on a claims-made basis, Design-Builder warrants that any retroactive date under the policy shall precede the effective date of this Contract and that either continuous coverage will be maintained or an extended discovery period will be exercised for a period of two (2) years at the time work under this contract is completed.
2. The policy shall cover professional misconduct or lack of ordinary skill for those positions defined in the Scope of Work of this contract.

Notice of Cancellation: With the exception of a ten (10) day notice of cancellation for non-payment of premium, any changes material to compliance with this contract in the insurance policies above shall require a thirty (30) day written notice.

Such policy shall not exclude coverage for the following:

1. Injury to or destruction of any property arising out of the collapse of/ or structural injury to any building or structure due to grading of land, excavation, borrowing, filling, backfilling, tunneling, pile driving, cofferdam work or caisson work.
2. Injury to or destruction of wires, conduits, pipes, mains, sewers, or other similar property or any apparatus in connection therewith, below the surface of the ground, if such injury or destruction is caused by and occurs during the use of mechanical equipment for the purpose of grading of land, paving, excavating, drilling; or injury to or destruction of any property at any time resulting there from.

3. Injury to or destruction of any property arising out of blasting or explosion.
4. Motor vehicle public liability and property damage insurance to cover each automobile, truck, and other vehicle used in the performance of the Contract in an amount of not less than \$1,000,000.00 for one person, and \$1,000,000.00 for more than one person, and property damage in the sum of \$1,000,000.00 resulting from any one accident which may arise from the operations of the Design-Builder in performing the work provided for herein.

The Design-Builder shall carry and maintain fire and extended coverage with an endorsement for vandalism and malicious mischief in Design-Builder's name and also in the name of the City in an amount of at least one hundred percent (100%) of the Contract amount (if applicable).

The Design-Builder shall secure "all risk"-type builder's risk insurance for work to be performed. Unless specifically authorized by the City, the amount of such insurance shall not be less than one hundred percent (100%) of the contract price. Such policy shall include coverage for earthquake, landslide, flood, collapse, or loss due to the results of faulty workmanship, during the contract time and until final acceptance of work by the City (if applicable).

The Design-Builder's insurance shall be primary insurance, and any insurance or self-insurance maintained by the City shall not contribute to it.

Any failure to comply with the claim reporting provisions of the policies or any breach of an insurance policy warranty shall not affect coverage afforded under the policy to protect the City

The City reserves the right to request and to receive, within ten (10) working days, certified copies of any or all of the herein required insurance policies and/or endorsements. The City shall not be obligated, however, to review same or to advise Design-Builder of any deficiencies in such policies and endorsements, and such receipt shall not relieve Design-Builder from, or be deemed a waiver of, the City's right to insist on strict fulfillment of Design-Builder's obligations under this Contract.

All Certificates of Insurance required by this Contract shall be identified with a Contract number and Project Title.

ARTICLE XII- BONDS

On or before the execution of the contract, the Design-Builder shall obtain in an amount equal to the full contract price a performance bond pursuant to A.R.S. § 34-222, conditioned upon the faithful performance of this contract in accordance with the plans, specifications and conditions herein. Such bond shall be solely for the protection of the City of Prescott. A copy of this bond shall be filed with the Prescott City Clerk.

Design-Builder shall also obtain a payment bond, pursuant to the provisions of A.R.S. § 34-222, in an amount equal to this full contract price herein, said bond to be solely for the protection of claimants supplying labor or materials to the Design-Builder or his Subcontractors in the prosecution of the work provided for in this contract. A copy of this bond shall be filed with the Prescott City Clerk.

All bonds must be written by an insurance company authorized to do business in the State of Arizona, to be evidenced by a Certificate of Authority as defined in ARS § 20-217, a copy of which certificate is to be attached to the applicable bid bond, payment bond and performance bond. In addition, depending upon the nature of the contract and amount thereof, the City Manager may also require insurance companies and/or bonding companies to have an "A" rating or better with Moody's or A.M. Best

Company, and/or to be included on the current list of “Companies Holding Certificates of Authority as Acceptable Sureties on Federal Bonds and as Acceptable Reinsuring Companies” as published in Circular 570 (as amended) by the audit staff, Bureau of Accounts, US Treasury Department.

ARTICLE XIII– OTHER WORK IN PROJECT AREA

The City, any other contractors, whether under contract with the City, a third party, and/or utilities, may be working within the project area while this Contract is in progress. The Design-Builder herein acknowledges that delays and disruptions may, and in all likelihood, will occur due to other work. The Design-Builder’s bid shall be deemed to have recognized and included costs arising from and associated with other work in the project area disclosed by the Contract Documents or which would be apparent to an experienced contractor exercising due diligence during inspection of the project documents, the question and answer session in the pre-proposal process or during site inspection. No payment will be made for any delays or disruptions in the work schedule that are wholly the fault of the Design-Builder, its agents, employees or any of the Design-Builder’s Subcontractors. In the event that the Design-Builder encounters delay or disruption in the project schedule due to factors not wholly the fault of the Design-Builder or within the Design-Builder’s control then the Contract may be adjusted pursuant to the Delay’s and Extension of Time provisions of the General Conditions and Contract Documents and a timely request submitted for Contract Amendment. Failure to submit a timely request for Contract Amendment shall be deemed a waiver of any entitlement to additional compensation.

ARTICLE XIV– NONDISCLOSURE

Except as otherwise required by law or this Contract, the Design-Builder, its officers, employees, Subcontractors, agents, and assigns shall not divulge to third parties (without the prior consent of the City) any information obtained by it in connection with its performance under this Contract.

ARTICLE XV- LAWS AND REGULATIONS

The Design-Builder shall at all times comply with all applicable laws, statutes, rules, regulations, and ordinances in its performance under this Contract, including without limitation those governing wages, hours, employment discrimination, and safety as provided in the General Conditions. The Design-Builder shall also comply with equal opportunity laws and regulations to the extent they are applicable.

ARTICLE XVI- PATENT AND COPYRIGHT

The Design-Builder shall indemnify, defend, and hold harmless the City, its officers, employees, agents and successors, against and from all claims, demands, losses, costs, expenses, suits, settlements, judgments, and damages (including attorneys’ fees), of any kind or nature whatsoever on account of infringement of any patent, copyrighted work, secret process, trade secret, un-patented invention, article, or otherwise, including claims thereof pertaining to, or arising from the Design-Builder’s performance under this Contract.

Should the Design-Builder’s officers, employees, agents, or assigns (or anyone of a like nature), in the performance of the work or as a result of performing the work, develop any trade secret, prepare any copyrighted material, make any improvement, originate any invention, develop any process, or otherwise, such trade secret, copyright, improvement, invention, or process shall be the property of the Design-Builder. However, the Design-Builder shall grant or cause to be granted to the City the right and/or license to permanently use, or cause to be used for the benefit of the City any such trade secret, copyright, improvement, design, invention, or process in any manner for so long as the City desires to use the same for the City’s own internal use.

ARTICLE XVII – WORK PRODUCTS

All work products of the Design-Builder for this Project are instruments of service for this Project only and shall remain the property of the City whether the Work is completed or not. All plans, drawings, specifications, data maps, studies and other information, including all copies thereof, furnished by the City shall remain the property of the City. These work products are not to be used on other work, and, with the exception of this Agreement, are to be returned/provided to the City upon request or at the completion of the Project.

ARTICLE XVIII - INDEPENDENT CONTRACTOR

The Design-Builder shall perform the work hereunder as an Independent Contractor, and all persons or entities employed by or under contract with the Design-Builder in connection herewith shall be employees of the Design-Builder and are not employees of the City in any respect.

ARTICLE XIX – ASSIGNMENT

The Design-Builder shall not assign this Contract, or any part hereof, without the prior written consent of the City. Any attempted assignment in violation hereof shall be void.

ARTICLE XX – NONWAIVER

The failure of the City to insist upon or enforce strict performance by the Design-Builder of any of the provisions of this Contract, or to exercise any of its rights hereunder, shall not be construed as a waiver or relinquishment to any extent of the City's right to assert or rely upon such terms or rights on any future occasion.

ARTICLE XXI – SEVERABILITY

Any provisions of this Contract prohibited or rendered unenforceable by local, state, or federal law, or by the ruling of any court of competent jurisdiction, shall be ineffective only to the extent of such prohibition or unenforceability without invalidating the remaining provisions of this Contract.

ARTICLE XXII - SAVINGS CLAUSE

In the event any phrase, clause, sentence, paragraph, section, article or other portion of this Contract shall become illegal, null or void or against public policy, for any reason, or shall be held by any court of competent jurisdiction to be illegal, null or void or against public policy, the remaining portions of this Contract shall not be affected thereby and shall remain in force and effect to the fullest extent permissible by law.

ARTICLE XXIII - CONFLICT-OF-INTEREST

This Contract may be canceled without penalty pursuant to ARS §38-511 in the event of a conflict of interest as described therein by any person significantly involved in negotiating this Contract on behalf of the City. In the event of the foregoing, the City further elects to recoup any fee or commission paid or due to any person significantly involved in negotiating this Contract on behalf of the City from any other party to the Contract, arising as a result of this Contract.

ARTICLE XXIV - MISCELLANEOUS

This Agreement may be terminated by either party upon ten (10) days written notice, with or without cause or upon completion of services. If this Agreement is terminated, the Design-Builder shall be paid for authorized services satisfactorily performed to the date of the Design-Builder's receipt of such termination notice.

This Agreement shall be construed under the laws of the State of Arizona.

This Contract constitutes the entire Contract between the parties hereto pertaining to the subject matter hereof and all prior and contemporaneous Agreements, representations, negotiations and understandings of the parties hereto, oral or written, are hereby superseded and merged herein.

This Contract is the result of negotiations by and between the parties. Although it has been drafted by the City Attorney, it is the result of the negotiations between the parties. Therefore, any ambiguity in this Agreement is not to be construed against either party.

This Agreement represents the entire and integrated Agreement between the City and the Design-Builder and supersedes all prior negotiations, representations or agreements, either written or oral. This Agreement may be amended only by written instrument signed by both the City and the Design-Builder. Written and signed Amendments shall automatically become part of the Contract, and shall supersede any inconsistent provision therein; provided, however, that any apparent inconsistency shall be resolved, if possible, by construing the provisions as mutually complementary and supplementary.

No oral order, objection, claim or notice by any party to the other shall affect or modify any of the terms or obligations contained in this Agreement, and none of the provisions of this Agreement shall be held to be waived or modified by reason of any act whatsoever, other than by a definitely agreed waiver or modification thereof in writing. No evidence of modification or waiver other than evidence of any such written notice, waiver or modification shall be introduced in any proceeding.

The parties hereto expressly covenant and agree that in the event of a dispute arising from this Agreement, each of the parties hereto waives any right to a trial by jury. In the event of litigation, the parties hereby agree to submit to a trial before the Court. Design-Builder further agrees that this provision shall be contained in all subcontracts related to the project, which is the subject of this Agreement.

The parties hereto expressly covenant and agree that in the event of litigation arising from this Agreement, neither party shall be entitled to an award of attorney fees, either pursuant to the Contract, pursuant to A.R.S. § 12-341.01 (A) and (B), or pursuant to any other state or federal statute, court rule, case law or common law. The Design-Builder further agrees that this provision shall be contained in all subcontracts related to the project that is the subject of this Agreement.

Any notices to be given by either party to the other must be in writing, and personally delivered or mailed by prepaid postage, at the following addresses:

Public Works Director	**
City of Prescott	**
433 N. Virginia Street	**
Prescott, AZ 86301	

In the event any provision of this Agreement shall be held to be invalid and unenforceable, the remaining provisions shall be valid and binding upon the parties. One or more waivers by either party of any provision, term, condition or covenant shall not be construed by the other party as a waiver of a subsequent breach of the same by the other party.

The Design-Builder Agrees that this Contract, as awarded, is for the stated work, and understands that payment for the total work will be on the basis of the indicated amount(s), as stated in the Design-Build bid.

IN WITNESS WHEREOF, three (3) identical counterparts of this Contract, each of which shall for all purposes be deemed an original thereof, have been duly executed by the parties herein above named, on the date and year first above written.

CITY:

DESIGN-BUILDER:

Harry B. Oberg, Mayor

Design-Builder

By: _____

Title: _____

ATTEST:

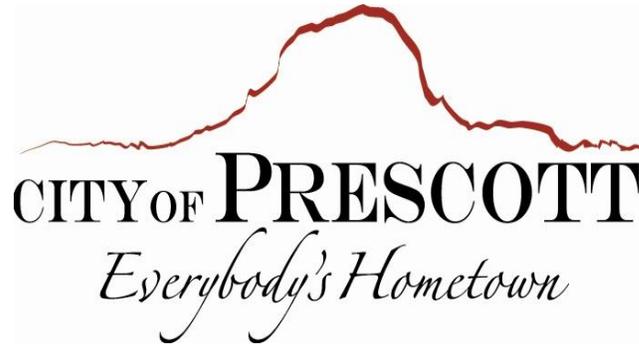
Dana R. DeLong, City Clerk

APPROVED AS TO FORM:

Jon M. Paladini, City Attorney

E. DESIGN-BUILD GENERAL CONDITIONS

SCADA INSTALLATION AND INTEGRATION PROJECT



SCADA Installation and Integration Project

Design-Build General Conditions

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COMMENCEMENT, PROSECUTION AND PROGRESS

PRECONSTRUCTION CONFERENCE

The Design-Builder is required to attend a Pre-construction Conference. The City will contact the Design-Builder to schedule a specific date, time and location for the Pre-construction Conference. The purpose of the meeting is to outline specific construction items and procedures and to address items, which require special attention on the part of the Design-Builder. The Design-Builder may also present proposed variations in procedures, which the Design-Builder believes may be of benefit to the project, reduce cost, or will reduce inconvenience to the public. Communication and coordination issues will be also addressed during the Pre-construction Conference. The Design-Builder will be required to provide five sets of the following information at the Pre-construction Conference:

- A. Names and emergency telephone number of key personnel involved in the project.
- B. A copy of each subcontractor's contract or purchase order agreement for each and every item of work under subcontract on the project.
- C. The Construction Schedule as defined elsewhere in the General Conditions.
- D. A payment schedule showing the estimated dollar volume of work for each calendar month during the life of the project.
- E. The Traffic Control and access management plan providing for continuous access to residents and businesses affected by the project.
- F. The Design-Builder's Company Safety Plan.
- G. The Design-Builder's Quality Control Plan.
- H. An itemized list of shop drawings, materials, mix designs, equipment submittals and a schedule indicating the dates each of these items will be transmitted to the Public Works Director for review.

Each of the above items is subject to review and approval by the Public Works Director.

COMMENCEMENT

The Design-Builder shall commence work on or before the tenth (10th) calendar day after receiving the Notice to Proceed, and shall complete all work under the Contract within the period of time specified in the Special Conditions. The City reserves the right to issue Notice to Proceed at any time between zero (0) and sixty (60) days after contract award. Notice to Proceed will be issued not later than sixty (60) calendar days after the Contract has been awarded unless otherwise agreed upon in writing, or as may be specified in the Special Conditions. In addition, Design-Builder shall not commence work until all required documents, bonds, plans and schedules have been received and approved by the City. These submittals will not affect the issuance of Notice to Proceed by the City.

PUBLIC NOTICE

- A. Design-Builder shall issue written notification to those residents affected by the SCADA Installation and Integration Project. This notification shall contain at a minimum: (1) Type of Work; (2) Design-Builder; (3) Design-Builder's Phone Number and Point of Contact; (4) Duration of Project; (5) Date Project Commences; (6) Description of Project Site; (7) Design-Builder's After-hours Point of Contact and Phone Number.

- B. The Design-Builder is required to post public notification signs at all entrances to the project specifying the following information: (1) Project Name/Description (2) Construction Calendar (3) Design-Builder Name/Phone Number Day and Night (4) City Public Works (928) 777-1130.
- C. The sign size and legend shall be appropriate for the intended purpose and be easily read. Sign background shall be blue with white letters. The sign size and legend content shall be approved by the Public Works Department prior to sign manufacture. All signs shall be posted prior to commencement of any work on the project. Signs will be removed by the Design-Builder upon final acceptance of the project. No direct payment shall be made for said signs, cost of such shall be considered incidental to the contract.

SUBCONTRACTORS

MAG Specifications, Section 108.2, including the following:

- A. All subcontractors and purchase orders for equipment shall state and establish guaranteed delivery dates, at such times as determined by the Design-Builder, which will allow the Design-Builder to complete the project within the Contract time.
- B. For purposes of this requirement, materials purchased directly from suppliers and installed by the Design-Builder's own forces shall be included in the Design-Builder's total and materials installed by subcontractors, regardless of who originally purchased them, will be included in the subcontractors' totals.
- C. The Design-Builder shall furnish the form list of subcontractors with his bid including the estimated amount of each subcontract. Additionally, a duplicate copy of each subcontract, including lower tier subcontracts, shall be delivered to the Public Works Director upon award of the project and prior to the issuance of the Notice to Proceed.

DESIGN-BUILDER AND SUBCONTRACTOR RECORDS

- A. The Design-Builder shall keep at the work site a copy of the Contract Documents and shall at all times give the Public Works Director access thereto.
- B. The Request for Statements of Qualifications, Scoping Report, General Conditions, Specifications, Plans, and all supplementary documents are intended to be complete and complementary and to prescribe a complete work. If any omissions are made of information necessary to carry out the full intent and meaning of the Contract Documents, the Design-Builder shall immediately call the matter to the attention of the Public Works Director for furnishing of detailed instructions. In case of discrepancies, the Specifications shall govern over the plans. Figured dimensions shall govern over scaled dimensions.
- C. Any drawings or plans listed anywhere in the Specifications or Addenda thereto shall be regarded as a part thereof and of the Contract. Anything mentioned in these Specifications and not indicated on the plans, or anything indicated on the plans and not mentioned in these Specifications, shall be in the same force and effect as if indicated or mentioned in both.
- D. The Design-Builder, subcontractors and all suppliers shall keep and maintain all books, papers, records, files, accounts, reports, bid documents with back-up data, including electronic data, and all other material relating to the contract and project for three years following completion and acceptance of the work. All records shall be accurately maintained in accordance with generally accepted accounting principles and practices uniformly and consistently applied in a format that will permit audit. The Public Works Director or his authorized representative(s) shall have

access at all reasonable times to all applicable records of the Design-Builder and the records of the Design-Builder's subcontractors.

The Design-Builder and subcontractors shall preserve all such materials for a period of three years after all payments to the Design-Builder or subcontractors, or until the final resolution of all claims made by the Design-Builder or subcontractor on this contract, whichever is later. The Design-Builder and subcontractors shall make all of the above materials available to the Public Works Director for auditing, inspection and copying and shall produce such materials upon written request at the office of the Public Works Director located at 433 N. Virginia St., Prescott Arizona.

The Design-Builder shall insert the above requirement in each subcontract, purchase order, lease agreement, or other document under which goods or services are provided for the performance of this contract and shall also include in all subcontracts a clause requiring subcontractors to include the above requirement in any lower-tier subcontract, purchase order, lease agreement or document under which goods or services are provided for the performance of this contract.

CHARACTER OF WORKMEN

MAG Specifications, Section 108.6.

SUSPENSION OF WORK

- A. The Public Works Director shall have the authority to suspend the work wholly or in part, for such period as he may deem necessary, due to unsuitable weather, or to such other conditions as are considered unfavorable for the suitable prosecution of the work, or for such time as he may deem necessary due to the failure on the part of the Design-Builder to carry out orders given, or to perform any provisions of the Contract. The Design-Builder shall immediately comply with the written order of the Public Works Director to suspend work wholly or in part. The suspended work shall be resumed when conditions are favorable and methods are corrected, as reviewed and accepted in writing by the Public Works Director.
- B. In case of suspension of work for any cause whatsoever, the Design-Builder shall be responsible for all materials and shall properly store them if necessary and shall provide suitable drainage and erect temporary structures where necessary.
- C. If the performance of all or any portion of the work is suspended or delayed by the Public Works Director in writing for an unreasonable period of time (not originally anticipated, customary, or inherent to the construction industry) and the Design-Builder believes that additional compensation and/or contract time is due as a result of such suspension or delay, the Design-Builder shall submit to the Public Works Director, in writing, a request for an adjustment within seven (7) calendar days of receipt of the notice to resume work. The request shall set forth the reasons and support for such adjustment.
- D. Upon receipt, the Public Works Director will evaluate the Design-Builder's request. If the Public Works Director agrees that the cost and/or time required for the performance of the contract has increased as a result of such suspension and the suspension was caused by conditions beyond the control of and not the fault of the Design-Builder, its suppliers, or subcontractors at any approved tier, and not caused by weather, the Public Works Director will make an adjustment (excluding profit) and modify the contract in writing accordingly. The Design-Builder will be notified of the Public Works Director's determination whether or not an adjustment of the contract is warranted. In the event an adjustment of the contract is warranted a contract amendment shall be executed by both parties evidencing mutual agreement to same.

- E. No contract adjustment will be allowed unless the Design-Builder has submitted the request for adjustment within the time limits prescribed.
- F. No contract adjustment will be allowed under this clause to the extent that performance would have been suspended or delayed by any other cause, or for which an adjustment is provided or excluded under any other term or condition of this contract.

DELAYS AND EXTENSION OF TIME

MAG Specifications, Section 108.7, including:

- A. It is the Design-Builder's responsibility to establish construction methods and a construction schedule, which will facilitate the completion of work required by this Contract within the contract period and with full consideration for the season during which the work is scheduled. Judgment as to hazardous conditions shall be made by the Public Works Director.
- B. To receive consideration for an extension of time, a request must be made in writing to the Public Works Director stating the reason for said request, and such request must be received by the Public Works Director as soon as reasonably practicable when the Design-Builder has knowledge or should have known of the delay causing event, condition or circumstances, but in no event later than immediately following the end of the delay-causing condition. The extension of time allowed shall be as determined by the Public Works Director and approved by the City. In setting the Contract time, it has been assumed that up to five (5) working days may be lost as a result of weather conditions which will slow down the normal progress of work; therefore no extensions in contract time will be allowed for the first five (5) working days lost due to bad weather conditions. An extension of time may be granted by the City after the expiration of the time originally fixed in the Contract or as previously extended, and the extension so granted shall be deemed to commence and be effective from the date of such expiration.
- C. Any extension of time shall not release the sureties upon any bond required under the Contract. Extensions of time in and of themselves will not be a basis for a request of additional compensation by the Design-Builder.
- D. Any delays in this project, or extensions of time which may be granted, shall not entitle the Design-Builder to any additional compensation or monies whatsoever, including but not limited to compensation for loss of anticipated profits, extended overhead, unabsorbed home office overhead, or any other payments, unless expressly agreed to by the City in a duly executed and approved contract amendment.

PAYMENT FOR DELAY

MAG 109.8 except as modified hereafter:

109.8.2, (B) Any compensation paid to the Design-Builder shall be in accordance with the General Conditions, Payment to Contractors, section of this Contract.

109.8.3 Extension of Contract Time: For any such delays, the Contract Time will be adjusted in accordance with the General Conditions, Delays and Extension of Time, section of this Contract.

TERMINATION FOR BREACH OF CONTRACT

MAG Specifications, Sections 108.10 and 108.11, including: The foregoing provisions are in addition to and not in limitation of any other rights or remedies available to the City.

METHODS AND EQUIPMENT

MAG Specifications, Section 108.6, including: The methods and equipment adopted by the Design-Builder shall be such as will secure a satisfactory quality of work and will enable the Design-Builder to complete the work in the time agreed upon. The selection and use of these methods and equipment is the responsibility of the Design-Builder.

DATE OF ACTUAL COMPLETION

The date upon which the project will be considered as complete shall be that date upon which the Work is accepted by the City.

FINAL ACCEPTANCE

MAG Specifications, Section 105.15 (B), including:

- A. After all work under the Contract has been completed, as determined by the Public Works Director, the Public Works Director will recommend in writing to the City that Final Acceptance of the entire work under this Contract be made as of the date of the Public Works Director final inspection. The City will make Final Acceptance promptly after receiving the Public Works Director's recommendation.
- B. Partial Acceptance may be given upon Substantial Completion of the work at the sole discretion of the Public Works Director in accordance MAG 105.15 and the paragraph entitled PARTIAL ACCEPTANCE OF WORK in these General Conditions.
- C. For the purpose of this section, Substantial Completion shall mean that stage in the progress of the Work where the Work or designated portion is sufficiently complete in accordance with the Contract Documents so that the City can occupy or utilize the Work for its intended use with only minor work items or cleanup items remaining to be accomplished. Partial Acceptance shall not be given for incomplete major work items nor minor work items affecting public health and safety.
- D. Contract Time accounting and/or Assessment of Liquidated Damages shall be suspended on the date of Partial Acceptance and the Design-Builder shall complete all remaining work items necessary for Final Acceptance within thirty (30) calendar days of the date of Partial Acceptance. The City shall withhold release of retention until all items under the Contract have been completed and Final Acceptance has been issued.

SAFETY, HEALTH AND SANITATION PROVISIONS

MAG Specifications, Section 107.5, including:

- A. The Design-Builder shall provide suitable and adequate sanitary conveniences for the use of all persons employed on the project. All sanitary conveniences shall conform to the regulations of the public authority having jurisdiction over such matters. At the completion of the project, all such sanitary conveniences shall be removed and the premises left in a sanitary condition.
- B. On all projects, with respect to sanitation facilities, for which Federal funds are allocated, the Design-Builder shall cooperate with and follow directions of representatives of the Public Health Service and the State. State and County public health service representatives shall have access to the work wherever it is in preparation or progress, and the Design-Builder shall provide proper facilities for such access and inspection.

TRAFFIC CONTROL

Traffic control is the responsibility of the Design-Builder and shall be in accordance with MAG Specifications, Section 401. The Design-Builder shall submit to the City, for approval, a traffic control plan for all activities connected with the proposed work.

WATER

- A. The Design-Builder shall supply adequate, pure cool drinking water with individual drinking cups for the use of employees on this construction. The quality of drinking water shall meet the “Standards for Public Water Supplies” specified in the State Health Department Code.
- B. It shall be the responsibility of the Design-Builder to provide and maintain, at his own expense, an adequate supply of water for his use for construction and to install and maintain necessary supply connections and piping for same. Before final acceptance of the completed project, all temporary connections and piping installed by the Design-Builder shall be removed.
- C. The Design-Builder shall apply for a fire hydrant meter for all construction water used if the Design-Builder desires to obtain water from the City distribution system at any point. All Design-Builders requesting construction water from the City must submit a Construction Water Meter Application to the Water Distribution Department. A \$1,000 deposit will be required for hydrant meters. If construction water use occurs during the months of May through September the Design-Builder shall also include a dust abatement program. Potable water may not be allowed for dust abatement during these months. Potable water can be used to process embankment fill and base materials year round. However, Design-Builders are encouraged to use treated effluent for construction activities. The City has two outlets for effluent, the Sundog Wastewater Treatment Plant and the Airport Wastewater Treatment Plant. The City will provide metered standpipes for effluent at both plants. The Design-Builder will be required to estimate daily and total potable/effluent water usage for the project as identified on the Construction Water Meter application. The Design-Builder will be responsible for all costs associated with obtaining and delivering construction water.

PROTECTION OF WORK

MAG Specifications, Section 107.10.

CLEANUP AND DUST CONTROL

MAG Specifications, Sections 104.1.3 and 104.1.4, including: Salvage material shall be stored at areas designated by the Public Works Director.

GUARANTEE OF WORK

MAG Specifications, Section 108.8, shall apply, but modify: Guarantee period is two (2) years. During the two year guarantee period, should the Design-Builder fail to remedy defective material and/or workmanship, or to make replacements within five (5) calendar days after written notice by the City, it is agreed that the City may make such repairs and replacements and the actual cost of the required labor and materials shall be chargeable to and payable by the Design-Builder.

CONTINGENCIES

All loss or damage arising from obstruction or difficulties which may be encountered in the prosecution of the work, from the action of the elements, or from any act or omission on the part of the Design-Builder or any person or agent employed by him shall be borne by the Design-Builder.

NOTICE AND SERVICE THEREOF

Any notice to the Design-Builder from the City relative to any part of this Contract shall be in writing and considered delivered and the service thereof completed when said Notice is posted, by first class mail, to the said Design-Builder at his last given address, or delivered in person to said Design-Builder or his authorized representative on the work.

PROJECT MEETINGS

- A. It shall be the responsibility of the Design-Builder to conduct weekly meetings to be attended by representatives of subcontractors, utilities, the Public Works Director and other interested parties for the purpose of keeping the project on schedule and to provide for necessary coordination of the work of the various parties. The Design-Builder shall take minutes at each meeting for distribution to all attendees the following week. The minutes shall be of sufficient detail to accurately recount the meeting discussion, including but not limited to progress, work schedule, submittals and certifications, utilities, construction issues, contract changes, safety and traffic control, action items, resolved and unresolved issues.
- B. Additionally the Design-Builder shall furnish the Public Works Director with written weekly project status reports at the beginning of each weekly project meeting. The report shall cover the work of the preceding work week and shall include the following for each week.
1. A comprehensive daily list of the Design-Builder's men and equipment performing the work on the jobsite.
 2. A comprehensive daily list of Design-Builder's subcontractors' men and equipment, if any, performing the work on the jobsite.
 3. A brief description of the work performed by the Design-Builder and Design-Builder's subcontractors, if any.
 4. The estimated percentage of each portion of the work performed for the period together with the total percentage of each portion of the work performed to the date of the report.
 5. A detailed summary of each work stoppage, if any, occasioned by the City, other contractors, or other designated reasons, which were beyond the Design-Builder's control.
 6. Comments or exceptions to prior weekly meeting minutes shall be addressed at each subsequent construction meeting.

CONSTRUCTION SCHEDULE

Per MAG Specifications, Section 108.4 and Section 108.5, including:

- A. The Construction schedule shall indicate the time of starting and completing each major phase of the project and such intermediate phases as will serve for well-defined control points. The schedule shall be of sufficient detail to define the Critical Path for project completion. It shall also indicate the scheduled receipt of major items of equipment and the items of equipment installation dates of which is critical to the scheduled progress of the project. Two (2) week look-ahead schedules will be provided by the Design-Builder at each weekly construction meeting. The comprehensive Project Schedule shall be updated and submitted monthly. Such updates shall include and accurately reflect additional work, changes in the work, delays to individual items of work and reasons therefore along with the extent of delay and any other items affecting the progress of the project.

- B. Failure by the Design-Builder to provide the weekly/monthly updates will result in the City withholding an amount equal to five percent (5%) of the monthly pay estimate relative to the billing period in which the schedule updates are to be provided. Said five percent (5%) withholding will be retained by the City until the required schedule updates are submitted by the Design-Builder, reviewed by the City and found to be current. When the schedule updates are determined to be in conformance with the provisions herein the five percent (5%) retainer will be released with the next monthly payment.
- C. The construction schedule shall serve as an index of progress prosecution as contemplated by the Design-Builder. In the event the actual construction progress varies substantially from the scheduled progress, the Public Works Director will require and the Design-Builder shall be required, within ten (10) calendar days written notice, to provide a revised construction schedule, giving in detail the particular changes in production as estimated by the Design-Builder to complete the work within the specified Contract Time. Time is of the essence in this regard.

ACCIDENT PREVENTION

MAG Specifications, Section 107.5 and 107.6 including:

- A. Machinery, equipment and other hazards shall be guarded or eliminated in accordance with the safety provisions of the Manual of Accident Prevention in Construction published by the Associated General Contractors of America, and the requirements of the Occupational Safety and Health Administration.
- B. First aid facilities and information posters conforming at least to the minimum requirements of the Occupational Safety and Health Administration shall be provided in a readily accessible location or locations.
- C. The Design-Builder shall make all reports as are, or may be, required by the Engineer or any authority having jurisdiction, and permit all safety inspections of the work being performed under this Contract. Before proceeding with any construction work, the Design-Builder shall take all the necessary action to comply with all provisions for safety and accident prevention. In the event the Design-Builder fails to comply with said safety provisions or directions of the Public Works Director, the Public Works Director without prejudice to any other rights of the City, may issue an order stopping all or any part of the work.
- D. Thereafter, a start order for resumption of the work may be issued at the discretion of the Public Works Director when in his opinion the deflection from safety requirements has been corrected. The Design-Builder shall make no claim for an extension of time or for compensation or damages by reason of or in connection with such work stoppage.

CONSTRUCTION FACILITIES

All construction hoists, elevators, scaffolds, stages, shoring, and similar temporary facilities shall be of ample size and capacity to adequately support and/or move the loads to which they will be subjected. All railings, enclosures, safety devices, and controls required by law or for adequate protection of life and property shall be provided.

TEMPORARY FACILITIES

The Design-Builder shall provide all temporary facilities and utilities required for prosecution of the work; protection of employees and the public; protection of the work from damage by fire, weather or vandalism; and such other facilities as may be specified or required by any legally applicable law, ordinance, rule, or regulation.

WARNING DEVICES AND BARRICADES

Per MAG Specifications, Section 107.7.

HAZARDS IN PUBLIC RIGHT-OF-WAY

Per MAG Specifications, Section 107.7.

HAZARDS IN PROTECTED AREAS

Excavations on project sites from which the public is to be excluded shall be marked or guarded in a manner appropriate for the hazard.

PROTECTION OF EXISTING ITEMS

The Design-Builder shall protect all existing structures, trees, shrubs, and other items on the project site that are to be preserved, by substantial barricades or other devices commensurate with the hazard, from injury or destruction by vehicles, equipment, workmen, or other agents.

PROJECT SECURITY

The Design-Builder shall make adequate provision, subject to the approval of the Public Works Director, to protect the project and Design-Builder's facilities from fire, theft, and vandalism, and the public from unnecessary exposure to injury.

FIRE EXTINGUISHER

At least one (1) fire extinguisher, rated at least 2A, shall be provided on the job site.

OFF-SITE ROADS

Except as otherwise shown or specified, off-site access roads shall be adequately maintained, graded-earth roads. Such roads shall be built only in the public right-of-way or easements obtained by the City. If the Design-Builder elects to build along some other alignment, he shall obtain, without additional cost to the City, necessary rights-of-way or easements.

NOISE ABATEMENT

In inhabited areas, particularly residential, operations shall be performed in a manner to minimize unnecessary noise generation. Particular consideration shall be given to noise generated by repair and service activities during the night hours in residential areas. No repair or service activities shall be conducted between the hours of 6:00 p.m. and 7:00 a.m.

DRAINAGE CONTROL

In excavation, fill, and grading operations, care shall be taken to disturb the pre-existing drainage pattern as little as possible. Particular care shall be taken not to direct drainage water onto private property or into streets or drainage ways inadequate for the increased flow.

PROJECT CLOSE-OUT

It is the intent of these Specifications and Contract Documents that the Design-Builder shall deliver a complete and operable facility capable of performing its intended functions and ready for use. The City shall withhold Final Payment and release of retention until ALL of the following items have been completed:

- A. Completion of all work, including punch-list items and Final Acceptance of the work by the City.
- B. Submittal by Design-Builder of final pay estimate, which shall show the amount of work performed according to the Contract and approved by the City.

- C. Submittal by the Design-Builder of all Project Record Documents, including As-Built drawings, operation and maintenance manuals, and other records as referenced herein.
- D. Submittal by Design-Builder of CONTRACTOR'S AFFIDAVIT REGARDING SETTLEMENT OF CLAIMS AND CERTIFICATION OF COMPLETION AND WARRANTIES.
- E. Closeout of any and all permits issued to the Design-Builder by the City or any other agency for the work included in the project.
- F. Submittal by Design-Builder of EPA SWPPP Notice of Termination (if applicable).

WASTE DISPOSAL, GRADING AND MATERIAL STORAGE

- A. The Design-Builder shall provide for the disposal of all surplus materials, waste products, debris, etc., and shall make necessary arrangements for such disposal. The Design-Builder shall obtain written permission from property owners(s) prior to disposing of any surplus materials, waste products, debris, etc., on private property, and shall also obtain the approval of the Public Works Director prior to such disposal.
- B. The Public Works Director will not approve the filling of ditches, washes, drainage ways, etc., which may in his opinion create water control problems.
- C. The Public Works Director will not approve disposal operations, which will, in his opinion, create unsightly and/or unsanitary nuisances.
- D. The Design-Builder shall maintain the disposal site(s) in a reasonable condition of appearance and safety during the construction period as required by the Public Works Director. Prior to final acceptance of the project, the Design-Builder shall have completed the leveling and cleanup of the disposal site(s) to the satisfaction of the Public Works Director.
- E. The Design-Builder shall obtain a grading permit or any other permit required by the City, Yavapai County or any other county, or State or federal rules, regulations, laws, ordinances, or any other regulatory authority for all construction operations of the Project, including but not limited to the following:
 - 1. Areas disturbed by the Design-Builder, including staging areas, borrow areas, waste areas, or material storage areas, located within the City limits that are subject to any requirements of the City Code or City Land Development Code, including but not limited to Section 6.7 – Site Disturbance, Grading and Restoration Standards, of the City Land Development Code; Section 9.6 – Site Disturbance and Grading Permit, or Chapter 16-2: DRAINAGE REGULATIONS;
 - 2. Areas outside of the City limits that are subject to the requirements of Yavapai County for any activities described in this section, “WASTE DISPOSAL”;
 - 3. The disposal of waste material on private property dependent upon site specific conditions at the waste area(s) and characteristics of the fill in accordance with Paragraph 1. The fees for a permit for this activity shall not be waived; said fees are incidental to the appropriate bid item(s);
 - 4. The staging or material storage area(s) that:
 - a. Are not City owned property on the project, or
 - b. Require clearing or grubbing in excess of 10,000 sf.

Fees for a permit(s) for this activity shall not be waived; said costs are incidental to the appropriate bid item(s).

5. Site disturbances for infrastructure improvements on City owned property not within the right-of-way for which the disturbance is greater than 50 cubic yards of material or in excess of 10,000 square feet. The associated fees for grading permits for this activity on City owned property shall be waived.

PROJECT RECORD DOCUMENTS

- A. The Design-Builder shall maintain at the site, available to the City and Engineer, one (1) copy of all Drawings, Specifications, Addenda, approved Shop Drawings, Change of Orders, and other modifications in good order and marked to record all changes made during construction. These shall be delivered to the City upon completion of the Project or the earlier termination of the parties' contract.
- B. The Design-Builder shall maintain any and all documentation to substantiate all costs on the project, including but not limited to those items included in "Force Account" computations, computations reflecting the actual cost of work on the project and computations substantiating any claimed increases or additional costs incurred in the project by the Design-Builder, and shall make those records available to the City (or provide copies thereof to the City) within 24 hours of request by the City. The failure of the Design-Builder to maintain and produce the foregoing documentation will preclude the Design-Builder from being entitled to any additional payments for any additional work in question.

CONTROL OF WORK

ABBREVIATIONS

MAG Specifications, Section 101.1, including abbreviations as shown on the Plans.

AUTHORITY AND DUTIES OF INSPECTOR

Per MAG Specifications, Section 105.9, including:

- A. An inspector is to be assigned to the project by the City to monitor the project and to keep the Public Works Director informed as to the progress of the work and the manner in which it is being done. Additionally, the inspector will call the Design-Builder's attention to any non-conformance with the Plans and Specifications. He will not be authorized to approve or accept any portion of the work or to act as foreman for the Design-Builder. Inspection will be done on an as needed or on-call basis.
- B. The inspector will exercise such additional authority only as may from time to time be delegated to him by the Public Works Director.

INSPECTION

MAG Specifications, Section 105.10, including:

Inspection is to be done by the City Public Works Department. The Design-Builder shall furnish the Public Works Director with every reasonable facility for ascertaining whether or not the work as performed is in accordance with the requirements and intent of the Specifications and Contract. If the Public Works Director requests it, the Design-Builder at any time before acceptance of the work shall remove or uncover such portions of the finished work as may be directed. After examination, the Design-Builder shall restore said portions of the work to the standards required by the

Specifications. Should the work thus exposed or examined prove acceptable, the uncovering or removing and the replacing of the covering or making good of the part removed will be paid for as provided under CHANGES IN THE WORK, but should the work so exposed or examined prove unacceptable, the uncovering or removing and the replacing of the covering or making good of the parts removed shall be at the Design-Builder's expense. Inspection or supervision by the Public Works Director shall not be considered as direct control of the individual workman and his work. The direct control shall be solely the responsibility of the Design-Builder's foreman and superintendent.

AUTHORITY OF THE ENGINEER

MAG Specifications, Section 105.1 with the following exception: References to “the Engineer” shall mean Public Works Director.

PLANS

- A. The Contract Plans consist of general drawings. These indicate such details as are necessary to give a comprehensive idea of the construction contemplated. All authorized alterations affecting the requirements and information given on the Contract Plans shall be in writing. The Contract Plans shall be supplemented by such working or shop drawings prepared by the Design-Builder as are necessary to adequately control the work. No change shall be made by the Design-Builder in any working or shop drawing after it has been accepted by the Public Works Director.
- B. The Design-Builder shall keep a copy of the Plans and Specifications at the job site, and shall at all times give the Public Works Director access thereto. Any drawings or plans listed in the Detailed Specifications shall be regarded as a part thereof and the Public Works Director will furnish from time to time such additional drawings, plans, profiles, and information as he may consider necessary for the Design-Builder's guidance.
- C. All authorized alterations affecting the requirements and information given on the accepted plans shall be in writing. No changes shall be made of any plan or drawing after the same has been accepted by the Public Works Director except by consent of the Public Works Director in writing.

CONFORMITY WITH PLANS AND ALLOWABLE DEVIATIONS

MAG Specifications, Section 105.3.

COORDINATION AND INTERPRETATION OF PLANS AND SPECIFICATIONS

MAG Specifications, Section 105.4, including:

- A. In the event of any doubt or question arising regarding the true meaning of these Specifications, Special Provisions, or the Plans, reference shall be made to the Public Works Director, whose decision thereon shall be final. In the event of any discrepancy between any drawing and the figures written thereon, the figures shall be taken as correct.
- B. In the event of there being a conflict between one contract document and any of the other contract documents the document highest in precedence shall control and supersede the document which is contrary to it. The order of precedence of the Contract Documents is as follows:
 - 1. Supplemental Agreements, the last in time being the first in precedence.
 - 2. The formal Contract.
 - 3. Request for Statements of Qualifications.

4. Project Scoping Report.
5. Special Provisions.
6. Technical Specifications.
7. Plans.
8. General Conditions.
9. Design-Builder Proposal.

ORDER OF WORK

- A. When required by the Contract Documents, the Design-Builder shall follow the sequence of operations as set forth therein.
- B. Full compensation for conforming to such requirements will be considered as included in the prices paid for contract items of work and no additional compensation will be allowed therefore.

CONSTRUCTION STAKES, LINES AND GRADES

MAG Specifications, Section 105.8.

REMOVAL OF UNACCEPTABLE AND/OR UNAUTHORIZED WORK

MAG Specification, Section 105.11.

MAINTENANCE DURING CONSTRUCTION

MAG Specifications, Section 105.12.

COOPERATION BETWEEN CONTRACTORS

The City reserves the right at any time to contract for and perform other additional work on or near the work covered by the contract.

When separate contracts are let within the limits of any one project, each contractor shall conduct his work so as not to interfere with or hinder the progress or completion of the work being performed by other contractors. Contractors working on the same project shall cooperate with each other as directed.

The Design-Builder shall arrange his work and shall place and dispose of the materials being used so as not to interfere with the operations of the other contractors within the limits of the same project. He shall join his work with that of others in an acceptable manner and shall perform it in proper sequence to that of others.

The City will not honor any claim for extra compensation due to delays, extra work, or extension of time caused by any other contractors working within the limits of the same project.

COORDINATION OF WORK

- A. Prior to starting construction, the Design-Builder shall submit their construction schedule to the Public Works Director for approval.
- B. It shall be the responsibility of the Design-Builder to maintain overall coordination of the project. Based on the general contract construction schedule prepared in accordance with these Specifications, the Design-Builder shall obtain from each of his subcontractors a similar schedule and shall be responsible for all parties maintaining these schedules or for coordinating changes necessitated by unforeseen difficulties.

LINES AND GRADES

All work under this Contract shall be built in accordance with the detailed scope of work.

MATERIALS AND WORKMANSHIP

GENERAL

MAG Specifications, Section 106.1, including:

- A. Where equipment, materials, or articles are referred to in the Specifications as “or equal”, or “equal to” any particular standard, the Public Works Director shall decide the question of equality.
- B. Wherever any standard published specification is referred to, the latest edition or revision, including all contract amendments, shall be used unless otherwise specified. Materials of a general description shall be the best of their several kinds, free from defects, and adapted to the use for which provided. The physical characteristics of all materials not particularly specified shall conform to the latest standards published by the American Society for Testing and Materials, where applicable. All material shall be new and of the specified quality and equal to the accepted samples, if samples have been submitted.
- C. All work shall be done and completed in a thorough, workmanlike manner notwithstanding any omission from these Specifications or from the Plans; and it shall be the duty of the Design-Builder to call the Public Works Director's attention to apparent errors or omissions and request instructions before proceeding with the work. The Public Works Director may, by appropriate instructions, correct errors and supply omissions, which instructions shall be binding upon the Design-Builder as though contained in the original Specifications or Plans.

SUBSTITUTION OF MATERIAL OR EQUIPMENT

MAG Specifications, Section 106.4, including: Requests relative to substitutions for materials or equipment specifically designated on the Plans or in the Specifications shall be made in writing, and such requests shall be accompanied by complete data on which the Public Works Director can make determination on the merits of the proposed substitution. The written request shall state how the product proposed for a substitution compares with or differs from the designated product in composition, size, arrangement, performance, etc., and in addition, the request shall be accompanied by documentary evidence of equality in price and delivery or evidence of difference in price and delivery. Data on price shall be in the form of certified quotations from suppliers of both the designated and proposed items. All items accepted for substitution shall be subject to all applicable provisions of the Specifications. Should substitution be allowed under the foregoing provisions, and should the item subsequently prove to be defective or otherwise unsatisfactory for the service for which it was intended, the Design-Builder, shall without cost to the City, and without obligation on the part of the Public Works Director, replace the item with the material originally specified.

FABRICATED MATERIALS AND SHOP DRAWINGS

Fabricated materials and shop drawings shall be handled as set forth in the Special Conditions.

MATERIALS FURNISHED BY THE CITY

MAG Specifications, Section 106.8.

STORAGE AND HANDLING OF MATERIALS

MAG Specifications, Section 106.5 and 106.6, including: Protection of materials and equipment stored on the site shall be the responsibility of the Design-Builder. The City reserves the right to direct the Design-Builder to provide proper means of protection for materials if such is deemed advisable by the Public Works Director; however, the exercise of or failure to exercise this right shall not be deemed to relieve the Design-Builder of his primary responsibility for protecting the material and equipment. The Design-Builder shall provide suitable warehouses or other adequate means of protection for such if the materials and equipment require storage and protection. The Design-Builder shall store and care for the materials and equipment in the most suitable manner to protect them from distortion, rain, dust, or other damage. The cost of replacing any material or equipment damaged in storage shall be borne by the Design-Builder, and the fact that material or equipment has been damaged after partial payment has been made shall not relieve the Design-Builder of his primary responsibility. No motor shall be left uncovered or unprotected.

REJECTED MATERIALS

MAG Specifications, Section 106.7.

UTILITIES

MAG Specifications, Section 107.11.

DRIVEWAYS AND WALKS

Inconvenience caused by digging across driveways and sidewalks shall be kept to a minimum by restoring the serviceability of the drive or sidewalk as soon as possible. Before blocking driveways, the Design-Builder shall notify the property owner. The Design-Builder shall replace or repair any damage done to driveways and walks to not less than the condition existing prior to the Design-Builder's work. If it is necessary to leave an excavation open across driveways or sidewalks, the Design-Builder shall provide temporary relief in the form of steel plates over the excavation. Direct access shall be provided at all times to fire engine houses, fire hydrants, hospitals, police stations, and at all other agencies or services where emergencies may require immediate access to same.

ROADS AND FENCES

Streets and roads subjected to interference by the prosecution of this work shall be kept open and maintained by the Design-Builder until the work is completed.

TREES AND SHRUBBERY

- A. All trees and shrubbery within the right-of-way or easements shall be protected by the Design-Builder insofar as practicable.
- B. In the event shrubbery or trees must be trimmed, or removed, the Design-Builder shall notify the property owner to do so within a reasonable time prior to construction. All shrubbery or trees not removed by the property owner shall be trimmed or removed by the Design-Builder and hauled from the job at the Design-Builder's expense.
- C. All trees, shrubs, hedges, brush, etc. designated on the Plans, or by the Public Works Director for removal, shall be completely removed and disposed of as indicated on the Plans or as specified by the Public Works Director.

IRRIGATION DITCHES AND STRUCTURES

The Design-Builder shall contact the owners of any ditches, irrigation lines, and appurtenances, which interfere with the work and shall make arrangements for dry- up or scheduling of water deliveries. The Design-Builder shall be liable for any damage due to irrigation facilities damaged by his operations and shall repair such damaged facilities to an “equal or better than” original condition.

SUBMITTALS

Per MAG Specifications, Section 105.2, including:

- A. In ample time for each to serve its proper purpose and function, the Design-Builder shall submit to the Public Works Director such schedules, reports, drawings, lists, literature samples, instructions, directions, and guarantees as are specified or reasonably required for construction, operation, and maintenance of the facilities to be built and/or furnished under this Contract.
- B. Shop drawings and data shall be submitted to the Public Works Director in such number of copies as will allow him to retain four (4) copies of each submittal. The submittal shall clearly indicate the specific area of the Specifications or Plans for which the submittal is made. The additional copies received by him will be returned to the Design-Builder's representative at the job site. The Public Works Director's notations of the action, which he has taken, will be noted on one (1) of these returned copies.
- C. The above drawings, lists, prints, samples, and other data shall become a part of the Contract and a copy of the same shall be kept with the job site plans and the fabrications furnished shall be in conformance with the same.

MATERIALS AND EQUIPMENT SCHEDULES

Drawings of minor or incidental fabricated materials and/or equipment may not be required by the Public Works Director. The Design-Builder shall furnish the Public Works Director tabulated lists of such fabrications, showing the names of the manufacturers and catalog numbers, together with samples of general data as may be required to permit determination by the Public Works Director as to their acceptability for incorporation in the work.

QUALITY CONTROL

- A. All material shall be of the specified quality and equal to the approved samples, if samples have been submitted. All work shall be done and completed in a thorough, workmanlike manner, notwithstanding any omission from these Specifications or from the Plans; and it shall be the duty of the Design-Builder to call the Public Works Director's attention to apparent errors or omissions and request instructions before proceeding with the work. The Public Works Director may, by appropriate instructions, correct errors and supply omissions, which instructions shall be as binding upon the Design-Builder as though contained in the original Specifications or Plans.
- B. Materials which will require testing and inspection at the place of origin shall not be shipped prior to such testing and inspection.

SAMPLES AND TESTS

Per MAG Specifications, Sections 106.2 and 106.3, including:

- A. At the option of the Public Works Director, the source of supply of each of the materials shall be approved by him before the delivery is started and before such material is used in the work. Representative preliminary samples of the character and quality prescribed shall be submitted by

the Design-Builder or producer of all materials to be used in the work for testing or examination as desired by the Public Works Director.

- B. Sieves used in determining the grading of samples of aggregates, select material, and other graded materials, shall conform to ASTM Designation E 11-81.

LEGAL RELATIONS AND RESPONSIBILITY

LAWS TO BE OBSERVED

MAG Specifications, Section 107.1.

ALIEN LABOR

The Design-Builder shall comply with the Immigration Reform and Control Act of 1996.

COMPLIANCE WITH FEDERAL AND STATE LAWS

The Design-Builder understands and acknowledges the applicability to it of the Americans with Disabilities Act, the Immigration Reform and Control Act of 1986 and the Drug Free Workplace Act of 1989. The following is only applicable to construction contracts: The Design-Builder must also comply with A.R.S. §34-301, "Employment of Aliens on Public Works Prohibited", and A.R.S. §34-302, as amended, "Residence Requirements for Employees".

Under the provisions of A.R.S. §41-4401, Design-Builder hereby warrants to the City that the Design-Builder and each of its subcontractors will comply with, and are contractually obligated to comply with, all Federal Immigration Laws and regulations that relate to their employees and A.R.S. §23-214(A) (hereinafter "Contractor Immigration Warranty").

A breach of the Contractor Immigration Warranty Shall constitute a material breach of this Contract and shall subject the Design-Builder to penalties up to and including termination of this Contract at the sole discretion of the City.

The City retains the legal right to inspect the papers of any Design-Builder or subcontractors' employee who works on this Contract to ensure that the Design-Builder or subcontractor is complying with the Contractor Immigration Warranty. Design-Builder agrees to assist the City in regard to any such inspections.

The City may, at its sole discretion, conduct random verification of the employment records of the Design-Builder and any of the subcontractors to ensure compliance with Contractor Immigration Warranty. Design-Builder agrees to assist the City in regard to any random verification performed.

Neither the Design-Builder nor any of the subcontractors shall be deemed to have materially breached the Contractor Immigration Warranty if the Design-Builder or subcontractor establishes that it has complied with the employment verification provisions prescribed by Sections 274A and 274B of the Federal Immigration and Nationality Act and the E-Verify requirements prescribed by A.R.S. §23-214, Subsection A.

The provisions of this Article must be included in any contract the Design-Builder enters into with any and all of its subcontractors who provide services under this Contract or any subcontract. "Services" are defined as furnishing labor, time or effort in the State of Arizona by building or transportation facility or improvement to real property.

EMPLOYMENT PROVISIONS

Subject to existing law, and regulations, illegal or undocumented aliens will not be employed by the Design-Builder for any work or services to be performed pursuant to this contract. The Design-Builder will ensure that this provision is expressly incorporated into any and all Subcontracts or subordinate agreements issued in support of this contract. Design-Builder agrees to comply with the provisions of Section 274A(a)(1)(A) and 274A(a)(2) of the Immigration and Nationality Act (8 U.S.C. 1324a(a)(1)(A), 1324a(a)(2)) (the “INA employment provisions”), and any amendments thereto, prohibiting the unlawful employment of illegal or undocumented aliens. Under the terms of this agreement, the Design-Builder shall not knowingly hire or employ for any work performed pursuant to this contract any workers or employees not lawfully authorized to work under the provisions of the Immigration and Nationality Act or any other applicable federal or state laws. Violation of the provisions of this section shall be deemed a material breach of this contract.

INDEPENDENT CONTRACTOR STATUS

It is expressly agreed and understood by and between the parties that the Design-Builder is being retained by the City as an independent contractor, and as such the Design-Builder shall not become a City employee, and is not entitled to payment or compensation from the City or to any fringe benefits to which other City employees are entitled. As an independent contractor, the Design-Builder further acknowledges that he is solely responsible for payment of any and all income taxes, FICA, withholding, unemployment insurance, or other taxes due and owing any governmental entity whatsoever as a result of this Agreement. As an independent contractor, the Design-Builder further agrees that he will conduct himself in a manner consistent with such status, and that he will neither hold himself out nor claim to be an officer or employee of the City by reason thereof, and that he will not make any claim, demand or application to or for any right or privilege applicable to any officer or employee of the City, including but not limited to workmen's compensation coverage, unemployment insurance benefits, social security coverage, or retirement membership or credit.

NONDISCRIMINATION

The Design-Builder, with regard to the work performed by it after award and during its performance of this contract, will not discriminate on the grounds of race, color, national origin, religion, sex, disability or familial status in the selection and retention of subcontractors, including procurement of materials and leases of equipment. The Design-Builder will not participate either directly or indirectly in the discrimination prohibited by or pursuant to Title VI of the Civil Rights Act of 1964, Section 504 of the Rehabilitation Act of 1973, Section 109 of the Housing and Community Development Act of 1974, the Age Discrimination Act of 1975, the Americans with Disabilities Act (Public Law 101-336, 42 U.S.C. 12101-12213) and all applicable federal regulations under the Act, and Arizona Governor Executive Orders 99-4, 2000-4 and 2009-09 as amended.

AMERICANS WITH DISABILITIES ACT

Design-Builder shall comply with all federal, state and local nondiscrimination statutes in the operation, implementation and delivery of, including state and federal civil rights and disabilities laws. In particular the Design-Builder shall ensure that the City's obligations for program, facility and service accessibility in Title II of the Americans with Disabilities Act are complied with in all activities arising under this contract, and shall hold harmless the City for any and all loss, including but not limited to damages, costs or expenses, incurred or arising from any alleged violations of the Americans with Disabilities Act under the auspices of this contract unless resulting from an intentional or actual negligent act of the City and its employees. Failure to comply with the

nondiscrimination or accessibility requirements herein shall be construed as nonperformance and may result in termination of funding, civil action or both.

PERMITS, TAXES AND LICENSES

MAG Specifications, Section 107.2, including: Except as otherwise provided in the Specifications, it is the duty of the Design-Builder to procure all permits and licenses, pay all charges and fees, and give all notices necessary and incident to the due and lawful prosecution of the work. All applicable permits, licenses and taxes are the responsibility of the Design-Builder.

PATENTED DEVICES, MATERIALS AND PROCESSES

MAG Specifications, Section 107.3.

SURVEY LAND MONUMENTS

Survey land monuments and property marks shall not be moved or otherwise disturbed by the Design-Builder until an authorized agent of the agency having jurisdiction over the land monuments or property marks setting, has witnessed or otherwise referenced their location, and only then in accordance with the requirements of the agency having jurisdiction. Any monuments displaced by the Design-Builder shall be replaced at the Design-Builder's expense.

PROTECTION OF PERSON AND PROPERTY

MAG Specifications, Sections 107.5 through 107.10, including:

The Design-Builder shall confine all aspects of his operations within the construction limits as identified in the project plans. Should the Design-Builder contemplate the use of any private property adjacent to the project, beyond the project limits, for materials and equipment storage or to perform any work, he shall first obtain the written permission of the property owner. The Design-Builder shall provide a copy of the owner's permission to enter the property and for what purpose to the Public Works Director prior to entering the property. The Design-Builder will be fully and solely responsible for any and all adverse impacts and / or damages caused by his operations on private property and the settlement of all claims pertaining thereto. Upon completion of his operations the Design-Builder shall obtain a signed release from the property owner pertaining to his activities on the owner's property and provide a copy of that document to the Public Works Director. The failure of the Design-Builder to comply with these provisions will result in the retention of some portion of Design-Builder funds, payable under the contract, until such claims are resolved.

PROTECTION OF ANTIQUITIES

MAG Specifications, Section 107.4.

PERSONAL LIABILITY OF PUBLIC OFFICIALS

MAG Specifications, Section 107.13.

NON-RESPONSIBILITY OF THE CITY

Indebtedness incurred for any cause in connection with this work must be paid by the Design-Builder, and the City is hereby relieved at all times from any indebtedness or claim other than payments under terms of the Contract.

NO WAIVER OF LEGAL RIGHTS

MAG Specifications, Section 107.14.

PROPERTY RIGHTS IN MATERIAL

Nothing in the Contract shall be construed as vesting in the Design-Builder any right of property in materials used after they have been attached or affixed to the work or the soil and accepted. All such materials shall become the property of the City upon being so attached or affixed and accepted.

PAYMENT TO DESIGN-BUILDERS

GENERAL

- A. The basis of payment for construction of this project shall be unit prices for all work actually performed in accordance with the Specifications and Scope of work, and shall include all labor and materials incorporated in the completed work.
- B. Upon final inspection and acceptance of the work, the City will pay the Design-Builder the amount earned under the Contract, as provided herein.

PARTIAL PAYMENT

- A. Once each month, the City Project Inspector and the Design-Builder's Superintendent shall meet or as necessary to jointly measure all work items under the contract to determine pay quantities for each pay period. Quantities of work items shall be documented on the respective plan sheets and separately in tabular fashion with Station to Station measurements noted to assure there is no duplication of payment for work performed. Measurements will be for work actually completed. No projections for expected completion of work will be allowed.
- B. Design-Builder shall submit partial payment requests in a format approved by Public Works together with the City Pay Request Application and Certification for Payment (form provided by Public Works) or equal, subject to approval by the Public Works Director.
- C. The City will retain ten percent (10%) of the amount of each such estimate to insure full and faithful compliance with the terms of these contract documents. After fifty percent (50%) of the work on this project has been completed, one half (½) of the amount retained shall be paid to the Design-Builder provided the Design-Builder is making satisfactory progress on the contract and there is no specific clause or claim requiring a greater amount to be retained. After the contract is fifty percent (50%) completed, only five percent (5%) of the amount of any subsequent progress payments made under the contract shall be retained provided the Design-Builder is making satisfactory progress on the project, except that if at any time the City determines satisfactory progress is not being made, ten percent (10%) retention shall be reinstated for all progress payments made under the contract subsequent to the determination.
- D. The Design-Builder shall furnish a detailed breakdown showing unit prices and quantities for use in preparing the monthly estimate. No partial payment will be made until this breakdown is presented by the Design-Builder and has been reviewed and accepted by the Public Works Director. Green-lined plan sheets shall be submitted with each monthly pay request illustrating the line item quantities constructed for the period. The green-lined plan sheets and pay estimate spreadsheets must reconcile with one another.
- E. No partial payment for job site delivered material will be made.

PAYMENT

For and in consideration of the faithful performance of the work, the City will pay to the Design-Builder the amount earned less retention as computed from the actual quantities of work performed under the Contract and to make such payment in the manner and at the time(s) specified, as follows:

- A. After final completion under the Contract, the Design-Builder shall render to the City a final estimate, which shall show the amount of work performed according to the Contract.
- B. Before the final payment will be made, the Design-Builder shall satisfy the City by affidavit that all bills for labor and materials incorporated in the work have been paid. See CONTRACTOR'S AFFIDAVIT REGARDING SETTLEMENT OF CLAIMS AND CERTIFICATION OF COMPLETION OF WARRANTIES, page 26. Additionally, the Design-Builder shall furnish lien waivers for all completed labor and materials consumed during the project.
- C. Final payment constituting the entire unpaid balance of the Contract sum (including all retained moneys) shall be paid by the City to the Design-Builder within sixty (60) days after completion of the work or filing the Notice of Completion of the Contract unless a specific written finding by the City of the reasons justifying the delay in payment is provided to the Design-Builder, and further provided that all work has been completed, the Contract fully performed, and any final certificate has been issued by the City's architect, if any. Prior to the final payment to the Design-Builder, the City shall deduct therefrom any and all unpaid privilege, license and other taxes, fees and any and all other unpaid moneys due the City from the Design-Builder, and shall apply to those moneys to the appropriate account. Design-Builder shall provide to the City any information necessary to determine the total amount(s) due. The quantities appearing in the Bidding Schedule are approximate only, and are prepared for the comparison of bids. Payment to the Design-Builder will be made only by actual quantities of work performed and accepted in accordance with the requirements of the Contract. Only the items listed in the Bidding Schedule are pay items. The scheduled quantities of work to be done and materials to be furnished may each be increased, decreased or omitted.
- D. **Final project As-built plans shall verify line item quantities constructed for the project by individual plan sheet.** Design-Builder shall submit final payment request in a format approved by Public Works together with the City Pay Request Application and Certification for Payment (form provided by Public Works).

PAYMENT OF ITEMS IN PROPOSAL

- A. Only those items listed in the Proposal under Bidding Schedule are pay items.
- B. Compensation for all work necessary for the completion of the project or improvement shall be included by the bidder in the price bid for the items shown in the Proposal.

CHANGES IN THE WORK

- A. The City, without invalidating the Contract, may order extra work, make changes by altering, or delete any portion of the work as specified herein, or as deemed necessary or desirable by the Public Works Director. All such work shall be executed under the conditions of the original Contract except that any claim for extension of time and additional cost caused thereby shall be adjusted at the time of ordering such change or extra work.
- B. Extra work shall be that work not indicated or detailed on the Plans and not specified. Such work shall be governed by all applicable provisions on the Contract Document.

- C. In giving instructions, the Public Works Director shall have authority to make minor changes in the work, not involving extra cost, and not inconsistent with the purposes of the work, but otherwise, except in an emergency endangering life or property, no extra work or change shall be made unless in pursuance of a written order by the Public Works Director, and no claim for an addition to the total amount of the Contract shall be valid unless so ordered. It is mutually understood that it is inherent in the nature of municipal construction that some changes in the Plans and Specifications may be necessary during the course of construction to adjust them to field conditions, and that it is of the essence of the Contract to recognize a normal and expected margin of change. The Public Works Director shall have the right to make such changes, from time to time, in the Plans, in the character of the work, and in the termination of the completion of the work in the most satisfactory manner without invalidating the Contract.
- D. Any change ordered by the Public Works Director which involves installation of work essential to complete the Contract, but for which no basis of payment is provided for herein, said payment therefore shall be subject to agreement prior to said work being performed.
- E. The prices agreed upon and any agreed upon adjustment in Contract time shall be incorporated in the written order issued by the Public Works Director, which shall be written so as to indicate acceptance on the part of the Design-Builder as evidenced by his signature. In the event prices cannot be agreed upon, the City reserves the right to terminate the Contract as it applies to the items in questions and make such arrangements as it may deem necessary to complete the work, or it may direct the Design-Builder to proceed with the items in question to be reimbursed pursuant to the unit prices in the Design-Builder's bid or on a force account basis as provided hereinafter, at the City's option.

FORCE ACCOUNT

The compensation for force account work performed by the Design-Builder shall be approved by the Public Works Director in the following manner:

- A. **LABOR:** The Design-Builder shall provide monthly certified payroll reports for all labor and for foremen in direct charge of the specific operations. The Design-Builder will be compensated as follows:
 - 1. The actual cost of wages paid by him but at rates not to exceed those for comparable labor currently employed on the project as determined by Public Works Director.
 - 2. The actual cost of social security taxes and unemployment compensation insurance. There will be no payment for Fringe Benefits unless mandated by Federal Law on Federally funded projects.
 - 3. An amount equal to fifteen percent (15%) of the actual cost of wages and other costs listed above to cover the Design-Builder's profit and overhead.
 - 4. In case work is performed by a subcontractor, the said fifteen percent (15%) will be added only once to the actual cost of the work, however, the Design-Builder may add five percent (5%) to the subcontractor's price to cover his own overhead and supervision.
- B. **TOOLS AND EQUIPMENT:** For any special or heavy equipment, the use of which has been authorized by the Public Works Director, except for small tools and manual equipment, the Design-Builder shall be reimbursed his actual cost of rental, not to exceed the latest Schedule of Equipment Rental Rates published by the Arizona Department of Transportation. In the event that any of the equipment to be used is not shown in said schedule, the rental rate for such

equipment shall be as agreed upon in writing before the work is started. No percentage shall be added to equipment rental rates. In the event said special or heavy equipment is owned by the Design-Builder, he shall be compensated only for the actual hours said equipment is required for the work under Force Account on the job site, at a rate not to exceed the latest ADOT. Schedule of Equipment Rental Rates.

- C. **MATERIALS:** For all materials accepted by the Public Works Director and used in the work the Design-Builder shall be paid the actual cost of such material, including transportation charges, to which cost shall be added a sum equal to fifteen percent (15%) thereof.
- D. **SUPERVISION OVERHEAD AND HOME OFFICE OVERHEAD:** No allowance shall be made for general superintendence. The cost of supervision and all overhead is presumed to be included in the fifteen percent (15%) added in accordance with the above.
- E. **RECORDS:** The Design-Builder's representative and the Public Works Director shall compare the records of the work performed as ordered on a force account basis at the end of each day on which such work is performed. Copies of these records shall be made on suitable forms provide for this purpose and signed by both the Public Works Director and the Design-Builder's representative. All claims for work done on a force account basis shall be certified and submitted to the Public Works Director by the Design-Builder, and such statements shall be filed with the Public Works Director not later than the fifth (5th) day of the month following that in which the work was actually performed.
- F. **BONDS AND INSURANCE:** The Design-Builder shall be paid the actual cost for additional bonding and insurance pertaining to Force Account work when the Design-Builder can provide evidence of additional payment for premiums on required payment and performance bonds. No duplication of payment for Design-Builder's costs associated with labor costs above will be allowed.
- G. The Public Works Director authorized representative is in charge of Force Account Work and has the authority to direct which labor and equipment will be used, to suspend operations, and to refuse to pay for any labor or equipment, which he feels is not doing productive work.

EXTRA WORK

New or additional work will be classed as extra work when determined by the Public Works Director that such work is not covered by the Contract.

CONTRACT AMENDMENT

The value of such work or change shall be determined and paid for with a Contract Amendment in one of the following ways according to the Contract Amendment Procedure set down by the Public Works Department, City, and at the option of the City:

- A. As may be mutually agreed upon by the City and the Design-Builder.
- B. By unit prices in accordance with the Design-Builder's bid.
- C. By lump sum based upon the Design-Builder's estimate and the Public Works Director's review and acceptance of the estimate.
- D. By Force Account in accordance with the requirements of that section.
- E. The Design-Builder shall do such extra work and furnish material and equipment therefore upon receipt of an accepted Contract Amendment or other written order of the Public Works Director. In no case shall work be undertaken without written notice from the Public Works Director to

proceed with the work. In absence of such Contract Amendment or other written order of the Public Works Director, the Design-Builder shall not be entitled to payment for any extra work. All contract amendments must be approved by the Public Works Director. Contract Amendments over \$10,000.00 must be approved by City Council.

- F. In the event that the Design-Builder and the City cannot agree on the compensation to be paid to the Design-Builder prior to the issuance of a Contract Amendment, then and in that event the City has the option of terminating the Contract with the Design-Builder or directing the Design-Builder to proceed and to receive compensation pursuant to the Force Account provisions herein. In the event that this Contract is terminated by the City pursuant to this subsection, the Design-Builder shall only be paid for those services performed to date of the City's Notice of Termination, said payment to be based upon the unit prices as set forth in the Design-Builder's bid. In no event shall the Design-Builder be entitled to additional compensation for lost profits, mobilization or de-mobilization costs, loss of anticipated profits, extended overhead, unabsorbed home office overhead, or any other payments other than for work actually performed as based upon unit prices. In the event that there are no unit prices pertaining to work in question, then and in that event the Design-Builder's compensation for early termination pursuant to this subsection shall be based upon Force Account as here-in-before described.
- G. It is expressly agreed that in the event of a Contract Amendment, any compensation due the Design-Builder shall be set forth in the Contract Amendment, and shall be considered full and complete payment (if any) for any and all work related costs, including but not limited to labor, materials, equipment, supervision, field office overhead, extended home office overhead, unabsorbed home office overhead, taxes, bonds, insurance and profits. Additionally, the Design-Builder shall not be entitled to any additional compensation based upon a Contract Amendment (or the accumulation of contract amendments) unless specifically set forth in that Contract Amendment.
- H. In the event that the Design-Builder submits a proposed Contract Amendment, the Public Works Director shall have ten (10) days after receipt of the Design-Builder's written proposed Contract Amendment to either accept or agree to the Contract Amendment under the above provisions or deny such proposed Contract Amendment. If necessary to assess the proper purpose and function of a Design-Builder's proposed Contract Amendment, because of the proposed Contract Amendment's complexity or scope, the Public Works Director may either accept and agree to the Contract Amendment or deny such proposed Contract Amendment under the above provisions beyond such ten (10) day period and for an additional reasonable period commensurate with the nature of the proposed Contract Amendment. The failure of any party to take any action within the time periods or in the manner specified in the subparagraph shall be deemed a waiver of that party's right to recover for such delay in acting.

CLAIMS FOR EXTRA WORK

If the Design-Builder claims that any instructions involve extra cost under this Contract, he shall give the Public Works Director written notice thereof within forty-eight (48) hours after the receipt of such instructions, and in any event before proceeding to execute the work, except in emergency endangering life or property, and the procedure shall then be as provided for under CHANGES IN THE WORK. No such claim shall be valid unless so made.

PARTIAL ACCEPTANCE OF WORK

- A. After completion of certain units of work under this Contract, including all testing and other preparation necessary for operation of the unit by the City as herein specified, but prior to final

project completion, provisions may be made for partial acceptance in writing by the City for these certain units only. The units to be included for partial acceptance prior to final project completion will be noted at the time of the pre-construction conference in accordance with Design-Builder's schedule, or by written notice to the Design-Builder at the earliest possible time.

- B. The guarantee period for these units shall commence with the date of final acceptance of the entire project by the City. Full payment for these units will not be made until final acceptance of the total work is made.
- C. Acceptance of any portion of the project prior to acceptance of the whole shall not be construed as absolving the Design-Builder of responsibility for any item of construction or incidental work included in the original Contract.

NOTIFICATION OF CHANGED CONDITIONS, FORMAL PROTEST AND DISPUTE RESOLUTION

MAG 110 as modified herein:

110.2.2(A) and 110.3.2, add the following: “In providing the information required by this section, the Design-Builder shall provide specific factual detail as to each item and show the methods of calculating each item.”

110.3.1 shall be amended as follows:

Level I shall mean the Public Works Project Manager as appointed by the Public Works Director

Level II shall mean the Public Works Division Manager as appointed by the Public Works Director

Level III shall mean the Public Works Director

In the event of litigation, the parties hereby agree to submit to a trial before the Court. The Design-Builder further agrees that this provision shall be contained in all subcontracts related to the project, which is the subject of this Agreement.

The parties hereto expressly covenant and agree that in the event of litigation arising from this Agreement, neither party shall be entitled to an award of attorney fees, either pursuant to the Contract, pursuant to A.R.S. § 12-341.01 (A) and (B), or pursuant to any other state or federal statute. The Design-Builder further agrees that this provision shall be contained in all subcontracts related to the project that is the subject of this Agreement.

110.4 The last sentence of the first paragraph shall read: “The arbitration of claims shall be conducted either in Prescott or Phoenix, Arizona as agreed to by the parties, or if the parties cannot agree, to be determined by the arbitrator, taking into consideration the convenience and costs to the parties and their witnesses.”

Delete the last two sentences of the section and replace with: “The decision or award of the arbitrator shall be nonbinding.”

Any resolution of a dispute in accordance with the applicable sections of MAG110 and this Contract which causes the Contract amount to be exceeded by \$10,000.00 or more shall not be final until approved by the City Council.

PUBLICITY RELEASES

The Design-Builder and their subcontractors and their suppliers, if any, shall not reveal to others through literature, brochures, or other types of publicity releases any information regarding the work

or the Design-Builder's activities or participation on the project without prior written approval from the City Public Works Director. Any and all jobsite photographs taken by the Design-Builder, subcontractor or others must be processed in duplicate form with copies provided to the Public Works Director. No project photographs shall be released to others without prior written approval of the Public Works Director.