May 14, 2014   Reference S1187612

Andy Hummel P.E.
The City of Sparks
431 Prater Way
Sparks, NV. 89431

Subject: City of Sparks Budgetary Estimate and Preliminary Design

Dear Andy,

Please review the information below and let us know if you have any questions. Thank you for considering GTH.

I.   **Scope of work summary:**

a. GTH has been requested to provide a proposal to monitor multiple remote sites as part of an overall SCADA system plan for the City of Sparks.
Currently there is no design criteria, therefore the information provided herein is our interpretation of the project requirements. We have invested considerable time reviewing the sites, performing site evaluations and a software based radio path study.
The information to follow is the property of George T. Hall Co., Inc. and not transferable to any other parties without mutually agreed upon compensation for engineering services invested to date

b. This proposal is based on industry standard hardware and software for system monitoring. Our approach is to utilize a radio system that does not require programmable hardware in the field.
This simplified approach provides a method of monitoring specific points that will be available for the master RTU (Remote Telemetry Unit) to poll and update that information back to a centralized graphical interface for monitoring, trending and alarming.

c. Due to the lack of structures at some of the sites the installation will be a joint effort with GTH (two days max per site) and other qualified personnel contracted by the City of Sparks. Some of these tasks will include (but not limited to):

- Installation of concrete pads for antenna towers where applicable.
- Mounting of enclosures.
- Installation of conduit and conductors to interface with existing control systems.

II. Site locations identified

Following are sites that have been previously defined as they locations where specific points of information will be required.

Item	Site Name	Description	Tower Required	Approx. Height
1	Nugget Tower East	Master	Yes	30'
2	Glendale/Galletti	Slave	No*	15'
3	Snider Way	Slave	Yes	10'
4	Meredith	Slave	No*	15'
5	Spice Island	Slave	Yes	10'
6	E. Greg St.	Slave	Yes	30'
7	Prater & Parlanti Lane	Slave	No*	15'
8	Marina Village	Slave	Yes	10'
9	Marina Park	Slave	Yes	10'
10	O'Callahan	Slave	Yes	10'
11	Pah-Rah Booster	Slave	Yes	25'
12	Kiley Booster	Slave	No*	15'
13	Golden Eagle Booster	Slave	No*	15'
14	Golden Eagle LS	Slave	Yes	10'
15	Golden Eagle; Effulent Tank	Slave	No*	15'
16	Deep Creek Drive; In Park	Slave	Yes	10'
17	Sparks Marina; Park	Slave	Yes	35'
18	Madison & Larkin	Slave	Yes	30'

* Note: These sites have existing antenna masts or structures that could be re-used for new antenna hardware.

III. RTU (Slave) Typical Materials

Each slave RTU will be fabricated and tested at GTH's facility prior to delivery to jobsite.
GTH personnel (one person) will be scheduled for a total of 16 hours for each RTU to assist with installation, mounting of equipment, low voltage wire terminations.
Additional onsite time would be invoiced at a predefined T&M rate.

Item	Desscription	Manufacturer
1	Nema 4 24" x 24" x 8" Enclosure	Saginaw
2	120VAC TVSS	Phoenix Contact
3	24VDC Power Supply w/ Integrated DC UPS	Phoenix Contact
4	RAD-900-IFS Radio	Phoenix Contact
5	RAD-DI8-IFS, 8 digital inputs (24VDC)	Phoenix Contact
6	RAD-AI4-IFS, 4 analog inputs (4-20 ma)	Phoenix Contact
7	Fuse Blocks / Terminal Blocks as req'd	Phoenix Contact
8	12VDC Batteries (2 Each)	Power Sonic
9	Antenna cable, Antenna, Surge Suppressor	Phoenix Contact
10	Free standing antenna tower where applicable	Rohn

** Note**

Each slave RTU will have the capability of monitoring the following points of I/O.
- Discrete 24 VDC only (on/off) signals such as float switches, intrusion switches, pressure switches – 8 total.

- Analog 4-20ma (variable) signals such as flow meters, level transmitters and temperature.

IV. **RTU (Master) Materials**

This unit will be mounted on the Nugget tower and handle the communications to all of the remote sites in addition to providing connectivity (Ethernet) to the SCADA PC. The connectivity between this master RTU (RJ45 Copper) and the City's SCADA computer via existing fiber optics or copper Ethernet network is the City's responsibility.

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6	RAD-AI4-IFS, 4 analog inputs (4-20 ma)	Phoenix Contact
7	Fuse Blocks / Terminal Blocks as req'd	Phoenix Contact
8	12VDC Batteries (2 Each)	Power Sonic
9	Antenna cable, Antenna, Surge Suppressor	Phoenix Contact
10	CPU w/ Modbus Serial Port	Schneider Electric
11	Power Supply - DC	Schneider Electric
12	6 Slot Back Plane	Schneider Electric
13	NOE - Ethernet (Modbus TCP) Module	Schneider Electric

V. **SCADA Software**

The City currently owns a licensed copy of Wonderware's InTouch Software (60K Runtime) and a SCADAlarm alarming software. This proposal includes upgrading these packages to the latest offering. Please note that the city does not own a license to the development tool for InTouch. GTH will use their own licensed development tools for programming the application as needed.

A computer workstation is not included but can be provided as part of this proposal upon request. It is assumed the City IT department will provide a PC that meets the SCADA software requirements as defined by GTH.

Item	Description	Manufacturer
1	Upgrade of existing 60K tag license w/ Support	Wonderware
2	Upgrade from SCADAlarm	Win-911

VI. **Non reoccurring engineering**

Following are tasks and services integral to the success of this project:

- Engineering

- o Detailed design review with owner
- o Software design for complete build out
- o Hardware design for complete build out
- o Submittals
- o O&M information

- AutoCAD drawings (panel and network)

- Programming
  - o SCADA development for monitoring of all sites (regardless of initial Slave RTU order quantity up to 17 units).
  - o Win911 alarm software development for all sites
- Testing
  - o In House SCADA and Radio system testing
  - o OnSite field testing of SCADA and Radio system
  - o Training of owner personnel (3 days)

- Master RTU as identified in Item IV.

- SCADA software as identified in Item V.

VII. Budgetary Pricing

1. Non reoccurring engineering fees as identified in Item VI.: $52,965.00
2. Initial order for Slave RTU's (5 sites to be determined): $46,500.00

Total estimate for 1. And 2. above: $99,465.00 (Taxes not included)

Optional -
3. **Each additional slave RTU: $9,300.00 (Taxes not included)**
   (Includes the labor and services identified within this proposal).

Note: Payment terms to be determined. Some portion of down payment will be required with progress payments for mutually agreed upon milestones.

Regards,

George Karsten
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