

## REQUEST FOR CONSTRUCTION CONTRACT CHANGE FINAL RECONCILING CHANGE ORDER

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City of Franklin  
Engineering Office  
109 Third Avenue South  
Franklin, Tn 37064

Contract Number: 2014-0288  
Project Name: Water Distribution and Collection  
System SCADA Improvements

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### **Background**

The Board of Mayor and Alderman passed a resolution to award and entered into a contract on September 13, 2016 with Revere Control Systems, Inc. for the Water Distribution System SCADA Improvements project. The amount of the contract entered into by the City of Franklin and Revere Control Systems, Inc. was for \$1,949,980.00 (which included an Owner's contingency of \$400,000). A substantial completion date of October 5, 2017, and a final completion date of January 3rd, 2018 were requirements in the contract.

The SCADA system improvements included, among other scope, replacement of remote telemetry units and associated routers and modems at each of the remote stations (i.e., wastewater pump stations, potable water booster pump stations, etc.). The remote telemetry unit included two modes of communication: 1} Radio (the primary mode), and 2} Cellular phone (the failover or backup mode).

### **Reason for Change Order:**

The reason for this change order is to perform final reconciling of contract amount and to modify the contractual substantial and final completion dates. A total of 19 Task Orders were written against the Owner's Contingency for a total dollar amount of \$283,171.02. Thus \$116,828.98 of the Owner's Contingency will be unused and the total dollar amount of the contract will be reduced by that amount. A Task Order Summary Sheet and each of the Task Orders are included in Attachment A.

In addition to the change in the contract amount, the substantial and final completion dates had to be moved due to challenges encountered in working out issues in the system. This change will modify the substantial completion date from October 5<sup>th</sup>, 2017 to March 30, 2018 and will modify the final completion date from January 3<sup>rd</sup>, 2018 to October 27<sup>th</sup>, 2018.

### **Attachments (List documents supporting change):**

Attachment A - Task Order Summary Sheet and Task Orders

<b>CHANGE IN CONTRACT PRICE:</b>	
Original Contract Price:	\$1,949,980.00
Net Increase in Contract Price From Previous Change Orders:	\$0
Contract Price Prior to This Change Order:	\$1,949,980.00
Net Increase or <Decrease> of This Change Order:	<\$116,828.98>
Contract Price with All Approved Change Orders:	\$1,833,151.02

<b>CHANGE IN CONTRACT TIMES</b>	
Original Contract Times	
Substantial Completion Date	10/5/2017
Final Completion Date	1/3/2018
Net Change From Previous Change Orders	
Substantial Completion	0 Days
Final Completion	0 Days
Contract Times Prior to This Change	
Substantial Completion Date	10/5/2017
Final Completion Date	1/3/2018
Increase in Time This Change Order	
Substantial Completion	175 Days
Final Completion	297 Days
Contract Times with All Approved Change Orders	
Substantial Completion Date	3/29/2018
Final Completion Date	10/27/2018

Now, Therefore, Revere Control Systems, Inc., hereby agrees to this Change Order, consisting of the above mentioned schedule changes, and agrees that this Change Order is hereby made a part of the original contract and will be performed by this Contractor in accordance with specifications thereof, and that the original contract remains in full force and effect, except in so far as specifically modified by this Change Order.

**RECOMMENDED FOR APPROVAL BY:**

ENGINEER

CITY PROJECT MANAGER

Name: Robert P. Huguenard Name: \_\_\_\_\_  
Signature: [Signature] Signature: \_\_\_\_\_  
Date: 11/7/2018 Date: \_\_\_\_\_

CITY WATER MANAGEMENT DIRECTOR

Name: \_\_\_\_\_  
Signature: \_\_\_\_\_  
Date: \_\_\_\_\_

**ACCEPTED BY CONTRACTOR:**

**APPROVED BY OWNER:**

Name: Nanette D. Johnson Name: \_\_\_\_\_  
Title: Vice President of Municipal Systems Title: \_\_\_\_\_  
Signature: [Signature] Signature: \_\_\_\_\_  
Date: 11/7/2018 Date: \_\_\_\_\_

ATTACHMENT A

TASK ORDER SUMMARY SHEET AND TASK ORDERS

**Table A1**  
**Work Order Summary Sheet**

Work Order Number	Description	Work Order Dollar Amount	Work Order Expended Amount	Date Sent to SRF for Review	Date Approved by SRF	Date Signed by Revere
1	Replacement computer for existing system	\$14,105.00	\$14,105.00	1/24/2017	1/25/2017	2/1/2017
2	Addition of remote pump on/off	\$64,004.00	\$64,004.00	5/31/2017	5/31/2017	6/9/2017
3	RTU Installation Changes - Racks	\$56,329.74	\$56,329.74	7/26/2017	7/27/2017	7/31/2017
4	Goose Creek/Red Wing controls modifications	\$19,226.00	\$19,226.00	7/26/2017	7/27/2017	7/31/2017
5	Old Hillsboro Road Strut Hardware	\$4,811.27	\$4,811.27	7/26/2017	7/27/2017	7/31/2017
6	Cradlepoint Part 1 Changes	\$13,046.00	\$13,046.00	9/13/2017	9/14/2017	11/1/2017
7	Cradlepoint Part 2 Changes	\$54,311.00	\$54,311.00	10/20/2017	10/24/2017	11/1/2017
8	Fieldstone Farms 1 Upgrade to AB PLC CPU	\$4,071.00	\$4,071.00	11/15/2017	11/17/2017	11/27/2017
9	Legends Booster Pump Station Control Modifications	\$19,690.87	\$19,690.87	11/15/2017	11/17/2017	11/27/2017
10	Credit for Radio Towers	(\$21,190.76)	(\$21,190.76)	1/16/2018	1/22/2018	1/30/2018
11	Columbia Avenue Tank - New Power Service Cable and Receptacle	\$4,099.10	\$4,099.10	1/16/2018	1/22/2018	1/30/2018
12	Credit for Elimination of Part of Trihedral Training	(\$3,924.80)	(\$3,924.80)	1/16/2018	1/22/2018	1/30/2018
13	Legends Booster Pump Station Additional Control Modifications	\$9,199.40	\$9,199.40	2/14/2018	2/21/2018	3/5/2018
14	Ash Drive Tank RTU Relocation	\$5,921.97	\$5,921.97	2/14/2018	2/21/2018	3/5/2018
15	Fieldstone Farms 2 - Make RTU the Controller	\$12,621.73	\$12,621.73	2/14/2018	2/21/2018	3/5/2018
16	Credit for Old Hillsboro Road Repairs Due to Miswiring	(\$890.92)	(\$890.92)	9/13/2018	9/14/2018	5/21/2018
17	Old Hillsboro Road Antenna and Antenna Cable Replacement	\$1,590.63	\$1,590.63	4/25/2018	5/1/2018	5/18/2018
18	Antenna Replacement and Addition of Mikrotic Devices	\$29,292.84	\$29,292.84	5/3/2018	6/7/2018	6/11/2018
19	Purchase of Additional VTScada Licenses	\$9,026.95	\$9,026.95	6/4/2018	6/7/2018	6/11/2018
20	Credit for Unused Allowance and Elimination of Natches Trace RTU Installation	(\$12,170.00)	(\$12,170.00)	10/11/2018	10/24/2018	10/31/2018
Total Expended		\$283,171.02	\$283,171.02			
Owner's Contingency Amount			\$400,000.00			
Remaining Funds			\$116,828.98			

**CONSTRUCTION CHANGE AUTHORIZATION (WORK ORDER)**

**TO:** Mr. David Abel  
Project Manager  
Revere Control Systems  
2240 Rocky Ridge Road  
Birmingham, AL 35216  
(205) 824-0004

**FROM:** CDM Smith  
3715 Northside Parkway NW  
Building 300, Suite 400  
Atlanta, GA 30327  
(404) 720-1400

**DATE:** January 25, 2017

**PROJECT:** City of Franklin, Tennessee  
Water Distribution and Collection Systems SCADA Improvements

**WORK ORDER NUMBER:** 001                      **CDM SMITH PROJ. NO.:** 14915-96594

**SUBJECT:** Replacement of existing SCADA system computer                      **CITY PROJECT NO.:** 2014-0288


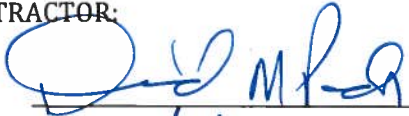
**REFERENCE:** December 5, 2016 Revere Quote Letter

**DESCRIPTION:**

The purpose of this Work Order is to direct Revere Control Systems to perform the work identified in the attached December 5, 2016 quote. In general the work includes 1) Purchasing and installing a computer to replace the backup computer for the existing SCADA system, 2) Copying and configuring the existing SCADA application to the new computer, 3) Once the new main RTU and antenna are in operation and all sites have been migrated to the new system, moving this computer to the Public Works building, adjacent to the new computer provided under this contract and configuring it to act as a hot backup, 4) Furnish an additional Trihedral VTSCADA license.

Per the attached quote, this work shall be performed for a lump sum amount of \$14,105. Half to be paid upon completion of items 1 and 2 and half to be paid upon completion of items 3 and 4. Work is subject to the terms and conditions of the agreement for project 2014-0288 not the terms and conditions Revere Control Systems attached to their quote.

**ATTACHMENTS:** December 5, 2016 Revere Quote Letter

<p><b>CDM SMITH:</b></p> <p>By: <u></u></p> <p>Date: <u>01/25/2017</u></p>	<p><b>CONTRACTOR:</b></p> <p>By: <u></u></p> <p>Date: <u>2/1/2017</u></p>
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Master Telemetry Computer Replacement
City of Franklin Water Management Department

December 5, 2016

CDM Smith
3200 Windy Hill Road, S.E.
Suite 210 West
Atlanta, Georgia 30339-5460

Attn: Mr. Robert Huguenard, PE, BCEE

Ref: City of Franklin Water Management Department
Collections and Distribution Telemetry SCADA System

Subj: Proposal to Add a Master SCADA PC to Temporarily Replace Existing PC and Configure as Backup to
New SCADA, Rev 2
COF Contract No. 2014-0288

Mr. Huguenard:

We are pleased to provide a proposal for the above referenced project. Work includes the following:

- 1. Furnish a new Dell Precision T5810 PC and 24" monitor (see attached datasheet)
2. Furnish an additional Trihedral VTSCADA runtime 10K license w/12-month support (see attached datasheet)
3. Onsite labor and expenses to transfer existing application to new PC and confirm communications per existing status. Note: Work does not include troubleshooting/repair of existing issues.
4. Configure as hot backup when replaced with new computer furnished under contract referenced above.

Labor

Table with 4 columns: Description, Hours, Rate, Total. Rows include Project Management (4 Hours, \$148/Hr, \$ 592) and Engineering (40 Hours, \$126/Hr, \$ 5,040). Total Labor: \$ 5,632.

Expenses

Table with 4 columns: Description, Quantity, Rate, Total. Rows include Mileage (372 Miles, \$0.54, \$ 201) and Food and Lodging (4 Days, \$174, \$ 696). Subtotal: \$ 897. 15% Profit: \$ 135. Expenses Total: \$ 1,032.

Materials

Table with 4 columns: Description, Quantity, Rate, Total. Rows include Dell T5810 workstation w/24" monitor (as of 12/2/2016) (1, \$ 1,679), Trihedral VT SCADA, Run, 10K Tags, 3 month SupportPlus (1, \$ 4,095), and Trihedral VT SCADA, Run, 10K Tags, 9 months SupportPlus (1, \$ 696). Subtotal: \$ 6,470. 15% Profit: \$ 971. Materials Total: \$ 7,441.

Lump Sum Price \$ 14,105



## Master Telemetry Computer Replacement City of Franklin Water Management Department

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<sup>1</sup>Non-labor profit figure based on 01035 1.06 B.6 and 00700 Article 12.01 C and 11.01 A.2

Price excludes applicable taxes

Delivery ARO: 4 weeks

See attached Terms and Conditions

Sincerely,

*David Abel*

David Abel, PMP

Municipal Project Manager

Revere Control Systems, Inc.

Phone: 615-604-1579

[dabel@reverecontrol.com](mailto:dabel@reverecontrol.com)

Attachments:

Terms and Conditions

Dell PC Datasheet

Dell Pricing Summary

VT SCADA Datasheets





## Dell Precision Tower 5000 Series (5810)

Big power in a compact, innovative design



### Experience the evolution of productivity

Power resource-exhausting, graphics-intensive workloads with ease, featuring:

- Dell Precision Optimizer v 3.5, enhances application performance by optimizing settings, for up to 121 percent application performance improvement
- Intel® Xeon® processor E5-1600 v4 product family, with Intel Turbo Boost Max Technology 3.0 (on select SKUs) delivers the single threaded performance you need to complete complex tasks quickly
- Manage large data sets with ease, with up to 256GB<sup>1,2</sup> of quad-channel 2400MHz DDR4 ECC RDIMM memory
- Choose from a broad selection of professional grade AMD FirePro™ or NVIDIA® Quadro® graphics
- Optional Intel PCIe SSD drives and M.2 PCIe NVMe SSDs on the actively cooled Dell Precision Ultra-Speed Drive Duo/Quad deliver superb read/write throughput, combined with exceptional reliability.
- Intel CAS-W storage option enables performance that is near solid state drive speeds at a significantly reduced cost versus a full SSD storage solution<sup>3</sup>

### Reduce environmental impact

- Dell Precision Tower 5000 Series is EPEAT®-registered<sup>4</sup> and offers ENERGY STAR® configurations, including 80 PLUS®-registered Gold power supplies

### Reliability you can count on

- Exclusive Reliable Memory Technology (RMT) PRO maximizes uptime by eliminating virtually all memory errors for more stability
- The result of hundreds of rigorous testing, Independent Software Vendor (ISV) certifications ensure your high performance applications run smoothly

### Best-in-class chassis design

- Straightforward, clutter-free interior provides superb air flow, easy access to components for serviceability and modifications, and improved acoustics
- The only mainstream tower workstation family to offer an externally accessible tool-less (lockable) power supply for superior serviceability
- Integrated front and rear aluminum handles for easy deployment and moves
- Room for up to (3) 3.5" or (4) 2.5" tool-less hard drives
- 825W PSU option for high wattage graphics cards support in compact chassis.
- Easy rack mounting via 0U rail shelf kit<sup>5</sup>

### Exceptional Service & Support

- Rest assured that your Dell Precision workstation will be well protected should an issue arise, with a standard 3 year limited hardware warranty<sup>6,7,8</sup>

Feature		Precision Tower 5000 Series (5810) Technical Specification				
Processor Options	Intel® Xeon® processor E5-1600 v4 Series, with Intel Turbo Boost Max 3.0 Technology on select SKUs, Select Intel Xeon E5-2600 v4 CPUs with up to 18 cores, Intel Advanced Vector Extensions, Intel Trusted Execution Technology, Intel AES New instructions, optional Intel vPro™ technology					
Operating System Options	Windows® 10 Professional (64 bit) Windows® 8.1 Professional (64-Bit) Windows® 7 Professional (64-Bit)		Red Hat® Enterprise Linux® 7.0 and 7.2 (required for Xeon E5-2600 v4 CPUs), RHEL 6.5 supported, 6.8 for E5-2600 v4 Ubuntu 14.04 NeoKylin 6.0 (China only)			
Chipset	Intel® C612					
Memory Options	Quad channel memory up to 256GB 2133MHz DDR4 RDIMM ECC memory, 8 DIMM Slots. (E5-2600 v4 CPUs ship with 2400MHz memory) Note: memory speed is dependent on specific Intel Xeon E5-1600 v3 or E5-2600 v4 Series processor installed					
Graphics <sup>4</sup> Options	Support for 2 PCI Express® x16 Gen 2/Gen 3 graphics cards up to 500W (total graphics in 2 slots, (with 825W PSU)					
	<b>High end 3D cards:</b> AMD FirePro W8100 NVIDIA Quadro M6000 NVIDIA Quadro K6000 NVIDIA Quadro M5000	<b>Mid-range 3D cards:</b> AMD FirePro W7100 AMD FirePro W5100 NVIDIA Quadro M4000 NVIDIA Quadro M2000 NVIDIA Quadro K2200	<b>Entry 3D cards:</b> AMD FirePro W4100 AMD FirePro W2100 NVIDIA Quadro K620 NVIDIA Quadro K420	<b>Professional 2D cards:</b> NVIDIA NVS 510 NVIDIA NVS 315 NVIDIA NVS 310		
Storage Options	Support for up to (4) M.2 PCIe SSDs and up to (3) 3.5" SATA or (4) 2.5" SATA/SAS drives. Optional controller required for SAS.					
	<b>M.2 PCIe SSD (NVMe)</b> Up to (4) 1TB drives on Dell Precision Ultra-Speed Drive Quad. <b>PCIe SSD HH/HL card</b> Up to (2) Intel 1.2TB PCIe SSD NVMe drives	<b>2.5" SATA SSD</b> Up to (4) 1TB drives <b>2.5" SAS SSD</b> Up to (4) 400GB drives	<b>2.5" SATA 7200 RPM</b> Up to (4) 512GB 7200 RPM	<b>3.5" SATA</b> Up to (3) 4TB 5400 RPM	<b>2.5" SAS 10K RPM 12Gb/s</b> Up to (4) 1.8TB <b>2.5" SAS 15K RPM 12Gb/s</b> Up to (4) 600GB	<b>2.5" Self Encrypting Drives</b> 512GB 2.5" FIPS SED (OPAL 2.0) SSD
Storage Controller	<b>Integrated:</b> Intel AHCI 6Gb/s SATA controller with six ports, two reserved for optical drives, Intel RSTe supports host based software RAID 0,1,5,10 <b>Optional:</b> LSI MegaRAID® SAS 9341-8i 12Gb/s SAS (6Gb/s SATA) PCIe controller supports software RAID 0,1,5,10. LSI MegaRAID® SAS 9361-8i 12Gb/s SAS (6Gb/s SATA) PCIe controller (1GB cache with Flash module/Super Cap backup) supports hardware RAID 0,1,5,10					
Communications	<b>Integrated:</b> Intel® i217 Gigabit Ethernet LAN 10/100/1000 <b>Optional:</b> Intel® i210 10/100/1000 single port PCIe (x1) Gigabit network card, Intel® X540-T2 10GbE dual port PCIe (x8) network card,					
Audio Controller	Integrated Realtek ALC3861 High Definition Audio Codec (2 Channel)					
Speakers	Internal Speaker; Optional Dell 2.0 stereo speaker systems available and Dell sound bar for select flat-panel displays					
Add-in cards	Optional: Dell Precision Ultra-Speed Drive Duo (HH/HL,x8) & Ultra-Speed drive Quad (FH/FL,x16) with active cooling. Support for up to 2 and 4 M.2 PCIe NVMe SSDs respectively. Optional 1394 a/b PCIe Card (3 Ports – 2x 1394b + 1x 1394a)			Optional dual & quad display Teradici PCoIP remote workstation host PCIe cards Optional Thunderbolt 2 PCIe Card Optional Serial Port PCIe Card		
I/O Ports	<b>Front</b> 3 – USB 2.0 1 – USB 3.0 1 – Microphone 1 – Headphone	<b>Internal</b> 1 – USB 2.0 1 2x5 USB 2.0 header. (Requires 3 <sup>rd</sup> party splitter cable to support 2 x USB 2.0 Type A ports) 4 – SATA 6Gb/s	<b>Rear</b> 3 – USB 2.0 3 – USB 3.0 2 – PS2	1 – RJ45 Network Connector 1 – Serial 1 – Audio Line in/Microphone 1 – Audio Line out		
Chassis	<b>HxWxD:</b> 16.30 x 6.79 x 18.54"; 41.40cm x 17.25cm x 47.09cm <b>Bays:</b> (1) external slimline optical bay; (2) internal 3.5" bays (support total of (2) 3.5" or 2.5" drives); (1) external 5.25" bay <b>Slots:</b> (2) PCIe x16 Gen 3; (1) PCIe x16 Gen 3 (wired x8) half length; (1) PCIe x4 Gen 2; (1) PCIe x1 Gen 2; (1) PCI 32 <b>Power Supply:</b> 825W, 685W, 425W 90% efficient (80PLUS Gold Certified) Externally accessible/removable					
Storage devices	<b>Slimline</b> options: DVD-ROM; DVD+/-RW, Optional <b>5.25" bay</b> devices: BD, DVD+/-RW; 19-in-1 media reader, 2 x 2.5" HDD/SSD kit					
Monitors	Dell UltraSharp Monitors – Award-winning high-performance monitors with PremierColor (on select models) and ultra-wide viewing, from 21.5" - 34" : Dell Monitors (P models) available from 19" – 28".					
Security Options	Trusted Platform Module (TPM 2.0 with Win 10, TPM 1.2 with Win 7/8.1); Chassis Intrusion switch; Setup/BIOS Password; I/O Interface Security; Kensington® lock slot, Padlock ring, lockable power supply; Dell Data Protection (DDP): DDP   Security Tools for authentication; DDP   Protected Workspace for malware; DDP   Encryption for data protection					
Regulatory & Environmental	Energy Star® configurations available including 80 PLUS® registered Gold power supplies; EPEAT® registered (see epeat.net for specific registration rating/status by country); China CECP; GS Mark. For a complete listing of declarations & certifications, see Dell's regulatory & compliance homepage at <a href="http://dell.com/regulatory_compliance">dell.com/regulatory_compliance</a>					
Warranty & Support Services	3-Year Limited Hardware Warranty and 3-year NBD On-Site Service after Remote Diagnosis Optional: Dell ProSupport is designed to rapidly respond to your business's needs, help protect your investment and sensitive data, and provide enhanced proactive support services to help reduce risk and complexity within your IT environment					
TAA Configurations	Yes					

Some options available only in select regions; ISV certification applies to select configurations 1. A 64-bit operating system is required to support 4GB or more of system memory; 2. GB means 1 billion bytes and TB equals 1 trillion bytes; actual capacity varies with preloaded material and operating environment and will be less. 3. Available in select regions. 4. See [epeat.net](http://epeat.net) for specific registration rating/status by country; 5. Available in select countries via S & P. 6. For copy of Ltd Hardware Warranty, write Dell USA LP, Attn: Warranties, One Dell Way, Round Rock, TX 78682 or see [www.dell.com/warranty](http://www.dell.com/warranty); 7. Remote Diagnosis is determination by online/phone technician of cause of issue; may involve customer access to inside of system and multiple or extended sessions. If issue is covered by Limited Hardware Warranty and not resolved remotely, technician and/or part will be dispatched, usually within 1 business day following completion of Remote Diagnosis. Availability varies. Other conditions apply; 8. Availability and terms of Dell Services vary by region. For more information, visit [www.dell.com/service-descriptions](http://www.dell.com/service-descriptions); Copyright 2016 Dell Inc. All rights reserved. Intel and Xeon are trademarks or registered trademarks of Intel Corporation or its subsidiaries in the United States of America and other countries. Microsoft, and Windows are trademarks or registered trademarks of Microsoft Corporation in the U.S. and other countries. Other trademarks or trade names may be used in this document to refer to either the entities claiming the marks and names or their products. Dell disclaims proprietary interest in the marks and names of others. Reproduction in any manner whatsoever without express written permission from Dell Inc. is strictly forbidden.



## Print Summary



### Precision Tower 5000 Series (5810)

Starting Price \$2,663.88  
 Instant Savings \$984.90

**Subtotal \$1,678.98**  
 As low as \$51.00 /month^

[Dell Business Credit | Apply](#)

[Discount Details](#)

[Ships in 3 - 5 Business Days](#)

My Selections All Options

- Precision Tower 5000 Series (5810)

**Date** 12/2/2016 7:32:39 AM Central Standard Time  
**Catalog Number** 4 Retail 04  
**Evalue Code** CUP5810W7P\_2

Catalog Number / Description	Product Code	Qty	SKU	Id
<b>Dell Precision Tower 5810:</b> Dell Precision Tower 5810 XCTO Base	T5810C	1	[210-ACQM]	1
<b>Processor:</b> Intel® Xeon® Processor E5-1620 v3 (4C, 3.5GHz, Turbo, HT, 10M, 140W)	E51620	1	[338-BFJW][412-AADM]	146
<b>Operating System:</b> Windows 7 Professional English, French, Spanish 64bit (Includes Windows 10 Pro License)	DW10P7M	1	[619-AIKN]	11
<b>Office Productivity Software:</b> Microsoft Office 30 Day Trial	13TMUI	1	[658-BCSB]	1002
<b>Non-Microsoft Application Software:</b> Dell Applications Windows 7	APPW7	1	[421-9982][422-0008][422-0052][444-BBBG][444-BBBS][640-BBDH][640-BBES][640-BBEW][640-BBHR][640-BBHS][658-BBIH]	1003
<b>Video Card:</b> AMD FirePro™ W4100 2GB (4 mDP) (4 mDP-DP adapters)	W4100	1	[490-BCCE]	6
<b>E-Star:</b> No Energy Star	NOESTAR	1	[387-BBBE]	122

<b>Chassis Options:</b> Dell Precision Tower 5810 425W TPM Chassis, BW	425L6BW	1	[321-BCEK]	116
<b>Memory:</b> 16GB (4x4GB) 2133MHz DDR4 RDIMM ECC	16G4R	1	[370-ABUO]	3
<b>HDD Controller:</b> Integrated Intel AHCI chipset SATA controller (6 INTCTL x 6.0Gb/s) - SW RAID 0/1/5/10		1	[403-BBGV]	9
<b>Internal Hard Drive Configuration:</b> C1 SATA 3.5 Inch, 1-2 Hard Drives	C1	1	[449-BBEF]	276
<b>RAID Configuration/Connectivity:</b> No RAID	NORAID	1	[780-BBCJ]	1009
<b>Boot Hard Drive:</b> 1TB 3.5" Serial-ATA (7,200 RPM) Hard Drive	1THD	1	[400-AIJM]	8
<b>2nd Hard Drive:</b> No Additional Hard Drive	NOHDDA	1	[401-AADF]	637
<b>3rd Hard Drive:</b> No Additional Hard Drive	NOHDDA	1	[401-AADF]	54
<b>4th Hard Drive:</b> No Additional Hard Drive	NOHDDA	1	[401-AADF]	51
<b>Storage Volume:</b> Boot drive or boot volume is less than 2TB	L2TB	1	[411-XXXY]	387
<b>CD ROM/DVD ROM:</b> 8x Slimline DVD-ROM Drive	DVDSL	1	[429-AAPD]	16
<b>Optical Software:</b> PowerDVD Software not included	NOPDVD	1	[429-AABU]	597
<b>Sound:</b> No Add-in Sound Card (Integrated Audio)	NOSND	1	[510-BBBW]	17
<b>Speakers:</b> Internal Speaker	INSPKR	1	[520-AADM]	18
<b>Additional Storage Devices:</b> No Media Card Reader	NMCR	1	[385-BBBL]	10
<b>Network Card:</b> No Network Card (Integrated NIC only)	NONIC	1	[555-BBJO]	13
<b>Thunderbolt Card:</b> Not Selected in this Configuration	NOTHB	1	[817-BBBC]	666
<b>Teradici Remote Workstation Access Host Card:</b> No Dell Tera2 Remote Access host card for the Wyse P25 Zero Client	NOCARD	1	[386-BBBE]	959
<b>Systems Management:</b> No Out-of-Band Systems Management	NOVPRO	1	[631-AAID]	49
<b>Dell Data Security Encryption:</b> No DDPE Encryption Software	NODDPE	1	[954-3465]	156
<b>Protect your PC:</b> No Security Software	NOSECSW	1	[650-AAAJ]	1014
<b>Keyboard:</b> Dell KB216 Wired Keyboard English Black	US216B	1	[580-ADJC]	4
<b>Mouse:</b> Dell MS116 Wired Mouse Black	MS116B	1	[275-BBBW]	12
<b>Adapters:</b> No Accessories	NOACCES	1	[461-AABV]	592
<b>External Speakers:</b> No External Speaker	NOEXSP	1	[520-AABF]	200095

<b>OS Recovery:</b> Recovery media not included	NOME81	1	[620-AAWD]	200013
<b>Dell Backup &amp; Recovery:</b> Dell Developed Recovery Environment	DDRE	1	[658-BCUV]	200076
<b>Resource DVD:</b> Resource DVD not Included	NORDVD	1	[430-XXYU]	50
<b>Quick Reference Guide:</b> Precision Workstation Tower 5810	PLCMT	1	[340-AMCB]	60
<b>Power Cords:</b> US 125V Power Cord	USPWR	1	[470-AAKG]	20
<b>Chassis intrusion switch:</b> Chassis Intrusion Switch	MTISWT	1	[461-AAAB]	289
<b>FGA Module:</b> No FGA	NOFGA	1	[817-BBBB]	572
<b>Packaging:</b> Dell Precision Packaging	SHPMTL	1	[328-BBEO][340-AEYP]	465
<b>Regulatory Label:</b> T5810 Regulatory Label (DAO)	REGLBL	1	[389-BFFO][389-BFJR]	676
<b>UPC Label:</b> No UPC Label	NOUPC	1	[389-BDCE]	292
<b>Processor Branding:</b> Intel® Xeon® Label	IXEON	1	[389-BBRO]	749
<b>TPM Security:</b> TPM	TPM	1	[329-BBJL]	297
<b>Canada Ship Options:</b> Non-Canada orders only	USNONE	1	[332-1286]	111
<b>Hardware Support Services:</b> 3 Year Hardware Service with Onsite/In-Home Service After Remote Diagnosis	NBD3	1	[997-7163][997-7165]	29
<b>Monitors:</b> Dell UltraSharp 24 InfinityEdge Monitor - U2417H	321-0165	1	[321-0165]	5113
<b>Documentation/Disks:</b> Safety/Environment and Regulatory Guide (English/French Multi-language)	EFDOC	1	[340-AGIK]	21
<b>Speakers &amp; Soundbars:</b> Dell USB Stereo Speaker System - AX210	318-2918	1	[318-2918]	6464
<b>Monitor Stands:</b> No Stand	NOSTND	1	[575-BBCH]	558



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\*Dell Business Credit: OFFER VARIES BY CREDITWORTHINESS AS DETERMINED BY LENDER. Offered by WebBank to Small

and Medium Business customers with approved credit. Taxes, shipping and other charges are extra and vary. Minimum monthly payments are the greater of \$15 or 2.5% of account balance.

snUS02

# VTScada®

Software for Monitoring & Control



## Instantly Intuitive.

VTScada removes frustration at every stage of the SCADA/HMI software life cycle; from pricing and licensing, to development and support. Our unique architecture integrates all core SCADA components into one easy-to-use package so you can start creating advanced monitoring and control systems in minutes.

30 years of innovation, one outstanding product.

VTScada AT A GLANCE	PAGES
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Intuitive Development	8
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VTScada's unique architecture allows you to easily scale an application from a few hundred tags on a single laptop all the way up to a multi-million tag system spanning distributed synchronized servers. Below are three common application configurations.

## SINGLE SERVER



## REDUNDANT SERVER (SEE OUR BUNDLE SHEET)



## ENTERPRISE / MULTI-PLANT





# TRANSPARENT LICENSING

Full installations of VTScada (i.e., Runtime or Development Runtime) are licensed per operating system instance.

Add optional components as needed.

VTScada Thin Clients are licensed by the number of concurrent users. Both full installations and Thin Clients are sized by the number of I/O tags the license will support.

1. CHOOSE A LICENSE AND TAG COUNT			
	Integrated Components Included (single installation)	Runtime	Development Runtime
		<input type="checkbox"/>	<input type="checkbox"/>
RUN AND OPERATE	Application Server (primary or redundant)	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
	Runtime Client	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
	Widgets and Graphics Library	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
	Historian	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
	Security	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
	Network and Computer Resource Monitoring with SNMP Agent	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
	Alarms and Events Database	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
	Trending and Reporting	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
	Slippy Maps integration	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
	Electronic Operator Logbooks	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
I/O DRIVERS	Common (e.g., Modbus, DF1, OPC Client, Omron, GE, Siemens)	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
	Advanced (e.g., DNP3, SNMP, Enron Modbus, BSAP)	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
	Proprietary (e.g., DataFlow Systems, Dexter Fortson, Aquatrol)	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
	DataLogger (e.g., Campbell Scientific, DF1, SCADAPack)	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
DEVELOP	Automatic Version Control (system-wide disaster recovery, audit tools)		<input checked="" type="checkbox"/>
	Idea Studio Efficient Development Environment (online, offline, multi-developer)		<input checked="" type="checkbox"/>
	Change Deployment		<input checked="" type="checkbox"/>
	Scripting and Debugging Tools		<input checked="" type="checkbox"/>
	ODBC Server, OPC Server, Web Services		<input checked="" type="checkbox"/>
2. SELECT AN I/O TAG COUNT	Only tags that read and write data to external equipment and software are counted against your license tag count. Tag counts include those in all applications running concurrently on the licensed computer.	1,000	<input type="checkbox"/>
		5,000	<input type="checkbox"/>
		10,000	<input checked="" type="checkbox"/>
		25,000	<input type="checkbox"/>
		To 2,500,000	<input type="checkbox"/>
3. SELECT OPTIONAL COMPONENTS - PRICED BY TAG COUNT			
	VTScada Alarm Notification System		<input type="checkbox"/>
	OPC, ODBC, Web Services for Runtime Licenses		<input type="checkbox"/>
4. ADD THIN CLIENTS - PRICED BY TAG COUNT	Select how many users can concurrently connect to your application via networked smartphones, tablets, PCs, and Macs.	Single	<input type="checkbox"/>
		5-Pack	<input type="checkbox"/>
		Unlimited	<input type="checkbox"/>



The Auto-generated Tiled Page Menu.

## GRAPHIC DISPLAY PAGES STANDARD

Every application includes standard pages for alarms, trends, reports, maps, and Thin Client monitoring.

- Open pages in full screen or windowed.
- 24-bit / 32-bit 'true color' support.
- Dual / quad monitor support.
- Supports consistent display on all screen resolutions.

## INTUITIVE PAGE NAVIGATION

- The auto-generated **Page Menu** lets you move easily through your application.
- Monitor multiple live pages at once using the standard **Tiled Page Menu** (left).
- Change pages with custom hotboxes and buttons.
- Users can pin their favorite pages along the bottom.

## VTScada REPORT GENERATION STANDARD

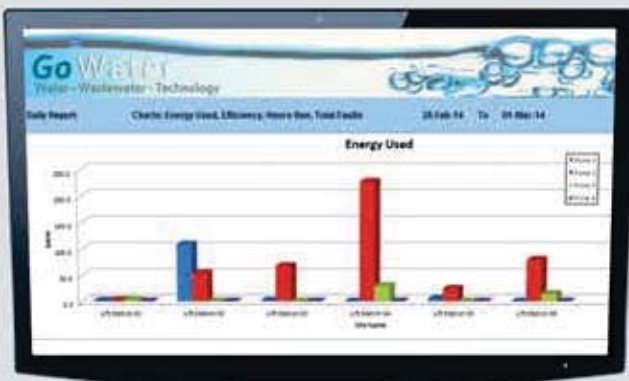
Intuitive reporting tools are part of every application.

**SCHEDULED AND AD-HOC REPORTS** - The standard Reports Page generates ad-hoc reports while the time-zone aware Report Tag can be triggered on schedule or on event.

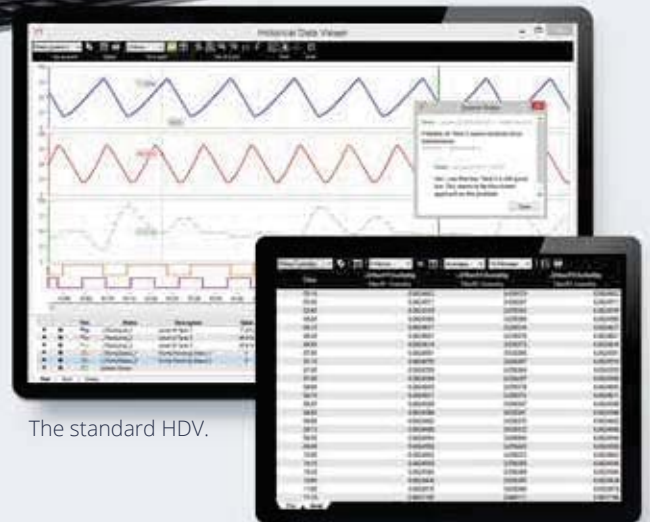
**PRE-DEFINED REPORTS** - The Reports Page includes a suite of standard reports for the water/wastewater industry. The Alarm Page (P. 5) includes new reports for managing nuisance alarms.

**OUTPUT OPTIONS** - Output to a screen, spreadsheet, database, or email attachment. Add custom script reports and Excel<sup>®</sup> templates as needed (below).

**THIRD-PARTY REPORTING** - Reporting products XLReporter<sup>®</sup> and Dream Report<sup>®</sup> both have integrated VTScada interfaces.



An Excel template report.



The standard HDV.

## HISTORICAL DATA VIEWER (HDV) STANDARD

Part of every VTScada application, the HDV combines historical and real-time data to display a continuous picture of any number of I/O values. See analog and digital data displayed simultaneously. It even supports square root and logarithmic scaling.

## OPERATORS CAN EASILY...

- Add unlimited pens representing individual tag values.
- Adjust each pen's appearance and save as a group.
- Add encrypted notes to explain atypical readings.
- Export any range of data to a file or database.
- Select overlapping, stacked, or tabular views.
- Display min, max, and average values.

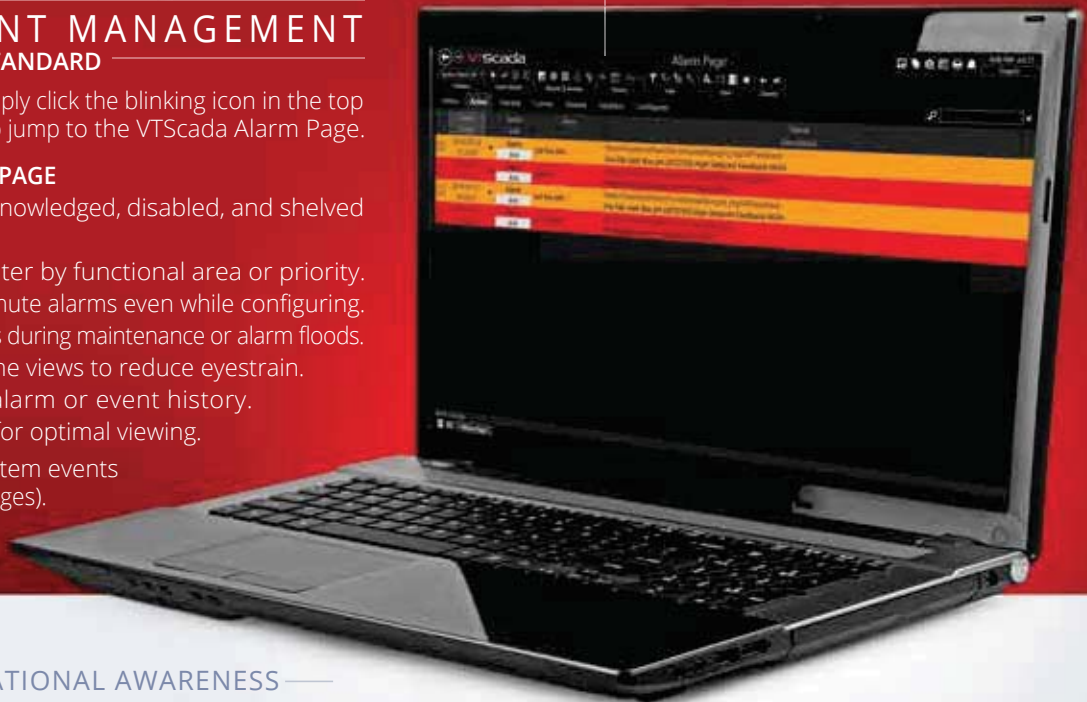
# OPERATOR INTERFACE

## ALARM & EVENT MANAGEMENT STANDARD

In the event of an alarm, simply click the blinking icon in the top right corner of every page to jump to the VTScada Alarm Page.

### THE RE-IMAGINED ALARM PAGE

- See current, active, unacknowledged, disabled, and shelved alarms.
- Sort by date/time and filter by functional area or priority.
- Acknowledge, silence, or mute alarms even while configuring.
- Shelf alarms to stop alerts during maintenance or alarm floods.
- Use daytime and nighttime views to reduce eyestrain.
- Print any range of the alarm or event history.
- Adjust text and row size for optimal viewing.
- Access time-stamped system events (e.g., logons, setpoint changes).



### — ADVANCED SITUATIONAL AWARENESS —

**ISA 18.2 COMPLIANT** - The enhanced Alarm Page and augmented tools help you enact the best practices of the ISA 18.2-2009 Alarm Management Standard.

- Combine text, symbols, color, and sound to easily convey alarm status and priority for each listed alarm.
- Easily plot an alarm's tag data or open related displays.
- Add encrypted operator notes to alarms.

**MULTI-PLANT ARCHITECTURE** - Create separate Alarm and Event databases for individual plants and processes for targeted alarm processing.

- New applications include Alarm and Event databases.
- Add more Alarm Database Tags as required.
- Sync distributed databases to protect history.
- Manage alarms even when disconnected from alarm servers.

### EASY ALARM CONFIGURATION

- Easily create alarm tags in the VTScada Tag Browser.
- Built-in alarms for Analog Status and Digital Status Tags.
- Embed customized alarm lists into display pages.



New Alarm reporting tools in VTScada 11.2.



## VTScada ALARM NOTIFICATION SYSTEM OPTIONAL

**ALARMS FIND YOU** - Receive and acknowledge alarms anywhere via SMS text messages, emails, pagers, and text-to-voice phone calls.

**PHONE ACCESS** - Logon from any phone to check levels, manage alarms, change setpoints, or control equipment.

**ALARM ROSTERS** - Create lists of up to 30 users to contact in sequence until an active alarm is acknowledged. Create any number of rosters for the whole application or specific functional areas. Change rosters by events or on a schedule (recorded as alarm history events).

**MOBILE ALARM MANAGEMENT** - VTScada Thin Clients (P. 7) allow you to easily manage alarms from any PC, smartphone, tablet, or Mac.



Auto-generated Slippy Maps for PCs and mobile devices.



## ENCRYPTED OPERATOR NOTES STANDARD

**NO MORE PAPER LOGBOOKS** - Are you required to keep a log of users' actions? VTScada includes a searchable electronic operator's notebook.

**DISTRIBUTED** - Create any number of notebooks. Embed a notebook on multiple pages. Add notes to points on a trend.

**SOCIAL** - Users can comment on each other's notes providing a useful dialog across shifts and departments.

**TAMPER-PROOF** - Notes include time-stamps and user names. Once created, they cannot be edited or deleted. Encrypted files cannot be read or altered outside VTScada.

**ACCESSIBLE** - Authorized users can access notes from any workstation or web client. Search by date. Print any range.

## VTScada SLIPPY MAPS STANDARD

### PUT YOUR SCADA SYSTEM ON THE MAP

**A SIMPLE INTERFACE** - Navigate remote sites with a click, toss, or scroll, the same way you use online tools like OpenStreetMap®. Embed dynamic maps into any page or use the standard map page (left).

**PICK A PIN TO SEE A SITE** - Pins change color based on polling status. Click to open each site. Drag pins into place or position them with lat and long coordinates.

**CACHED MAP TILES** - Online applications pull map tiles from providers like OpenStreetMap®\*. Pre-load tiles for offline applications or load your own custom made tiles. Once displayed, tiles are cached indefinitely.

**CONNECT YOUR DOTS** - Configure site-to-site connectors that simulate pipes, power lines, or other infrastructure. Appearance can change based on system variables. Add arrows, labels, or customized icons.

**MOBILE MAPPING** - VTScada Thin Clients (P. 7) support Slippy Maps on mobile devices.

\* Map tiles from commercial and open source websites may be subject to terms of license or use agreements, compliance with which is the user's responsibility.

## STICKY PAGE NOTES STANDARD

- Leave co-workers temporary messages and reminders.
- Add to any page or every page.
- Cover control elements to discourage use.
- Easy to create, format, and edit.
- Hide/show all notes with one click.



Posting and editing notes is a snap.

# SECURE MOBILE ACCESS

## VTScada THIN CLIENTS OPTIONAL

Monitor and control your process from any networked Windows PCs or any modern mobile device.

**SIMPLE LICENSING** - Clients are licensed by concurrent users and require one or more Runtime or Development Runtime licenses. Individual and bundled pricing available.

**FULLY INTEGRATED INTERNET SERVER** - Eliminates the need for third-party products like Apache® or Microsoft IIS®.

**CONFIGURE IN SECONDS** - No need to rebuild displays.

**MILITARY-GRADE ENCRYPTION** - Support for Transport Layer Security (TLS) protects application security data.

**THIN CLIENT MONITOR** - Displays and logs Thin Client activity. Send messages to clients or force disconnection. Logs user IP, computer name, screens viewed, session length.



See page 15 for OS and hardware requirements.



Choose the display format  
that best suits your  
device or data plan.



## ACCESS CLIENTS IN ONE OF THREE WAYS

### VTScada ANYWHERE CLIENT SMARTPHONES, TABLETS, PCS, MACS

A consistent workstation experience across any modern computer, smartphone, and tablet. Monitor and control your process and manage alarms in any HTML5 browser.

**EASY ON DATA** - 'Push' technology provides real-time data without overloading your mobile data plan.

**ZERO-FOOTPRINT** - Nothing to install. No Java either.

**NOTE:** You can run reports and view trends but not export their data to a file. Logged off sessions are not supported.

### VTScada INTERNET CLIENT (VIC) PCS AND LAPTOPS

An operational interface identical to a full-installation Runtime License. This includes monitoring, control, security, reports, trends, and alarm acknowledgment. Open connections from a desktop icon or a web link. Uses include:

**SECURE REMOTE PORTAL** - Log in from any online Windows PC.

**FLEXIBLE WORKSTATION** - A hassle-free alternative to Thick Clients.

### MOBILE INTERNET CLIENT (MIC) SMARTPHONES, TABLETS, PCS, MACS

Perfect for even the smallest screens and data plans, the MIC allows you to control your process and manage alarms with a touch or pinch from any HTML5-compliant browser. Refresh data manually or set a refresh rate that suits your cellular plan.

Easily switch between:

**TEXT-BASED** - This tactile easy-to-read text-and-trend interface makes the best use of smaller screens and data plans.

**FULL GRAPHICS** - See full-resolution displays on demand. Pinch to zoom in. Tap to set values, view tool tips, or plot trends.



Example of High Performance Graphics.

**HIGH PERFORMANCE OR HIGH IMPACT GRAPHICS**

Create muted or dynamic looking displays depending on your design philosophy. Dynamically color grey-scale graphics based on process values.

**FAMILIAR RIBBON INTERFACE** - Easily customize the context-sensitive toolbar.

**OVER 200 GRAPHIC 'WIDGETS'** - Recreate your process with photo-realistic meters, switches, and animations.

**EXTENSIVE GRAPHIC LIBRARY** - Includes over 4,500 industry-specific images, symbols, and polygons. Import JPG, BMP, PNG, WMF, and EMF files right from your desktop.

**AUTO ALIGNMENT** - Snap points effortlessly align and space your graphics for you.

**FLEXIBLE TAG DEVELOPMENT** - Lay out graphics first and create tags later or vice-versa. Search and replace any tag referenced by a page.

**THE VTScada IDEA STUDIO STANDARD**

**START CREATING GREAT DISPLAYS IN MINUTES**

Many projects lack the budget to create outstanding looking SCADA displays. Often, developers barely have time to get all the data on the screen.

The results can leave end users disappointed.

We designed VTScada to be instantly intuitive with a huge library of built-in drag-and-drop elements that are easily selected and aligned. Zoom in to focus on the fine details.

No more messy screens.



Drag-and-drop lighting effects.

**LIGHTING OVERLAY TILES** - Add depth to pages and direct the focus of operators.

**PHOTO REALISTIC BACKGROUND TILES** - Create a consistent look and divide pages into functional areas. Drag-and-drop over 100 patterns.

**STYLE SETTINGS TAGS** - Create consistent display conventions for groups of Widgets (e.g., red for "off" and green for "on"; or vice-versa).

**SIMPLE PIPE DRAWING** - Draw 3D pipes with just a few clicks. Use tag values or calculations to change appearance based on calculations or tag values.

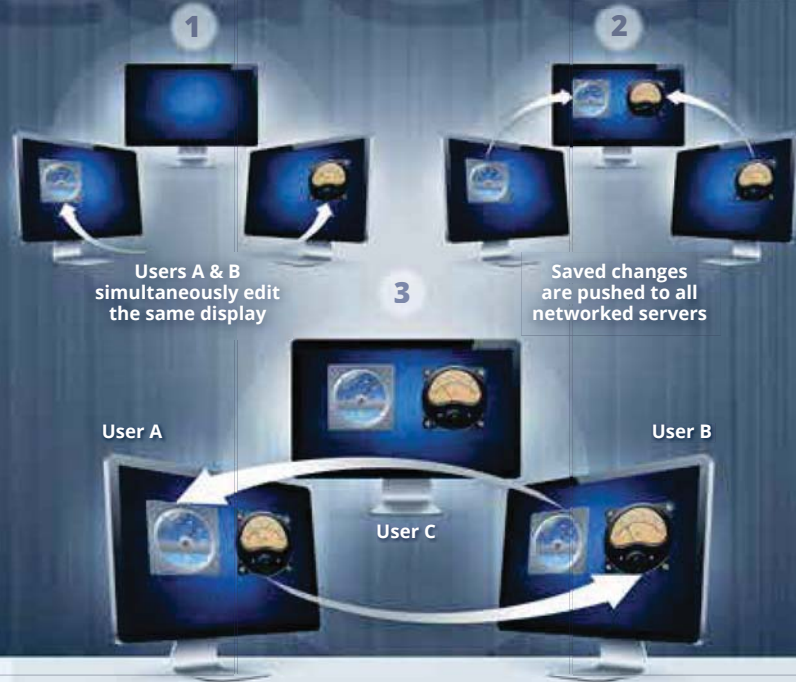
**BUILD ONCE, VIEW ANYWHERE** - Design for multiple monitor resolutions. Choose from full screen or pop-up displays. Configure dual or quad monitors in compatible computers. VTScada Thin Clients (P. 7) support full graphics on mobile devices.



## REAL-TIME CONFIGURATION STANDARD

Edit tags, displays, and application properties without interrupting your monitoring and control process.

- Work with live I/O.
- Apply changes without restarting.
- Multiple users can develop simultaneously.
- No configuration server required.
- Conflicts are resolved automatically.
- Push validated changes to all networked computers.
- Edit tags via VTScada Thin Clients.
- Edit server lists using VTScada Runtime Licenses.



## APPLICATION VERSION CONTROL (AVC) STANDARD IN DEVELOPMENT RUNTIME LICENSES

Unique to VTScada, AVC provides change traceability, enhances application management in networked environments, and greatly improves recovery from unexpected effects of configuration.

- See a history of all changes by all users on all servers.
- See side-by-side incremental changes in each version.
- Instantly switch to any previous good version.
- Merge changes in multi-developer environments.
- Undo specific changes without universal rollback.

Version	Time Applied
LAPTOP-D75	Mon May 30, 2016 19:45:10.876
LAPTOP-D74	Mon May 30, 2016 19:44:56.895
LAPTOP-D73	Mon May 30, 2016 19:43:26.169
LAPTOP-D72	Mon May 30, 2016 19:42:06.916
LAPTOP-D71	Mon May 30, 2016 19:40:47.077
LAPTOP-D70	Mon May 30, 2016 19:39:27.884
LAPTOP-D69	Mon May 30, 2016 19:38:08.018
LAPTOP-D68	Mon May 30, 2016 19:36:48.152
LAPTOP-D67	Mon May 30, 2016 19:35:28.352
LAPTOP-D66	Wed May 11, 2016 10:14:08.305
LAPTOP-D65	Wed May 11, 2016 10:16:34.956
LAPTOP-D64	Wed May 11, 2016 10:16:21.257
LAPTOP-D63	Wed May 11, 2016 10:16:11.446
LAPTOP-D62	Wed May 11, 2016 10:16:04.696
LAPTOP-D61	Wed May 11, 2016 10:15:53.635

VTScada Application Version Control.

## SIMPLE APPLICATION DEPLOYMENT STANDARD

**VTScada ChangeSets** - Easily distribute new or updated applications to multiple computers with one file. Easily generate ChangeSet files to share with your support team via email, FTP, or memory stick. Create and apply ChangeSets without system restart.

- Reuse work by cloning existing applications.
- Backup/restore applications with version history.
- Update OEM layers without affecting end user applications.

## ADVANCED CUSTOMIZATION

**SCRIPTING LANGUAGE** - In addition to drag-and-drop tools, VTScada provides a powerful object-oriented scripting language (similar to C++) that allows unlimited customization. Saved code changes are recorded in the Application Version Control system and can only be imported by authorized developers.

Examples include custom services (e.g., to start tasks or watch for events), custom tag types, custom drivers, and custom API calls to third-party software products.

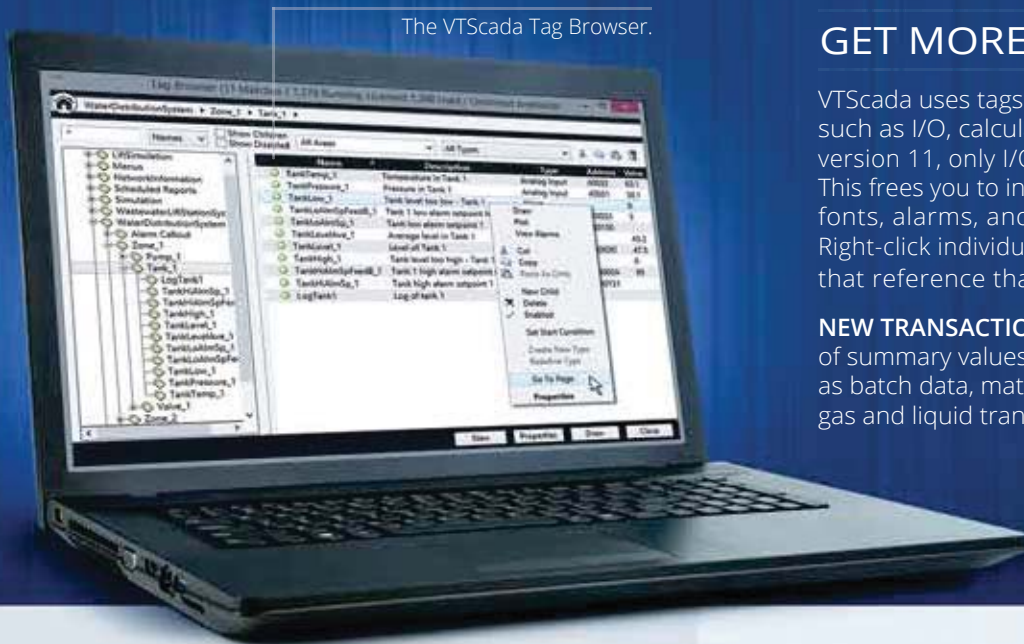
### SCRIPTING DEBUGGING TOOLS

- Million thread history with dead thread identification.
- Tracing of all VTScada activities.
- View device driver error stats and sent/received.
- Source Debugger highlights what code has been run/tested.

### SOFT LOGIC CONTROL

Alternative data sources for output controls:

- Deadband tags with delay and hysteresis (deadbanding).
- Calculation tags with mathematical and logical functions.
- Expression tags with complex scripting logic.



The VTScada Tag Browser.

## GET MORE FROM YOUR TAGS

VTScada uses tags to manage application resources such as I/O, calculations, alarms, and menus. Since version 11, only I/O counts towards your tag count. This frees you to include any number of menu items, fonts, alarms, and other configuration tag types. Right-click individual tags to plot data or view pages that reference that value.

**NEW TRANSACTION LOGGER** - Records a collection of summary values representing a transaction, such as batch data, material-handling operations, or bulk gas and liquid transfers.

## HIGH-EFFICIENCY TAG DEVELOPMENT

- **TAG EXPORT** - Create and edit tags outside of VTScada via Access<sup>®</sup>, Excel<sup>®</sup>, SQL Server<sup>®</sup>.
- **MULTI-WRITE TAG** - Writes up to 50 outputs with one action. Useful for starting HMIs or replacing PLCs.
- **HISTORY STATISTICS TAG** - Displays calculated values.
- **TRIGGER TAG** - Initiates actions based on time or changes.
- **MANUAL TAG VALUES** - Test systems without live I/O.
- **RATE-OF-CHANGE TAG** - Detects rapid value changes (e.g., leaks) or lack of changes (e.g., failed pumps or valves).
- **INTEGRATED ALARMS AND LOGGING** - Built into certain analog and digital tag types.
- **ADVANCED PUMP STATUS TAGS** - Built-in High/Low Alarms. Delays reduce alarms for minor changes.
- **LOG ON CHANGE** - Only save meaningful data to the DB.
- **'QUESTIONABLE' FLAGS** - Flag new I/O while commissioning.

## HIERARCHICAL TAG STRUCTURES

**VTScada TAG BROWSER** (above) - Create and edit tags in this intuitive interface. Configure reusable tag structures that model how real-world elements relate. For example, a pump tag can be an assembly of I/O and communication drivers or a lift station can have multiple pumps.

**CLONE WHOLE SUBSYSTEMS** - Simply copy the parent tag. Copied tags automatically reference their new scope.

**MULTI-TAG SELECTION** - Saves time when copying, enabling, disabling, or deleting tags. Rename and reorganize tags without losing their history, page references, or alarms.

## REUSABLE TEMPLATES - TAGS & GRAPHICS

**REUSABLE PAGE TAG TEMPLATES** - Combinations of tag structures and graphics that simplify configuration of applications with similar assets.

**BUILT-IN TEMPLATES** - Use pre-defined Page templates for these two Remote Telemetry Units (RTU) which have consistent configurations from device to device:

- Xylem MultiSmart<sup>®</sup>
- MPE Pump Controllers<sup>®</sup>

Also useful for similar devices or as examples.

**TEMPLATES INCLUDE:** Alarms, analog and digital inputs, digital controls, analog setpoints, counters and runtime totalizers, data age, communication link status, latitude/longitude with slippy maps support, summary starts/stops.



A Pre-made Lift Station Template.



## REDUNDANCY AND AUTOMATIC FAILOVER

Protect your process with the most reliable, comprehensive, and user-friendly approach to SCADA redundancy.

### SCADA SERVERS

In seconds, configure any computer running a Runtime or Development Runtime license to be a redundant hot backup server that can take over polling and data logging should the primary server go offline.

### INTERNET SERVERS

If a Thin Client server goes offline, client connections seamlessly switch to the next designated server.

### HISTORICAL AND CONFIGURATION HISTORY

Each server maintains a synchronized copy of the application's tags, displays, security settings, scripts, networked variables, configuration history, and historical database.

### ALARM MANAGEMENT

Applications now support any number of distributed synchronized Alarm and Event databases.

### I/O CONNECTIONS

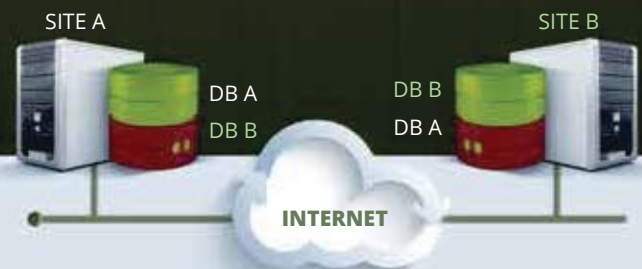
If a communications network or I/O device fails, VTScada's Driver Multiplexer can automatically fail over to a backup.



Automatic Server Failover (Application and Thin Client Servers)



Failover to redundant networks or devices.



Redundant geographically separated Historians.

## REAL-TIME SYSTEM BACKUP

### HISTORY AND CONFIGURATION

Integrated architecture and fast networking allows every SCADA server to be a real-time copy of the whole application including:

- The latest configuration history.
- Up-to-the-second historical data.
- Alarm, Event, and Tag databases.

Each distributed server is an off-site disaster backup. Requires multiple VTScada Licenses.



## SCADA SOFTWARE AS A SERVICE

### RUN VTScada WITHOUT A LOGGED-ON WINDOW USER

- Useful when IT policy forbids unattended logged-on Windows users.
- VTScada service automatically starts with Windows®.
- No logged-on user required.

## SERVER AND NETWORK HEALTH MONITORING

Monitor and alarm critical computer resources (e.g., CPU usage, virtual memory used, hard drive space) and network status.



An example of a custom Workstation Health Dashboard.



## BUILT-IN DATA LOGGING STANDARD

The VTScada Historian is part of every application. Tags receiving data begin logging automatically.

**BUILT FOR SPEED** - The Historian can log up to 4,000 values/sec. Remote Historians sync across a WAN at up to 160,000 values/sec.

**PROTECTING HISTORICAL DATA** - Create multiple synchronized historians at multiple sites.

**THIRD-PARTY DATABASE SUPPORT** - In addition to the native Historian, VTScada also supports other industry standard database formats (left).

**EFFICIENT LOGGING** - Log on time of day or changes in value. Use deadbands and delays to avoid recording irrelevant changes in values.

## ENTERPRISE CONNECTIVITY PACKAGE STANDARD IN DEVELOPMENT RUNTIME LICENSES

**OPC SERVER** - Allows OPC-compliant programs (including other VTScada applications with OPC clients) to exchange live data to and from a standard VTScada application.

**OPC CLIENT** - Allows VTScada applications to exchange live data with an OPC-compliant server (including VTScada applications with configured OPC servers).

**ODBC SERVER** - Use popular software like XLReporter®, Dream Report®, SAP Crystal Reports®, Microsoft Access®, or Excel® to extract system data from your application. VTScada acts as a database where each logged tag represents a table of timestamps and values that reporting software can query to retrieve logged values. XLReporter® and Dream Report® both feature integrated interfaces to VTScada.

**VTScada WEB SERVICES** - This SOAP (XML) interface allows business systems to request real-time and historical data from VTScada. Supports time/date ranges, min, max, time of min, time of max, average, total, and SQL that include SELECT commands and WHERE clauses.

## MODEM MANAGEMENT

- Pool modems across servers for improved efficiency.
- Includes a custom Unimodem driver.
- Supports logging of modem activities.
- Configure dedicated modems for functional areas.
- Data and Alarm Notification routed to appropriate voice/data modem(s) or email servers. No configuration necessary.
- Display modem events, usage stats, and modem status.

## NON-PROPRIETARY CONNECTIVITY DEVICE DRIVER LIBRARY STANDARD

### CONNECT TO ANY COMBINATION OF HARDWARE

Out-of-the-box, VTScada supports over 100 industry standard and proprietary I/O protocols, each with built-in communications alarms. Use OPC by choice, not necessity. We can also create new drivers to meet specific needs.

- **COMMON PROTOCOLS** - DNP3, DF1, Modbus (serial, TCP/IP, RTU), OPC, SNMP, DDE
- **DATA LOGGER PROTOCOLS**- Enron Modbus, Campbell Scientific Pakbus, Stevens
- **PROPRIETARY DEVICES** - Motorola, GE, Siemens, Omron, BSAP, DFS, Dexter Fortson
- **RADIO DIAGNOSTICS DRIVERS** - MDS, DataRadios®

## NATIVE POLLING DRIVER STANDARD

Integrated polling eliminates the need for a master PLC device reducing hardware costs, integration time, and points of failure. VTScada simplifies device communications by automatically organizing scheduled polling cycles and communications channels. Reduce the number of required radios by transmitting multiple protocols on a single communications link.

- Configure any number of polling groups.
- Select 'Fast Polling' rate for specific RTUs.
- Poll by external triggers, on schedule, or on command.
- Enable or disable polling in any polling driver.
- Display min, max, and average values.

## MORE CONTROL, LESS COMPLEXITY STANDARD

VTScada makes security management simple, scalable, and infinitely configurable. Authorized users can manage security within the standard operator interface, then instantly deploy their changes across the entire system without restarting.

### WINDOWS® SECURITY INTEGRATION (OPTIONAL)

- Configure VTScada to use your Windows log-in account.
- No need to manage Windows and VTScada accounts.

### PROXIMITY CARD READERS

- Log on the same way you enter a secured building.
- Configure Operator Notes to require authentication.



## A SMARTER APPROACH TO ACCOUNT MANAGEMENT

Each application includes security accounts and settings that control system-wide access to workstations, Thin Clients, and alarm notification. Rather than choosing from an ever-growing list of privileges, VTScada uses 'Rules' and 'Roles' to allow you to quickly generate and manage highly-specialized user accounts.

**RULES** - A combination of tags, privileges, and locations that allows you to finely tune what users can do and from where. Grant different users access to different areas without creating new privileges.

**ROLES** - Combinations of Rules and other Roles that match the duties of specific jobs (e.g., Plant 1 Operator).

## UNPARALLELED TRACEABILITY

**OPERATIONS** - Operator activity such as setpoint changes, log on/off, and security modifications are recorded as events in the Alarm Manager (P. 5). This includes actions performed via servers, Thin Clients, and the Alarm Notification System.

**CONFIGURATION** - Integrated Application Version Control (P. 9) automatically tracks all changes on all workstations. It detects manual changes to configuration files made by unauthorized users or malware, and automatically restores them. Repository includes hash codes to detect attempts to modify it.

**REMOTE ACCESS** - Thin Client Monitor (P. 7) displays and logs remote activity and allows you to message or disconnect clients. Logs user IP, computer name, screens viewed, and session length.

## ADVANCED ENCRYPTION AND NETWORK PROTECTION

- **INDUSTRY-STANDARD SECURITY** - Security Manager complies with industry-standard RFCs for security.
- **MILITARY-GRADE ENCRYPTION** - For the Security Database and security credentials passed between clients and servers.
- **ENCRYPTED NOTES** - Time-stamped operator and trend notes cannot be deleted or modified.
- **HASHED USER PASSWORDS** - Passwords are never held in a form that anyone can decrypt and recover.
- **TLS/VPN SUPPORT** - Thin Clients support Transport Layer Security (TLS), firewalls, and VPN access.
- **TLS EMAIL SUPPORT** - The Alarm Notification System (P. 5) supports SMTP email servers requiring TLS (e.g., Gmail®).
- **BLOCK/ALLOW IP ADDRESSES** - Optionally control which IPs may or may not connect to your application.
- **CODE TAMPERING DETECTION** - On startup, VTScada automatically detects unauthorized changes to source files, and restores the currently approved files from the tamper-proof repository.
- **SERVER AND PORT FAILOVER** - Easily configure automatic failover for SCADA servers and communication ports.



The VTScada Support Team

## THE VTScada SUPPORT TEAM

If you have ever been frustrated while trying to access help from a major supplier, you will find our approach to be a refreshing change.

Our team of developers, programmers, and engineers provide the most accessible, reliable, and comprehensive support in the industry.

That is why our customers keep coming back for upgrades, enhancements, and consulting services as their facilities grow and their needs evolve.

Note: Support packages do not include hardware troubleshooting, training, or system design.

## CHOOSE THE LEVEL OF SUPPORT YOU NEED

TYPE	COVERAGE	PRICE	INCLUDES
<b>SupportPlus Service</b>	First 90-days Monday to Friday 8 to 4 PM EST	Included with software purchase.	<ul style="list-style-type: none"> <li>VTScada software specific (Non-application specific)</li> <li>Phone, fax, and email support</li> <li>Seamless version compatibility</li> <li>Product upgrades and value protection</li> </ul>
<b>SupportPlus Service Yearly Renewal</b>	Annual Monday to Friday 8 to 4 PM EST	15% of purchase price so long as support never lapses.	<ul style="list-style-type: none"> <li>VTScada software specific (Non-application specific)</li> <li>Phone, fax, and email support</li> <li>Seamless version compatibility</li> <li>Product upgrades and value protection</li> </ul>
<b>SupportPlus Service Re-instatement</b>	Annual Monday to Friday 8 to 4 PM EST	15% per lapsed year, cumulative up to 75%, on current license value. Recalculated license value carries forward.	<ul style="list-style-type: none"> <li>VTScada software specific (Non-application specific)</li> <li>Seamless version compatibility</li> <li>Product upgrades and value protection</li> </ul>
<b>SupportPlus 24/7 Emergency Support</b>	Annual 24/7	5% of license value (min \$1,200)	<ul style="list-style-type: none"> <li>VTScada software specific (Non-application specific)</li> <li>Phone, fax, and email support</li> <li>Requires active SupportPlus contract</li> <li>Nights, weekends, holidays</li> </ul>
<b>SupportPlus Premium 8/5</b>	Annual Monday to Friday 8 to 4 PM EST	Based on application Contact Trihedral	<ul style="list-style-type: none"> <li>Dedicated support team trained on your application</li> <li>Guaranteed response times</li> <li>Remote application access for hands-on diagnostics</li> <li>Unlimited email and phone support</li> </ul>
<b>SupportPlus Premium 24/7</b>	Annual 24/7	Based on application Contact Trihedral	<ul style="list-style-type: none"> <li>Dedicated team trained on your application</li> <li>Unlimited email and phone support</li> <li>Guaranteed response times</li> <li>Remote application access for hands-on diagnostics</li> </ul>
<b>Ad-hoc Support</b>	Hourly As contracted Contact Trihedral	Standard hourly rate plus expenses.	<ul style="list-style-type: none"> <li>Application-specific support</li> <li>On-site, email, phone</li> </ul>

## SOFTWARE TRAINING COURSES

Courses are available at our Bedford and Orlando training facilities or on-site anywhere in North America upon request.

**OPERATION & CONFIGURATION** - An introduction to VTScada for SIs, OEMs, consultants, operators, maintenance, and IT staff.

**INTRODUCTION TO SCRIPTING** - Customization and configuration using VTScada Script for advanced developers.

**ADVANCED CONFIGURATION AND SCRIPTING**

For advanced system integrators and OEMs

Custom courses can be created based upon specific requirements.

See available courses: [Trihedral.com/training](http://Trihedral.com/training)

# HARDWARE AND OS REQUIREMENTS

## FOR INSTALLED RUNTIME OR DEVELOPMENT RUNTIME LICENSES

Actual requirements depend upon your specific application. Visit [www.trihedral.com](http://www.trihedral.com) for the latest requirements.

### MINIMUM REQUIREMENTS

#### Servers or Workstation PCs

- 32-bit or 64-bit Windows Operating System
- 2GHz dual-core processor
- 20GB free hard drive space
- 8GB RAM

#### Laptops, Tablet PCs, and Panel PCs

- 32-bit or 64-bit Windows Operating System
- 2GHz dual-core processor
- 20GB free hard drive space
- 4GB RAM

## RECOMMENDATIONS

- 64-bit versions of Windows (you can run 32-bit VTScada on 64-bit OS).
- 3GHz dual or quad core processors (higher clock speeds help, more cores don't).
- 16GB or more of RAM for systems over 100,000 tags.
- Use Solid State Drives (SSD) for the highest performance.
- Keep historian on a separate hard drive from VTScada and the OS.
- Windows-compatible printer to print VTScada pages or reports.
- 100MB/1GB Ethernet is required for networking.
- Alarm Notification System needs a voice modem for voice phone notifications.
- Sound card and speakers are required for alarm annunciation.
- RS-232 port if needed for communications with serial I/O devices.
- When running VTScada on a virtual server, avoid running other virtual servers on the same computer.
- WAP was removed in version 11.2. Use VTScada Thin Clients instead.

## COMPATIBLE OPERATING SYSTEMS BY VERSION

VTScada Version	Win 10 32 & 64-Bit	Win 8.1 32 & 64-Bit	Win 8.0 32 & 64-Bit	Win 7 64-Bit	Win 7 32-Bit	Vista 64-Bit	Vista 32-Bit	Server 2012 (+R2)	Server 2008 (+R2)	Server 2003	XP
8.X					✓		✓		✓	✓	✓
9.X				✓	✓	✓	✓		✓	✓	✓
10.X		✓	✓	✓	✓	✓	✓	✓	✓ <sup>1.</sup>	✓ <sup>2.</sup>	✓ <sup>3.</sup>
11.X	✓	✓	✓	✓	✓	✓	✓	✓	✓ <sup>1.</sup>	Thin Client Only	Thin Client Only

Windows 7 Embedded® has been tested for some Panel PC implementations. Contact us for details.

### PLEASE NOTE

- No NetDDE for Windows Vista and higher (removed in XP SP2).
- VTScada 10 uses IANA registered TCP/IP port 5780 (not 1160). Configure your firewall to route RPC traffic accordingly.
- When reusing internal devices like modems or sound cards, ensure the new computer has the correct motherboard slots.
- Make sure the third-party software you use with VTScada (e.g., accounting or reporting) is compatible with the new OS.
- Ensure new operating systems have drivers for your modems.
- Visit [www.trihedral.com](http://www.trihedral.com) for recommended modems.

1. Server 2008 computers can require speakers or audio cards for Alarm Notification functionality. Manual modem configuration may be required.

2. Server 2003 requires this hotfix to be installed:  
<http://support.microsoft.com/kb/938397>

3. XP requires Service Pack 3 or higher.

## FOR THIN CLIENTS ON SMART PHONES, TABLETS, DESKTOPS, AND LAPTOPS

Requires network access to one or more installed VTScada licenses with Thin Client access enabled and configured.

### WINDOWS DESKTOP/LAPTOP SYSTEMS

#### The VTScada Internet Client (VIC)

Access clients from networked computers running Windows Server 2003 or newer (no VTScada installation required).

- Launch from desktop icon - On first connection, download a small program from the VTScada server.
- Launch using a URL in Internet Explorer - Ensure ActiveX is enabled.

### OTHER OPERATING SYSTEMS

#### VTScada Anywhere Client and Mobile Internet Client (MIC)

**HTML5-compliant browsers.** We recommend the latest versions of:

- Safari® (OS X, iOS)
- Chrome® (Windows®, iOS®, Android®)

#### Other HTML5-compliant browsers

- Microsoft Edge® (Windows®)
- Opera® (Windows®, iOS®, Android®)
- Firefox® (Windows®, iOS®, Android®)
- Internet Explorer Mobile® (Windows Mobile®)

# EASY TO TRY

## VTScada TRIALS AND DEMOS

We believe the best way to understand how VTScada is instantly intuitive is to use it.

To get started, we invite you to visit our website.  
**[www.trihedral.com](http://www.trihedral.com)**

Press the button on the front page to launch an on-line demo or download our 90-day trial.

You can also use the links below.

If you have any questions, don't hesitate to call.

**1-800-463-2783**  
Toll-free in North America



### FULL 90-DAY TRIAL

In just minutes, download a full version of VTScada to install on your Windows PC. One installation provides you with all core SCADA components. Use the instantly intuitive Idea Studio to create professional-looking custom screens.

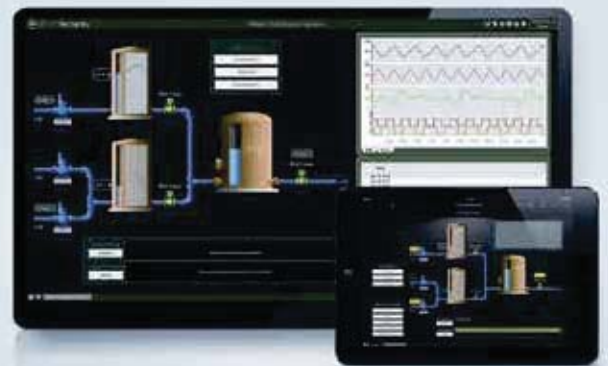
**[www.trihedral.com/trial](http://www.trihedral.com/trial)**



### ONLINE DEMOS

Instantly explore working SCADA applications without installing VTScada. This fully functional Thin Client operator interface includes alarms, trends, maps, and industry-specific displays from real-world applications.

**[www.trihedral.com/demo](http://www.trihedral.com/demo)**



### CONTACT US

**Visit [www.trihedral.com](http://www.trihedral.com)**

**Write [info@trihedral.com](mailto:info@trihedral.com)**

**Call 1.800.463.2783 (North America)**

Corporate Headquarters.....	Bedford, Nova Scotia, Canada.....	1.902.835.1575
Western Canada Office.....	Calgary, Alberta, Canada.....	1.403.921.5199
South Eastern USA Office.....	Orlando, Florida, USA.....	1.407.888.8203
South Western USA Office.....	Houston, Texas, USA.....	1.800.463.2783
European Office.....	Aberdeen, Scotland, UK.....	+44 (0) 1224 258910

Updated July 29, 2016

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**Quotation**

Quote Number Q11328  
 Terms Net 30 Days  
 Date 12-05-2016  
 Sales Person Alan Hudson  
 Valid Until 01-04-2017  
 Tax Info. Tax ID# 26-0449423

**Bill To**  
 Dave Abel  
 Revere Control Systems - AL  
 2240 Rocky Ridge Road  
 Birmingham, AL 35216  
 USA

**Ship To**  
 Dave Abel  
 Revere Control Systems - AL  
 2240 Rocky Ridge Road  
 Birmingham, AL 35216  
 USA

**New License - City of Franklin, TN**

#	Qty.	Product	Unit Price	Ext. Price
1	1	VTScada 10K - Runtime - New - Includes Three Months of SupportPlus	\$ 4,095.00	\$ 4,095.00
2	1	VTScada 10K - Alarm Notification - New - Includes Three Months of SupportPlus	\$ 2,095.00	\$ 2,095.00
3	1	SupportPlus - Additional Nine Months	\$ 696.42	\$ 696.42

Proposed Maintenance Expiry Date: Three Months or One Year from Purchase Date  
 License Value for Renewals: \$6,190.00

**Quotation Totals**

Currency: US Dollar  
 Subtotal: \$ 6,886.42  
 Total: \$ 6,886.42

**Terms and Conditions:**

VTScada is licensed exclusively in accordance with the VTScada Software License Agreement (Standard Conditions) and the VTScada Software Standard Support Services Agreement (Standard Conditions) available from <https://www.trihedral.com/license-agreement>.

VTScada support and upgrade pricing are in accordance with the previously accepted license agreement terms and any differing purchase order terms proposed will not be accepted without written agreement by Trihedral.

The SupportPlus renewal quote contains grandfathered pricing that is contingent upon the receipt of a purchase order before the quote expiry date (as agreed to under the VTScada license terms of the original license). Purchase orders received with an alteration of previously accepted terms, or after the quote expiry date, will require a re-quote of the renewal price at current pricing.

**Quotation Accepted By**

Quote Number Q11328

Print Name \_\_\_\_\_

Title \_\_\_\_\_

Signature \_\_\_\_\_

Date \_\_\_\_\_

## **CONSTRUCTION CHANGE AUTHORIZATION (WORK ORDER)**

**TO:** Mr. David Abel  
Project Manager  
Revere Control Systems  
2240 Rocky Ridge Road  
Birmingham, AL 35216  
(205) 824-0004

**FROM:** CDM Smith  
3715 Northside Parkway NW  
Building 300, Suite 400  
Atlanta, GA 30327  
(404) 720-1400

**DATE:** June 8, 2017

**PROJECT:** City of Franklin, Tennessee  
Water Distribution and Collection Systems SCADA Improvements

**WORK ORDER NUMBER:** 002                      **CDM SMITH PROJ. NO.:** 14915-96594

**SUBJECT:** Modification of Existing Pump Control Panels to Add Remote Pump On/Off Capability                      **CITY PROJECT NO.:** 2014-0288

**REFERENCE:** April 26, 2017 Revere Control Proposal (attached)

### DESCRIPTION:

The purpose of this Field Order is to direct Revere Control Systems to modify pump control panels at 29 of the existing remote sites to add the ability to turn pumps on and off remotely via the new RTU and VTSCADA application. The scope and the sites that will be modified are identified in the attached proposal.

The work shall be performed for a lump sum price of \$61,004. In addition, an unanticipated conditions allowance of \$3,000 is established. Work under the allowance must be pre-approved by the Engineer. Measurement and payment for the lump sum component shall be as follows:

- Site Investigation and Wiring Diagrams – \$13,578 paid upon completion of all work.
- Site Modifications for Two Pump Sites (27 sites) - \$1,330 to be paid upon completion of each site.
- Site Modifications for Westhaven Site - \$1,468 to be paid upon completion of the work at the Westhaven site.
- Site Modifications for Goose Creek/Red Wing Site - \$1,605 to be paid upon completion of the work at the Goose Creek/Red Wing Site.



- Field Service Portal to Portal Labor and Expenses - \$292 to be paid upon completion of each of the first 28 sites and \$267 to be paid upon completion of the 29<sup>th</sup> site.

The work under this Work Order must be completed 30 calendar days prior to the contractual final completion date.

ATTACHMENTS: April 26, 2017 Revere Controls Proposal (attached)

CDM SMITH:

CONTRACTOR:

By: \_\_\_\_\_

By: Paul Kal

Date: \_\_\_\_\_

Date: 6/9/2017



# Existing Pump Controls Remote On-Off Modification City of Franklin Water Management Department

April 26, 2017

CDM Smith  
3200 Windy Hill Road, S.E.  
Suite 210 West  
Atlanta, Georgia 30339-5460

Attn: Mr. Robert Huguenard, PE, BCEE

Ref: City of Franklin Water Management Department  
Collections and Distribution Telemetry SCADA System

Subj: Proposal to Modify Existing Pump Control Panels to Add Remote Pump On Off, Rev 1  
COF Contract No. 2014-0288

Mr. Huguenard:

We are pleased to provide a proposal for the above referenced project. Work includes the following:

1. Investigation of pump control panels and any other existing controls at each of the remote sites to determine which sites allow or lack the ability to accommodate remote manual start and stop commands from the new RTU and VTSCADA application.
2. Prepare a general scope and cost for each site to include the materials and labor necessary to modify the controls to allow remote manual control. The modified controls shall allow override start and stop commands whenever the pump controls are neither in HAND or OFF at the local pump control panel.

## **I. Site Investigation and Wiring Diagrams**

### **Labor**

Project Management.....	4 Hours .....	\$148/Hr .....	\$ 592
Engineering Lead .....	72 Hours .....	\$148/Hr .....	\$ 10,656
CAD .....	16 Hours .....	\$72/Hr .....	<u>\$ 1,152</u>
(40 hours onsite, 8 hour portal-to-portal from Birmingham, AL, 24 hours diagrams) Labor Total:			\$ 12,400

### **Expenses**

Mileage.....	372 Miles.....	\$0.54.....	\$ 201
Food and Lodging .....	5 Days.....	\$174.....	\$ 870
(40 hours onsite, 8 hour portal-to-portal from Birmingham, AL)			
Subtotal:			\$ 1,071
10% Profit:			<u>\$ 107</u>
Expenses Total:			\$ 1,178

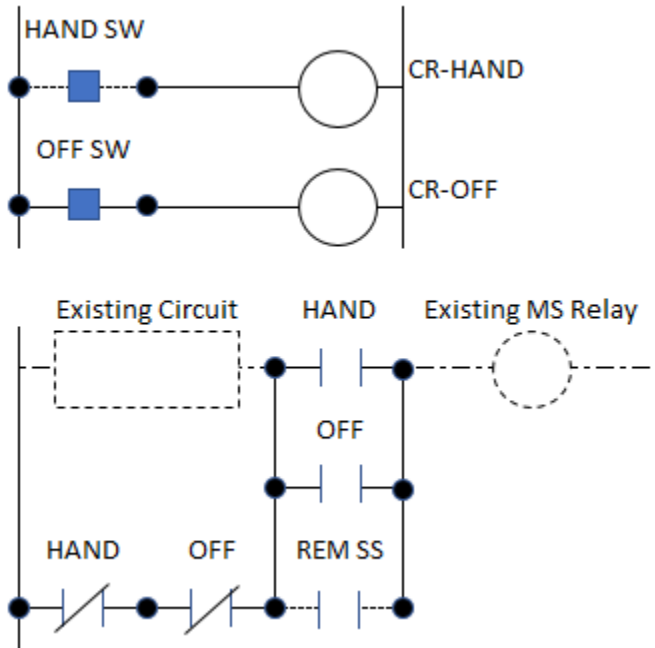
### **Materials**

None .....			\$ 0
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Lump Sum Price ..... \$ 13,578

**II. Site Modification**

Each pump circuit that can be modified shall be based on the basic circuit shown below:



If possible, contact blocks will be added to the existing H-O-A. If not possible, the existing H-O-A switch will be replaced with a switch that can support multiple blocks. Two (2) relays and wire will be added to the existing circuit. Prior to work, Revere shall coordinate with the City of Franklin for up to one (1) day of downtime to install the switch blocks (or switch), relays and wire to the existing circuit.

**Per Site Work (2 Pump Panel – see list of sites on last page):**
**Labor**

Field Service ..... 8 Hours ..... \$108/Hr .....\$ 864

**Material and Expenses**

Food and Lodging ..... 1 Days..... \$174.....\$ 174

Switch Bocks, Relays, misc.....\$ 250

Subtotal: \$ 424

10% Profit: \$ 42

M&E Total: \$ 466

Per site price (excluding portal-portal travel hours and expenses) .....\$ 1,330



Existing Pump Controls Remote On-Off Modification  
City of Franklin Water Management Department

**Per Site Work (3 Pump Panel – Westhaven):**

**Labor**

Field Service ..... 8 Hours ..... \$108/Hr .....\$ 864

**Material and Expenses**

Food and Lodging ..... 1 Days..... \$174.....\$ 174

Switch Bocks, Relays, misc.....\$ 375

Subtotal: \$ 549

10% Profit: \$ 55

M&E Total: \$ 604

Per site price (excluding portal-portal travel hours and expenses) .....\$ 1,468

**Per Site Work (4 Pump Panel – Goose Creek/Red Wing):**

**Labor**

Field Service ..... 8 Hours ..... \$108/Hr .....\$ 864

**Material and Expenses**

Food and Lodging ..... 1 Days..... \$174.....\$ 174

Switch Bocks, Relays, misc.....\$ 500

Subtotal: \$ 674

10% Profit: \$ 67

M&E Total: \$ 741

Per site price (excluding portal-portal travel hours and expenses) .....\$ 1,605

**Field Service Portal-Portal Expenses (based on average 5 sites per week, est. 8 trips):**

**Labor**

Field Service ..... 64 Hours ..... \$108/Hr .....\$ 6,912  
(8 hour portal-to-portal from Birmingham)

**Material and Expenses**

Food and Lodging ..... 8 Days..... \$174.....\$ 1,392

10% Profit: \$ 139

Expenses Total: \$ 1,531

Field Service Portal-Portal Travel Expenses .....\$ 8,443



**Labor and Material Allowance for Unanticipated Conditions**

The material costs and labor included in the estimate for the actual implementation is an estimate based on the information available to Revere at this time. Upon completion of the field investigation, we will be able to determine if additional materials and labor are required to complete the task. Since the exact conditions cannot be predicted until the field investigation is performed, we propose establishing a \$3,000 allowance. Use of allowance funds shall require Engineer preauthorization.

**2 Pump Sites (based on submitted I/O List):**

Amelia, Avalon 3, Avalon 4, Breezeway 1, Breezeway 2, Carters Creek, Cheekwood, Cotton Lane, Falcon Creek, FieldStone Farms 2, Forest Crossing 1, Forest Crossing 2, Founders Pointe, Hillsboro Road, Holiday Inn, Ivy Glenn, Ladd Park, McKays Mill, Moore’s Lane, Old Hillsboro Road, Riverview, Rodgershire, Royal Oaks, SE Corridor, The Meadows, Treemont 1, Treemont 2

**III. Price Summary**

Engineering Site Investigation and Wiring Diagrams .....	\$ 13,578
27 2-pump sites, Goose Creek and Westhaven .....	\$ 38,983
Field Service Travel Labor and Expenses .....	\$ 8,443
Unanticipated Conditions Allowance .....	\$ 3,000
	Total: \$ 64,004

If resources allow, site work on the existing pump control panels shall be scheduled to be complete by substantial completion; however, substantial completion is not contingent on completion of this work. Work shall be complete by Final Completion.

Terms and Conditions from the current contract agreement apply.

Sincerely,

*David Abel*

David Abel, PMP  
Municipal Project Manager  
Revere Control Systems, Inc.  
Phone: 615-604-1579  
[dabel@reverecontrol.com](mailto:dabel@reverecontrol.com)

**CONSTRUCTION CHANGE AUTHORIZATION (WORK ORDER)**

**TO:** Mr. David Abel  
Project Manager  
Revere Control Systems  
2240 Rocky Ridge Road  
Birmingham, AL 35216  
(205) 824-0004

**FROM:** CDM Smith  
3715 Northside Parkway NW  
Building 300, Suite 400  
Atlanta, GA 30327  
(404) 720-1400

**DATE:** July 27, 2017

**PROJECT:** City of Franklin, Tennessee  
Water Distribution and Collection Systems SCADA Improvements

**WORK ORDER NUMBER:** 003  
**CDM SMITH PROJ. NO.:** 14915-96594

**SUBJECT:** RTU Installation Changes  
**CITY PROJECT NO.:** 2014-0288

**REFERENCE:** June 16, 2017 Revere Control Proposal (attached)

**DESCRIPTION:**

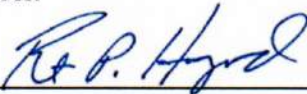
Stone and Sons, Revere Control Systems electrical subcontractor, has identified several sites where either the existing stands are inadequate to support the new RTU or a new location and stand are required. The purpose of this Field Order is to direct Revere Control Systems to perform certain RTU installation changes. The scope of work for the changes is detailed in the attached proposal dated June 16, 2017. The attached proposal identifies the scope of work for each site along with the associated cost for each site. The work shall be performed for a lump sum price of \$56,329.74. Application for payment for each site may be made when the work for that site is completed.

There will be an impact to the substantial completion date associated with this work, however, the schedule impact associated with this work order overlaps with schedule impacts associated with other work orders. Therefore, assigning a number of days of delay individually for the work orders is not possible. A separate work order will be issued to establish a single change in the substantial completion date. Revere Control will submit a change order request providing justification for a substantial completion date change. No change to the Final completion date will be issued.

**ATTACHMENTS:** June 16, 2017 Revere Controls Proposal (attached)

**CDM SMITH:**

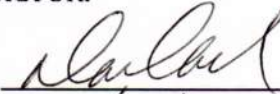
By:



Date: July 27, 2017

**CONTRACTOR:**

By:



Date:

7/31/2017

June 16, 2017

CDM Smith  
3200 Windy Hill Road, S.E.  
Suite 210 West  
Atlanta, Georgia 30339-5460

Attn: Mr. Robert Huguenard, PE, BCEE

Ref: City of Franklin Water Management Department  
CDM Project Number 14915-96594-SCADA  
COF Contract No. 2014-0288

Subj: RTU Installation Changes

Mr. Huguenard:

Our electrical subcontractor, Stones and Sons, has identified several sites where either the existing stands are inadequate to support the new RTU or a new location and stand are required. The labor to make these adjustments constitute approximately 550 man hours to their scope of work and may impact meeting the substantial completion date if revising the order of installation cannot accommodate the added work. Below and attached are descriptions of the added work and backup documentation:

1. **Fieldstone Farms SW**  
Add new RTU stand, install new antenna, conduit and wire to existing Horner Control Panel  
Labor and Material ..... \$ 5,831.48  
10% Profit: \$ 583.15  
Total: \$ 6,414.63
2. **Avalon Repeater**  
New RTU stand next to tower  
Labor and Material ..... \$ 4,108.42  
10% Profit: \$ 410.84  
Total: \$ 4,519.26
3. **Carter's Creek Pike**  
Modify strut rack to accommodate new RTU size  
Labor and Material ..... \$ 2,724.16  
10% Profit: \$ 272.42  
Total: \$ 2,996.58
4. **Carter's Creek Tank**  
Existing stand cannot support new RTU; replace in place new stand  
Labor and Material ..... \$ 2,308.29  
10% Profit: \$ 230.83  
Total: \$ 2,539.12
5. **Falcon Creek**  
Replace existing stand in place; RTU will face the opposite direction for proper clearance from fence  
Labor and Material ..... \$ 2,552.09  
10% Profit: \$ 255.21  
Total: \$ 2,807.30

6. **Fieldstone Farms 2**  
 Modifying strut rack to accommodate new RTU size  
 Labor and Material ..... \$ 1,700.23  
 10% Profit: \$ 170.02  
 Total: \$ 1,870.05
  
7. **Forrest Crossing 1**  
 Existing RTU in 480V panel; new RTU stand to the right when entering the gate  
 Labor and Material ..... \$ 4,590.80  
 10% Profit: \$ 459.08  
 Total: \$ 5,049.88
  
8. **Forrest Crossing 2**  
 Modify strut rack to accommodate new RTU size  
 Labor and Material ..... \$ 1,683.71  
 10% Profit: \$ 168.37  
 Total: \$ 1,852.081
  
9. **Founders Pointe**  
 Tower will not support new RTU; install new RTU stand next to tower  
 Labor and Material ..... \$ 4,019.79  
 10% Profit: \$ 401.98  
 Total: \$ 4,421.77
  
10. **Grassland**  
 Existing RTU supports will not accommodate new RTU size; new RTU mounted to tank next to existing RTU  
 Labor and Material ..... \$ 1,114.70  
 10% Profit: \$ 111.47  
 Total: \$ 1,226.17
  
11. **Ivy Glenn**  
 Existing sun shade and RTU supports too small to accommodate new RTU; demo existing sun shade and RTU supports and install new aluminum stand in place  
 Labor and Material ..... \$ 2,147.29  
 10% Profit: \$ 214.73  
 Total: \$ 2,362.02
  
12. **Long Lane 2**  
 Existing stand cannot support new RTU; replace in place new stand  
 Labor and Material ..... \$ 2,147.29  
 10% Profit: \$ 214.73  
 Total: \$ 2,362.02
  
13. **McKay's Mill 2**  
 Existing stand cannot support new RTU; new rack to the right of existing RTU next to the fence  
 Labor and Material ..... \$ 3,816.24  
 10% Profit: \$ 381.62  
 Total: \$ 4,197.86
  
14. **Moore's Lane**  
 Existing stand cannot support new RTU; install new aluminum stand back-to-back with existing rack  
 Labor and Material ..... \$ 2,686.58  
 10% Profit: \$ 268.66  
 Total: \$ 2,955.24



**15. Natchez Trace Metering Vault**

Modifying strut rack to accommodate new RTU

Labor and Material .....	\$ 1,488.57
10% Profit: \$	<u>148.86</u>
Total: \$	1,637.43

**16. Riverview**

Existing stand cannot support new RTU; new stand to the right at gate entrance

Labor and Material .....	\$ 4,140.54
10% Profit: \$	<u>414.05</u>
Total: \$	4,554.59

**17. Rodgershire**

New RTU will not fit on side of pump hut; install new RTU stand to right of RTU next to hut slab

Labor and Material .....	\$ 4,148.67
10% Profit: \$	<u>414.87</u>
Total: \$	4,563.54

**Price Summary**

Labor and Materials .....	\$ 51,208.85
10% Profit.....	<u>\$ 5,120.89</u>
Total: \$	56,329.74

**Schedule Impact**

Add 4 weeks to current schedule.

Attachments:

Stone and Sons Labor and Material Breakdown

Terms and Conditions from the current contract agreement apply.

Sincerely,

*David Abel*

David Abel

Municipal Project Manager

Revere Control Systems, Inc.

Phone: 615-604-1579

[dabel@reverecontrol.com](mailto:dabel@reverecontrol.com)

**Stone & Sons Electrical Contractors, Inc.**

2530 Queenstown Rd.  
 Birmingham, AL 35210  
 205-833-8494  
 205-833-9390

Job # 772001 Change Order # 772001-01 Date: 6/1/2017

Job Name: Franklin SCADA Improvements Location: Franklin, TN  
 County: \_\_\_\_\_

General Contractor: Revere GC Job # 615-604-1579  
 GC Project Manager: David Abel Contact Number: \_\_\_\_\_

Engineer: CDM Smith Engineer Job # 14915-96594-SCADA  
 Engineer Rep: Bob Huguenard Contact Number: 615-320-3161

Description: Add New RTU Stand to Fieldstone Farms SW  
Install New Antenna  
Conduit and Wire to existing Horner Control Panel

Written By: Caleb Johnson  
 Title: Project Manager

Qty.	Description	Unit Price	Units	Total	Labor	Units	Total
1	See Attachment "A"	\$ 2,004.29	ea	\$ 2,004.29	69.10	ea	69.10
8	Project Management per hour	\$ 72.00	ea	\$ 576.00			0.00
78.1	Food and Lodging per hour	\$ 8.00	ea	\$ 624.80			0.00
				\$ -			0.00
				\$ -			0.00
				\$ -			0.00
				\$ -			0.00
				\$ -			0.00
				\$ -			0.00
				\$ -			0.00
				\$ -			0.00
				\$ -			0.00
				\$ -			0.00
				\$ -			0.00
				\$ -			0.00

Tax Exempt:  YES  NO

State Tax: 0.00% County Tax: 0.00%

Labor Rate: \$27.00

Overhead & Profit: 15.00%

Material SubTotal: \$3,205.09

Total Tax: 0.00%


Material Total: \$3,205.09

Labor Total: \$1,865.76

Overhead & Profit: \$760.63

Total: \$5,831.48

Engineer Rep. : \_\_\_\_\_  
 Title: \_\_\_\_\_  
 Date: \_\_\_\_\_

Stone and Sons:   
 Title: PM  
 Date: 6/1/2017

**Change Order Attachement "A"**  
**Job #772001**  
**Change Order # 772001-01**

Qty	Description	Unit Price	Units	Total	Labor	Units	Total
				\$ -			\$ -
5.00	3/4" LT FLEX	\$ 83.60	C	\$ 4.18	3.00	C	\$ 0.15
5.00	1" LT FLEX	\$ 114.86	C	\$ 5.74	4.00	C	\$ 0.20
5.00	1 1/2" LT FLEX	\$ 282.13	C	\$ 14.11	6.00	C	\$ 0.30
1.00	3/4" ALUM LT INSUL STRAIGHT CONN	\$ 1,123.56	C	\$ 11.24	13.00	C	\$ 0.13
1.00	1" ALUM LT INSUL STRAIGHT CONN	\$ 1,867.93	C	\$ 18.68	15.00	C	\$ 0.15
1.00	1 1/2" ALUM LT INSUL STRAIGHT CONN	\$ 4,819.00	C	\$ 48.19	20.00	C	\$ 0.20
1.00	3/4" ALUM LT INSUL 90 DEG CONN	\$ 1,553.34	C	\$ 15.53	15.00	C	\$ 0.15
1.00	1" ALUM LT INSUL 90 DEG CONN	\$ 3,802.00	C	\$ 38.02	18.00	C	\$ 0.18
1.00	1 1/2" ALUM LT INSUL 90 DEG CONN	\$ 7,591.00	C	\$ 75.91	22.00	C	\$ 0.22
15.00	3/4" ARC (AL)	\$ 98.38	C	\$ 14.76	4.00	C	\$ 0.60
25.00	1" ARC (AL)	\$ 143.35	C	\$ 35.84	5.00	C	\$ 1.25
15.00	1 1/2" ARC (AL)	\$ 233.30	C	\$ 35.00	6.40	C	\$ 0.96
1.00	3/4" ARC MYERS HUB	\$ 274.95	C	\$ 2.75	20.00	C	\$ 0.20
1.00	1" ARC MYERS HUB	\$ 326.31	C	\$ 3.26	25.00	C	\$ 0.25
1.00	1 1/2" ARC MYERS HUB	\$ 459.24	C	\$ 4.59	30.00	C	\$ 0.30
2.00	3/4" ARC COUPLING	\$ 211.00	C	\$ 4.22	6.00	C	\$ 0.12
2.00	1" ARC COUPLING	\$ 275.00	C	\$ 5.50	7.00	C	\$ 0.14
2.00	1 1/2" ARC COUPLING	\$ 388.00	C	\$ 7.76	8.00	C	\$ 0.16
2.00	3/4" ARC 90 DEG ELBOW	\$ 583.00	C	\$ 11.66	15.00	C	\$ 0.30
3.00	1" ARC 90 DEG ELBOW	\$ 848.57	C	\$ 25.46	20.00	C	\$ 0.60
2.00	1 1/2" ARC 90 DEG ELBOW	\$ 1,676.00	C	\$ 33.52	30.00	C	\$ 0.60
20.00	#6 BARE COPPER	\$ 317.60	M	\$ 6.35	9.00	M	\$ 0.18
20.00	#2/0 BARE COPPER	\$ 1,610.26	M	\$ 32.21	20.00	M	\$ 0.40
880.00	#14 XHHW	\$ 77.65	M	\$ 68.33	4.32	M	\$ 3.80
160.00	#12 XHHW	\$ 116.68	M	\$ 18.67	5.13	M	\$ 0.82
80.00	#16- 1P TWISTED CBL SHLD	\$ 800.00	M	\$ 64.00	4.50	M	\$ 0.36
56.00	WIRE #	\$ 1.00	EA	\$ 56.00	0.03	EA	\$ 1.68
1.00	ALUMINUM STAND	\$ 600.00	EA	\$ 600.00	6.00	EA	\$ 6.00
8.00	1/2" S.S. STUD ANCHOR	\$ 7.06	EA	\$ 56.48	0.35	EA	\$ 2.80
8.00	#12 WIRE POWER TERM	\$ 0.25	EA	\$ 2.00	0.08	EA	\$ 0.64
2.00	# 6 WIRE POWER TERM	\$ 1.00	EA	\$ 2.00	0.14	EA	\$ 0.28
2.00	# 2/0 WIRE POWER TERM	\$ 1.00	EA	\$ 2.00	0.34	EA	\$ 0.68
4.00	#16 WIRE CONTROL TERM	\$ 0.25	EA	\$ 1.00	0.07	EA	\$ 0.28
44.00	#14 WIRE CONTROL TERM	\$ 0.25	EA	\$ 11.00	0.08	EA	\$ 3.52
2.00	3/4"x10' GALV GRD ROD	\$ 24.17	EA	\$ 48.34	1.00	EA	\$ 2.00
2.00	CADWELD 2/0 CABLE>GRD ROD	\$ 50.00	EA	\$ 100.00	0.25	EA	\$ 0.50
10.00	TRENCH (12"x3' DEEP)	\$ 6.00	EA	\$ 60.00	0.10	EA	\$ 1.00
4.00	POST BASE HAND DIG 3'	\$ -	EA	\$ -	3.00	EA	\$ 12.00
4.00	POUR POST BASE 3'	\$ 30.00	EA	\$ 120.00	2.00	EA	\$ 8.00
1.00	Antenna Pole	\$ 140.00	EA	\$ 140.00	2.00	EA	\$ 2.00
1.00	Antenna Foundation	\$ 200.00	EA	\$ 200.00	5.00	EA	\$ 5.00
25.00	Antenna Cable		EA	\$ -	0.04	EA	\$ 1.00
2.00	Antenna Cable Connector		EA	\$ -	1.00	EA	\$ 2.00
1.00	Antenna Ground Kit		EA	\$ -	1.00	EA	\$ 1.00
1.00	Antenna		EA	\$ -	6.00	EA	\$ 6.00
				\$ -			\$ -
				<b>\$ 2,004.29</b>			<b>\$ 69.10</b>

**Stone & Sons Electrical Contractors, Inc.**

2530 Queenstown Rd.  
 Birmingham, AL 35210  
 205-833-8494  
 205-833-9390

Job # 772001 Change Order # 772001-02 Date: 6/1/2017

Job Name: Franklin SCADA Improvements Location: Franklin, TN  
 County: \_\_\_\_\_

General Contractor: Revere GC Job # 615-604-1579  
 GC Project Manager: David Abel Contact Number: \_\_\_\_\_

Engineer: CDM Smith Engineer Job # 14915-96594-SCADA  
 Engineer Rep: Bob Huguenard Contact Number: 615-320-3161

Description: Avalon Repeater  
New RTU stand next to tower

Written By: Caleb Johnson  
 Title: Project Manager

Qty.	Description	Unit Price	Units	Total	Labor	Units	Total
1	See Attachment "A"	\$ 1,362.37	ea	\$ 1,362.37	50.75	ea	50.75
6	Project Management per hour	\$ 72.00	ea	\$ 432.00			0.00
51	Food and Lodging per hour	\$ 8.00	ea	\$ 408.00			0.00
				\$ -			0.00
				\$ -			0.00
				\$ -			0.00
				\$ -			0.00
				\$ -			0.00
				\$ -			0.00
				\$ -			0.00
				\$ -			0.00
				\$ -			0.00
				\$ -			0.00
				\$ -			0.00
				\$ -			0.00

Tax Exempt:  YES  NO  
 State Tax: 0.00% County Tax: 0.00%  
 Labor Rate: \$27.00  
 Overhead & Profit: 15.00%

Material SubTotal: \$2,202.37  
 Total Tax: 0.00%  
 Material Total: \$2,202.37  
 Labor Total: \$1,370.16  
 Overhead & Profit: \$535.88  
 Total: \$4,108.42

Engineer Rep. : \_\_\_\_\_  
 Title: \_\_\_\_\_  
 Date: \_\_\_\_\_

Stone and Sons: \_\_\_\_\_  
 Title: \_\_\_\_\_  
 Date: \_\_\_\_\_



**Stone & Sons Electrical Contractors, Inc.**

2530 Queenstown Rd.  
 Birmingham, AL 35210  
 205-833-8494  
 205-833-9390

Job # 772001 Change Order # 772001-02 Date: 6/1/2017

Job Name: Franklin SCADA Improvements Location: Franklin, TN  
 County: \_\_\_\_\_

General Contractor: Revere GC Job # 615-604-1579  
 GC Project Manager: David Abel Contact Number: \_\_\_\_\_

Engineer: CDM Smith Engineer Job # 14915-96594-SCADA  
 Engineer Rep: Bob Huguenard Contact Number: 615-320-3161

Description: Carter's Creek Pike  
Modifying strut rack to accommodate new RTU size

Written By: Caleb Johnson  
 Title: Project Manager

Qty.	Description	Unit Price	Units	Total	Labor	Units	Total
1	See Attachment "A"	\$ 1,432.41	ea	\$ 1,432.41	20.46	ea	20.46
3	Project Management per hour	\$ 72.00	ea	\$ 216.00			0.00
21	Food and Lodging per hour	\$ 8.00	ea	\$ 168.00			0.00
				\$ -			0.00
				\$ -			0.00
				\$ -			0.00
				\$ -			0.00
				\$ -			0.00
				\$ -			0.00
				\$ -			0.00
				\$ -			0.00
				\$ -			0.00
				\$ -			0.00
				\$ -			0.00

Tax Exempt:  YES  NO  
 State Tax: 0.00% County Tax: 0.00%  
 Labor Rate: \$27.00  
 Overhead & Profit: 15.00%

Material SubTotal: \$1,816.41  
 Total Tax: 0.00%  
 Material Total: \$1,816.41  
 Labor Total: \$552.42  
 Overhead & Profit: \$355.32  
 Total: \$2,724.16

Engineer Rep. : \_\_\_\_\_  
 Title: \_\_\_\_\_  
 Date: \_\_\_\_\_

Stone and Sons: \_\_\_\_\_  
 Title: \_\_\_\_\_  
 Date: \_\_\_\_\_



**Stone & Sons Electrical Contractors, Inc.**

2530 Queenstown Rd.  
 Birmingham, AL 35210  
 205-833-8494  
 205-833-9390

Job # 772001 Change Order # 772001-02 Date: 6/1/2017

Job Name: Franklin SCADA Improvements Location: Franklin, TN  
 County: \_\_\_\_\_

General Contractor: Revere GC Job # 615-604-1579  
 GC Project Manager: David Abel Contact Number: \_\_\_\_\_

Engineer: CDM Smith Engineer Job # 14915-96594-SCADA  
 Engineer Rep: Bob Huguenard Contact Number: 615-320-3161

Description: Carter's Creek Tank  
Existing stand cannot support RTU  
Replace in place with new stand

Written By: Caleb Johnson  
 Title: Project Manager

Qty.	Description	Unit Price	Units	Total	Labor	Units	Total
1	See Attachment "A"	\$ 797.00	ea	\$ 797.00	28.23	ea	28.23
3	Project Management per hour	\$ 72.00	ea	\$ 216.00			0.00
29	Food and Lodging per hour	\$ 8.00	ea	\$ 232.00			0.00
				\$ -			0.00
				\$ -			0.00
				\$ -			0.00
				\$ -			0.00
				\$ -			0.00
				\$ -			0.00
				\$ -			0.00
				\$ -			0.00
				\$ -			0.00
				\$ -			0.00
				\$ -			0.00
				\$ -			0.00

Tax Exempt:  YES  NO Material SubTotal: \$1,245.00  
 State Tax: 0.00% County Tax: 0.00% Total Tax: 0.00%  
 Material Total: \$1,245.00  
 Labor Rate: \$27.00 Labor Total: \$762.21  
 Overhead & Profit: 15.00% Overhead & Profit: \$301.08  
 Total: \$2,308.29

Engineer Rep. : \_\_\_\_\_  
 Title: \_\_\_\_\_  
 Date: \_\_\_\_\_

Stone and Sons: \_\_\_\_\_  
 Title: \_\_\_\_\_  
 Date: \_\_\_\_\_





**Stone & Sons Electrical Contractors, Inc.**

2530 Queenstown Rd.  
Birmingham, AL 35210  
205-833-8494  
205-833-9390

Job # 772001 Change Order # 772001-02 Date: 6/1/2017

Job Name: Franklin SCADA Improvements Location: Franklin, TN  
County: \_\_\_\_\_

General Contractor: Revere GC Job # 615-604-1579  
GC Project Manager: David Abel Contact Number: \_\_\_\_\_

Engineer: CDM Smith Engineer Job # 14915-96594-SCADA  
Engineer Rep: Bob Huguenard Contact Number: 615-320-3161

Description: Falcon Creek  
New RTU stand in place of existing stand  
RTU will face the opposite direction for proper clearance from fence

Written By: Caleb Johnson  
Title: Project Manager

Qty.	Description	Unit Price	Units	Total	Labor	Units	Total
1	See Attachment "A"	\$ 797.00	ea	\$ 797.00	32.23	ea	32.23
4	Project Management per hour	\$ 72.00	ea	\$ 288.00			0.00
33	Food and Lodging per hour	\$ 8.00	ea	\$ 264.00			0.00
				\$ -			0.00
				\$ -			0.00
				\$ -			0.00
				\$ -			0.00
				\$ -			0.00
				\$ -			0.00
				\$ -			0.00
				\$ -			0.00
				\$ -			0.00
				\$ -			0.00
				\$ -			0.00

Tax Exempt:  YES  NO

State Tax: 0.00% County Tax: 0.00%

Labor Rate: \$27.00

Overhead & Profit: 15.00%

Material SubTotal: \$1,349.00

Total Tax: 0.00%

Material Total: \$1,349.00

Labor Total: \$870.21

Overhead & Profit: \$332.88

Total: \$2,552.09

Engineer Rep. : \_\_\_\_\_  
Title: \_\_\_\_\_  
Date: \_\_\_\_\_

Stone and Sons: \_\_\_\_\_  
Title: \_\_\_\_\_  
Date: \_\_\_\_\_



**Stone & Sons Electrical Contractors, Inc.**

2530 Queenstown Rd.  
 Birmingham, AL 35210  
 205-833-8494  
 205-833-9390

Job # 772001 Change Order # 772001-02 Date: 6/1/2017

Job Name: Franklin SCADA Improvements Location: Franklin, TN  
 County: \_\_\_\_\_

General Contractor: Revere GC Job # 615-604-1579  
 GC Project Manager: David Abel Contact Number: \_\_\_\_\_

Engineer: CDM Smith Engineer Job # 14915-96594-SCADA  
 Engineer Rep: Bob Huguenard Contact Number: 615-320-3161

Description: Fieldstone Farms 2  
Modifying strut rack to accommodate new RTU size

Written By: Caleb Johnson  
 Title: Project Manager

Qty.	Description	Unit Price	Units	Total	Labor	Units	Total
1	See Attachment "A"	\$ 790.66	ea	\$ 790.66	15.40	ea	15.40
2	Project Management per hour	\$ 72.00	ea	\$ 144.00			0.00
16	Food and Lodging per hour	\$ 8.00	ea	\$ 128.00			0.00
				\$ -			0.00
				\$ -			0.00
				\$ -			0.00
				\$ -			0.00
				\$ -			0.00
				\$ -			0.00
				\$ -			0.00
				\$ -			0.00
				\$ -			0.00
				\$ -			0.00
				\$ -			0.00

Tax Exempt:  YES  NO

State Tax: 0.00% County Tax: 0.00%

Labor Rate: \$27.00

Overhead & Profit: 15.00%

Material SubTotal: \$1,062.66

Total Tax: 0.00%

Material Total: \$1,062.66

Labor Total: \$415.80

Overhead & Profit: \$221.77

Total: \$1,700.23

Engineer Rep. : \_\_\_\_\_  
 Title: \_\_\_\_\_  
 Date: \_\_\_\_\_

Stone and Sons: \_\_\_\_\_  
 Title: \_\_\_\_\_  
 Date: \_\_\_\_\_



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2530 Queenstown Rd.  
 Birmingham, AL 35210  
 205-833-8494  
 205-833-9390

Job # 772001 Change Order # 772001-02 Date: 6/1/2017

Job Name: Franklin SCADA Improvements Location: Franklin, TN  
 County: \_\_\_\_\_

General Contractor: Revere GC Job # 615-604-1579  
 GC Project Manager: David Abel Contact Number: \_\_\_\_\_

Engineer: CDM Smith Engineer Job # 14915-96594-SCADA  
 Engineer Rep: Bob Huguenard Contact Number: 615-320-3161

Description: Forrest Crossing 1  
Existing RTU in 480V panel  
New RTU stand to the right when entering gate

Written By: Caleb Johnson  
 Title: Project Manager

Qty.	Description	Unit Price	Units	Total	Labor	Units	Total
1	See Attachment "A"	\$ 1,507.63	ea	\$ 1,507.63	58.53	ea	58.53
6	Project Management per hour	\$ 72.00	ea	\$ 432.00			0.00
59	Food and Lodging per hour	\$ 8.00	ea	\$ 472.00			0.00
				\$ -			0.00
				\$ -			0.00
				\$ -			0.00
				\$ -			0.00
				\$ -			0.00
				\$ -			0.00
				\$ -			0.00
				\$ -			0.00
				\$ -			0.00
				\$ -			0.00
				\$ -			0.00
				\$ -			0.00

Tax Exempt:  YES  NO

State Tax: 0.00% County Tax: 0.00%

Labor Rate: \$27.00

Overhead & Profit: 15.00%

Material SubTotal: \$2,411.63

Total Tax: 0.00%

Material Total: \$2,411.63

Labor Total: \$1,580.37

Overhead & Profit: \$598.80

Total: \$4,590.80

Engineer Rep. : \_\_\_\_\_  
 Title: \_\_\_\_\_  
 Date: \_\_\_\_\_

Stone and Sons: \_\_\_\_\_  
 Title: \_\_\_\_\_  
 Date: \_\_\_\_\_



**Stone & Sons Electrical Contractors, Inc.**

2530 Queenstown Rd.  
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205-833-8494  
205-833-9390

Job # 772001 Change Order # 772001-02 Date: 6/1/2017

Job Name: Franklin SCADA Improvements Location: Franklin, TN  
County: \_\_\_\_\_

General Contractor: Revere GC Job # 615-604-1579  
GC Project Manager: David Abel Contact Number: \_\_\_\_\_

Engineer: CDM Smith Engineer Job # 14915-96594-SCADA  
Engineer Rep: Bob Huguenard Contact Number: 615-320-3161

Description: Forrest Crossing 2  
Modifying strut rack to accommodate new RTU size

Written By: Caleb Johnson  
Title: Project Manager

Qty.	Description	Unit Price	Units	Total	Labor	Units	Total
1	See Attachment "A"	\$ 725.10	ea	\$ 725.10	17.00	ea	17.00
2	Project Management per hour	\$ 72.00	ea	\$ 144.00			0.00
17	Food and Lodging per hour	\$ 8.00	ea	\$ 136.00			0.00
				\$ -			0.00
				\$ -			0.00
				\$ -			0.00
				\$ -			0.00
				\$ -			0.00
				\$ -			0.00
				\$ -			0.00
				\$ -			0.00
				\$ -			0.00
				\$ -			0.00
				\$ -			0.00
				\$ -			0.00

Tax Exempt:  YES  NO

State Tax: 0.00% County Tax: 0.00%

Labor Rate: \$27.00

Overhead & Profit: 15.00%

Material SubTotal: \$1,005.10

Total Tax: 0.00%

Material Total: \$1,005.10

Labor Total: \$459.00

Overhead & Profit: \$219.61

Total: \$1,683.71

Engineer Rep. : \_\_\_\_\_  
Title: \_\_\_\_\_  
Date: \_\_\_\_\_

Stone and Sons: \_\_\_\_\_  
Title: \_\_\_\_\_  
Date: \_\_\_\_\_





**Stone & Sons Electrical Contractors, Inc.**

2530 Queenstown Rd.  
 Birmingham, AL 35210  
 205-833-8494  
 205-833-9390

Job # 772001 Change Order # 772001-02 Date: 6/1/2017

Job Name: Franklin SCADA Improvements Location: Franklin, TN  
 County: \_\_\_\_\_

General Contractor: Revere GC Job # 615-604-1579  
 GC Project Manager: David Abel Contact Number: \_\_\_\_\_

Engineer: CDM Smith Engineer Job # 14915-96594-SCADA  
 Engineer Rep: Bob Huguenard Contact Number: 615-320-3161

Description: Founders Pointe  
Tower will not support new RTU  
Install new RTU stand next to tower

Written By: Caleb Johnson  
 Title: Project Manager

Qty.	Description	Unit Price	Units	Total	Labor	Units	Total
1	See Attachment "A"	\$ 1,290.70	ea	\$ 1,290.70	50.55	ea	50.55
6	Project Management per hour	\$ 72.00	ea	\$ 432.00			0.00
51	Food and Lodging per hour	\$ 8.00	ea	\$ 408.00			0.00
				\$ -			0.00
				\$ -			0.00
				\$ -			0.00
				\$ -			0.00
				\$ -			0.00
				\$ -			0.00
				\$ -			0.00
				\$ -			0.00
				\$ -			0.00
				\$ -			0.00
				\$ -			0.00

Tax Exempt:  YES  NO

State Tax: 0.00% County Tax: 0.00%

Labor Rate: \$27.00

Overhead & Profit: 15.00%

Material SubTotal: \$2,130.70

Total Tax: 0.00%

Material Total: \$2,130.70

Labor Total: \$1,364.76

Overhead & Profit: \$524.32

Total: \$4,019.79

Engineer Rep. : \_\_\_\_\_  
 Title: \_\_\_\_\_  
 Date: \_\_\_\_\_

Stone and Sons: \_\_\_\_\_  
 Title: \_\_\_\_\_  
 Date: \_\_\_\_\_



**Stone & Sons Electrical Contractors, Inc.**

2530 Queenstown Rd.  
 Birmingham, AL 35210  
 205-833-8494  
 205-833-9390

Job # 772001 Change Order # 772001-02 Date: 6/1/2017

Job Name: Franklin SCADA Improvements Location: Franklin, TN  
 County: \_\_\_\_\_

General Contractor: Revere GC Job # 615-604-1579  
 GC Project Manager: David Abel Contact Number: \_\_\_\_\_

Engineer: CDM Smith Engineer Job # 14915-96594-SCADA  
 Engineer Rep: Bob Huguenard Contact Number: 615-320-3161

Description: Grassland  
New RTU mounted to tank next to existing RTU  
Existing RTU supports will not accommodate new RTU size

Written By: Caleb Johnson  
 Title: Project Manager

Qty.	Description	Unit Price	Units	Total	Labor	Units	Total
1	See Attachment "A"	\$ 444.62	ea	\$ 444.62	10.84	ea	10.84
2	Project Management per hour	\$ 72.00	ea	\$ 144.00			0.00
11	Food and Lodging per hour	\$ 8.00	ea	\$ 88.00			0.00
				\$ -			0.00
				\$ -			0.00
				\$ -			0.00
				\$ -			0.00
				\$ -			0.00
				\$ -			0.00
				\$ -			0.00
				\$ -			0.00
				\$ -			0.00
				\$ -			0.00
				\$ -			0.00
				\$ -			0.00

Tax Exempt:  YES  NO Material SubTotal: \$676.62

State Tax: 0.00% County Tax: 0.00% Total Tax: 0.00%

Material Total: \$676.62

Labor Rate: \$27.00 Labor Total: \$292.68

Overhead & Profit: 15.00% Overhead & Profit: \$145.40

Total: \$1,114.70

Engineer Rep. : \_\_\_\_\_  
 Title: \_\_\_\_\_  
 Date: \_\_\_\_\_

Stone and Sons: \_\_\_\_\_  
 Title: \_\_\_\_\_  
 Date: \_\_\_\_\_



**Stone & Sons Electrical Contractors, Inc.**

2530 Queenstown Rd.  
Birmingham, AL 35210  
205-833-8494  
205-833-9390

Job # 772001 Change Order # 772001-02 Date: 6/1/2017

Job Name: Franklin SCADA Improvements Location: Franklin, TN  
County: \_\_\_\_\_

General Contractor: Revere GC Job # 615-604-1579  
GC Project Manager: David Abel Contact Number: \_\_\_\_\_

Engineer: CDM Smith Engineer Job # 14915-96594-SCADA  
Engineer Rep: Bob Huguenard Contact Number: 615-320-3161

Description: Ivy Glenn  
Existing sun shade and RTU supports not large enough to accommodate new RTU  
Demo existing sun shade and RTU supports and install new aluminum stand in place

Written By: Caleb Johnson  
Title: Project Manager

Qty.	Description	Unit Price	Units	Total	Labor	Units	Total
1	See Attachment "A"	\$ 797.00	ea	\$ 797.00	24.23	ea	24.23
3	Project Management per hour	\$ 72.00	ea	\$ 216.00			0.00
25	Food and Lodging per hour	\$ 8.00	ea	\$ 200.00			0.00
				\$ -			0.00
				\$ -			0.00
				\$ -			0.00
				\$ -			0.00
				\$ -			0.00
				\$ -			0.00
				\$ -			0.00
				\$ -			0.00
				\$ -			0.00
				\$ -			0.00
				\$ -			0.00

Tax Exempt: <input checked="" type="checkbox"/> YES	NO	Material SubTotal: <u>\$1,213.00</u>
State Tax: <u>0.00%</u>	County Tax: <u>0.00%</u>	Total Tax: <u>0.00%</u>
		Material Total: <u>\$1,213.00</u>
Labor Rate: <u>\$27.00</u>		Labor Total: <u>\$654.21</u>
Overhead & Profit: <u>15.00%</u>		Overhead & Profit: <u>\$280.08</u>
		Total: <u>\$2,147.29</u>

Engineer Rep. : \_\_\_\_\_  
Title: \_\_\_\_\_  
Date: \_\_\_\_\_

Stone and Sons: \_\_\_\_\_  
Title: \_\_\_\_\_  
Date: \_\_\_\_\_



**Stone & Sons Electrical Contractors, Inc.**

2530 Queenstown Rd.  
 Birmingham, AL 35210  
 205-833-8494  
 205-833-9390

Job # 772001 Change Order # 772001-02 Date: 6/1/2017

Job Name: Franklin SCADA Improvements Location: Franklin, TN  
 County: \_\_\_\_\_

General Contractor: Revere GC Job # 615-604-1579  
 GC Project Manager: David Abel Contact Number: \_\_\_\_\_

Engineer: CDM Smith Engineer Job # 14915-96594-SCADA  
 Engineer Rep: Bob Huguenard Contact Number: 615-320-3161

Description: Long Lane 2  
Existing RTU not large enough or physically sound enough to support RTU  
Install new aluminum stand in place

Written By: Caleb Johnson  
 Title: Project Manager

Qty.	Description	Unit Price	Units	Total	Labor	Units	Total
1	See Attachment "A"	\$ 797.00	ea	\$ 797.00	24.23	ea	24.23
3	Project Management per hour	\$ 72.00	ea	\$ 216.00			0.00
25	Food and Lodging per hour	\$ 8.00	ea	\$ 200.00			0.00
				\$ -			0.00
				\$ -			0.00
				\$ -			0.00
				\$ -			0.00
				\$ -			0.00
				\$ -			0.00
				\$ -			0.00
				\$ -			0.00
				\$ -			0.00
				\$ -			0.00
				\$ -			0.00

Tax Exempt:  YES  NO Material SubTotal: \$1,213.00  
 State Tax: 0.00% County Tax: 0.00% Total Tax: 0.00%  
 Material Total: \$1,213.00  
 Labor Rate: \$27.00 Labor Total: \$654.21  
 Overhead & Profit: 15.00% Overhead & Profit: \$280.08  
 Total: \$2,147.29

Engineer Rep. : \_\_\_\_\_  
 Title: \_\_\_\_\_  
 Date: \_\_\_\_\_

Stone and Sons: \_\_\_\_\_  
 Title: \_\_\_\_\_  
 Date: \_\_\_\_\_





**Stone & Sons Electrical Contractors, Inc.**

2530 Queenstown Rd.  
Birmingham, AL 35210  
205-833-8494  
205-833-9390

Job # 772001 Change Order # 772001-02 Date: 6/1/2017

Job Name: Franklin SCADA Improvements Location: Franklin, TN  
County: \_\_\_\_\_

General Contractor: Revere GC Job # 615-604-1579  
GC Project Manager: David Abel Contact Number: \_\_\_\_\_

Engineer: CDM Smith Engineer Job # 14915-96594-SCADA  
Engineer Rep: Bob Huguenard Contact Number: 615-320-3161

Description: McKay's Mill 2  
Existing rack not large enough to accommodate new RTU size  
New rack to the right of existing RTU next to the fence

Written By: Caleb Johnson  
Title: Project Manager

Qty.	Description	Unit Price	Units	Total	Labor	Units	Total
1	See Attachment "A"	\$ 1,290.70	ea	\$ 1,290.70	47.55	ea	47.55
5	Project Management per hour	\$ 72.00	ea	\$ 360.00			0.00
48	Food and Lodging per hour	\$ 8.00	ea	\$ 384.00			0.00
				\$ -			0.00
				\$ -			0.00
				\$ -			0.00
				\$ -			0.00
				\$ -			0.00
				\$ -			0.00
				\$ -			0.00
				\$ -			0.00
				\$ -			0.00
				\$ -			0.00
				\$ -			0.00

Tax Exempt:  YES  NO

State Tax: 0.00% County Tax: 0.00%

Labor Rate: \$27.00

Overhead & Profit: 15.00%

Material SubTotal: \$2,034.70

Total Tax: 0.00%

Material Total: \$2,034.70

Labor Total: \$1,283.76

Overhead & Profit: \$497.77

Total: \$3,816.24

Engineer Rep. : \_\_\_\_\_  
Title: \_\_\_\_\_  
Date: \_\_\_\_\_

Stone and Sons: \_\_\_\_\_  
Title: \_\_\_\_\_  
Date: \_\_\_\_\_



**Stone & Sons Electrical Contractors, Inc.**

2530 Queenstown Rd.  
 Birmingham, AL 35210  
 205-833-8494  
 205-833-9390

Job # 772001 Change Order # 772001-02 Date: 6/1/2017

Job Name: Franklin SCADA Improvements Location: Franklin, TN  
 County: \_\_\_\_\_

General Contractor: Revere GC Job # 615-604-1579  
 GC Project Manager: David Abel Contact Number: \_\_\_\_\_

Engineer: CDM Smith Engineer Job # 14915-96594-SCADA  
 Engineer Rep: Bob Huguenard Contact Number: 615-320-3161

Description: Moores Lane  
Existing RTU stand not structurally sound enough to accommodate new RTU  
Install new aluminum stand back to back with existing rack

Written By: Caleb Johnson  
 Title: Project Manager

Qty.	Description	Unit Price	Units	Total	Labor	Units	Total
1	See Attachment "A"	\$ 1,111.60	ea	\$ 1,111.60	28.76	ea	28.76
3	Project Management per hour	\$ 72.00	ea	\$ 216.00			0.00
29	Food and Lodging per hour	\$ 8.00	ea	\$ 232.00			0.00
				\$ -			0.00
				\$ -			0.00
				\$ -			0.00
				\$ -			0.00
				\$ -			0.00
				\$ -			0.00
				\$ -			0.00
				\$ -			0.00
				\$ -			0.00
				\$ -			0.00
				\$ -			0.00

Tax Exempt:  YES  NO Material SubTotal: \$1,559.60  
 State Tax: 0.00% County Tax: 0.00% Total Tax: 0.00%  
 Material Total: \$1,559.60  
 Labor Rate: \$27.00 Labor Total: \$776.55  
 Overhead & Profit: 15.00% Overhead & Profit: \$350.42  
 Total: \$2,686.58

Engineer Rep. : \_\_\_\_\_  
 Title: \_\_\_\_\_  
 Date: \_\_\_\_\_

Stone and Sons: \_\_\_\_\_  
 Title: \_\_\_\_\_  
 Date: \_\_\_\_\_



**Stone & Sons Electrical Contractors, Inc.**

2530 Queenstown Rd.  
 Birmingham, AL 35210  
 205-833-8494  
 205-833-9390

Job # 772001 Change Order # 772001-02 Date: 6/1/2017

Job Name: Franklin SCADA Improvements Location: Franklin, TN  
 County: \_\_\_\_\_

General Contractor: Revere GC Job # 615-604-1579  
 GC Project Manager: David Abel Contact Number: \_\_\_\_\_

Engineer: CDM Smith Engineer Job # 14915-96594-SCADA  
 Engineer Rep: Bob Huguenard Contact Number: 615-320-3161

Description: Natchez Metering Vault  
Modifying strut rack to accommodate new RTU weight and size

Written By: Caleb Johnson  
 Title: Project Manager

Qty.	Description	Unit Price	Units	Total	Labor	Units	Total
1	See Attachment "A"	\$ 566.21	ea	\$ 566.21	16.60	ea	16.60
2	Project Management per hour	\$ 72.00	ea	\$ 144.00			0.00
17	Food and Lodging per hour	\$ 8.00	ea	\$ 136.00			0.00
				\$ -			0.00
				\$ -			0.00
				\$ -			0.00
				\$ -			0.00
				\$ -			0.00
				\$ -			0.00
				\$ -			0.00
				\$ -			0.00
				\$ -			0.00
				\$ -			0.00
				\$ -			0.00
				\$ -			0.00

Tax Exempt:  YES  NO Material SubTotal: \$846.21  
 State Tax: 0.00% County Tax: 0.00% Total Tax: 0.00%  
 Material Total: \$846.21  
 Labor Rate: \$27.00 Labor Total: \$448.20  
 Overhead & Profit: 15.00% Overhead & Profit: \$194.16  
 Total: \$1,488.57

Engineer Rep. : \_\_\_\_\_  
 Title: \_\_\_\_\_  
 Date: \_\_\_\_\_

Stone and Sons: \_\_\_\_\_  
 Title: \_\_\_\_\_  
 Date: \_\_\_\_\_



**Stone & Sons Electrical Contractors, Inc.**

2530 Queenstown Rd.  
 Birmingham, AL 35210  
 205-833-8494  
 205-833-9390

Job # 772001 Change Order # 772001-02 Date: 6/1/2017

Job Name: Franklin SCADA Improvements Location: Franklin, TN  
 County: \_\_\_\_\_

General Contractor: Revere GC Job # 615-604-1579  
 GC Project Manager: David Abel Contact Number: \_\_\_\_\_

Engineer: CDM Smith Engineer Job # 14915-96594-SCADA  
 Engineer Rep: Bob Huguenard Contact Number: 615-320-3161

Description: Riverview  
Existing rack not large enough to accommodate new RTU  
New stand to the right when you come through the gate

Written By: Caleb Johnson  
 Title: Project Manager

Qty.	Description	Unit Price	Units	Total	Labor	Units	Total
1	See Attachment "A"	\$ 1,290.70	ea	\$ 1,290.70	53.55	ea	53.55
6	Project Management per hour	\$ 72.00	ea	\$ 432.00			0.00
54	Food and Lodging per hour	\$ 8.00	ea	\$ 432.00			0.00
				\$ -			0.00
				\$ -			0.00
				\$ -			0.00
				\$ -			0.00
				\$ -			0.00
				\$ -			0.00
				\$ -			0.00
				\$ -			0.00
				\$ -			0.00
				\$ -			0.00
				\$ -			0.00

Tax Exempt:  YES  NO

State Tax: 0.00% County Tax: 0.00%

Labor Rate: \$27.00

Overhead & Profit: 15.00%

Material SubTotal: \$2,154.70

Total Tax: 0.00%

Material Total: \$2,154.70

Labor Total: \$1,445.76

Overhead & Profit: \$540.07

Total: \$4,140.54

Engineer Rep. : \_\_\_\_\_  
 Title: \_\_\_\_\_  
 Date: \_\_\_\_\_

Stone and Sons: \_\_\_\_\_  
 Title: \_\_\_\_\_  
 Date: \_\_\_\_\_





**Stone & Sons Electrical Contractors, Inc.**

2530 Queenstown Rd.  
 Birmingham, AL 35210  
 205-833-8494  
 205-833-9390

Job # 772001 Change Order # 772001-02 Date: 6/1/2017

Job Name: Franklin SCADA Improvements Location: Franklin, TN  
 County: \_\_\_\_\_

General Contractor: Revere GC Job # 615-604-1579  
 GC Project Manager: David Abel Contact Number: \_\_\_\_\_

Engineer: CDM Smith Engineer Job # 14915-96594-SCADA  
 Engineer Rep: Bob Huguenard Contact Number: 615-320-3161

Description: Rodgershire  
New RTU will not fit on side of Pump Hut  
Install new RTU stand to the right of RTU next to hut slab

Written By: Caleb Johnson  
 Title: Project Manager

Qty.	Description	Unit Price	Units	Total	Labor	Units	Total
1	See Attachment "A"	\$ 1,362.37	ea	\$ 1,362.37	51.75	ea	51.75
6	Project Management per hour	\$ 72.00	ea	\$ 432.00			0.00
52	Food and Lodging per hour	\$ 8.00	ea	\$ 416.00			0.00
				\$ -			0.00
				\$ -			0.00
				\$ -			0.00
				\$ -			0.00
				\$ -			0.00
				\$ -			0.00
				\$ -			0.00
				\$ -			0.00
				\$ -			0.00
				\$ -			0.00
				\$ -			0.00
				\$ -			0.00

Tax Exempt:  YES  NO

State Tax: 0.00% County Tax: 0.00%

Labor Rate: \$27.00

Overhead & Profit: 15.00%

Material SubTotal: \$2,210.37

Total Tax: 0.00%

Material Total: \$2,210.37

Labor Total: \$1,397.16

Overhead & Profit: \$541.13

Total: \$4,148.67

Engineer Rep. : \_\_\_\_\_  
 Title: \_\_\_\_\_  
 Date: \_\_\_\_\_

Stone and Sons: \_\_\_\_\_  
 Title: \_\_\_\_\_  
 Date: \_\_\_\_\_



## **CONSTRUCTION CHANGE AUTHORIZATION (WORK ORDER)**

**TO:** Mr. David Abel  
Project Manager  
Revere Control Systems  
2240 Rocky Ridge Road  
Birmingham, AL 35216  
(205) 824-0004

**FROM:** CDM Smith  
3715 Northside Parkway NW  
Building 300, Suite 400  
Atlanta, GA 30327  
(404) 720-1400

**DATE:** July 27, 2017

**PROJECT:** City of Franklin, Tennessee  
Water Distribution and Collection Systems SCADA Improvements

**WORK ORDER NUMBER:** 004      **CDM SMITH PROJ. NO.:** 14915-96594

**SUBJECT:** Goose Creek/Redwing Booster Pump Station Modifications Changes      **CITY PROJECT NO.:** 2014-0288

**REFERENCE:** June 14, 2017 Revere Control Proposal (attached)  
May 31, 2017 RFP No. 3 (attached)  
May 31, 2017 RFI (attached)

### DESCRIPTION:

A request for proposal for Goose Creek/Red Wing Booster Pump Station control modifications issued on May 31, 2017 (see attached) and included, among other things, removal of the existing pump control panel and programming the new RTU to perform the duties the pump controller is now performing. The existing pump controller is a proprietary controller that is at the end of its life and is no longer being supported by the manufacturer. A request for information was submitted during that same time period that identified a problem with available space, which resulted in guidance to change the shape of the panel (i.e., narrower and higher) to fit the space. This Work Order covers the changes defined in the two documents identified above and the attached Revere Control Systems proposal.

The work shall be performed for a lump sum price of \$19,226.

There will be an impact to the substantial completion date associated with this work, however, the schedule impact associated with this work order overlaps with schedule impacts associated with other work orders. Therefore, assigning a number of days of delay individually for the work orders is not possible. A separate work order will be issued to establish a single change in the substantial completion date. Revere Control will submit a change order request providing justification for a substantial completion date change. No change to the Final completion date will be issued.


ATTACHMENTS: June 14, 2017 Revere Controls Proposal (attached)  
May 31, 2017 RFP No. 3 (attached)  
May 31, 2017 RFI (attached)

CDM SMITH:

By: 

Date: July 27, 2017

CONTRACTOR:

By: 

Date: 7/31/2017



June 14, 2017

CDM Smith  
3200 Windy Hill Road, S.E.  
Suite 210 West  
Atlanta, Georgia 30339-5460

Attn: Mr. Robert Huguenard, PE, BCEE

Ref: City of Franklin Water Management Department  
CDM Project Number 14915-96594-SCADA  
COF Contract No. 2014-0288

Subj: Goose Creek/Red Wing Booster Pump Station Control Modifications  
RFP #03

Mr. Huguenard:

We are pleased to provide a proposal for the above referenced project. Work includes the following:

1. Prepare shop drawings and modify testing procedures submittal
2. Re-fabricate new 48" x 36" x 12" RTU using a 48"x 30" x10" enclosure
3. Add a 10" Panelview 6 Plus OIT into new RTU
4. Add PLC OIT programming per RFP #03 directions
5. Demo existing pump controller
6. Pull or replace power and control wiring into new RTU
7. Field Test

**I. Submittals**

**Labor**

Project Management.....	2 Hours .....	\$148/Hr .....	\$ 296
Engineering Lead .....	4 Hours .....	\$148/Hr .....	\$ 592
OIT and PLC Programming ...	40 Hours .....	\$126/Hr .....	\$ 5,040
CAD .....	16 Hours .....	\$72/Hr .....	\$ 1,152
Documentation .....	8 Hours .....	\$77/Hr .....	\$ 616
		Labor Total:	\$ 7,696

**Expenses**

None ..... \$ 0

**Materials**

None ..... \$ 0

Lump Sum Price ..... \$ 7,696

**II. Production**
**Labor**

Shop .....	40 Hours .....	\$68/Hr .....	\$ 2,720
QC .....	4 Hours .....	\$108/Hr .....	\$ 432
Programming (Testing) .....	8 Hours .....	\$126/Hr .....	\$ 1,008
			Labor Total: \$ 4,160

**Expenses**

None .....	\$ 0
------------	------

**Materials**

Hoffman A48H30CLP enclosure w/subpan .....	\$ 493
AB Panelview 6 Plus, 10" Color touchscreen OIT 2711P-T10C4*8 .....	\$ 2,422
Shop Materials (Panduit, wire labels, etc.) .....	\$ 200
Subtotal: \$ 3,115	
10% Profit: \$ 312	
Material Total: \$ 3,427	

Lump Sum Price .....	\$ 7,587
----------------------	----------

**III. Site Modification**
**Labor**

Engineering .....	8 Hours .....	\$148/Hr .....	\$ 1,184
(ID and tag pump control wiring. Note: the motor starter circuits and local Hand-Off-Auto switches shall remain in place)			
Programming .....	8 Hours .....	\$126/Hr .....	\$ 1,008
(Test Pump Controls)			
			Labor Total: \$ 2,192

**Material and Expenses**

Electrical (demo pump controller, pull wire) .....	\$ 1,252
Food and Lodging .....	2 Days..... \$ 174.....
Subtotal: \$ 1,600	
10% Profit: \$ 160	
M&E Total: \$ 1,760	

Lump Sum Price .....	\$ 3,952
----------------------	----------

**IV. Price Summary**

Submittals .....	\$ 7,696
Production .....	\$ 7,578
Site Work.....	\$ 3,952
Total: \$ 19,226	

**V. Schedule Impact**

Add 6 weeks to current schedule from time of executed change order to allow for submittals, hardware delivery, production and factory programming.

Terms and Conditions from the current contract agreement apply.

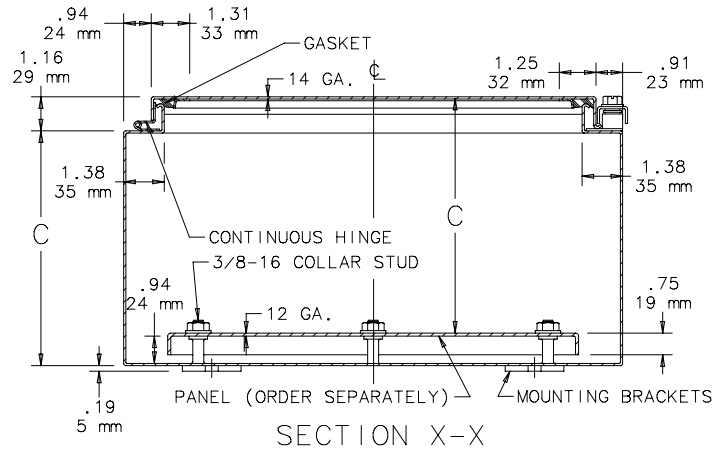
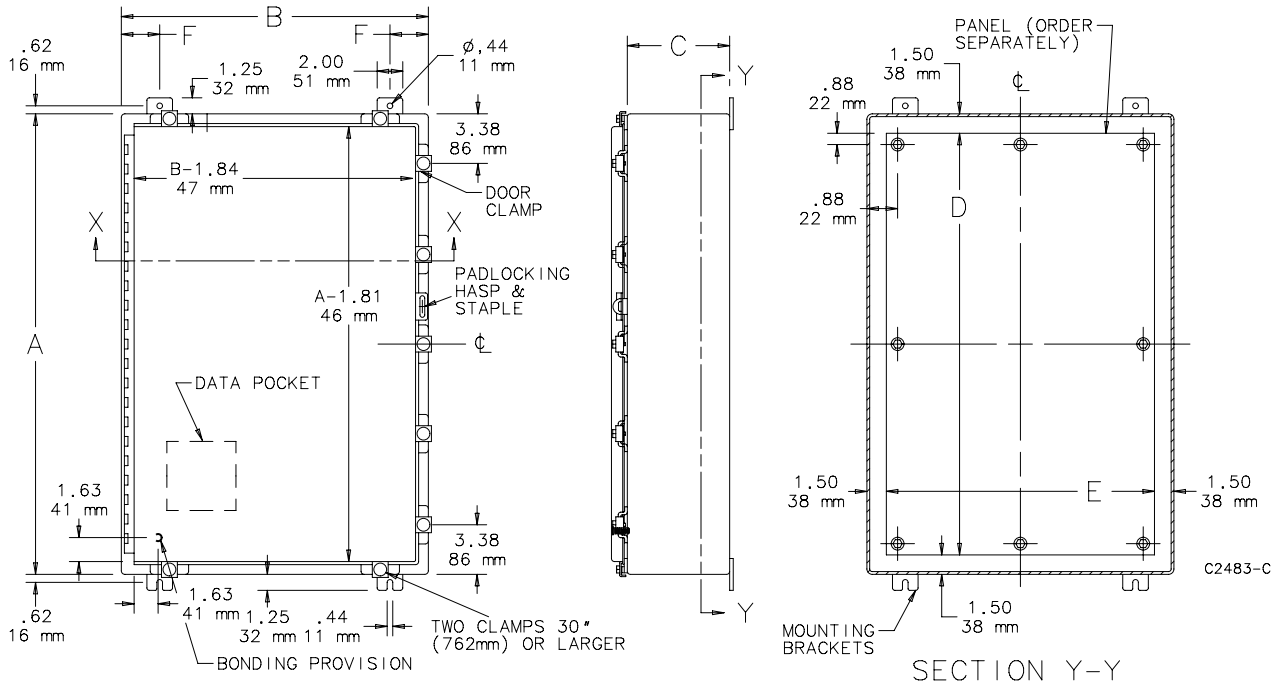
Sincerely,

*David Abel*

David Abel  
Municipal Project Manager  
Revere Control Systems, Inc.  
Phone: 615-604-1579  
[dabel@reverecontrol.com](mailto:dabel@reverecontrol.com)







Popular Accessories

Enclosure Width (B Dimension)	Hole Seals	Window Kits
12 in. (305 mm)	AS050	APWK53NF
16 in. (406 mm)	AS050	APWK53NF
20 in. (508 mm)	AS050	APWK53NF
24 in. (610 mm)	AS050	APWK53NF
30 in. (762 mm)	AS050	APWK53NF
36 in. (914 mm)	AS050	APWK53NF

# PanelView Plus 6 Terminals - 700 to 1500

This platform use modular components with value-added options for flexible system configuration. These components are usable across the entire PanelView Plus 6 platform and install with minimal effort:

- Color display modules ranging from 6.5 to 15-inches in size with either key, touch screen, or combination key/touch-screen input
- Windows CE logic modules providing desktop access
- Optional communication modules for network communication



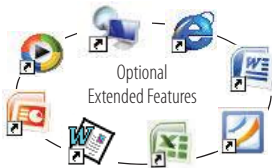
Configured terminals with a display module and logic module can be ordered as a single catalog number or as separate components for field installation.

A high-bright display for outdoor use, plus conformal-coated and marine-certified components, extend this platforms ability to operate in environments with even more stringent and varying requirements.

The core component of this platform is the high-performance logic module that runs a closed or open Windows CE desktop environment with optional, extended features and file viewers. System integrators and OEMs can configure and deploy systems that allow or restrict desktop access.

## Logic Module Features

Features	Description
High memory capacity	512 MB nonvolatile memory and 512 MB RAM
Power input	AC or DC
Network interface	For optional DH+, DH-485, or ControlNet communication module
Communication ports	Ethernet, RS-232 serial
USB ports	2 USB host ports for connecting a USB mouse, keyboard, printer, and USB drives that are hot swappable 1 USB device port for connecting a host personal computer
Secure Digital (SD) card slot	Hot-swappable card slot supports 1784-SDx SD cards for transferring files, upgrading firmware, or logging data
Operating system	<p>All terminals run the Windows CE 6.0 operating system (OS) providing OS functionality needed for most users needs:</p> <ul style="list-style-type: none"> <li>• FTP server</li> <li>• VNC client/server</li> <li>• PDF reader</li> <li>• Active X controls</li> <li>• Third-party device support</li> </ul> <p>Additional functionality is available by ordering terminals with optional, extended features:</p> <ul style="list-style-type: none"> <li>• Internet Explorer web browser</li> <li>• Remote desktop connection</li> <li>• Media player</li> <li>• Microsoft file viewers for PowerPoint, Excel, and Word</li> <li>• WordPad text editor</li> </ul>
FactoryTalk View software	<ul style="list-style-type: none"> <li>• FactoryTalk View Machine Edition Station (runtime) software, version 6.0 or later, is preloaded and activated on each terminal</li> <li>• Single license support for FactoryTalk ViewPoint software, version 1.2 or later, gives remote users access to a terminal's displays via standard web browser</li> <li>• HMI applications are developed with FactoryTalk View Studio for Machine Edition software, which is purchased separately</li> </ul>



## Product Selections

Bulletin	Input Type	Display Size	Display Type	Communication	Power	Operating System	Special Option
<b>2711P-</b>	<b>K</b> = Keypad <b>T</b> = Touch <b>B</b> = Keypad/Touch	<b>7</b> = 6.5 in. <b>10</b> = 10.4 in. <b>12</b> = 12.1 in. <b>15</b> = 15 in.	<b>C</b> = Color	<b>4</b> = Ethernet, RS-232, (2) USB	<b>A</b> = AC <b>D</b> = DC	<b>8</b> = Windows CE 6.0 <b>9</b> = Windows CE 6.0 with extended features	<b>K</b> = Conformal-coated

### PanelView Plus 6 Terminals without Extended Features

Cat. No.			Display		Communication		Input Power	Memory RAM/Nonvolatile <sup>(1)</sup>
Keypad	Touch	Keypad/Touch	Size	Type	RS-232	Ethernet		
<b>700 Model</b>								
2711P-K7C4D8	2711P-T7C4D8	2711P-B7C4D8	6.5-in.	Color	•	•	DC	512 MB/512 MB
–	2711P-T7C4D8K	–			•	•	DC	512 MB/512 MB
2711P-K7C4A8	2711P-T7C4A8	2711P-B7C4A8			•	•	AC	512 MB/512 MB
<b>1000 Model</b>								
2711P-K10C4D8	2711P-T10C4D8	2711P-B10C4D8	10.4-in.	Color	•	•	DC	512 MB/512 MB
2711P-K10C4A8	2711P-T10C4A8	2711P-B10C4A8			•	•	AC	512 MB/512 MB
<b>1250 Model</b>								
2711P-K12C4D8	2711P-T12C4D8	2711P-B12C4D8	12.1-in.	Color	•	•	DC	512 MB/512 MB
–	2711P-T12C4D8K	–			•	•	DC	512 MB/512 MB
2711P-K12C4A8	2711P-T12C4A8	2711P-B12C4A8			•	•	AC	512 MB/512 MB
<b>1500 Model</b>								
2711P-K15C4D8	2711P-T15C4D8	2711P-B15C4D8	15-in.	Color	•	•	DC	512 MB/512 MB
2711P-K15C4A8	2711P-T15C4A8	2711P-B15C4A8			•	•	AC	512 MB/512 MB

(1) All terminals support FactoryTalk View Machine Edition Station software, version 6.0 or later, and the Windows CE 6.0 operating system without extended features and Microsoft file viewers.

### PanelView Plus 6 Terminals with Extended Features

Cat. No.			Display		Communication		Input Power	Memory RAM/Nonvolatile <sup>(1)</sup>
Keypad	Touch	Keypad/Touch	Size	Type	RS-232	Ethernet		
<b>700 Model</b>								
2711P-K7C4D9	2711P-T7C4D9	2711P-B7C4D9	6.5-in.	Color	•	•	DC	512 MB/512 MB
2711P-K7C4A9	2711P-T7C4A9	2711P-B7C4A9			•	•	AC	512 MB/512 MB
<b>1000 Model</b>								
2711P-K10C4D9	2711P-T10C4D9	2711P-B10C4D9	10.4-in.	Color	•	•	DC	512 MB/512 MB
2711P-K10C4A9	2711P-T10C4A9	2711P-B10C4A9			•	•	AC	512 MB/512 MB
<b>1250 Model</b>								
2711P-K12C4D9	2711P-T12C4D9	2711P-B12C4D9	12.1-in.	Color	•	•	DC	512 MB/512 MB
2711P-K12C4A9	2711P-T12C4A9	2711P-B12C4A9			•	•	AC	512 MB/512 MB
<b>1500 Model</b>								
2711P-K15C4D9	2711P-T15C4D9	2711P-B15C4D9	15-in.	Color	•	•	DC	512 MB/512 MB
2711P-K15C4A9	2711P-T15C4A9	2711P-B15C4A9			•	•	AC	512 MB/512 MB

(1) All terminals support FactoryTalk View Machine Edition Station software, version 6.0 or later, and the Windows CE 6.0 operating system with extended features and Microsoft file viewers.

## **REQUEST FOR PROPOSAL No. 3**

Mr. David Abel Project Manager Revere Control Systems 2240 Rocky Ridge Road Birmingham, AL 35216 (205) 824-0004	<b>FROM:</b>	CDM Smith 210 25 <sup>th</sup> Avenue North Suite 1102 Nashville, TN 37203 (615) 320-3161
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**DATE:** May 31, 2017

**PROJECT:** City of Franklin, Water Management Department  
Water Distribution & Collection System SCADA Improvements

**PCO NUMBER:** N/A **CDM SMITH PROJ. NO.:** 14915-96594-SCADA

**ASSOCIATED RFI NUMBER:** N/A **COF CONTRACT NO.:** 2014-0288

**SUBJECT:** Goose Creek/Red Wing Booster Pump Station Control Modifications

**REFERENCE:** N/A

The purpose of this RFP is to request a proposal for certain control modifications for the Goose Creek/Red Wing Booster Pump Station. The proposed modifications can be defined as follows:

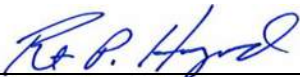
- Remove the existing controller in the Pump Control Panel in the Goose Creek/Red Wing Booster Pump Station. Program the Allen-Bradley CompactLogix PLC that is to be furnished in the new station RTU to serve as the pump station controller. Either re-route or replace all power wiring, I/O wiring, and network cable. Re-route or replace wiring to door-mounted controls.
- Furnish an Allen-Bradley PanelView color touchscreen operator interface terminal (OIT) of 10" nominal size, to replace the existing USFilter OI3000 operator interface. Mount the new OIT in the same location on the panel door. If additional steel plate is required, match the paint color and finish. Securely install power wiring, and an Ethernet network cable to connect to the new RTU PLC.
- Provide application engineering services in accordance with the standards specified in Section 13306. This shall include PLC programming to duplicate the existing as-built control logic and control functionality, and OIT graphic screens that provide an operator with all the control and monitoring functions available.

The control logic shall be as follows:

- The pump controls shall operate one wetwell with two pumps. Provide identical programming and graphics, disabled and hidden, that will operate a future second wetwell with two pumps in parallel.
- The wetwell level will be controlled based on wetwell level sensed by a submersible transducer and programmable setpoints. The set points shall be Lead Pump on and off, Lag Pump on and off, High Level Alarm and Low Level Alarm. Coordinate with the Owner to obtain correct set point values. When the Lead Pump On level is reached, the VFD of the Lead Pump will be started. If the level continues to rise to the Lag Pump On level, the Lag Pump VFD will be started. The Lag and Lead pumps will stop upon level falling to the Lag Off and Lead Off set points respectively.
- Note that there is a hardwired, float-based backup control system that will operate the pumps in a fixed speed mode upon a failure of the primary control system or if the high level float is reached. It has four floats for operation, consisting of all pumps off, lead pump required, lag pump required and high level alarm. If the backup system is engaged by the high level float, both pumps will be required with a staggered start for the first operation and lead/lag alternating operation until the primary system is manually restored. Backup control will be locked out of operation until the High Level Float is reached for the first time. A manual restore push button needs to be pressed to restore to primary control from the backup mode. Provide an interlock to the PLC program to prevent PID windup while the backup control system is in use.
- All running pumps shall run at the same speed, which will be determined by a proportional-only PID loop output, directly proportional to the operating level range of the wetwell. Each VFD will have a NEMA rated full speed bypass starter that can be manually selected for operation instead of the VFD, or will automatically be switched on in the event of a VFD fault.
- The Lead and Lag pumps will be alternated in a first-on first-off scheme of alternation, or on a 24-hour timer, whichever comes first. If a pump fails to run when called, the other pump will start immediately, and the failed pump will be taken out of the alternation sequence until it is returned to service by an operator.
- There will be a Cleaning Cycle operation in the program. It will run once per day on a 24-hour timer, or when manually requested. It will start all pumps at maximum speed, and run them until the Low Level set point is reached. After completion of the clean cycle, normal operation shall resume.
- Provide all available monitoring and control at the local panel-mounted OIT, including the following. Wetwell level, pump status, speed feedback, and alarms shall be displayed on the main graphic screen of the OIT. Run times and pump starts (for each day and for all time) shall be calculated and displayed in a table. Controls shall include: manual override of each pump (start/stop and speed control), level set point configuration, Lead/Lag manual initiate

and timer configuration, PID loop configuration, VFD maximum/minimum speed configuration, Cleaning Cycle manual initiate and timer configuration.

Provide for a separate Operational Readiness Test and Functional Demonstration Test, as per Section 13302, for this portion of the work and provide separate submittal(s) for this portion of the work that conform to the main submittal requirements of Section 13300 and related Sections.

Signed:  \_\_\_\_\_  
Robert P. Huguenard

## Request for Information

Project Name: City of Franklin Water Management Department- Water Distribution & Collection System SCADA Improvements		
Owner's Project No.: 2014-0288	CDM Smith Project No.: 14915-96594-SCADA	
Contractor: Revere Control Systems	RFI No.: 013	
	Date: 5/31/2017	
Subject: RTU Mounting		
Spec Section:		Detail: E-11

QUESTION:	
<p>This is a replace existing in place site. Mounting the new RTU flush to the ATS with a close nipple leaves 9" of overhang and less than 36" of clearance from the control panel on the adjacent wall (see attached sketch). We think the RTU door will just barely be able to open. Since part of the RTU does not meet the 36" of clearance, please advise on what to do.</p>	
Please Respond by This Date:6/15/2017	
Submitted by Contractor: David Abel, Revere Control Systems	Date:5/31/2017
Received by (CDM Smith):	Date:

RESPONSE:	
<p>The new RTU panel should be located inside the conditioned space in the same location as the existing RTU. A 48"x36"x12" panel as submitted is too large to provide 36" of clearance in front of the door. Therefore furnish a new enclosure that can accommodate the new RTU and appurtenances with adequate door clearance, of NEMA 12 steel construction and no more than 30" wide. Submit proposed revisions, cost and schedule impact for this change and the changes requested in RFP 003 for the same site (Goose Creek/Red Wing BPS).</p>	
By: Scott Whitmore	Date: 6/8/2017
Distribution: Contractor, Owner, File, Field, RFI Notebook	



**CONSTRUCTION CHANGE AUTHORIZATION (WORK ORDER)**

**TO:** Mr. David Abel  
Project Manager  
Revere Control Systems  
2240 Rocky Ridge Road  
Birmingham, AL 35216  
(205) 824-0004

**FROM:** CDM Smith  
3715 Northside Parkway NW  
Building 300, Suite 400  
Atlanta, GA 30327  
(404) 720-1400

**DATE:** July 27, 2017

**PROJECT:** City of Franklin, Tennessee  
Water Distribution and Collection Systems SCADA Improvements

**WORK ORDER NUMBER:** 005  
**CDM SMITH PROJ. NO.:** 14915-96594

**SUBJECT:** Old Hillsboro Road Strut  
Hardware  
**CITY PROJECT NO.:** 2014-0288

**REFERENCE:** July 11, 2017 Revere Control Proposal (attached)


**DESCRIPTION:**

Revere Control Systems is directed to furnish new 316 stainless steel struts for mounting in place of the existing wooden posts for mounting of the RTU at the Old Hillsboro Road site. The scope of work and cost for the changes is detailed in the attached proposal dated July 11, 2017. The attached proposal provides costs for both galvanized and stainless-steel struts. Stainless steel shall be used. The work shall be performed for a lump sum price of \$4,811.27. Application for payment may be made when the work for that site is completed.

**ATTACHMENTS:** July 11, 2017 Revere Controls Proposal (attached)

**CDM SMITH:**

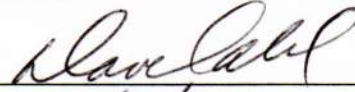
By:



Date: July 27, 2017

**CONTRACTOR:**

By:



Date:

7/31/2017



July 11, 2017

CDM Smith  
3200 Windy Hill Road, S.E.  
Suite 210 West  
Atlanta, Georgia 30339-5460

Attn: Mr. Robert Huguenard, PE, BCEE

Ref: City of Franklin Water Management Department  
CDM Project Number 14915-96594-SCADA  
COF Contract No. 2014-0288

Subj: Old Hillsboro Road Strut Hardware

Mr. Huguenard:

Per RFI-09, we were directed to furnish new galvanized struts for mounting to replace the existing wooden posts. However, at the progress meeting held on 7/5, we were directed to use 316SS. Below are the prices for using galvanized (per RFI-09) and 316SS per progress meeting notes:

**Materials**

Option 1: Galvanized Strut.....	\$ 2,172.24
10% Profit:	<u>\$ 217.22</u>
Material Total:	\$ 2,389.46
Option 2: 316 SS .....	\$ 4,373.88
10% Profit:	<u>\$ 437.39</u>
Material Total:	\$ 4,811.27

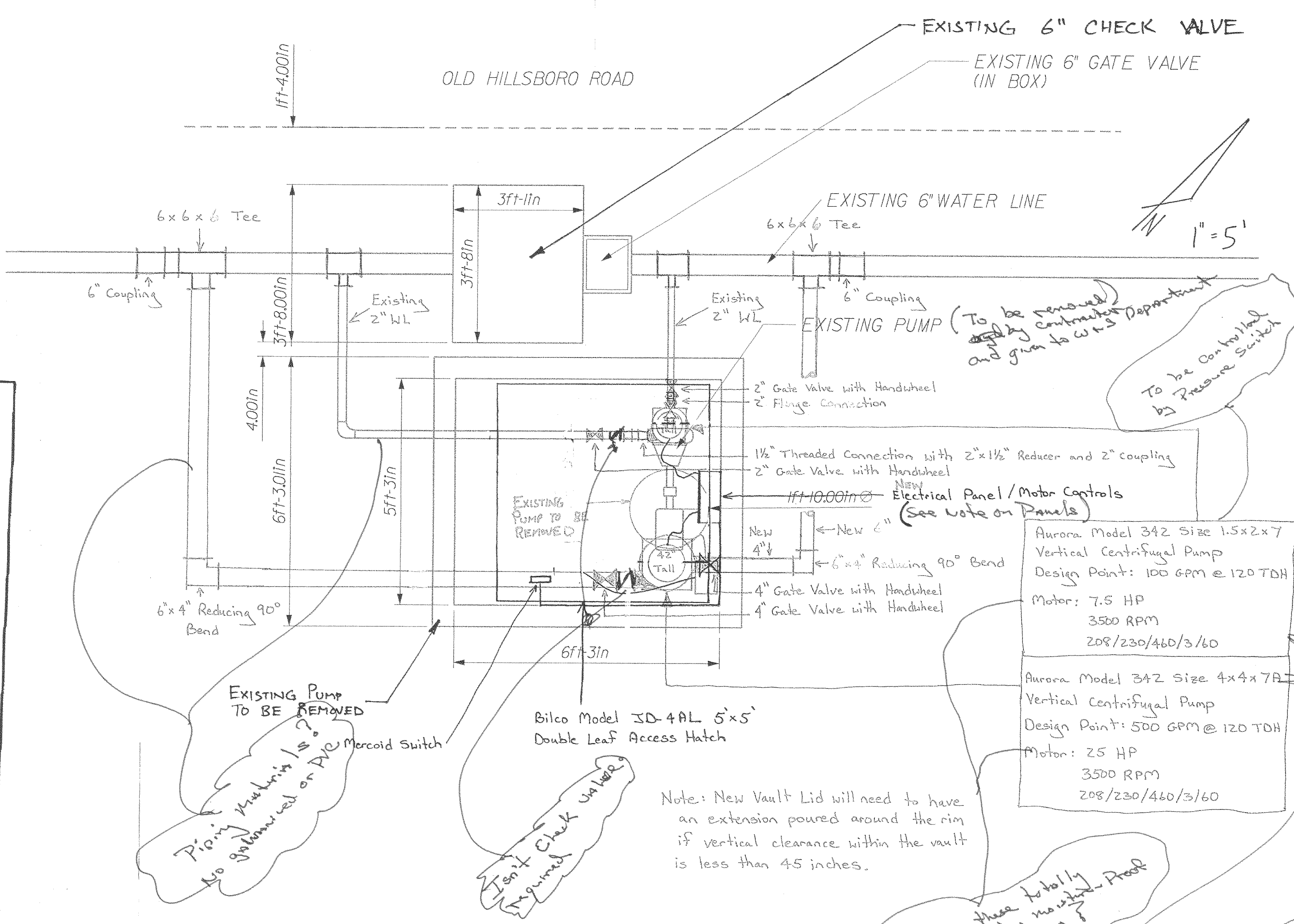
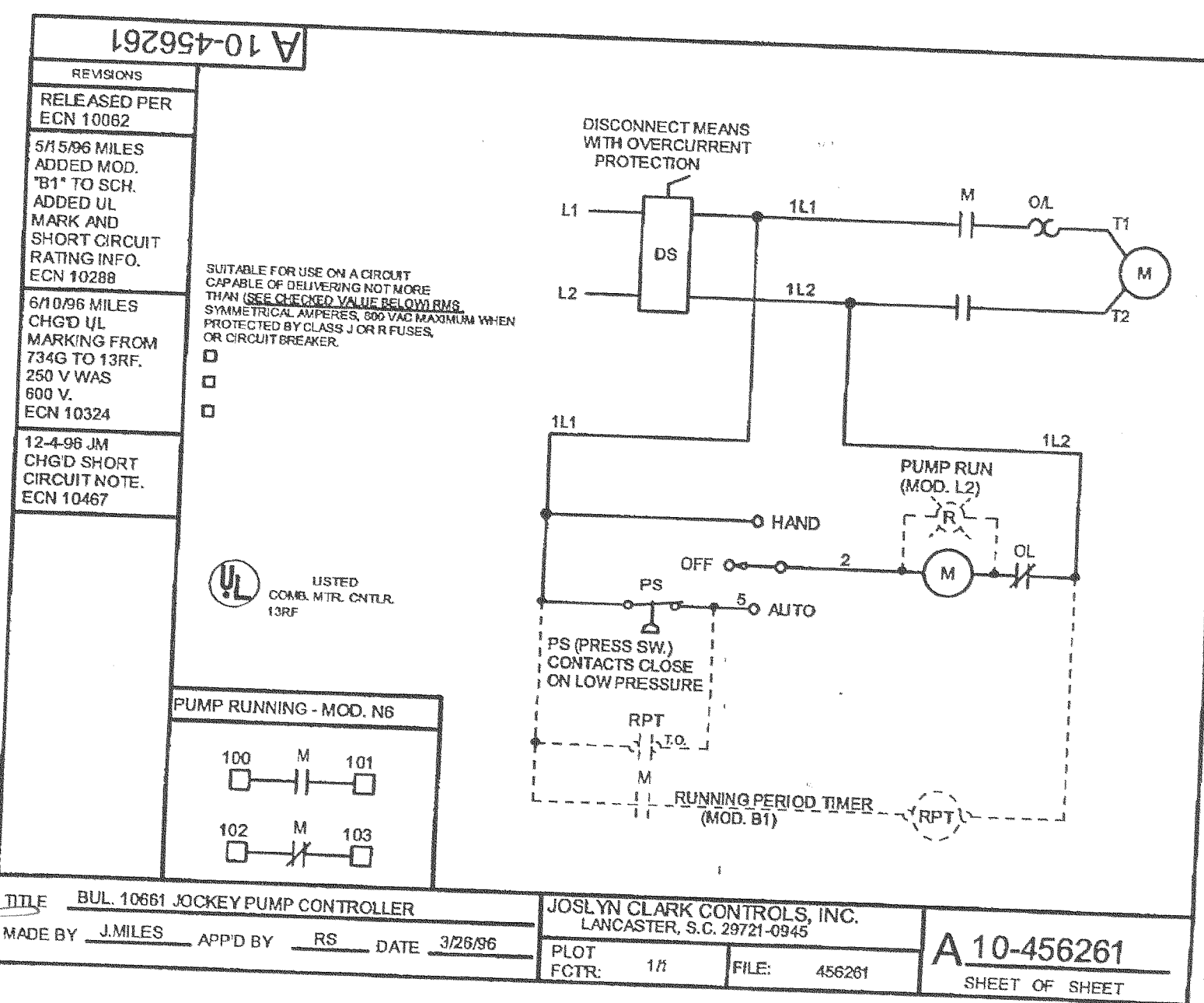
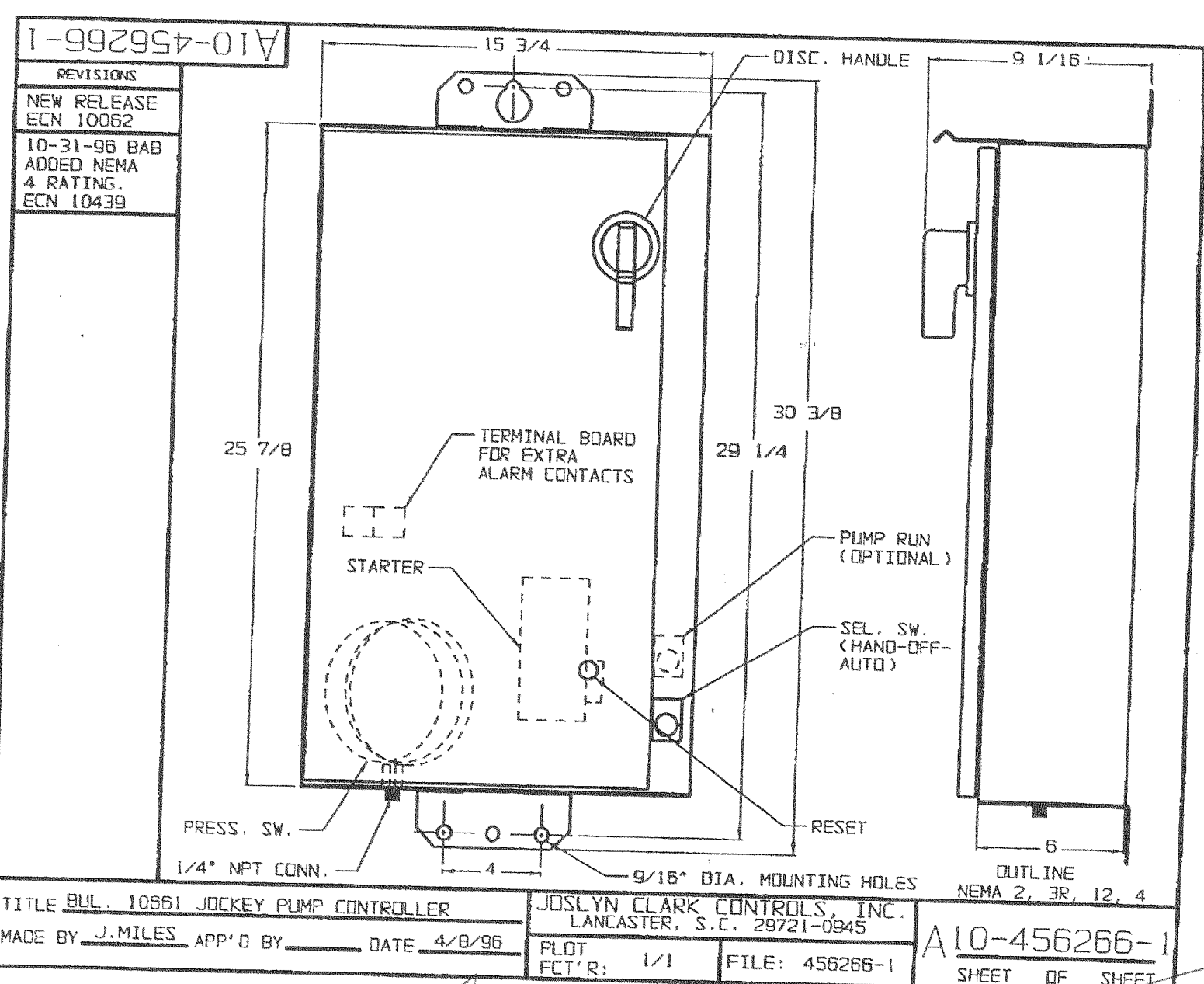
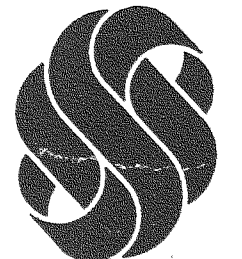
Old Hillsboro Road replacement is currently scheduled to be replaced on 9/11 barring other delays. Please issue a change order for either option within 10 days to avoid impacting substantial completion delays.

Terms and Conditions from the current contract agreement apply.

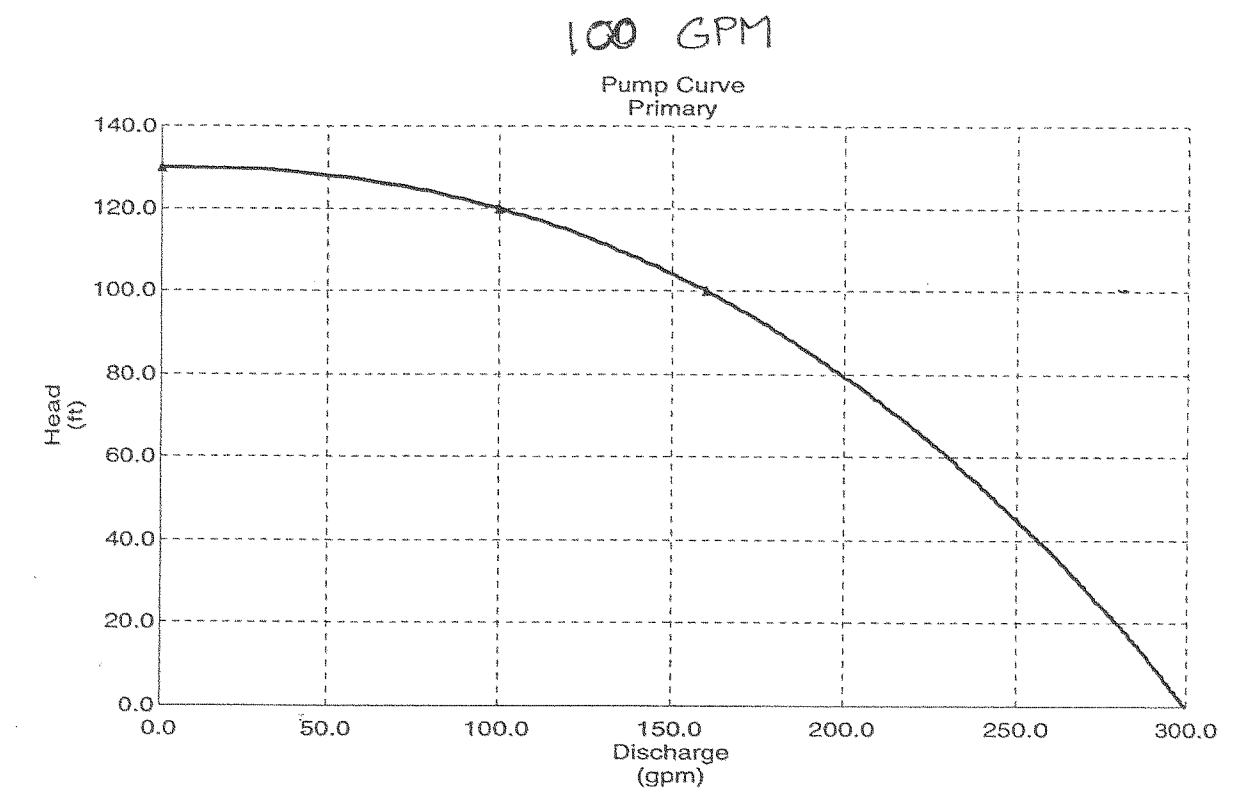
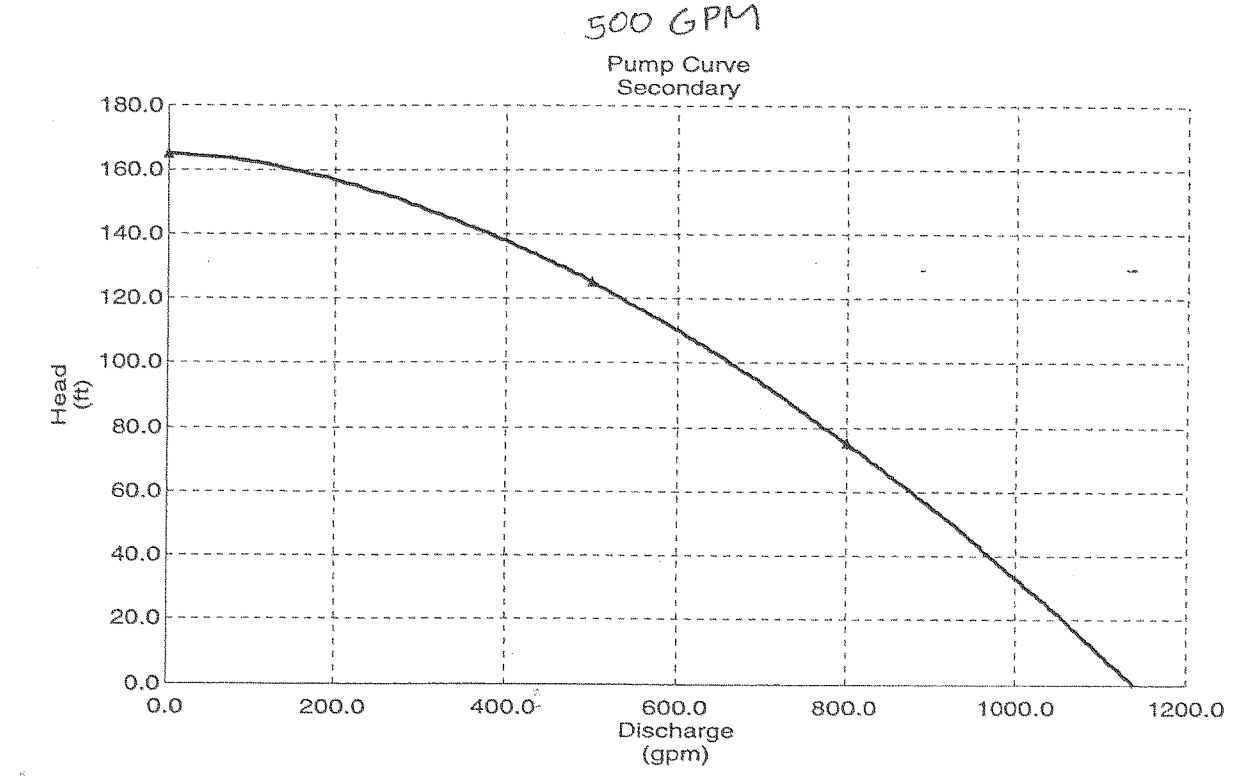
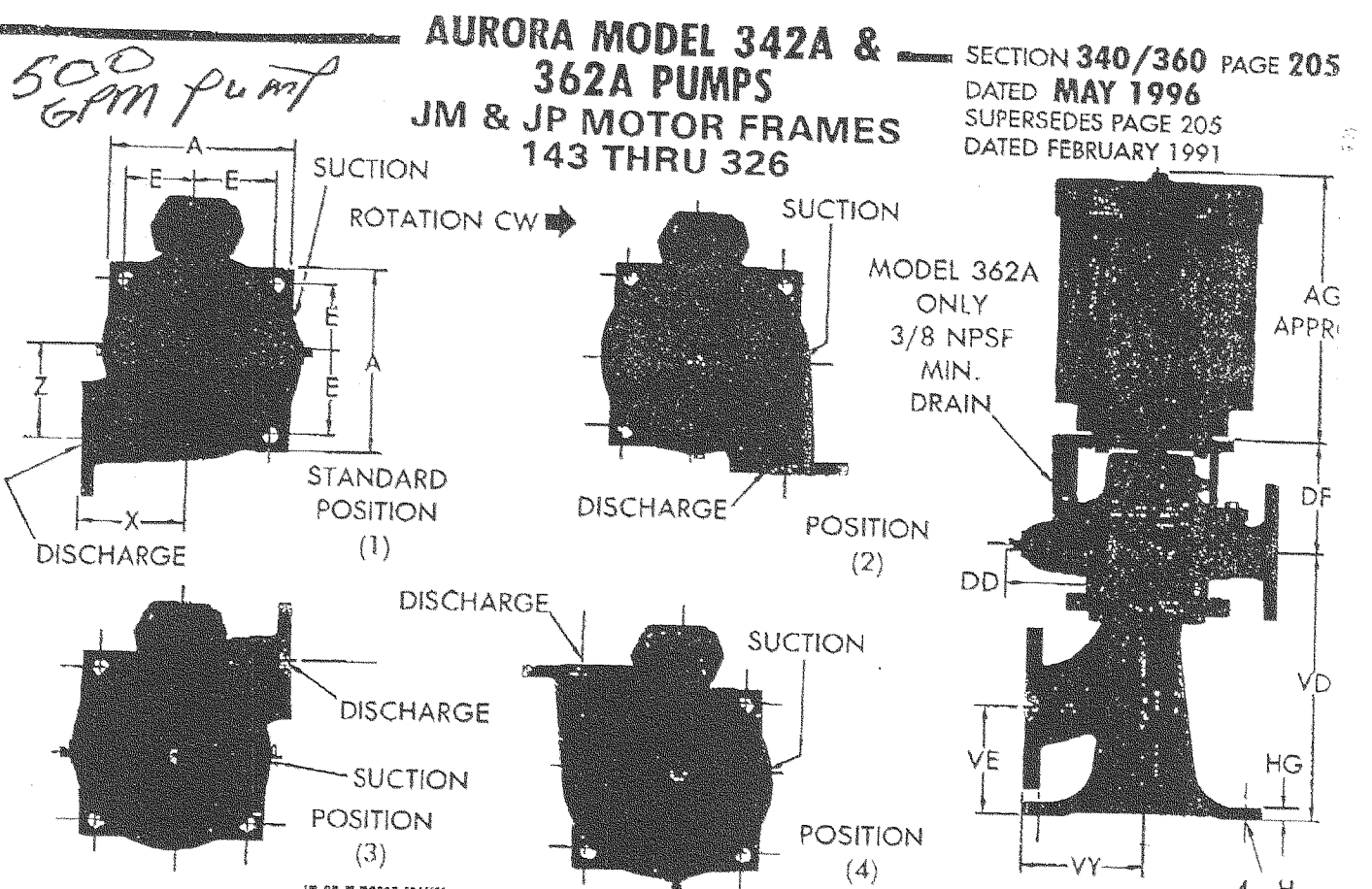
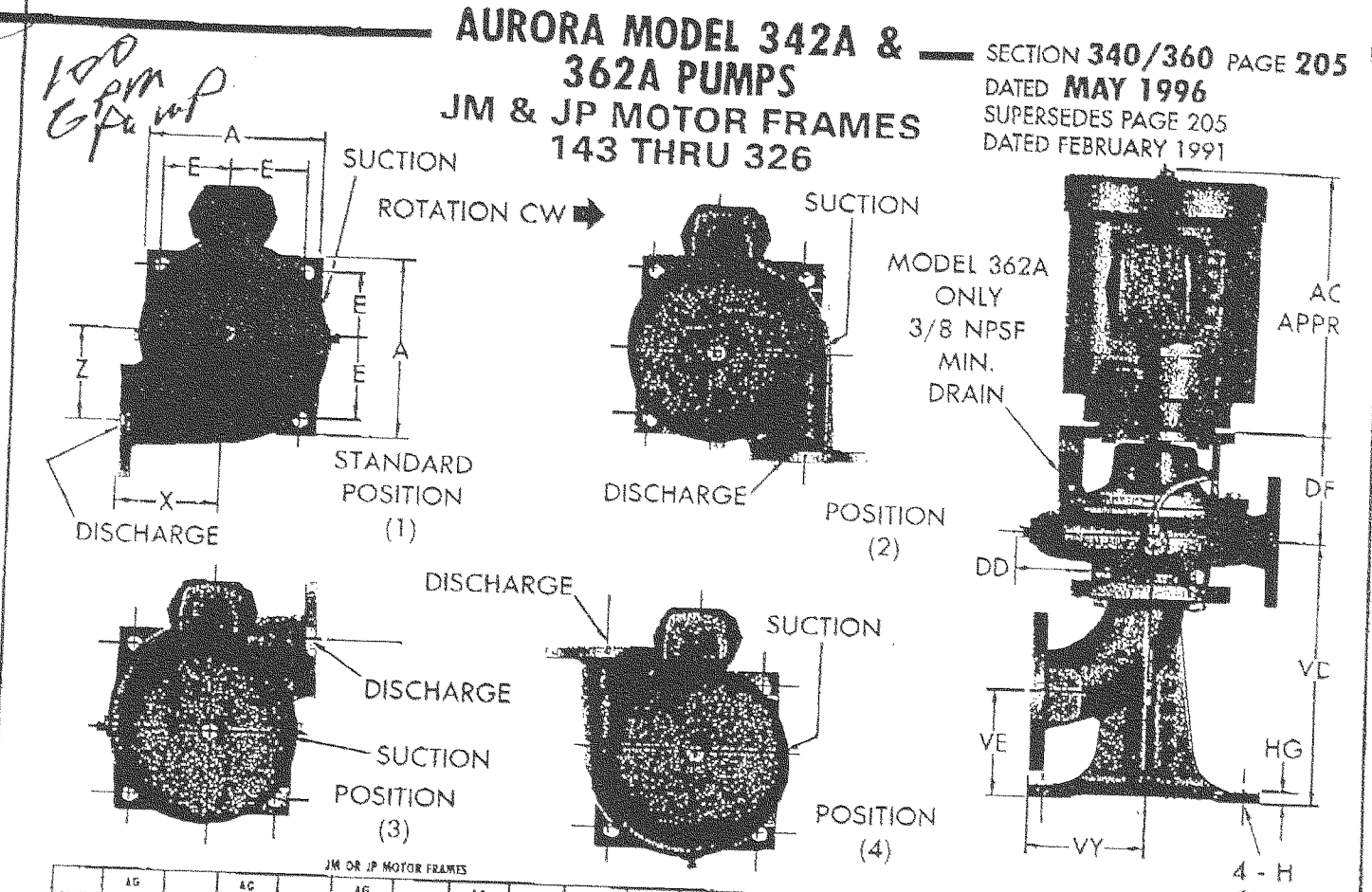
Sincerely,

*David Abel*

David Abel  
Municipal Project Manager  
Revere Control Systems, Inc.  
Phone: 615-604-1579  
[dabel@reverecontrol.com](mailto:dabel@reverecontrol.com)



Pump Controller + disconnects to be mounted external of Pump Pit in NEMA, weatherable enclosure lockable



Are these totally enclosed, weather-proof 1200/60 Comm. motor to be provided by installer

CITY OF FRANKLIN  
 WATER AND WASTEWATER DEPT.  
 REVIEW OF THIS DOCUMENT HAS BEEN MADE ONLY FOR CONFORMANCE WITH THE DESIGN CONCEPT OF THE PROJECT AND APPROVAL OR REPROVAL AS NOTED SHALL NOT BE THE CONTRACTOR'S RESPONSIBILITY FOR ANY ERRORS, OMISSIONS, OR FOR FURNISHING THE MATERIALS AND EQUIPMENT OF PROPER DIMENSION, SIZE, QUANTITY, QUALITY, AND ALL PERFORMANCE CHARACTERISTICS TO MEET THE REQUIREMENTS AND INTENT OF THE CONTRACT DOCUMENTS.

APPROVED  
 APPROVED AS NOTED  
 DISAPPROVED (SEE COMMENTS)

DATE 9/23/99 BY Edy Woodard

PUMP WITH FLANGED SECTION CONNECTIONS AND FINGERED DISCHARGE CONNECTIONS

DISCHARGE	SUCTION	SECTION OF				SECTION OF			
		143	144	145	146	147	148	149	150
1 1/2	2	3	4	5	6	7	8	9	10
1 1/2	2	3	4	5	6	7	8	9	10

PUMP WITH FLANGED SECTION CONNECTIONS AND FINGERED DISCHARGE CONNECTIONS

DISCHARGE	SUCTION	SECTION OF				SECTION OF			
		143	144	145	146	147	148	149	150
1 1/2	2	3	4	5	6	7	8	9	10
1 1/2	2	3	4	5	6	7	8	9	10

NO.	BY	DATE	REVISION

**OFFSITE BOOSTER PUMP**  
 OLD HILLSBORO ROAD  
**C7.1**

Dr: EDS Des: DKK Chk: MDH  
 File: 17765.00 Date: 05-20-98



**Stone & Sons Electrical Contractors, Inc.**

2530 Queenstown Rd.  
 Birmingham, AL 35210  
 205-833-8494  
 205-833-9390

Job # 772001 Change Order # 772001-03 Date: 6/30/2017

Job Name: Franklin SCADA Improvements Location: Franklin, TN  
 County: \_\_\_\_\_

General Contractor: Revere GC Job # 615-604-1579  
 GC Project Manager: David Abel Contact Number: \_\_\_\_\_

Engineer: CDM Smith Engineer Job # 14915-96594-SCADA  
 Engineer Rep: Bob Huguenard Contact Number: 615-320-3161

Description: Old Hillsboro Rd (RFI #9)  
Replace existing strut rack with new 316 stainless strut rack

Written By: Caleb Johnson  
 Title: Project Manager

Qty.	Description	Unit Price	Units	Total	Labor	Units	Total
1	See Attachment "A"	\$ 2,716.43	ea	\$ 2,716.43	27.73	ea	27.73
3	Project Management per hour	\$ 72.00	ea	\$ 216.00			0.00
28	Food and Lodging per hour	\$ 8.00	ea	\$ 224.00			0.00
				\$ -			0.00
				\$ -			0.00
				\$ -			0.00
				\$ -			0.00
				\$ -			0.00
				\$ -			0.00
				\$ -			0.00
				\$ -			0.00
				\$ -			0.00
				\$ -			0.00
				\$ -			0.00
				\$ -			0.00

Tax Exempt:  YES  NO

State Tax: 0.00% County Tax: 0.00%

Labor Rate: \$27.00

Overhead & Profit: 15.00%

Material SubTotal: \$3,156.43

Total Tax: 0.00%

Material Total: \$3,156.43

Labor Total: \$748.71

Overhead & Profit: \$585.77

Total: \$4,490.91

Engineer Rep. : \_\_\_\_\_  
 Title: \_\_\_\_\_  
 Date: \_\_\_\_\_

Stone and Sons: \_\_\_\_\_  
 Title: \_\_\_\_\_  
 Date: \_\_\_\_\_



## **RESPONSE TO REQUEST FOR INFORMATION**

**TO:** Mr. David Abel  
Revere  
Rocky Ridge Road  
Birmingham, AL 35216  
((205) 824-0004

**FROM:** CDM Smith  
3200 Windy Hill Road  
Suite 210 West  
Atlanta, GA 30339  
(404) 720-1400

**DATE:** 05/18/2017

**PROJECT:** City of Franklin Water Management Department  
Water Distribution & Collection System SCADA Improvements

**RFI NUMBER:** 9


**CDM SMITH PROJ. NO.:** 14915-96594

**SUBJECT:** Old Hillsboro Road BPS

**COF CONTRACT NO.:** 2014-0288

### **Response:**

Comments attached.

Signed:   
Jennifer K. Carter for Scott Whitmore

## Request for Information

Project Name: City of Franklin Water Management Department- Water Distribution & Collection System SCADA Improvements		
Owner's Project No.: 2014-0288	CDM Smith Project No.: 14915-96594-SCADA	
Contractor: Revere Control Systems	RFI No.: 009	
	Date: 4/4/2017	
Subject: Old Hillsboro Road BPS		
Spec Section:		Detail: G-1; I-6

QUESTION:	
<ol style="list-style-type: none"> <li>1. Per 3/7/17 meeting, we are to provide a new pole, antenna and cable at this site. We understand neighboring land owners may be difficult. Please advise on location to set the pole.</li> <li>2. The existing RTU is presently located on the back side of the Pump Control Panel – please advise if it is to remain in this location (note: close to the road in a bad location).</li> <li>3. Note: RTU drawings for this site were decaying in the bottom of the RTU, attempt was made to salvage I/O and markups.</li> </ol>	
Please Respond by This Date:4/14/2017	
Submitted by Contractor: David Abel, Revere Control Systems	Date:4/4/2017
Received by (CDM Smith):	Date: 4/14/2017

RESPONSE:	
<ol style="list-style-type: none"> <li>1. Retain the existing mounting configuration. The existing antenna and cable shall be reused if they are functional when the radio link is tested.</li> <li>2. New RTU shall be mounted in the same location as the old RTU, back to back with the Pump Control Panel. However please furnish new galvanized struts for mounting to replace the existing wooden post.</li> <li>3. See attached for an additional drawing of the site. From this we believe that Pump 1 &amp; 2 Running &amp; Overload are the points available to be monitored.</li> </ol>	
By: Scott Whitmore	Date: 5/17/2017
Distribution: Contractor, Owner, File, Field, RFI Notebook	

## CONSTRUCTION CHANGE AUTHORIZATION (WORK ORDER)

**TO:** Mr. David Abel  
Project Manager  
Revere Control Systems  
2240 Rocky Ridge Road  
Birmingham, AL 35216  
(205) 824-0004

**FROM:** CDM Smith  
3715 Northside Parkway NW  
Building 300, Suite 400  
Atlanta, GA 30327  
(404) 720-1400

**DATE:** September 22, 2017

**PROJECT:** City of Franklin, Tennessee  
Water Distribution and Collection Systems SCADA Improvements

**WORK ORDER NUMBER:** 006 **CDM SMITH PROJ. NO.:** 14915-96594

**SUBJECT:** Conversion to Cradlepoint Routers in the RTUs **CITY PROJECT NO.:** 2014-0288

**REFERENCE:** August 31, 2017 Revere Proposal (attached)

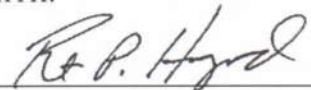
**DESCRIPTION:**

The purpose of this Work Order is to authorize proceeding with preparations for replacement of the existing Sierra modems and Moxa routers with Cradlepoint IBR1150LP6-NA devices. The attached proposal identifies three tasks, where the first two are associated with research and testing to verify that the Cradlepoint units are compatible with the Verizon and City systems and the third task includes purchasing of the Cradlepoint units and installation of the units in the RTUs at each site. All indications are that the units are compatible, but we feel it would be prudent to physically verify compatibility prior to purchasing all of the Cradlepoint units. This Work Order authorizes the performance of the first two scope items in the attached proposal. Once compatibility is verified another Work Order will be issued for the third scope item.

The second scope item offers license options of one year, 4 year, or 6 year. A one-year license shall be provided. This work shall be performed for a total lump sum price of \$13,046. It is recognized that impacts to the substantial and final completion will result from this change. Schedule changes will be addressed in a separate Work Order after Revere has the opportunity to evaluate schedule impacts and submit a proposed schedule change.

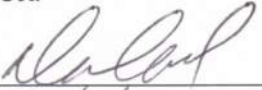
ATTACHMENTS: September 22, 2017 Revere Proposal (attached)

CDM SMITH:

By: 

Date: September 22, 2017

CONTRACTOR:

By: 

Date: 11/1/2017



**CONSTRUCTION CHANGE AUTHORIZATION (WORK ORDER)**

**TO:** Mr. David Abel  
Project Manager  
Revere Control Systems  
2240 Rocky Ridge Road  
Birmingham, AL 35216  
(205) 824-0004

**FROM:** CDM Smith  
3715 Northside Parkway NW  
Building 300, Suite 400  
Atlanta, GA 30327  
(404) 720-1400

**DATE:** November 1, 2017

**PROJECT:** City of Franklin, Tennessee  
Water Distribution and Collection Systems SCADA Improvements

**WORK ORDER NUMBER:** 007                      **CDM SMITH PROJ. NO.:** 14915-96594

**SUBJECT:** Conversion to Cradlepoint Routers in the RTUs, Part 2                      **CITY PROJECT NO.:** 2014-0288

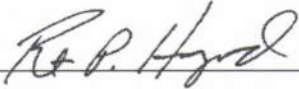
**REFERENCE:** August 31, 2017 Revere Proposal (attached)

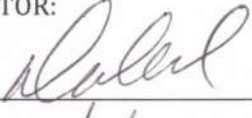
**DESCRIPTION:**

The work under Work Order 006 was completed and it has been shown that the Cradlepoint units are compatible with the City and Verizon systems. The purpose of this Work Order is to authorize the next step, which is to replace the existing Sierra modems and Moxa routers with Cradlepoint IBR1150LP6-NA devices. The attached proposal identifies three tasks, where the first two are associated with research and testing to verify that the Cradlepoint units are compatible with the Verizon and City systems and the third task includes purchasing of the Cradlepoint units and installation of the units in the RTUs at each site. This work order is for the third task.

The third scope item offers license options of one year, 4 year, or 6 year. A one-year license shall be provided. This work shall be performed for a total lump sum price of \$54,311. It is recognized that impacts to the substantial and final completion will result from this change. Schedule changes will be addressed in a separate Work Order after Revere has the opportunity to evaluate schedule impacts and submit a proposed schedule change.

**ATTACHMENTS:** August 31, 2017 Revere Proposal (attached)

**CDM SMITH:**  
By:   
Date: November 1, 2017

**CONTRACTOR:**  
By:   
Date: 11/1/2017

**CONSTRUCTION CHANGE AUTHORIZATION (WORK ORDER)**

<b>TO:</b>	Mr. David Abel Project Manager Revere Control Systems 2240 Rocky Ridge Road Birmingham, AL 35216 (205) 824-0004	<b>FROM:</b>	CDM Smith 3715 Northside Parkway NW Building 300, Suite 400 Atlanta, GA 30327 (404) 720-1400
<b>DATE:</b>	November 20, 2017		
<b>PROJECT:</b>	City of Franklin, Tennessee Water Distribution and Collection Systems SCADA Improvements		
<b>WORK ORDER NUMBER:</b>	008	<b>CDM SMITH PROJ. NO.:</b>	14915-96594
<b>SUBJECT:</b>	Fieldstone Farms 1 Upgrade to AB PLC CPU	<b>CITY PROJECT NO.:</b>	2014-0288
<b>REFERENCE:</b>	October 12, 2017 Revere Proposal (attached)		

**DESCRIPTION:**

The existing CPU in the AB PLC at the Fieldstone Farms 1 site will not communicate with the latest version of RS Logix 5000 (the PLC program software used for the upgrades under this project). The purpose of this Work Order is to direct the replacement of the existing CPU with a model 1769-L33ERM CPU, which is the same model used in all other new RTUs. The scope is described in more detail in the attached Revere proposal.

The work under this Work Order shall be performed for a lump sum cost of \$4,071.00. No change in schedule is required for this Work Order.

**ATTACHMENTS:** October 12, 2017 Revere Proposal (attached)

**CDM SMITH:**

By: \_\_\_\_\_

Date: November 20, 2017

**CONTRACTOR:**

By: \_\_\_\_\_

Date: 11/27/2017

**CONSTRUCTION CHANGE AUTHORIZATION (WORK ORDER)**

**TO:** Mr. David Abel  
Project Manager  
Revere Control Systems  
2240 Rocky Ridge Road  
Birmingham, AL 35216  
(205) 824-0004

**FROM:** CDM Smith  
3715 Northside Parkway NW  
Building 300, Suite 400  
Atlanta, GA 30327  
(404) 720-1400

**DATE:** November 20, 2017

**PROJECT:** City of Franklin, Tennessee  
Water Distribution and Collection Systems SCADA Improvements

**WORK ORDER NUMBER:** 009 **CDM SMITH PROJ. NO.:** 14915-96594

**SUBJECT:** Legends Booster Pump Station **CITY PROJECT NO.:** 2014-0288  
Control Modifications

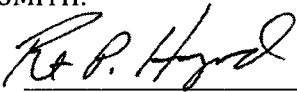
**REFERENCE:** October 20, 2017 Revere Proposal (attached)

**DESCRIPTION:**


The existing controller at the Legends Booster Pump Station is obsolete and operates on an obsolete program that is no longer supported. Therefore, necessary modifications to the control logic cannot be made. However, the new RTU PLC, which is being installed at this pump station is capable of performing all of the functions of the controller. Removing the existing controller and programming the RTU to take over control of the system will solve this problem. In addition to the above issue, the existing operator interface terminal (OIT) is obsolete and cannot work with the new system. Removal of the old OIT and installation of a new OIT will solve this problem.

This Work Order directs removal of the old controller and the old OIT, installation of a new OIT, and performing programming necessary to enable the new RTU to control the pump station and to enable use of the new OIT. The scope is described in more detail in the attached Revere proposal. Please note, the attached proposal erroneously identified the OIT as a "6" Panelview 6 OIT" in one location. A 10" Panelview OIT shall be provided as indicated under the Materials cost section. The work under this Work Order shall be performed for a lump sum cost of \$19,690.87. No change in schedule is required for this Work Order.

CDM SMITH:

By:   
Date: November 20, 2017

CONTRACTOR:

By:   
Date: 11/27/2017

## **CONSTRUCTION CHANGE AUTHORIZATION (WORK ORDER)**

**TO:** Mr. David Abel  
Project Manager  
Revere Control Systems  
2240 Rocky Ridge Road  
Birmingham, AL 35216  
(205) 824-0004

**FROM:** CDM Smith  
3715 Northside Parkway NW  
Building 300, Suite 400  
Atlanta, GA 30327  
(404) 720-1400

**DATE:** January 25, 2018

**PROJECT:** City of Franklin, Tennessee  
Water Distribution and Collection Systems SCADA Improvements

**WORK ORDER NUMBER:** 010      **CDM SMITH PROJ. NO.:** 14915-96594

**SUBJECT:** Credit for Radio Tower Structures      **CITY PROJECT NO.:** 2014-0288

**REFERENCE:** August 31, 2017 Revere Letter (attached)

**DESCRIPTION:**

This work order eliminates the three radio tower structures from the contract. Revere Control Systems will provide a \$21,190.76 credit for elimination of the towers and the labor for erection of the towers.

**ATTACHMENTS:** August 31, 2017 Revere Letter (attached)

**CDM SMITH:**

By: 

Date: January 25, 2018

**CONTRACTOR:**

By: 

Date: 1/30/2018

**CONSTRUCTION CHANGE AUTHORIZATION (WORK ORDER)**

**TO:** Mr. David Abel  
Project Manager  
Revere Control Systems  
2240 Rocky Ridge Road  
Birmingham, AL 35216  
(205) 824-0004

**FROM:** CDM Smith  
3715 Northside Parkway NW  
Building 300, Suite 400  
Atlanta, GA 30327  
(404) 720-1400

**DATE:** January 25, 2018

**PROJECT:** City of Franklin, Tennessee  
Water Distribution and Collection Systems SCADA Improvements

**WORK ORDER NUMBER:** 011 **CDM SMITH PROJ. NO.:** 14915-96594

**SUBJECT:** Columbia Avenue Tank  
New Power Service Cable and  
Receptacle **CITY PROJECT NO.:** 2014-0288


**REFERENCE:** December 15, 2017 Revere Proposal (attached)

**DESCRIPTION:**


This work order includes addition of new cable from the service entrance to the site (pulled through new conduit installed by the City) and addition of a new receptacle.

The work under this Work Order shall be performed for a lump sum cost of \$4,099.10. No change in schedule is required for this Work Order.

CDM SMITH:

By:   
Date: January 25, 2018

CONTRACTOR:

By:   
Date: 1/30/2018

**CONSTRUCTION CHANGE AUTHORIZATION (WORK ORDER)**

**TO:** Mr. David Abel  
Project Manager  
Revere Control Systems  
2240 Rocky Ridge Road  
Birmingham, AL 35216  
(205) 824-0004

**FROM:** CDM Smith  
3715 Northside Parkway NW  
Building 300, Suite 400  
Atlanta, GA 30327  
(404) 720-1400

**DATE:** January 25, 2018

**PROJECT:** City of Franklin, Tennessee  
Water Distribution and Collection Systems SCADA Improvements

**WORK ORDER NUMBER:** 012    **CDM SMITH PROJ. NO.:** 14915-96594

**SUBJECT:** Credit for Elimination of Trihedral Training    **CITY PROJECT NO.:** 2014-0288

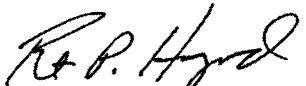
**REFERENCE:** August 31, 2017 Revere Letter (attached)

**DESCRIPTION:**

This work order eliminates a portion of the Trihedral training (see attached letter from Revere Control Systems). Revere Control Systems will provide a \$3,924.80 credit for elimination of the training.

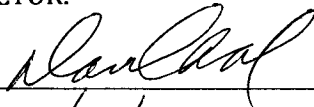
**ATTACHMENTS:** August 31, 2017 Revere Letter (attached)

**CDM SMITH:**

By:  \_\_\_\_\_

Date: January 25, 2018

**CONTRACTOR:**

By:  \_\_\_\_\_

Date: 1/30/2018

# **CONSTRUCTION CHANGE AUTHORIZATION (WORK ORDER)**

**TO:** Mr. David Abel  
Project Manager  
Revere Control Systems  
2240 Rocky Ridge Road  
Birmingham, AL 35216  
(205) 824-0004

**FROM:** CDM Smith  
3715 Northside Parkway NW  
Building 300, Suite 400  
Atlanta, GA 30327  
(404) 720-1400

**DATE:** March 5, 2018

**PROJECT:** City of Franklin, Tennessee  
Water Distribution and Collection Systems SCADA Improvements

**WORK ORDER NUMBER:** 013      **CDM SMITH PROJ. NO.:** 14915-96594

**SUBJECT:** Legends Booster Pump Station      **CITY PROJECT NO.:** 2014-0288  
Additional Modifications

**REFERENCE:** January 2, 2018 Revere Proposal (attached)

**DESCRIPTION:**

While performing work authorized under Work Order 9, which included demolition of the pump controller and replacement with a new RTU, installation changes were agreed to with the City of Franklin to work around some conflicts. The changes included relocation of the transformer and load center then building a stand and rack for the RTU. The revised installation required additional conduit, wire, supports, etc.

The work under this Work Order shall be performed for a lump sum cost of \$9,199.40. No change in schedule is required for this Work Order.

CDM SMITH:

By:

Date: March 5, 2018

CONTRACTOR:

By:

Date: 3/5/2018

**CONSTRUCTION CHANGE AUTHORIZATION (WORK ORDER)**

**TO:** Mr. David Abel  
Project Manager  
Revere Control Systems  
2240 Rocky Ridge Road  
Birmingham, AL 35216  
(205) 824-0004

**FROM:** CDM Smith  
3715 Northside Parkway NW  
Building 300, Suite 400  
Atlanta, GA 30327  
(404) 720-1400

**DATE:** March 5, 2018

**PROJECT:** City of Franklin, Tennessee  
Water Distribution and Collection Systems SCADA Improvements

**WORK ORDER NUMBER:** 011 014 Rdr **CDM SMITH PROJ. NO.:** 14915-96594

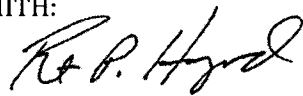
**SUBJECT:** Ash Drive Tank RTU Relocation **CITY PROJECT NO.:** 2014-0288


**REFERENCE:** December 15, 2017 Revere Proposal (attached)

**DESCRIPTION:**

This work order includes additional material and labor required to relocate the RTU from the vault to a location on the tank. The new RTU was not able to be installed in the vault due to space constraints. The additional cost is associated with the mounting stand, hardware, conduit, wire, etc.

The work under this Work Order shall be performed for a lump sum cost of \$5,921.97. No change in schedule is required for this Work Order.

**CDM SMITH:**  
By:   
Date: March 5, 2018

**CONTRACTOR:**  
By:   
Date: 3/5/2018



## **CONSTRUCTION CHANGE AUTHORIZATION (WORK ORDER)**

**TO:** Mr. David Abel  
Project Manager  
Revere Control Systems  
2240 Rocky Ridge Road  
Birmingham, AL 35216  
(205) 824-0004

**FROM:** CDM Smith  
3715 Northside Parkway NW  
Building 300, Suite 400  
Atlanta, GA 30327  
(404) 720-1400

**DATE:** March 5, 2018

**PROJECT:** City of Franklin, Tennessee  
Water Distribution and Collection Systems SCADA Improvements

**WORK ORDER NUMBER:** 015                      **CDM SMITH PROJ. NO.:** 14915-96594

**SUBJECT:** Fieldstone Farms 2  
RTU and Controller  
Modifications                      **CITY PROJECT NO.:** 2014-0288

**REFERENCE:** January 26, 2018 Revere Proposal (attached)

### DESCRIPTION:

The pumping system at the Fieldstone Farms 2 site is currently controlled by two separate controllers, a Gorman Rupp and a MicroLogix controller. This unusual setup makes this station different from the other stations and add challenges in that this configuration will not allow remote override of the pumps. To rectify this issue, this Work Order directs removal of the two existing controllers and programming of the new RTU to become the new pump station controller as well as the telemetry unit. The scope of work is defined on the attached January 26, 2018 proposal from Revere. While the proposal doesn't specifically identify removing unused switches from the panel and installing a plate over the openings, that shall also be included in the scope.

The work under this Work Order shall be performed for a lump sum cost of \$12,621.73. The request for increasing the scheduled final completion by 4 weeks is acknowledged and will be addressed in a change order as this cannot be granted in a Work Order.

CDM SMITH:

By:

Date: March 5, 2018

CONTRACTOR:

By:

Date: 3/5/2018



Parkview Towers  
210 25<sup>th</sup> Avenue North, Suite 1102  
Nashville, Tennessee 37203  
tel: 615-771-2466  
fax: 615-778-9733

May 17, 2018

Mr. David Abel  
Revere Control Systems  
2240 Rocky Ridge Road  
Birmingham, Alabama 35216

Subject: Old Hillsboro Road Booster Pump Station Repairs  
Franklin SCADA System Improvements

Dear Dave:

As I indicated in a previous communication, the City had to make some repairs at the Old Hillsboro Booster Pump Station (Pump Station) as a result of some miswiring that was performed by your crews. The purpose of this letter is to provide you with the details of the situation and propose a method for compensating the City for their costs. The following paragraphs provide a summary of event, a summary of incurred costs, and a proposed method of compensation.

### Summary of Events

On November 29, 2017 Revere Control Systems (RCS) reported that there was no speed feedback or control to Pump Number 1 or the lag pump at the Pump Station. RCS was still in the process of constructing the SCADA system and appurtenances at the Pump Station at that point in time. Upon learning this, Layne Warf with the City of Franklin Water Management Division (City) reported to Harvey Smithson, Service Division's Superintendent, that the Pump had no previous issue with speed feedback or the drive prior to the SCADA construction effort by RCS.

Once RCS had the SCADA system up and running on cellular communication they noted that Pump Number 1 always showed 100% speed reference and attributed this to a bad drive. RCS disabled the speed discrepancy alarm and recommended the City replace the failing drive. At the January 22, 2018 SCADA construction progress meeting the City agreed to investigate the issue further. City Staff observed and confirmed that there was not a signal indicating that Pump Number 1 was running.

On February 9, 2018 the City called their local integrator who helps in emergency situations. The local integrator replaced the board on drive number one, however they were still unable to get a feedback signal. After further troubleshooting, it was discovered that RCS wiring from the drive to the input/output was backward, and as a result the output for the run signal was





Old Hillsboro Road Booster Pump Station Repairs

May 17, 2018

Page 2

damaged. Consequently, the City purchased and installed a new board and the pump has since been sending correct feedback signals.

### **Summary of Incurred Costs**

Resolving the issue required City personnel time as time and materials from the local integrator. The costs incurred by the City are summarized in the following bullets as supported by the attached invoice from the local integrator and the attached spreadsheet detailing the City's cost.

- City Staff and Resources Cost - \$273.42
- Local Integrator Labor/Equipment Cost - \$617.50
- Total Cost Incurred by the City - \$890.92

### **Proposed Method of Compensation**

To compensate the City for their costs, we propose the RCS execute the attached preparing a task order for a credit of \$890.92. Please verify your concurrence with this action by signing the attached task order.

Please feel free to call me if you have any questions.

Very truly yours,

A handwritten signature in blue ink that reads "R. P. Huguenard".

Robert P. Huguenard  
Senior Project Manager  
CDM Smith

Enclosures

cc: Michelle Hatcher, City of Franklin  
Brian Goodwin, City of Franklin  
Zack Daniel, CDM Smith

**CONSTRUCTION CHANGE AUTHORIZATION (WORK ORDER)**

**TO:** Mr. David Abel  
Project Manager  
Revere Control Systems  
2240 Rocky Ridge Road  
Birmingham, AL 35216  
(205) 824-0004

**FROM:** CDM Smith  
3715 Northside Parkway NW  
Building 300, Suite 400  
Atlanta, GA 30327  
(404) 720-1400

**DATE:** May 17, 2018

**PROJECT:** City of Franklin, Tennessee  
Water Distribution and Collection Systems SCADA Improvements

**WORK ORDER NUMBER:** 016 **CDM SMITH PROJ. NO.:** 14915-96594

**SUBJECT:** Credit for Old Hillsboro Road Repairs Due to Miswiring **CITY PROJECT NO.:** 2014-0288

**REFERENCE:** May17, 2018 Letter from CDM Smith to RCS (attached)

**DESCRIPTION:**

This work order provides a credit to compensate the City for work provided to repair damage due to Revere Control Systems (RCS) miswiring from the Pump Number 1 Drive to the input/output point (see attached letter). Revere Control Systems agrees to provide a \$890.92 credit.

**ATTACHMENTS:** May 17, 2018 Letter from CDM Smith to RCS (attached)

**CDM SMITH:**

By:

Date: May 17, 2018

**CONTRACTOR:**

By:

Date: 5/21/2018



# Independent Controls

PO Box 1721  
White House, TN 37188

# Invoice

www.i-controlz.com  
jimmyb@i-controlz.com

Cell: 615-879-1653  
Fax: 855-260-8231

<b>Bill To:</b>
Franklin TN Water Management 124 Lumber Drive Franklin TN 37064

Date	Invoice Number	Due Date	Terms	P.O. Number	Project
03/16/18	12023338	03/16/18	Due on receipt		Old Hillsboro Rd BPS

Item	Description	Quantity	Rate	Amount
labor	Troubleshoot VFD analog output to new SCADA panel. Found analog output was producing a very high voltage and was determined to be a damaged main control board.	2.5	95.00	237.50
labor	Installed new main control board to VFD. After board installation the analog output had an extremely high voltage output (the same as the old board). Verified the correct programming to the new board. After all the checks, it was determined that the analog out of the new board was also bad now. Traced the wiring and found the analog input and output to the drive were reversed. The analog input was using the 24vdc from the SCADA panel and was landed on the Analog output of the drive which uses a internal 24vdc. since the two separate voltages were applied to the output of the drive, the result was damaging the analog output #1. Reprogrammed the drive to use the analog output #2.	4	95.00	380.00

			Subtotal	\$617.50
			Sales Tax (0.0%)	\$0.00
			<b>Total</b>	<b>\$617.50</b>

**ITEMIZED PROJECT COST**

3/16/2018

PROJECT # TBD

Old Hillsboro Booster Station

**LABOR**

PAYROLL ID	CLASSIFICATION	HOURS	RATE	OVERHEAD RATE	TOTAL
	Maintenance Technician	3	\$ 20.50	\$ 15.00	\$ 106.50
	Maintenance Technician	3	\$ 20.64	\$ 15.00	\$ 106.92
					\$ -
					\$ -
					\$ -
					\$ -
SUB-TOTAL					\$ 213.42

**EQUIPMENT**

TYPE	HOURS	RATE	TOTAL
1 Ton Pick Up	3	\$ 20.00	\$ 60.00
SUB-TOTAL			\$ 60.00

**MATERIALS**

MATERIALS	QUANTITY	UNIT PRICE	TOTAL
		\$ -	\$ -
		\$ -	\$ -
		\$ -	\$ -
SUB-TOTAL			\$ -
TOTAL			\$ 273.42

**CONSTRUCTION CHANGE AUTHORIZATION (WORK ORDER)**

**TO:** Mr. David Abel  
Project Manager  
Revere Control Systems  
2240 Rocky Ridge Road  
Birmingham, AL 35216  
(205) 824-0004

**FROM:** CDM Smith  
3715 Northside Parkway NW  
Building 300, Suite 400  
Atlanta, GA 30327  
(404) 720-1400

**DATE:** May 17, 2018

**PROJECT:** City of Franklin, Tennessee  
Water Distribution and Collection Systems SCADA Improvements

**WORK ORDER NUMBER:** 017 **CDM SMITH PROJ. NO.:** 14915-96594

**SUBJECT:** Old Hillsboro Road  
Antenna and Antenna Cable  
Replacement **CITY PROJECT NO.:** 2014-0288


**REFERENCE:** April 24, 2018 email from David Abel to Bob Huguenard

**DESCRIPTION:**


There have been repeated communication failures at the Old Hillsboro Road when it is in the radio communication mode. This is the site where the antenna was relocated to point to the Fieldstone Farms 2 repeater station. Per the radio survey, the signal strength is good, but the antenna and cable are the original and have been there a long time and may have degraded over time due to weather related problems or water intrusion. The purpose of the Work Order is to direct replacement of the antenna and antenna cable.

The work under this Work Order shall be performed for a lump sum cost of \$1,590.63. Details are provided in the attached email and associated attachments.

CDM SMITH:

By:   
Date: May 17, 2018

CONTRACTOR:

By:   
Date: 5/18/2018

## Huguenard, Robert

---

**From:** David Abel <dabel@reverecontrol.com>  
**Sent:** Tuesday, April 24, 2018 9:24 AM  
**To:** Huguenard, Robert  
**Cc:** Michelle Hatcher (michelle.hatcher@franklintn.gov); Brian Goodwin; Gregg Gray  
**Subject:** W0012: RE: COMM FAIL  
**Attachments:** Old Hillsboro Rd BPS Antenna 009.jpg; IMG\_3388.jpg; RE: W0012: COF Hillsboro Road Antenna Placement; W0012 - Radio Survey Test Sheets - Old Hillsboro BPS.pdf; Antenna Repair and Routers Quote.pdf

Hi Bob,

Recapping our phone conversation, I asked the team about this. This is the site where the antenna needed to be relocated to point to the FF2 repeater. Per the radio survey, the signal strength is OK, but it's still the original antenna and cable that Tom states has been there "a long time" and may be susceptible to weather related problems that we've often run into (water, e.g.). We would be happy to replace the hardware. Based on the recent quote for repairs, additional costs would be:

### Labor

10 hours @ \$108/hour                   \$ 1,080.00  
(6 hours travel, 4 hours onsite)

### Expenses

Mileage (370 @ \$0.54/mile)           \$ 199.80  
Per Diem                                   \$ 50.00  
Expenses Subtotal:                   \$ 249.80

### Materials

Antenna                                   \$ 116.92  
Connectors                               \$ 18.26  
Ground kit                               \$ 23.20  
Weather-proofing                       \$ 12.83  
20' Cable                                 \$ 18.20  
  \$ 189.41  
Shipping                                 \$ 25.00  
Material Subtotal:                   \$ 214.41

Expenses and Materials :   \$ 464.21

10% Markup Matl's and Expenses   \$ 46.42  
  \$ 510.63

Total:   \$ 1,590.63

Thanks,

**David Abel**



(615) 604-1579



---

**From:** Huguenard, Robert <HuguenardRP@cdmsmith.com>  
**Sent:** Monday, April 23, 2018 9:17 AM  
**To:** David Abel <dabel@reverecontrol.com>  
**Cc:** Michelle Hatcher (michelle.hatcher@franklintn.gov) <michelle.hatcher@franklintn.gov>; Brian Goodwin <brian.goodwin@franklintn.gov>  
**Subject:** FW: COMM FAIL

Dave – See message about communication fails below.

---

**From:** Tom Lamb <[Tom.Lamb@ct-eng.net](mailto:Tom.Lamb@ct-eng.net)>  
**Sent:** Monday, April 23, 2018 9:36 AM  
**To:** Huguenard, Robert <[HuguenardRP@cdmsmith.com](mailto:HuguenardRP@cdmsmith.com)>  
**Subject:** FW: COMM FAIL

See below.

---

**From:** Chad Hanes <[chad.hanes@franklintn.gov](mailto:chad.hanes@franklintn.gov)>  
**Sent:** Monday, April 23, 2018 7:39 AM  
**To:** Tom Lamb <[Tom.Lamb@ct-eng.net](mailto:Tom.Lamb@ct-eng.net)>  
**Subject:** COMM FAIL

Saturday 21 I had 2 comm fails at Old Hillsboro Road buster. 30 minutes apart or so. LETTING YOU KNOW. CHAD

Sent from my Verizon, Samsung Galaxy smartphone

This message and all attachments are PRIVATE, and may contain information that is CONFIDENTIAL. If you received this message in error, any disclosure, copy, distribution or use of the contents of this message is prohibited. Please notify the sender by reply e-mail and delete the message and all attachments immediately.







## RADIO SURVEY TEST SHEET

Job	W0012, Franklin, TN	Master or Repeater Site	Remote Site
Site Info	Site Name Fieldstone 2	Old Hillsboro Rd	
	Site Location (Long. and Lat.) 35° 58' 01.2 N, 086° 53' 25.2" W	36° 00' 04.5" N, 086° 53' 28.8" W	
	Site Elevation (ft. above sea level) 192.9	182.9	
Antenna Info	Antenna Height (ft) 80	15	
	Antenna Type Omni	Yagi	
	Antenna Gain (dB) 6	9.2	
	Antenna Azimuth (degrees) n/a	200	
Radio Info	Radio Manufacturer GE MDS	GE MDS	
	Radio Model SD01	SD01	
	Radio Receiver Sensitivity (dBm) -112	-112	
	Transmit Frequency (MHz) 173.3375	173.3375	
	Receive Frequency (MHz) 173.3375	173.3375	
	Transmit Power (W) 5	5	
	RSSI (dBm) -86	-84	
	Noise Floor (dBm) -120	-120	
	Signal to Noise Ratio (dB) 34	36	
	Fade Margin (dB) 26	28	
Wattmeter Test	Forward Power (W) 4.5	3.5	
	Reverse Power (W) 0.35	0.8	
Radio Link Test	Transmitted Packet Count 15	15	
	Received Packet Count 15	15	
	Total Bits 1000	1000	
	Bit Errors 0	0	
Radio Ping Test	Packets Transmitted 30	30	
	Packet Loss (%) 0	0	
	Average Round Trip Time (ms) 807	727	
Weather	Sunny, 68 Degrees, 4pm, 4-17-18		

## **CONSTRUCTION CHANGE AUTHORIZATION (WORK ORDER)**

**TO:** Mr. David Abel  
Project Manager  
Revere Control Systems  
2240 Rocky Ridge Road  
Birmingham, AL 35216  
(205) 824-0004

**FROM:** CDM Smith  
3715 Northside Parkway NW  
Building 300, Suite 400  
Atlanta, GA 30327  
(404) 720-1400

**DATE:** June 9, 2018

**PROJECT:** City of Franklin, Tennessee  
Water Distribution and Collection Systems SCADA Improvements

**WORK ORDER NUMBER:** 018      **CDM SMITH PROJ. NO.:** 14915-96594

**SUBJECT:** Antenna Replacement and  
Addition of Mikrotik Devices      **CITY PROJECT NO.:** 2014-0288

**REFERENCE:** April 26, 2018 Revere Control Proposal (attached)

### DESCRIPTION:

Each of the remote sites in the SCADA system is designed to operate via radio and fault over to cellular if radio signal is lost. By design, all the remote sites were initially connected into the SCADA system via cellular only, and once all sites were up and operating, they were all switched over to radio with cellular fault over. After startup of the radio system certain stations experienced radio communication failures on a regular basis. Since the radio surveys at these stations show adequate signal strength the problem was determined to be the existing older antennas and cables. One purpose of this work order is to compensate Revere Control Systems for replacement of antennas and cables at the Fieldstone Farms 1, Avalon 3, Avalon 4, and Avalon repeater site.

In addition, the routers/modems at each remote site are designed to transmit operating data to the cloud on a regular basis and this transmission (when multiplied by 41 sites) was overwhelming the radio bandwidth, which was causing the remote sites to fault over to cellular on a full-time basis. The information being transmitted was not needed but could not be turned off in the routers/modems. To rectify this problem, Revere Control Systems added a Mikrotik device to each remote site that screens out most of this data transmission. The second purpose of this work order is to compensate Revere Control Systems for the addition of these devices.

The work under this Task Order shall be performed for a lump sum price of \$29,292.84.

ATTACHMENTS: April 26, 2018 Revere Controls Proposal (attached)

CDM SMITH:

By:

Date: June 9, 2018

CONTRACTOR:

By:

Date: **June 11, 2018**



**Antenna Repairs and Mikrotek Routers**  
**City of Franklin Water Management Department**

---

April 26, 2017

CDM Smith  
 3200 Windy Hill Road, S.E.  
 Suite 210 West  
 Atlanta, Georgia 30339-5460

Attn: Mr. Robert Huguenard, PE, BCEE

Ref: City of Franklin Water Management Department  
 Collections and Distribution Telemetry SCADA System

Subj: Quote for Antenna Repairs and Mikrotek Routers, Rev 1

Mr. Huguenard:

As you know, antenna repairs were required at the Fieldstone Farms 1, Avalon 3, Avalon 4 and Avalon repeater sites. We also needed to add an additional Mikrotek router at each site. This quote is for compensation for labor and materials we provided in good faith to resolve the issues on a timely basis. There were many other sites where we replaced cable and connectors to improve signal strengths and reliability, but we will waive seeking compensation for those instances.

**Labor**

Project Management.....	2 Hours .....	\$148/Hr .....	\$ 296
Site Services .....	184 Hours .....	\$108/Hr .....	<u>\$ 19,872</u>
(2 techs for 2 weeks onsite including 24 hours portal-to-portal from Birmingham, AL) Labor Total:			\$ 20,168

**Expenses**

Mileage.....	744 Miles.....	\$0.545.....	\$ 405.48
Meals .....	20 Days.....	\$ 59.....	\$ 1,180.00
Lodging .....	20 Days.....	\$ 148.91.....	<u>\$ 2,978.20</u>
Subtotal:			\$ 4,563.68

**Materials**

Avalon repeater Omni antenna .....	\$ 670.65	
Avalon 3, 4 and Fieldstone Farms 1 Yagi antennas, connectors .....	\$ 787.80	
Mikrotek routers and rail adapters .....	<u>\$ 2,688.06</u>	
Subtotal:		\$ 4,146.51
10% Profit:		<u>\$ 414.65</u>
Material Total:		\$ 4,561.16

Total Price ..... \$ 29,292.84



Antenna Repairs and Mikrotik Routers  
City of Franklin Water Management Department

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Current Terms and Conditions apply

Sincerely,

*David Abel*

David Abel  
Municipal Project Manager  
Revere Control Systems, Inc.  
Phone: 615-604-1579  
[dabel@reverecontrol.com](mailto:dabel@reverecontrol.com)



Revere Control Systems  
 2240 Rocky Ridge Road  
 Birmingham, AL 35216  
 Phone: 205-824-0004  
 Fax: 205-824-0408



## Purchase Order W0012120

P.O. #: W0012120	
------------------	--

Vendor: TESSC001 TESCO TECHNOLOGIES PO BOX 102885 ATLANTA, GA 30368-2885 USA Ph: (410) 229-1076 / Fax: (410) 527-0005 Contact: Dan Miccolupi	Ship To: Stone & Sons Electrical c/o City of Franklin Public W. 124 Lumber Drive Franklin, TN 37064
--	---

P.O. Date: 04/16/18      Delivery Date: 04/19/18 Ordered By: GREG ODOM Remarks: ORDER: 104725	Ship Via: 3RD DAY SELECT Shipping Terms: ShipPoint Prepay & Add Payment Terms: NET 30 DAYS Instructions:
---	---

Seq	Part Number	Description	U/M	Quantity	Unit Cost	Extension
001	137510	OMNI ANTENNA, ANT150F2, TELEWAVE	EA	1.00	670.6500	670.65
<b>Total:</b>						<b>670.65</b>



## Purchase Order W0012115

P.O. #: W0012115	
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Vendor: TESSC001 TESCO TECHNOLOGIES PO BOX 102885 ATLANTA, GA 30368-2885 USA Ph: (410) 229-1076 / Fax: (410) 527-0005 Contact: Dan Miccolupi	Ship To: Stone & Sons Electrical c/o City of Franklin Public W. 124 Lumber Drive Franklin, TN 37064
--	---

P.O. Date: 04/04/18      Delivery Date: 04/09/18 Ordered By: GREG ODOM Remarks: ORDER: 077798 & 077799	Ship Via: Ground Shipping Terms: ShipPoint Prepay & Add Payment Terms: NET 30 DAYS Instructions:
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Seq	Part Number	Description	U/M	Quantity	Unit Cost	Extension
001	1482695	YAGI ANTENNA, MYA1505KN	EA	3.00	116.9200	350.76
002	338985	N Male Hex/Knurl Combo No Brai	EA	6.00	9.1300	54.78
003	310778	GK-S400TT - GROUND KIT FOR LMR400	EA	3.00	23.2000	69.60
004	18264	Universal Weatherproofing Kit	EA	2.00	12.8300	25.66
005	59520	LMR400 CABLE PER FOOT	EA	200.00	0.9100	182.00
<b>Total:</b>						<b>682.80</b>

Revere Control Systems  
 2240 Rocky Ridge Road  
 Birmingham, AL 35216  
 Phone: 205-824-0004  
 Fax: 205-824-0408



## Purchase Order W0012116

P.O. #: W0012116	
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Vendor: CITEL001 CITEL, INC. 11381 INTERCHANGE CIRCLE S MIRAMAR, FL 33025 USA Ph: (800) 248-3548 / Fax: (954) 430-7785 Contact: Citel Inc.	Ship To: STONE & SONS ELECTRICAL C/O CITY OF FRANKLIN P.W. 124 LUMBER DRIVE FRANKLIN, TN 37064
--	--

P.O. Date: 04/04/18 ..... Delivery Date: 04/09/18 Ordered By: GREG ODOM Remarks: JACK SHAW	Ship Via: Ground Shipping Terms: ShipPoint Prepay & Add Payment Terms: NET 30 DAYS Instructions:
--	---

Seq	Part Number	Description	U/M	Quantity	Unit Cost	Extension
001	P8AX09-N-FF	CITEL COAXIAL SPD, N-F TO N-F	EA	3.00	35.0000	105.00
<b>Total:</b>						<b>105.00</b>

## Jason Johanneson

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**From:** support@roc-noc.com  
**Sent:** Monday, March 19, 2018 1:37 PM  
**To:** Jason Johanneson  
**Subject:** ICD Group, Inc: Order receipt #35238

**Follow Up Flag:** Follow up  
**Flag Status:** Flagged

You have received this notification from [ICD Group, Inc](#) because you are a registered user or you or some other registered user requested some information for you from our store.

Dear Jason Johanneson,

Thank you for your order. Please come back soon!

**Invoice:**



**roc-noc**  
Network Operations Center

## INVOICE

**Date:** 03-19-2018 13:36

**Order id:** #35238

**Order status:** Queued

**Payment method:**

Credit Card

**Delivery method:**

FedEx Priority Overnight  
(R)

### ICD Group, Inc

121 Hall Street, Rockford

61107, Illinois

United States

**CALL US:** 888-762-5662

**International:** 815-209-

2224

Fax: 815-968-6888

Email: support@roc-

noc.com

**Email:** jjohanneson@reverecontrol.com

**First name:** Jason

**Last name:** Johanneson

**Company:** Revere Control Systems

### Billing address

### Shipping address

**First name:** Jason  
**Last name:** Johanneson  
**Address:** 2240 Rocky Ridge Rd  
**City:** Birmingham  
**State:** Alabama  
**Country:** United States  
**Zip/Postal code:** 35216  
**Phone:** 2055686334  
**Fax:**

**First name:** Jason  
**Last name:** Johanneson  
**Address:** 2240 Rocky Ridge Rd  
**City:** Birmingham  
**State:** Alabama  
**Country:** United States  
**Zip/Postal code:** 35216  
**Phone:** 2055686334  
**Fax:**

### Products ordered

SKU	Product	Item price	Quantity	Total
RB750Gr3	Mikrotik RouterBoard hEX RB/750Gr3 RB750Gr3 (was RB750G) 5 port 10/100/1000 switch and/or router in molded plastic case with power supply - New! <b>Options:</b> Power_Supply: includes 12vdc 12 watt US power supply (default)	\$57.00	41	\$2337.00

**Subtotal:** \$2337.00

**Shipping cost:** \$287.06

**Total: \$2624.06**

Thank you for your purchase!

---

Thank you for using our shopping system

ICD Group, Inc  
Phone: 888-762-5662  
Fax: 815-968-6888  
URL: [rOc-nOc.com](http://rOc-nOc.com)

Revere Control Systems  
 2240 Rocky Ridge Road  
 Birmingham, AL 35216  
 Phone: 205-824-0004  
 Fax: 205-824-0408



## Purchase Order W0012118

P.O. #: W0012118	
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Vendor: SOUTH005 SOUTHERN CONTROLS, INC. PO BOX 210399 MONTGOMERY, AL 36121-0399 USA Ph: (205) 424-1979 / Fax: (205) 426-6040 Contact: Debi Dorr Southern C	Ship To: Revere Control Systems, Inc. 2240 Rocky Ridge Road Birmingham, AL 35216
---	---

P.O. Date: 04/11/18 ..... Delivery Date: 04/13/18 Ordered By: GREG ODOM Remarks: DANIEL MOTE	Ship Via: UPS 2 Day Shipping Terms: ShipPoint Prepay & Add Payment Terms: NET 25 DAYS Instructions:
--	--

Seq	Part Number	Description	U/M	Quantity	Unit Cost	Extension
001	1201578	PHNX UNIVERSAL RAIL ADAPTER 3	EA	100.00	0.6400	64.00
<b>Total:</b>						<b>64.00</b>

**CONSTRUCTION CHANGE AUTHORIZATION (WORK ORDER)**

**TO:** Mr. David Abel  
Project Manager  
Revere Control Systems  
2240 Rocky Ridge Road  
Birmingham, AL 35216  
(205) 824-0004

**FROM:** CDM Smith  
3715 Northside Parkway NW  
Building 300, Suite 400  
Atlanta, GA 30327  
(404) 720-1400

**DATE:** June 9, 2018

**PROJECT:** City of Franklin, Tennessee  
Water Distribution and Collection Systems SCADA Improvements

**WORK ORDER NUMBER:** 019 **CDM SMITH PROJ. NO.:** 14915-96594

**SUBJECT:** Purchase of Additional VTScada Licenses **CITY PROJECT NO.:** 2014-0288

**REFERENCE:** May 2, 2018 Revere Control Proposal and May 4 clarification letter from Trihedral (attached)

**DESCRIPTION:**

The City discovered during startup, when the SCADA system was turned over for City operation, that operators were frequently not able to log into the VTScada system due to the limited number of available licenses. The purpose of this Work Order is to purchase additional licenses. It turns out that the Unlimited Thin Client package is the most cost-effective way for the City to obtain the additional licenses that are needed. Please see the attached quote and follow up letter documenting clarifications provided by Trihedral during a conference call with the City, CDM Smith, and Revere.

The work under this Task Order shall be performed for a lump sum price of \$9026.95.

**ATTACHMENTS:** May 2, 2018 Revere Controls Proposal and May 4 clarification letter from Trihedral (attached)

CDM SMITH:

By: \_\_\_\_\_

Date: June 9, 2018

CONTRACTOR:

By: \_\_\_\_\_

Date: June 11, 2018



May 2, 2018

CDM Smith  
3200 Windy Hill Road, S.E.  
Suite 210 West  
Atlanta, Georgia 30339-5460

Attn: Mr. Robert Huguenard, PE, BCEE

Ref: City of Franklin Water Management Department  
CDM Project Number 14915-96594-SCADA  
COF Contract No. 2014-0288

Subj: Additional VTScada Thin Client Licenses

Mr. Huguenard:

Trihedral offers to sell a package of licenses that includes unlimited thin clients, additional training and support for \$8,206.32. The price for a single, 10K Thin Client is \$3,295 and \$10,195 for a 5-pack of licenses. I highly recommend purchasing the package.

Unlimited Thin Client package .....	\$ 8,206.32
	10% Profit: <u>\$ 820.63</u>
	Total: \$ 9,026.95

**Schedule Impact**

No impact to substantial nor final completion dates.

Attachments:  
Package Quote  
US Pricing

Terms and Conditions from the current contract agreement apply.

Sincerely,

*David Abel*

David Abel  
Municipal Project Manager  
Revere Control Systems, Inc.  
Phone: 615-604-1579  
[dabel@reverecontrol.com](mailto:dabel@reverecontrol.com)





**Quotation**

Quote Number Q13814  
 Terms Net 30 Days  
 Date 05-01-2018  
 Sales Person Alan Hudson  
 Valid Until 05-31-2018  
 Tax Info. Tax ID# 26-0449423

<b>Bill To</b>	<b>Ship To</b>
Dave Abel Revere Control Systems - AL 2240 Rocky Ridge Road Birmingham, AL 35216 USA	Gregg Gray Revere Control Systems - AL 2240 Rocky Ridge Road Birmingham, AL 35216 USA

**S/N 52050, 52051 - City of Franklin, TN Water Distribution & Collection**

#	Qty.	Product	Unit Price	Ext. Price
1	1	~*~VTScada 10K Dual Server Premium~*~Upgrade	\$ 8,000.00	\$ 8,000.00
1	2	VTScada 10K - Development Runtime		
2	1	VTScada 10K - Thin Client - Unlimited		
3	2	VTScada 10K - Alarm Notification		
4	1	VTScada Operation and Configuration Training Course		
5	1	Bundle SupportPlus		
6	1	Bundle 24/7 Emergency Support		
7	-1	Time-Limited Bundle Discount		
8	-1	Current Bundle Trade-in Value		

Proposed SupportPlus Expiry Date: January 19, 2019  
 Bundle Value for Renewals: \$30,595.00

**Group Totals**

Subtotal: \$ 8,000.00  
 Total: \$ 8,000.00

**S/N 51905 - City of Franklin, TN - City of Franklin TN Telemetry Upgrade PC Replacement - Laptop**

#	Qty.	Product	Unit Price	Ext. Price
1	1	24/7 Emergency Support - S/N 51905	\$ 206.32	\$ 206.32

24/7 Emergency Support is not discounted if Trihedral is first tier support.

With the addition of 24/7 Emergency Support to your existing SupportPlus Service, help is always available. This service is intended for emergency issues directly associated with VTScada software. It does not cover application specific issues, over the phone training or advanced system design. It cannot replace training or the services of engineers, consultants or integrators.

Emergency Support can only be added to a valid SupportPlus contract and cannot be purchased as a standalone service. The cost of the service is 5% of the calculated software value with a minimum of \$1,200.00 per year.

24/7 support is limited to those licenses on which support has been purchased. Licenses comprised of distributed sub-systems affect system loads in a variety of ways and as such require support to be purchased on all connected components.

**Group Totals**

Subtotal: \$ 206.32  
 Total: \$ 206.32

Quotation Totals

Currency:	US Dollar
Subtotal:	\$ 8,206.32
Total:	\$ 8,206.32

**Terms and Conditions:**

VTScada is licensed exclusively in accordance with the VTScada Software License Agreement (Standard Conditions) and the VTScada Software Standard Support Services Agreement (Standard Conditions) available from <https://www.trihedral.com/license-agreement>.

VTScada support and upgrade pricing are in accordance with the previously accepted license agreement terms and any differing purchase order terms proposed will not be accepted without written agreement by Trihedral.

The SupportPlus renewal quote contains grandfathered pricing that is contingent upon the receipt of a purchase order before the quote expiry date (as agreed to under the VTScada license terms of the original license). Purchase orders received with an alteration of previously accepted terms, or after the quote expiry date, will require a re-quote of the renewal price at current pricing.

**Quotation Accepted By**

Quote Number	Q13814
Print Name	_____
Title	_____
Signature	_____
Date	_____

I/O Tags	Development Runtime	Runtime	Alarm Notification (Email, SMS, Voice)	ODBC, OPC, WEB Services For Runtime Licenses	Thin Clients (concurrent PC and Mobile connections)		
					Single	5-Pack	Unlimited
1,000	5,095	2,595	1,095	1,495	2,095	6,495	7,095
5,000	6,595	3,395	2,095	1,995	2,595	8,895	13,295
10,000	8,195	4,095	2,095	2,095	3,295	10,195	19,395
25,000	9,795	4,895	3,295	2,495	4,095	13,295	30,595
Up to 2,500,000	Please refer to Enterprise Pricing Sheet						

**Support Options - Single Vendor**

90 days SupportPlus Technical Support and Product Updates	Included with software purchase
Annual SupportPlus Technical Support and Product Updates.	15% of total software purchase price
Annual 24/7 Emergency Product Support. Available as extension of annual SupportPlus.	5% (minimum \$1,200)

	Integrated Components Included (single installation)	Development Runtime	Runtime
Run and Operate	<b>Application Server</b> - Primary or redundant event-driven execution for any scale	√	√
	<b>Runtime Client</b> - Can function as a complete or partial back-up for system operations	√	√
	<b>Widgets and Graphics Library</b> - 1,000's for many industries and applications	√	√
	<b>Historian</b> - High performance with zero set-up time needed	√	√
	<b>Security</b> - Integrated and extensible by both privilege and role-based models	√	√
	<b>Network and Computer Resource Monitoring With SNMP Agent</b> - A total system view	√	√
	<b>Alarms and Events</b> - Unlimited logging of all user and system actions	√	√
	<b>Trending</b> - Automatic and available with no additional set-up	√	√
	<b>Reporting</b> - Manual or automatic report creation with extensible options	√	√
	<b>Slippy Maps Integration</b> - Available either on-line or off-line with full pan and zoom	√	√
I/O Drivers	<b>Electronic Operator Logbooks</b> - Tamperproof recording of noteworthy events	√	√
	<b>Common</b> (e.g. Modbus, DF1, CIP/ENIP, Siemens S7, Omron Host Link, OPC)	√	√
	<b>Advanced</b> (e.g. DNP3, SNMP, Motorola ACE, CalAmp and MDS radio diagnostics)	√	√
	<b>Proprietary</b> (e.g. DataFlow Systems and others)	√	√
Develop	<b>DataLogger</b> (e.g. DF1, SCADAPack)	√	√
	<b>Automatic Version Control</b> - System-wide disaster recovery and audit tools	√	
	<b>Idea Studio</b> - Efficient development environment online, offline and multi-developer	√	
	<b>Change Deployment</b> - Remotely update all computers with a single click	√	
	<b>Scripting and Debugging Tools</b> - Powerful event-driven language of 700+ functions	√	
	<b>ODBC Server, OPC Server, Web Services</b> - Sharing process data and services with 3 <sup>rd</sup> party systems	√	

Prices in effect as of January 1, 2016. Subject to change without notice.

VTScada and the Idea Studio are registered trademarks of Trihedral Engineering Limited. Allen-Bradley, SCADAPack, DataFlow Systems, Modbus, CIP, ENIP, Siemens S7, Omron Host Link, OPC, DNP3, SNMP, Motorola ACE, CalAmp and MDS are trademarks of their respective owners.

May 4, 2018

Revere Control Systems  
2240 Rocky Ridge Road  
Birmingham AL 35216

Attn: Dave Abel

Re: Quote #Q13814 - Addition of Thin Clients to the Franklin TN VTScada license

Hello Dave.

Thank you for initiating the teleconference on Friday, May 04, 2018 for the purpose of better understanding Quotation #Q13814. I am sorry that our quote was confusing. Our intent was to help Franklin get the most value out of their existing license and provide them the most economical way to add three additional thin client connections. As we discussed, the option we ended up with would give Franklin an unlimited number of concurrent thin clients.

Here is my summary of our conversation today.

- The existing Franklin VTScada license is the 10K Tag Dual Server Config. It includes licenses for two servers, two developments, two alarm notification systems, and two concurrent thin clients. The original pricing was per the Bundle at a cost of \$22,595.
- The pricing for three additional thin clients would be \$3,295 each; \$9,885 total. (plus SupportPlus to match the existing licensing)
- The better value would be the purchase a five pack of thin clients at \$10,195. (plus SupportPlus to match the existing licensing)
- The best value would be to upgrade the 10K Dual Server Config Bundle to the Dual Server Premium Bundle by simply paying the difference in pricing for the two bundles.  
\$30,595 (for the Premium) - \$22,595 (for the Config) = \$8000 difference.  
(plus SupportPlus to match the existing licensing)
- This makes the Premium Bundle (with the Unlimited Thin Clients) less expensive by \$1,885 (price for the three additional thin clients) and \$2,195 (price for the five pack of thin clients).
- The cost to synchronize the SupportPlus expiry dates is \$206.32. Since the Premium Bundle offers 24/7 Emergency Support as standard, the SupportPlus would have 24/7 until the expiry date of January 19, 2019.
- Keeping SupportPlus current is an annual cost of 15% of original purchase price, as long as it stays current and does not lapse. Adding 24/7 emergency support would add an additional 5% (for a total of 20% of original purchase price). For this license, the 15% (or 20%) would be based on the total license value of \$30,595, yielding an annual cost of \$4589.25 (or \$6119). Most of our customers carry the normal SupportPlus.

- SupportPlus provides for technical support as well as continual updates of the “latest and greatest” versions of VTScada.
- SupportPlus renewal is optional. Should you choose not to renew, the VTScada license is still valid and will continue to run flawlessly but new versions of the software will not be available.

Hopefully this summary accurately represents our call on Friday. Please make any corrections necessary. Let me know of any other questions or concerns.

Have a wonderful week!

Alan Hudson

VTScada software by Trihedral

[alan.hudson@trihedral.com](mailto:alan.hudson@trihedral.com)

205-612-6665

Attachments:

- US Price List, Small and Medium Systems
- US Price List, Bundles
- SupportPlus datasheet
- SupportPlus 24/7 datasheet

**CONSTRUCTION CHANGE AUTHORIZATION (WORK ORDER)**

**TO:** Mr. David Abel  
Project Manager  
Revere Control Systems  
2240 Rocky Ridge Road  
Birmingham, AL 35216  
(205) 824-0004

**FROM:** CDM Smith  
3715 Northside Parkway NW  
Building 300, Suite 400  
Atlanta, GA 30327  
(404) 720-1400

**DATE:** October 31, 2018

**PROJECT:** City of Franklin, Tennessee  
Water Distribution and Collection Systems SCADA Improvements

**WORK ORDER NUMBER:** 020 **CDM SMITH PROJ. NO.:** 14915-96594

**SUBJECT:** Credits for Unused Allowance and Credit for Natchez Trace RTU Installation **CITY PROJECT NO.:** 2014-0288

**REFERENCE:** October 10, 2018 credit proposal letter from David Abel to Bob Huguenard

**DESCRIPTION:**

Work Order 002 included an allowance for unforeseen conditions, which was not used. This Work Order credits that allowance back to the Owner. In addition, performance of the Natchez Trace RTU work was dependent upon Harpeth Valley Utilities completing their adjoining work first. That work was not complete in time for the Natchez Trace RTU to be completed under this project. Therefore, this Work Order also credits the amount of the remaining Natchez Trace RTU work. The RTU has been installed, but conduit installation, wire pulling and termination, and field testing must still be completed. The remaining Natchez Trace work will be performed by Revere under a separate maintenance contract, so the same amount credited under this Work Order will be included under the maintenance contract.

Revere Controls agrees to provide a credit of \$3,000 for the unused allowance under Work Order 2 and a credit of \$9,170 for the Natchez Trace RTU work that will no longer be performed under this contract. The total credit provided under the Work Order is \$12,170.

CDM SMITH:

By: \_\_\_\_\_

Date: October 31, 2018

CONTRACTOR:

By: \_\_\_\_\_

Date: 10/31/2018



October 10, 2018

CDM Smith  
3200 Windy Hill Road, S.E.  
Suite 210 West  
Atlanta, Georgia 30339-5460

Attn: Mr. Robert Huguenard, PE, BCEE

Ref: City of Franklin Water Management Department  
CDM Project Number 14915-96594-SCADA  
COF Contract No. 2014-0288

Subj: Close Out Changes

Mr. Huguenard:

Below are quotes to close out the remaining two work orders:

1. Credit for unused allowance to Work Order 002 Modification of Existing Pump Control Panels to Add Remote Pump On/Off Capability

Allowance Credit.....< \$ 3,000.00 >

2. Credit for completing the Natchez Trace RTU Installation (ref. Email RE: Revere Maintenance Contract dtd 10/8). Work includes the following: a) completing the conduit entries into the Harpeth Valley Utilities RTU and Revere Control System RTU; b) furnishing, installing and terminating each TSP's between the panels using the existing conduit installed during recent site upgrade; c) completing field testing. This credit will be added to the professional services contract.

Credit from existing contract to be added to services contract.....< \$ 9,170.00 >

Lump Sum Total Credit.....< \$ 12,170.00>

Terms and Conditions from the current contract agreement apply.

Sincerely,

*David Abel*

David Abel  
Municipal Project Manager  
Revere Control Systems, Inc.  
Phone: 615-604-1579  
[dabel@reverecontrol.com](mailto:dabel@reverecontrol.com)