**City of Clearwater, Florida**
**Water Treatment Plant 1 SCADA PLC Upgrades**
**City Project No. 17-0041-UT**

**Equipment Bill of Materials Summary**
**April 4, 2019**

This summary describes the upgrades and modifications planned for the WTP No. 1 SCADA system.

1. CP-100 Modifications

   a. PLC I/O Rack:

      The SLC 5/05 based PLC system will be replaced, in kind, with the ControlLogix series system. The PLC processor 1747-L552 will be replaced with the 1756-L72 ControlLogix processor. I/O modules will include 8-channel 4-20 mA analog inputs, 8-channel 4-20 mA analog outputs, 16-point 120 VAC digital inputs and 16 point digital relay outputs.

      The Prosoft MVI46-MCM Modbus serial module, used to communicate with the switchgear and MCC power monitors, will be replaced with the Prosoft MVI56E-MCMR Modbus serial module for ControlLogix controllers.

      To maintain consistency with previous projects, all analog input modules - either four or eight channels – will be combined and replaced with the 1756-IF8I 8-channel modules.

      Digital input card 1746-IN16, which is a 24AC/DC and used only for the signals from the generator system, will be replaced with the 1756-IB16 module, a 24VDC input card.

      The 1747-SDN Device Network module will be removed and two 1756-ENT2 Ethernet network cards will be included. The first network card is used to communicate with the SCADA network infrastructure and the other is used to communicate with the Ethernet Remote I/O devices and Ethernet VFDs.

   b. Panel Network Infrastructure:

      Two managed Stratix Ethernet switches are provided to replace the existing unmanaged switch and various fiber optic converter modules.

      The first Stratix switch is for the SCADA network and will include copper Ethernet ports for connection of CP-110, CP-100, two control room SCADA computers, the alarm notification autodialer and the IT Interplant Ethernet switch.

The fiber optics ports will have connections to the in-plant PLC panels including CP-200, CP-400, the Wellfield Master Radio panel and the Well No. 31 panel, using the existing fiber optics infrastructure.

The second Stratix Ethernet switch is for the Remote I/O network and will include connections to the Ethernet VFDs in the electrical room on copper ports. A fiber optic port will be used to connect/extend to the CP-200 Remote I/O Ethernet switch.

2. CP-200 Modifications

   a. PLC I/O Rack:

      Similar to CP-100, the SLC 5/05 based PLC system will be replaced, in kind, with the ControlLogix series system. The PLC processor 1747-L552 will be replaced with the 1756-L72 ControlLogix processor.

      Again, to maintain consistency with previous projects, all analog input modules - either four or eight channels – will be combined and replaced with the 1756-IF8I 8-channel modules.

      The 1747-SDN Device Network module will be removed and two 1756-ENT2 Ethernet network cards included. The first network card is used to communicate with the SCADA network and the other is used to communicate with the Ethernet Remote I/O devices and Ethernet VFDs.

   b. Panel Network Infrastructure:

      Two managed Stratix Ethernet switches are provided to replace the existing unmanaged switch. The first switch is for the SCADA network and will include a copper connection to the CP-200 PLC processor and fiber optic connections to the Fluoride and CP-100 PLC panels using the existing fiber optics infrastructure.

      The second Stratix Ethernet switch is for the Remote I/O network and will have fiber optic connections to the Remote I/O panels including Dual Media Filters DM1, DM2, DM3, DM4, the Pretreatment Sodium Hypochlorite, Antiscalant, Sodium Bisulfite, Sodium Hydroxide, Reverse Osmosis Skids RO1 and RO2 and the CP-100 Remote I/O switch using the existing fiber optics infrastructure.

      A new 72 connection fiber optic patch panel will be mounted inside the CP-200 PLC panel and will include all of the fiber optic connections. The existing device network/fiber panel patch is decommissioned.

3. Remote I/O Device Network Panels:

   Typical for all Remote I/O Device Network panels, the 1794-ADN device network adapter modules for each panel will be replaced with a 1794-AENT Ethernet adapter modules.

   - Dual Media No. 1 (Site 1)
   - Dual Media No. 2 (Site 2)
   - Dual Media No. 3 (Site 3)

- Dual Media No. 4 (Site 4)
- Pretreatment Sodium Hypochlorite (Site 5)
- Antiscalant (Site 7)
- Sodium Bisulfite (Site 9)
- Sodium Hydroxide (Site 10)
- RO Skid No. 1 (Site 11)
- RO Skid No. 2 (Site 12)

All the existing physical input and output modules associated with the Remote I/O panel will be maintained without modification.

VFDs still operating on Device Network will be replaced with Ethernet VFDs, by the City outside of this project.

4. Wellfield Master Radio Panel

   a. PLC I/O Rack Infrastructure:

      No modifications are planned for the wellfields or the related radio system communications as part of this project. To maintain the current communications system, the SLC 5/05 processor, now located in the CP-100 PLC panel, will be relocated to the Wellfield Master Radio Panel.

      A power supply and a small PLC rack will be provided by the City for a temporary installation until the City moves forward with upgrade to the wellfields.

   b. Panel Network Infrastructure:

      An unmanaged Phoenix Contact Ethernet switch will be installed at the master radio panel for connection of the PLC to the plant PLC/SCADA network. The Fiber/Serial communication type between the radio panel and CP-100 will be converted to Fiber/Ethernet, using the existing fiber optics infrastructure. The serial communications from the radio to the PLC will be localized to the control panel.

5. CP400 Modifications

   a. Panel Network Infrastructure:

      A managed Stratix Ethernet switch is included to replace the existing unmanaged switch in the PLC panel.

      The switch will include connections to the CP-400 PLC processor, the panel SCADA client computer, the Pretreatment Sodium Hypochlorite Remote I/O and the Post-Treatment Sodium Hypochlorite Remote I/O on the copper ports.

      One fiber optic port is used to connect the Ammonia remote I/O panel and the other is used to connect to the CP-100 PLC/SCADA network using the existing fiber optics infrastructure.

6. IT Network Rack

A new Stratix Layer 3 Ethernet Switch is provided for future implementation of the Interplant Communications connection.

A new, larger server rack is included for the existing Historian server and to hold the Interplant SCADA equipment.

7. Control Room

The existing RACO Catalyst Alarm Autodialer uses Modbus protocol and a Prosoft gateway device to communicate with Allen Bradley PLC processors for alarm information. A new RACO Catalyst Autodialer will use Ethernet IP protocol to communicate directly with the PLCs.

| WTP No. 1 PLC Upgrades Bill of Materials By Location | | | | | | |
|---|---|---|---|---|---|---|
| City Project No. 17-0041-UT | | | | | | |
| City of Clearwater, FL | | | | | | |
| **Qty.** | **Manufacturer** | **Model** | **Description** | **Cost** | **Extended** | **Notes** |
| **CP-100** | | | | | | |
| 1 | Allen Bradley | 1756-A13 | ControlLogix Chassis, 13 Slot | $778.30 | $778.30 | |
| 1 | Allen Bradley | 1756-L72 | ControlLogix 5672 Processor With 4 Mbytes Memory | $7,686 | $7,686 | |
| 2 | Allen Bradley | 1756-EN2T | EtherNet 10-100M Bridge Module | $2,828.20 | $5,656 | |
| 1 | Allen Bradley | 1756-PA72 | Power Supply, 85-265 VAC (5V @ 10 Amp) | $956 | $956 | |
| 2 | Allen Bradley | 1756-IA16 | 16 Point Discrete Input 120 VAC (1756-TBNH) | $484.16 | $968 | |
| 1 | Allen Bradley | 1756-OW16I | 16 Point Discrete Output 120 VAC / 120 VDC (1756-TBCH) | $656.81 | $657 | |
| 1 | Allen Bradley | 1756-IB16 | 16 Point Discrete Input 24VDC (1756-TBNH) | $595.60 | $596 | Generator Signals |
| 4 | Allen Bradley | 1756-IF8I | 8 Channel Analog Input isolated (36 PIN) (1756-TBCH) | $2,286.49 | $9,146 | |
| 1 | ProSoft | MVI56E-MCMR | Modbus Serial Communications | $2,259.00 | $2,259 | |
| 3 | Allen Bradley | 1756-N2 | Empty Slot Filler for 1756 Chassis | $29.75 | $89 | |
| 3 | Allen Bradley | 1756-TBNH | 20 Pin Screw Clamp Block with Standard Housing | $73 | $218 | |
| 5 | Allen Bradley | 1756-TBCH | 36 Pin Screw Clamp RTB with Standard Housing | $89.78 | $449 | |
| 2 | Allen Bradley | 1783-MS10T | Stratix 8000 Managed Ethernet Switch, 10 ports base | $2,424.43 | $4,849 | |
| 1 | Allen Bradley | 1783-MX08T | Stratix 8000 copper expansion module, 8 ports | $1,432.37 | $1,432 | |
| 1 | Allen Bradley | 1783-MS08S | Stratix 8000 SFP expansion module, 8 ports | $1,120.86 | $1,121 | |
| 6 | Allen Bradley | 1783-SFP100FX | Transceivers Multimode Fiber 100Base-SX Multimode | $195.50 | $1,173 | |
| 6 | | | 6ft Fiber Optic Jumper with ST to LC Connector | $30.00 | $180 | |
| 2 | | | 6ft Cat 6 Jumper - 24 AWG | $10.00 | $20 | |
| | | | | | | |
| **CP-200** | | | | | | |
| 1 | Allen Bradley | 1756-A13 | ControlLogix Chassis, 13 Slot | $778.30 | $778.30 | |
| 1 | Allen Bradley | 1756-L72 | ControlLogix 5672 Processor With 4 Mbytes Memory | $7,686 | $7,686 | |
| 2 | Allen Bradley | 1756-EN2T | EtherNet 10-100M Bridge Module | $2,828.20 | $5,656 | |
| 1 | Allen Bradley | 1756-PA72 | Power Supply, 85-265 VAC (5V @ 10 Amp) | $956 | $956 | |
| 1 | Allen Bradley | 1756-IA16 | 16 Point Discrete Input 120 VAC (1756-TBNH) | $484.16 | $484 | |
| 1 | Allen Bradley | 1756-OW16I | 16 Point Discrete Output 120 VAC / 120 VDC (1756-TBCH) | $656.81 | $657 | |
| 2 | Allen Bradley | 1756-IF8I | 8 Channel Analog Inputs isolated (36 PIN) (1756-TBCH) | $2,286.49 | $4,573 | |
| 1 | Allen Bradley | 1756-OF8I | 8 Channel Analog Outputs isolated (20 Pin) (1756-TBCH) | $2,726.80 | $2,727 | |
| 5 | Allen Bradley | 1756-N2 | Empty Slot Filler for 1756 Chassis | $29.75 | $149 | |
| 1 | Allen Bradley | 1756-TBNH | 20 Pin Screw Clamp Block with Standard Housing | $73 | $73 | |
| 4 | Allen Bradley | 1756-TBCH | 36 Pin Screw Clamp RTB with Standard Housing | $89.78 | $359 | |
| 2 | Allen Bradley | 1783-MS10T | Stratix 8000 Managed Ethernet Switch, 10 ports base | $2,424.43 | $4,849 | |
| 12 | Allen Bradley | 1783-SFP100FX | Transceivers Multimode Fiber 100Base-SX Multimode | $195.50 | $2,346 | |
| 1 | Allen Bradley | 1783-MS08S | Stratix 8000 SFP expansion module, 8 ports | $1,120.86 | $1,121 | |
| 12 | | | 6ft Fiber Optic Jumper with ST to LC Connector | $30.00 | $360 | |
| 1 | | | 6ft Fiber Optic Jumper with ST to ST Connector | $30.00 | $30 | |
| 2 | | | 6ft Cat 6 Jumper - 24 AWG | $10.00 | $20 | |
| 1 | Corning | WCH-06P | 6 CCH Fiber Optic Patch Panel | $250 | $250 | |
| 6 | Corning | CCH-CP12-G5 | CCH 12 ports SC connectors | $77 | $460 | |
| | | | | | | |
| **DM1 (Site 1)** | | | | | | |
| 1 | Allen Bradley | 1794-AENT | Ethernet Communication Module | $729.89 | $730 | |
| 1 | Phoenix Contact | 2891398 | Unmanaged Ethernet Switch 6 Copper 10/100 & 2 Multimode 10/100/1000 | $850.00 | $850 | |
| 1 | | | 6ft Fiber Optic Jumper with ST to SC Connector | $30.00 | $30 | |
| 1 | | | 6ft Cat 6 Jumper - 24 AWG | $10.00 | $10 | |
| 3 | | | 6ft Fiber Optic Jumper with SC to SC Connector | $30.00 | $90 | |
| | | | | | | |
| **DM2 (Site 2)** | | | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| 1 | Allen Bradley | 1794-AENT | Ethernet Communication Module | $729.89 | $730 | |
| 1 | Phoenix Contact | 2891398 | Unmanaged Ethernet Switch 6 Copper 10/100 & 2 Multimode 10/100/1000 | $850.00 | $850 | |
| 1 | | | 6ft Fiber Optic Jumper with ST to SC Connector | $30.00 | $30 | |
| 1 | | | 6ft Cat 6 Jumper - 24 AWG | $10.00 | $10 | |
| | | | | | | |
| **DM3 (Site 3)** | | | | | | |
| 1 | Allen Bradley | 1794-AENT | Ethernet Communication Module | $729.89 | $730 | |
| 1 | Phoenix Contact | 2891398 | Unmanaged Ethernet Switch 6 Copper 10/100 & 2 Multimode 10/100/1000 | $850.00 | $850 | |
| 1 | | | 6ft Fiber Optic Jumper with ST to SC Connector | $30.00 | $30 | |
| 1 | | | 6ft Cat 6 Jumper - 24 AWG | $10.00 | $10 | |
| | | | | | | |
| **DM4 (Site 4)** | | | | | | |
| 1 | Allen Bradley | 1794-AENT | Ethernet Communication Module | $729.89 | $730 | |
| 1 | Phoenix Contact | 2891398 | Unmanaged Ethernet Switch 6 Copper 10/100 & 2 Multimode 10/100/1000 | $850.00 | $850 | |
| 1 | | | 6ft Fiber Optic Jumper with ST to SC Connector | $30.00 | $30 | |
| 1 | | | 6ft Cat 6 Jumper - 24 AWG | $10.00 | $10 | |
| | | | | | | |
| **PRE-TREAT HYPO (Site 5)** | | | | | | |
| 1 | Allen Bradley | 1794-AENT | Ethernet Communication Module | $729.89 | $730 | |
| 1 | Phoenix Contact | 2891398 | Unmanaged Ethernet Switch 6 Copper 10/100 & 2 Multimode 10/100/1000 | $850.00 | $850 | |
| 1 | | | 6ft Fiber Optic Jumper with ST to SC Connector | $30.00 | $30 | |
| 1 | | | 6ft Cat 6 Jumper - 24 AWG | $10.00 | $10 | |
| | | | | | | |
| **ANTISCALANT (Site 7)** | | | | | | |
| 1 | Allen Bradley | 1794-AENT | Ethernet Communication Module | $729.89 | $730 | |
| 1 | Phoenix Contact | 2891398 | Unmanaged Ethernet Switch 6 Copper 10/100 & 2 Multimode 10/100/1000 | $850.00 | $850 | |
| 1 | | | 6ft Fiber Optic Jumper with ST to SC Connector | $30.00 | $30 | |
| 1 | | | 6ft Cat 6 Jumper - 24 AWG | $10.00 | $10 | |
| | | | | | | |
| **FLOURIDE (Site 8)** | | | | | | |
| 1 | Phoenix Contact | 2891398 | Unmanaged Ethernet Switch 6 Copper 10/100 & 2 Multimode 10/100/1000 | $850.00 | $850 | |
| 1 | | | 6ft Fiber Optic Jumper with ST to SC Connector | $30.00 | $30 | |
| 3 | | | 6ft Fiber Optic Jumper with ST to ST Connector | $30.00 | $90 | |
| | | | | | | |
| **SODIUM BISULFITE (Site 9)** | | | | | | |
| 1 | Allen Bradley | 1794-AENT | Ethernet Communication Module | $729.89 | $730 | |
| 1 | Phoenix Contact | 2891398 | Unmanaged Ethernet Switch 6 Copper 10/100 & 2 Multimode 10/100/1000 | $850.00 | $850 | |
| 1 | | | 6ft Fiber Optic Jumper with ST to SC Connector | $30.00 | $30 | |
| 1 | | | 6ft Cat 6 Jumper - 24 AWG | $10.00 | $10 | |
| | | | | | | |
| **SODIUM HYDROXIDE (Site 10)** | | | | | | |
| 1 | Allen Bradley | 1794-AENT | Ethernet Communication Module | $729.89 | $730 | |
| 1 | Phoenix Contact | 2891398 | Unmanaged Ethernet Switch 6 Copper 10/100 & 2 Multimode 10/100/1000 | $850.00 | $850 | |
| 1 | | | 6ft Fiber Optic Jumper with ST to SC Connector | $30.00 | $30 | |
| 1 | | | 6ft Cat 6 Jumper - 24 AWG | $10.00 | $10 | |
| | | | | | | |
| **RO SKID 1 (Site 11)** | | | | | | |
| 1 | Allen Bradley | 1794-AENT | Ethernet Communication Module | $729.89 | $730 | |
| 1 | Allen Bradley | 2891398 | Unmanaged Ethernet Switch 6 Copper 10/100 & 2 Multimode 10/100/1000 | $850.00 | $850 | |
| 1 | | | 6ft Fiber Optic Jumper with ST to SC Connector | $30.00 | $30 | |
| 1 | | | 6ft Cat 6 Jumper - 24 AWG | $10.00 | $10 | |
| | | | | | | |
| **RO SKID 2 (Site 12)** | | | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| 1 | Allen Bradley | 1794-AENT | Ethernet Communication Module | $729.89 | $730 | |
| 1 | Phoenix Contact | 2891398 | Unmanaged Ethernet Switch 6 Copper 10/100 /2Multimode 100 | $850.00 | $850 | |
| 1 | | | 6ft Fiber Optic Jumper with ST to SC Connector | $30.00 | $30 | |
| 1 | | | 6ft Cat 6 Jumper - 24 AWG | $10.00 | $10 | |
| | | | | | | |
| **Wellfiled Master Radio Panel** | | | | | | |
| 1 | Phoenix Contact | 2891398 | Unmanaged Ethernet Switch 6 Copper 10/100 & 2 Multimode 10/100/1000 | $850.00 | $850 | |
| 1 | | | 6ft Fiber Optic Jumper with LC to SC Connector | $30.00 | $30 | |
| 1 | | | 6ft Cat 6 Jumper - 24 AWG | $10.00 | $10 | |
| 1 | Allen Bradley | 1746-A4 | SLC 5/05 Chassis, 4 Slot | - | - | Provided from City existing inventory, if available. Otherwise, reuse existing |
| 1 | Allen Bradley | 1747-L552 | SLC 5/05 Processor | - | - | Provided from City existing inventory, if available. Otherwise, reuse existing |
| 1 | Allen Bradley | 1746-P1 or P7 | SLC 5/05 Power Supply | - | - | Provided from City existing inventory, if available. Otherwise, reuse existing |
| | | | | | | |
| **CP-400** | | | | | | |
| 1 | Allen Bradley | 1783-MS10T | Stratix 8000 Managed Ethernet Switch, 10 ports base | $2,424.43 | $2,424 | |
| 1 | Allen Bradley | 1783-MS08S | Stratix 8000 SFP expansion module, 8 ports | $1,120.86 | $1,121 | |
| 3 | Allen Bradley | 1783-SFP100FX | Transceivers Multimode Fiber 100Base-SX Multimode | $195.50 | $587 | |
| 3 | | | 6ft Fiber Optic Jumper with ST to LC Connector | $30.00 | $90 | |
| 2 | | | 6ft Cat 6 Jumper - 24 AWG | $10.00 | $20 | |
| | | | | | | |
| **IT Panel** | | | | | | |
| 1 | Allen Bradley | 1783-RMS10T | Managed Ethernet Switch Layer 3 with 8 Copper 10/100 and 2 Fiber 100 | $5,004.15 | $5,004 | |
| 2 | Allen Bradley | 1783-SFP100LX | Transceivers Single-Mode 100Base-SX | $389.15 | $778 | |
| 2 | | | 6ft Fiber Optic Jumper with LC to LC Connector | $30.00 | $60 | |
| 1 | Phoenix Contact | 2866750 | Power supply unit - STEP-PS/ 1AC/24DC/5A | $227.00 | $227 | |
| 1 | Tripplite | SR24UB | IT Network Rack (45.6" Hight, 23.63" Witde. 33.5 Depth) | $900.00 | $900 | Existing SR12UB dimensions(25.1" Hight, 23.63" Witde. 33.5 Depth) |
| | | | | | | |
| **Control Room** | | | | | | |
| 1 | RACO | 706C10-2-020-1450ET | Catalyst Data Logger and Alarm Notification Ethernet IP 256 addres | $5,595.00 | $5,595 | |
| | | | | | | |
| **Equipment Cost Total** | | | | | **$106,720** | |

| WTP No. 1 PLC Upgrades Bill of Materials By Manufacturer | | | | | | |
|---|---|---|---|---|---|---|
| City Project No. 17-0041-UT | | | | | | |
| City of Clearwater, FL | | | | | | |
| **Qty.** | **Manufacturer** | **Model** | **Description** | **Cost** | **Extended** | **Notes** |
| | | | | | | |
| 2 | Allen Bradley | 1756-A13 | ControlLogix Chassis, 13 Slot | $778.30 | $1,556.60 | |
| 2 | Allen Bradley | 1756-L72 | ControlLogix 5672 Processor With 4 Mbytes Memory | $7,686 | $15,371 | |
| 4 | Allen Bradley | 1756-EN2T | EtherNet 10-100M Bridge Module | $2,828.20 | $11,313 | |
| 2 | Allen Bradley | 1756-PA72 | Power Supply, 85-265 VAC (5V @ 10 Amp) | $956 | $1,911 | |
| 3 | Allen Bradley | 1756-IA16 | 16 Point Discrete Input 120 VAC (1756-TBNH) | $484.16 | $1,452 | |
| 2 | Allen Bradley | 1756-OW16I | 16 Point Discrete Output 120 VAC / 120 VDC (1756-TBCH) | $656.81 | $1,314 | |
| 1 | Allen Bradley | 1756-IB16 | 16 Point Discrete Input 24VDC (1756-TBNH) | $595.60 | $596 | Generator Signals |
| 6 | Allen Bradley | 1756-IF8I | 8 Channel Analog Inputs isolated (36 PIN) (1756-TBCH) | $2,286.49 | $13,719 | |
| 1 | Allen Bradley | 1756-OF8I | 8 Channel Analog Output isolated (20 Pin) (1756-TBCH) | $2,726.80 | $2,727 | |
| 8 | Allen Bradley | 1756-N2 | Empty Slot Filler for 1756 Chassis | $29.75 | $238 | |
| 4 | Allen Bradley | 1756-TBNH | 20 Pin Screw Clamp Block with Standard Housing | $73 | $290 | |
| 9 | Allen Bradley | 1756-TBCH | 36 Pin Screw Clamp RTB with Standard Housing | $89.78 | $808 | |
| 10 | Allen Bradley | 1794-AENT | Flex I/O Ethernet Communications Module | $729.89 | $7,299 | |
| 5 | Allen Bradley | 1783-MS10T | Stratix 8000 Managed Ethernet Switch, 10 ports base | $2,424.43 | $12,122 | |
| 1 | Allen Bradley | 1783-MX08T | Stratix 8000 Copper Expansion module, 8 ports | $1,432.37 | $1,432 | |
| 3 | Allen Bradley | 1783-MS08S | Stratix 8000 SFP Expansion module, 8 ports | $1,120.86 | $3,363 | |
| 21 | Allen Bradley | 1783-SFP100FX | Transceivers Multimode Fiber 100Base-SX Multimode | $195.50 | $4,106 | |
| 1 | Allen Bradley | 1783-RMS10T | Managed Ethernet Switch Layer 3 with 8 Copper 10/100 and 2 Fiber 100 | $5,004.15 | $5,004 | |
| 2 | Allen Bradley | 1783-SFP100LX | Transceivers Single-Mode 100Base-SX | $389.15 | $778 | |
| | | | | | | |
| 1 | Allen Bradley | 1746-A4 | SLC 5/05 Chassis, 4 Slot | - | - | Provided from City existing inventory, if available. Otherwise, reuse existing |
| 1 | Allen Bradley | 1747-L552 | SLC 5/05 Processor | - | - | Provided from City existing inventory, if available. Otherwise, reuse existing |
| 1 | Allen Bradley | 1746-P1 or P7 | SLC 5/05 Power Supply | - | - | Provided from City existing inventory, if available. Otherwise, reuse existing |
| | | | | | | |
| 1 | ProSoft | MVI56E-MCMR | Modbus Serial Communications | $2,259.00 | $2,259 | |
| | | | | | | |
| 12 | Phoenix Contact | 2891398 | Unmanaged Ethernet Switch 6 Copper 10/100 & 2 Multimode 10/100/1000 | $850.00 | $10,200 | |
| 1 | Phoenix Contact | 2866750 | Power supply unit - STEP-PS/ 1AC/24DC/5A | $227.00 | $227 | |
| | | | | | | |
| 1 | Tripplite | SR24UB | IT Network Rack (45.6" Hight, 23.63" Witde. 33.5 Depth) | $900.00 | $900 | Existing SR12UB dimensions(25.1" Hight, 23.63" Witde. 33.5 Depth) |
| | | | | | | |
| 1 | RACO | 706C10-2-020-1450ET | Catalyst Data Logger and Alarm Notification Ethernet IP 256 addres | $5,595.00 | $5,595 | |
| | | | | | | |
| 1 | Corning | WCH-06P | 6 CCH Fiber Optic Patch Panel | $250 | $250 | |
| 6 | Corning | CCH-CP12-G5 | CCH 12 ports SC connectors | $77 | $460 | |
| | | | | | | |
| 17 | | | 6ft Cat 6 Jumper - 24 AWG | $10.00 | $170 | |
| | | | | | | |
| 21 | | | 6ft Fiber Optic Jumper with ST to LC Connector | $30.00 | $630 | |
| 4 | | | 6ft Fiber Optic Jumper with ST to ST Connector | $30.00 | $120 | |
| 11 | | | 6ft Fiber Optic Jumper with ST to SC Connector | $30.00 | $330 | |
| 1 | | | 6ft Fiber Optic Jumper with LC to SC Connector | $30.00 | $30 | |
| 2 | | | 6ft Fiber Optic Jumper with LC to LC Connector | $30.00 | $60 | |
| 3 | | | 6ft Fiber Optic Jumper with SC to SC Connector | $30.00 | $90 | |
| | | | | | | |
| **Equipment Cost Total** | | | | | **$106,720** | |

WATER TREATMENT PLANT INTERCONNECTIONS
SINGLE MODE FIBER OPTIC CABLE
SINGLE MODE FIBER OPTIC CABLE
IT CITY NETWORK (ELECTRICAL ROOM)
LAYER 3 STRATIX SWITCH (MS) PLANT INTERCONNECT
SCADA COMPUTERS (CONTROL ROOM)
PROGRAMMING COMPUTER
ALARM AUTODIALER
RACO ALARMS
PC-116 SCADA MASTER
PC-117 SCADA BACKUP
CAT6
CP-400 HIGH SERVICE & CHLORINATION
COMPACTLOGIX
SCADA CLIENT
SCADA SWITCH (MS)
PATCH PANEL
PRE-TREATMENT SODIUM HYPOCHLORITE
POST TREATMENT SODIUM HYPOCHLORITE
NOTE 1
ETHERNET SWITCH (UMS)
FLEX-I/O
PATCH PANEL
AQUA AMMONIA
NOTE 1
CHEMICAL FEED PUMP 1
CHEMICAL FEED PUMP 2
12 STRAND FIBER-OPTIC ETHERNET
6 STRAND FIBER-OPTIC ETHERNET
CP-100 MAIN CONTROL PANEL (ELECTRICAL ROOM)
CONTROLLOGIX
SCADA SWITCH (MS)
PATCH PANEL
RS485 (MCC POWER MONITOR)
RS485 (SWGR POWER MONITOR)
REMOTE I/O SWITCH (MS)
12 STRAND FIBER-OPTICS
NOTE 2
CP-200 CONTROL PANEL (MOUNTED ON WALL NEAR RO SKIDS)
CONTROLLOGIX
SCADA SWITCH (MS)
REMOTE I/O SWITCH (MS)
DUAL MEDIA FILTER #1
DUAL MEDIA FILTER #2
DUAL MEDIA FILTER #3
DUAL MEDIA FILTER #4
6 STRAND FIBER-OPTIC ETHERNET
12 STRAND FIBER-OPTIC ETHERNET
CP-110 DECANT SYSTEM (ELECTRICAL ROOM)
COMPACTLOGIX
PATCH PANEL
ETHERNET SWITCH (UMS)
NOTE 1
6 STRAND FIBER-OPTIC ETHERNET
12 STRAND FIBER-OPTIC ETHERNET
CAT6 (CABLES)
MEMBRANE #2 RO SKID CP-200B
MEMBRANE #1 RO SKID CP-200A
FLUORIDE
NOTE 3
TRANSFER PUMP
ANTISCALANT
SODIUM BUSILFITE
SODIUM HYDROXIDE
CP-120 DECANT REMOTE I/O
FLEX-I/O
OPI
CP-130 ARSENIC ABSORPTION
COMPACTLOGIX
SCADA CLIENT
CAT6 (CABLES)
ETHERNET VFD
LOCAL CONTROLS
RAW WATER BOOSTER PUMP 1
RAW WATER BOOSTER PUMP 2
RAW WATER BOOSTER PUMP 3
RAW WATER BOOSTER PUMP 4
CLEANING SYSTEM PUMP VFD
REVERSE OSMOSIS 1 HIGH PRESSURE PUMP
REVERSE OSMOSIS 2 HIGH PRESSURE PUMP
BLEND PUMP VFD 1
BLEND PUMP VFD 2
BLEND PUMP VFD 3
BLEND PUMP VFD 4
WELL No. 31
SLC 5/05
WELLFIELD MASTER RADIO PANEL
RADIO
RS-232
RLSP
TYPICAL REMOTE WELLFIELD PANEL (10)
SLC 5/03 OR SLC 5/05
EXISTING PLC

LEGEND:

SCADA - SUPERVISORY CONTROL AND DATA ACQUISITION
OPI - OPERATOR INTERFACE
CP - CONTROL PANEL
PC - PERSONAL COMPUTER
MS - MANAGED SWITCH
UMS - UNMANAGD SWITCH
CAT6 - CATEGORY 6 ETHERNET CABLE (SOLID LINES)
FO - FIBER OPTICS CABLE (DASHED LINES)
RS-232 - SERIAL COMMUNICATION CABLE
RLSP- RADIO LINE SURGE PROTECTION

NOTES:
1. NOT MODIFIED AS PART OF PROJECT.
2. ONE PAIR OF FIBER STRANDS USED FOR EACH OF SCADA NETWORK AND REMOTE I/O NETWORK.
3. DETAILS AS SHOWN FROM CONTRACTOR SUBMITTAL DOCUMENTS FOR ONGOING PROJECT.

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M&C PROJECT NO.: 0992-0246

RECORD DRAWINGS
SURVEYED BY:
DRAWN BY:
REVIEWED BY:
PROJECT ENGINEER — DATE
APPROVED BY:
ENGINEER — DATE

| REVISION | BY | DATE |
|---|---|---|

CITY OF CLEARWATER, FLORIDA
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# WTP No. 1 PLC UPGRADES

## PROPOSED SCADA SYSTEM NETWORK OVERVIEW

| | | | |
|---|---|---|---|
| DWG NAME: | FIELD BOOK: | SURVEYED BY: | SCALE: VERT. |
| CONTRACT NO.: 0992-0246 | DATE DRAWN: MARCH 2019 | DRAWN BY: FEV | HORIZ. |
| JOB NO.: 17-0041-UT | DESIGNED BY: FEV | CHECKED BY: MDT | SHEET NO.: 1 OF 1 |

APPROVED FOR CONSTRUCTION