

**CARSON CITY PURCHASING AND CONTRACTS**

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**<http://www.carson.org/index.aspx?page=998>**

**NOTICE TO CONTRACTORS**

**BID #1415-061**

**Sodium Hypochlorite Tank Replacement Project**

**PWP # CC-2014-330**

**Addendum No. 1**

Please make the following additions/changes/clarifications to the above referenced project:

1. On sheet C6 of the plans the "water supply line (by others)" is not within the scope of the project and will be installed by the City. The Contractor's will be responsible to install the check valve and everything on the building side of the valve including the utility box as shown on the plans.
2. There is a conflict between detail 1 sheet C8 of the plans and detail B sheet E2 regarding the tank level display. The contractor is to relocate the existing tank display pedestal as shown on sheet E2 rather than supporting the tank level display with preformed channel as shown on C8.
3. The NaClO tanks shall be labeled Tank "A" (tank to the west) and tank "B" (tank to the east). Please use these labels rather than the labels referred to on note 8 on sheet E3.
4. Information on the fire alarm and sprinkler system has been provided at the back of this addendum. A complete set of shop drawings it to be submitted and approved by the Carson City Fire Department. The fire alarm system and plumbing shall be included to the list of required submittals noted in the Special Conditions of the bid document. The fire sprinkler system will not need additional corrosion protection beyond what is typically provided excluding where the riser penetrates the containment floor as shown on the attached "Fire Riser Location and #3 Water Plan."
5. A drawings showing more details on the tank connections and location has been provided for your reference.

The following is based on questions received prior to October 2<sup>nd</sup>, 2014:

6. *DEMO-west wall-is contractor to abandon in place existing pipe conduits for cl2 service / water system. Method of abandonment.*

The existing pumps and piping shown on the west side of the NaClO tanks on sheet C3 are to be removed and disposed of except for the 2" #3 water line. The 2" #3 water line is to be relocated 30" above finish floor where it currently penetrates the slab. The existing hose bib may be re-used and the drip line to the swamp cooler reconnected. All abandoned pipe conduits within the limits of the new containment basin are to be removed and the conduits capped where they continue beyond the new containment basin limits.

7. *The contract time of 48 working days does not work and will not allow for procurement of the longer lead items such as tanks and pumps. The procurement time for these items will be submittals 3 weeks, approval estimated at 3 weeks, fabrication 6 weeks, delivery 3 days for a total of +/- 12 weeks. Can the contract time be extended by 2-3 months or can the notice to proceed be delayed until the procurement of the long lead items is complete?*

The start of the construction period will begin with consideration of long lead times for items.

8. *CA. 12 Requires all submittal to be submitted within 15 calendar days of the Notice to Proceed with \$250.00/cd damages for late submittals. As per item 1 above we are hearing submittals will take 3 weeks can this time be extended or the NTP delayed to allow for submittal/procurement?*

The City will work with the Contractor to determine a Notice to Proceed date in consideration of lead time items and their submittals.

9. *GC 7.13 By-Pass Pumping of Sanitary Sewer. I did not see where bypass pumping would be required on this project. Please confirm that this section does not apply and that there is not bypass pumping required.*

No by-pass pumping will be required for this project

10. *Regarding the existing PLC program that is within the Allen Bradley SLC 500. The project calls for a new Schneider Electric M340 PLC to replace the existing SLC 500. In order to determine a more accurate budgetary estimate of time and cost to perform the migration, can a copy of the existing PLC program be made available?*

*Regarding the existing I/O modules and the hard wiring to the modules. It appears there is more I/O than indicated on sheet E5 of the electrical drawings. Is there a more detailed I/O drawing that can be made available for the bidding process?*

It is the City's intention that the PLC program be migrated using Schneider Electric software conversion tools as shown under step one of the Rockwell Migration Brochure included in this addendum. Additionally the hardware migration shall be performed using the Schneider quick wiring adapters as shown under step two of the attached brochure.

A copy of the existing program is not being provided during the bid process. By utilizing the conversion software and adapter hardware available from Schneider the new PLC programming

efforts should be limited to QA/QC of the migration and the new I/O and controls as shown in the bid set.

*11. Shall the sump pit and sump pit walls be wet cured as called out in the notes of sheet C5?*

Yes, all concrete within the containment basin shall be wet cured as called out in the plans.

*12. Plan sheet C6 references building ventilation requirements and existing equipment. Are we to assume this is for reference only and not a requirement to install new equipment?*

Yes, no new ventilation equipment will need to be installed.

October 3, 2014

Re: Sodium Hypochlorite Tank Replacement Project  
Addendum #1

This addendum is in response to questions posed by bidders and to present clarification to the contract documents.

1. Clarification to General Requirement 'G': Conduits above 18" may be EMT type.
2. Paint all new conduits using an industrial latex paint system to match existing color and type. Include water-based primer, intermediate coat, and top coat (MPI Gloss Level 1).
3. Modification to Sheet Note 3/E4: "Provide a minimum 12" red identification triangle at the new 24V hypochlorite emergency stop. Pushbutton type shall be 30.5mm type mounted in a NEMA-4 surface-mount pushbutton enclosure. Mount hypochlorite emergency stop at 66" A.F.G."
4. Addition to Sheet Note 3/E5: "Provide separate conduits for analog, discrete, and power conductors and cables."
5. Clarifications to Programming and Screen Requirements:

Sheet Note 1/E5:

- g. Contractor shall be responsible for producing graphic screens for the new operator interface terminal (OIT) touchscreen panel.
- h. Incorporate existing and new signals into new touchscreen interface. See A/E5: SCADA/RTU Signal Requirements for an accounting of signals to be incorporated. Contractor shall furnish a licensed copy of Vijeo Designer for programming the OIT.
- i. Programming of Wonderware Human Machine Interface (HMI) desktop station shall be performed by Carson City personnel.
- n. Contractor shall program local OIT to display all information that was displayed by the Panalarm annunciator system.

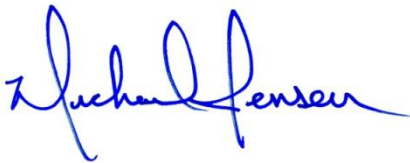
Sheet Note 2/E5 requires that screen layouts and I/O schedule be submitted for owner and engineer approval.

*Sodium Hypochlorite Tank Replacement Project  
Addendum #1 (continued...)*

6. The existing control strategy will continue as programmed with modifications as prescribed by Carson City personnel. Modifications required to be made to the existing control strategy and integration of additional signals / controls shall be provided to and coordinated with Carson City personnel. This shall include pump controls & monitoring, camera functions, alarm conditions & resulting actions, displays, and network connectivity.
7. The emergency stop will signal at 24V to the new RTU which will then initiate an alarm condition. Resultant alarm action shall be coordinated with Carson City personnel.
8. Clarification to Equipment Item-1 on Sheet E1: Modify and coordinate access control equipment and scope with previously established Stanley Security quote #Q-00539113 made to Carson City. Include Stanley Precision non-electrified mechanical crash-bars for two doors in addition to the original quote scope. Include installation and required modifications to existing doors for new system.
9. Provide a fire alarm system design and install equipment per the attached specification section "283111 – Digital, Addressable Fire-Alarm System". Location for new fire alarm panel shall be adjacent the existing network cabinet and between the existing fire extinguisher as shown in E/E2. Power source, conduit, and conductors shall be Panel-'LP-A' Circuit 16, connected with (3)-#12 in 3/4" C. Signal conductors shall be extended to the existing network cabinet with an Ethernet Cat-6 cable in 3/4" C.

I trust that the above stated is clear; however, please feel free to contact me with any additional questions or comments.

Respectfully submitted,



Michael Jensen, PE  
Jensen Engineering, Inc.

SECTION 283111 - DIGITAL, ADDRESSABLE FIRE-ALARM SYSTEM

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Fire-alarm control unit.
2. Manual fire-alarm boxes.
3. System smoke detectors.
4. Heat detectors.
5. Notification appliances.
6. Remote annunciator.
7. Addressable interface device.
8. Digital alarm communicator transmitter.

- B. Fire alarm system shall integrate with existing security system by Desert Hills Security, Reno.

1.2 ACTION SUBMITTALS

- A. Product Data: For each type of product, including furnished options and accessories.

- B. Shop Drawings: For fire-alarm system.

1. Comply with recommendations and requirements in the "Documentation" section of the "Fundamentals" chapter in NFPA 72.
2. Include plans, elevations, sections, details, and attachments to other work.
3. Include details of equipment assemblies. Indicate dimensions, weights, loads, required clearances, method of field assembly, components, and locations. Indicate conductor sizes, indicate termination locations and requirements, and distinguish between factory and field wiring.
4. Detail assembly and support requirements.
5. Include voltage drop calculations for notification-appliance circuits.
6. Include battery-size calculations.
7. Include input/output matrix.
8. Include statement from manufacturer that all equipment and components have been tested as a system and meet all requirements in this Specification and in NFPA 72.
9. Include performance parameters and installation details for each detector.
10. Include floor plans to indicate final outlet locations showing address of each addressable device. Show size and route of cable and conduits and point-to-point wiring diagrams.

- C. General Submittal Requirements:

1. Submittals shall be approved by authorities having jurisdiction prior to submitting them to Owner.
2. Shop Drawings shall be prepared by persons with the following qualifications:

- a. Trained and certified by manufacturer in fire-alarm system design.
  - b. NICET-certified, fire-alarm technician.
  - c. Licensed or certified by authorities having jurisdiction.
- D. Delegated-Design Submittal: For notification appliances and smoke and heat detectors, in addition to submittals listed above, indicate compliance with performance requirements and design criteria, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.
1. Drawings showing the location of each notification appliance and smoke and heat detector, ratings of each, and installation details as needed to comply with listing conditions of the device.
  2. Design Calculations: Calculate requirements for selecting the spacing and sensitivity of detection, complying with NFPA 72. Calculate spacing and intensities for strobe signals and sound-pressure levels for audible appliances.
  3. Indicate audible appliances required to produce square wave signal per NFPA 72.

### 1.3 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For Installer.
- B. Retain "Seismic Qualification Certificates" Paragraph below if required by seismic criteria applicable to Project. See ASCE/SEI 7 for certification requirements for equipment and components.
- C. Seismic Qualification Certificates: For fire-alarm control unit, accessories, and components, from manufacturer.
- D. Field quality-control reports.
- E. Sample warranty.

### 1.4 CLOSEOUT SUBMITTALS

- A. Operation and Maintenance Data: For fire-alarm systems and components to include in emergency, operation, and maintenance manuals.
  1. Include the following:
    - a. Comply with the "Records" section of the "Inspection, Testing and Maintenance" chapter in NFPA 72.
    - b. Provide "Fire Alarm and Emergency Communications System Record of Completion Documents" according to the "Completion Documents" Article in the "Documentation" section of the "Fundamentals" chapter in NFPA 72.
    - c. Complete wiring diagrams showing connections between all devices and equipment.
    - d. Record copy of site-specific software.
    - e. Provide "Inspection and Testing Form" according to the "Inspection, Testing and Maintenance" chapter in NFPA 72, and include the following:

- 1) Equipment tested.
  - 2) Frequency of testing of installed components.
  - 3) Frequency of inspection of installed components.
  - 4) Requirements and recommendations related to results of maintenance.
  - 5) Manufacturer's user training manuals.
- f. Manufacturer's required maintenance related to system warranty requirements.
- g. Abbreviated operating instructions for mounting at fire-alarm control unit and each annunciator unit.

B. Software and Firmware Operational Documentation:

1. Software operating and upgrade manuals.
2. Program Software Backup: On magnetic media or compact disk, complete with data files.
3. Device address list.
4. Printout of software application and graphic screens.

## 1.5 QUALITY ASSURANCE

- A. Installer Qualifications: Personnel shall be trained and certified by manufacturer for installation of units required for this Project.
- B. Installer Qualifications: Installation shall be by personnel certified by NICET as a fire-alarm technician.
- C. NFPA Certification: Obtain certification according to NFPA 72 by an NRTL (nationally recognized testing laboratory).

## 1.6 WARRANTY

- A. Manufacturer agrees to repair or replace fire-alarm system equipment and components that fail in materials or workmanship within specified warranty period.
1. Warranty Extent: All equipment and components not covered in the Maintenance Service Agreement.
  2. Warranty Period: Five years from date of Substantial Completion.

## PART 2 - PRODUCTS

### 2.1 SYSTEM DESCRIPTION

- A. General Electric – Vigilante Series (no equal will be accepted).
- B. Source Limitations for Fire-Alarm System and Components: Components shall be compatible with, and operate as an extension of, existing system. Provide system manufacturer's certification that all components provided have been tested as, and will operate as, a system.



- C. All components provided shall be listed for use with the selected system.
- D. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

## 2.2 SYSTEMS OPERATIONAL DESCRIPTION

- A. Fire-alarm signal initiation shall be by one or more of the following devices and systems:
  - 1. Manual stations.
  - 2. Heat detectors.
  - 3. Smoke detectors.
- B. Fire-alarm signal shall initiate the following actions:
  - 1. Continuously operate alarm notification appliances.
  - 2. Transmit an alarm signal to the remote alarm receiving station.
  - 3. Unlock electric door locks in designated egress paths.
  - 4. Record events in the system memory.
- C. System trouble signal initiation shall be by one or more of the following devices and actions:
  - 1. Open circuits, shorts, and grounds in designated circuits.
  - 2. Opening, tampering with, or removing alarm-initiating and supervisory signal-initiating devices.
  - 3. Loss of communication with any addressable sensor, input module, relay, control module, or remote annunciator.
  - 4. Loss of primary power at fire-alarm control unit.
  - 5. Ground or a single break in internal circuits of fire-alarm control unit.
  - 6. Abnormal ac voltage at fire-alarm control unit.
  - 7. Break in standby battery circuitry.
  - 8. Failure of battery charging.
  - 9. Abnormal position of any switch at fire-alarm control unit or annunciator.
- D. System Supervisory Signal Actions:
  - 1. Initiate notification appliances.
  - 2. After a time delay of 200 seconds, transmit a trouble or supervisory signal to the remote alarm receiving station.

## 2.3 PERFORMANCE REQUIREMENTS

- A. Seismic Performance: Fire-alarm control unit and raceways shall withstand the effects of earthquake motions determined according to ASCE/SEI 7.
  - 1. The term "withstand" means "the unit will remain in place without separation of any parts from the device when subjected to the seismic forces specified and the unit will be fully operational after the seismic event."

2.4 FIRE-ALARM CONTROL UNIT

A. General Requirements for Fire-Alarm Control Unit:

1. Field-programmable, microprocessor-based, modular, power-limited design with electronic modules, complying with UL 864.
2. Addressable Initiation Device Circuits: The FACP shall indicate which communication zones have been silenced and shall provide selective silencing of alarm notification appliance by building communication zone.
3. Addressable Control Circuits for Operation of Notification Appliances and Mechanical Equipment: The FACP shall be listed for releasing service.

B. Alphanumeric Display and System Controls: Arranged for interface between human operator at fire-alarm control unit and addressable system components including annunciation and supervision. Display alarm, supervisory, and component status messages and the programming and control menu.

1. Annunciator and Display: Liquid-crystal type, 80 characters, minimum.
2. Keypad: Arranged to permit entry and execution of programming, display, and control commands.

C. Initiating-Device, Notification-Appliance, and Signaling-Line Circuits:

1. Pathway Class Designations: NFPA 72, Class B.
2. Pathway Survivability: Level 0.

D. Notification-Appliance Circuit:

1. Audible appliances shall sound in a three-pulse temporal pattern, as defined in NFPA 72.
2. Visual alarm appliances shall flash in synchronization where multiple appliances are in the same field of view, as defined in NFPA 72.

E. Remote Smoke-Detector Sensitivity Adjustment: Controls shall select specific addressable smoke detectors for adjustment, display their current status and sensitivity settings, and change those settings. Allow controls to be used to program repetitive, time-scheduled, and automated changes in sensitivity of specific detector groups. Record sensitivity adjustments and sensitivity-adjustment schedule changes in system memory.

F. Transmission to Remote Alarm Receiving Station: Automatically transmit alarm, supervisory, and trouble signals to a remote alarm station.

G. Primary Power: 24-V dc obtained from 120-V ac service and a power-supply module. Initiating devices, notification appliances, signaling lines, trouble signals, supervisory signals and supervisory and digital alarm communicator transmitters shall be powered by 24-V dc source.

1. Alarm current draw of entire fire-alarm system shall not exceed 80 percent of the power-supply module rating.

H. Secondary Power: 24-V dc supply system with batteries, automatic battery charger, and automatic transfer switch.

2.5 MANUAL FIRE-ALARM BOXES

A. General Requirements for Manual Fire-Alarm Boxes: Comply with UL 38.

1. Single-action mechanism, pull-lever type; with integral addressable module arranged to communicate manual-station status (normal, alarm, or trouble) to fire-alarm control unit.
2. Station Reset: Key- or wrench-operated switch.

2.6 SYSTEM SMOKE DETECTORS

A. General Requirements for System Smoke Detectors:

1. Comply with UL 268; operating at 24-V dc, nominal.
2. Detectors shall be four or two-wire type.
3. Integral Addressable Module: Arranged to communicate detector status (normal, alarm, or trouble) to fire-alarm control unit.
4. Base Mounting: Detector and associated electronic components shall be mounted in a twist-lock module that connects to a fixed base. Provide terminals in the fixed base for connection to building wiring.
5. Self-Restoring: Detectors do not require resetting or readjustment after actuation to restore them to normal operation.
6. Integral Visual-Indicating Light: LED type, indicating detector has operated and power-on status.
7. Remote Control: Unless otherwise indicated, detectors shall be digital-addressable type, individually monitored at fire-alarm control unit for calibration, sensitivity, and alarm condition.
  - a. Rate-of-rise temperature characteristic of combination smoke- and heat-detection units shall be selectable at fire-alarm control unit for 15 or 20 deg F per minute.
  - b. Fixed-temperature sensing characteristic of combination smoke- and heat-detection units shall be independent of rate-of-rise sensing and shall be settable at fire-alarm control unit to operate at 135 or 155 deg F.
  - c. Multiple levels of detection sensitivity for each sensor.
  - d. Sensitivity levels based on time of day.

B. Photoelectric Smoke Detectors:

1. Detector address shall be accessible from fire-alarm control unit and shall be able to identify the detector's location within the system and its sensitivity setting.
2. An operator at fire-alarm control unit, having the designated access level, shall be able to manually access the following for each detector:
  - a. Primary status.
  - b. Device type.
  - c. Present average value.
  - d. Present sensitivity selected.
  - e. Sensor range (normal, dirty, etc.).

## 2.7 HEAT DETECTORS

- A. General Requirements for Heat Detectors: Comply with UL 521.
  - 1. Temperature sensors shall test for and communicate the sensitivity range of the device.
- B. Heat Detector, Combination Type: Actuated by either a fixed temperature or a rate of rise.
  - 1. Mounting: Adapter plate for outlet box mounting.
  - 2. Integral Addressable Module: Arranged to communicate detector status (normal, alarm, or trouble) to fire-alarm control unit.

## 2.8 NOTIFICATION APPLIANCES

- A. General Requirements for Notification Appliances: Connected to notification-appliance signal circuits, zoned as indicated, equipped for mounting as indicated, and with screw terminals for system connections.
  - 1. Combination Devices: Factory-integrated audible and visible devices in a single-mounting assembly, equipped for mounting as indicated, and with screw terminals for system connections.
- B. Chimes: Vibrating type.
- C. Horns: Electric-vibrating-polarized type, 24-V dc; with provision for housing the operating mechanism behind a grille. Comply with UL 464.
- D. Visible Notification Appliances: Xenon strobe lights complying with UL 1971, with clear or nominal white polycarbonate lens mounted on an aluminum faceplate. The word "FIRE" is engraved in minimum 1-inch- high letters on the lens.
  - 1. Mounting: Wall mounted unless otherwise indicated.
  - 2. Flashing shall be in a temporal pattern, synchronized with other units.
  - 3. Strobe Leads: Factory connected to screw terminals.
  - 4. Mounting Faceplate: Factory finished, red.

## 2.9 REMOTE ANNUNCIATOR

- A. Description: Annunciator functions shall match those of fire-alarm control unit for alarm, supervisory, and trouble indications. Manual switching functions shall match those of fire-alarm control unit, including acknowledging, silencing, resetting, and testing.
  - 1. Mounting: Surface cabinet, NEMA 250, Type 1.
- B. Display Type and Functional Performance: Alphanumeric display and LED indicating lights shall match those of fire-alarm control unit. Provide controls to acknowledge, silence, reset, and test functions for alarm, supervisory, and trouble signals.

2.10 ADDRESSABLE INTERFACE DEVICE

A. General:

1. Include address-setting means on the module.
2. Store an internal identifying code for control panel use to identify the module type.
3. Listed for controlling fan motor controllers.

B. Monitor Module: Microelectronic module providing a system address for alarm-initiating devices for wired applications with normally open contacts.

C. Integral Relay: Capable of providing a direct signal to circuit-breaker shunt trip for power shutdown.

1. Allow the control panel to switch the relay contacts on command.
2. Have a minimum of two normally open and two normally closed contacts available for field wiring.

D. Control Module:

1. Operate notification devices.

2.11 DIGITAL ALARM COMMUNICATOR TRANSMITTER

A. Digital alarm communicator transmitter shall be acceptable to the remote central station and shall comply with UL 632.

B. Functional Performance: Unit shall receive an alarm, supervisory, or trouble signal from fire-alarm control unit and automatically signal remote central station. When contact is made with central station(s), signals shall be transmitted. If service on either line is interrupted for longer than 45 seconds, transmitter shall initiate a local trouble signal and transmit the signal indicating loss of communication to the remote alarm receiving station. Transmitter shall automatically report communication restoration to the central station.

C. Local functions and display at the digital alarm communicator transmitter shall include the following:

1. Programming device.
2. LED display.
3. Manual test report function and manual transmission clear indication.
4. Communications failure with the central station or fire-alarm control unit.

D. Digital data transmission shall include the following:

1. Address of the alarm-initiating device.
2. Address of the supervisory signal.
3. Address of the trouble-initiating device.
4. Loss of ac supply.
5. Loss of power.
6. Low battery.

7. Abnormal test signal.
  8. Communication bus failure.
- E. Secondary Power: Integral rechargeable battery and automatic charger.
- F. Self-Test: Conducted automatically every 24 hours with report transmitted to central station.

### PART 3 - EXECUTION

#### 3.1 EQUIPMENT INSTALLATION

- A. Comply with NFPA 72, NFPA 101, and requirements of authorities having jurisdiction for installation and testing of fire-alarm equipment. Install all electrical wiring to comply with requirements in NFPA 70 including, but not limited to, Article 760, "Fire Alarm Systems."
- B. Connecting to Existing Equipment: Verify that existing fire-alarm system is operational before making changes or connections.
- C. Equipment Mounting: Install fire-alarm control unit on finished floor.
1. Comply with requirements for seismic-restraint devices.
- D. Install wall-mounted equipment, with tops of cabinets not more than 78 inches above the finished floor.
1. Comply with requirements for seismic-restraint devices.
- E. Manual Fire-Alarm Boxes:
1. Install manual fire-alarm box in the normal path of egress within 60 inches of the exit doorway.
  2. Mount manual fire-alarm box on a background of a contrasting color.
  3. The operable part of manual fire-alarm box shall be between 42 inches and 48 inches above floor level. All devices shall be mounted at the same height unless otherwise indicated.
- F. Smoke- or Heat-Detector Spacing: Comply with NFPA 72.
- G. Single-Station Smoke Detectors: Where more than one smoke alarm is installed within a dwelling or suite, they shall be connected so that the operation of any smoke alarm causes the alarm in all smoke alarms to sound.
- H. Remote Status and Alarm Indicators: Install in a visible location near each smoke detector that is not readily visible from normal viewing position.
- I. Audible Alarm-Indicating Devices: Install not less than 6 inches below the ceiling. Install bells and horns on flush-mounted back boxes with the device-operating mechanism concealed behind a grille. Install all devices at the same height unless otherwise indicated.

- J. Visible Alarm-Indicating Devices: Install adjacent to each alarm bell or alarm horn and at least 6 inches below the ceiling. Install all devices at the same height unless otherwise indicated.
- K. Device Location-Indicating Lights: Locate in public space near the device they monitor.

### 3.2 PATHWAYS

- A. Pathways above recessed ceilings and in nonaccessible locations may be routed exposed.
  - 1. Exposed pathways located less than 96 inches above the floor shall be installed in EMT.
- B. Pathways shall be installed in EMT.
- C. Exposed EMT shall be painted red enamel.

### 3.3 CONNECTIONS

- A. For fire-protection systems related to doors in fire-rated walls and partitions and to doors in smoke partitions, connect hardware and devices to fire-alarm system.
  - 1. Verify that hardware and devices are listed for use with installed fire-alarm system before making connections.
- B. Make addressable connections with a supervised interface device to the following devices and systems. Install the interface device less than 36 inches from the device controlled. Make an addressable confirmation connection when such feedback is available at the device or system being controlled.
  - 1. Electronically locked doors and access gates.
  - 2. Supervisory connections at fire-extinguisher locations.

### 3.4 IDENTIFICATION

- A. Identify system components, wiring, cabling, and terminals. Comply with requirements for identification specified in "Identification for Electrical Systems."
- B. Install framed instructions in a location visible from fire-alarm control unit.

### 3.5 GROUNDING

- A. Ground fire-alarm control unit and associated circuits; comply with IEEE 1100. Install a ground wire from main service ground to fire-alarm control unit.
- B. Ground shielded cables at the control panel location only. Insulate shield at device location.

### 3.6 FIELD QUALITY CONTROL

- A. Field tests shall be witnessed by owner's representative.
- B. Perform the following tests and inspections:
  - 1. Visual Inspection: Conduct visual inspection prior to testing.
    - a. Inspection shall be based on completed record Drawings and system documentation that is required by NFPA 72 in its "Completion Documents, Preparation" table in the "Documentation" section of the "Fundamentals" chapter.
    - b. Comply with the "Visual Inspection Frequencies" table in the "Inspection" section of the "Inspection, Testing and Maintenance" chapter in NFPA 72; retain the "Initial/Reacceptance" column and list only the installed components.
  - 2. System Testing: Comply with the "Test Methods" table in the "Testing" section of the "Inspection, Testing and Maintenance" chapter in NFPA 72.
  - 3. Test audible appliances for the public operating mode according to manufacturer's written instructions. Perform the test using a portable sound-level meter complying with Type 2 requirements in ANSI S1.4.
  - 4. Test audible appliances for the private operating mode according to manufacturer's written instructions.
  - 5. Test visible appliances for the public operating mode according to manufacturer's written instructions.
  - 6. Factory-authorized service representative shall prepare the "Fire Alarm System Record of Completion" in the "Documentation" section of the "Fundamentals" chapter in NFPA 72 and the "Inspection and Testing Form" in the "Records" section of the "Inspection, Testing and Maintenance" chapter in NFPA 72.
- C. Reacceptance Testing: Perform reacceptance testing to verify the proper operation of added or replaced devices and appliances.
- D. Fire-alarm system will be considered defective if it does not pass tests and inspections.
- E. Prepare test and inspection reports.
- F. Maintenance Test and Inspection: Perform tests and inspections listed for weekly, monthly, quarterly, and semiannual periods. Use forms developed for initial tests and inspections.
- G. Annual Test and Inspection: One year after date of Substantial Completion, test fire-alarm system complying with visual and testing inspection requirements in NFPA 72. Use forms developed for initial tests and inspections.

### 3.7 SOFTWARE SERVICE AGREEMENT

- A. Comply with UL 864.
- B. Technical Support: Beginning at Substantial Completion, service agreement shall include software support for two years.



- C. Upgrade Service: At Substantial Completion, update software to latest version. Install and program software upgrades that become available within two years from date of Substantial Completion. Upgrading software shall include operating system and new or revised licenses for using software.
  - 1. Upgrade Notice: At least 30 days to allow Owner to schedule access to system and to upgrade computer equipment if necessary.

3.8 DEMONSTRATION

- A. Train Owner's maintenance personnel to adjust, operate, and maintain fire-alarm system.

END OF SECTION 283111

# FIRE PROTECTION

## 1. GENERAL

### A. DESCRIPTION

- i. Provide an Automatic Sprinkler System as specified, with piping as required in accordance with the requirements of NFPA 13 and 24. Contractor shall assume full responsibility for system design, approval, and installation. The scope of this project is to provide a sprinkler system within the building with a 5' stub outside the building to be connected to a future fire service line.

### B. SUBMITTALS

- i. Shop Drawings: Submit shop drawings as per GENERAL and SPECIAL CONDITIONS before fabrication or ordering materials. Include the following:
  - 1. Sprinkler installation drawings for wet pipe and freeze protected systems.
  - 2. Catalog cuts of materials.
  - 3. Hydraulic calculations.
- ii. Approval: Submit complete set of shop drawings to the Carson City Fire Department for approval, prior to submitting to Engineer and installation.

## 2. PRODUCTS

### A. MATERIALS

- i. Sprinkler Heads: All sprinklers shall be Underwriters Laboratories, Inc. approved.
- ii. Hangers and Supports: NFPA 13.

## 3. AUTHORITY

### A. INSTALLATION

- i. Installation shall conform to the latest editions of NFPA 13.
- ii. Installation shall be by a State Licensed Fire Protection Contractor in compliance with Section 607 of the State Fire Marshal's regulations, Type G.
- iii. Design drawings and design calculations shall be signed by a NICET Level 3 Technician or stamped by a Nevada licensed fire protection engineer and so indicated.

## 4. EXECUTION

### A. FABRICATION AND INSTALLATION

- i. In accordance with Standards of National Fire Protection Association.

### B. HANGER RODS

- i. Mild steel in accordance with the following schedule:

<u>MATERIAL</u>	<u>PIPE SIZE</u>	<u>HANGER ROD SIZE</u>	<u>CENTER TO CENTER</u>
Steel	2-inch and smaller	3/8-inch diameter	8-feet
Steel	2½-inch to 3-inch	1/2-inch diameter	10-feet
Steel	4-inch to 6-inch	5/8-inch diameter	14-feet

### C. PIPE SLEEVES

- i. Adjust-O-Crete, A.M.I. Products, or equal, 24-gauge, electrogalvanized steel, adjustable sleeve.

#### D. ESCUTCHEONS

- i. Chromium-plated floor and ceiling plates with set screws to hold securely in place. Provide on pipes passing through exposed ceiling, floors, and walls in visible locations.

#### E. SPRINKLER HEADS

- i. General: Protect sprinklers in areas subject to physical damage with approved wire guards.
- ii. Recessed Heads in Finished Ceilings: Reliable Semi-recessed F1FR chrome plated.
- iii. Upright Heads (Concealed or in Rooms Without Ceiling): Reliable F1FR.
- iv. Horizontal Sidewall: Reliable F1FR chrome plated.

#### F. GENERAL

- i. A certificate of registration in accordance with Section 608 of the Nevada State Fire Marshal's Regulations is required for the licensee's supervisor of installation.
- ii. Sprinkler densities and available water pressures shall be determined by the contractor.
- iii. Design shall include that required for seismic protection and freeze protection.
- iv. A sprinkler cabinet with spare heads and a wrench shall be furnished in accordance with NFPA.
- v. 1" grids are not acceptable.
- vi. Rooms with elevated ambient temperatures shall have high temperature heads.
- vii. Unheated rooms or areas shall be protected with glycol loops.
- viii. Work shall include coordination with other trades to insure that space allocations are shared.
- ix. Coordinate all exposed sprinkler piping with Engineer.
- x. Velocities shall not exceed 30 FPS.

#### G. BACKFLOW PROTECTION

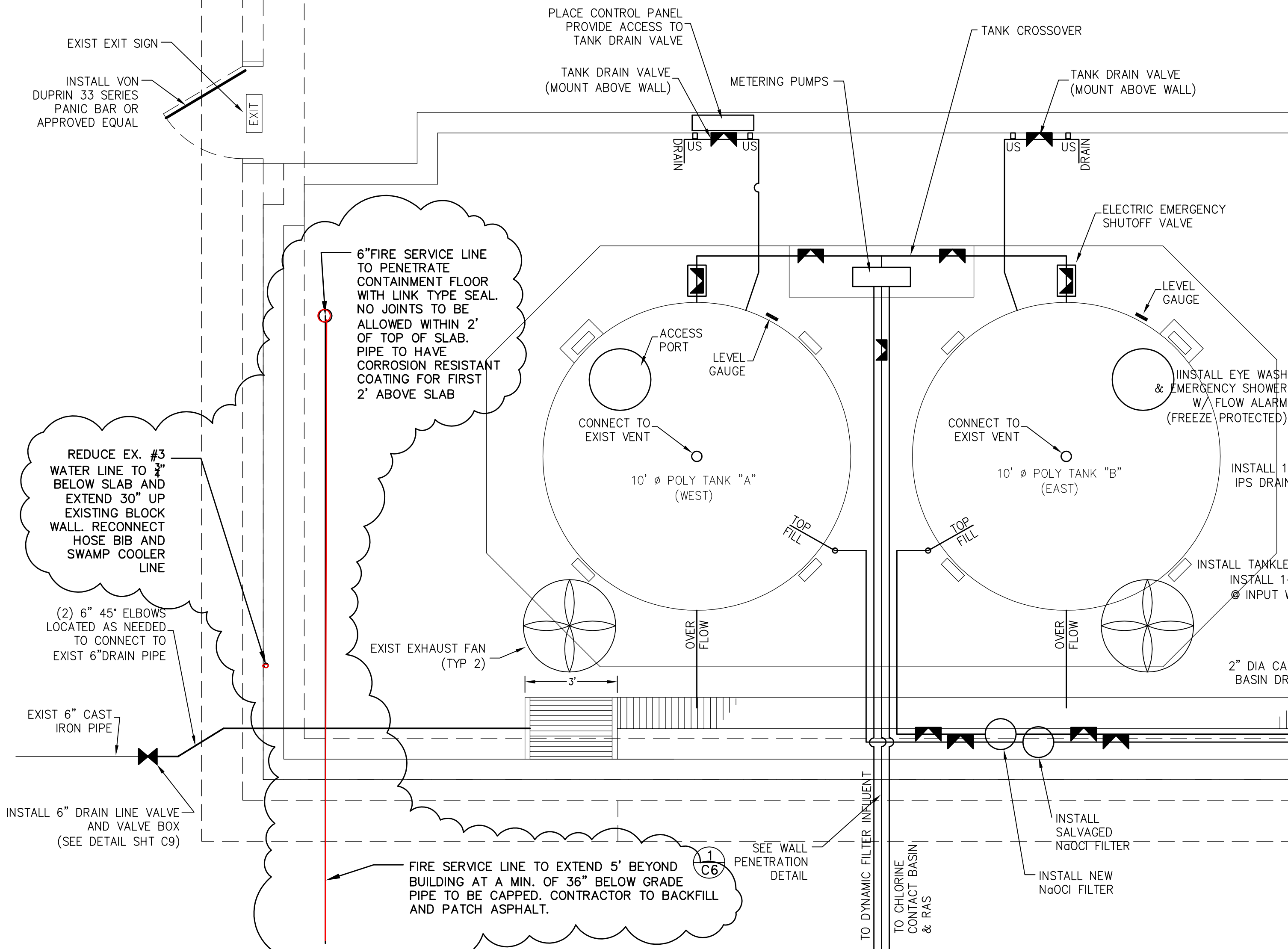
- i. Zone of reduced pressure type at each anti-freeze loop. Provide drain from BFP to an approved disposal point. Provide expansion tank as required to accommodate thermal expansion. The reduced pressure principle assembly shall be a Wilkins Model 975 XL.
- ii. Provide a spring loaded double-check detector assembly on each fire sprinkler riser conforming with "FCCCHR of USC." Wilkins Model 350 DA.
- iii. All backflow devices shall be UL, FM, USC and State of Nevada Health Division approved.

#### H. SYSTEM SUPERVISION

- i. Flow Detector Alarm Switch:
  - 1. Water Flow Alarm: Provide in each sprinkler system connected to U/L listed central station supervisory alarm.
  - 2. Supervision of all valves connected to U/L listed central station supervisory alarm if not shown or called for in Electrical Section.

**END OF SECTION**

# Fire Riser Location and #3 Water Plan



**PUBLIC WORKS DEPARTMENT**

**ADMINISTRATION**

3505 Butti Way  
Carson City, NV 89701-3498  
Ph: 775-887-2355  
Fx: 775-887-2112

**FLEET SERVICES**

3303 Butti Way, Building 2  
Carson City, NV 89701-3498  
Ph: 775-887-2356  
Fx: 775-887-2258

**OPERATIONS**

(Water, Sewer, Wastewater,  
Streets, Landfill, Environmental)  
3505 Butti Way  
Carson City, NV 89701-3498  
Ph: 775-887-2355  
Fx: 775-887-2112

**ENGINEERING/  
TRANSPORTATION/  
CAPITAL PROJECTS**

3505 Butti Way  
Carson City, NV 89701-3498  
Ph: 775-887-2355  
Fx: 775-887-2112

**BUILDING and SAFETY  
PERMIT CENTER**

108 E. Proctor Street  
Carson City, NV 89701-4240  
Ph: 775-887-2310  
Fx: 775-887-2202

**PLANNING**

108 E. Proctor Street  
Carson City, NV 89701-4240  
Ph: 775-887-2180  
Fx: 775-887-2278

**HEARING IMPAIRED**

Dial 711

**CARSON CITY NEVADA**

Consolidated Municipality and State Capital



**PUBLIC WORKS FIRE FLOW DATA SHEET\***

Testing Personnel: ROB SHINE

Date of Test: 10-1-2014 Time of Test: 8:00 AM

Requested By: DARREN ANDERSON

Phone: 775-283-7584

Email address: danderson@carson.org

Test Locations: FIFTH & AIRPORT  
(Street and Cross Street)

Pressure Zone 4880

Comments: \_\_\_\_\_

Mainline Size: 16"

Pressure: Static (S) 110 PSI

Residual (R) 105 PSI

Pitot (P) 70 PSI

Pitot Flow Value 1320 GPM

Exit Coefficient (C) 0.845 Exit Diameter (inches) (D) 2.5"

$Q_F$  = Flow Quantity From Hydrant

$Q_F = (29.84) \times (C) \times (D^2) \times (\sqrt{P})$

$Q_F = (29.84) \times (0.845) \times (6.25) \times (8.37)$

$Q_F = 1319$  Gallons Per Minute

Available Water Calculation:

$H_f = S - R$

$H_f = 110 - 105 = 5$

$H_f = S - 20$

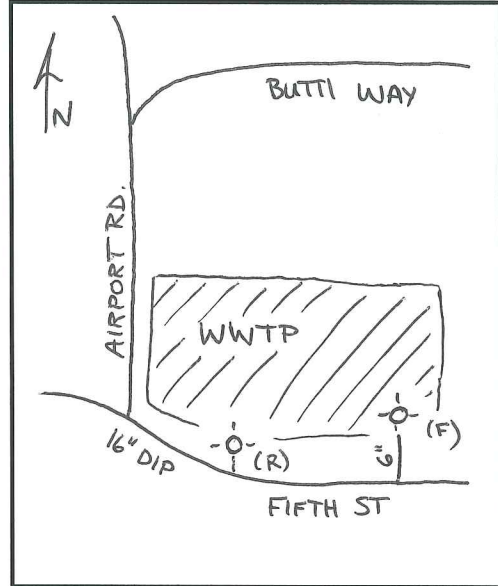
$H_f = 110 - 20 \text{ PSI} = 90$

$Q_R = Q_F \times (H_r^{0.54} / H_f^{0.54})$

$Q_R = 1319 \times (11.36 / 2.38)$

$Q_R = 6295$

$Q_R = 6295$  G.P.M. = Total Available Water at 20 PSI Residual.



\*Based on NFPA 291 – 2013 Edition

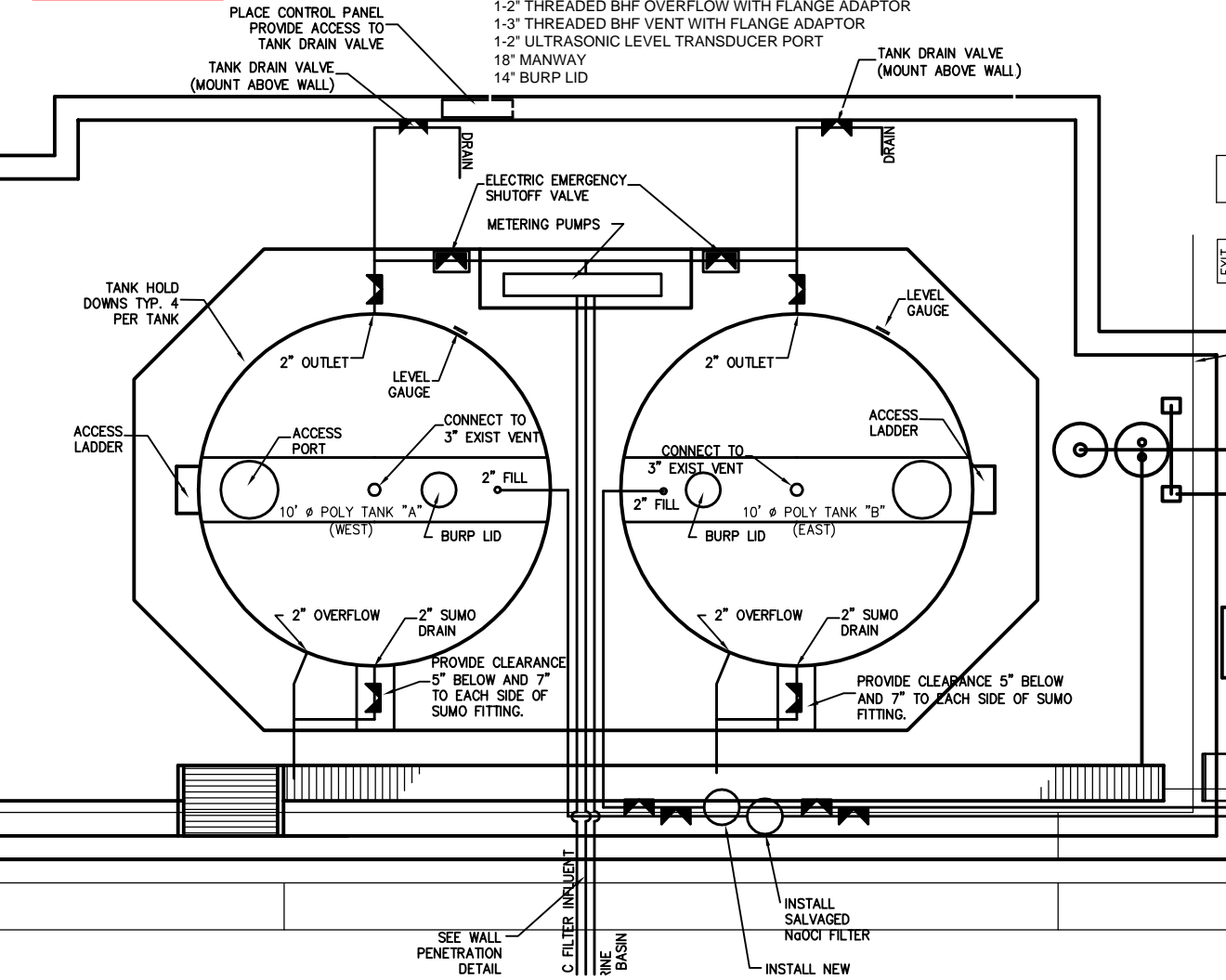
Updated 8/5/2013

Pursuant to NFPA 291 (2013 Edition) fire flow test data over 5 years old should not be used.



**ADDITIONAL  
TANK INFO**

- TANK CONNECTIONS:**  
 LADDER CONNECTIONS AND SEISMIC RESTRAINT CONNECTIONS  
 1-2" THREADED BHF INLET WITH FLANGE ADAPTER  
 1-2" BOLTED DOUBLE FLANGE OUTLET WITH FLANGE ADAPTER  
 1-2" BOLTED DOUBLE FLANGE DRAIN (SUMO) WITH FLANGE ADAPTOR  
 1-2" THREADED BHF OVERFLOW WITH FLANGE ADAPTOR  
 1-3" THREADED BHF VENT WITH FLANGE ADAPTOR  
 1-2" ULTRASONIC LEVEL TRANSDUCER PORT  
 18" MANWAY  
 14" BURP LID





# Better plant performance begins with an efficient control system

Migrate your legacy Rockwell PLC to a Unity-based Modicon control platform for a complete state-of-the-art solution





## The risks of an ageing control system

As industrial systems around the world get older, a significant number are nearing the end of their useful life, like the Rockwell SLC500. Updating your aged installations with the latest technology now will help you retain your productivity and competitive edge by avoiding:

- > Unscheduled downtime
- > Expensive repairs and long lead times for spare parts
- > Inability to support new information technologies
- > Unreliable electronics
- > Diminishing productivity
- > Limited network options and restricted openness



# Modernize your control system now and maximize uptime and production



Modernizing your control system is much more than just a technological upgrade. It is your first step on the path toward innovative industrial process management that also optimizes your existing investment.

When modernizing your control system, you need a partner with experience, someone who understands the specifics of your industry and can unlock the opportunities to expansion and competitiveness – and very importantly – someone who has the global resources to support you with:

- > Open, integrated and scalable automation architectures
- > Global support and solid execution capabilities
- > Complete service capabilities to support you throughout the entire lifecycle of your system
- > In-depth knowledge of your industry and a large network of partners to help build a complete solution
- > Improved energy efficiency

When choosing Schneider Electric, you also choose the leader in energy management, from the device level all the way to the enterprise level.

Unscheduled  
downtime costs  
on average

**5%**

of the value of  
total production.

Source: ARC survey 2010

# Easy 2-step migration of your legacy SLC500 to Modicon M340

With your challenges in mind, we have developed a migration solution that allows you to quickly and easily migrate your legacy Rockwell Automation SLC500 systems to cutting-edge Schneider Electric M340 programmable automation controllers powered by our Unity™ software platform.

#### Our migration solution provides:

- > Reduced engineering costs
- > Automatic software conversion
- > Reduced risk and costs
- > Minimum production downtime

## Step 1 | Software conversion: Securing your existing SLC500 application investment

Schneider Electric has developed custom software tools that rapidly create high-quality conversions of Rockwell PLC applications. Schneider Electric service teams and partners apply these tools to modernize your installation with minimum risk to you.

Every piece of information, including all I/O tag names, comments, and rung comments are preserved and presented in Unity, with the same look and feel so that your operation staff is instantly comfortable. Your historical investment in application programming is protected. Once in Unity that investment can be extended through Unity's best-in-class power and functionality.

#### Benefits of Unity Pro software:

- > Similar look and feel to your legacy SLC500 in terms of code execution and documentation. No new system training needed
- > Easy-to-use graphical user interface with drag-and-drop functionality
- > Built-in library of pre-tested application function blocks
- > Customizable, user-developed function blocks that can be used in other applications
- > Advanced, intuitive diagnostics to help eliminate errors
- > Compliance with international PLC programming standard EN61131-3
- > Choice of five IEC programming languages



With Schneider Electric, you achieve a smooth, risk-free migration while optimizing uptime and production



Before conversion

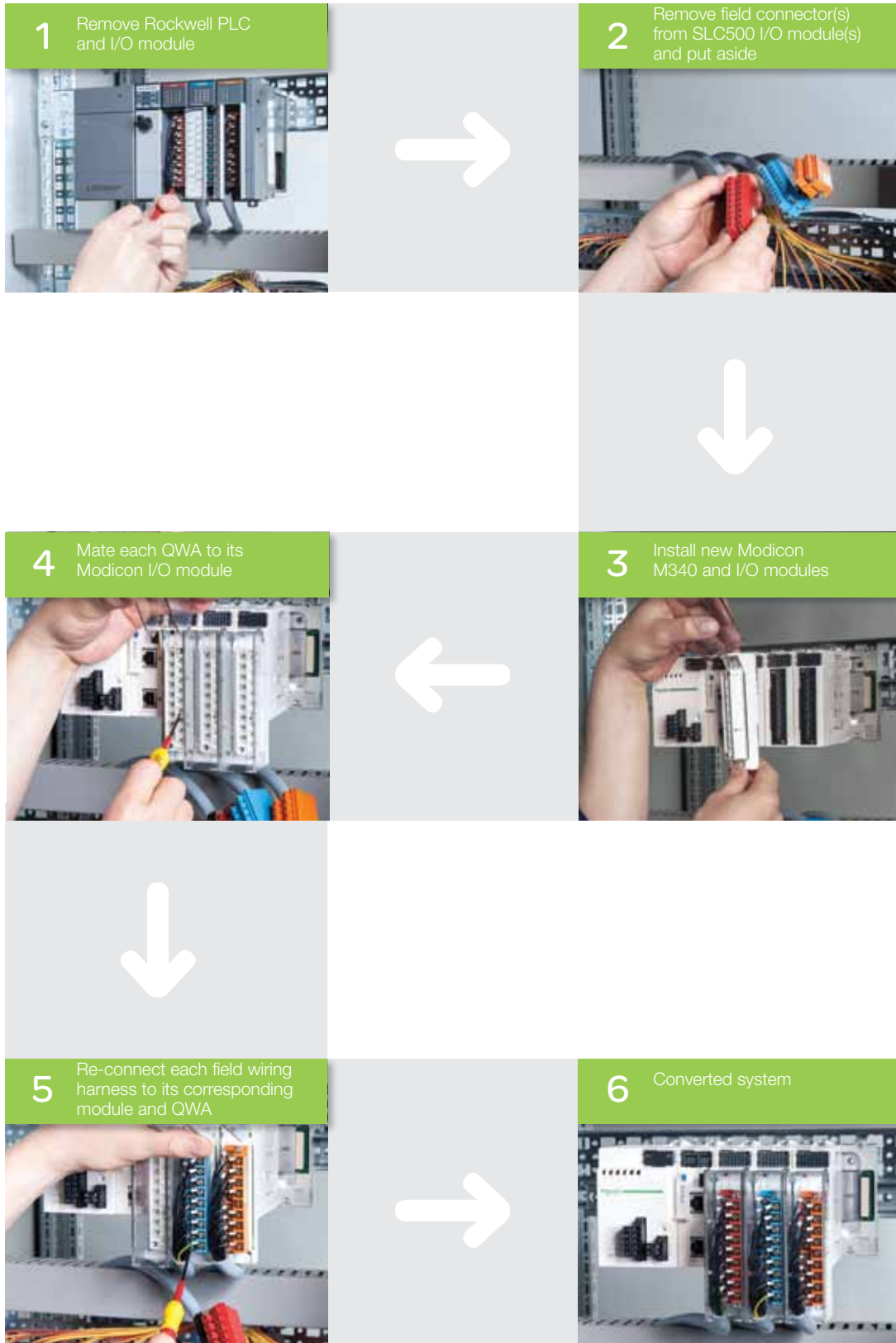


After conversion

## Step 2 | Hardware migration: Seamless migration from the SLC500 controller and I/O to Modicon 340 control system

Thanks to our extensive I/O cross reference documentation you can migrate your control system with confidence. Our quick wiring solution allows you to keep existing field wiring and simply connect the terminal block to the new Modicon™ M340 I/O without having to touch a single wire - thus eliminating problems from faulty wiring.

# Connecting couldn't be easier

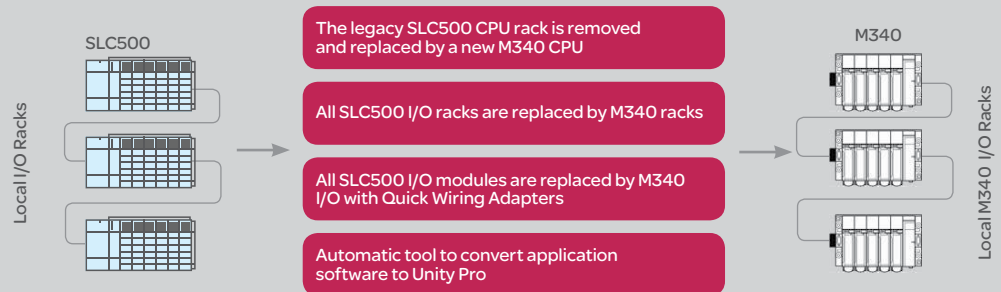


Enjoy the benefits and features of your new Modicon 340 control system

Using the I/O Quick Wiring system from Schneider Electric saves you hours and eliminates the risk of a faulty rewiring.

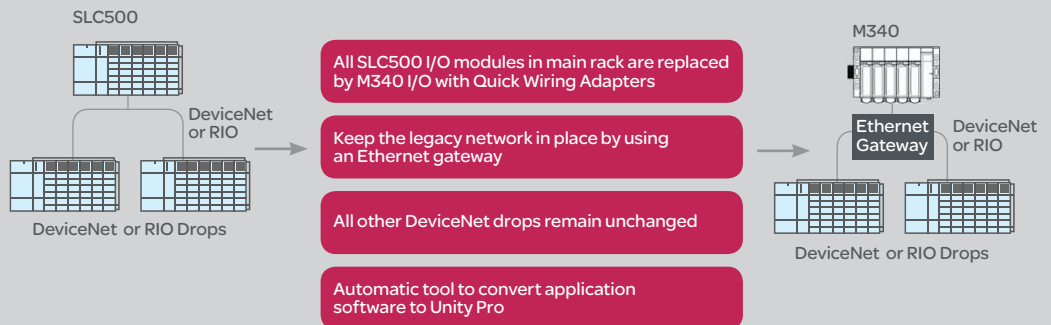
# Typical Rockwell SLC 500 control architectures that can be migrated

## Full migration - PLC with extended I/O rack

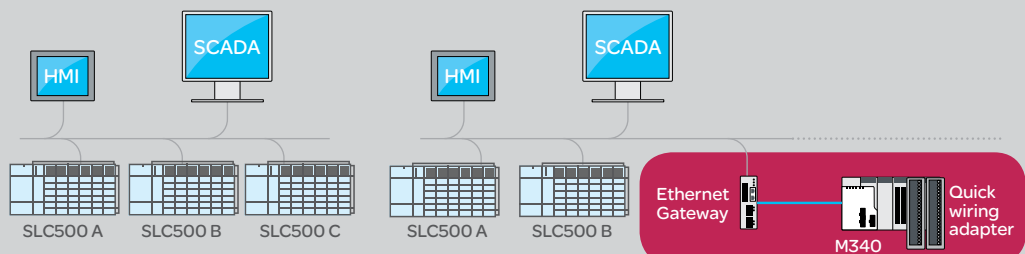


## Partial migration

- > Replace the CPU and manage SLC500 I/O racks with a Unity controller



- > Replace the CPU and keep connection to a supervisory network





## Enjoy the benefits of a modernized control platform

- > Quick access to the latest network solutions
- > Easy access to the information you need to optimize productivity
- > Improved Mean Time Between Failures
- > Cost-effective maintenance and service





Modernizing your control system not only boosts your productivity today, it will benefit you well into the future as well

# Your modernized control platform is your gateway to the possibilities of PlantStruxure...

With Schneider Electric's Rockwell migration program, you preserve your existing investment, capitalize on the benefits of an automatic and risk-free migration, keep the same look and feel of your user interface, reduce your cost of ownership, and, very importantly, open the door to the openness and integration of our cutting edge PlantStruxure™ architecture.

## PlantStruxure architecture: the future of the industrial control system

Evolving to PlantStruxure architecture is your first step into a world of optimized openness and integration!

PlantStruxure™ is Schneider Electric's collaborative and integrated automation architecture for industrial and infrastructure customers. It brings together our Telemetry, PLC/SCADA and DCS offerings with complete lifecycle services to help make your operations more efficient. From initial design to modernization, PlantStruxure transparently connects control, operation and enterprise levels of your business.

### PlantStruxure architecture helps to:

- > Reduce engineering, operations and maintenance costs
- > Maximize plant and production efficiency
- > Improve production quality
- > Protect people, plant assets and the environment
- > Maximize return on investment

## PlantStruxure PES (Process Expert System): The next step

Embed Active Energy Management into your process

### Powerful Libraries

open • extensible • process aware

### Integrated Software

engineering • operations • maintenance

### Open Architecture

flexible • scalable • standard

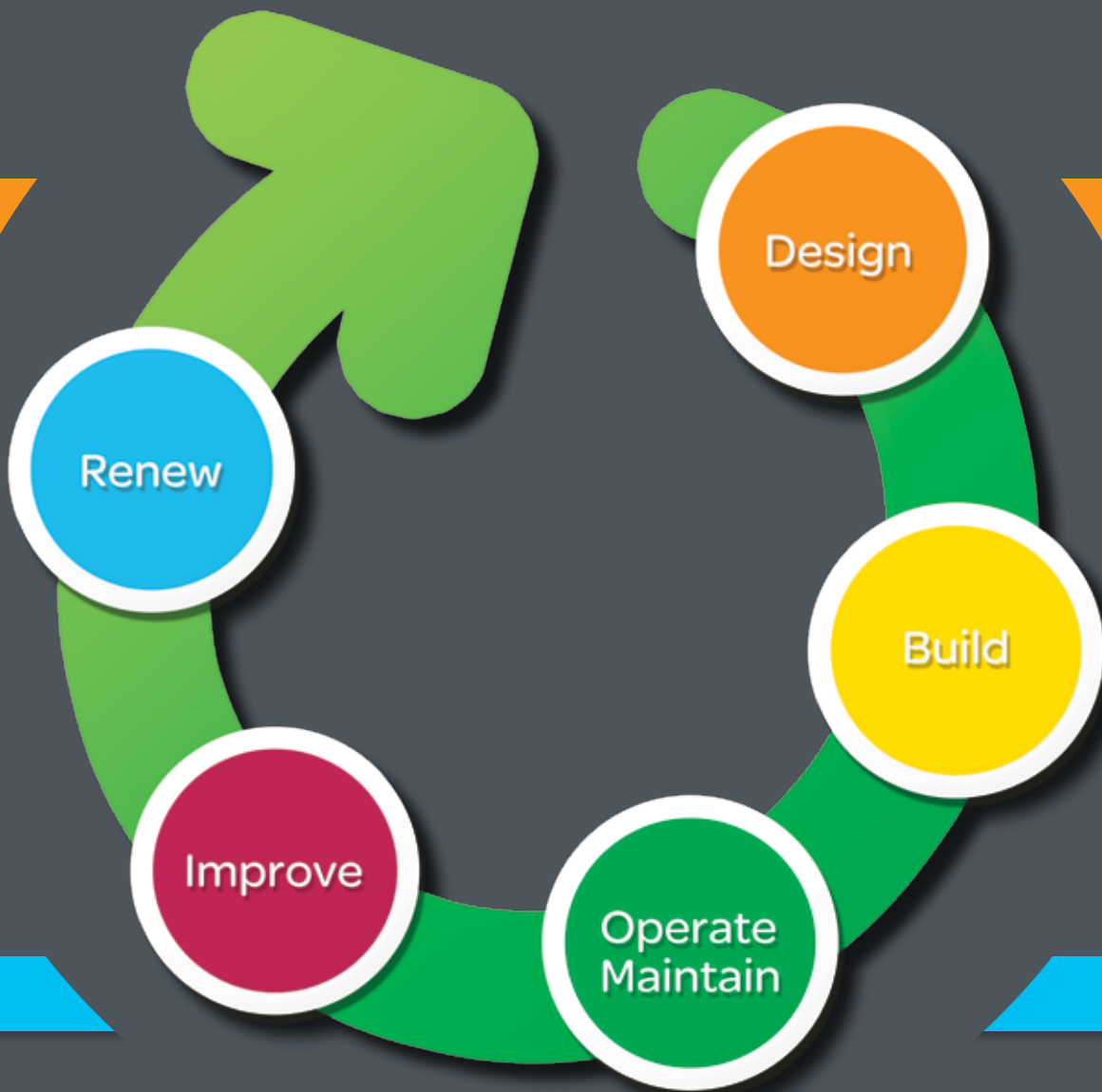
Optimize your asset performance with lifecycle services

By migrating the heart of your automation control system to Schneider Electric, you take the first step toward an integrated and open DCS. PlantStruxure PES is the next step.

PES has been designed as a true system with a unique object-oriented database, navigation capabilities, and change propagation. PES also offers a set of industry-specific libraries with embedded energy management functionality that makes it easy to improve both your process efficiency and your energy efficiency.

PES has taken the best of a DCS – system integration, single database, and powerful diagnostics capabilities – and combined them with the best of PLC/SCADA-based solutions to give you enhanced openness, flexibility, and ease of use.

With Schneider Electric, you maintain the functionality of your solution throughout the entire life cycle.





# You need a partner with proven tools, methodologies, and processes

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A successful and efficient modernization is achieved by working with a competent partner. Schneider Electric has more than 40 years' of experience in the automation industry. With operations in more than 100 countries and 40 automation centres staffed with more than 1400 professional application engineers, we have the worldwide network needed to support you every step of the way.

We work closely with you to apply best practices and deliver the confidence, safety and quality you deserve in the execution of your migration strategy.

## Design: Best solutions for your needs

- > **Understand** your challenges
- > **Find** innovative technical solutions

## Build: Availability of your solution

- > **Ensure** the delivery of your solution
- > **Provide** on-site services and support

## Operate/Maintain: Smooth processes

- > **Balance** the functioning of your assets to reduce the number of failures
- > **Enhance** your staff's competencies to operate more effectively

## Improve: Proven expertise for high performance

- > **Identify**, through your installation audit, functional limitations, and provide improvement recommendations
- > **Define** the right technical solutions to limit the risks during the modernization phase

## Renew: Risk-free and easy upgrade

- > **Ensure** restart of the installation in the same conditions as before the operation and limit downtime
- > **Increase** flexibility and safety with advanced automation solutions



Make the most of your energy<sup>SM</sup>

**Schneider Electric Industries SAS**

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05-2013