TLCD ARCHITECTURE

Addendum No. One

for:

Napa Valley College
Wine Storage Building

at

2277 Napa-Vallejo Hwy, Napa, California

for the

Napa Community College District
Napa, California

Project No. 05067.00

Date: March 28, 2007

Note: The following changes, modifications and additions to the Project Manual and Drawings described within this Addendum are made a part thereof and are subject to all of the requirements thereof as if originally specified.

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ADDENDUM NO. One

Napa Valley College Wine Storage Building

2277 Napa-Vallejo Hwy
Napa, California

STAMPS, SIGNATURES AND APPROVALS

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Santa Rosa, CA 95404
707.525.5600

Lefler Engineers, Inc.
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33 New Montgomery Street, Suite 850
San Francisco, CA 94105
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ADDENDUM NO. One

To the Plans and Specifications for:

Napa Valley College Wine Storage Building

Date: March 28, 2007

TLCD Architecture

CIVIL

1.1 REVISIONS TO CIVIL PLANS

A. Addendum to sheet C2, drawing AC1.1:

1. The existing gas line previously shown as ending at the southwestern corner of the proposed wine storage building in fact continues along the eastern side of the existing sidewalk on the western side of the proposed wine storage building. This existing gas line runs parallel to the sidewalk and continues north under the sidewalk and then continues to the adjacent building that is to the northwest of the proposed wine storage building. We have shown a tap into this existing gas line for the proposed wine storage building with the point of connection being at the north side of the building.

2. The existing 2 inch water line that is to supply the proposed wine storage building is now shown to end on the south side of the existing walkway. We also indicate a new water valve at the point of connection.

3. The continuation of the proposed 2 inch water line, which is to supply the building to the northwest of the proposed wine storage building, is now shown to be running in a northerly direction on the west side of the wine storage building and continuing west to service the building.

4. The existing water valve within the proposed concrete entrance at the eastern side of the proposed wine storage building is now labeled to be removed.

5. The proposed post indicator valve at the southeast corner of the wine storage building has been removed with the understanding that the fire department connection assembly includes a post indicator valve.

C. Addendum to sheet C3, drawing AC1.3:

1. Additional electrical information was obtained in the field that an electrical conduit runs underneath the access road for the proposed wine storage building and existing winery and continues north parallel with the proposed fire protection line to supply electric for outside lighting.

D. Addendum to sheet C3, drawing AC1.4:

1. This drawing indicates information obtained in the field showing the existing gas meter and check valve upstream of the point of connection to the existing gas line that is to supply the proposed wine storage building. See drawing AC1.1 for point of connection into existing gas line.

E. Addendum to sheet C4, drawing AC1.5:

1. Gas Service Trench Detail

ARCHITECTURAL

1.2 GEOTECHNICAL REPORT

A. Copies of Geotechnical reports are available from the Owner

1.3 REVISIONS TO GENERAL CONDITIONS:

A. Refer to 1. Definitions: Delete the definition of DSA in its entirety.
Refer to 28 Modifications of Contract, sub-paragraph a: Delete the last sentence of the first paragraph from the words "All modifications" to "DSA."

1.4 REVISIONS TO SUPPLEMENTAL GENERAL CONDITIONS:

A. Refer to Item 3 Liquidated Damages: Delete the milestone "Submit DSA deferred approval shop drawings or submittals" in its entirety.

1.5 PERMITTING PROCESS CLARIFICATION

A. Contractor shall coordinate and obtain all required inspections, permits and all other work by The City of Napa during the duration of the project other than the Building Permit, which has been obtained by the Owner.

1.6 REVISIONS TO ARCHITECTURAL PLANS

A. See attached sketch AA1.1 for revisions to detail 7/A5.

MECHANICAL

1.7 REVISIONS AND CLARIFICATIONS TO MECHANICAL & PLUMBING PLANS

A. Sketch AM1.1: The sketch shows a schematic detail of the temperature control requirements for the unit heater. Also see the sequence of operation in specification section 15900, TADCS.

B. Sketch AM1.2: The sketch shows a schematic detail of the temperature control requirements for the unit cooler. Also see the sequence of operation in specification section 15900, TADCS.

C. Sketch AP.1: The sketch shows the relocation of the gas service, the elimination of the gas meter, and the addition of a gas pressure regulator.

D. Sketch AP.2: Sheet note #7 has been changed.

1.8 REVISIONS TO SPECIFICATIONS

A. Replace Section 15900 TADCS in its entirety with attached section 15900 TADCS.

ELECTRICAL

1.9 REVISIONS TO ELECTRICAL PLANS

SKETCH NO.	SHEET NO.	DESCRIPTION OF CHANGES
AE1.1	E0.1	Occupancy sensors added.
AE1.2	E1.1	EMS site conduit note added.
AE1.3	E1.1	EMS conduit added.
AE1.4	E2.1	Occupancy sensor note added.
AE1.5	E2.1	EMS Lighting control diagram added.
AE1.6	E2.1	Occupancy sensors added.
AE1.7	E2.1	Occupancy sensors added.
AE1.8	E2.1	Occupancy sensors added.

END OF ADDENDUM NO. ONE

LIST OF ATTACHMENTS

Specifications: Specification Section 15900, TADCS

Drawings: AC1.1-AC1.5, AA1.1, AM1.1-AM1.2, AP1.1-AP1.2, AE1.1-AE1.8

SECTION 15900 - TADCS

PART 1 - GENERAL

1.1 PRODUCTS FURNISHED BUT NOT INSTALLED UNDER THIS SECTION

A. Wind Up Timer

1.2 PRODUCTS INSTALLED BUT NOT FURNISHED UNDER THIS SECTION

A. None.

1.3 PRODUCTS NOT FURNISHED OR INSTALLED BUT INTEGRATED WITH THE WORK OF THIS SECTION

A. General:
1. Coordination Meeting: The Installer furnishing the DDC network shall meet with the Installer(s) furnishing each of the following products to coordinate details of the interface between these products and the DDC network. The Owner or his designated representative shall be present at this meeting. Each Installer shall provide the Owner and all other Installers with details of the proposed interface including PICS for BACnet equipment, hardware and software identifiers for the interface points, network identifiers, wiring requirements, communication speeds, and required network accessories. The purpose of this meeting shall be to insure there are no unresolved issues regarding the integration of these products into the DDC network. Submittals for these products shall not be approved prior to the completion of this meeting.

B. Door Lock Hardware
1. The door hardware for the new doors in the Wine Storage building will be provided by the general contractor with the doors.
2. Retrofit of the existing doors in the Winery is the responsibility of the control contractor.

C. Section 15800 - Terminal Heating And Cooling Unit:
1. Unit ventilators, unit heaters, fan coils, etc.: Unit ventilators, unit heaters, fan coils, cabinet heaters, convective or fin tube heaters, zone reheat, and similar terminal units: These units shall be furnished configured to accept control inputs from an external building automation system controller as specified in Section 15900, Appendix A. Factory mounted safeties and other controls shall not interfere with this controller.

D. NVC EMS ETHERNET
1. The NVC EMS ETHERNET network connection(s) will be provided by NVC at the new Wine Storage Building. Allow for room and power for a small network switch and wireless Ethernet connection. Coordinate with HVC.

1.4 RELATED SECTIONS

A. The General Conditions of the Contract, Supplementary Conditions, and General Requirements are part of this specification and shall be used in conjunction with this section as part of the contract documents.

B. The following sections constitute related work:
1. Section 15400 - Plumbing
2. Section 15800 - Heating, Ventilating, and Air-Conditioning Equipment
3. Section 16010 - Basic Electrical Requirements
4. Section 16050 - Basic Materials and Methods
5. Section 16400 - Service and Distribution
6. Section 16500 - Lighting

1.5 DESCRIPTION

A. General: The control system shall consist of one or more controllers communicating on the Tour Andover proprietary Infinet bus connected to new CX controller(s) and existing Cyberstation front end.
1. Full DDC HVAC control will be provided for:
a. One DX cooling system serving the Bonded Wine Storage room (Room 102) and the Library Wine Storage room (Room 103).
b. One gas fired Unit Heater serving the Secure Storage area (Room 101).
c. Provide one six hour line voltage wind up timer for installation by the electrical contractor to control the Electric Wall Heater.
2. Full Security Control will be provided for the Bonded Wine Storage room (Room 102) and the Library Wine Storage room (Room 103) including card readers (HID ProxPro), door monitoring and motion detection.
3. Access Control (keypad and card - HID ProxPro with Keypad) shall be added to two doors in the existing Winery Building, the door into the Cellar Room from outside including a door sensor and the door from the Cellar Room into the Barrel Room including a door sensor for this door. All retrofit of the existing doors is the responsibility of the control contractor. In addition a door sensor will be added to the Roll Up door from outside into the Cellar Room.
4. Relocate control of the two existing Winery Infinet controllers to the new Winery CX controller provided as part of this work.
5. Control 3 On/Off lighting loads by connecting to contactors provided and installed by the Electrical Contractor.

B. The system shall directly control HVAC equipment as specified in Section 15900 Appendix A (Sequences of Operation).

1.6 APPROVED CONTROL SYSTEMS

A. The following are approved control system suppliers, manufacturers, and product lines:

Supplier	Manufacturer	Product Line
Any	Tour Andover Controls	Continuum

B. Continuum Tour Andover Controls is the only acceptable control system manufacturer to match existing Napa Valley College systems.
   1. The Contractor shall use only operator workstation software, controller software, custom application programming language, and controllers from the corresponding manufacturer and product line.
   2. Other products specified herein (such as sensors, valves, dampers, and actuators) need not be manufactured by the above manufacturer.

1.7 QUALITY ASSURANCE

A. Installer and Manufacturer Qualifications:
   1. Installer shall have an established working relationship with Control System Manufacturer.
   2. Installer shall have successfully completed Control System Manufacturer's control system training. Upon request, Installer shall present record of completed training including course outlines.

1.8 CODES AND STANDARDS

A. Work, materials, and equipment shall comply with the most restrictive of local, state, and federal authorities' codes and ordinances or these plans and specifications. As a minimum, the installation shall comply with current editions in effect 30 days prior to receipt of bids of the following codes:
   1. National Electric Code (NEC)
   2. International Building Code (IBC)
      a. Section 719 Ducts and Air Transfer Openings
      b. Section 907 Fire Alarm and Detection Systems
      c. Section 909 Smoke Control Systems
      d. Chapter 28 Mechanical
   3. International Mechanical Code (IMC)
   4. ANSI/ASHRAE 135-2004: Data Communication Protocol for Building Automation and Control Systems (BACNET)

1.9 SYSTEM PERFORMANCE

A. Performance Standards. System shall conform to the following minimum standards over network connections. Systems shall be tested using manufacturer's recommended hardware and software for operator workstation (server and browser for web-based systems).
   1. Program Execution Frequency. Custom and standard applications shall be capable of running as often as once every 5 sec. Select execution times consistent with the mechanical process under control.
   2. Performance: Programmable controllers shall be able to completely execute DDC PID control loops at a frequency adjustable down to once per sec. Select execution times consistent with the mechanical process under control.
   3. Reporting Accuracy: System shall report values with minimum end-to-end accuracy listed in Table 1.
   4. Control Stability and Accuracy: Control loops shall maintain measured variable at setpoint within tolerances listed in Table 2.

Table 1 Reporting Accuracy

Measured Variable	Reported Accuracy
Space Temperature	±0.5ºC (±1ºF)
Ducted Air	±0.5ºC (±1ºF)
Outside Air	±1.0ºC (±2ºF)
Dew Point	±1.5ºC (±3ºF)
Water Temperature	±0.5ºC (±1ºF)
Delta-T	±0.15ºC (±0.25ºF)
Relative Humidity	±5% RH
Water Flow	±2% of full scale
Airflow (terminal)	±10% of full scale (see Note 1)
Airflow (measuring stations)	±5% of full scale
Airflow (pressurized spaces)	±3% of full scale
Air Pressure (ducts)	±25 Pa (±0.1 in. w.g.)
Air Pressure (space)	±3 Pa (±0.01 in. w.g.)
Water Pressure	±2% of full scale (see Note 2)
Electrical (A, V, W, Power Factor)	±1% of reading (see Note 3)
Carbon Monoxide (CO)	±5% of reading
Carbon Dioxide (CO_2)	±50 ppm

Note 1: Accuracy applies to 10% - 100% of scale
Note 2: For both absolute and differential pressure
Note 3: Not including utility-supplied meters

Table 2 Control Stability and Accuracy

Controlled Variable	Control Accuracy	Range of Medium
Air Pressure	±50 Pa (±0.2 in. w.g.) ±3 Pa (±0.01 in. w.g.)	0-1.5 kPa (0-6 in. w.g.) -25 to 25 Pa (-0.1 to 0.1 in. w.g.)
Airflow	±10% of full scale	
Space Temperature	±1.0ºC (±2.0ºF)	
Duct Temperature	±1.5ºC (±3ºF)	
Humidity	±5% RH	
Fluid Pressure	±10 kPa (±1.5 psi) ±250 Pa (±1.0 in. w.g.)	MPa (1-150 psi) 0-12.5 kPa (0-50 in. w.g.) differential

1.10 SUBMITTALS

A. Product Submittal Requirements: Meet requirements of Division 1, Section "Submittal Procedures" on Shop Drawings, Product Data, and Samples. Provide six copies of shop drawings and other submittals on hardware, software, and equipment to be installed or furnished. Begin no work until submittals have been approved for conformity with design intent. Provide drawings as AutoCAD 2006 (or newer) compatible files on magnetic or optical disk (file format: .DWG, .DXF, .VSD, or comparable) and 3 prints of each drawing on 11" x 17" paper. When manufacturer's cutsheets apply to a product series rather than a specific

product, clearly indicate applicable data by highlighting or by other means. Clearly reference covered specification and drawing on each submittal. General catalogs shall not be accepted as cutsheets to fulfill submittal requirements. Select and show submittal quantities appropriate to scope of work. Submittal approval does not relieve Contractor of responsibility to supply sufficient quantities to complete work. Provide submittals within 12 weeks of contract award on the following:

1. Direct Digital Control System Hardware:
   a. Complete bill of materials indicating quantity, manufacturer, model number, and relevant technical data of equipment to be used.
   b. Manufacturer's description and technical data such as performance curves, product specifications, and installation and maintenance instructions for items listed below and for relevant items not listed below:
      (1) Direct digital controllers (controller panels)
      (2) Transducers and transmitters
      (3) Sensors (include accuracy data)
      (4) Actuators
      (5) Valves
      (6) Relays and switches
      (7) Control panels
      (8) Power supplies
      (9) Batteries
      (10) Operator interface equipment
      (11) Wiring
   c. Wiring diagrams and layouts for each control panel: Show termination numbers.
   d. Floor plan schematic diagrams indicating field sensor and controller locations.
   e. Riser diagrams showing control network layout, communication protocol, and wire types.
   f. Network riser diagrams of wiring between central control unit and control panels.
2. Controlled Systems:
   a. Riser diagrams showing control network layout, communication protocol, and wire types.
   b. Schematic diagram of each controlled system. Label control points with point names. Graphically show locations of control elements.
   c. Schematic wiring diagram of each controlled system. Label control elements and terminals. Where a control element is also shown on control system schematic, use the same name.
   d. Instrumentation list (Bill of Materials) for each controlled system. List each control system element in a table. Show element name, type of device, manufacturer, model number, and product data sheet number.
   e. Complete description of control system operation including sequences of operation. Include and reference schematic diagram of controlled system. List I/O points and software points specified in Section 15900 Appendix A.
3. Description of process, report formats, and checklists to be used in Section 15900 Article 3.16 (Control System Demonstration and Acceptance).

B. Schedules:
   1. Schedule of work provided within one month of contract award, indicating:
      a. Intended sequence of work items.

b. Start date of each work item.
c. Duration of each work item.
d. Planned delivery dates for ordered material and equipment and expected lead times.
e. Milestones indicating possible restraints on work by other trades or situations.

2. Monthly written status reports indicating work completed and revisions to expected delivery dates. Include updated schedule of work.

C. Project Record Documents: Comply with requirements of Division 1 Section "Project Record Documents" and the following. Submit three copies of record (as-built) documents upon completion of installation for approval prior to final completion. Submittal shall consist of:

1. Project Record Drawings: As-built versions of submittal shop drawings provided as AutoCAD 2006 (or newer) compatible files on magnetic or optical disk (file format: .DWG, .DXF, .VSD, or comparable) and 6 prints of each drawing on 11" x 17" paper.
2. Testing and Commissioning Reports and Checklists: Completed versions of reports, checklists, and trend logs used to meet requirements of Section 15900 Article 3.16 (Control System Demonstration and Acceptance).
3. Operation and Maintenance (O&M) Manual: Printed, electronic, or online help documentation of the following:
   a. As-built versions of submittal product data.
   b. Names, addresses, and telephone numbers of installing contractors and service representatives for equipment and control systems.
   c. Operator's manual with procedures for operating control systems: logging on and off, handling alarms, producing point reports, trending data, overriding computer control, and changing setpoints and variables.
   d. List of recommended spare parts with part numbers and suppliers.
   e. Complete original-issue documentation, installation, and maintenance information for furnished third-party hardware including computer equipment and sensors.
   f. Licenses, guarantees, and warranty documents for equipment and systems.
   g. Recommended preventive maintenance procedures for system components, including schedule of tasks such as inspection, cleaning, and calibration; time between tasks; and task descriptions.

D. Training Materials: Provide course outline and materials for each class at least six weeks before first class. Training shall be furnished via instructor-led sessions, computer-based training, or web-based training. Engineer will modify course outlines and materials if necessary to meet Owner's needs. Engineer will review and approve course outlines and materials at least three weeks before first class.

1.11 WARRANTY

A. Warrant work as follows:

1. Warrant labor and materials for specified control system free from defects for a period of 12 months (or longer as indicated in the General Conditions) after final acceptance. Control system failures during warranty period shall be adjusted, repaired, or replaced at no additional cost or reduction in service to Owner. Respond during normal business hours within 24 hours of Owner's warranty service request.
2. Work shall have a single warranty date, even if Owner receives beneficial use due to early system start-up.

3. If Engineer determines that equipment and systems operate satisfactorily at the end of final start-up, testing, and commissioning phase, Engineer will certify in writing that control system operation has been tested and accepted in accordance with the terms of this specification. Date of acceptance shall be as defined in the General Conditions.
4. Provide updates to operator workstation or web server software, project-specific software, graphic software, database software, and firmware that resolve Contractor-identified software deficiencies at no charge during warranty period. If available, Owner can purchase in-warranty service agreement to receive upgrades for functional enhancements associated with above-mentioned items. Do not install updates or upgrades without Owner's written authorization.
5. Exception: Contractor shall not be required to warrant reused devices except those that have been rebuilt or repaired. Installation labor and materials shall be warranted. Demonstrate operable condition of reused devices at time of Engineer's acceptance.

1.12 OWNERSHIP OF PROPRIETARY MATERIAL

A. Project-specific software and documentation shall become Owner's property. This includes, but is not limited to:
1. Graphics
2. Record drawings
3. Database
4. Application programming code
5. Documentation

PART 2 - PRODUCTS

2.1 MATERIALS

A. Use new products the manufacturer is currently manufacturing and selling for use in new installations. Do not use this installation as a product test site unless explicitly approved in writing by Owner. Spare parts shall be available for at least five years after completion of this contract.

2.2 COMMUNICATION

A. Control products, communication media, connectors, repeaters, hubs, and routers shall comprise a unified control network. A gateway (translator) shall communicate with third-party equipment furnished or installed by others.

B. Install new wiring and network devices as required to provide a complete and workable control network.

C. Each controller shall have a communication port for temporary connection to a laptop computer or other operator interface. Connection shall support memory downloads and other commissioning and troubleshooting operations.

2.3 OPERATOR INTERFACE

A. All Operator Interface programming is excluded from this project. All schedule, graphics and alarm programming indicated in other sections of this document will be accomplished by Napa Valley College.

2.4 CONTROLLER SOFTWARE

A. Building, energy management application and access control software shall reside and operate in system controllers.

B. PID Control: System shall provide direct- and reverse-acting PID (proportional-integral-derivative) algorithms. Each algorithm shall have anti-windup and selectable controlled variable, setpoint, and PID gains. Each algorithm shall calculate a time-varying analog value that can be used to position an output or to stage a series of outputs.

C. Staggered Start: System shall stagger controlled equipment restart after power outage. Operator shall be able to adjust equipment restart order and time delay between equipment restarts.

D. Anti-Short Cycling: Binary output objects shall be protected from short cycling by means of adjustable minimum on-time and off-time settings.

E. On and Off Control with Differential: System shall provide direct- and reverse-acting on and off algorithms with adjustable differential to cycle a binary output based on a controlled variable and setpoint.

F. Runtime Totalization: System shall provide an algorithm that can totalize runtime for each binary input and output. Operator shall be able to enable runtime alarm based on exceeded adjustable runtime limit. Configure and enable runtime totalization and alarms as specified in Section 15900 Appendix A (Sequence of Operations).

2.5 CONTROLLERS

A. General: Controllers shall be Tour Andover Infinity II or Infinity (if Infinity II controllers of the same functionality are not available).

B. Communication:
1. All new controllers will be on the existing Andover Infinet network on the existing Andover CX in the Warehouse.
2. A new Infinet II (I2) Infilink 200 repeater/hub will be installed in the Winery electrical room to serve the existing Winery Infinet controllers as well as all new controllers.
3. New Infinet controllers will be brought online in coordination with Napa Valley College. Once an Infinity controller receives a valid Infinet ID the ID number will not change.

C. Environment: Controller hardware shall be suitable for anticipated ambient conditions.
1. Controllers used outdoors or in wet ambient conditions shall be mounted in waterproof enclosures and shall be rated for operation at -29°C to 60°C (-20°F to 140°F).
2. Controllers used in conditioned space shall be mounted in dust-protective enclosures and shall be rated for operation at 0°C to 50°C (32°F to 120°F).

D. Transformer: ASC power supply shall be fused or current limiting and shall be rated at a minimum of 125% of ASC power consumption.

2.7 POWER SUPPLIES AND LINE FILTERING

A. Power Supplies: Control transformers shall be UL listed. Furnish Class 2 current-limiting type or furnish over-current protection in primary and secondary circuits for Class 2 service in accordance with NEC requirements. Limit connected loads to 80% of rated capacity.
   1. DC power supply output shall match output current and voltage requirements. Unit shall be full-wave rectifier type with output ripple of 5.0 mV maximum peak-to-peak. Regulation shall be 1.0% line and load combined, with 100-microsecond response time for 50% load changes. Unit shall have built-in over-voltage and over-current protection and shall be able to withstand 150% current overload for at least three seconds without trip-out or failure.
      a. Unit shall operate between 0°C and 50°C (32°F and 120°F). EM/RF shall meet FCC Class B and VDE 0871 for Class B and MILSTD 810C for shock and vibration.
      b. Line voltage units shall be UL recognized and CSA listed.

B. Power Line Filtering:
   1. Provide internal or external transient voltage and surge suppression for controllers. Surge protection shall have:
      b. Dielectric strength of 1000 V minimum
      c. Response time of 10 nanoseconds or less
      d. Transverse mode noise attenuation of 65 dB or greater
      e. Common mode noise attenuation of 150 dB or greater at 40-100 Hz

2.8 AUXILIARY CONTROL DEVICES

A. Electric Damper Actuators:
   1. Stall Protection: Mechanical or electronic stall protection shall prevent actuator damage throughout the actuator's rotation.
   2. Spring-Return Mechanism: Actuators used for power-failure and safety applications shall have an internal mechanical spring-return mechanism or an uninterruptible power supply (UPS).
   3. Signal and Range: Proportional actuators shall accept a 0-10 Vdc or a 0-20 mA control signal and shall have a 2-10 Vdc or 4-20 mA operating range. (Floating motor actuators may be substituted for proportional actuators in terminal unit applications as described in paragraph 2.6H.)
   4. Wiring. 24 Vac and 24 Vdc actuators shall operate on Class 2 wiring.
   5. Manual Positioning: Operators shall be able to manually position each actuator when the actuator is not powered. Non-spring-return actuators shall have an external manual gear release. Spring-return actuators with more than 7 N·m (60 in.-lb) torque capacity shall have a manual crank.

B. Binary Temperature Devices:
   1. Low-Voltage Space Thermostats: Low-voltage space thermostats shall be 24 V, bimetal-operated, mercury-switch type, with adjustable or fixed anticipation heater, concealed setpoint adjustment, 13°C-30°C (55°F-85°F) setpoint range, 1°C (2°F) maximum differential, and vented ABS plastic cover.

2. Line-Voltage Space Thermostats: Line-voltage space thermostats shall be bimetal-actuated, open-contact type or bellows-actuated, enclosed, snap-switch type or equivalent solid-state type, with heat anticipator, UL listing for electrical rating, concealed setpoint adjustment, 13°C-30°C (55°F-85°F) setpoint range, 1°C (2°F) maximum differential, and vented ABS plastic cover.
3. Low-Limit Thermostats: Low-limit airstream thermostats shall be UL listed, vapor pressure type. Element shall be at least 6 m (20 ft) long. Element shall sense temperature in each 30 cm (1 ft) section and shall respond to lowest sensed temperature. Low-limit thermostat shall be manual reset only.

C. Temperature Sensors:
1. Type: Temperature sensors shall be thermistor.
2. Duct Sensors: Duct sensors shall be single point or averaging as shown. Averaging sensors shall be a minimum of 1.5 m (5 ft) in length per 1 m^2(10 ft^2) of duct cross-section.
3. Space Sensors: Space sensors shall have setpoint adjustment, override switch, display, and communication port as shown.
4. Differential Sensors: Provide matched sensors for differential temperature measurement.

D. Humidity Sensors:
1. Duct and room sensors shall have a sensing range of 20%-80%.
2. Duct sensors shall have a sampling chamber.
3. Outdoor air humidity sensors shall have a sensing range of 20%-95% RH and shall be suitable for ambient conditions of 40°C-75°C (40°F-170°F).
4. Humidity sensors shall not drift more than 1% of full scale annually.

E. Flow Switches: Flow-proving switches shall be paddle (water service only) or differential pressure type (air or water service) as shown. Switches shall be UL listed, SPDT snap-acting, and pilot duty rated (125 VA minimum).
1. Paddle switches shall have adjustable sensitivity and NEMA 1 enclosure unless otherwise specified.
2. Differential pressure switches shall have scale range and differential suitable for intended application and NEMA 1 enclosure unless otherwise specified.

F. Relays:
1. Control Relays: Control relays shall be plug-in type, UL listed, and shall have dust cover and LED "energized" indicator. Contact rating, configuration, and coil voltage shall be suitable for application.
2. Time Delay Relays: Time delay relays shall be solid-state plug-in type, UL listed, and shall have adjustable time delay. Delay shall be adjustable ±100% from setpoint shown. Contact rating, configuration, and coil voltage shall be suitable for application. Provide NEMA 1 enclosure for relays not installed in local control panel.

G. Override Timers:
1. Unless implemented in control software, override timers shall be spring-wound line voltage, UL Listed, with contact rating and configuration required by application. Provide 0-6 hour calibrated dial unless otherwise specified. Flush mount timer on local control panel face or where shown.

H. Current Transmitters:
1. AC current transmitters shall be self-powered, combination split-core current transformer type with built-in rectifier and high-gain servo amplifier with 4-20 mA two-wire output. ull-scale unit ranges shall be 10 A, 20 A, 50 A, 100 A, 150 A, and 200 A, with internal zero and span adjustment. Unit accuracy shall be ±1% full-scale at 500 ohm maximum burden.
2. Transmitter shall meet or exceed ANSI/ISA S50.1 requirements and shall be UL/CSA recognized.
3. Unit shall be split-core type for clamp-on installation on existing wiring.

I. Voltage Transformers:
1. AC voltage transformers shall be UL/CSA recognized, 600 Vac rated, and shall have built-in fuse protection.
2. Transformers shall be suitable for ambient temperatures of 4°C-55°C (40°F-130°F) and shall provide ±0.5% accuracy at 24 Vac and 5 VA load.
3. Windings (except for terminals) shall be completely enclosed with metal or plastic.

J. Current Switches:
1. Current-operated switches shall be self-powered, solid-state with adjustable trip current. Select switches to match application current and DDC system output requirements.

K. Pressure Transducers:
1. Transducers shall have linear output signal and field-adjustable zero and span.
2. Continuous operating conditions of positive or negative pressure 50% greater than calibrated span shall not damage transducer sensing elements.
3. Water pressure transducer diaphragm shall be stainless steel with minimum proof pressure of 1000 kPa (150 psi). Transducer shall have 4-20 mA output, suitable mounting provisions, and block and bleed valves.
4. Water differential pressure transducer diaphragm shall be stainless steel with minimum proof pressure of 1000 kPa (150 psi). Over-range limit (differential pressure) and maximum static pressure shall be 2000 kPa (300 psi.). Transducer shall have 4-20 mA output, suitable mounting provisions, and 5-valve manifold.

L. Differential Pressure Switches: Differential pressure switches (air or water service) shall be UL listed, SPDT snap-acting, pilot duty rated (125 VA minimum) and shall have scale range and differential suitable for intended application and NEMA 1 enclosure unless otherwise specified.

M. Local Control Panels:
1. Indoor control panels shall be fully enclosed NEMA 1 construction with hinged door key-lock latch and removable sub-panels. A common key shall open each control panel and sub-panel.
2. Prewire internal and face-mounted device connections with color-coded stranded conductors tie-wrapped or neatly installed in plastic troughs. Field connection terminals shall be UL listed for 600 V service, individually identified per control and interlock drawings, with adequate clearance for field wiring.
3. Each local panel shall have a control power source power switch (on-off) with overcurrent protection.

2.9 WIRING AND RACEWAYS

A. General: Provide copper wiring, plenum cable, and raceways. Materials and installation shall comply with the requirements of Division 16.

B. Insulated wire shall use copper conductors and shall be UL listed for 90°C (200°F) minimum service.

C. All low voltage wiring running in underground conduits shall be direct burial or water proof rated.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Thoroughly examine project plans for control device and equipment locations. Report discrepancies, conflicts, or omissions to Architect or Engineer for resolution before starting rough-in work.

B. Inspect site to verify that equipment can be installed as shown. Report discrepancies, conflicts, or omissions to Engineer for resolution before starting rough-in work.

C. Examine drawings and specifications for work of others. Report inadequate headroom or space conditions or other discrepancies to Engineer and obtain written instructions for changes necessary to accommodate Section 15900 work with work of others. Controls Contractor shall perform at his expense necessary changes in specified work caused by failure or neglect to report discrepancies.\

3.2 PROTECTION

A. Controls Contractor shall protect against and be liable for damage to work and to material caused by Contractor's work or employees.

B. Controls Contractor shall be responsible for work and equipment until inspected, tested, and accepted. Protect material not immediately installed. Close open ends of work with temporary covers or plugs during storage and construction to prevent entry of foreign objects.

3.3 COORDINATION

A. Site:
1. Assist in coordinating space conditions to accommodate the work of each trade where work will be installed near or will interfere with work of other trades. If installation without coordination causes interference with work of other trades, Contractor shall correct conditions without extra charge.
2. Coordinate and schedule work with other work in the same area and with work dependent upon other work to facilitate mutual progress.

B. Submittals: See Section 15900 Article 1.10 (Submittals).

C. Test and Balance:
1. Provide Test and Balance Contractor a single set of necessary tools to interface to control system for testing and balancing.

2. Train Test and Balance Contractor to use control system interface tools.
3. Provide a qualified technician to assist with testing and balancing the first 20 terminal units.
4. Test and Balance Contractor shall return tools undamaged and in working condition at completion of testing and balancing.

D. Coordination with Other Controls: Integrate with and coordinate controls and control devices furnished or installed by others as follows.
1. Communication media and equipment shall be provided as specified in Section 15900 Article 2.2 (Communication).
2. Each supplier of a controls product shall configure, program, start up, and test that product to meet the sequences of operation described in Section 15900 Appendix A regardless of where within the contract documents those products are described.
3. Coordinate and resolve incompatibility issues that arise between control products provided under this section and those provided under other sections or divisions of this specification.
4. Controls Contractor shall be responsible for integration of control products provided by multiple suppliers regardless of where integration is described within the contract documents.

3.4 GENERAL WORKMANSHIP

A. Install equipment, piping, and wiring or raceway horizontally, vertically, and parallel to walls wherever possible.

B. Provide sufficient slack and flexible connections to allow for piping and equipment vibration isolation.

C. Install equipment in readily accessible locations as defined by National Electrical Code (NEC) Chapter 1 Article 100 Part A.

D. Verify wiring integrity to ensure continuity and freedom from shorts and ground faults.

E Equipment, installation, and wiring shall comply with industry specifications and standards and local codes for performance, reliability, and compatibility.

3.5 FIELD QUALITY CONTROL

A. Work, materials, and equipment shall comply with rules and regulations of applicable local, state, and federal codes and ordinances as identified in Section 15900 Article 1.8 (Codes and Standards).

B. Continually monitor field installation for code compliance and workmanship quality.

C. Contractor shall arrange for work inspection by local or state authorities having jurisdiction over the work.

3.6 WIRING

A. Control and interlock wiring and installation shall comply with national and local electrical codes, Division 16, and manufacturer's recommendations. Where the requirements of Section 15900 differ from Division 16, Section 15900 shall take precedence.

B. NEC Class 1 (line voltage) wiring shall be UL listed in approved raceway as specified by NEC and Division 16.

C. Low-voltage wiring shall meet NEC Class 2 requirements. Subfuse low-voltage power circuits as required to meet Class 2 current limit.

D. NEC Class 2 (current-limited) wires not in raceway but in concealed and accessible locations such as return air plenums shall be UL listed for the intended application.

E. Install wiring in raceway where subject to mechanical damage and at levels below 3 m (10ft) in mechanical, electrical, or service rooms.

F. Install Class 1 and Class 2 wiring in separate raceways. Boxes and panels containing high-voltage wiring and equipment shall not be used for low-voltage wiring except for the purpose of interfacing the two through relays and transformers.

G. Do not install wiring in raceway containing tubing.

H. Run exposed Class 2 wiring parallel to a surface or perpendicular to it and tie neatly at 3 m (10 ft) intervals.

I. All low voltage wiring (power, sensor and signal) running in underground conduits shall be direct burial or water proof rated.

J. Use structural members to support or anchor plenum cables without raceway. Do not use ductwork, electrical raceways, piping, or ceiling suspension systems to support or anchor cables.

K. Secure raceways with raceway clamps fastened to structure and spaced according to code requirements. Raceways and pull boxes shall not be hung on or attached to ductwork, electrical raceways, piping, or ceiling suspension systems.

L. Size raceway and select wire size and type in accordance with manufacturer's recommendations and NEC requirements.

M. Include one pull string in each raceway 2.5 cm (1 in.) or larger.

N. Use color-coded conductors throughout.

O. Locate control and status relays in designated enclosures only. Do not install control and status relays in packaged equipment control panel enclosures containing Class 1 starters.

P. Conceal raceways except within mechanical, electrical, or service rooms. Maintain minimum clearance of 15 cm (6 in.) between raceway and high-temperature equipment such as steam pipes or flues.

Q. Adhere to requirements in Division 16 where raceway crosses building expansion joints.

R. Install insulated bushings on raceway ends and enclosure openings. Seal top ends of vertical raceways.

S. Terminate control and interlock wiring related to the work of this section. Maintain at the job site updated (as-built) wiring diagrams that identify terminations.

T. Flexible metal raceways and liquid-tight flexible metal raceways shall not exceed 1 m (3 ft) in length and shall be supported at each end. Do not use flexible metal raceway less than ½ in. electrical trade size. Use liquid-tight flexible metal raceways in areas exposed to moisture including chiller and boiler rooms.

U. Install raceway rigidly, support adequately, ream at both ends, and leave clean and free of obstructions. Join raceway sections with couplings and according to code. Make terminations in boxes with fittings. Make terminations not in boxes with bushings.

3.7 COMMUNICATION WIRING

A. Communication wiring shall be low-voltage Class 2 wiring and shall comply with Article 3.7 (Wiring).

B. Install communication wiring in separate raceways and enclosures from other Class 2 wiring.

C. During installation do not exceed maximum cable pulling, tension, or bend radius specified by the cable manufacturer.

D. Verify entire network's integrity following cable installation using appropriate tests for each cable.

E. Install lightning arrestor according to manufacturer's recommendations between cable and ground where a cable enters or exits a building.

F. Each run of communication wiring shall be a continuous length without splices when that length is commercially available. Runs longer than commercially available lengths shall have as few splices as possible using commercially available lengths.

G. Label communication wiring to indicate origination and destination.

H. Ground coaxial cable according to NEC regulations article on "Communications Circuits, Cable, and Protector Grounding."

I. All communication wiring running in underground conduits shall be direct burial or water proof rated.

3.9 INSTALLATION OF SENSORS

A. Install sensors according to manufacturer's recommendations.

B. Mount sensors rigidly and adequately for operating environment.

C. Install room temperature sensors on concealed junction boxes properly supported by wall framing.

D. Air seal wires attached to sensors in their raceways or in the wall to prevent sensor readings from being affected by air transmitted from other areas.

E. Use averaging sensors in mixing plenums and hot and cold decks. Install averaging sensors in a serpentine manner vertically across duct. Support each bend with a capillary clip.

F. Install mixing plenum low-limit sensors in a serpentine manner horizontally across duct. Support each bend with a capillary clip. Provide 3 m (1 ft) of sensing element for each 1 m^2 (1 ft^2) of coil area.

G. Install pipe-mounted temperature sensors in wells. Install liquid temperature sensors with heat-conducting fluid in thermal wells.

H. Install outdoor air temperature sensors on north wall at designated location with sun shield.

I. Differential Air Static Pressure:
1. Supply Duct Static Pressure: Pipe high-pressure tap to duct using a pitot tube. Make pressure tap connections according to manufacturer's recommendations.
2. Return Duct Static Pressure: Pipe high-pressure tap to duct using a pitot tube. Make pressure tap connections according to manufacturer's recommendations.
3. Building Static Pressure: Pipe pressure sensor's low-pressure port to the static pressure port located on the outside of the building through a high-volume accumulator. Pipe high-pressure port to a location behind a thermostat cover.
4. Piping to pressure transducer pressure ports shall contain a capped test port adjacent to transducer.
5. Pressure transducers, except those controlling VAV boxes, shall be located in control panels, not on monitored equipment or on ductwork. Mount transducers in a vibration-free location accessible for service without use of ladders or special equipment.
6. Mount gauge tees adjacent to air and water differential pressure taps. Install shut-off valves before tee for water gauges.

J. Smoke detectors, freezestats, high-pressure cut-offs, and other safety switches shall be hard-wired to de-energize equipment as described in the sequence of operation. Switches shall require manual reset. Provide contacts that allow DDC software to monitor safety switch status.

3.10 FLOW SWITCH INSTALLATION

A. Use correct paddle for pipe diameter.

B. Adjust flow switch according to manufacturer's instructions.

3.11 ACTUATORS

A. General: Mount actuators and adapters according to manufacturer's recommendations.

B. Electric and Electronic Damper Actuators: Mount actuators directly on damper shaft or jackshaft unless shown as a linkage installation. Link actuators according to manufacturer's recommendations.
   1. For low-leakage dampers with seals, mount actuator with a minimum 5° travel available for damper seal tightening.
   2. To compress seals when spring-return actuators are used on normally closed dampers, power actuator to approximately 5° open position, manually close the damper, then tighten linkage.
   3. Check operation of damper-actuator combination to confirm that actuator modulates damper smoothly throughout stroke to both open and closed positions.
   4. Provide necessary mounting hardware and linkages for actuator installation.

C. Valve Actuators: Connect actuators to valves with adapters approved by actuator manufacturer.

3.12 WARNING LABELS

A. Affix permanent warning labels to equipment that can be automatically started by the control system.
   1. Labels shall use white lettering (12-point type or larger) on a red background.
   2. Warning labels shall read as follows.

C A U T I O N
This equipment is operating under automatic control and may start or stop at any time without warning. Switch disconnect to "Off" position before servicing.

B. Affix permanent warning labels to motor starters and control panels that are connected to multiple power sources utilizing separate disconnects.
   1. Labels shall use white lettering (12-point type or larger) on a red background.
   2. Warning labels shall read as follows.

C A U T I O N
This equipment is fed from more than one power source with separate disconnects. Disconnect to "Off" position before servicing.

3.13 IDENTIFICATION OF HARDWARE AND WIRING

A. Label wiring and cabling, including that within factory-fabricated panels, with control system address or termination number at each end within 5 cm (2 in.) of termination.

B. Label pneumatic tubing at each end within 5 cm (2 in.) of termination with a descriptive identifier.

C. Permanently label or code each point of field terminal strips to show instrument or item served.

D. Label control panels with minimum 1 cm (½ in.) letters on laminated plastic nameplates.

E. Label each control component with a permanent label. Label plug-in components such that label remains stationary during component replacement.

F. Label room sensors related to terminal boxes or valves with nameplates.

G. Manufacturers' nameplates and UL or CSA labels shall be visible and legible after equipment is installed.

H. Label identifiers shall match record documents.

3.14 PROGRAMMING

A. Point Naming: Name points as shown on the equipment points list provided with each sequence of operation. See Section 15900 Appendix A (Sequences of Operation). If character limitations or space restrictions make it advisable to shorten the name, the abbreviations given in Appendix C may be used.

B. Software Programming: Programming shall provide actions for each possible situation. Graphic- or parameter-based programs shall be documented. Text-based programs shall be modular, structured, and commented to clearly describe each section of the program.
   1. Application Programming: Provide application programming that adheres to sequences of operation specified in Section 15900 Appendix A. Program documentation or comment statements shall reflect language used in sequences of operation.
   2. System Programming: Provide system programming necessary for system operation.

3.15 CONTROL SYSTEM CHECKOUT AND TESTING

A. Startup Testing: Complete startup testing to verify operational control system before notifying Owner of system demonstration. Provide Owner with schedule for startup testing. Owner may have representative present during any or all startup testing.
   1. Calibrate and prepare for service each instrument, control, and accessory equipment furnished under Section 15900.
   2. Verify that control wiring is properly connected and free of shorts and ground faults. Verify that terminations are tight.
   3. Enable control systems and verify each input device's calibration. Calibrate each device according to manufacturer's recommendations.
   4. Verify that binary output devices such as relays, solenoid valves, two-position actuators and control valves, and magnetic starters, operate properly and that normal positions are correct.
   5. Verify that analog output devices such as I/Ps and actuators are functional, that start and span are correct, and that direction and normal positions are correct. Check control valves and automatic dampers to ensure proper action and closure. Make necessary adjustments to valve stem and damper blade travel.
   6. Prepare a log documenting startup testing of each input and output device, with technician's initials certifying each device has been tested and calibrated.
   7. Verify that system operates according to sequences of operation. Simulate and observe each operational mode by overriding and varying inputs and schedules. Tune PID loops and each control routine that requires tuning.
   8. Alarms and Interlocks:
      a. Check each alarm with an appropriate signal at a value that will trip the alarm.
      b. Trip interlocks using field contacts to check logic and to ensure that actuators fail in the proper direction.

c. Test interlock actions by simulating alarm conditions to check initiating value of variable and interlock action.

3.16 CONTROL SYSTEM DEMONSTRATION AND ACCEPTANCE

A. Demonstration: Comply with the requirements of Division 1 Section "Demonstration and Training" and the following. Prior to acceptance, perform the following performance tests to demonstrate system operation and compliance with specification after and in addition to tests specified in Article 3.17 (Control System Checkout and Testing). Provide Engineer with log documenting completion of startup tests.

1. Engineer will be present to observe and review system demonstration. Notify Engineer at least 10 days before system demonstration begins.
2. Demonstration shall follow process submitted and approved under Section 15900 Article 1.10 (Submittals). Complete approved checklists and forms for each system as part of system demonstration.
3. Demonstrate actual field operation of each sequence of operation as specified in Section 15900 Appendix A. Provide at least two persons equipped with two-way communication. Demonstrate calibration and response of any input and output points requested by Engineer. Provide and operate test equipment required to prove proper system operation.
4. Demonstrate compliance with Section 15900 Part 1 (System Performance).
5. Demonstrate compliance with sequences of operation through each operational mode.
6. Demonstrate each of the following:
   a. DDC Loop Response: Supply graphical trend data output showing each DDC loop's response to a setpoint change representing an actuator position change of at least 25% of full range. Trend sampling rate shall be from 10 seconds to 3 minutes, depending on loop speed. Each sample's trend data shall show setpoint, actuator position, and controlled variable values. Engineer will require further tuning of each loop that displays unreasonably under- or over-damped control.
   b. Building fire alarm system interface.
7. Tests that fail to demonstrate proper system operation shall be repeated after Contractor makes necessary repairs or revisions to hardware or software to successfully complete each test.

B. Acceptance:

1. After tests described in this specification are performed to the satisfaction of both Engineer and Owner, Engineer will accept control system as meeting completion requirements. Engineer may exempt tests from completion requirements that cannot be performed due to circumstances beyond Contractor's control. Engineer will provide written statement of each exempted test. Exempted tests shall be performed as part of warranty.
2. System shall not be accepted until completed demonstration forms and checklists are submitted and approved as required in Section 15900 Article 1.10 (Submittals).

3.17 CLEANING

A. Each day clean up debris resulting from work. Remove packaging material as soon as its contents have been removed. Collect waste and place in designated location.

B. On completion of work in each area, clean work debris and equipment. Keep areas free from dust, dirt, and debris.

C. On completion of work, check equipment furnished under this section for paint damage. Repair damaged factory-finished paint to match adjacent areas. Replace deformed cabinets and enclosures with new material and repaint to match adjacent areas.

3.18 TRAINING

A. Provide training for a designated staff of Owner's representatives in compliance with Division 1 Section "Demonstration and Training" and the following: Training shall be provided via self-paced training, web-based or computer-based training, classroom training, or a combination of training methods.

B. Training shall enable students to accomplish the following objectives:
1. Proficiently operate system
2. Understand control system architecture and configuration
3. Understand DDC system components
4. Understand system operation, including DDC system control and optimizing routines (algorithms)
5. Operate workstation and peripherals
6. Log on and off system
7. Access graphics, point reports, and logs
8. Adjust and change system setpoints, time schedules, and holiday schedules
9. Recognize common HVAC system malfunctions by observing system graphics, trend graphs, and other system tools
10. Understand system drawings and Operation and Maintenance manual
11. Understand job layout and location of control components
12. Access data from DDC controllers
13. Operate portable operator's terminals
14. Create and change system graphics
15. Create, delete, and modify alarms, including configuring alarm reactions
16. Create, delete, and modify point trend logs (graphs) and multi-point trend graphs
17. Configure and run reports
18. Add, remove, and modify system's physical points
19. Create, modify, and delete application programming
20. Add operator interface stations
21. Add a new controller to system
22. Download firmware and advanced applications programming to a controller
23. Configure and calibrate I/O points
24. Maintain software and prepare backups
25. Interface with job-specific, third-party operator software
26. Add new users and understand password security procedures

C. Divide presentation of objectives into three sessions (1-13, 14-23, and 24-26). Participants will attend one or more of sessions, depending on knowledge level required.
1. Day-to-day Operators (objectives 1-13)
2. Advanced Operators (objectives 1-13 and 14-23)
3. System Managers and Administrators (objectives 1-13 and 24-26)

D. Provide course outline and materials according to Section 15900 Article 1.10 (Submittals). Provide one copy of training material per student.

E. Instructors shall be factory-trained and experienced in presenting this material.

F. Perform classroom training using a network of working controllers representative of installed hardware.

3.19 SEQUENCE OF OPERATION

A. See Section 15900 Appendix A (Sequences of Operation).

3.20 POINTS LIST

A. Points lists are integrated into Section 15900 Appendix A (Sequences of Operation).

APPENDIX A: SEQUENCES OF OPERATION

1. Gas Unit Heater (Typical of 1)

Run Conditions - Scheduled:
The unit shall run according to a user definable time schedule in the following modes:

- Occupied Mode: The unit shall maintain a heating setpoint of 60°F (adj.).
- Unoccupied Mode : The unit shall maintain a heating setpoint of 50°F (adj.).

Alarms shall be provided as follows:

- Low Zone Temp: If the zone temperature is less than the heating setpoint by a user definable amount (adj.).

Fan:
The fan shall run anytime the zone temperature drops below heating setpoint, unless shutdown on safeties.

Gas Heating Stage:
The controller shall measure the zone temperature and stage the heating to maintain its heating setpoint. To prevent short cycling, the stage shall have a user definable (adj.) minimum runtime.

The heating shall be enabled whenever:

- Outside air temperature is less than 60°F (adj.).
- AND the zone temperature is below heating setpoint.
- AND the fan is on.

Discharge Air Temperature:
The controller shall monitor the discharge air temperature.

	Hardware Points			
Point Name	AI	AO	BI	BO
Zone Temp	×			
Discharge Air Temp	×			
Fan Start/Stop				×
Heating Stage 1				×
Totals	2	0	0	2
Total Hardware (4)				

2. Unit Cooler (Typical of 1)

Run Conditions - Continuous:
The unit shall run continuously and shall maintain:

- A 60°F (adj.) cooling setpoint

Fan:
The fan shall run anytime the zone temperature raises above the cooling setpoint, unless shutdown on safeties.

Cooling Stage:
The controller shall measure the zone temperature and stage the cooling to maintain its cooling setpoint. To prevent short cycling, the stage shall have a user definable (adj.) minimum runtime.

The cooling shall be enabled whenever:

- The zone temperature is above cooling setpoint.
- AND the fan is on.

Discharge Air Temperature:
The controller shall monitor the discharge air temperature.

Fan Status:
The controller shall monitor the fan status.

	Hardware Points			
Point Name	**AI**	**AO**	**BI**	**BO**
Zone Temp	×			
Zone Setpoint	x			
Discharge Air Temp	×			
Fan Status			×	
Fan Start/Stop				×
Cooling Stage 1				×
Totals	**3**	**0**	**1**	**2**

Total Hardware (6)

Access/Security Control:

	Hardware Points			
Point Name	AI	AO	BI	BO
Doors (Card Readers)	4			
Door Control				4
Door Status			6	
Motion Detectors			2	
Totals	4	0	8	4

END OF SECTION 15900

INSTALL NEW WATER LINE UNDER EXISTING PCC SLAB.

CONNECT TO EXISTING GAS LINE

GRADE TO DRAIN

SEE MECHANICAL ENGINEER'S PLAN FOR GAS LINE SIZE, REGULATOR AND OTHER GAS LINE REQUIREMENTS

ELECTRICAL PANEL, SEE ELECTRICAL PLAN FOR EXACT CONNECTION POINT AND TRENCH DETAILS.

EXISTING CONTAINER TO BE REMOVED BY NAPA VALLEY COLLEGE STAFF.

SEE PLUMBING PLAN FOR EXACT HOSE BIB LOCATION AND DETAILS

PROPOSED STORAGE BUILDING

FF=23.00

PROPOSED AIR-CONDITIONING PAD, GRADE TOP OF PAD TO 23.00 (TYP.)

SEE PLUMBING PLAN FOR EXACT FIRE SPRINKLER RISER LOCATION.

INSTALL 4" SDR 35 PVC @ S=1.0%

INSTALL 2" SCH 40 PVC WATER LINE

INSTALL 4" SDR 35 PVC @ S=1.0%

INSTALL 2" SCH 40 PVC WATER LINE

EXISTING 4" SD

REMOVE & REPLACE EXISTING BOLLARDS (TYP. OF 2, SEE REMOVABLE BOLLARD DETAIL THIS SHEET)

PROPOSED COLUMN (TYP. OF 2)

REMOVE WATER VALVE AND DISPOSE OF PROPERLY OFF SITE

INSTALL FIRE DEPARTMENT CONNECTION PER CITY OF NAPA STANDARDS

INSTALL THRUST BLOCK (TYP. SEE DETAIL, SHEET C4)

INSTALL BOLLARDS (TYP. OF 2, SEE STANDARD BOLLARD DETAIL THIS SHEET)

GRIND EXISTING AC PAVING AS NEEDED TO ACHIEVE SMOOTH CONFORM WITH PROPOSED AC DRIVEWAY (TYP.)

CHRISTY PULLBOX, SEE ELECTRICAL PLAN FOR EXACT PHONE AND CABLE CONNECTION POINT AND TRENCH DETAILS.

EXISTING DI INVERT=19.32

CHRISTY PULLBOX, SEE ELECTRICAL PLAN FOR EXACT ELECTRICAL CONNECTION POINT AND TRENCH DETAILS.

EXISTING 2" WATER LINE

CHECK VALVE

CONNECT TO EXISTING WATER LINE

UTIL. ENCLOSURE

INSTALL 4" C900 CL 200 PVC WATER LINE

6" PVC

1/2" WILLOW

2" TREE

SCALE: 1" = 10'

TLCD ARCHITECTURE
111 Santa Rosa Avenue, Suite 300
Santa Rosa, CA 95404
707 525-5600
FAX 707 525-5616

OWNER'S RECORD DOCUMENT - FOR REFERENCE ONLY

PROJECT NAME
Napa Valley College Wine Storage Building

PROJECT ADDRESS
**2277 Napa-Vallejo Hwy.
Napa, CA**

PROJECT NO:
05067.00

DATE:
03/21/07

BY:
BARTELT ENGINEERING

DESCRIPTION:
Addendum #1

GRADING & UTILITY PLAN

1" = 10'

REGISTERED PROFESSIONAL ENGINEER
PAUL N. BARTELT
No. 45102
Exp. 9-30-08
CIVIL
STATE OF CALIFORNIA

DRAWING NO:
AC1.1

CHRISTY PULLBOX, SEE ELECTRICAL PLAN FOR EXACT PHONE AND CABLE CONNECTION POINT AND TRENCH DETAILS.

PAD TO 23.00 (TYP.)

INSTALL 4" SDR 35 PVC @ S=1.0%

INSTALL 2" SCH 40 PVC WATER LINE

EXISTING DI INVERT=19.32

CHRISTY PULLBOX, SEE ELECTRICAL PLAN FOR EXACT ELECTRICAL CONNECTION POINT AND TRENCH DETAILS.

INSTALL BOLLARDS (TYP. OF 2, SEE STANDARD BOLLARD DETAIL THIS SHEET)

CONNECTION PER CITY OF NAPA STANDARDS

INSTALL THRUST BLOCK (TYP. SEE DETAIL, SHEET C4)

GRIND EXISTING AC PAVING AS NEEDED TO ACHIEVE SMOOTH CONFORM WITH PROPOSED AC DRIVEWAY (TYP.)

6" PVC

1/2" WILLOW

EXISTING 2" WATER LINE

CHECK VALVE

UTIL. ENCLOSURE

CONNECT TO EXISTING WATER LINE

INSTALL 4" C900 PVC WATER LINE

ICVs

EXISTING WINERY BUILDING

SEE ELECTRICAL PLAN FOR EXACT CONNECTION POINT AND TRENCH DETAILS.

SCALE: 1" = 10'

EXISTI LEACHF

EXISTING IOC RESERVE AR

OWNER'S RECORD DOCUMENT - FOR REFERENCE ONLY

TLCD ARCHITECTURE
111 Santa Rosa Avenue, Suite 300
Santa Rosa, CA 95404
707 525-5600
FAX 707 525-5616

PROJECT NAME
Napa Valley College Wine Storage Building

PROJECT ADDRESS
2277 Napa-Vallejo Hwy. Napa, CA

PROJECT NO:
05067.00

DATE:
03/21/07

BY:
BARTELT ENGINEERING

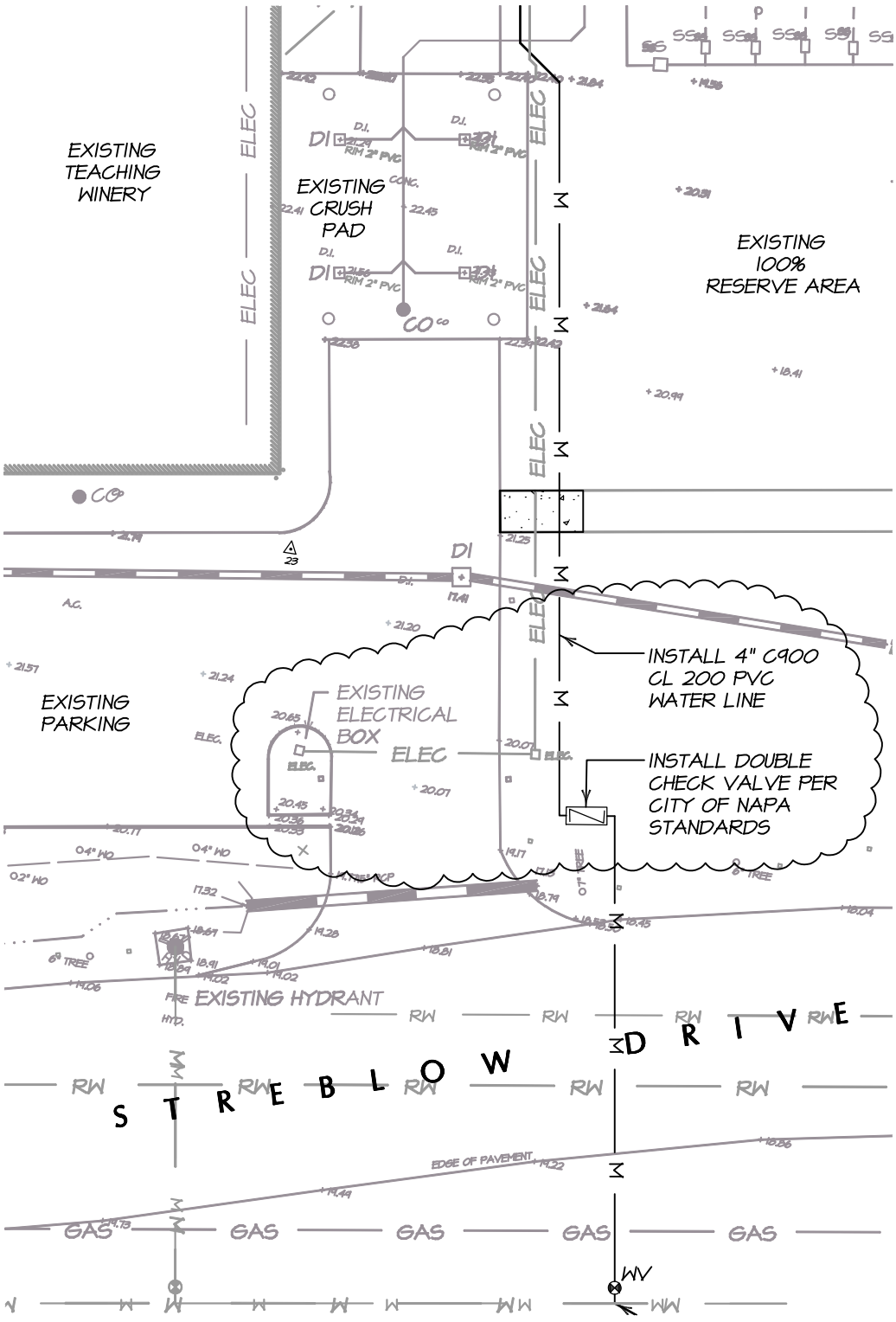
DESCRIPTION:
Addendum #1

GRADING & UTILITY PLAN

1" = 10'

REGISTERED PROFESSIONAL ENGINEER
PAUL N. BARTELT
No. 45102
Exp. 9-30-08
CIVIL
STATE OF CALIFORNIA

DRAWING NO:
AC1.2



OWNER'S RECORD DOCUMENT - FOR REFERENCE ONLY

TLCD ARCHITECTURE
111 Santa Rosa Avenue, Suite 300
Santa Rosa, CA 95404
707 525-5600
FAX 707 525-5616

PROJECT NAME
Napa Valley College Wine Storage Building

PROJECT ADDRESS
2277 Napa-Vallejo Hwy.
Napa, CA

PROJECT NO:
05067.00

DATE:
03/21/07

BY:
BARTELT ENGINEERING

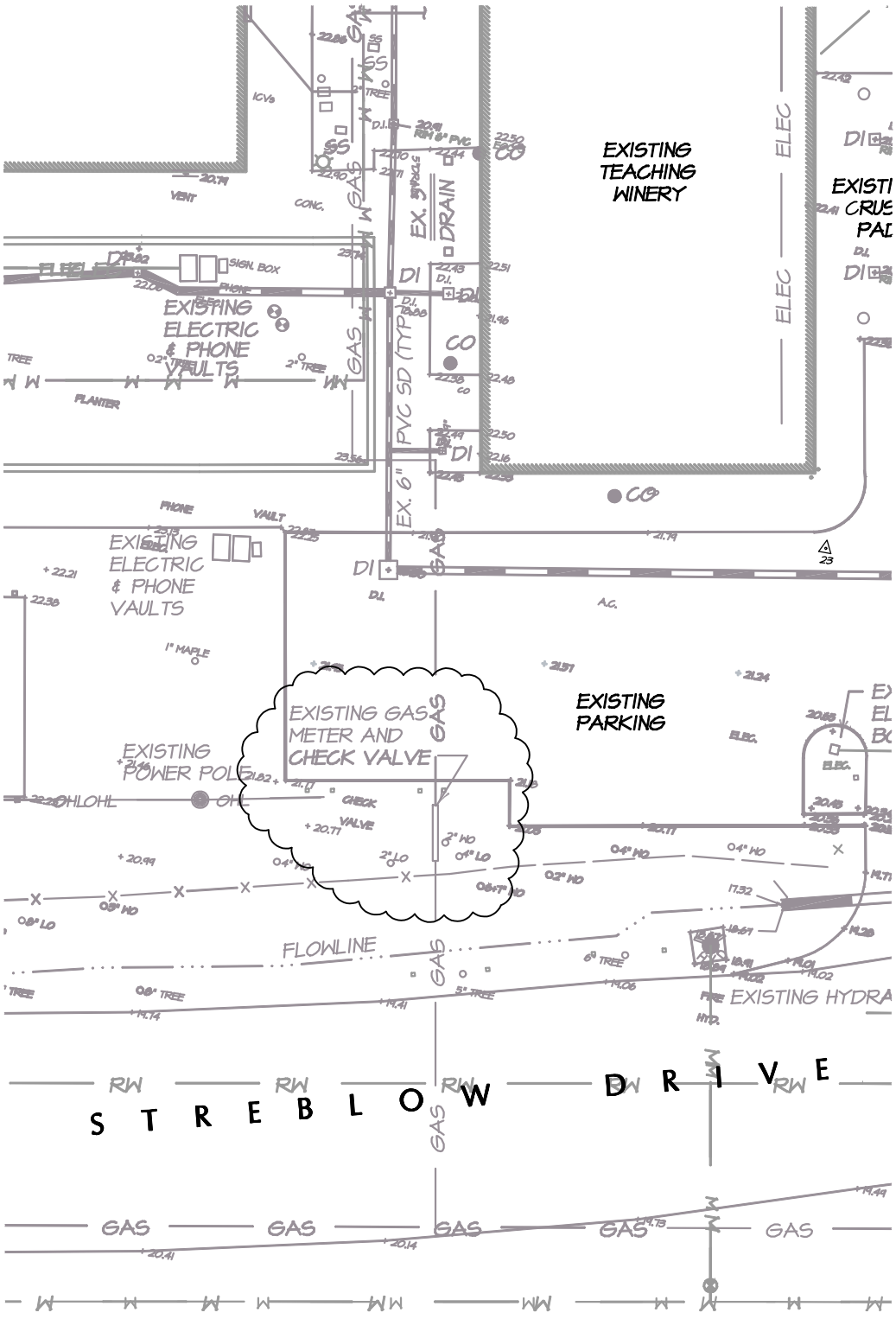
DESCRIPTION:
Addendum #1

OVERALL UTILITY PLAN

1" = 20'

REGISTERED PROFESSIONAL ENGINEER
PAUL N. BARTELT
No. 45102
Exp. 9-30-08
CIVIL
STATE OF CALIFORNIA

DRAWING NO:
AC1.3



OWNER'S RECORD DOCUMENT - FOR REFERENCE ONLY

TLCD ARCHITECTURE
111 Santa Rosa Avenue, Suite 300
Santa Rosa, CA 95404
707 525-5600
FAX 707 525-5616

PROJECT NAME
Napa Valley College Wine Storage Building

PROJECT ADDRESS
**2277 Napa-Vallejo Hwy.
Napa, CA**

PROJECT NO:
05067.00

DATE:
03/21/07

BY:
BARTELT ENGINEERING

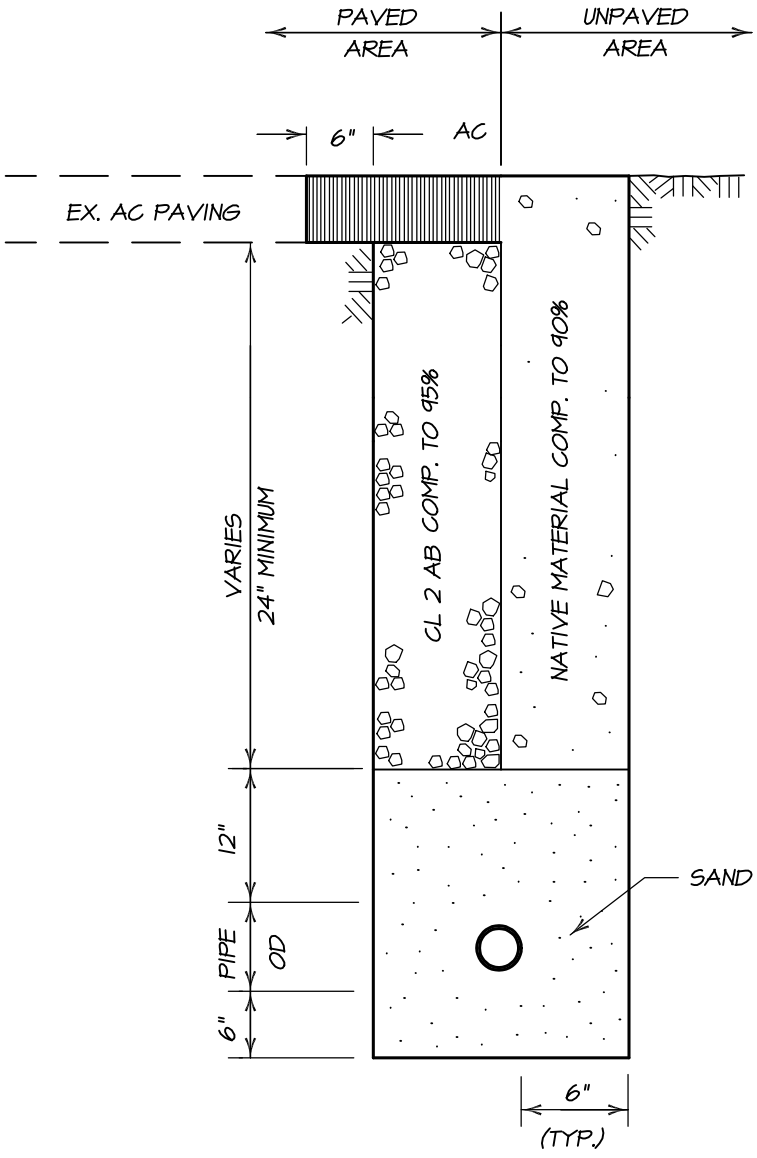
DESCRIPTION:
Addendum #1

OVERALL UTILITY PLAN

1" = 20'

REGISTERED PROFESSIONAL ENGINEER
PAUL N. BARTELT
No. 45102
Exp. 9-30-08
CIVIL
STATE OF CALIFORNIA

DRAWING NO:
AC1.4



GAS SERVICE TRENCH DETAIL

NO SCALE

TLCD ARCHITECTURE
111 Santa Rosa Avenue, Suite 300
Santa Rosa, CA 95404
707 525-5600
FAX 707 525-5616

PROJECT NAME

Napa Valley College Wine Storage Building

PROJECT ADDRESS

**2277 Napa-Vallejo Hwy.
Napa, CA**

PROJECT NO:

05067.00

DATE:

03/21/07

BY:

BARTELT ENGINEERING

DESCRIPTION:

Addendum #1

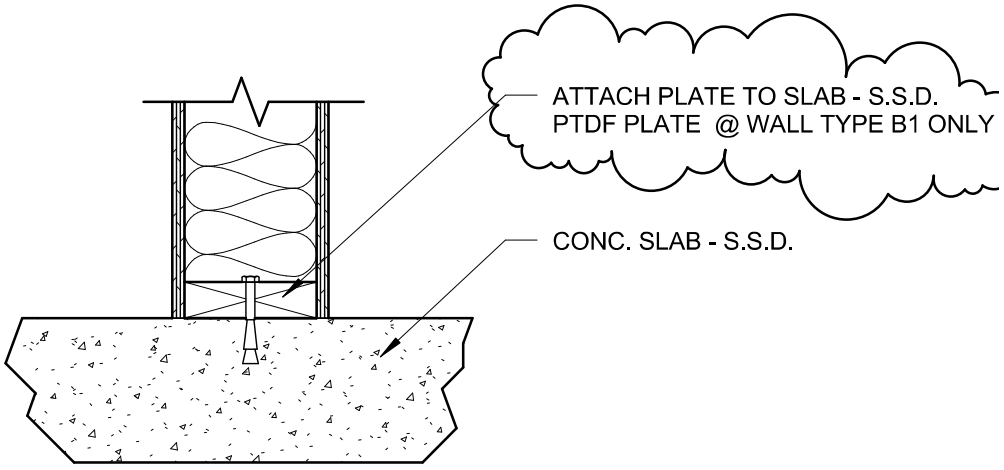
DETAIL SHEET

NO SCALE

REGISTERED PROFESSIONAL ENGINEER
PAUL N. BARTELT
No. 45102
Exp. 9-30-08
CIVIL
STATE OF CALIFORNIA

DRAWING NO:

AC1.5



1 INT. WALL BASE

1 1/2" = 1'-0"

OWNER'S RECORD DOCUMENT - FOR REFERENCE ONLY

TLCD ARCHITECTURE
111 Santa Rosa Avenue, Suite 300
Santa Rosa, CA 95405
707-525-5600
FAX 707-525-5616

PROJECT NAME

WINE STORAGE BUILDING

PROJECT ADDRESS

2277 NAPA-VALLEJO HWY. NAPA, CA 94558

PROJECT NO:

05067.00

DATE:

January 10, 2007

BY:

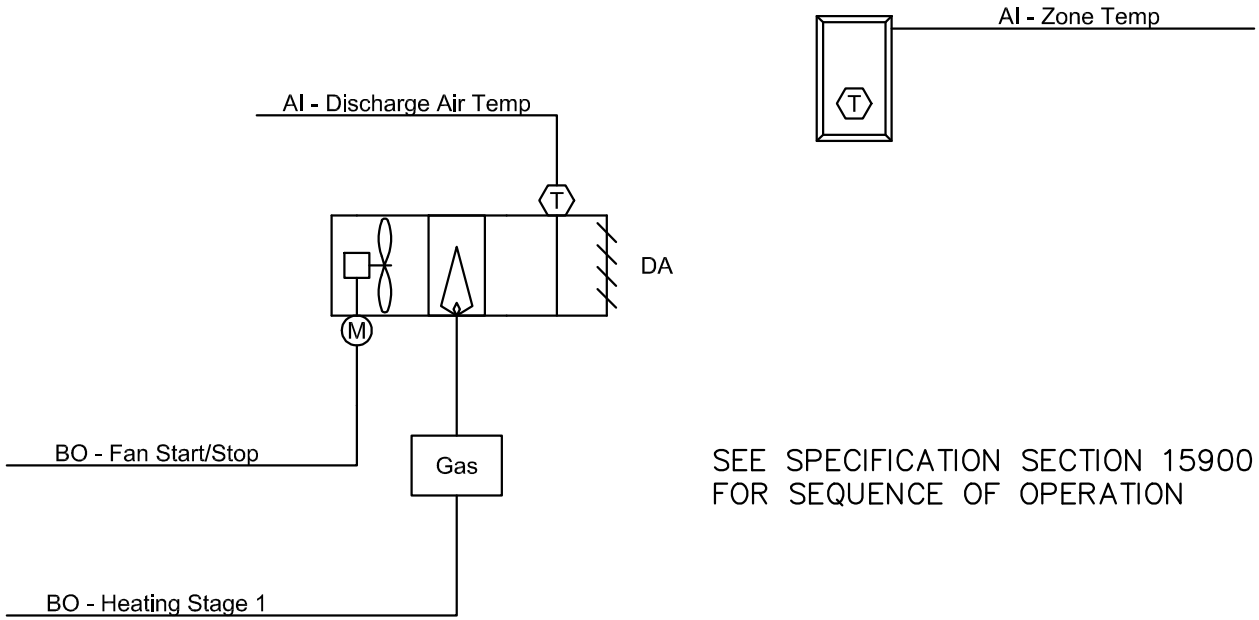
G.E.M.

DESCRIPTION:

ADDENDUM #1 INT. WALL BASE DETAIL

DRAWING NO:

AA1.1



SEE SPECIFICATION SECTION 15900
FOR SEQUENCE OF OPERATION

1 UNIT HEATER CONTROL

NOT TO SCALE

OWNER'S RECORD DOCUMENT - FOR REFERENCE ONLY

TLCD ARCHITECTURE
111 Santa Rosa Avenue, Suite 300
Santa Rosa, CA 95404
707 525-5600
FAX 707 525-5616

PROJECT NAME
Napa Valley
College Wine
Storage Building

PROJECT ADDRESS
2277 Napa-Vallejo
Hwy.
Napa, CA

PROJECT NO:
05067.00

DATE:
03/28/07

BY:
MJL

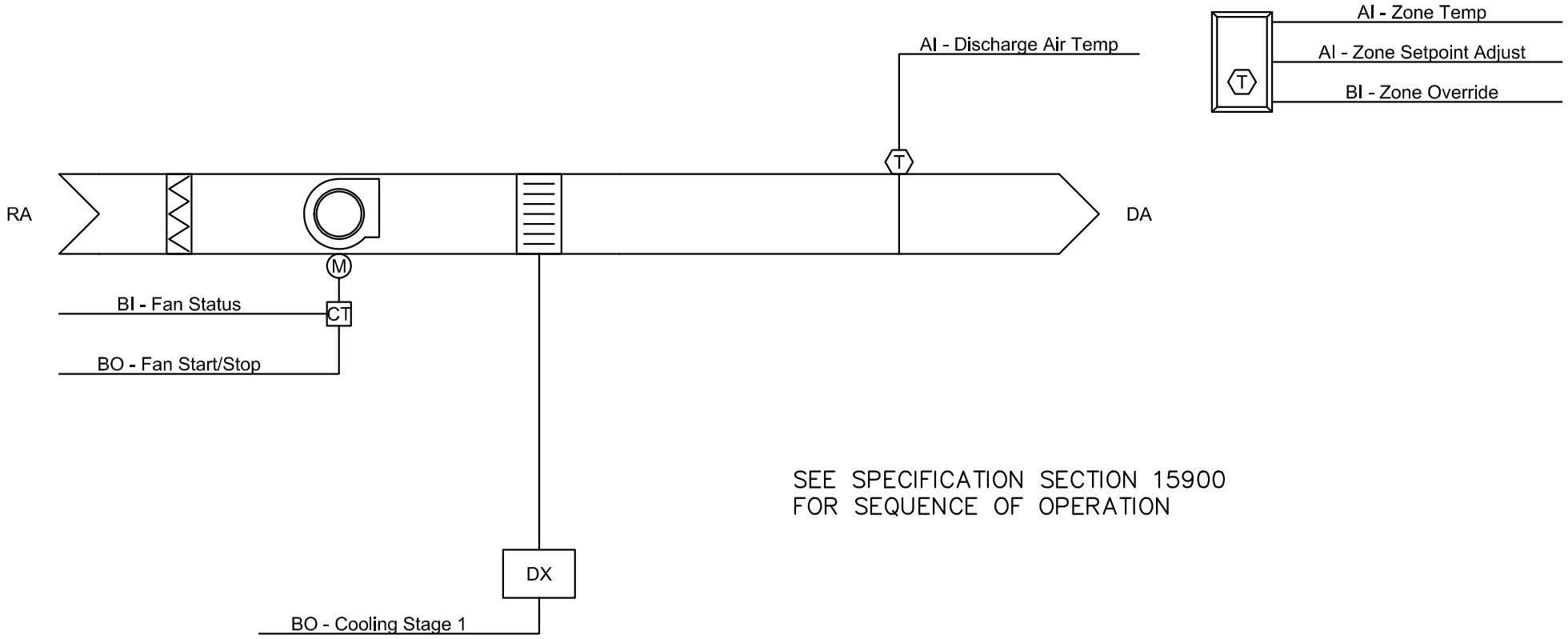
DESCRIPTION:
Addendum #1

HVAC CONTROL
DIAGRAM #1

NO SCALE

REGISTERED PROFESSIONAL ENGINEER
MICHAEL J. LEFLER
Exp. 12-31-07
No. 22,208
STATE OF CALIFORNIA
MECHANICAL

DRAWING NO:
AM1.1



SEE SPECIFICATION SECTION 15900
FOR SEQUENCE OF OPERATION

2 UNIT COOLER CONTROL

NOT TO SCALE

OWNER'S RECORD DOCUMENT - FOR REFERENCE ONLY

TLCD ARCHITECTURE
111 Santa Rosa Avenue, Suite 300
Santa Rosa, CA 95404
707 525-5600
FAX 707 525-5616

PROJECT NAME
Napa Valley
College Wine
Storage Building

PROJECT ADDRESS
2277 Napa-Vallejo
Hwy.
Napa, CA

PROJECT NO:
05067.00

DATE:
03/28/07

BY:
MJL

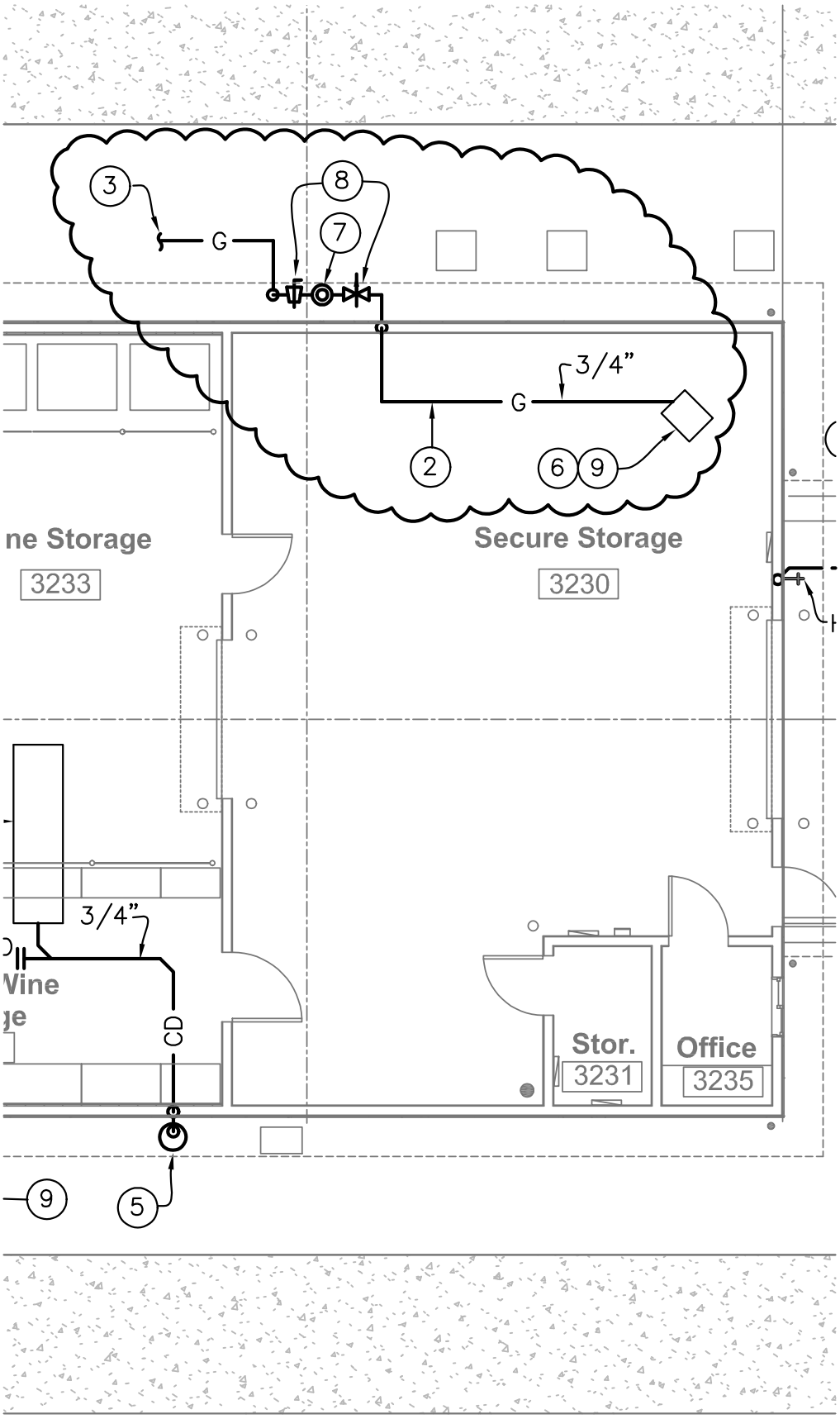
DESCRIPTION:
Addendum #1

HVAC CONTROL
DIAGRAM #2

NO SCALE

REGISTERED PROFESSIONAL ENGINEER
MICHAEL J. LEFLER
Exp. 12-31-07
No. 22,208
STATE OF CALIFORNIA
MECHANICAL

DRAWING NO:
AM1.2



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TLCD ARCHITECTURE
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Santa Rosa, CA 95404
707 525-5600
FAX 707 525-5616

PROJECT NAME
Napa Valley College Wine Storage Building

PROJECT ADDRESS
**2277 Napa-Vallejo Hwy.
Napa, CA**

PROJECT NO:
05067.00

DATE:
04/03/07

BY:
MJL

DESCRIPTION:
Addendum #1

Plumbing Floor Plan

1/8" = 1'-0"

REGISTERED PROFESSIONAL ENGINEER
MICHAEL J. LEFLER
Exp. 12-31-07
No. 22,208
MECHANICAL
STATE OF CALIFORNIA

DRAWING NO:
AP1.1

5. INSTALL DRY SUMP. SEE DETAIL 1/P2.1.

6. CONNECT GAS PIPING TO MECHANICAL EQUIPMENT THROUGH DIRT LEG, GAS COCK, AND UNION.

7. INSTALL NEW GAS PRESSURE REGULATOR. SIZE REGULATOR FOR 60,000 BTU/HR AT A 7" WC OUTLET PRESSURE. VERIFY INLET PRESSURE ON SITE.

8. INSTALL EARTHQUAKE VALVE AND GAS COCK.

9. MECHANICAL EQUIPMENT. VERIFY EXACT LOCATION.

10. INSTALL HOSE BIBB WITH VACUUM BREAKER. CONNECT 1/2" CW.

OWNER'S RECORD DOCUMENT - FOR REFERENCE ONLY

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PROJECT NAME
Napa Valley College Wine Storage Building

PROJECT ADDRESS
2277 Napa-Vallejo Hwy. Napa, CA

PROJECT NO:
05067.00

DATE:
04/03/07

BY:
MJL

DESCRIPTION:
Addendum #1

Plumbing Floor Plan

NO SCALE

REGISTERED PROFESSIONAL ENGINEER
MICHAEL J. LEFLER
Exp. 12-31-07
No. 22,208
MECHANICAL
STATE OF CALIFORNIA

DRAWING NO:
AP1.2

SYMBOLS LIST

INDICATES EMERGENCY OR NITELITE FIXTURE WITH QUANTITY OF EMERGENCY BALLASTS AS DESIGNATED ON PLANS AND FIXTURE SCHEDULE.

a OS b

WALL MOUNTED SWITCH TYPE INFRARED OCCUPANCY SENSOR; UP 48" U.O.N; WATTSTOPPER #WA-200 (SINGLE) AND #WA-300 (DUAL) AS NOTED BY LETTERS ADJACENT. SET TO FIXED 30 MINUTE TIME DELAY AND MAX SENSITIVITY.

6

CEILING MOUNTED ULTRASONIC OCCUPANCY SENSOR WITH POWER PACK. NUMBER ADJACENT INDICATES AREA OF COVERAGE. (6=600 SQ.FT., 11=1100 SQFT., 22=2200 SQ.FT.) WATTSTOPPER #WT-605, WT-1105, WT-2205

P

OCCUPANCY SENSOR POWER PACK; WATTSTOPPER #BZ-100.

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PROJECT NAME
Napa Valley College Wine Storage Building

PROJECT ADDRESS
2277 Napa-Vallejo Hwy.
Napa, CA

PROJECT NO:
05067.00

DATE:
03/28/07

BY:
RS

DESCRIPTION:
Addendum #1

REFERENCE:
E0.1
SYMBOLS LIST, GENERAL NOTES, FIXTURE SCHEDULE & DIAGRAMS

NO SCALE

DRAWING NO:
AE1.1

NUMBERED SHEET NOTES

21 PROVIDE AND INSTALL FIRE ALARM WIRING TO FIRE SPRINKLER DEVICES AS INDICATED IN 1" UNDERGROUND CONDUIT, SEE 1/E5.2.

22 PROVIDE AND INSTALL TWO 2" CONDUITS FROM EXISTING WINERY BUILDING TO NEW STORAGE BUILDING FOR NEW EMS WIRING AND FUTURE FIRE ALARM WIRING. STUB CONDUIT INTO EXISTING WINERY BUILDING.

23 PROVIDE AND INSTALL 2" CONDUIT FOR (F) FIRE ALARM USE.

24 PROVIDE AND INSTALL TWO 2" CONDUITS TO BUILDING D FOR FUTURE USE.

OWNER'S RECORD DOCUMENT - FOR REFERENCE ONLY

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PROJECT ADDRESS
2277 Napa-Vallejo Hwy.
Napa, CA

PROJECT NO:
05067.00

DATE:
03/28/07

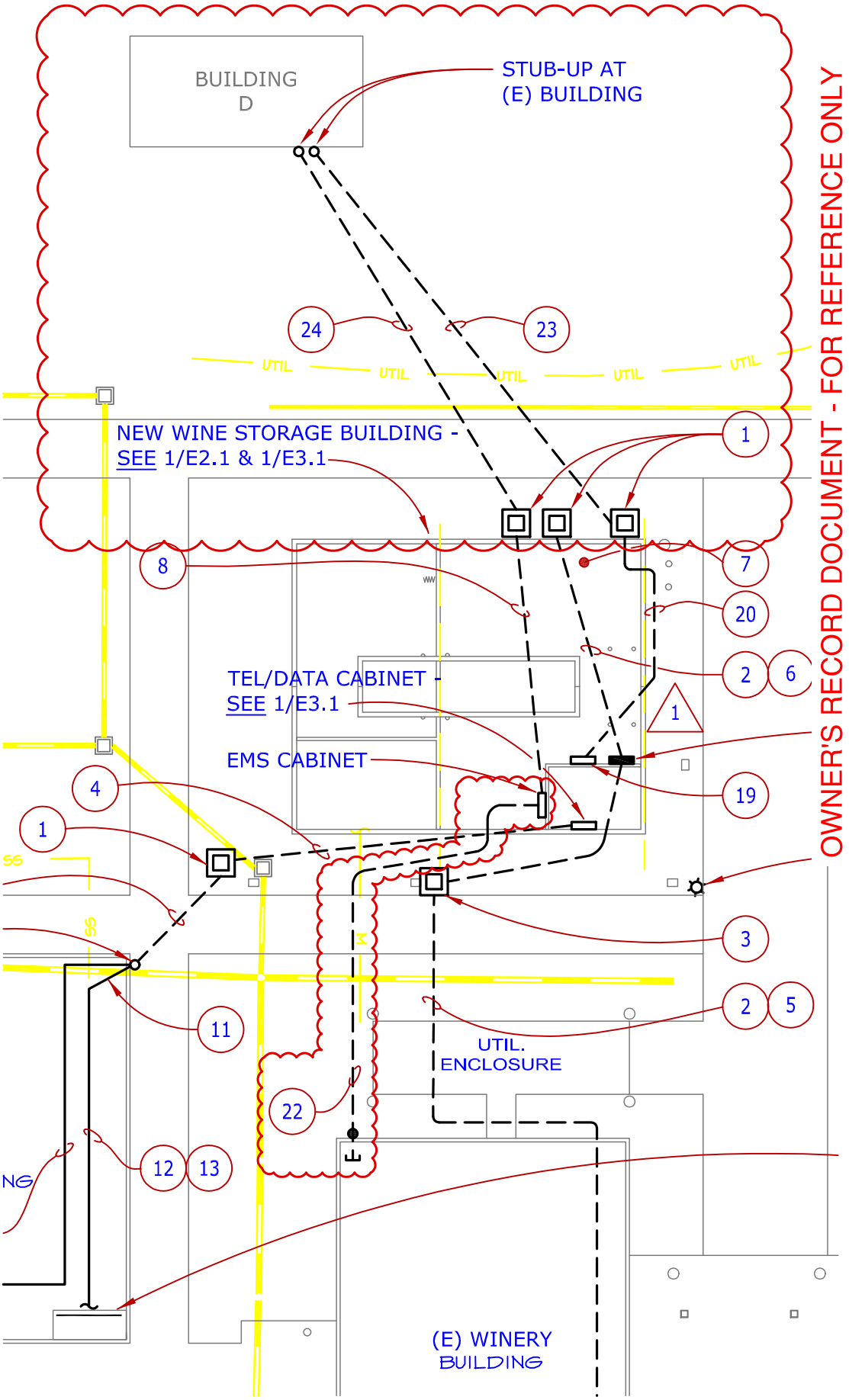
BY:
RS

DESCRIPTION:
Addendum #1

REFERENCE:
E1.1

SITE PLAN - ELECTRICAL
NO SCALE

DRAWING NO:
AE1.2



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111 Santa Rosa Avenue, Suite 300
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707 525-5600
FAX 707 525-5616

PROJECT NAME
Napa Valley College Wine Storage Building

PROJECT ADDRESS
**2277 Napa-Vallejo Hwy.
Napa, CA**

PROJECT NO:
05067.00

DATE:
03/28/07

BY:
RS

DESCRIPTION:
Addendum #1

REFERENCE:
E1.1

SITE PLAN - ELECTRICAL

1" = 20'-0"

DRAWING NO:
AE1.3

P:\2006\NAPA_VALLEY_COLLEGE_WINE_STORAGE_BUILDING-206030\CAD_E1.1-NVC-WS.dwg, 4/3/2007 3:44:27 PM

NUMBERED SHEET NOTES

1. CHAIN HANG FIXTURES IN-BETWEEN TRUSSES AT 12'-0" A.F.F. TO BOTTOM OF FIXTURE.
2. SURFACE MOUNT OCCUPANCY SENSOR TO BOTTOM OF TRUSS. MOUNT POWER PACK ABOVE OCCUPANCY SENSOR ON TOP OF TRUSS CHORD.
3. MOUNT FIXTURE AT 8'-6" A.F.G. TO CENTER OF FIXTURE. VERIFY EXACT MOUNTING HEIGHT WITH ARCHITECT PRIOR TO ROUGH-IN.
4. AIR CRAFT CABLE MOUNT FIXTURES IN-BETWEEN TRUSSES AT 8'-0" A.F.F. TO BOTTOM OF FIXTURE.

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707 525-5600
FAX 707 525-5616

PROJECT NAME
Napa Valley College Wine Storage Building

PROJECT ADDRESS
2277 Napa-Vallejo Hwy.
Napa, CA

PROJECT NO:
05067.00

DATE:
03/28/07

BY:
RS

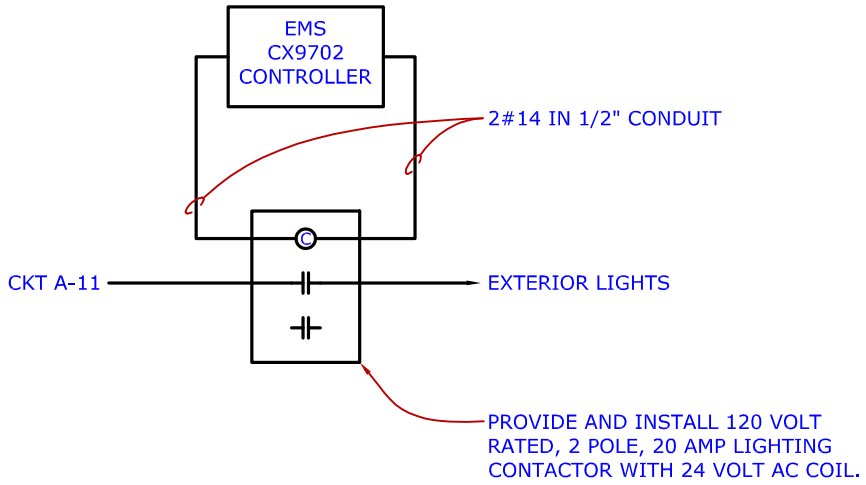
DESCRIPTION:
Addendum #1

REFERENCE:
E2.1

FLOOR PLAN - LIGHTING

NO SCALE

DRAWING NO:
AE1.4



EXTERIOR LIGHTING CONTROLS

SCALE: NO SCALE
FILE:

2
E2.1

OWNER'S RECORD DOCUMENT - FOR REFERENCE ONLY

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111 Santa Rosa Avenue, Suite 300
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707 525-5600
FAX 707 525-5616

PROJECT NAME
Napa Valley
College Wine
Storage Building

PROJECT ADDRESS
2277 Napa-Vallejo
Hwy.
Napa, CA

PROJECT NO:
05067.00

DATE:
03/28/07

BY:
RS

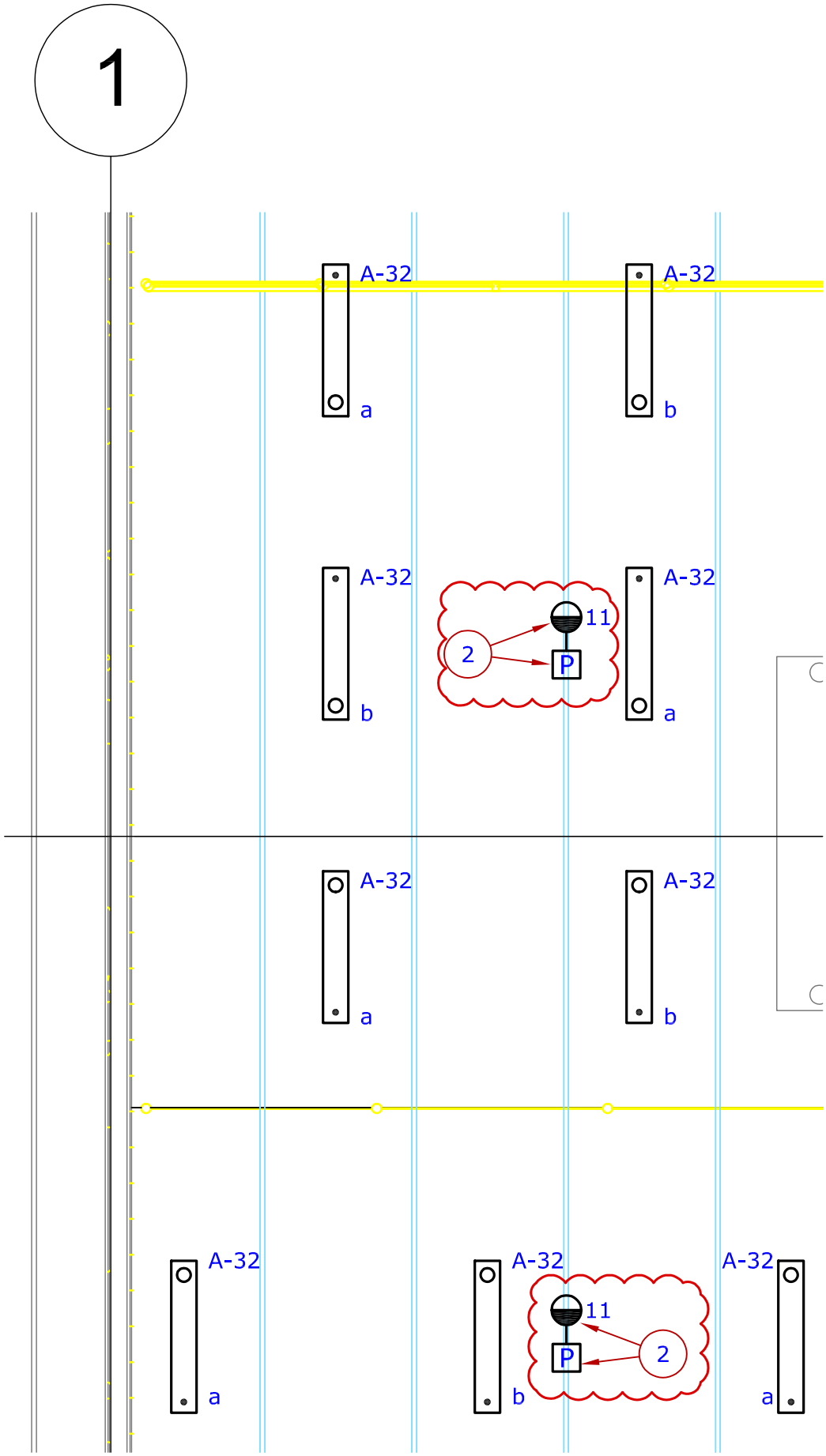
DESCRIPTION:
Addendum #1

REFERENCE:
E2.1

FLOOR PLAN -
LIGHTING

NO SCALE

DRAWING NO:
AE1.5



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111 Santa Rosa Avenue, Suite 300
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707 525-5600
FAX 707 525-5616

PROJECT NAME
Napa Valley College Wine Storage Building

PROJECT ADDRESS
**2277 Napa-Vallejo Hwy.
Napa, CA**

PROJECT NO:
05067.00

DATE:
03/28/07

BY:
RS

DESCRIPTION:
Addendum #1

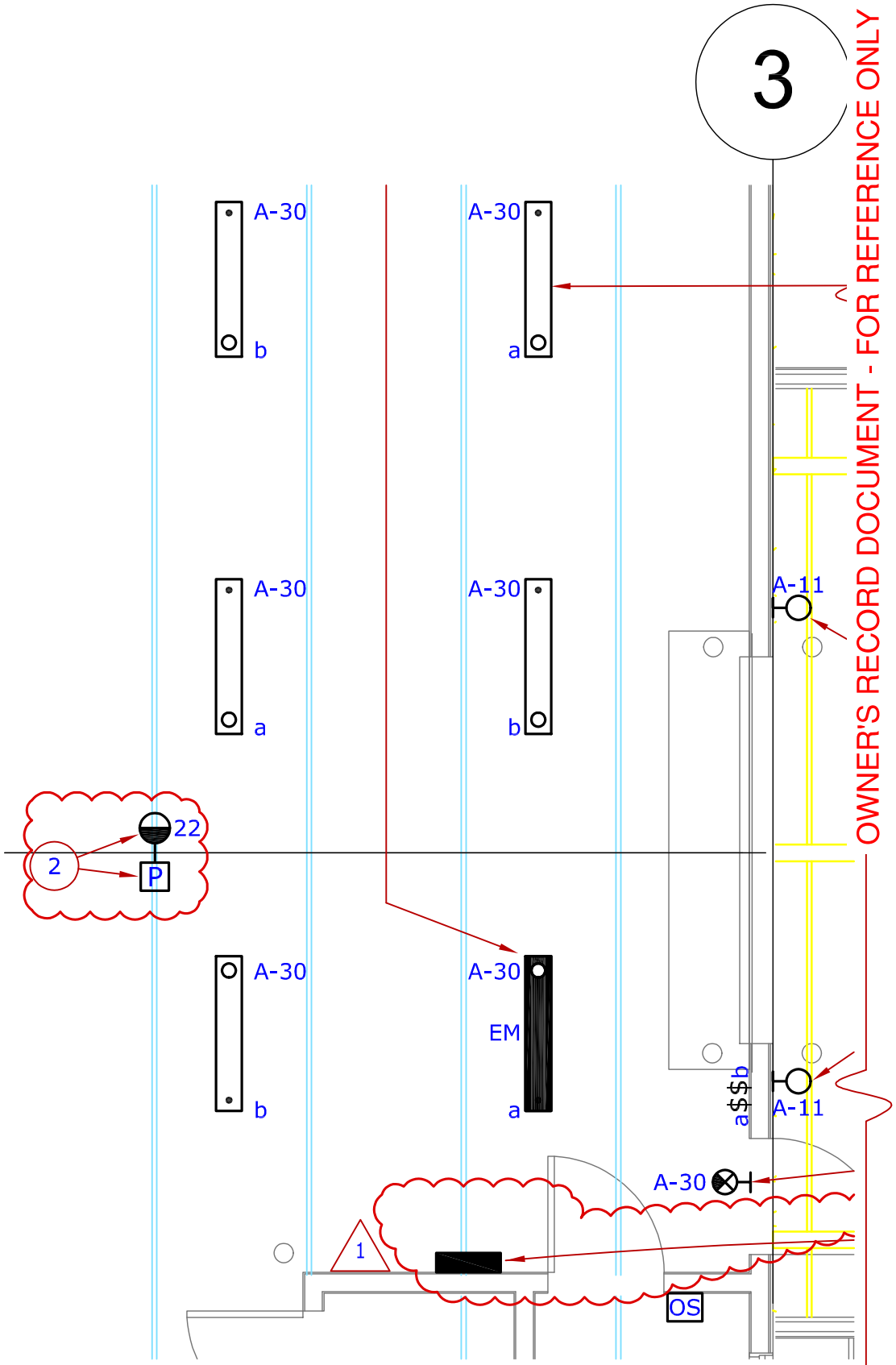
REFERENCE:
E2.1

FLOOR PLAN - LIGHTING

1/4" = 1'-0"

DRAWING NO:
AE1.6

P:\2006\NAPA_VALLEY_COLLEGE_WINE_STORAGE_BUILDING-206030\CAD_E2.1-NVC-WS.dwg, 4/2/2007 5:04:19 PM



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TLCD ARCHITECTURE
111 Santa Rosa Avenue, Suite 300
Santa Rosa, CA 95404
707 525-5600
FAX 707 525-5616

PROJECT NAME
Napa Valley College Wine Storage Building

PROJECT ADDRESS
**2277 Napa-Vallejo Hwy.
Napa, CA**

PROJECT NO:
05067.00

DATE:
03/28/07

BY:
RS

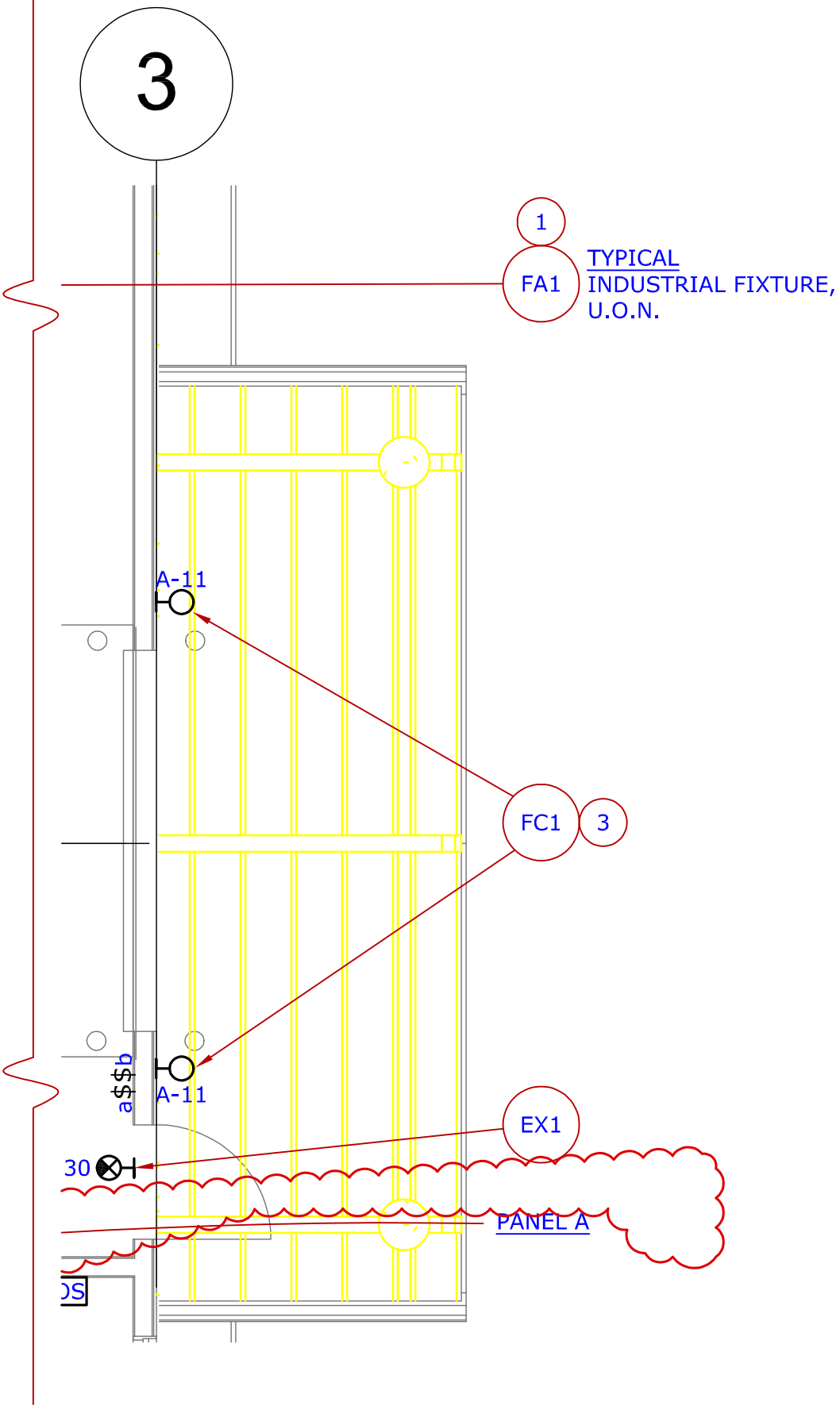
DESCRIPTION:
Addendum #1

REFERENCE:
E2.1

FLOOR PLAN - LIGHTING

1/4" = 1'-0"

DRAWING NO:
AE1.7



OWNER'S RECORD DOCUMENT - FOR REFERENCE ONLY

TLCD ARCHITECTURE
111 Santa Rosa Avenue, Suite 300
Santa Rosa, CA 95404
707 525-5600
FAX 707 525-5616

PROJECT NAME
Napa Valley College Wine Storage Building

PROJECT ADDRESS
**2277 Napa-Vallejo Hwy.
Napa, CA**

PROJECT NO:
05067.00

DATE:
03/28/07

BY:
RS

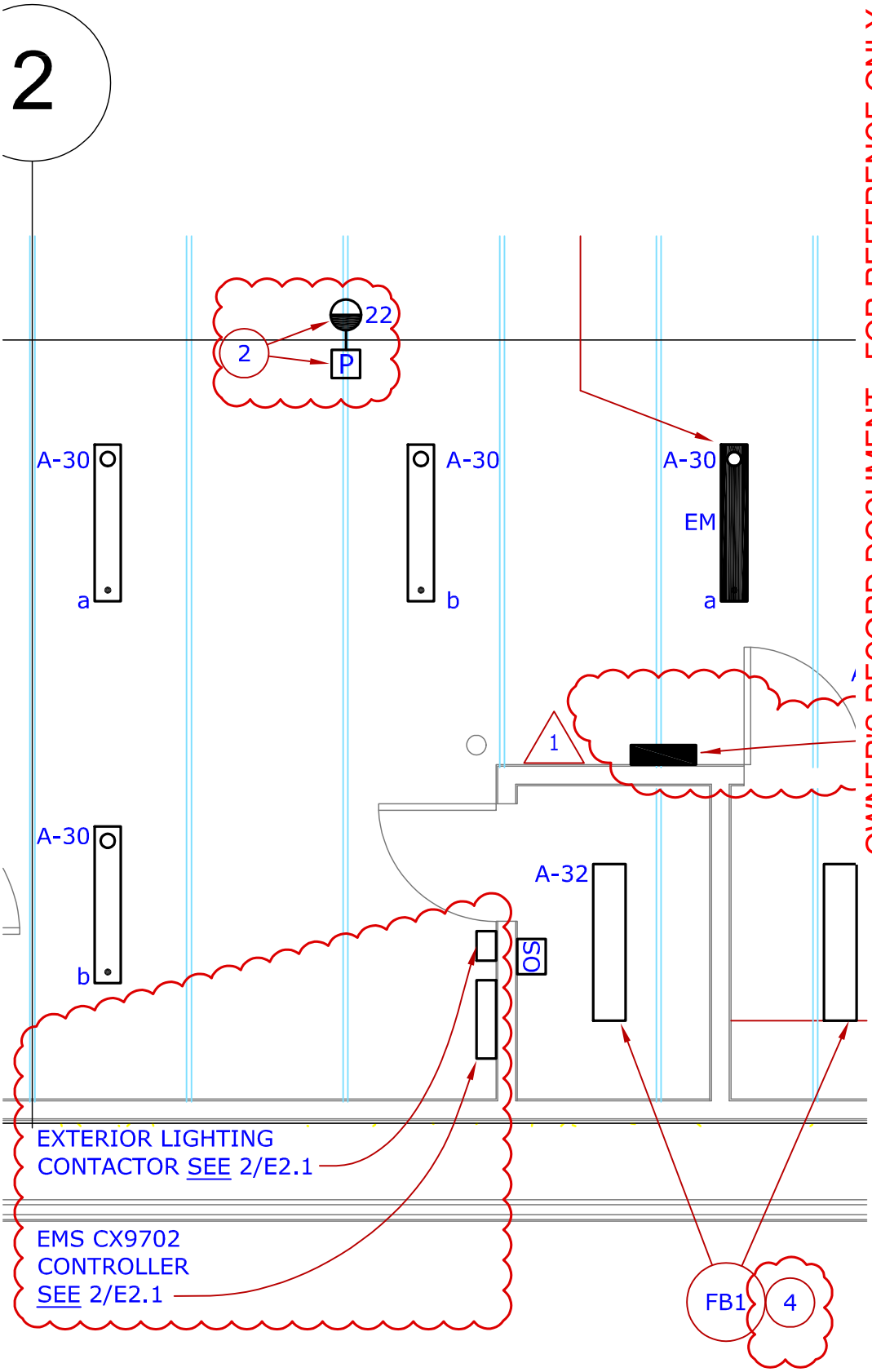
DESCRIPTION:
Addendum #1

REFERENCE:
E2.1

FLOOR PLAN - LIGHTING

1/4" = 1'-0"

DRAWING NO:
AE1.8



OWNER'S RECORD DOCUMENT - FOR REFERENCE ONLY

TLCD ARCHITECTURE
111 Santa Rosa Avenue, Suite 300
Santa Rosa, CA 95404
707 525-5600
FAX 707 525-5616

PROJECT NAME
Napa Valley College Wine Storage Building

PROJECT ADDRESS
**2277 Napa-Vallejo Hwy.
Napa, CA**

PROJECT NO:
05067.00

DATE:
03/28/07

BY:
RS

DESCRIPTION:
Addendum #1

REFERENCE:
E2.1

FLOOR PLAN - LIGHTING

1/4" = 1'-0"

DRAWING NO:
AE1.9

P:\2006\NAPA_VALLEY_COLLEGE_WINE_STORAGE_BUILDING-206030\CAD_E2.1-NVC-WS.dwg, 4/2/2007 5:06:12 PM

NUMBERED SHEET NOTES

1. COORDINATE LOCATION PRIOR TO ROUGH-IN.
2. PROVIDE AND INSTALL ANDOVER CARD READER, SEE 2/E3.1.
3. PROVIDE AND INSTALL 3/4" CONDUIT TO J-BOX AT CEILING.
4. NOT USED.
5. PROVIDE AND INSTALL 3/4" CONDUIT HOMERUN TO EMS PANEL (POWER SUPPLY)

12. 120 VOLT CIRCUIT FOR FIRE SPRINKLER BELL COORDINATE LOCATION WITH FIRE SPRINKLER CONTRACTOR, SEE 1/E5.2.
13. PROVIDE AND INSTALL ANDOVER SMART SENSOR FOR SECURITY USE.
14. PROVIDE AND INSTALL 3/4" CONDUIT WITH ANDOVER CABLE TO CX9702 EMS CONTROLLER. COORDINATE WIRE TYPE WITH ANDOVER.
15. PROVIDE AND INSTALL ANDOVER SECURITY MOTION SENSOR.

OWNER'S RECORD DOCUMENT - FOR REFERENCE ONLY

DRAWING NO: **AE1.10**

FLOOR PLAN - POWER & SIGNAL

NO SCALE

BY: **RS**

DATE: **03/28/07**

DESCRIPTION: **Addendum #1**

REFERENCE: **E3.1**

PROJECT NO: **05067.00**

PROJECT ADDRESS
2277 Napa-Vallejo Hwy.
Napa, CA

PROJECT NAME
Napa Valley College Wine Storage Building

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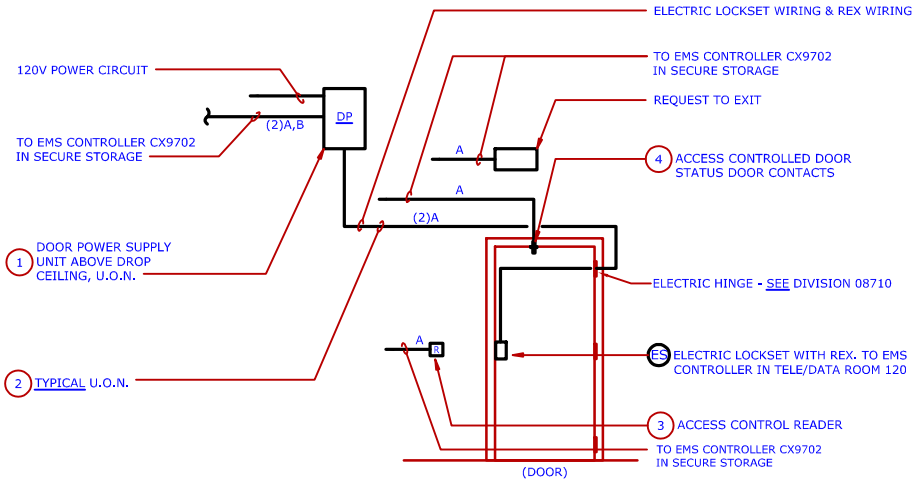
Santa Rosa, CA 95404
707 525-5600
FAX 707 525-5616



DETAIL NUMBERED NOTES

1. DOOR POWER SUPPLY UNITS SHALL BE INSTALLED AND CONNECTED BY DIVISION 16.
2. ALL CONDUIT AND WIRING AND TERMINATIONS SHALL BE PROVIDED AND INSTALLED BY DIV. 16. ALL WIRING SHALL BE IN CONDUIT, U.O.N.
3. PROVIDE AND INSTALL CARD READER HID TYPE 54S5BBN00. MUST BE COMPLIANT WITH ANDOVER ACCESS CONTROL SYSTEM.
4. PROVIDE AND INSTALL DOOR CONTACTS, SENTROL TYPE SR-R1078M/N OR EQUAL, SEE DIVISION 08710.

WIRING LEGEND

A	NON SHIELD PAIR #18 AWG BELDEN CABLE #8442/8461 OR EQUAL
B	3-#14 AWG THHN

VERIFY ALL WIRING TYPES WITH ANDOVER EQUIPMENT VENDOR PRIOR TO ROUGH-IN.

NOTE:
THIS DIAGRAM INDICATES A TYPICAL DOOR WITH ELECTRICAL COMPONENTS. SEE DOOR SCHEDULE AND HARDWARE GROUP FOR ACTUAL COMPONENTS REQUIRED FOR EACH DOOR.

TYPICAL ACCESS CONTROLLED DOOR DIAGRAM

2 E3.1

SCALE: NO SCALE
FILE:

OWNER'S RECORD DOCUMENT - FOR REFERENCE ONLY

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111 Santa Rosa Avenue, Suite 300
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707 525-5600
FAX 707 525-5616

PROJECT NAME
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2277 Napa-Vallejo Hwy.
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PROJECT NO:
05067.00

DATE:
03/28/07

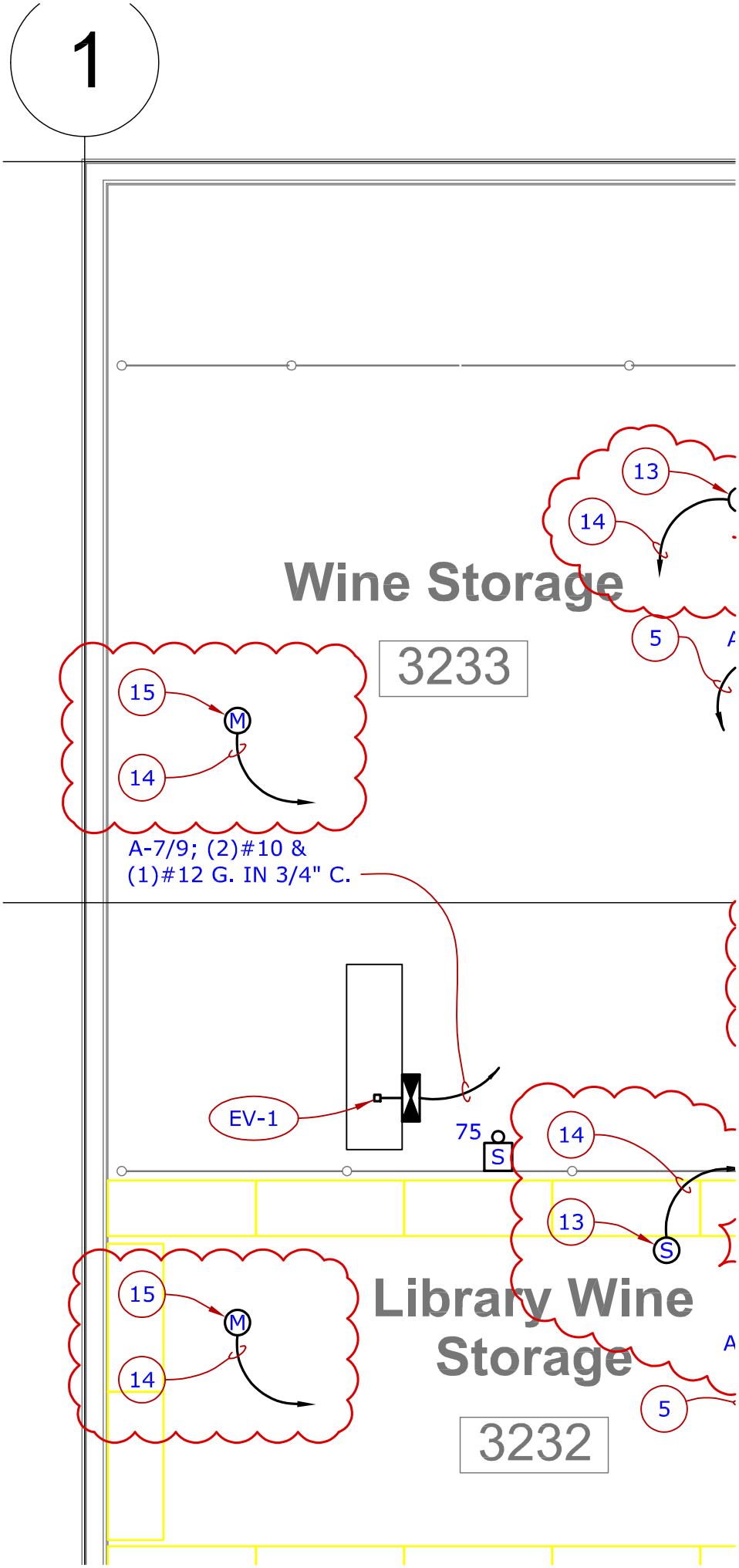
BY:
RS

DESCRIPTION:
Addendum #1

REFERENCE:
E3.1

FLOOR PLAN - POWER & SIGNAL
NO SCALE

DRAWING NO:
AE1.11



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PROJECT NO:
05067.00

DATE:
03/28/07

BY:
RS

DESCRIPTION:
Addendum #1

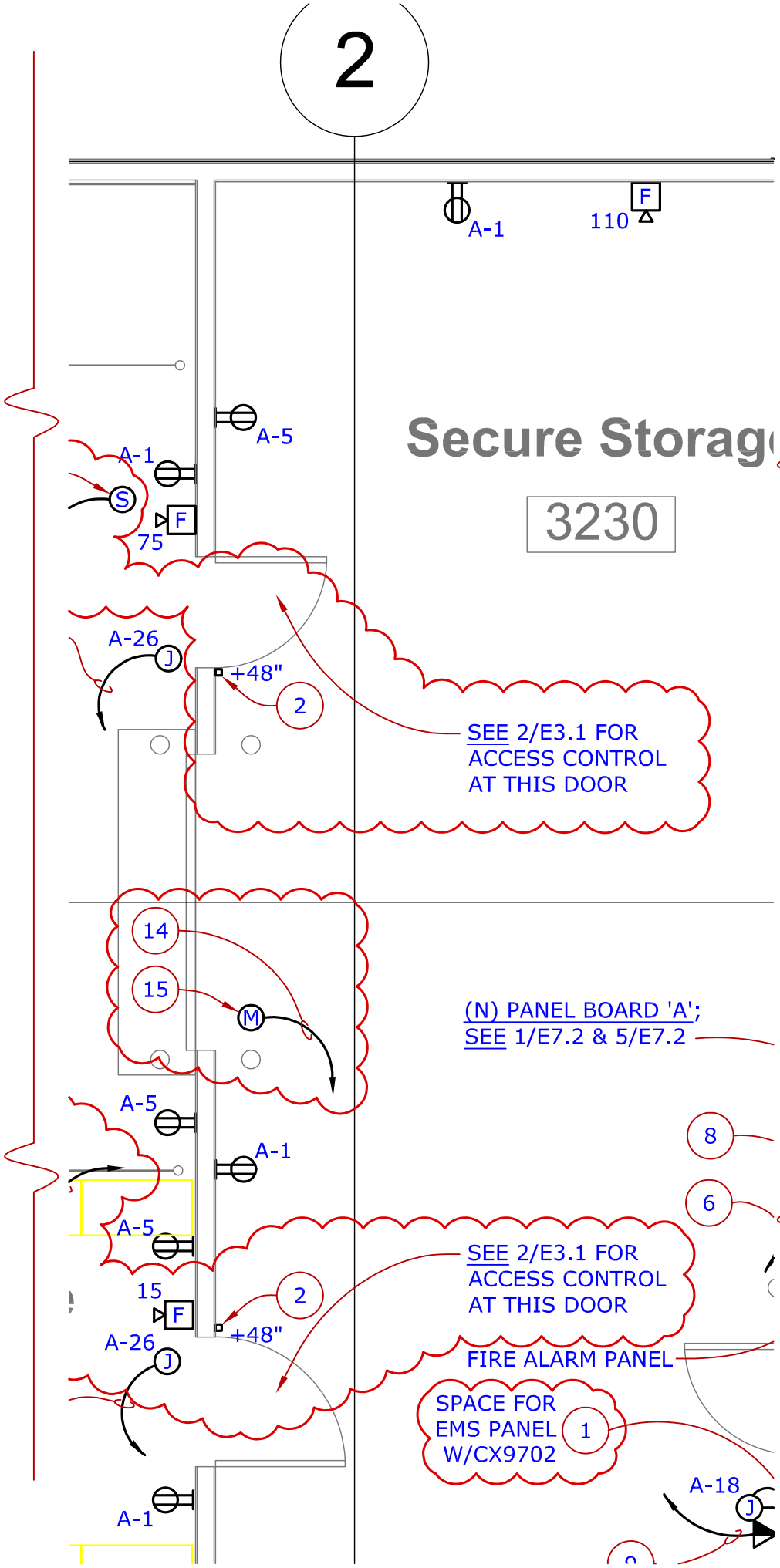
REFERENCE:
E3.1

FLOOR PLAN - POWER & SIGNAL

1/4" = 1'-0"

DRAWING NO:
AE1.12

P:\2006\NAPA_VALLEY_COLLEGE_WINE_STORAGE_BUILDING-206030\CAD_E3.1-NVC-WS.dwg, 4/2/2007 5:07:56 PM



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05067.00

DATE:
03/28/07

BY:
RS

DESCRIPTION:
Addendum #1

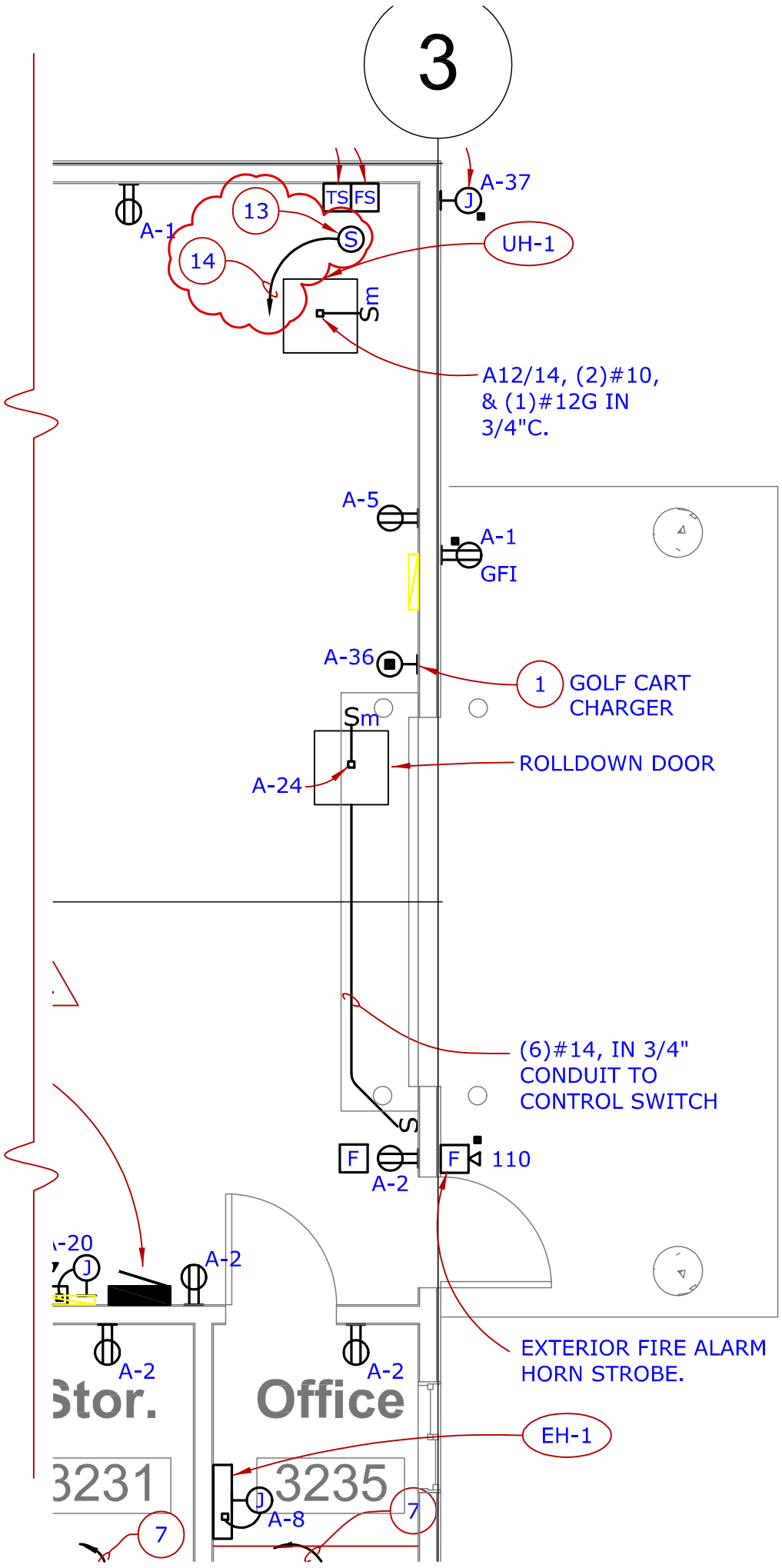
REFERENCE:
E3.1

FLOOR PLAN - POWER & SIGNAL

1/4" = 1'-0"

DRAWING NO:
AE1.13

P:\2006\NAPA_VALLEY_COLLEGE_WINE_STORAGE_BUILDING-206030\CAD_E3.1-NVC-WS.dwg, 4/2/2007 5:08:28 PM



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OWNER'S RECORD DOCUMENT - FOR REFERENCE ONLY

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05067.00

DATE:
03/28/07

BY:
RS

DESCRIPTION:
Addendum #1

REFERENCE:
E3.1

FLOOR PLAN - POWER & SIGNAL

1/4" = 1'-0"

DRAWING NO:
AE1.14