

ADDENDUM



Date: February 7, 2014

Project: Wayne State College
Student Center
Electrical Distribution Panel

To: Bidding Contractors

Project No.: 2013-100

Addendum No.: 1

CC:

CHANGES TO PROJECT MANUAL

Section 00 11 16 – Notice to Bidders

1. Revise the following dates:

New Bid Date - February 25, 2014 at 2:00 pm

New Mandatory Pre-bid walk-thru Date – February 18, 2014 at 1:30 pm at the Student Center in the Main Lobby

Add the following section:

Section 26 05 73 – Overcurrent Protective Device Coordination Study

1.1 SUMMARY

- A. This Section includes computer-based, fault-current and selective overcurrent protective device coordination studies. Protective devices shall be set based on results of the protective device selective coordination study. **Devices to be coordinated shall only be the new adjustable electronic trip breakers being installed as part of this project.**

1.2 ACTION SUBMITTALS

- A. Other Action Submittals: The following submittals shall be made after the approval process for system protective devices has been completed.
 1. Selective Coordination-study input data, including completed computer program input data sheets.
 2. Study and Equipment Evaluation Reports.
 3. Selective Coordination-Study Report.
 4. One-line diagram with required breaker sizes, trip ratings and settings, and frame sizes.
 5. Electrical contractor shall be responsible for providing all data acquisition to electrical equipment mfr. This shall include but not be limited to: conduit type(s) and lengths, wire type and lengths, and all lineal footage of conduit/wire runs, etc to accurately determine available fault current and selective coordination-study report.

PART 2 - EXECUTION

2.1 EXAMINATION

- A. Examine Project overcurrent protective device submittals for compliance with electrical distribution system coordination requirements and other conditions affecting performance. **Devices to be coordinated shall only be the new adjustable electronic trip breakers being installed as part of this project.**
 1. Proceed with coordination study only after relevant equipment submittals have been assembled. Overcurrent protective devices that have not been submitted and approved prior to coordination study may not be used in study.

2.2 POWER SYSTEM DATA

- A. Gather and tabulate the following input data to support coordination study:
 1. Product Data for overcurrent protective devices specified in other electrical Sections and involved in overcurrent protective device coordination studies. Use equipment designation tags that are consistent with electrical distribution system diagrams, overcurrent protective device submittals, input and output data, and recommended device settings.



2. Impedance of utility service entrance. Contact utility for available fault current.
3. Electrical Distribution System Diagram: In hard-copy and electronic-copy formats, showing the following:
 - a. Circuit-breaker and fuse-current ratings and types.
 - b. Relays and associated power and current transformer ratings and ratios.
 - c. Transformer kilovolt amperes, primary and secondary voltages, connection type, impedance, and X/R ratios.
 - d. Cables: Indicate conduit material, sizes of conductors, conductor material, insulation, and length.
 - e. Busway ampacity and impedance.
 - f. Motor horsepower and code letter designation according to NEMA MG 1.
4. Data sheets to supplement electrical distribution system diagram, cross-referenced with tag numbers on diagram, showing the following:
 - a. Special load considerations, including starting inrush currents and frequent starting and stopping.
 - b. Transformer characteristics, including primary protective device, magnetic inrush current, and overload capability.
 - c. Motor full-load current, locked rotor current, service factor, starting time, type of start, and thermal-damage curve.
 - d. Generator thermal-damage curve.
 - e. Ratings, types, and settings of utility company's overcurrent protective devices.
 - f. Special overcurrent protective device settings or types stipulated by utility company.
 - g. Time-current-characteristic curves of devices indicated to be coordinated.
 - h. Manufacturer, frame size, interrupting rating in amperes rms symmetrical, ampere or current sensor rating, long-time adjustment range, short-time adjustment range, and instantaneous adjustment range for circuit breakers.
 - i. Manufacturer and type, ampere-tap adjustment range, time-delay adjustment range, instantaneous attachment adjustment range, and current transformer ratio for overcurrent relays.
 - j. Panelboards, switchboards, motor-control center ampacity, and interrupting rating in amperes rms symmetrical.

2.3 FAULT-CURRENT STUDY

- A. Calculate the maximum available short-circuit current in amperes rms symmetrical at circuit-breaker positions of the electrical power distribution system. The calculation shall be for a current immediately after initiation and for a three-phase bolted short circuit at each of the following:
 1. Switchgear and switchboard bus.
 2. Distribution panelboard.
 3. Branch circuit panelboard.
- B. Study electrical distribution system from normal and alternate power sources throughout electrical distribution system for Project. Include studies of system-switching configurations and alternate operations that could result in maximum fault conditions.
- C. Calculate momentary and interrupting duties on the basis of maximum available fault current.
- D. Calculations to verify interrupting ratings of overcurrent protective devices shall comply with IEEE 141 and IEEE 242.
 1. Low-Voltage Circuit Breakers: IEEE 1015 and IEEE C37.20.1.
- E. Study Report:
 1. Show calculated X/R ratios and equipment interrupting rating (1/2-cycle) fault currents on electrical distribution system diagram.
- F. Equipment Evaluation Report:
 1. For 600-V overcurrent protective devices, ensure that interrupting ratings are equal to or higher than calculated 1/2-cycle symmetrical fault current.
 2. For devices and equipment rated for asymmetrical fault current, apply multiplication factors listed in the standards to 1/2-cycle symmetrical fault current.



3. Verify adequacy of phase conductors at maximum three-phase bolted fault currents; verify adequacy of equipment grounding conductors and grounding electrode conductors at maximum ground-fault currents. Ensure that short-circuit withstand ratings are equal to or higher than calculated 1/2-cycle symmetrical fault current.

2.4 COORDINATION STUDY

- A. Perform coordination study using approved computer software program. Prepare a written report using results of fault-current study. Comply with IEEE 399.
 1. Calculate the maximum and minimum 1/2-cycle short-circuit currents.
 2. Calculate the maximum and minimum interrupting duty (5 cycles to 2 seconds) short-circuit currents.
 3. Calculate the maximum and minimum ground-fault currents.
- B. Comply with IEEE 141 recommendations for fault currents and time intervals.
- C. Conductor Protection: Protect cables against damage from fault currents according to ICEA P-32-382, ICEA P-45-482, and conductor melting curves in IEEE 242. Demonstrate that equipment withstands the maximum short-circuit current for a time equivalent to the tripping time of the primary relay protection or total clearing time of the fuse. To determine temperatures that damage insulation, use curves from cable manufacturers or from listed standards indicating conductor size and short-circuit current.
- D. Coordination-Study Report: Prepare a written report indicating the following results of coordination study:
 1. Tabular Format of Settings Selected for Overcurrent Protective Devices:
 - a. Device tag.
 - b. Relay-current transformer ratios; and tap, time-dial, and instantaneous-pickup values.
 - c. Circuit-breaker sensor rating; and long-time, short-time, and instantaneous settings.
 - d. Fuse-current rating and type.
 - e. Ground-fault relay-pickup and time-delay settings.
 2. Coordination Curves: Prepared to determine settings of overcurrent protective devices to achieve selective coordination. Graphically illustrate that adequate time separation exists between devices installed in series, including power utility company's upstream devices. Prepare separate sets of curves for the switching schemes and for emergency periods where the power source is local generation. Show the following information:
 - a. Device tag.
 - b. Voltage and current ratio for curves.
 - c. No damage, melting, and clearing curves for fuses.
 - d. Cable damage curves.
 - e. Maximum fault-current cutoff point.
- E. Completed data sheets for setting of overcurrent protective devices.

END OF SECTION 26 05 73

CHANGES TO PROJECT DRAWINGS

Sheet E2

Student Center Lower Level Electrical Plan

1. Revise electrical room layout to accommodate existing piping. See attached drawing AD01.E2-1.
2. Relocate junction box 'JB1' to east side of building. Verify location with owner prior to installation. See attached drawing AD01.E2-1.



Luminaire Schedule

3. Provide 2-lamps per cross section for light fixture type-1.

Sheet E5

Electrical One-Line Diagram

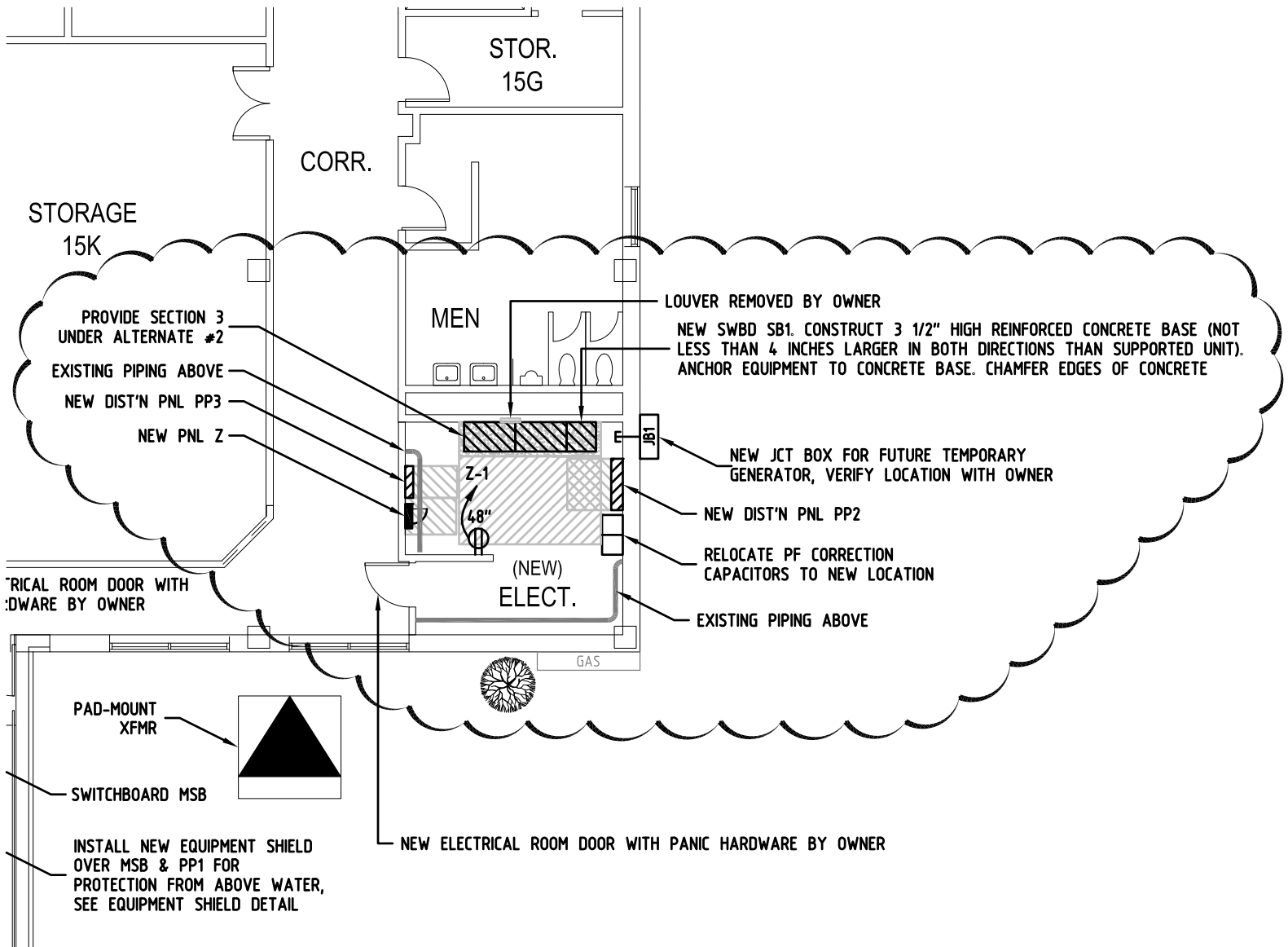
1. Provide 200/3 sub-feed circuit breaker in panel 'KP1' for panel 'S' in lieu of 225/3. Revise feeder to panel 'S' to 4-#3/0 plus 1-#6 gnd in existing 2" C. See attached drawing AD01.E5-1.
2. A fault current and overcurrent protective device coordination study shall be completed by the electrical equipment manufacturer & applied to the new electrical distribution system and all new adjustable electronic trip breakers. The cost of the study shall be incurred by the contractor & included in their bid. Provide all data acquisition to the electrical equipment manufacturer. This shall include, but not limited to, conduit types/lengths, wire type/lengths & all lineal footage of conduit/wire runs, etc. to accurately determine available fault current & OCPD coordination.

Sheet E6

Panel Schedules

3. Panel schedule 'KP1' – provide 200/3 sub-feed circuit breaker for Panel S in lieu of 225/3.

By: Jason Leu	Date: 2/7/14
----------------------	---------------------



STUDENT CENTER LOWER LEVEL ELECTRICAL PLAN



SCALE: 3/32" = 1'-0"

4630 Antelope Creek Rd Ste 200
P: 402-488-0075 / F: 402-488-0272

www.a-e-sys.com

620 N. 129th Street, Omaha, NE 68154
P: 402-504-3885 / F: 402-504-4598



PROJECT: Student Center
Electrical Distribution Panel

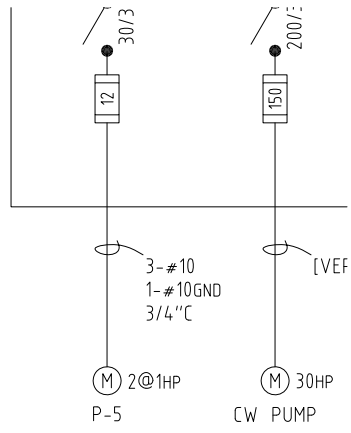
PROJECT #: 2013-100

DESCRIPTION: Addendum #1

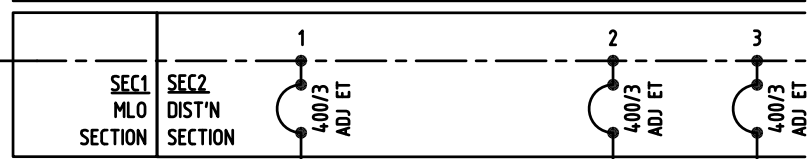
SHEET:

E2

AD01.E2-1



NEW SWBD SB1
 BASE BID: SQUARE QED (ALT#1: CUTLER-HAMMER, SIEMENS, GE)
 2000A MLO 120/208V 3Ø4W 42kA FREESTANDING TYPE-1
 PROVIDE SECTIONS 1&2 UNDER BASE BID - PROVIDE SECTION 3 UNDER ALTE

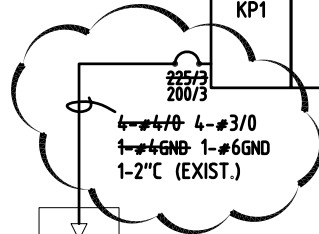


NEW JCT BOX JB1
 36"x42"x15" WEATHPROOF JCT BOX ON BLDG EXTERIOR FOR FUTURE TEMPORARY GENERATOR

[TYPICAL] EXTEND EXISTING CONDUIT/WIRE TO NEW SWBD LOCATION. FIELD VERIFY SIZES

8-#3/0
 2-#3GND
 2-3" C (EXIST.)

SNACK BAR (DIST'N PNL DP3)



1 ELECTRICAL ONE-LINE DIAGRAM

NOT TO SCALE

4630 Antelope Creek Rd Ste 200
 P: 402-488-0075 / F: 402-488-0272

www.a-e-sys.com

620 N. 129th Street, Omaha, NE 68154
 P: 402-504-3885 / F: 402-504-4598



PROJECT: Student Center
 Electrical Distribution Panel
 PROJECT #: 2013-100
 DESCRIPTION: Addendum #1

SHEET:
E5
 AD01.E5-1