WAUBONSEE COMMUNITY COLLEGE

INVITATION FOR BID (IFB)

04-18-004 Electrical Arc Flash Study Bid
Monday, April 30, 2018 @ 2:00 p.m.

Waubonsee Community College (WCC) seeks sealed bids from qualified vendors to provide electrical arc flash, thermographic non-intrusive inspection of the distribution switchgear at the Main Plant, Collins Hall, Auditorium, Weigel Hall, Ackerlow Hall and Henning Computer Center located at the Sugar Grove Campus.

A mandatory pre-bid meeting will be held on Friday, April 20, 2018 @ 9:00 a.m. in Bodie Hall, Room 150.

Responses to this IFB shall be submitted in a sealed envelope to the address below. **Envelopes must be clearly identified with the name of the IFB and Due Date/Time.** Proposals received after the date and time specified in this IFB will not be considered.

Theresa Larson, Purchasing Manager
Waubonsee Community College
4S783 State Route 47
Dickson Building Room 259
Sugar Grove, IL 60554-9903

PROPOSED SCHEDULE

IFB Issued	Monday, April 16, 2018
Mandatory Pre-Bid Meeting	Friday, April 20, 2018 at 9:00 a.m.
Last Day for Submittal of Questions	Wednesday, April 25, 2018
Bids Due	Monday, April 30, 2018 at 2:00 p.m.
Recommendation of Award	Wednesday, May 16, 2018

All correspondence or questions concerning the IFB should be addressed to purchasing@waubonsee.edu.

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COLLEGE OVERVIEW

Waubonsee Community College (WCC), located forty-five miles west of Chicago, Illinois, has served more than 250,000 students since its inception. As one of 48 public community colleges in the Illinois Community College System, WCC is governed by a board of trustees composed of seven community members elected from the district at large and a student trustee selected by the student body. WCC serves 22 municipalities, 12 public high school districts and nine private high schools in a five-county, 600-square-mile district with the current district population estimated at 428,120. In order to proactively address student and community needs, WCC has cultivated a learning-centered culture that values, and an infrastructure that advances, continuous quality improvement.

Vision
Waubonsee Community College opens the door of knowledge, sparks imaginations, and enlightens lives through learning. We welcome the diverse abilities, goals, and experiences of individuals standing on the threshold of discovery. Our success is defined by the dreams we help shape, the opportunities we help design, and the futures we help create.

Values
Quality — We constantly redefine what it means to be "the best," seeking to improve in every area and exceed the expectations of those we serve.

Value — We focus every resource directly on the search for learning, creating tangible benefits in everything we do.

Innovation — We are actively engaged on the frontiers of education, continuously improving the learning environment for our students and communities.

Service — We view the world from the perspective of those we serve — anticipating needs and striving to exceed expectations while demonstrating a caring, knowledgeable, consistent connection with each individual every time they meet us.

Accessibility — We remove barriers to learning formed by time, geography, education, culture, experience or beliefs to provide a full range of quality educational opportunities for all who can benefit.

Mission Statement
Waubonsee Community College is a public, comprehensive community college which was organized in 1966, as mandated by the Illinois Public Community College Act, to provide education and training services for individuals in portions of Kane, Kendall, DeKalb, LaSalle and Will counties of District 516. The philosophy of Waubonsee Community College is based on the premise that education is the corner-stone of a literate, democratic society; that learning is a lifelong process; and that the pursuit of knowledge must be supported by institutional policies that demonstrate the values of quality, value, innovation, service and accessibility.

GENERAL REQUIREMENTS

Information

1. Bid documents are available for download from the college's purchasing webpage at **https://www.waubonsee.edu/businesses/purchasing/**.
2. All Bid prices must be good for a period of 60 days from the date of opening.
3. The college reserves the right to award this project to one vendor or split the award based on the best interests of the college.
4. The price bid for each item is the full purchase price, including delivery to destination, rigging expenses, balancing provisions no matter what the cause for imbalance, and includes all transportation and handling charges, premiums on bonds, material or service costs, patent royalties and all other overhead charges of every kind and nature. Unless otherwise specified, prices shall remain firm for the contract period. List all costs individually on a separate sheet.
5. The college will issue a purchase order upon award by the college's Board of Trustees. Invoices will be paid monthly for work completed. The college's payment terms are net 30 days.
6. The Prevailing Wage Act requires contractors and subcontractors to pay laborers, workers and mechanics employed on PUBLIC WORKS construction projects no less than the general prevailing rate of wages (consisting of hourly cash wages plus fringe benefits) for work of a similar character in the county where the work is performed.
7. It is the policy of the board of trustees to encourage the participation of businesses owned by minorities, females and persons with disabilities in contracts the college awards. This policy shall be furthered by complying with the Business Enterprise for Minorities, Females and Persons with Disabilities Act, 30 ILCS 575/0.01 et seq. and by cooperating with the Illinois Business Enterprise Council.

Instructions

1. Provide one (1) original and two (2) copies of your Bid in a sealed envelope.
2. Complete and return the Authorization for Bid and all attachment pages as identified in this bid document.
3. Erasures or changes in bids must be initialed. White-out is NOT permitted.
4. Bids may be withdrawn by written request from Bidder or his agent prior to the date and time established for opening of Bids.
5. A Bid Bond is NOT required for this project.
6. A Performance and Payment Bond is NOT required for this project.
7. Respondents may not contact any college employee to discuss this IFB. **All correspondence or questions concerning the IFB should be addressed to purchasing@waubonsee.edu.**
8. All questions must be submitted in writing and will be responded to by addendum. Do not expect an immediate answer. Include your email address and/or fax number for any necessary communication.
9. Respondents are responsible for checking the college's purchasing webpage for updates to the IFB and will be required to acknowledge receipt of the addenda in the IFB response.
10. All late, faxed or emailed Bids will be rejected.
11. Bids must include a signed Authorization of Bid form, completed certificates and the Business Enterprise Program information page.
12. Provide a minimum of three (3) education client references for similar services performed, preferably services performed for community colleges.

SCOPE OF WORK

Summary
Bid is for electrical arc flash, thermographic non-intrusive inspection of the distribution switchgear at Building W (Auto Body), Bodie Hall and Von Ohlen Hall located at the Sugar Grove Campus.

General
1. Vendors involved in providing servicing under this project require a minimum of five years' experience.

Subcontractors
1. Identify any work to be subcontracted and provide company name, contact information and purpose.
    a. Waubonsee Community College reserves the right to reject any subcontractor.

Approach, Plan of Work and Timeline
1. Waubonsee Community College estimates a start date after May 17, 2018 and completion by June 30, 2018. Firms should identify if this timeline is reasonable or if more time would be required.
2. Include primary and secondary electrical equipment such as substations, switchgear, bus run, transformers, starter disconnects, distribution and motor control centers.
3. Bidder to provide electrician to provide services needed for the study including opening panels or remove front covers so that all connections can be properly inspected.

Execution
1. Perform thermographic nonintrusive inspection of the distribution switchgear in six buildings. The location map provided below depicts the areas to perform the survey.
2. The contractor will provide the necessary materials, staff and equipment to safely perform the inspection in accordance with all state, local and OSHA codes. During the inspection the contractor will properly label all distribution and switch gear with permanent marking per label spec which will include switch identifier and terminology that identifies what is served and specific arc flash nomenclature.
3. The results of the thermographic survey will provide specific action items which may include the need to shut down distribution and perform maintenance or repair to the switch gear or disconnect devices.
4. Opening up the switchgear cabinets to be performed by contracted electricians only.
5. A completed report with detailed information for each building in paper and electronic form is required per this specification.
6. This proposal is based upon the Field Service Representative(s) performing this scope of work during regular working hours Monday through Friday from 8:00 AM to 5:00 PM.

Protection
1. Extreme care shall be taken by Contractor to safeguard all existing facilities, site amenities, utilities, irrigation systems, windows, and vehicles on or around the job site. Damage done to public and/or private property by the Contractor, shall be the responsibility of the Contractor and shall be repaired and/or replaced by Contractor at no additional cost to the college.

2. The Contractor shall use all means to protect existing objects, structures and vegetation. In the event of damage, the Contractor shall immediately make all repairs, replacements and dressings to damaged materials, to the approval of the college, at no additional cost to the college.

Waste and Disposal

1. Contractor shall be responsible for all cleaning required for work under the Contractor's jurisdiction as well as for keeping all work areas, passageways, ramps, stairs and all other areas of the premises free of accumulation of surplus materials, rubbish, debris and scrap which may be caused by the Contractor's operations.
2. Remove rubbish, debris and scrap promptly upon its accumulation and in no event later than the end of each workday. Contractor is responsible for the management and removal of waste materials, including hazardous materials, to be disposed of in accordance with all applicable laws, regulations, codes, rules, and standards.
3. Burning of rubbish or debris is not allowed at the site. Rubbish, debris and scrap is not to be thrown through any window or other opening, or dropped from any great height; it shall be conducted to the ground, to waiting truck(s) or removable container(s) by means of approved chutes or other means of controlled conveyance.
4. Spillages of oil, grease or other liquids that could cause a slippery or otherwise hazardous situation or stain a finished surface shall be cleaned up immediately.
5. If rubbish and debris is not removed, or if surfaces are not cleaned as specified above, the college reserves the right to have said work done by others and the related cost(s) will be deducted from monies due the Contractor.

GENERAL SPECIFICATIONS

1.1 DESCRIPTION

A. Waubonsee Community College desires the professional services to implement an arc flash hazard program to supplement/enhance our existing electrical safety program, provide additional safety measures for our employees and contractors, and provide compliance with OSHA and recognized industry standards of NFPA 70E. Waubonsee desires to retain a qualified professional/engineering firm to assist in the development and implementation of the arc flash and protection coordination study. Waubonsee desires that the successful firm will provide WCC with the following:

1. An electrical arc flash hazard analysis, including:

   a) The development of an up-to-date electrical system one-line diagram and model with an accurate representation of the installed electrical system performed and stamped by a professional engineer (PE).

   b) Determination of all possible system operating modes and conditions that can impact short circuit currents and arc flash hazard energy levels.

   c) Short circuit and equipment duty study to verify that equipment is rated to safely handle short circuit currents without creating hazardous conditions.

   d) Protective device coordination study and analysis to help ensure proper electrical system reliability and to determine if arc flash hazard energy levels can be reduced.

   e) Arc flash hazard assessment for locations and/or equipment where workers are exposed to the risk. Provide Arc flash hazard analysis study to

determine incident energies, hazard/risk categories for all equipment and Personal Protective Equipment (PPE).

f) Recommendations and modifications to reduce incident energies. Recalculate values as required.

g) A copy of the power system model and electronic file that is fully compatible with arc flash and electrical safety program implementation software.

2. Support services for implementation of the arc flash analysis at the Sugar Grove Facilities, including:

a) The completed engineered Power System Model, Single Line Diagrams, Arc Flash Analysis and Protection Coordination Study will be provided by the contractor to Waubonsee Community College for use at a later date in its native software format.(SKM, E-Tap…etc.)

b) A copy of the modeling software/program.

c) The reports will be delivered in Word document format. The data will be delivered in Excel format and the drawings in PDF format and CAD.

d) Field data collection will be required.

e) Arc flash hazard labeling is required.

f) Arc flash and electrical safety training shall be by Waubonsee Community College.

g) Personal Protective Equipment (PPE) training shall be by WCC.

h) Consulting services to assist Waubonsee Community College with development of safe work practices and procedures shall be by others.

B. An electrical arc flash hazard analysis shall be performed for the Sugar Grove Campus to determine incident energy, arc flash protection boundaries, and required PPE for all electrical equipment. The calculations shall comply with NFPA-70E 2009, and IEEE-1584 except as noted and performed and stamped by a professional electrical engineer (PE).

C. The purpose of this study is to provide a comprehensive software model of the Sugar Grove campus electrical systems to comply with the following standards and requirements:

- NFPA 70, National Electric Code 2008 (110.16)
- NEC 2008 Handbook
- OSHA 29 CFR 1910.269; OSHA 1910.132(d)(1)
- IEEE Std 1584-2002, IEEE Guide for Performing Arc-Flash Hazard Calculations and IEEE Std. 1584a-2004 (Amendment 1)
- NFPA 70E, Standard for Electrical Safety in the Workplace 2009 Edition

This arc flash model will serve as an integral part of an ongoing safety program by providing integral work permits and arc flash calculations in compliance with NFPA-70E 2009 Article 130.1, and 130.3 for each piece of electrical equipment in the Waubonsee Community College Sugar Grove Campus.

1. **NFPA-70E (2009 Edition) Article 205.2, 120.2(F)(1):** Updated and verified one- line diagram for all electrical distribution voltages including all sources for lock- out and tag out procedures.

2. **NFPA-70E (2009 Edition) Article 210.3, 210.5:** Updated short circuit and equipment duty verification study showing all electrical equipment is properly rated to withstand and interrupt the available short circuit duty per ANSI Standards and NEMA/UL/NEC requirements.

3. **NFPA-70E (2004) Article 400.6, 410.9:** (Removed in 70E 2009 but should be referenced for a complete specification). Updated protective device coordination study showing the system protective devices are properly set to coordinate and clear a fault without extensive equipment damage or personnel risk.

4. **NFPA-70E (2009 Edition) Article 130.3, 110.8(B)(1)(b):** Updated arc flash study providing maximum incident energies, arc flash boundaries, and PPE requirements for each equipment in the system.

5. **NFPA-70E (2009 Edition) Article 130.3(C):** Updated labeling displaying the worst-case arc hazard values for each equipment.

D. The analysis shall consist of the following:

1. Field data collection by qualified personnel (as defined by NFPA 70E).
2. Data entry and system one-line modeling in commercially available power system software. (SKM version 6.5 or equivalent)
3. Model verification.
4. Short Circuit and equipment verification study.
5. Protective device coordination study.
6. Arc flash hazard study.
7. Detailed report and findings of the analysis.
8. Electronic copies of the Project Report and the System Modeling File.
9. Review of a draft copy of the report and presentation of the final copy of the report in person, via teleconference, or web conference.
10. Hard copies of the project report (note all printing, postage, etc.) shall be included in proposed project pricing.

E. The analysis and procedures shall comply with the following standards and recommended practices for power system studies.

1. NFPA-70E, 2009 Standard for Electrical Safety in the Workplace
2. IEEE-1584-2002
3. IEEE-242 “Buff Book” Protection and Coordination of Industrial Power Systems
4. IEEE-399 “Brown Book” Power System Analysis
5. IEEE-141 “Red Book” Electric Power Distribution for Industrial Plants

1.2 DATA COLLECTION

Field data collection shall be performed by a qualified, as defined by NFPA 70E – 2009, consultant/contractor to ensure accurate equipment modeling.

A. Consultant/contractor field personnel shall have up-to-date training in electrical safety and shall supply and utilize their own Personal Protective Equipment for electrical shock hazards

and arc flash hazards. Consultant/contractor shall provide an Energized Work Permit or job safety analysis for all field work where live parts are exposed. Waubonsee personnel shall not be responsible for reviewing or evaluating successful consultant/contractors safety program for suitability.

B. Consultant/contractor shall obtain all Waubonsee safety requirements, permits and reviews and shall comply with all Waubonsee work permits, work procedures & safety protocols.

C. Field data collection and system modeling shall be based on the system represented by the one-line drawings provided by Waubonsee.

1. For the purposes of this proposal any existing drawings shall represent the Waubonsee Sugar Grove campus, but are not deemed complete or accurate. It is estimated that approximately 50% of the drawings represent conditions in the 1970's and the remaining 50% represents conditions in the 1980's or later. Consultant/contractor shall take this into account when providing study pricing for the arc flash study.
2. The attached preliminary listing of substations, panels, motor control centers, motor control panels and electrical equipment was developed based on site inspections by Waubonsee Community College. This document is indented to provide a general magnitude of scope. The Consultant/contractor shall include allowance in the project pricing to provide a complete study of the actual electrical distribution systems.

D. Equipment shall be visually inspected to collect the necessary nameplate data used in the analysis. Consultant/contractor is responsible for visual verification of this data, including transformers, switchgear and breakers, relays, direct-acting trip units, etc. Data that may not be readily accessible or may not have nameplate data such as conductors, bus way, etc. can be taken from drawings when available.

E. Waubonsee Community College will provide personnel to escort the Consultant/contractor throughout the Sugar Grove Campus However, it is expected that the Consultant/contractor's qualified personnel (or sub-contracted qualified personnel) will identify equipment location and open all equipment doors, locks, interlocks etc. necessary to collect nameplate data.

F. Any and all outages required to gather field data will be prearranged with WCC.

G. Where equipment data is available from the plant/facility on updated drawings, consultant/contractor may use this data in building the model, but shall field verify information.

Data collection shall include the step down transformer from the utility service (including primary relaying) down through each motor control center (MCC) and 120/208 volt panel for all systems including those served by transformers rated less than 125 kVA as per IEEE-1584-2002.

H. Consultant/contractor shall obtain from the utility the minimum, normal, and maximum operating service voltage levels, three-phase short circuit MVA and X/R ratio, as well as line-to-ground short circuit MVA and X/R ratio at the point of connection as shown on the drawings.

I. Consultant/contractor shall comply with all of the consultant/contractor safety program requirements and the plant/facility safety regulations during field data collection. Waubonsee Community College shall not be responsible for development of consultant/contractor safety program or safety procedures utilized during the data gathering process. A minimum of HRC #2 PPE rated 8 cal/cm2 or greater shall be worn by field data collection personnel at all times when exposed to energized electrical equipment.

1.3 SYSTEM MODELING

A. The system model shall be developed using SKM software package or equivalent that meets the performance specifications developed in this Section. To ensure compliance with NFPA-70E 2009, ANSI, and IEEE Standards, and OSHA mandates, no exceptions or substitutions to the performance specification are allowed.

B. The system model shall be laid out in one drawing per plant and in a manner that provides for easy viewing of all analysis results. The one drawing requirement ensures that problem areas found and highlighted by the program are easily seen and not hidden or buried in multiple drawings, eliminating potential human errors where multiple drawing verification is required.

C. All one-line symbols shall be spaced properly to facilitate viewing results on the one-line.

D. Equipment names used in the modeling software shall be identical to the equipment and naming convention shown on the existing facility drawings and equipment unless conflicts exist. Consultant/contractor shall bring all naming convention conflicts or deficiencies to the attention of Waubonsee facility staff members for clarification.

E. Waubonsee Community College may have multiple operating conditions, including, but not limited to, generation on/off, shutdown, bus-ties, start-up, emergency operation, etc. Consultant/contractor shall discuss facility operation with designated Waubonsee facility personnel to determine the possible operating modes of the system. Each of the operating modes shall be documented and modeled in the software in order to determine the worst-case arc flash hazard and associated parameters for the electrical equipment.

F. The software shall model each operating mode in a manner such that each mode is a scenario or change case from the base case.

G. The file shall be self-contained and have all necessary information to describe the one-line, system data, settings, and analysis information.

H. Lumped low voltage motor groups for MCC’s shall be modeled per IEEE standards using groups less than 50 Hp. Low voltage motors rated more than 50HP shall be modeled individually. Where motor list data is not available, single lumped groups may be modeled per IEEE-141 “Red Book”.

I. All low voltage power circuit breaker (LVPCB), insulated case (ICCB), molded case (MCCB) and fuse data shall be modeled based on the actual nameplate data including manufacturer, type, style, trip device, and actual settings. Generic substitutions or assumptions shall not be allowed unless data cannot be field verified. All assumptions shall be documented in the report.

J. All relay data shall be modeled based on the actual nameplate data including manufacturer, type, style, trip device, and actual settings. Generic substitutions or assumptions shall not be allowed unless data cannot be field verified. All assumptions shall be documented in the report.

K. All relay types for the distribution system shall be modeled on the one-line diagram (and database) including phase and ground overcurrent, differential, residual, ground neutral, etc. to establish a complete and detailed system model where protective device data can be easily modified and updated by the facility and all data is available for a comprehensive protective device coordination study if required in the future.

L. Relay models shall depict the actual connection requirements. Programs using generic CT and overcurrent symbols as shown are not acceptable since they do not depict the actual protective system and can lead to confusion in determining arc flash results and proper protective device modeling.

M. All equipment modeling must have a corresponding one-line diagram symbol. This means that there can be no hidden database models. The purpose is for Waubonsee Community College to easily see all equipment, its associated data, to be able to link documents to the equipment as a data repository, etc. and to see problems right on the one-line.

N. All system modeling shall conform to the accepted modeling practices as outlined in IEEE-399 “Brown Book”. Contractor/consultant may provide more advanced modeling techniques where compliance with the specification is maintained.

1.4 MODEL VERIFICATION

A. The system model shall be verified by reviewing the results of short circuit current flows for all buses/equipment in the system. The results shall be viewed on each branch and total flow into a bus/equipment on the system one-line diagram. The purpose is to visually check all buses/equipment with the expected amount of short circuit current, identify and correct any problem areas.

1.5 SHORT CIRCUIT STUDY

A. A short circuit study shall be performed to verify all equipment duties in the system.

B. The calculations shall comply with ANSI C37.010, C37.13, C37.5, IEEE-141, and IEEE-399. The short circuit study shall verify the system electrical equipment is properly rated to

withstand and interrupt the expected bolted and arcing faults in the system. Improperly rated and applied equipment may not protect personnel against arc flash hazards even if properly applied PPE is used.

C. The equipment duty verification shall determine both the line side and load side fault current through each equipment and use the highest current to verify equipment ratings. Standard bus faults are not acceptable for protective devices in that they do not accurately model the current through the device and consequently they provide erroneous results. For solidly grounded systems, both three-phase and single-line- to-ground faults should be modeled. For other grounding configurations only a three-phase fault is required.

D. Equipment duty results shall be graphically displayed on the electrical one-line as well as tabular report format.

E. The results of the equipment duty verification tabular format report shall provide the following data:

1. Equipment name and kV
2. Manufacture, type, style, and ratings of the device
3. Actual line or load side currents through the device and percent over/under duty
4. Flag any devices showing VIOLATION or WARNING level for visual identification on the report.

F. A report of all problem areas shall be provided. Consultant/contractor shall notify WCC facility personnel immediately of all problems found in the system before proceeding in the study. A recommended action list shall be provided for all underrated equipment in the system.

1.6 PROTECTIVE DEVICE COORDINATION (PDC) STUDY

A. A PDC study shall be performed in order to determine if the system protection characteristics are sufficient to provide reliable power to the facilities. The PDC study will also determine if the existing settings entered in the software will provide proper personnel protection in the arc flash portion of this study. For facilities/buildings where the main distribution is low voltage (under 600 volts) and only instantaneous breakers or fuses are used, this section may not apply.

B. The PDC study shall consist of selecting major system feeders and plotting the time-current curves (TCC's) to verify proper selective operation of the protective devices. The study should also determine if the settings can be enhanced to provide increased personnel/equipment protection without sacrificing selective coordination. It is expected that the protective device coordination include all substation/building distribution equipment and major feeders.

C. The consultant/contractor shall notify WCC facility staff of any potential problems in the protective device settings that affect either selective operation and reliability or personnel protection and shall provide recommendations for changes to the settings in writing before continuing with the study. The WCC facility personnel (Dan Larsen, Ed Plante) may then opt to utilize existing settings or to change the settings before continuing on with the arc flash study.

D. As specified in the data collection and modeling sections, all PDC data shall be modeled on the one-line diagram and in the equipment database.

E. The consultant/contractor shall contact the serving utility and obtain protective device settings for all service entrance overcurrent devices in series with the facility and affecting coordination with facilities distribution system.

F. The TCC's shall graphically illustrate on log-log paper that adequate time separation exists between series devices. The specific time current characteristics of each protective device shall be plotted in such a manner that sufficient upstream devices will be clearly depicted on one sheet to prove selective coordination.

1. TCC's shall include a system one-line diagram and protective device coordination curves for each device in the selected area. The TCC shall be printed in color on 8 ½ x 11" paper – full size portrait mode, using a log-log scale. The one-line diagram shall be part of the TCC and include all protective devices, equipment names, and short circuit currents calculated from the main one-line. The purpose of this requirement is to provide all necessary information on one sheet, in a format easily readable and standard to the industry.
2. For low voltage systems, TCC's shall be developed for both phase and ground protective devices. One phase and one ground TCC should be developed for each system. The TCC should show the largest feeder/motor protective device in the MCC or panel up through the switchgear/switchboard feeder breaker, transformer secondary main, substation primary fuse, and medium voltage feeder breaker. For secondary switchboards serving large loads or a wide variety of loads that may affect upstream coordination, additional TCC's may be required.
3. The following specific information shall also be shown on the coordination curves:
    a) Device identification
    b) Voltage and current ratio for curves
    c) Transformer three phase and single-line-to-ground ANSI damage curves
    d) Transformer inrush points
    e) Minimum melting, and clearing curves for fuses, and if available the no-damage curve
    f) Cable damage curves
    g) Motor starting locked rotor curves, and if available the motor locked rotor damage point
    h) Maximum short circuit cut-off point
    i) Clearly marked short circuit current levels through each protective device/branch, which should be based on the appropriate current through the device, i.e. Momentary, Interrupting or 30 Cycle current
    j) Protective device one-line diagram clearly showing all protective devices on the time-current curve, labels for each device, open breakers, faulted buses, and the short circuit current flowing in each branch.

k) Each TCC sheet shall have appropriate identification and a one-line diagram that applies to the specific portion of the system associated with time-current curves on that sheet.

l) Each protective device curve shall be terminated at a point reflecting maximum symmetrical or asymmetrical fault current through the device.

m) Identify the device associated with each curve by manufacturer type, function, and setting – i.e. tap, time delay, and instantaneous, pickup, etc.

n) Primary Protective Device Settings for Delta-Wye Connected Transformer:

(1) Secondary Line-To-Ground Fault Protection: Provide primary protective device operating band within the transformer's characteristics curve, including a point equal to 58 percent of ANSI C57.12.00 withstand point.

(2) Secondary Line-To-Line Faults: Provide 16 percent current margin between primary protective devices and associated secondary device characteristic curves.

o) o. Typical time separations for curves:

Consultant/contractor shall discuss the advantages and disadvantages of various time separation settings between device curves with WCC facility personnel to help determine how the system settings shall be optimized for selectivity and arc flash hazard reduction.

G. A setting table shall be developed to summarize the settings selected/existing for the protective devices. The table shall include the following:

1. Device identification

2. For low voltage breakers, the circuit breaker manufacturer, type, and style, sensor rating, long-time, short time, instantaneous settings, and time bands. For breakers with ground fault capability, the pickup and time delay

3. Fuse manufacturer, type, style, and rating

4. Protective relay manufacturer, type, style, function (51, 50, 67, etc.) pickup, current multiplier, time dial, and delay for multi-function units, list all devices being used. Include the CT and/or PT ratios for each function

H. The software shall provide complete integration of the one-line, database, short circuit, protective device coordination and arc flash analysis functions to provide accurate calculations and avoid errors and inefficiencies associated with multiple data entry programs. Programs using separate PDC or TCC plotting packages are not allowed.

1.7 ARC FLASH STUDY

A. A detailed arc flash study shall be performed to determine potential arc flash incident energies, arc flash boundaries, shock hazard boundaries and proper personal protective equipment (PPE) for all energized electrical system equipment tasks for the electrical systems studied. The calculations shall comply with NFPA-70E 2009, and IEEE-1584. Bolted short circuit

calculations used in the above standards shall comply with ANSI C37.010, C37.13, C37.5, IEEE-141, and IEEE-399. The purpose of this study is to determine arc flash hazards in conformance with NFPA-70E and WCC's safety program, and to provide a comprehensive software model of the electrical distribution system, which provides integral work permits and arc flash calculations in compliance with NFPA 70E Articles 130.1 and 130.3 for all equipment in the facility. The software program used in this study shall comply with the above standards. No substitutions in calculation methods will be allowed.

B. The arc flash study shall determine the following results for each system mode of operation developed in Section 1.3E (Modeling). The results shall be provided in spreadsheet format for each mode and electrical system location to provide easy viewing and comparison. Worst-case arc flash energy levels shall be flagged and the spreadsheet comparison table shall be capable of providing its output directly to high quality vinyl label printers. The calculations shall, as a minimum, include a comparison of both 100% and 85% arcing currents for low voltage equipment for each electrical system configuration or operating mode, indicating worst-case arc flash hazards. The spreadsheet results shall include:

1. Equipment name and voltage
2. Upstream equipment device name and ANSI function, i.e. 51/50, etc.
3. Equipment type, i.e. switchgear, MCC, Panel, VFD, etc.
4. Equipment arc gap
5. Bolted and estimated arcing fault current at the fault point (equipment) in symmetrical amperes. The estimated arcing current should be based on the arcing current equations used.
6. Trip time, opening time, and total clearing time (total Arc time) of the protective device
7. Worst-case arc flash boundary for each bus/equipment in the model
8. Worst-case arc flash hazard incident energy in cal/cm2 for each bus/equipment in the model
9. Worst-case personal protective equipment (PPE) for each bus/equipment in the model
10. Working distances for up to five different distances showing items 7, 8, and 9 for each distance
11. Indicate "Danger/Hazardous" areas where incident energy is greater than 40 cal/cm^2 and provide recommendations to reduced arc flash energy levels for these areas
12. Flag results where 85% arcing current provided worst-case results

C. Each mode of operation shall include a detailed write-up indicating areas where incident energy calculations and PPE requirements are higher than calculated in the normal operating mode.

D. Consultant/contractor shall provide a detailed arc flash analysis report including as a minimum:

1. Introduction
2. Methodology

3. Information Sources
4. Assumptions including generic substitutions when data cannot be field verified. This type of assumptions shall be documented in the report.
5. Arc Flash Energy and other consideration for various System Modes of Operation (maintenance mode, bus-tie, co-gen on/off, etc.)
6. Arc Energy at 100% and reduced currents
7. IEEE 1584-2002 Considerations.
8. Overcurrent Protective Device Changes, Replacements or Setting Changes implemented in study to reduce arc flash hazard exposure.
9. Explanation of Data in Arc Flash Hazard Report Tables
10. NFPA 70E Information
    a) Shock Hazards with covers removed.
    b) Shock Hazard Approach Boundaries.
        (1) Limited Approach Boundary
        (2) Restricted Approach Boundary
        (3) 3) Prohibited Approach Boundary
    c) Arc Flash Hazard Boundaries

11. Results of Arc Flash Hazard Analysis for high voltage, medium voltage and low voltage systems, including:
    a) Working distances.
    b) Energy Levels
    c) PPE Requirements
    d) Recommendations to reduce arc flash hazard energy and exposure.

12. Arc Flash Hazard Report
    a) 3 Hard Copies
    b) 1 Electronic Copy in WORD or Excel format and PDF (5.0 or later)
    c) 1 Electronic copy in latest version of SKM format or its native software

13. Electronic file for Power System Modeling Software as developed and utilized for this analysis.

E. Contractor shall provide print labels for Waubonsee for all equipment in the system from the project study file. Assume two (2) labels per equipment/bus in your estimate using 4" x 6" labels. The labels shall be UV resistant vinyl labels (white with orange warning strip and black letters) conforming to ANSI-Z 535. The labels shall be printable directly from the power system software utilized for the study. Labels installed by the contractor.

F. The software shall provide complete integration of the one-line, database, short circuit and PDC and Arc flash functions. Software using separate short circuit, PDC, TCC or arc flash programs is not allowed. Spreadsheet calculations are not allowed. The purpose of this section is to ensure that the arc flash hazard calculations comply with NFPA-70E and IEEE-1584, and that the calculations are programmed with necessary requirements to help eliminate possible errors in the arc flash Calculations. The additional purpose is to establish a detailed software model of the

Sugar Grove Campus electrical distribution systems, which will document Waubonsee Community College compliance with the OSHA requirements and NFPA 70E mandates. This model will serve as an integral part of Wabaunsee's safety program by providing integral work permits and arc flash calculations in compliance with NFPA-70E Article 130.1(A)(2) for each electrical equipment in the facility.

1. Arc flash calculations shall be performed with enhanced IEEE-1584 equations, which eliminate voltage discontinuities and the non-conservative/average results of the standard equations. The purpose of this requirement is to ensure that the calculated incident energies are closer to actual test results insuring a conservative calculation minimizing personnel risk.
2. Arc flash calculations shall be based on the fastest clearing upstream protective device protecting the equipment for single sources and the slowest upstream protective device for multiple sources. The calculations shall automatically compare all series and parallel upstream protective devices in the system to determine the fastest series device or a conservative parallel clearing time.
3. The arc flash calculations shall include arc flash boundary, incident energy, PPE Requirements, and working distances.
4. The arc flash calculations shall include calculations for all operating modes to ensure the worse arc flash magnitude.
5. The arc flash calculations shall provide integral "Work Tasks" for the listed equipment types. The tasks shall be derived from 70E Table 130.7(C)(9)(a) and be specific to the equipment type. Listed equipment types shall include:
    a) Switchgear, Switchboards, Panelboards, MCC, VFD, UPS, ATS, Interrupting Switch, NEMA E2 Contactor, Conductor, Open Air for 100-200 volt equipment.
    b) Switchgear, Switchboards, Panelboards, MCC, VFD, UPS, ATS, Interrupting Switch, NEMA E2 Contactor, Conductor, Open Air for 200-1000 volt equipment.

6. Work Tasks shall have a user-defined library that provides the following customizable features for each work task:
    a) Work Tasks for each specific equipment type and voltage range b. Working distance units English
    b) Work distance for each task
    c) V-rated gloves and tool requirements
    d) Job description and procedures
    e) Safe work practices description
    f) Hazard Risk Category (HRC) reduction - HRC reduction can only be used based on a documented risk assessment as an integral part of a safety program.

1.8 REPORTING AND ANALYSIS SUMMARY

Provide a detailed written report that includes the following:

A. Executive Summary: The executive summary shall cover, at an executive level, the findings of the study, recommendations, and requirements for maintaining NFPA-70E compliance.

B. Identify all assumptions regarding data collection and modeling including generic substitutions when data cannot be field verified. All assumptions must also be verified with Waubonsee facility personnel for approval prior to final calculations/analysis.

C. A statement of the scope that shall provide details of what actions were intended to be performed for each aspect of the study, including short circuit, protective device coordination, and arc flash.

D. Description of system and explanation of bus and branch numbering system.

E. A statement of the modes of operation that were studied and each scenario/plant operating condition shall be thoroughly documented.

F. Detailed report and results of short circuit, coordination, and arc flash studies including:
1. Recommendations and additions to equipment rating and/or PDC characteristics
2. Recommendations to reduce arc flash hazards for equipment with incident energies over 40 cal/cm^2

G. The report shall document all identified problem areas. A recommended action list shall be provided for all underrated equipment in the system. The report also documents any potential problems, which have already been notified and discussed with WCC personnel, regarding protective device settings that affect either selective operation and reliability or personnel protection. The recommended changes to the settings are also documented in this report to provide increased personnel/equipment protection without sacrificing selective coordination.

H. Prioritized recommendations for all studies

I. Action list and check off column for all recommendations

1.9 SUBMITTALS

A. Three (3) printed copies (hardcopies) of the completed study report shall be provided and two (2) digital copies, one in Microsoft Word or Excel and one in Adobe Acrobat PDF format.

B. The contractor shall conduct two meetings with WCC to review a draft copy of the report and to discuss the final report. Teleconferencing or web conferencing is acceptable.

C. The Contractor will provide updated Distribution One Line drawings as a part of submittal meeting.

1.10 QUALITY ASSURANCE

A. The studies shall be in conformance with the NFPA and ANSI Standards, and IEEE recommended practices detailed in this section. No substitutions in study methods or software conformance will be allowed.

B. Consultant/contractor shall attach brochures, resumes, references and other information indicating how your firm is qualified to provide the services outlined in this document.

C. The consultant/contractor is responsible for compliance with all performance specifications in this proposal. Any deviation from complete compliance must be noted on the consultant/contractor's proposal and the performance specification submitted for review and approved before work begins. All work not in compliance with the performance specification will be deemed unacceptable and payment withheld or work terminated without pay.

D. Consultant/contractor shall indicate compliance with WCC insurance requirements.

E. The analysis shall be prepared with the SKM power system modeling software or equivalent that meets with WCC approval.

1.11 PROJECT TIMELINE

Provide a proposed project timeline with your specification response. Timeline shall include contract award date; on-site data collection timeframe, system model development and analysis timeframe, draft report presentation and final report presentation.

WAUBONSEE COMMUNITY COLLEGE

Sample Table:

ARC FLASH HAZARD ANALYSIS TABLE
WAUBONSEE COMM. COLLEGE - SUGAR GROVE, IL BASED ON AS-FOUND SETTINGS

ID	kV	Type	Bus Gap (mm)	Grounding	Working Distance (in)	Output Rpt.	**Total Energy (cal/cm2)**	**AFB (ft)**	Final FCT (sec)	Ia at FCT (kA)	Source PD ID	Total Ibf at FCT (kA)	Trip Time (sec)	Open Time (sec)
0666 ATS -GEN PNL	0.480	Panelboard	25	Grounded	18	AF-GEN	13.57	6.6	2.000	2.14	0666-01 ATS GEN FDR MAINS	3.10	2.000	0.000
0777 SSR DISC	0.480	Panelboard	25	Grounded	18	AF-GEN	13.57	6.6	2.000	2.14	0666-01 ATS GEN FDR MAINS	3.10	2.000	0.000
0888 MAIN DC	0.480	Panelboard	25	Grounded	18	AF-MAX	172	30.9	2.000	24.09		45.86	2.000	0.000
0999 MAIN PLANT GEAR PRIM	0.480	Panelboard	25	Grounded	18	AF-MAX	164	30.0	2.000	23.06	0999-01 MAIN PLANT PRIMAR	43.59	2.000	0.000
1000 MAIN PNLT SWBD	0.480	Panelboard	25	Grounded	18	AF-MAX	164	30.0	2.000	23.06	0999-01 MAIN PLANT PRIMAR	43.59	2.000	0.000
1044 UNKNOWN SW	0.208	Panelboard	25	Grounded	18	AF-MAX	44	13.5	2.000	6.84	1050-04 WLDG SHOP FDR	19.06	2.000	0.000
1045 UNKNOWN	0.208	Panelboard	25	Grounded	18	AF-MAX	0.21	0.5	0.010	6.63	1044-02 UNKNOWN FDR	18.22	0.010	0.000
1046 HEAT SW	0.208	Panelboard	25	Grounded	18	AF-MAX	37.21	12.2	2.000	5.85	1050-04 WLDG SHOP FDR	15.26	2.000	0.000
1047 PHY-PH SW	0.208	Panelboard	25	Grounded	18	AF-MAX	44	13.4	2.000	6.79	1050-04 WLDG SHOP FDR	18.84	2.000	0.000
1050 PDP-3	0.480	Panelboard	25	Grounded	18	AF-LOW	15.32	7.1	0.427	10.76	1000-02 PDP-3 FDR	21.58	0.427	0.000
1051 PNL A DISC	0.208	Panelboard	25	Grounded	18	AF-MAX	1.20	1.5		2.24		3.88		0.000
1052 PNL R DISC	0.208	Panelboard	25	Grounded	18	AF-MAX	1.20	1.5		2.24		3.88		0.000
1053 PNL P DISC	0.208	Panelboard	25	Grounded	18	AF-MAX	1.20	1.5		2.24		3.88		0.000
1054 PNL N DISC	0.208	Panelboard	25	Grounded	18	AF-MAX	1.20	1.5		2.24		3.88		0.000
1055 PNLT	0.480	Panelboard	25	Grounded	18	AF-MAX	0.30	0.6	0.010	9.01	1050-03 PNL T FDR	14.51	0.010	0.000
1060 WELD XFER SEC PNL	0.208	Panelboard	25	Grounded	18	AF-MAX	46	13.8	2.000	7.07	1050-04 WLDG SHOP FDR	19.97	2.000	0.000
1061 BD-S WELDSHOP	0.208	Panelboard	25	Grounded	18	AF-MAX	38.15	12.3	2.000	5.99	1050-04 WLDG SHOP FDR	15.77	2.000	0.000

1062 BD-F WELDSHOP-AC1	0.208	Panelboard	25	Grounded	18	AF-MAX	33.73	11.5	2.000	5.34		13.41	2.000	0.000
1063 HEAT PNL	0.208	Panelboard	25	Grounded	18	AF-LOW	0.17	0.5	0.010	5.42	1060-04 HEAT FDR	13.66	0.010	0.000
1064 PHY-TH-1 PNL	0.208	Panelboard	25	Grounded	18	AF-LOW	0.18	0.5	0.014	4.23	1060-05 PHY-TH-1 FDR	12.13	0.014	0.000
1065 DC BUS	0.480	Panelboard	25	Grounded	18	AF-MAX	0.42	0.8	0.010	12.41	1050-05 XFER SHOP	21.11	0.010	0.000
1066 LNC BUS WAY	0.208	Panelboard	25	Grounded	18	AF-MAX	19.62	8.2	2.000	3.24	1050-05 XFER SHOP	6.56	2.000	0.000
1067 PNL VW	0.208	Panelboard	25	Grounded	18	AF-LOW	1.20	1.5		2.21		3.81		0.000
1068 PNL B (OLD K)	0.480	Panelboard	25	Grounded	18	AF-MAX	0.55	0.9	0.010	15.93	1050-07 PNL B FDR	28.27	0.010	0.000
1070 XFER SEC.	0.208	Panelboard	25	Grounded	18	AF-LOW	1.20	1.5		2.22		3.84		0.000
1071 PNL A	0.208	Panelboard	25	Grounded	18	AF-LOW	1.20	1.5		1.78		2.80		0.000
1071 PNL A(OLD L)	0.208	Panelboard	25	Grounded	18	AF-MAX	1.20	1.5		1.82		2.89		0.000
1072 PNL R	0.208	Panelboard	25	Grounded	18	AF-LOW	1.20	1.5		1.66		2.53		0.000
1073 PNL P	0.208	Panelboard	25	Grounded	18	AF-LOW	1.20	1.5		1.66		2.53		0.000
1074 PNL N	0.208	Panelboard	25	Grounded	18	AF-LOW	1.20	1.5		2.18		3.74		0.000
1075 COLLINS MAIN DISC	0.480	Panelboard	25	Grounded	18	AF-LOW	33.47	11.4	1.708	6.14	1000-03 PDP-1 FDR	11.20	1.708	0.000
1076 WELD SHOP	0.480	Panelboard	25	Grounded	18	AF-MAX	0.59	1.0	0.010	17.11	1050-08 WELD FDR	30.74	0.010	0.000
1077 CNC RM SW	0.480	Panelboard	25	Grounded	18	AF-MAX	0.34	0.7	0.010	10.25	1076-01 CNC RM DISC	16.87	0.010	0.000
1078 CNC RM	0.208	Panelboard	25	Grounded	18	AF-LOW	1.20	1.5		1.53		2.27		0.000
1080 PDP#1	0.480	Panelboard	25	Grounded	18	AF-LOW	33.93	11.5	1.738	6.12	1075-02 COLLINS SW	11.15	1.738	0.000
1081 ELEV 2	0.480	Panelboard	25	Grounded	18	AF-MAX	0.27	0.6	0.010	8.12	1080-02 ELEV FDR	12.84	0.010	0.000

1.12 POWER SYSTEM ENGINEERING ARC FLASH LABELING PRACTICE

A. SCHEDULE FOR INFRARED SCAN

Equipment to be maintained:

- **Building W:**
  - Panelboards: 5
  - Disconnect: 10

- **Bodie Hall**:
  - Main Disconnect: 1
  - Panelboards: 13
  - Disconnect: 4

- **Von Ohlen:**
  - Panelboards: 12
  - Disconnect: 10
  - Motors: 4

1.12 INFRARED SCANNING

A. Note: Proper infrared scanning of electrical power systems requires that the system be energized and under normal load. WARNING: Infrared scanning of energized electrical systems poses potential safety hazards for the person performing the scan, the person(s) opening/removing covers and any other persons working within the limited approach boundary (often 10 feet or further) of the work area. A proper job briefing, safety review and job hazard analysis are required prior to commencing work. ***All relevant safe work practices must be strictly adhered to.***

1. Visual and Mechanical Inspection

   a) Document equipment nameplate data on test report.

   b) Visually inspect equipment prior to removal of covers or opening doors to determine if any obvious signs of impending mechanical failure or deterioration indicate it may not be safe to proceed. Document any deficiencies.

2. Infrared Scan

   a) Gain access to equipment to be scanned by opening hinged covers or removal of bolted covers. This is to be performed by contracted electricians provided by chosen vendor once awarded project.

   b) Perform infrared scan in accordance with operating procedures for the specific scanning equipment utilized.

   c) For equipment indicating abnormal temperatures, attempt to determine equipment loading or take current measurements when it is safe to do so, document findings.

d) Record a thermal and visual light picture for all devices that have been scanned. Identify photos that of out of tolerance and document severity.

e) Prepare a final report including list of scanned equipment, out of tolerance conditions and recommendations for any required corrective actions.

f) Contractor to provide up dated riser line diagrams for Bodie, Von Ohlen, Von Ohlen Boiler Room and Auto body.

g) Provide documented photo and report binder with an electronic version at closing.

3. **Report** Contents

a) Prioritized Recommendations: Critical, Serious, Advisory

b) Quantified potential annual energy $ savings upon recommendation completion**

c) Individual recommendation details, suggested corrective action, and accompanying IR

d) Anomaly and control photo.

e) Housekeeping recommendations with accompanying control photos

f) Inventory list of surveyed equipment.

g) Provide a written and electronic version, report and specifics of Job details with Photos.

WAUBONSEE COMMUNITY COLLEGE - STANDARD TERMS AND CONDITIONS

Legal Entity: Waubonsee Community College District 516, commonly known as Waubonsee Community College is described herein as "Buyer" or "WCC".
Seller: The "Seller" means any person, business or entity designated on this purchase order or contracted to provide "Deliverables." Deliverables means the tangible and/or intangible personal property, product, service, software, information technology, telecommunications technology, apparatus, equipment, supplies, repairs, or other goods delivered pursuant to this purchase order, including items incident to the provision of services.
Limitation of Authority: All purchases shall be made in accordance with Illinois law. No officer or employee of WCC not expressly authorized under Illinois law, shall make any purchase on its behalf, or enter into any contract of purchase, verbal or written, for any Deliverable of any kind or description, or accept any of them on approval or otherwise. Seller is directed to applicable Illinois law to verify the authority of any person purportedly signing on behalf of the Legal Entity. The Buyer will not be responsible for articles delivered and/or services performed for its account without a specific written purchase order that has been authorized by the Purchasing Manager.
Governing Law and Limitation of Liability: This Agreement shall be governed and construed in accordance with the law of Illinois without reference to its conflict of laws and/or provisions. It is the intent of the parties that arbitration and mediation shall not be a remedy or prerequisite required by this contract, and any reference to "arbitration" or "mediation" contained in any contract or agreement resulting from the execution of this Purchase Order is void and of no legal effect. The parties waive any right to demand a trial by Jury and agree that the venue for litigation arising from this Purchase Order or any Contract or Agreement entered into subsequent to the execution of this Purchase Order shall be in the Circuit Court for the 16th Judicial Circuit, Kane County, Illinois regardless of the place of business or residence of Seller. The parties agree that this venue is convenient for all of them and each consent to the personal jurisdiction of such court. In the event of any litigation the prevailing party shall have the right to recover its reasonable attorney's fees and costs. WCC shall not be liable to the Seller, or to any subcontractor, regardless of the form of action, for any consequential, incidental, indirect, or special damages, or for any claim or demand based on a release of information, or patent, copyright, or other intellectual property right infringement.
Indemnification: The Seller agrees to hold harmless and indemnify WCC, its officers, agents, trustees and employees, and defend each of them, against any losses, damages, judgments, claims, expenses, costs and liabilities imposed upon or incurred by or asserted against WCC, its officers, agents, trustees or employees, including reasonable attorneys' fees and expenses, arising out of the acts or omissions of Seller, its officers, agents or employees, resulting from or connected with Seller's performance hereunder or failure to comply with any applicable law or regulation.
Bidding: Seller certifies that it is not barred from bidding on agreement/contract as a result of a conviction for either bid rigging or bid rotating under Illinois law. WCC reserves the right to reject any and all bids, and waive any bid irregularities.
Purchases: A purchase order is required for all orders. Seller shall invoice Buyer for the goods at the time of final shipment unless otherwise provided for in this purchase order. Invoices shall show the purchase order number for each separate purchase order number issued. Failure to do so may result in a delay of payment. Packing slip shall be affixed to outside of package(s), listing contents of each package and notating an authorized purchase order number. Shipments without a purchase order will be rejected at the receiving dock.
Warranty:
1) Seller warrants that all Deliverables furnished hereunder will be free from defects in design, material, and workmanship, and will conform to applicable specifications, drawings, samples, and descriptions. This warranty is in addition to any warranties available under law, from the manufacturer, or any standard warranty of Seller.
2) At the time of delivery, no software shall contain any virus, timer, counter or other limiting design, instruction, or routine that would erase data or programming or cause the software or any hardware or computer system to become inoperable or otherwise incapable of being used in the full manner for which it was designed.
3) No Deliverable shall violate or infringe upon the rights of any third party, including, without limitation, any patent, copyright, trademark, trade secret, or other proprietary rights of any kind.
4) Seller warrants that it has full title to the Deliverables and has the right to grant to WCC the rights and licenses contemplated herein without the consent of any third party.

Assignment: This purchase order may not be assigned, and no duty or right hereunder may be delegated, or monies payable hereunder, by Seller and Seller may not use any sub-contractor to perform hereunder, without the prior written consent of Buyer, which consent may be given or withheld at Buyer's sole discretion. Any assignment made without such consent shall be null and void.

Prices: Buyer accepts Seller's quote or bid prices as recorded on Seller's proposal and on this purchase order which shall not be changed prior to delivery or completion of services without Buyer's prior written agreement. Unless otherwise provided in this purchase order, the price includes all charges for freight and insurance. No separate charges, except those clearly recorded on Seller's proposal and on this purchase order can, or will be allowed. Seller represents that the price charged for the goods and services covered by this purchase order is commercially reasonable and is the lowest price charged by Seller to buyers of a class of purchasers similar to Buyer under conditions similar to those specified in this purchase order. All prices quoted are in U.S. dollars.

Cancellation:

1) In addition to all other rights and remedies provided for hereunder or under law (including without limitation, damages) Buyer may cancel all or any part of this purchase order:
    a) if Seller breaches any of the terms, warranties or provisions hereof
    b) upon the occurrence of any event entitling Buyer to reject the goods
    c) if any insolvency proceeding is instituted by or against Seller
    d) if Seller provides material false information to Buyer
2) Buyer, at Buyer's sole discretion, may cancel this purchase order at any time as to the goods not then delivered.
3) Buyer shall not be deemed to have canceled this purchase order unless it notifies Seller of its intent to do so in writing. Upon receipt of such notice Seller will immediately stop work and notify any other parties performing any part of the work to stop work and will protect property in Seller's possession in which Buyer has or may acquire an interest.
4) Unless Buyer exercises its right to cancel because of the events described in paragraph (1) above or because of other event or condition caused by or under the control of Seller, Seller may claim:
    a) Reimbursement for actual out-of-pocket cost incurred by Seller as a result of such cancellation (exclusive of costs for materials that Seller can use on other orders) and
    b) A reasonable profit on the work performed by Seller prior to cancellation. Such claim must be made within twenty (20) days of the notice of cancellation and the total amount of such claim shall not exceed the purchase price for the completed goods. In the event of cancellation Seller shall deliver to WCC all material and information as may have been involved in the provision of services or Deliverables to the date of termination.

Taxes: Waubonsee Community College is exempt from Federal Excise and State Sales Taxes and such taxes shall not be included in prices. Federal Excise Tax Exception Certificate will be furnished upon request.

Articles or Services: Deliverables and/or services to be delivered or performed shall be in accordance with the terms, prices, delivery time, specifications, and conditions as recorded on Seller's proposal and as itemized on this purchase order. Stated delivery time must be adhered to. Buyer reserves the right to cancel this order if Seller does not make deliveries as specified on this order. No substitutions of articles or change of any nature shall be made without written authorization from the Buyer.

Inspection, Acceptance and Payment by Buyer: All Deliverables shall be received subject to Buyer's right to inspection and rejection. Those rejected as a result of inspection will be held for Seller's inspection at Seller's risk and, if Seller directs, will be returned at Seller's expense. Freight to and from original destination for excess goods except for customary quantity variations recognized by trade practice, will be paid by Seller. Payment for Deliverables on an order prior to inspection shall not constitute acceptance.

Responsibility for Deliverables and Risk of Loss: All shipments are to be made "F.O.B. Destination" unless otherwise specified on Seller's proposal and on this purchase order and accepted by Buyer. Seller assumes and accepts that all risk of loss of goods covered hereby shall be borne by Seller until goods have been received and accepted by Buyer or received, installed, and accepted by Buyer, whichever is applicable. When articles are sold "F.O.B. Point of Origin" and the purchase order confirms this, Seller is to prepay shipping charge and record prepaid charges on invoice and attach the original receipt, freight bill or express receipt to the invoice.

OSHA: All equipment and material shall be in accordance with applicable OSHA Rules and Regulations in effect at the time of order.

MSDS: Seller shall forward any required material safety data sheet (MSDS) to Buyer on all products subject to this order.

Prevailing Wage: When a contract/order requires construction of Public Works as defined in the Illinois Prevailing Wage Act, including new structures, renovation, remodeling and expansion of existing structures, maintenance and repair of equipment on a construction site, transportation of equipment or materials to or from a construction site:

1) Seller and its subcontractors must pay prevailing wage to any laborers or workers working on the project. It is Seller's responsibility to determine the appropriate current prevailing wage rate.
2) Seller shall maintain a certified payroll which will be required prior to payment, and shall be required to submit a Wage Certification Form and maintain records in accordance with the Prevailing Wage Act [820 ILCS 130/1-12]
3) Prior to payment of the purchase price, Seller shall furnish lien waivers, releases, affidavits, and other documents as Buyer requires, keeping Buyer's premises lien free.

Bonds: For Public Works projects over $50,000, the Seller shall furnish a Performance Bond and a Labor and Material Bond in an amount equal to the contract before commencing work. The surety on the bond shall be a company that is licensed by the Department of Insurance authorizing it to execute surety bonds and the company shall have a financial strength rating of at least A- as rated by A.M. Best Company, Inc., Moody's Investor Service, Standard & Poor's Corporation, or a similar rating agency.

Confidential Data: Seller shall develop, implement, maintain and use appropriate administrative, technical and physical security measures to preserve the confidentiality, integrity and availability of all confidential data, whether in hard copy or electronically maintained or transmitted, received from, or on behalf of WCC or its students. These measures will be extended by contract to all subcontractors used by the Seller. Unless authorized by WCC, Seller may not copy, store, or transmit unencrypted confidential and sensitive data on non-WCC-owned/leased computing devices, or other portable storage or computing devices. Seller shall destroy such data when they are no longer needed for the purpose for which they were released.

Non-Disclosure: Seller shall not announce this agreement and relationship in any press releases or other publications, or use WCC's name or logo's in any marketing materials without prior written consent of WCC.

1) All information that is obtained and work performed under this agreement and the Seller's Waubonsee Community College contract/order is considered sensitive, may or may not require use of sensitive and personal data and information and falls under one or more categories of information that is subject to protection from disclosure and misuse, including but not limited to: personal information and highly restricted personal information in connection with law enforcement sensitive data and information, the Privacy Act of 1974, 5 U.S.C. § 552a et. seq., the Family Educational Rights and Privacy Act of 1974, 20 U.S.C. § 1232g et seq. (FERPA), and personal information as defined under and governed by the Personal Information Protection Act, 815 ILCS 530 et seq.
2) Seller agrees to comply with all federal and state statutes, rules and regulations as identified in the Waubonsee Acceptable Usage Agreement (located at www.waubonsee.edu/it), understands that disclosure of any information, by any means, for a purpose or to an extent unauthorized herein, shall be grounds for immediate termination of the contract/order and this agreement, and may subject the offender to criminal and civil sanctions.
3) All source materials/data/information and resultant work products compiled or created and any information or portion of information derived therefrom are the property of the Waubonsee Community College and must not be used by Seller for any purpose other than the purpose outlined by the contract/order and this agreement.
4) Neither Seller, nor its officers, directors, agents, or employees shall divulge, sell, or distribute any information obtained from Waubonsee Community College or derived therefrom at any point in time to a third party, even after termination or expiration of a contract/order, except as may otherwise be required by law.
5) Seller shall notify each of its officers, directors, agents, and employees having access to the Waubonsee Community College information that such information may be used only for the purpose and to the extent authorized in this contract.

Insurance: During the term of this agreement, upon Buyer's request, Seller shall maintain, and require its subcontractors to maintain, insurance policies with limits acceptable to Buyer, to protect against claims that may arise from this purchase order. In addition, Seller and its subcontractors shall maintain Workman's Compensation insurance and Comprehensive Automobile Liability insurance coverage in amounts as required by Illinois law. Seller may be required to provide additional insurance as noted in the BID/RFP documents including but not limited

to professional liability, E & O (Errors and Omissions), environmental liability and umbrella coverage. WCC, its officers, agents, employees and assigns as will be named as Additional Insured thereunder on a primary and noncontributory basis and certificate holder for all work performed on Buyer's property.

Independent Contractor: Seller shall perform its obligations as an independent contractor of WCC and nothing herein shall be deemed to constitute Seller and WCC as partners, joint venturers, or principal and agent. Seller has no authority to represent WCC and shall not represent that it or any of its subcontractors are in any manner agents or employees of WCC.

License: Upon payment in full for software, Seller grants to WCC a perpetual, non-exclusive, worldwide, irrevocable, fully paid right and license to install and use the software on all computing devices used by or for the benefit of WCC. This license is subject to the limitation on the maximum number of end users or other limitations listed on Seller's proposal, but if none, this license shall be deemed to be enterprise-wide and the software may be used by all WCC end users without any maximum number. Any Deliverable under this purchase order that may be subject to a copyright shall be considered a "work for hire" as defined by the U.S. Copyright Act and shall be owned by WCC and WCC shall be considered the author of such item. If a Deliverable shall not be considered a "work for hire" under the U.S. Copyright laws, Seller hereby irrevocably assigns all right, title, and interest in the Deliverable, including all intellectual property rights effective from the moment of creation of the Deliverable.

Smoke Free Campus: The policy of the WCC Board of Trustees is to have a smoke free college environment. Smoking on college grounds and inside college facilities and college vehicles is prohibited. Smoking is only permitted inside private vehicles.

Affirmative Action/Equal Opportunity: Waubonsee Community College is an Affirmative Action/Equal Opportunity Employer and does not discriminate against any employee or service provider because of race, sex, color, age, religion, national origin, marital status, veteran's status, physical or mental disability or any other protected status under federal or state law.

Entire Agreement: This purchase order, together with any written documents incorporated by reference, constitutes the entire agreement between Buyer and Seller with respect to this transaction and supersedes all previous communications. Any additional or different terms by the Seller or Seller's acknowledgement are rejected by the Buyer unless expressly agreed to in writing by an authorized representative of the Buyer. This agreement shall be binding upon and inure to the benefit of all heirs, personal representative, successors and assigns of the Seller.

INSURANCE AND INDEMNITY REQUIREMENTS

1. SAFETY**:** The Contractor, its agents, employees, material men and its Subcontractors will perform all work on the project in a safe and responsible manner, and in compliance with all Federal, State and local safety requirements and standards.

2. INDEMNIFICATION**:** The work performed by the Contractor shall be at the risk of the Contractor exclusively. To the extent permitted by law, Contractor shall indemnify, defend, and hold harmless Owner, affiliated companies of Owner, their partners, joint venturers, representatives, members, designees, officers, directors, shareholders, employees, agents, successors, and assigns ("Indemnified Parties"), from and against any and all claims for bodily injury, death or damage to property, demands, damages, actions, causes of action, suits, losses, judgments, obligations and any liabilities, costs and expenses (including but not limited to investigative and repair costs, attorney's fees and costs, and consultants' fees and costs) which arise in whole or in part or are in any way connected with the Work performed, Materials furnished, or Services provided under this Agreement by Sub-Contractor or its agents.

3. INSURANCE: The insurance required shall be written for the duration of the Contract in amounts not less than the following minimum limits or as required by law whichever is greater. The Insurer must give the college at least 30 days prior written notice of cancellation and termination of the firm's coverage thereunder. All subcontractors the firm hires must comply with the same

requirements.

a. Comprehensive General Liability including Contractor's protective liability, Contractual liability, Completed Operations and Products liability. The latter shall be written for a period of one year from the date of acceptance by the Owner, to be renewed annually as long as the contract is in force. Minimum limits shall be as follows:
    i. Not less than $1 million dollars Each Occurrence, $2 million Products/Completed Operations aggregate, $1 million Personal and Advertising Injury limits, and $2 million General Aggregate subject to a per project aggregate.
    ii. Firm shall provide Waubonsee Community College with a Certificate of Insurance and endorsement naming Waubonsee Community College District No. 516, its officers, agents, employees and assigns as Additional Insured thereunder on a primary and noncontributory basis.

b. Workman's Compensation as required by all applicable laws including employer's liability in the amount of $500,000.00 or as otherwise limited by law.

c. Comprehensive Business Automobile Liability including non-ownership and hired car coverage as well as owned vehicles. Minimum limits shall be as follows:
    i. Written in the amount of not less than $1 million each accident and covering any auto.

d. Umbrella Liability Insurance: Written in the amount of no less than $2 million each accident.

4. PROPERTY INSURANCE: It is agreed that the Contractor shall purchase and maintain property insurance for its material left at the job site. Contractor waives all rights of subrogation against Owner for loss of, or damage to, Contractor's work, tools, machinery, equipment, materials or supplies.

AUTHORIZATION OF BID

I HEREBY AUTHORIZE THIS BID, ACKNOWLEDGING THAT I UNDERSTAND AND AGREE TO THE BID INSTRUCTIONS AND SPECIFICATIONS. I WARRANT THAT ALL INFORMATION PROVIDED IN THE SUBMITTED BID IS TRUE AND ACCURATE. I FURTHER WARRANT THAT FAILURE TO HAVE READ ALL THE PROVISIONS OF THIS SOLICITATION SHALL NOT BE CAUSE TO ALTER ANY RESULTING CONTRACT OR REQUEST ADDITIONAL COMPENSATION. BY SIGNING THIS DOCUMENT, I CERTIFY THAT THE FIRM IS NOT BARRED FROM BIDDING IN THE STATE OF ILLINOIS OR AT THE FEDERAL LEVEL.

_____
Name of Firm

_____
Authorized Signature Typed or Printed Name Date

_____
Address

_____
City State Zip Code

_____
Telephone Number Fax Number

_____
Email Address

Bids must be made in the official name of the firm or individual which business is conducted, stating official business address, and must be signed in ink by a person authorized to legally bind the person, partnership, company, or corporation submitting the Bid.

Acknowledgement of Addenda

I acknowledge having received addenda # _____.

To Be Returned with Bid

- ☐ AUTHORIZATION OF BID
- ☐ BID FORM / COST BREAKDOWN
- ☐ SUBCONTRACTORS / REFERENCES
- ☐ CERTIFICATE OF COMPLIANCE WITH ILLINOIS DRUG-FREE WORKPLACE ACT
- ☐ CERTIFICATE OF COMPLIANCE WITH ILLINOIS HUMAN RIGHTS ACT
- ☐ ELIGIBILITY CERTIFICATION AND NON-COLLUSION AFFIDAVIT
- ☐ BUSINESS ENTERPRISE PROGRAM INFORMATION

BID FORM

TOTAL BASE BID
Having examined the bid documents in Bid 04-18-004, as prepared Waubonsee Community College for **Electrical Arc Flash Study**, and having inspected the site and the conditions affecting and governing the construction of said Project, the Bidder hereby proposes to furnish all labor and materials, supervision, coordination, travel time/expenses, transportation, services and equipment to provide a complete report, in both printed and electronic format, express report delivery for the sum of:

Please print clearly.

Item #	Thermographic Inspection	Bid Price
1	Auto Body (Bldg. W)	$
2	Bodie Hall	$
3	Von Ohlen Hall	$
4	Von Ohlen Boiler Room	$
5	Electrician Labor	$
	TOTAL ALL ABOVE	$

Item #	Arc Flash Survey Inspection and Labeling	Bid Price
1	Auto Body (Bldg. W)	$
2	Bodie Hall	$
3	Von Ohlen Hall	$
4	Von Ohlen Boiler Room	$
5	Electrician Labor	$
	TOTAL ALL ABOVE	$

PROJECT TIMELINE

Provide a proposed project timeline with your specification response. Timeline shall include contract award date; on-site data collection timeframe, system model development and analysis timeframe, draft report presentation and final report presentation.

SUBCONTRACTORS (attach additional pages as necessary)

REFERENCES OF SIMILAR WORK PERFORMED

Name Phone Number

Company Name

Address

City State ZIP Code

Name Phone Number

Company Name

Address

City State ZIP Code

Name Phone Number

Company Name

Address

City State ZIP Code

CERTIFICATE OF COMPLIANCE WITH ILLINOIS DRUG-FREE WORKPLACE ACT

_____ Contractor, having 25 employees, does hereby certify pursuant to Section 3 or the Illinois Drug-Free Workplace Act (Ill. Rev. Stat. Ch. 127 132.313) that [he, she, it] shall provide a drug-free workplace for all employees engaged in the performance of work under the contract by complying with the requirements of the Illinois Drug-Free Workplace Act, further certified, that [her, she, it] is not ineligible for award of this contract by reason of debarment for a violation of the Illinois Drug- Free Workplace Act.

Firm Name:_____

By:_____
(Authorized Agent of Contractor)

CERTIFICATE OF COMPLIANCE WITH ILLINOIS HUMAN RIGHTS ACT

_____ Contractor, does hereby certify pursuant to P.A. 87-1257, the Illinois Human Rights Act, the (he, she, it) has adopted a written sexual harassment policy that includes at a minimum the following information: (i) the illegality of sexual harassment; (ii) the definition of sexual harassment under Illinois law; (iii) a description of sexual harassment, utilizing examples; (iv) an employer's internal complaint process, including penalty; (v) the legal recourse, investigative and complaint process available through the Department of Human Right Commission; (vi) directions on how to contact the Department and Commission; and (vii) protection against retaliation as provided by Section 6-101 of the Illinois Human Rights Act.

Firm Name:_____

By:_____
(Authorized Agent of Contractor)

ELIGIBILITY CERTIFICATION AND NON-COLLUSION AFFIDAVIT

Public Act 85-1295 (Illinois Revised Statutes, 1987, ch. 38, art. 33E) requires that all contractors bidding for public agencies in the State of Illinois certify that they are not barred from bidding on public contracts for bid rigging or bid rotation.

The following certification must be signed and submitted with bidder's bid proposal. **FAILURE TO DO SO WILL RESULT IN DISQUALIFICATION OF THE BIDDER.**

_____, as part of its bid

on a (name of contractor)

contract for the 04-17-002 – Electrical Arc Flash Study, hereby certifies that said contractor is not barred from bidding on the aforementioned contract as a result of a violation of either Section 33E-3 or 33E-4 of Article 33E of Chapter 38 of the Illinois Revised Statutes.

The undersigned further certifies and affirms that this proposal was prepared independently for this project and that it contains no fees or amounts other than for legitimate execution of this work as specified and that it includes no understandings or agreements in restraint of trade.

Firm Name:

_____

By:_____

(Authorized Agent of Contractor)

_____ Title

SUBSCRIBED and SWORN TO before me

this _____day of_____.

_____ NOTARY

PUBLIC

STATE OF ILLINOIS BUSINESS ENTERPRISE FOR MINORITIES, FEMALES AND PERSONS WITH DISABILITIES ACT INFORMATION

Vendor shall provide the following information on the status of its business so that the college can comply with the Business Enterprise for Minorities, Females and Persons with Disabilities Act, 30 ILCS 575/1, et seq.

Diverse Business (information about the business owner(s) only)

- ☐ African American
- ☐ Alaskan Native/Native American
- ☐ Asian American
- ☐ Disabled
- ☐ Female
- ☐ Hispanic American
- ☐ Veteran
- ☐ Not Applicable

Small Business

- ☐ HUBZone small business
- ☐ Service-disabled veteran-owned small business
- ☐ Small Business
- ☐ Small disadvantaged business
- ☐ Veteran-owned small business
- ☐ Women-owned small business
- ☐ Not Applicable

Certifying Organization

- ☐ DCMS (Department of Central Management Services) Business Enterprise Program
- ☐ CMBDC (Chicago Minority Business Development Council)
- ☐ IDOT (Illinois Department of Transportation)
- ☐ WBDC (Women's Business Development Center)
- ☐ Other (Please Specify)
- ☐ Not Applicable

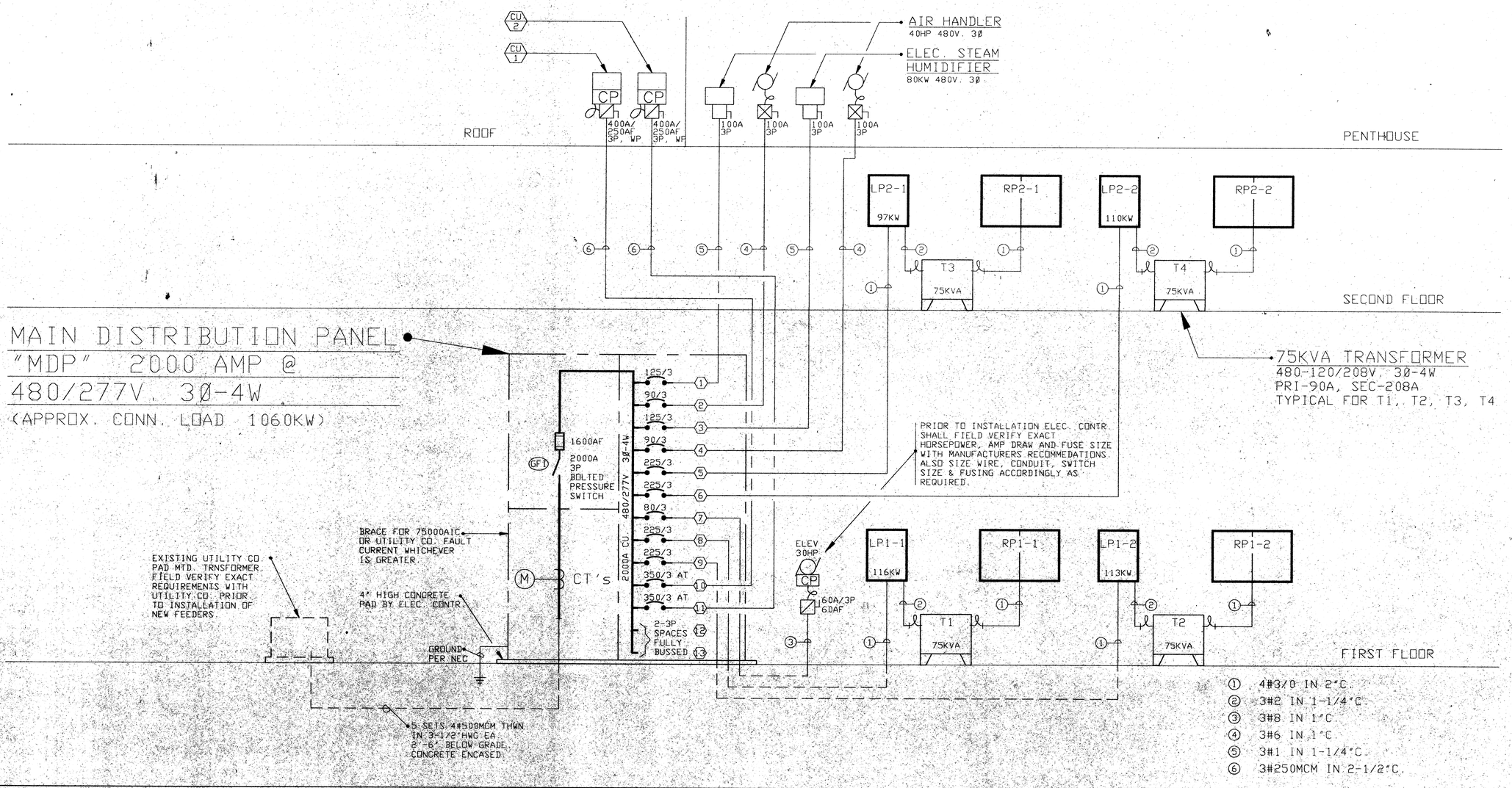
For more information please visit:

http://www.illinois.gov/cms/business/sell2/bep/Pages/Default.aspx

DRAWINGS AND SKETCHES

The following pages contain:

1. Bodie Hall
2. Von Ohlen Hall Panel Board Schedule
3. Von Ohlen Hall Single Line Diagram



RISER DIAGRAM
NO SCALE

Waubonsee Community College

Phase I Campus Development Classroom Building

Waubonsee Community College
Sugar Grove, Illinois

Consultants:

Larson Engineering of Illinois
124 South Webster Street
Naperville, Illinois 60540
(708)357-0164

Chase Associates, Inc.
830 West Northwest Hwy.
Palatine, Illinois 60067
(708)991-8060

Leonard Dreas & Assoc., Inc.
888 South Edgelawn Dr.
Aurora, Illinois 60506
(708)897-4105

Con Spec, Inc.
4704 West Waveland Ave.
Chicago, Illinois 60641
(312)725-3959

REVISIONS

6/15/91 ISSUED FOR BID

PRISCO, DUFFY & ASSOCIATES, LTD.
ARCHITECTS/PLANNERS

1811 WEST DIEHL ROAD
NAPERVILLE, IL 60540
(708)369-5550

Job No.	9008.00
Drawn By	
Checked By	
Date	
Sheet Title	RISER DIAGRAM & PENTHOUSE PLANS
Sheet No.	E-1

1 PANELBOARD SCHEDULE

NOTES

1. BRANCH CIRCUIT CONDUCTORS SHALL BE #12 AWG. EXCEPT AS OTHERWISE NOTED.
2. HOMERUN BRANCH CIRCUIT CONDUIT SHALL BE 3/4" MINIMUM SIZE EXCEPT AS OTHERWISE NOTED.
3. FLUSH WALL MOUNTED PANELBOARDS SHALL HAVE SPARE EMPTY CONDUITS STUBBED UP (AND CAPPED) INTO CEILING SPACE AS FOLLOWS:
   - A 20 CKT PANEL (AND BELOW) – 4 CONDUITS
   - B 30 CKT PANEL – 6 CONDUITS
   - C 42 CKT. PANEL – 8 CONDUITS

PANEL DESIG.	LOCATION	MOUNTING	VOLTAGE, PHASE & NO. OF WIRES	SIZE OF MAINS	CIRCUIT BREAKERS INSTALLED – SIZE AND NUMBER: 20 AMP. 1P.	20 AMP. 2P.	20 AMP. 3P.	30 AMP. 1P.	30 AMP. 2P.	30 AMP. 3P.	70 AMP. 3P.	SPARES 20A–1P	BLANK SPACES	PANEL SIZE (TOTAL NUMBER OF POLE CKTS.)	NOTES:
GA	RM-147-GYM.	SURFACE	277/480V, 3Φ-4W	200 AMP.	22	–	–	–	–	–				30	
FA	RM-125-FINE ARTS	SURFACE	↓	100 AMP.	7	–	–	–	–	–		11	–	18	
FB	RM-236-FINE ARTS	SURFACE	↓	100 AMP.	11	–	1	–	–	–		10		24	
SA	RM-132-SCIENCE	SURFACE	↓	100 AMP.	12	–	1	–	–	–		3	–	18	
SB	RM-229-SCIENCE	SURFACE	277/480V, 3Φ-4W	100 AMP.	10	–	–	–	–	–		8	–	18	
G1	RM-147-GYM.	SURFACE	120/208V, 3Φ-4W	200 AMP.	42	–	–	3	–	–	1	–	–	48	TWO SECTION PANEL
G2	RM-147-GYM.	SURFACE	↓	200 AMP.	40	–	–	2	–	–		–	–	42	
G3	RM-147-GYM.	SURFACE	↓	100 AMP.	18	–	–	1	–	–		5	–	24	
F1	RM-125-FINE ARTS	SURFACE	↓	200 AMP.	31	–	–	–	–	–		5	–	36	
F2	RM-236-FINE ARTS	SURFACE	↓	200 AMP.	40	–	–	–	–	–		2	–	42	
F3	RM-236-FINE ARTS	SURFACE	↓	200 AMP.	22		5		1			3	–	42	
S1	RM-132-SCIENCE	SURFACE	↓	200 AMP.	36	–	–	–	1	–		4	–	42	
S2	RM-132-SCIENCE	SURFACE	↓	200 AMP.	34	–	–	–	–	–		8	–	42	
S3	RM-229-SCIENCE	SURFACE	↓	200 AMP.	35	–	–	–	–	–		7	–	42	
S4	RM-229-SCIENCE	SURFACE	↓	200 AMP.	32	–	–	–	–	–		10	–	42	
L1	RM-105-LGI	SURFACE	120/208V, 3Φ-4W	200 AMP.	35	–	–	–	–	–		7	–	42	
F4	RM-236-FINE ARTS	SURFACE	120/208V, 3Φ-4W	200 AMP.	–	–	–	–	5	–		14	12	36	
DPL	RM-205-LGI	SURFACE	120/208V, 3Φ-4W	100 AMP.	17	(SPECIAL DIMMER PANEL)						–	1	18	FOR DETAIL RE: 4E27
DB	RM-129-FINE ARTS	SURFACE	↓	—	11	(SPECIAL DIMMER PANEL)						–	–	11	FOR CKT SCHEDULE RE: 2E22

CRS

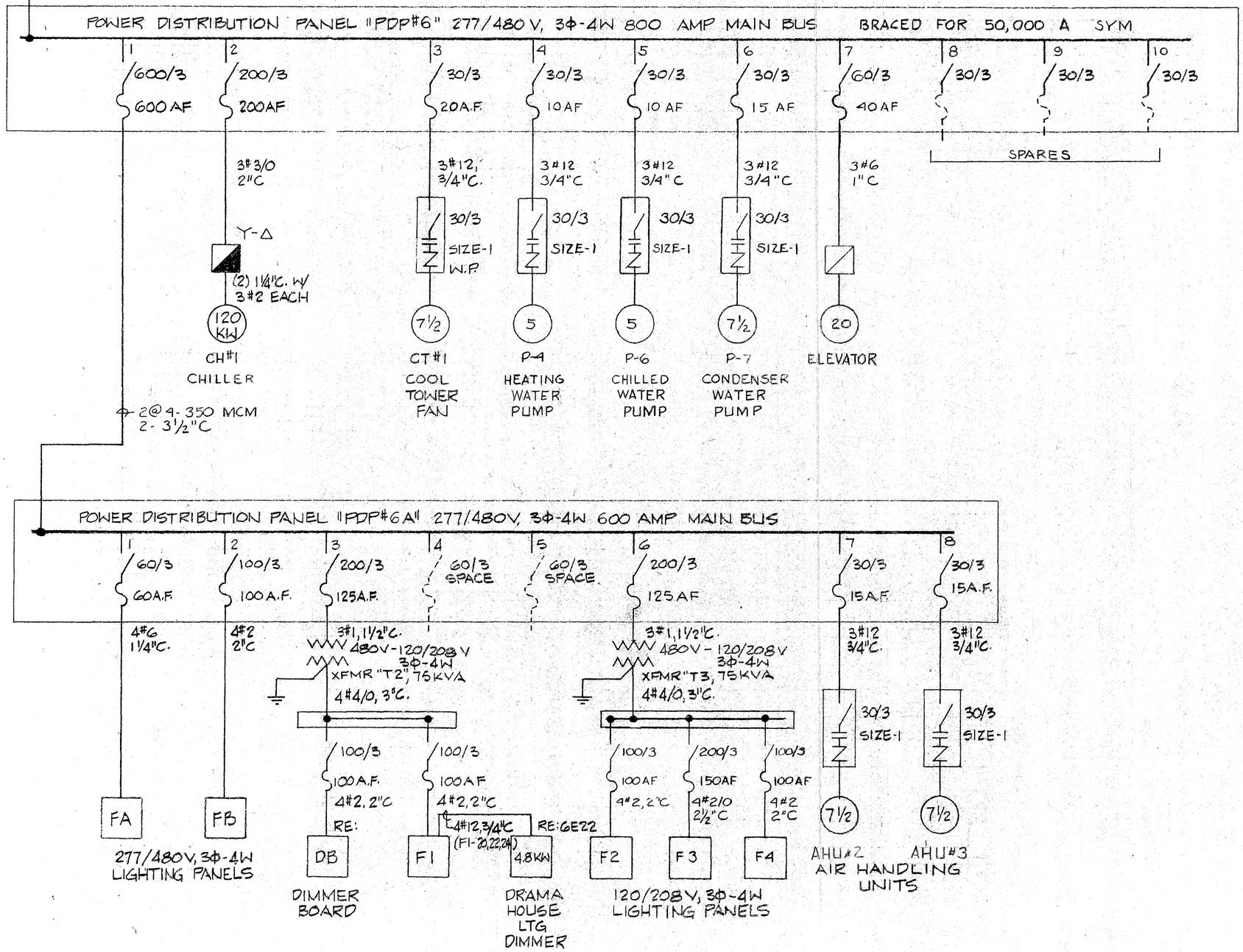
CAUDILL
ROWLETT
SCOTT

PROJ 69.4
REV 7-6-71
DATE 8-15-70

E[illegible]

OF 31

CKT "MSB-7" FROM EXIST MAIN SWBD IN CENTRAL PLANT "A" RE: 1E20 SINGLE LINE & 1E1 FOR UNDERGROUND ROUTING.



1 SINGLE LINE DIAGRAM - FINE ARTS BLDG

NOTE: ALL CONDUCTORS ARE COPPER UNLESS NOTED "ALUMINUM"

WALB SUGAR GROVE ILLINOIS

COMMUNITY COLLEGES

CRS
CAUDILL ROWLETT SCOTT

PROJ 69.4
REV 7-6-71
DATE 8-15-70

E 1 83

OF 31