Attach A.

Scope of Work

ASSESS the CONDITION of Milwaukee County Courthouse (CTH) bldg. # 10, consisting of 703,347 Sq. Ft. located at 901 N. 10th Street, Milwaukee, WI. The Electrical Consultant shall REVIEW RECORD DOCUMENTS, ELECTRICAL INVENTORY (found in attachments & in VFA), CONDUCT STAFF INTERVIEWS, and CONDUCT a WALK-THROUGH SURVEY of the property to, IDENTIFY Physical and Code Compliant Defects. The Electrical Consultant shall PREPARE, PREPARE a PROPERTY CONDITION ASSESSMENT REPORT (PCAR). The PCAR shall include a review and update of the Asset Description in VFA, a Description of each Requirement (Defects), and Recommended Actions (Repairs and Improvements) with Cost Estimates (cost estimates will be done by the County's FAT and assisted by the Consultant). The PCAR shall also include a Life Cycle Cost Analysis for the building electrical systems, security and fire alarm systems and components.

As part of this project, Milwaukee County is also asking for electrical drawings to represent existing conditions of all inventoried equipment. Floor plan base drawings will be provided by Milwaukee County in AutoCAD 2015. This work shall be listed as an additive alternate cost.

The CTH Property Condition Assessment Project performance standards shall be based on the American Society for Testing and Materials (ASTM) – Standard Guide for Property Condition Assessments: Baseline Property Condition Assessment Process. Designation: E 2018-08.

Consultants will be required to be familiar with VFA.facilities and be able to perform simple tasks within the web-based software. A two hour training session will be provided by the Milwaukee County Facilities Assessment Team in our office.

A. Document Reviews and Interviews

Prior to conducting a walk through survey with the Milwaukee County Facility Assessment Team (FAT), the Electrical Consultant and their Sub-consultant(s) shall review all available facility documentation including information in VFA to determine the original building occupancy design, past capital improvement modifications, status of past facility study recommendations, and function of existing electrical equipment and systems. The facility documentation may include but not be limited to original design documents/drawings, equipment inventory in VFA developed by Milwaukee County FAT and Courthouse facility maintenance, studies and analysis, and remodeling project drawings.

Prior to conducting a walk through survey the Electrical Consultant and their Subconsultant(s) shall conduct management staff interviews to augment the walk-through survey, to obtain a better understanding of the building's present and future function, and to identify known code compliance and physical defects. At the conclusion of the walk through survey the Electrical Consultant with the Milwaukee County Facility Assessment Team shall conduct a review meeting with CTH facility management staff to clarify building requirements and recommended actions.

B. Walk-Through Survey

The Electrical Consultant and Sub-consultant(s) shall conduct a facility inspection as specified herein, to produce an accurate assessment that identifies code compliance and all visible and discernable defects (through non-destructive means) inclusive of all items on FAT Inventory in VFA and attached herein. Requirements (Defects) shall include all electrical components/elements, and system/equipment requiring maintenance, repair, and/or replacement.

The PCA will focus on the following property elements:

- Landscape Systems – light fixtures, and softscape items requiring electrical power.
- Exterior Systems – building lighting.
- Health/Fire/Life Safety System requirements.
- Heating, Ventilation, and Air Conditioning Systems Electrical Components.
- Potential Energy Conservation Measures.
- Potential Environmental Hazardous Materials.
- Electrical Systems – Transformers, Emergency Generator, Power Distribution, and Lighting.
- Plumbing Systems electrical components
- Vertical/Horizontal Transport Systems.
- Communication Security/Fire Systems.
- Special Construction, requiring electrical power, i.e. sound/ intercom/ public address systems.

C. Recommended Actions and Cost Estimates

For each facility requirement identified in the walk through survey, a detailed means of correcting the condition (repair/improvement task) shall be developed by the electrical consultant along with the Milwaukee County Facility Assessment Team. Each recommended action will include a detailed construction cost estimate including a description of the construction methods, and required labor and material quantities necessary to complete the repair/improvement task.
In addition, the electrical consultant shall also develop a means of correcting all client supplied requirement(s), and shall include a detailed construction cost estimate for each recommended action, including a description of recommended construction methods, and required labor and material quantities necessary to complete the repair/improvement task. Construction Cost Estimates shall be developed through the 2015 R.S. Means standards of construction for the Milwaukee County area and based on the following criteria.

Each requirement shall be digitally photographed and assigned a unique identifier within the database. The database shall also enable users to track completed repairs and improvements.

Requirements requiring additional investigation and analysis beyond the project scope shall be brought to the attention of the Milwaukee County Project Manager for possible contract inclusion. Specialized Investigations beyond the project scope shall only be implemented through a contract fee extension approved by Milwaukee County.

D. Specialized Testing and Inspection

The following Specialized Tests and Inspections shall be conducted as specified in SECTION II - H. SPECIALIZED TESTING and INSPECTION REQUIREMENTS.

Electrical System Inspection and Testing

(Dry-Type) Transformers

The consultant shall conduct the following Visual and Mechanical Inspections.

- Verify that any shipping braces and bolts have been removed.
- Verify the operation of auxiliary devices, such as fans, indicators, and tap changers.
- Check Bolt Torque Levels in accordance with U.S. Standards Specifications.
- Check for proper grounding of core and frame.

The consultant shall conduct the following Electrical Tests.

- Perform an insulation resistance test winding to winding and winding to ground.
- Perform a turns radio test between windings for all tap positions.

The consultant shall measure the average daily electrical demand, the maximum daily electrical demand, and the peak hour electrical demand of each transformer.

Panel Boards/Small Disconnects/Starters/Controls Panels

The consultant shall conduct the following Inspections and Tests on Electrical Panels, and Low Voltage Circuit breakers according to the inventory attached.

- Infrared Testing
- Grounding-NEC Code Compliance on Over Current and Wiring Methods.
- Bonding-NEC Code Compliance on Over Current and Wiring Methods.
- Physical Condition-Check Hole Closures, Proper Cover, Missing Breakers/Blanks, Clearance, and Foreign Matter (Dust, Oil, and Combustibles.
- Circuit Breakers-Check for Smooth Operation, and Condition of Molded Case.
- Check Bolt Torque Levels in accordance with Manufacturer's Standard Specifications.

The consultant shall conduct the following Electrical Tests on Distribution Breakers.

- Measure Contact Resistance
- Check Insulation Resistance at 1000 Volts D.C. for one minute from pole to pole, from each pole to ground, and across open contacts of each phase.
- Test Trip Release on each circuit breaker.
- Determine minimum long-time pick-up current when possible.

- Determine long-time delay utilizing primary current injection method at 300% of rating.
- Determine instantaneous pick-up current utilizing primary injection run-up or pulse method.

Motors

The consultant shall conduct the following Electrical Tests on the motors for the (4) Chiller Chilled Water pumps, (4) Condenser water pumps, (3) Chilled Water system pumps and (4) Air Handler Chilled Water pumps. They range from 10 – 25 H.P.

IR (Infrared Thermography)

MCA (Motor Circuit Analysis)

- Resistance (IEEE Std 118-1978, IEEE Std 389-1996)
- Inductance (IEEE Std 388-1992 Inductance and Impedance Unbalance, IEEE Std 1201989)
- Impedance (IEEE Std 388-1992, IEEE Std 389-1996, IEEE Std 43-2000, and, IEEE Std 120-1989)
- Phase Angle (IEEE Std 120-1989)
- Frequency Response Tests (IEEE Std 3891996)
- Insulation Resistance Tests – Covered under IEEE Std 43-2000.

Vibration Analysis

The Electrical Consultant shall provide an Electrical System Inspection and Test Report as part of the Electrical Risk Management Report. The Report shall summarize all inspection and test results, electrical demand load readings, and list all deficiencies and corrections for the facility.

The Electrical Consultant shall assist the FAT's Electrical Coordinator documenting all electrical requirements and repair/improvement actions from the Electrical Risk Management Report into the VFA Assessment Software database. The Consultant shall provide a construction cost estimate for each recommended repair/improvement action in accordance with standard PCA cost estimating requirements.

E. Prioritization/Categorization/Classification of Assessment Data

Each requirement and associated correction shall be organized within the database as follows:

1. Requirement Priorities

Each identified requirement shall be prioritized based on the following criteria:

Priority 1 Currently Critical (Immediate)

Conditions under this priority require immediate action to:

a. correct a cited life safety hazard
b. stop accelerated deterioration
c. return a facility to operation

Priority 2 Potentially Critical
Conditions under this priority inhibit the operation of the building. Conditions in this priority include:
a. improper or intermittent operations
b. rapid deterioration
c. potential life safety hazard

Priority 3 Predictable Deterioration
Conditions under this priority require appropriate attention to preclude predictable deterioration, and the associated damage or higher costs if deferred further. Energy Conservation requirements not included in priorities 1 or 2 shall be included in this priority.

Priority 4 Recommended Improvements
Conditions under this priority represent a functional improvement to existing conditions, and may include system improvements and/or aesthetic improvements. These improvements are not required for the most basic function of the facility. However the recommended action may improve the overall facility function and/or reduce long-term maintenance costs. This priority includes building components that have exceeded their useful life, but are still in operation.

Priority 5 Current Code/Standards
Conditions under this priority include items that do not conform to existing codes, but are "grandfathered" in their condition. No action is required at this time, but should substantial work be undertaken in contiguous areas, requirements listed in this priority must be addressed.
a. correct ADA barrier free accessibility

2. Requirement Categories
Each identified requirement shall be assigned one of the following categories:

Code Compliance (Priority 1 or 5)
- **Accessibility:** Conditions that violate ADA guidelines. (Examples: Non-compliant building entrances, plumbing fixtures, and door hardware).
- **Building Code:** Conditions that violate Building codes (Example: Any conditions that disregard building electrical, mechanical, and plumbing codes.)
- **Life Safety:** Conditions that violate the NFPA 101 Life Safety Code.

Operations (Priority's 2, 3, 4)

- **Energy:** Conditions that adversely affect energy use (Examples: Single pane windows, old or no pipe insulation, and old fan systems beyond useful life).
- **Maintenance:** Components or systems that require routine maintenance (Tasks with an estimated cost of $ 2,500 or lower).
- **Security:** Conditions that compromise the protection of the assets or its occupants (Examples: Broken locks, lack of lighting).

Functionality (Priority 4)

- **Mission:** Components or systems that do not meet the standards of the organization to provide services (Example: Non-uniform paint and décor; equipment upgrades to ensure a facility is operational 24/7).
- **Modernization:** Conditions that need to be made modern in appearance or function (Example: outdated furniture/office equipment/cash registers).
- **Plant Adaptation:** Components or systems that must change to fit a new or adapted use (Example: Renovation or restoration of old space).
- **Obsolescence:** Components or systems that are or are becoming obsolete (Example: Outdated equipment).
- **Capacity:** Problems with the system's ability to keep up with demand load (Examples: Heating equipment and/or Electrical System that cannot adequately maintain its occupancy, overcrowding).

Integrity (Priority's 2, 3, 4)

- **Appearance:** Problems with the asset's appearance that are not functional in nature (Examples: Peeling paint, worn carpet).
- **Reliability:** Components or systems that cannot be depended upon (Examples: Equipment that functions correctly but sometimes is unpredictable).
- **Beyond Rated Life:** A component or system that has exceeded its rated life (Example: A 20 year warranted roof that's 30 years old).

Environmental (Priority 2, 3, or 5)

- **Air/Water Quality:** Conditions that affect the environmental quality of the water or air (Examples: Insufficient ventilation, lack of chemical treatment, no backflow protection).
- **Asbestos:** Visible observance of suspected Asbestos Containing Materials.
- **Lead:** Visible observance of suspected lead-based paint.
- **PCB:** Visible observance of suspected PCB-containing materials in building equipment (Example: Transformer)
- **CFC:** Visible observance of suspected chlorofluorocarbon containing gas in building equipment (Example: Air conditioning equipment containing CFC refrigerant R-22).

Miscellaneous (Priority's 1-5)

- **Other:** Other deficient items not covered in all other categories (Example: Space utilization).

3. Classification

Each deficient requirement and associated correction shall be classified by its major Prime System. That is, each requirement and correction shall be classified as a Landscape System, Exterior Building System, Health/Fire/Life Safety System, Barrier Free Accessibility System, HVAC System, Electrical System, Plumbing System, Fire Protection System, Vertical/Horizontal Transport System, Security Systems, and Special Construction

F. Facility Renewal Calculations

The Consultant will assist the Milwaukee County FAT in the following: Identifying the rate of investment required to maintain components of the plant as they degrade and become unusable is critical to the long-range planning and funding of the facilities. The consultant shall analyze and model the rates of degradation of each facility components and report on required reinvestment rate on an annual basis to replace components as such components become dysfunctional. Elements of the analysis will include:

1. Identification of the approximate replacement cost of each building component.
2. Rates of standard degradation of each component and the cost to replace/ refurbish that component.
3. Current condition of each building component.
4. The ability to analyze multi-year combinations of repair/improvement investments.

The systems should also be capable of generating multi-level financial modeling based on deferred maintenance backlog, capital renewal and selected time frame. Systems should be capable of analyzing and projecting funding for time periods up to 100 years.

G. Preventative Maintenance Practices and Recommendations

The Preventative Maintenance Program review shall include Fire Alarm System, Security Alarm System, Communication Systems, Horizontal/Vertical Transport Systems, and Electrical Systems.
Communication Systems include:
Public Address equipment, Fire Alarms, Security Alarms.
Horizontal/Vertical Transport Systems include:
Elevators, Escalators, and Conveyors
Electrical Systems include:
Transformers, Transfer Switches, Main Disconnect Switches, Generators, Distribution Panels, Circuit Breaker Panels, and Motor Starter Panels.

Review existing preventative maintenance practices and provide recommended maintenance tasks, implementation schedules, and required man-hours based on manufacturer recommendations, and/or National Maintenance Standards and Practices, to be added to or replace existing preventative Maintenance measures.

Preventative Maintenance Practices and Recommendations Report Format

The Preventative Maintenance Report shall be determined after reviewing existing Preventative Maintenance Format and future needs with the Facility Manager.

H. Electrical Drawings

Provide "existing conditions" Electrical Power and Distribution drawings of each floor including Mezzanine Levels and Roof. Also provide One-Line Diagram from marked-up hand-drawn drawings.

I. Specialized Testing and Inspection Requirements

See Scope of Work

Project Deliverables

1. Provide (For Review) Submit in Word and or Excel format along with PDF electronic copies of draft Electrical Risk Management Report including specialized testing and PM Summary Report.

2. Provide Submit in Word and or Excel format along with PDF electronic copies of final PCAR and final PM Summary Report to Milwaukee County on CD-ROM in PDF format.

Auto CAD drawings to be submitted in 2013 or newer release.