

BID OF _____

2017

PROPOSAL, CONTRACT, BOND AND SPECIFICATIONS

FOR

OVERTURE CENTER GARAGE ELEVATOR MODERNIZATION

CONTRACT NO. 7889

PROJECT NO. 10403

MUNIS NO. 10403

IN

MADISON, DANE COUNTY, WISCONSIN

AWARDED BY THE COMMON COUNCIL
MADISON, WISCONSIN ON _____

CITY ENGINEERING DIVISION
1600 EMIL STREET
MADISON, WISCONSIN 53713

<https://bidexpress.com/login>

**OVERTURE CENTER GARAGE ELEVATOR MODERNIZATION
CONTRACT NO. 7889**

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This Proposal, and Agreement have
been prepared by:

**CITY ENGINEERING DIVISION
CITY OF MADISON
MADISON, DANE COUNTY, WISCONSIN**



Robert F. Phillips, P.E., City Engineer

RFP: CMB

SECTION A: ADVERTISEMENT FOR BIDS AND INSTRUCTIONS TO BIDDERS

REQUEST FOR BID FOR PUBLIC WORKS CONSTRUCTION CITY OF MADISON, WISCONSIN

A BEST VALUE CONTRACTING MUNICIPALITY

PROJECT NAME:	OVERTURE CENTER GARAGE ELEVATOR MODERNIZATION
CONTRACT NO.:	7889
SBE GOAL	5%
BID BOND	5%
PRE BID MEETING (SBE) (1:00 P.M.)	2/17/2017
PRE BID CONFERENCE (1:00 P.M.)	1/26/2017
PREQUALIFICATION APPLICATION DUE (1:00 P.M.)	2/17/2017
BID SUBMISSION (1:00 P.M.)	2/24/2017
BID OPEN (1:30 P.M.)	2/24/2017
PUBLISHED IN WSJ	1/20, 1/27, 2/3, 2/10 & 2/17/2017

PRE BID MEETING: Representatives of the Affirmative Action Department will be present to discuss the Small Business Enterprise requirements at 1600 Emil Street, Madison Wisconsin.

PRE BID CONFERENCE:

A pre-bid conference will be conducted onsite at 318 W. Mifflin Street at 1 P.M., Thursday, January 26, 2017.

A representative from the city's elevator consultant company will be on hand to conduct an onsite walk through, discuss the plans, specifications and expectations of the contract. The city project manager will also be on hand to answer general contract questions.

PREQUALIFICATION APPLICATION: Forms are available on our website, www.cityofmadison.com/business/pw/forms.cfm. If not currently prequalified in the categories listed in Section A, an amendment to your Prequalification will need to be submitted prior to the same due date. Postmark is not applicable.

BIDS TO BE SUBMITTED by hand to 1600 EMIL ST., MADISON, WI 53713 or online at www.bidexpress.com.

THE BID OPENING is at 1600 EMIL ST., MADISON, WI 53713.

STANDARD SPECIFICATIONS

The City of Madison's Standard Specifications for Public Works Construction - 2016 Edition, as supplemented and amended from time to time, forms a part of these contract documents as if attached hereto.

These standard specifications are available on the City of Madison Public Works website, www.cityofmadison.com/Business/PW/specs.cfm.

The Contractor shall review these Specifications prior to preparation of proposals for the work to be done under this contract, with specific attention to Article 102, "BIDDING REQUIREMENTS AND CONDITIONS" and Article 103, "AWARD AND EXECUTION OF THE CONTRACT." For the convenience of the bidder, below are highlights of three subsections of the specifications.

SECTION 102.1: PRE-QUALIFICATION OF BIDDERS

In accordance with Wisconsin State Statutes 66.0901 (2) and (3), all bidders must submit to the Board of Public Works proof of responsibility on forms furnished by the City. The City requires that all bidders be qualified on a biennial basis.

Bidders must present satisfactory evidence that they have been regularly engaged in the type of work specified herein and they are fully prepared with necessary capital, materials, machinery and supervisory personnel to conduct the work to be contracted for to the satisfaction of the City. All bidders must be pre-qualified by the Board of Public Works for the type of construction on which they are bidding prior to the opening of the bid.

In accordance with Section 39.02(9)(a)l. of the General Ordinances, all bidders shall submit in writing to the Affirmative Action Division Manager of the City of Madison, a Certificate of Compliance or an Affirmative Action Plan at the same time or prior to the submission of the proof of responsibility forms.

The bidder shall be disqualified if the bidder fails to or refuses to, prior to opening of the bid, submit a Certificate of compliance, Affirmative Action Plan or Affirmative Action Data Update, as applicable, as defined by Section 39.02 of the General Ordinances (entitled Affirmative Action) and as required by Section 102.11 of the Standard Specifications.

SECTION 102.4 PROPOSAL

No bid will be accepted that does not contain an adequate or reasonable price for each and every item named in the Schedule of Unit Prices.

A lump sum bid for the work in accordance with the plans and specifications is required. The lump sum bid must be the same as the total amounts bid for the various items and it shall be inserted in the space provided.

All papers bound with or attached to the proposal form are considered a part thereof and must not be detached or altered when the proposal is submitted. The plans, specifications and other documents designated in the proposal form will be considered a part of the proposal whether attached or not.

A proposal submitted by an individual shall be signed by the bidder or by a duly authorized agent. A proposal submitted by a partnership shall be signed by a member/partner or by a duly authorized agent thereof. A proposal submitted by a corporation shall be signed by an authorized officer or duly authorized registered agent of such corporation, and the proposal shall show the name of the State under the laws of which such corporation was chartered. The required signatures shall in all cases appear in the space provided thereof on the proposal.

Each proposal shall be placed, together with the proposal guaranty, in a sealed envelope, so marked as to indicate name of project, the contract number or option to which it applies, and the name and address of the Contractor or submitted electronically through Bid Express (www.bidexpress.com). Proposals will be accepted at the location, the time and the date designated in the advertisement. Proposals received after the time and date designated will be returned to the bidder unopened.

SECTION 102.5: BID DEPOSIT (PROPOSAL GUARANTY)

All bids, sealed or electronic, must be accompanied with a Bid Bond equal to at least 5% of the bid or a Certificate of Annual/Biennial Bid Bond or certified check, payable to the City Treasurer. Bid deposit of the successful bidders shall be returned within forty-eight (48) hours following execution of the contract and bond as required.

MINOR DISCREPENCIES

Bidder is responsible for submitting all forms necessary for the City to determine compliance with State and City bidding requirements. Notwithstanding any language to the contrary contained herein, the City

may exercise its discretion to allow bidders to correct or supplement submissions after bid opening, if the minor discrepancy, bid irregularity or omission is insignificant and not one related to price, quality, quantity, time of completion or performance of the contract.

Bidders for this Contract(s) must be Pre-Qualified for at least one of the following type(s) of construction denoted by an

Building Demolition

- 101 Asbestos Removal
- 120 House Mover

- 110 Building Demolition

Street, Utility and Site Construction

- 201 Asphalt Paving
- 205 Blasting
- 210 Boring/Pipe Jacking
- 215 Concrete Paving
- 220 Con. Sidewalk/Curb & Gutter/Misc. Flat Work
- 221 Concrete Bases and Other Concrete Work
- 222 Concrete Removal
- 225 Dredging
- 230 Fencing
- 235 Fiber Optic Cable/Conduit Installation
- 240 Grading and Earthwork
- 241 Horizontal Saw Cutting of Sidewalk
- 242 Infrared Seamless Patching
- 245 Landscaping, Maintenance
- 246 Ecological Restoration
- 250 Landscaping, Site and Street
- 251 Parking Ramp Maintenance
- 252 Pavement Marking
- 255 Pavement Sealcoating and Crack Sealing
- 260 Petroleum Above/Below Ground Storage Tank Removal/Installation
- 262 Playground Installer

- 265 Retaining Walls, Precast Modular Units
- 270 Retaining Walls, Reinforced Concrete
- 275 Sanitary, Storm Sewer and Water Main Construction
- 276 Sawcutting
- 280 Sewer Lateral Drain Cleaning/Internal TV Insp.
- 285 Sewer Lining
- 290 Sewer Pipe Bursting
- 295 Soil Borings
- 300 Soil Nailing
- 305 Storm & Sanitary Sewer Laterals & Water Svc.
- 310 Street Construction
- 315 Street Lighting
- 318 Tennis Court Resurfacing
- 320 Traffic Signals
- 325 Traffic Signing & Marking
- 332 Tree pruning/removal
- 333 Tree, pesticide treatment of
- 335 Trucking
- 340 Utility Transmission Lines including Natural Gas, Electrical & Communications
- 399 Other _____

Bridge Construction

- 501 Bridge Construction and/or Repair

Building Construction

- 401 Floor Covering (including carpet, ceramic tile installation, rubber, VCT)
- 402 Building Automation Systems
- 403 Concrete
- 404 Doors and Windows
- 405 Electrical - Power, Lighting & Communications
- 410 Elevator - Lifts
- 412 Fire Suppression
- 413 Furnishings - Furniture and Window Treatments
- 415 General Building Construction, Equal or Less than \$250,000
- 420 General Building Construction, \$250,000 to \$1,500,000
- 425 General Building Construction, Over \$1,500,000
- 428 Glass and/or Glazing
- 429 Hazardous Material Removal
- 430 Heating, Ventilating and Air Conditioning (HVAC)
- 433 Insulation - Thermal
- 435 Masonry/Tuck pointing

- 437 Metals
- 440 Painting and Wallcovering
- 445 Plumbing
- 450 Pump Repair
- 455 Pump Systems
- 460 Roofing and Moisture Protection
- 464 Tower Crane Operator
- 461 Solar Photovoltaic/Hot Water Systems
- 465 Soil/Groundwater Remediation
- 466 Warning Sirens
- 470 Water Supply Elevated Tanks
- 475 Water Supply Wells
- 480 Wood, Plastics & Composites - Structural & Architectural
- 499 Other _____

State of Wisconsin Certifications

- 1 Class 5 Blaster - Blasting Operations and Activities 2500 feet and closer to inhabited buildings for quarries, open pits and road cuts.
- 2 Class 6 Blaster - Blasting Operations and Activities 2500 feet and closer to inhabited buildings for trenches, site excavations, basements, underwater demolition, underground excavations, or structures 15 feet or less in height.
- 3 Class 7 Blaster - Blasting Operations and Activities for structures greater than 15 ' in height, bridges, towers, and any of the objects or purposes listed as "Class 5 Blaster or Class 6 Blaster".
- 4 Petroleum Above/Below Ground Storage Tank Removal and Installation (Attach copies of State Certifications.)
- 5 Hazardous Material Removal (Contractor to be certified for asbestos and lead abatement per the Wisconsin Department of Health Services, Asbestos and Lead Section (A&LS).) See the following link for application: www.dhs.wisconsin.gov/Asbestos/Cert. State of Wisconsin Performance of Asbestos Abatement Certificate must be attached.
- 6 Certification number as a Certified Arborist or Certified Tree Worker as administered by the International Society of Arboriculture
- 7 Pesticide application (Certification for Commercial Applicator For Hire with the certification in the category of turf and landscape (3.0) and possess a current license issued by the DATCP)
- 8 State of Wisconsin Master Plumbers License.

SECTION B: PROPOSAL

Please refer to the
Bid Express Website
at <https://bidexpress.com>
look up contract number
and go to
Section B: Proposal Page

You can access all City of Madison bid solicitations for FREE at www.bidexpress.com

Click on the "Register for Free" button and follow the instructions to register your company and yourself. You will be asked for a payment subscription preference, since you may wish to bid online someday. Simply choose the method to pay on a 'per bid' basis. This requires no payment until / unless you actually bid online. You can also choose the monthly subscription plan at this time. You will, however, be asked to provide payment information. Remember, you can change your preference at anytime. You will then be able to complete your free registration and have full access to the site. Your free access does not require completion of the 'Digital ID' process, so you will have instant access for viewing and downloading. To be prepared in case you ever do wish to bid online, you may wish to establish your digital ID also, since you cannot bid without a Digital ID.

If you have any problems with the free registration process, you can call the bidexpress help team, toll free at 1-888-352-2439 (option 1, option1).

SECTION C: SMALL BUSINESS ENTERPRISE

Instructions to Bidders City of Madison SBE Program Information

2 Small Business Enterprise (SBE) Program Information

2.1 Policy and Goal

The City of Madison reaffirms its policy of nondiscrimination in the conduct of City business by maintaining a procurement process which remains open to all who have the potential and ability to sell goods and services to the City. It is the policy of the City of Madison to allow Small Business Enterprises (SBE) maximum feasible opportunity to participate in City of Madison contracting. The bidder acknowledges that its bid has been submitted in accordance with the SBE program and is for the public's protection and welfare.

Please refer to the "ADVERTISEMENT FOR BIDS" for the goal for the utilization of SBEs on this project. SBEs may participate as subcontractors, vendors and/or suppliers, which provide a commercially useful function. The dollar value for SBE suppliers or 'materials only' vendors shall be discounted to 60% for purposes of meeting SBE goals.

A bidder which achieves or exceeds the SBE goal will be in compliance with the SBE requirements of this project. In the event that the bidder is unable to achieve the SBE goal, the bidder must demonstrate that a good faith effort to do so was made. Failure to either achieve the goal or demonstrate a good faith effort to do so will be grounds for the bidder being deemed a non-responsible contractor ineligible for award of this contract.

A bidder may count towards its attainment of the SBE goal only those expenditures to SBEs that perform a commercially useful function. For purposes of evaluating a bidder's responsiveness to the attainment of the SBE goal, the contract participation by an SBE is based on the percentage of the total base bid proposed by the Contractor. The total base bid price is inclusive of all addenda.

Work performed by an SBE firm in a particular transaction can be counted toward the goal only if it involves a commercially useful function. That is, in light of industry practices and other relevant considerations, does the SBE firm have a necessary and useful role in the transaction, of a kind for which there is a market outside the context of the SBE Program, or is the firm's role a superfluous step added in an attempt to obtain credit towards goals? If, in the judgment of the Affirmative Action Division, the SBE firm will not perform a commercially useful function in the transaction, no credit towards goals will be awarded.

The question of whether a firm is performing a commercially useful function is completely separate from the question of whether the firm is an eligible SBE. A firm is eligible if it meets the definitional criteria and ownership and control requirements, as set forth in the City of Madison's SBE Program.

If the City of Madison determines that the SBE firm is performing a commercially useful function, then the City of Madison must then decide what that function is. If the commercially useful function is that of an SBE vendor / supplier that regularly transacts business with the respective product, then the City of Madison will count 60% of the value of the product supplied toward SBE goals.

To be counted, the SBE vendor / supplier must be engaged in selling the product in question to the public. This is important in distinguishing an SBE vendor / supplier, which has a regular trade with a variety of customers, from a firm which performs supplier-like functions on an ad hoc basis or for only one or two contractors with whom it has a special relationship.

A supplier of bulk goods may qualify as an eligible SBE vendor / supplier if it either maintains an inventory or owns or operates distribution equipment. With respect to the distribution equipment; e.g., a fleet of trucks, the term "operates" is intended to cover a situation in which the supplier leases the equipment on a regular basis for its entire business. It is not intended to cover a situation in which the firm simply provides drivers for trucks owned or leased by another party; e.g., a prime contractor, or leases such a party's trucks on an ad hoc basis for a specific job.

If the commercially useful function being performed is not that of a qualified SBE vendor / supplier, but rather that of delivery of products, obtaining bonding or insurance, procurement of personnel, acting as a broker or manufacturer's representative in the procurement of supplies, facilities, or materials, etc., only the fees or commissions will apply towards the goal.

For example, a business that simply transfers title of a product from manufacturer to ultimate purchaser; e. g., a sales representative who re-invoices a steel product from the steel company to the Contractor, or a firm that puts a product into a container for delivery would not be considered a qualified SBE vendor / supplier. The Contractor would not receive credit based on a percentage of the cost of the product for working with such firms.

Concerning the use of services that help the Contractor obtain needed supplies, personnel, materials or equipment to perform a contract: only the fee received by the service provider will be counted toward the goal. For example, use of a SBE sales representative or distributor for a steel company, if performing a commercially useful function at all, would entitle the Contractor receiving the steel to count only the fee paid to the representative or distributor toward the goal. This provision would also govern fees for professional and other services obtained expressly and solely to perform work relating to a specific contract.

Concerning transportation or delivery services: if an SBE trucking company picks up a product from a manufacturer or a qualified vendor / supplier and delivers the product to the Contractor, the commercially useful function it is performing is not that of a supplier, but simply that of a transporter of goods. Unless the trucking company is itself the manufacturer or a qualified vendor / supplier in the product, credit cannot be given based on a percentage of the cost of the product. Rather, credit would be allowed for the cost of the transportation service.

The City is aware that the rule's language does not explicitly mention every kind of business that may contribute work on this project. In administering these programs, the City would, on a case-by-case basis, determine the appropriate counting formula to apply in a particular situation.

2.2 Contract Compliance

Questions concerning the SBE Program shall be directed to the Contract Compliance Officer of the City of Madison Department of Civil Rights, Affirmative Action Division, 210 Martin Luther King, Jr. Blvd., Room 523, Madison, WI 53703; telephone (608) 266-4910.

2.3 Certification of SBE by City of Madison

The Affirmative Action Division maintains a directory of SBEs which are currently certified as such by the City of Madison. Contact the Contract Compliance Officer as indicated in Section 2.2 to receive a copy of the SBE Directory or you may access the SBE Directory online at www.cityofmadison.com/dcr/aaTBDir.cfm.

All contractors, subcontractors, vendors and suppliers seeking SBE status must complete and submit the **Targeted Business Certification Application** to the City of Madison Affirmative Action Division by the time and date established for receipt of bids. A copy of the Targeted Business Certification Application is available by contacting the Contract Compliance Officer at the address and telephone indicated in Section 2.2 or you may access the Targeted Business Certification Application online at www.cityofmadison.com/dcr/aaTBDir.cfm. Submittal of the Targeted Business Certification Application by the time specified does not guarantee that the applicant will be certified as a SBE eligible to be utilized towards meeting the SBE goal for this project.

2.4 Small Business Enterprise Compliance Report

2.4.1 Good Faith Efforts

Bidders shall take all necessary affirmative steps to assure that SBEs are utilized when possible and that the established SBE goal for this project is achieved. A contractor who self performs a portion of the work, and is pre-qualified to perform that category of work, may subcontract that portion of the work, but shall not be required to do so. When a bidder is unable to achieve the established SBE goal, the bidder must demonstrate that a good faith effort to do so was made. Such a good faith effort should include the following:

- 2.4.1.1 Attendance at the pre-bid meeting.
- 2.4.1.2 Using the City of Madison's directory of certified SBEs to identify SBEs from which to solicit bids.
- 2.4.1.3 Assuring that SBEs are solicited whenever they are potential sources.
- 2.4.1.4 Referring prospective SBEs to the City of Madison Affirmative Action Division for certification.
- 2.4.1.5 Dividing total project requirements into smaller tasks and/or quantities, where economically feasible, to permit maximum feasible SBE participation.
- 2.4.1.6 Establishing delivery schedules, where requirements permit, which will encourage participation by SBEs.
- 2.4.1.7 Providing SBEs with specific information regarding the work to be performed.
- 2.4.1.8 Contacting SBEs in advance of the deadline to allow such businesses sufficient time to prepare a bid.
- 2.4.1.9 Utilizing the bid of a qualified and competent SBE when the bid of such a business is deemed reasonable (i.e. 5% above the lowest bidder), although not necessarily low.
- 2.4.1.10 Contacting SBEs which submit a bid, to inquire about the details of the bid and confirm that the scope of the work was interpreted as intended.
- 2.4.1.11 Completion of Cover Page (page C-6), Summary Sheet (page C-7) and SBE Contact Reports (pages C-8 and C9) if applicable.

2.4.2 Reporting SBE Utilization and Good Faith Efforts

The Small Business Enterprise Compliance Report is to be submitted by the bidder with the bid: This report is due by the specified bid closing time and date. Bids submitted without a completed SBE Compliance Report as outlined below may be deemed non-responsible and the bidder ineligible for award of this contract. Notwithstanding any language to the contrary contained herein, the City may exercise its discretion to allow bidders to correct or supplement submissions after bid opening, if the minor discrepancy, bid irregularity or omission is insignificant and not one related to price, quality, quantity, time of completion, performance of the contract, or percentage of SBE utilization.

2.4.2.1 If the Bidder meets or exceeds the goal established for SBE utilization, the Small Business Enterprise Compliance Report shall consist of the following:

- 2.4.2.1.1 **Cover Page**, Page C-6; and
- 2.4.2.1.2 **Summary Sheet**, C-7.

2.4.2.2 If the bidder does not meet the goal established for SBE utilization, the Small Business Enterprise Compliance Report shall consist of the following:

- 2.4.2.2.1 **Cover Page**, Page C-6;
- 2.4.2.2.2 **Summary Sheet**, C-7; and
- 2.4.2.2.3 **SBE Contact Report**, C-8 and C-9. (A separate Contact Report must be completed for each applicable SBE which is not utilized.)

2.5 Appeal Procedure

A bidder which does not achieve the established goal and is found non-responsible for failure to demonstrate a good faith effort to achieve such goal and subsequently denied eligibility for award of contract may appeal that decision to the Small Business Enterprises Appeals Committee. All appeals shall be made in writing, and shall be delivered to and received by the City Engineer no later than 4:30 PM on the third business day following the bidder's receipt of the written notification of ineligibility by the Affirmative Action Division Manager. Postmark not acceptable. The notice of appeal shall state the basis for the appeal of the decision of the Affirmative Action Division Manager. The Appeal shall take place in accordance with Madison General Ordinance 33.54.

2.6 SBE Requirements After Award of the Contract

The successful bidder shall identify SBE subcontractors, suppliers and vendors on the subcontractor list in accordance with the specifications. The Contractor shall submit a detailed explanation of any variances between the listing of SBE subcontractors, vendors and/or suppliers on the subcontractor list and the Contractor's SBE Compliance Report for SBE participation.

No change in SBE subcontractors, vendors and/or suppliers from those SBEs indicated in the SBE Compliance Report will be allowed without prior approval from the Engineer and the Affirmative Action Division. The contractor shall submit in writing to the City of Madison Affirmative Action Division a request to change any SBE citing specific reasons which necessitate such a change. The Affirmative Action Division will use a general test of reasonableness in approving or rejecting the contractor's request for change. If the request is approved, the Contractor will make every effort to utilize another SBE if available.

The City will monitor the project to ensure that the actual percentage commitment to SBE firms is carried out.

2.7 SBE Definition and Eligibility Guidelines

A Small Business Enterprise is a business concern awarded certification by the City of Madison. For the purposes of this program a Small Business Enterprise is defined as:

- A. An independent business operated under a single management. The business may not be a subsidiary of any other business and the stock or ownership may not be held by any individual or any business operating in the same or a similar field. In determining whether an entity qualifies as a SBE, the City shall consider all factors relevant to being an independent business including, but not limited to, the date the business was established, adequacy of its resources for the work in which it proposes to involve itself, the degree to which financial, equipment leasing and other relationships exist with other ineligible firms in the same or similar lines of work. SBE owner(s) shall enjoy the customary incidents of ownership and shall share in the risks and profits commensurate with their enjoyment interests, as demonstrated by an examination of the substance rather than form or arrangements that may be reflected in its ownership documents.
- B. A business that has averaged no more than \$4.0 million in annual gross receipts over the prior three year period and the principal owner(s) do not have a personal net worth in excess of \$1.32 million.

Firm and/or individuals that submit fraudulent documents/testimony may be barred from doing business with the City and/or forfeit existing contracts.

SBE certification is valid for one (1) year unless revoked.

**OVERTURE CENTER GARAGE ELEVATOR MODERNIZATION
CONTRACT NO. 7889**

Small Business Enterprise Compliance Report

**This information may be submitted electronically through
Bid Express or submitted with bid in sealed envelope.**

Cover Sheet

Prime Bidder Information

Company: _____

Address: _____

Telephone Number: _____ Fax Number: _____

Contact Person/Title: _____

Prime Bidder Certification

I, _____, _____ of
Name Title

_____ certify that the information
Company

contained in this SBE Compliance Report is true and correct to the best of my knowledge and belief.

Witness' Signature

Bidder's Signature

Date

**OVERTURE CENTER GARAGE ELEVATOR MODERNIZATION
CONTRACT NO. 7889**

Small Business Enterprise Compliance Report

SBE Contact Report

Submit separate copy of this form for each SBE which you are not able to utilize towards meeting the SBE goal for this project. Attach separate sheets if necessary.

SBE Information

Company: _____

Address: _____

Telephone Number: _____

Contact Person/Title: _____

1. Outline below all efforts to solicit a bid from the above SBE. Include date, means of contact, who from your company made this contact and the result.

2. Describe the information provided to the aforementioned SBE regarding the scope of work for which he/she was to provide a bid.

Is this the same scope of work on which the subcontractor you intend to utilize based his/her bid?

Yes No

3. Did this SBE submit a bid? Yes No

4. Is the General Contractor pre-qualified to self-perform this category of work?

Yes No

5. If you responded "Yes" to Question 3, please check the items below which apply and provide the requested detail. If you responded "No" to Question 3, please skip ahead to item 6 below.

The SBE listed above is unavailable for work on this project for the following reasons. Provide specific detail for this conclusion.

The SBE listed above is unqualified for work on this project. Provide specific details for this conclusion.

The SBE listed above provided a price that was unreasonable (i.e. more than 5% above the lowest bidder). Provide specific detail for this conclusion including the SBE's price and the price of the subcontractor you intend to utilize.

A contract with the SBE listed above may constitute a breach of the bidder's collective bargaining agreements. Provide specific detail for this conclusion including, but not limited to, correspondence from the SBE indicating it will not sign a project labor agreement and/or correspondence from the applicable trade union indicating a project labor agreement will not be allowed at the time of project bidding.

Other; please specify reason(s) other than listed above which made it impossible for you to utilize this SBE on this project.

6. Describe any other good faith efforts:

SECTION D: SPECIAL PROVISIONS

OVERTURE CENTER GARAGE ELEVATOR MODERNIZATION CONTRACT NO. 7889

It is the intent of these Special Provisions to set forth the final contractual intent as to the matter involved and shall prevail over the Standard Specifications and plans whenever in conflict therewith. In order that comparisons between the Special Provisions can be readily made, the numbering system for the Special Provisions is equivalent to that of the Specifications.

Whenever in these Specifications the term "Standard Specifications" appears, it shall be taken to refer to the City of Madison Standard Specifications for Public Works Construction and Supplements thereto.

SECTION 102.12: BEST VALUE CONTRACTING

This Contract shall be considered a Best Value Contract if the Contractor's bid is equal to or greater than \$59,000 for a single trade contract; or equal to or greater than \$288,000 for a multi-trade contract pursuant to MGO 33.07(7).

ARTICLE 104: SCOPE OF WORK

This project will provide for the modernization of the existing Dover electric passenger elevator at Overture Center Parking Garage, State Reg. No. 18544 located at 318 W. Mifflin Street, Madison WI.

SECTION 109.2: PROSECUTION OF THE WORK

Construction work must begin within seven (7) calendar days after the date appearing on mailed notice to do so shall have been sent to the Contractor and shall be carried on at a rate so as to secure full completion within the contract time, the rate of progress and the time of completion being essential conditions of this Agreement.

SECTION 109.7: TIME OF COMPLETION

The total time of completion of the contract shall be 170 CALENDAR DAYS.

PRE-BID INFORMATION

The City's designee for Design Engineer is: Paul Rosenberg
Company: Performance Elevator Consulting, LLC.
Phone: Voice/Fax 262-242-3077, Mobile 262-853-1054
Email: PerformElevCons@wi.rr.com

The City's designee for Project Manager is: David Wills
Company: City of Madison Parking Utility
Phone: 608-261-9981
Email: dwills@cityofmadison.com

PRE BID CONFERENCE:

A pre-bid conference will be conducted onsite at 318 W. Mifflin Street at 1:00 P.M., Thursday, January 26, 2017.

A representative from the city's elevator consultant company will be on hand to conduct an onsite walk through, discuss the plans, specifications and expectations of the contract. The city project manager will also be on hand to answer general contract questions.

Project No. 10403

SECTION 14 21 00 – ELECTRIC ELEVATOR ALTERATIONS

PART 1 – GENERAL

1.01 DESCRIPTION OF WORK

General provisions of the specification, including General and Supplementary Conditions, apply to this Section.

- A. This Section addresses the modernization of one (1) existing Dover electric passenger elevator at the Overture Center Parking Garage, State Reg. No. 18544, located at 318 W. Mifflin Street, Madison, WI. This Section indicates the extent of the renovations.
- B. The Base Bid will cover all elevator work and the related work of other trades. See the Sections 1.13, 1.14, and the General Conditions for contract administration and format of bids.
- C. Work shall include all work and material specified for a complete and first class installation in every respect, and is to proceed without interruption until complete.
- D. Where a device or part of the equipment is referred to in the singular number, it is intended that such reference shall apply to all devices, unless otherwise noted.
- E. Unless specifically identified as “Retain” or “Reuse” in Part 2, provide new equipment. Equipment that is “Retained” or “Reused” shall be reconditioned or renewed to place into satisfactory condition for reuse. Any components not specifically replaced (retained components) shall be cleaned, adjusted, lubricated, refurbished, recalibrated, fasteners tightened, painted, tested, and guaranteed for term of warranty period.
- F. Where Contractor is directed to “Provide” devices or equipment, such devices or equipment shall be furnished and installed as work under this project.
- G. Contractor shall provide all labor, elevator equipment, material, transportation, tools and equipment, temporary protection, rigging and hoisting, lubricants and cleaning supplies, employee safety equipment, coordination, supervision, and other work or items required to perform work under this Section, whether or not expressly stated.
- H. Contractor shall be solely responsible for complete compliance with contract documents, omissions, environmental regulations, for verifying all existing clearances and dimensions, existing conditions, for verifying all calculations and voltages found in this Specification at the job site, for code compliance, fabrication, and for coordination of work of other trades.
- I. Progress meetings may be called periodically. Contractor's Project Manager and elevator subcontractor representative shall attend progress meetings to provide status updates on the modernization work and to coordinate Work by Others.

1.02 RELATED WORK INCLUDED UNDER THIS SECTION

The following work must be undertaken as work under this Section.

A. Machine Room: See drawing ME000

1. Minimum 7'0" headroom below new conduits, ventilation equipment, lights, etc.
2. The machine room access door shall be identified with signage stating "Elevator Machine Room" or equivalent in minimum 1" high letters.
3. An independent ventilation or air conditioning system shall protect against the overheating of the electrical equipment. Maintain the room at an ambient temperature of 50°F degrees to 95°F degrees and non-condensing humidity up to 95%; or otherwise within the control manufacturer's specifications.
4. Maintenance or replacement of elevator machine room heating, as required to maintain the temperature range above.
5. The power operated intake louver and exhaust fan should be abandoned or interlocked with the new AC. Insulate blocked penthouse vent.
6. Remove all internet access point equipment and wiring entirely from the elevator machine room. Patch conduit entry point below disconnect switch.
7. A Class ABC fire extinguisher in the machine room, located convenient to the access door. (existing)

B. Electrical Service, Conductors and Devices: See Division 26 and drawing ME100

1. Remove electrical service from the existing elevator disconnect switch to the existing controller in the elevator machine room.
2. Connect service conductors to terminals of the new elevator controller through new or existing fused disconnect switch. Supply shall have a separate equipment grounding conductor and a direct solid ground.
3. All disconnect switches in machine room should be labeled as to their function and provided with signage to identify location of supply side overcurrent protection. Any abandoned switches can be removed.
4. Separate branch circuits in machine room located in new subpanel containing 1) car light circuits (with overcurrent device), 2) machine room light and receptacle, and 3) pit light and receptacle (optional), and 4) utilization equipment such as air conditioners and electric heaters.
5. 110 V single-phase power to elevator controller for car lighting and exhaust fan.
6. Lighting in the machine room to provide illumination of not less than 19 fc throughout the room. Install with 7'0" minimum headroom below new lights and coordinate new lighting location with the Elevator Contractor. All new fluorescent or LED lighting is recommended to replace the existing T-12

fixtures. Note: the machine room walls can be painted to provide better illumination.

7. Adequate illumination over stairway access to machine room.
8. New lighting in the elevator pit and illumination of not less than 10fc at the pit floor, operated by a single new light switch accessible from the bottom hoistway door. Fluorescent or LED lighting is recommended.
9. Machine room shall have a minimum of one GFCI duplex receptacle.
10. Elevator pit shall have a minimum of one GFCI duplex receptacle. An additional non-GFCI outlet is permitted in the pit for future sump pump (optional).
11. Telephone service to elevator controller. All telephone wiring in the machine room should be protected or run in conduit. A second telephone line to controller for remote monitoring, as required.

C. Fire Alarm: See Division 28 and drawing ME100

1. System type fire alarm initiating devices at elevator lobbies and machine room to initiate Firefighters' Service. Provide any upgrades to comply with NFPA 72-2013 6.16.3 and 6.16.4. Install relays within 3 ft of the new elevator controls as required. A separate signal (flashing hat) must be derived from the elevator machine room smoke detector.
2. Coordination and preliminary testing of all heat and smoke detectors and Firefighter's Service prior to the time of acceptance inspection is included as work under this section.

D. Other:

1. Protection of floors, walls, and elevator entrances. Keep hoistway doors in the closed position or provide sufficient barricades to protect the Public and contractor personnel from open hoistways during work activity per good industry standards and OSHA Regulation.
2. Any refinishing of hoistway entrance frames, door panels, and/or walls at the elevator lobbies.
3. Repair or replacement of four electric heaters in the elevator hoistway.
4. Finish flooring in elevator car enclosures.
5. Cutting and/or patching of equipment room floor, interior hoistway walls, and for signal fixtures. Contractor shall provide any needed cutouts and shall patch and close up any existing openings no longer required.
6. Disposal of all existing elevator equipment removed by the Contractor.
7. Verify the adequacy of the supports for new Emergency Rope Brake or traction machine by a licensed professional engineer, if required for City of Madison Fire Department or WI Department of Safety and Professional Services approval.
8. Any painting inside the elevator hoistway other than specified.

1.03 REGULATORY REQUIREMENTS

- A. Elevator system design and installation shall comply with all applicable safety codes, including but not limited to the following, or subsequent code editions in effect as of date of contract signature.
 - 1. ASME A17.1-2013 Safety Code for Elevators and Escalators.
 - 2. ICC/ANSI A117.1-2003, Accessible and Usable Buildings and Facilities
 - 3. ADAAG Americans with Disabilities Act Accessibility Guidelines
 - 4. NFPA 70-2011, National Electrical Code
 - 5. NFPA 72-2013, National Fire Alarm and Signaling Code adopted in Madison
 - 6. Wisconsin Administrative Code Chapter SPS 318 effective 9/1/14
 - 7. IBC-2009, International Building Code
 - 8. Madison Chapter 40 Conveyance Code
- B. Contractor shall apply for any permits necessary for work, pay all City, State, and Local permit and inspection fees, and obtain cutting or burning permits as required for their work. The Contractor shall also pay reinspection fees for deficiencies or violations that are the responsibility of the Contractor or subcontractors per terms of this Section.
- C. Provide all installer and contractor licenses, permits, and perform required acceptance tests, including all applicable fees.
- D. Contractor shall also provide all additional material or modifications to equipment required to meet enforceable codes, standards, and laws.
- E. Provide copies of permit application "Conditionally Approved" by the City of Madison Fire Department to Owner per SPS 318.1008(4). The elevator approval letter shall be posted prior to construction at or near the equipment rooms, and a copy of the approved elevator plans shall be available at the site.

1.04 QUALITY ASSURANCE

- A. Bidder shall utilize an Elevator Contractor with a minimum five-year record of successful experience in the business of installing, modernizing, and servicing elevators of the type covered by this specification.
- B. Contractor shall use skilled installers, trained and experienced in installing the equipment. All work shall be performed in a workmanlike manner and is to include all materials, accessories, and labor necessary for a complete and proper operating system, whether or not expressly specified.

1.05 SAFETY AND HAZARDOUS MATERIALS

- A. Owner or his designee may approve all chemicals and lubricants prior to Contractor bringing them on site. Contractor shall furnish a Hazard

Communication Safety Data Sheet (SDSs) and proper labeling for each hazardous chemical to be brought into the premises in compliance with OSHA Hazard Communication Standards, and track usage for EPA reporting purposes.

- B. Contractor shall be solely responsible for initiating, maintaining, and supervising all safety programs or initiatives and shall comply with applicable safety laws, good industry standards, and take all reasonable precautions for the safety of property, Contractor's employees, employees of Owner or outside contractors, and the general public.
 - 1. The Contractor is solely responsible for providing all safety training to their employees in compliance with State, Federal, or local requirements including, but not limited to, Lockout/Tagout, Electrical Safety, Mechanical Stored Energy, Hazardous Communication, Bloodborne Pathogens, and accessing elevator pits, car tops, and Confined Spaces.
 - 2. The Owner reserves the right to request and review records documenting evidence of training received, and to require at no cost, that Contractor's personnel successfully complete training programs conducted by Owner or its affiliates.
- C. Asbestos and lead paint: There is no anticipated asbestos or lead paint associated with work under this Section. Any materials which the Contractor encounters and suspects may contain asbestos or lead paint shall be left undisturbed until such time that they can be tested by Owner or his agent, and verified to be free of asbestos or lead paint.

1.06 SITE INSPECTIONS

Each bidder has the obligation to survey the existing elevator and is responsible for verifying all conditions and the accuracy of the information contained in the specification and drawings.

A Pre-Bid conference will be held at the Overture Center Parking Garage. Check bidding documents for date and time.

- A. Requests for additional site inspections after the mandatory Pre-Bid Conference may be scheduled through Parking Operations Supervisor David Wills at 608-261-9981 or dwills@cityofmadison.com.
- B. No modifications or adjustments to bids shall be allowed because of any error, neglect, or failure on the part of the bidder to verify site conditions, or should the information contained in the specification or drawings be in error. Any items omitted from the specification or drawings which are necessary for the completion of the elevator modernization shall be considered to be a part of the specification, although not directly referenced.
- C. Failure to visit site or failure to examine any and all documents will in no way relieve successful Bidder from the necessity of furnishing any materials or equipment, or performing any work that may be required. Neglect of above requirements will not be grounds for delay in work or additional compensation.

- D. By submitting a bid, Contractor acknowledges that it has surveyed, inspected, and is familiar with the equipment.

1.07 SCHEDULE

Bidders shall identify their tentative construction schedule as shown below and on the Bid Form, effective with date of contract signature.

Shop Drawings/Approval _____ wks
Manufacturing/Delivery _____ wks
Installation _____ wks

- A. Base Bid shall include an accelerated installation schedule using shift work for all field labor to reduce the duration of the project. Shift work shall proceed with a two person crew each working a successive shift Monday through Friday. The first crew works an 8-hour shift, the second crew works a subsequent 7.5 hour shift.
- B. Once started, work shall be pursued continuously during two consecutive work shifts without interruption until complete.
- C. After award, successful bidder shall provide a project schedule as a PDF document. Contractor shall periodically update schedule, and incorporate Owner work items upon request.

1.08 SUBSTITUTION OF MATERIALS

- A. All requests for substitution shall be submitted in writing prior to bidding and shall include sufficient product information and time allowance to permit Consultant to evaluate the request prior to the bid due date.
- B. The Owner specifically reserves the right to reject or approve any and all substitute materials or equipment in order to insure compliance with the minimum standards of quality established for the project herein specified.
- C. When an item is approved as an equal, either by the specification or by approved substitution, this item shall provide the same end results and maintain the style and appearances established for this project to the Consultant's and Owner's satisfaction. Any modification, additional fitting or change to the approved items to accomplish these results shall be at the expense of the Contractor.

1.09 TEMPORARY SERVICE

Should temporary use of an elevator be required to transport materials, the Contractor shall accommodate Owner by providing an operator, when an elevator is capable of being operated. However, the Contractor shall be compensated at the hourly labor rate shown on the Bid Form. It is stipulated that the project completion provided on the bid form will be extended by the cumulative time period of temporary use.

1.10 SUBMITTAL DATA

Submittals will be reviewed for general compliance with design concept and contract documents only. Compliance with contract documents, Code requirements, dimensions, fit, finishes, and integration with the existing elevator equipment remains the Contractor's responsibility. Within 30 days after award of contract, provide submittals required by Sections A-B-C. Allow 14 days for response to submittals. Contractor shall respond to submittal review comments in writing within 7 days of submittal return, promptly incorporating changes so that delivery and installation schedules are not delayed.

- A. SCHEDULE OF VALUES: Contractor shall provide a schedule of values using AIA documents that identify the material and labor for the elevator modernization.
- B. PRODUCT DATA: Submit manufacturer's product data for each principal component in the form of a single electronic PDF file, including:
 - 1. Elevator controls – brochure and product data
 - 2. Traction machine with DC brake
 - 3. Drive motor
 - 4. Rope gripper
 - 5. Door operator
 - 6. Signal fixtures
- C. SHOP DRAWINGS: Within 30 days after award of contract and before beginning equipment fabrication, submit six (6) copies scaled shop drawings for review.
 - 1. Hoistway and machine room plans drawings. Indicate maximum dynamic and static loads imposed on building structure at point of support, including machine and guide rails, and maximum loads imposed by emergency brake.
 - 2. Car enclosure drawings including color rendering
 - 3. All signal fixtures
 - 4. The Contractor shall provide copies of "Conditionally Approved" permit applications each to Owner and Consultant prior to commencing with field installation.
- D. SAMPLES: 3-inch square samples of car enclosure finishes upon request.
- E. SDS(s): Owner may approve all chemicals and lubricants prior to Contractor bringing them on site. The Contractor shall furnish a Safety Data Sheet and proper labeling for each hazardous chemical to be brought into the premises in compliance with OSHA Hazard Communication Standards, and track usage for EPA reporting purposes.

- F. MAINTENANCE MANUALS: Submit electronically as a single electronic PDF file with index and two (2) hard (printed) copies before submittal of final invoice. Operating and maintenance instructions shall include:
1. Bound 8-1/2 inch x 11 inch binders with durable plastic covers.
 2. Binder cover with title and name of project, table of contents, and reinforced dividers to organize sections.
 3. Complete replacement parts listing with part numbers and sourcing information.
 4. Firefighters' Operation instructions.
 5. Operation, maintenance, and repair procedures for components including rope gripper, DC brake, door operator, etc.
 6. Lubrication instructions including recommended products and frequency
 7. Full installation, adjustment, maintenance, troubleshooting, and repair procedures for elevator controls, including AC Drive.
 8. Maintenance check charts, indicating recommend tasks and intervals.
 9. On-Site Documentation and On-Site Maintenance Records per elevator code requirements.
 10. Copies of all inspection and test reports and certificates.
 11. Provide a Maintenance Control Program (MCP) accessible to the elevator personnel and documenting compliance with ASME A17.1 Section 8.6. Where unique or product-specific procedures or methods are required to inspect or test equipment, such procedures or methods shall be included in the Maintenance Control Program. The MCP shall be the Owner's property and shall not be removed from the premises.
 12. All Code required written procedures (e.g., check out, inspection, testing, and maintenance). Procedures for tests, periodic inspections, maintenance, replacements, adjustments, and repairs for all SIL rated E/E/PES electrical protective devices and circuits shall be incorporated into and made part of the Maintenance Control Program.
- G. WIRING DIAGRAMS: The contractor shall provide complete As-Built schematic wiring diagrams of the new control systems, including field revisions and factory updates. Provide full sized hard copy and one electronic PDF file to Owner, and a full sized laminated set stored in the elevator machine room. PDF file shall be submitted on a USB jump (flash) drive.
- H. FINAL DRAWINGS/DOCUMENTS: Final or record "As-Built" submittal of layout and signal fixture drawings shall also be provided on disks containing electronic media copies. Drawings shall be in AutoCAD and texts in Microsoft Word for Windows. PDF files are also an acceptable form of electronic media.
- I. TEST REPORTS: Provide copy of Inspection and Acceptance reports from City of Madison Fire Department. A copy shall also be retained in the On-Site Documentation.

- J. CLOSEOUT DOCUMENTS: All Maintenance Manuals, As Built Drawings, Wiring Diagrams, Warranty Statement, and Waivers of Lien (upon request of Owner or their representative) shall be provided by Contractor within 15 days of substantial completion, and before final payment request has been submitted. Acceptance of such records shall not constitute a waiver of any deviation to perform work in accordance with the Contract Documents. PDF files shall be submitted on a USB jump (flash) drive.

1.11 WARRANTY

- A. The equipment installed shall be warranted by Contractor against defects in materials and workmanship for a period of 12 months starting on the date of final acceptance by Owner. Warranty shall include correction of defective material or workmanship to the satisfaction of the Owner and Consultant.
- B. Owner shall have the right to reject defective or inferior material or workmanship, which shall comply in every respect with the Contract Documents. Contractor shall make modifications, adjustments, and improvements of new equipment to meet performance or other requirements of this specification at no additional cost to Owner.
- C. Defective" is defined to include, but not limited to, operating or control system failures, failure of new components, performance below required minimum standards, excessive wear, unusual deterioration or aging of materials or finishes, finishes not complying with specifications, the need for excessive maintenance, unsafe conditions, abnormal noise or vibration, and other unusual, unexpected, or unsatisfactory conditions.
- D. Control equipment and motor warranty by controller manufacturer shall be a minimum of 12 months after date of acceptance.
- E. Neither the final payment nor any provision of the contract documents relieves the Contractor of the responsibility for negligence or faulty materials or workmanship within the extent and period provided by law.

1.12 MAINTENANCE

Contractor shall provide callback service on the elevator beginning with the commencement date of the field work.

In addition provide complete maintenance service and 24 hour callback service for a period of 12 months after project completion, beginning with the date of substantial completion. All elevator equipment whether new or retained shall be fully covered under maintenance, any proration of costs to Owner is not permitted.

- A. Maintenance service shall be performed by skilled and trained employees of the Contractor and shall not be subcontracted. Contractor shall provide all material and labor, and original equipment manufacturer (OEM) parts shall be used.

- B. The preventive maintenance program after project completion shall include a scheduled inspection, cleaning, lubrication, adjustment, and repair or replacement of worn or defective parts.
- C. Preventive maintenance after substantial completion shall include monthly examinations at approximately 30 day intervals at a minimum.
- D. Beginning with final acceptance of the elevators by Owner, a minimum of twelve (12) inspections are required in the 12 month warranty and maintenance period. In the event the minimum site visitations are not provided, the Contractor shall extend his warranty and complete maintenance, covering all callbacks, repairs, parts, testing, labor and any other items necessary to keep the elevators in like new condition until a minimum of twelve maintenance examinations at approximately 30 day intervals have been completed.
- E. Maintenance shall include callbacks at any hour of any day at no additional cost subject to the exclusions in Section F below.
- F. Repair or replacement due to low voltage, misuse, abuse, or neglect caused by persons other than Contractor's or subcontractor's personnel are excluded from coverage.
- G. Contractor is solely responsible for providing a written record of work performed at the time of each visit, which must be kept in the elevator equipment room. Contractor is solely responsible for all maintenance records requirements of A17.1-2013 Req. 8.6.1.2 and Records per Req. 8.6.1.4, including a Maintenance Control Program and testing and documentation of Firefighters' Emergency Operation at quarterly intervals. Maintenance record format is subject to approval by Owner and hard copy records shall be kept in the machine room and available to the Owner at all times.
- H. Maintain the elevator machine room, hoistway, car top, and pit, and equipment in these areas in clean condition throughout and at the end of the one year warranty and maintenance period
- I. Contractor shall respond on site within two hours of any request for service during regular working hours, and within 30 minutes for entrapments during regular working hours.
- J. Response time from time of call to mechanic arriving on site shall not exceed 2 hours for overtime callbacks.
- K. Category 1 tests shall be performed and documented again at approximately 30 days prior to of the expiration of the 12 month warranty and maintenance period.

PART 2 – PRODUCTS

2.01 SCOPE OF MODERNIZATION:

FEATURE/COMPONENT	EXISTING ELEVATOR	DISPOSITION
WI REGISTRATION NO	18544	RETAIN
RATED LOAD	2500 LBS	RETAIN
RATED SPEED	200 FPM	RETAIN
NET TRAVEL	APPROXIMATELY 61' 7"	RETAIN (VERIFY)
POWER SUPPLY	230 VOLTS	RETAIN (VERIFY VOLTAGE)
LANDINGS	7 LANDINGS IN LINE	RETAIN
FLOOR DESIGNATIONS	Y1-X1/X2-Y2/Y3-X3/X4-Y4/Y5-X5/X6-Y6/Y7/Z7	RETAIN (VERIFY)
MACHINE LOCATION	OVERHEAD	NEW IN EXIST OH LOCATION
DRIVING MACHINE	DOVER GD-45 GEARED	NEW HOLLISTER-WHITNEY #54 WITH DISC BRAKE
DRIVE MOTOR	12.5 HP, 230 VDC	15 HP LOW SLIP AC MOTOR
EMERGENCY BRAKE	NONE	HW #620 ROPE GRIPPER
SUSPENSION ROPES	(6) 1/2" IRON OR STEEL	NEW 8 X 19 CLASS TRACTION STEEL
DEFLECTOR SHEAVE	DOVER OH	NEW HOLLISTER-WHITNEY
OPERATION CONTROL	SELECTIVE COLLECTIVE	RETAIN OPERATION
MOTION CONTROL	GENERATOR-FIELD CONTROL	NEW REGENERATIVE TYPE VVVF AC DIGITAL CLOSED LOOP
CONTROLLER	RELAY LOGIC	NEW NON-PROPRIETARY MICROPROCESSOR
CONTROL FEATURES, NEW	FIREFIGHTERS' OPERATION A17.1-2013 , LOADWEIGHING BYPASS OPERATION, INDEPENDENT SERVICE, HOISTWAY ACCESS, ASCENDING CAR AND UIM PROTECTION	
EMERG POWER OPER	NONE	NONE
INSIDE CAR DIMENSIONS	APPROX 5' 8" W X 4' 11" D	RETAIN EXISTING SIZE

FEATURE/COMPONENT	EXISTING ELEVATOR	DISPOSITION
ENTRANCE SIZE	3' 6" W X 7' 0" H CENTER OPENING	RETAIN
DOOR OPERATOR	DOVER HD-73	GAL MOVFR-II
CAR DOOR EQUIPMENT	DOVER	NEW GAL HANGAR, HEADER, TRACKS, CLUTCH
REOPENING DEVICE	FORMULA SYSTEMS FCU47	NEW FCU47/CEDES CEGARD
CAR SILL	NICKEL SILVER	RETAIN OR REPLACE
CAR DOOR RESTRICTOR	HINGED CAR RESTRICTOR W/ STEEL HOISTWAY MTD BRKTS	RETAIN OR REPLACE WITH IDENTICAL SYSTEM
HOISTWAY DOOR EQUIPMENT	DOVER	NEW HANGARS, TRACKS, INTERLOCKS, CLOSERS, SECONDARY RETAINERS
HOISTWAY DOOR PANELS	3' 6" W X 7' 0" H CENTER OPENING, 1-1/2 HR LABELED, WITH VISION PANELS	RETAIN, CLEAN, REUSE, ADAPT AS REQUIRED
HOISTWAY DOOR GIBS	CORRODED STEEL GIBS	NEW GALVANIZED GIBS, SECONDARY SILL RETAINER PER DOOR PANEL
HOISTWAY DOOR SILLS	ALUMINUM	RETAIN, CLEAN, AND POLISH
HOISTWAY FASCIA AND DUST COVERS	SHEET STEEL	RETAIN AND PAINT EXISTING, REPLACE CORRODED
SAFETY	DOVER FLEXIBLE GUIDE CLAMP 63200	RETAIN AND TEST
SPEED GOVERNOR AND TENSION SHEAVE	DOVER 66700	NEW HOLLISTER-WHITNEY MODEL 201/202, OR 207
COMPENSATION	NONE	PROVIDE WHISPERFLEX WHERE RECOMMENDED
CAR/CWT BUFFERS	DOVER SPRING BUFFERS	RETAIN, CLEAN, PAINT
PLATFORM	ALL STEEL WITH PLYWOOD SUBFLOORING	REPLACE SUBFLOORING AND SHEET STEEL FIREPROOFING
CAR FRAME	STRUCTURAL STEEL	RETAIN, CHECK FSTN, PAINT

FEATURE/COMPONENT	EXISTING ELEVATOR	DISPOSITION
CAR ENCLOSURE	PLASTIC LAMINATE SIDE WALLS, 2 REAR GLASS PANELS	REPLACE WITH NEW CAR ENCLOSURE AS SPECIFIED
TOP OF CAR RAILING	NONE	PROVIDE WHERE >12" CTW
PLATFORM APRON	CORRODED STEEL	REPLACE W/ 48" VERTICAL DIM
CAR ROLLER GUIDES	DOVER 4" ROLLER GUIDES	RETAIN AND RECONDITION
GUIDE RAILS, BRKTS	15# CAR / 8# COUNTERWEIGHT	RETAIN, TIGHTEN FASTENERS, ALIGN AS REQ'D
COUNTERWEIGHT	FRAME TYPE	RETAIN, REBALANCE, PAINT
CWT ROLLER GUIDES	DOVER 4" ROLLER GUIDES	RETAIN AND RECONDITION
LIMIT SWITCHES	MECHANICAL ROLLER	NEW COMPAT W/ CONTROLS
SIGNAL FIXTURES	DOVER VANDAL RESISTANT, ROUND ILLUMINATED BUTTONS	NEW INNOVATION INDUSTRIES BRUISER POSITIVE STOP WITH LED ILLUMINATION
CAR OPERATING PANEL	APPLIED	NEW INTEGRAL WITH ADA PHONE, P/I, FS DEVICES
CAR POSITION INDICATOR	LIGHT UP TYPE IN TRANSOM	NEW VANDAL RESISTANT DIGITAL TYPE IN COP
CAR DIRECTION IND	TRANSOM MOUNTED	NEW V/R IN CAR RETURN COLUMN OPPOSITE COP
CORRIDOR STATIONS	RECESSED, VANDAL RESISTANT WITH ROUND PB	NEW FLUSH MOUNTED OVER EXISTING BOXES
FIRE KEY BOX	KEYED SUPRA 0520	NEW V/R BOX W/ FEO-KI KEY
TOP OF CAR INSPECT	EXIST NOT CODE COMPLIANT	NEW PER CURRENT CODE
JAMB BRAILLE	EXISTING	RETAIN, REPLACE MISSING
IN CASE OF FIRE SIGNS	VARIOUS	BY OWNER
PIT LADDER		REPLACE EXISTING
PIT STOP SWITCH		REPLACE EXISTING
CAR AND HW WIRING		NEW WIRE, BOXES, AND RACEWAYS THROUGHOUT

2.02 MATERIALS

The following suppliers and products may be considered approved providing they comply with other specification requirements. Other suppliers and products must be approved by Consultant and The Owner in writing prior to Bid Date.

A. MICROPROCESSOR-BASED GROUP CONTROLS

1. GAL Manufacturing – GALaxy Elevator Control
2. Motion Control Engineering – Motion 4000
3. Smartrise – SRA AC
4. or approved equal

B. TRACTION MACHINE

1. Hollister-Whitney #54
2. or approved equal

C. CLOSED LOOP DOOR OPERATOR

1. G.A.L. Manufacturing – MOVFR II
2. or approved equal

D. EMERGENCY ROPE BRAKE

1. Hollister-Whitney Rope Gripper™ Model 620
2. or approved equal

E. SIGNAL FIXTURES

1. Innovation Industries, Incorporated with “Bruiser” stainless steel buttons
2. or approved equal

F. CAR ENCLOSURE

1. Concept Elevator
2. Globe Architectural
3. G&R Elevator
4. Schumacher Elevator
5. or approved equal

2.03 SIMPLEX SELECTIVE COLLECTIVE OPERATION

Operation shall be automatic by means of the car and landing buttons. Stops registered by the momentary actuation of the car or landing buttons shall be made in the order in which the landings are reached in each direction of travel after the buttons have been actuated. All stops shall be subject to the respective car or landing button being actuated sufficiently in advance of the arrival of the car at that landing to enable the stop to be made. The direction of travel for an idle car shall be established by the first car or landing button actuated.

“UP” landing calls shall be answered while the car is traveling in the up direction and “DOWN” landing calls shall be answered while the car is traveling down. The car shall reverse after the uppermost or lowermost car or landing call has been answered, and then proceed to answer car calls and landing calls registered in the opposite direction of travel.

If the car without registered car calls arrives at a floor on which both up and down hall calls are registered, it shall initially respond to the hall call in the direction that the car is traveling. If no car call or hall call is registered for further travel in that direction, the car shall respond to the hall call in the opposite direction.

There shall be no perceptible delay after the car gate is closed prior to initiating movement of the elevator car.

2.04 MACHINE ROOM EQUIPMENT

A. MICROPROCESSOR BASED CONTROLS

The elevator controllers shall be microprocessor based, designed specifically for elevator applications, and shall comply with all applicable elevator and electrical safety codes. Elevator logic shall be implemented with a real-time, multi-tasking operating system to allow the processor to simultaneously execute elevator control logic, drive control logic, operator interface logic, and communication support. The controller shall be approved to the latest edition of ASME-A17.5, and a complete procedure for testing and demonstrating compliance to the latest edition of ASME A17.1 shall be provided. The control system shall include any required transformers, and a 3-phase filter to reduce EMI where recommended by the controls manufacturer or required by jobsite conditions.

1. MOTION CONTROL: Microprocessor based AC, variable-voltage, variable frequency with digitally encoded closed-loop velocity feedback suitable for operation specified and capable of providing smooth, comfortable car acceleration, retardation, and dynamic braking. The closed loop feedback power control shall continuously monitor the actual elevator speed for optimal, safe operation.
2. POWER CONVERSION AND REGULATION: The drive shall be fully regenerative to allow the overhauling loads to feed clean power back to the building's electrical system. The drive shall not create excessive audible noise from the elevator motor.
3. ON-BOARD DIAGNOSTICS: The elevator controllers shall have extensive diagnostic capability. All available programming options or parameters shall have field programmable parameters (door times, etc). The control system

shall be equipped with a minimum 15" built-in flat screen LCD touch screen or minimum 17" desktop display to allow user interface to all controller adjustment and setup parameters and to display diagnostic information. The display shall show data and menus in readily understood character format, rather than using numeric, binary, or other installation codes. Time based requirements to upgrade software or access shall be prohibited. Programmable options and parameters shall be stored in nonvolatile memory.

4. TESTING COMPATIBLE: Onboard software shall enable any service provider to perform all applicable Category 1 and Category 5 tests without additional interface or access codes.
5. INDEPENDENT SERVICE: Independent service operation shall be provided so that actuation of a key switch in the car operating panel will cancel any existing car calls, and hold the doors open at the landing. The car will then respond only to car calls. Car and hoistway doors will only close with constant pressure on a car call push-button or door close button.
6. HOISTWAY ACCESS OPERATION: When enabled by the in-car inspection key switch, access to the car top and pit shall be available through means of key switches at both terminal landings. The operation of the continuous pressure key switch at either access landing will initiate and maintain movement of the car with the hoistway doors at this landing open, subject to code requirements.
7. MACHINE ROOM INSPECTION OPERATION: An inspection switch and an up/down switch shall be provided in the controller to enable inspection operation.
8. UNINTENDED MOTION/ASCENDING CAR OVERSPEED PROTECTION.
9. LEVELING: The elevators shall be equipped with automatic two-way leveling to control leveling of the car to within .25" or better above or below the landing sill, with any load up to full load.
10. LOAD WEIGHING: Provide means for weighing car passenger load. Provide hall call by-pass when the car is filled to preset percentage of rated capacity and traveling in down direction. If car loading relative to weight in car is not commensurate with number of registered car calls, cancel car calls.
11. HOME LANDING: Provide the means for automatic return to the main floor. Return car nonstop after answering pre-registered car calls, and park with doors open for an adjustable time period of 60 - 90 seconds. Upon expiration of time period, car shall automatically close its doors and revert to normal operation.
12. CAR POSITION INDICATOR: Provide digital driver for new digital car position indicator.
13. FIREFIGHTERS' EMERGENCY OPERATION: FEO and operating features shall be incorporated per ANSI A17.1-2013 code requirements.
14. TECHNICAL SUPPORT: In-house technical support from the control manufacturer for the life of the product, available to both the initial installer and any future maintenance company.

15. PARTS AVAILABILITY: Minimum of 15 years available supply for key spare and replacement parts.

B. NEW GEARED TRACTION MACHINE

A new heavy duty overhead machine of the single worm geared traction type shall be designed for the existing 2500 lb capacity and 200 FPM rated speed. The traction machine shall utilize tapered roller bearings and have a bronze ring gear and a hardened steel worm on an integral shaft. All components shall be mounted on a continuous steel base plate.

1. AC MOTOR: The new traction machine shall be equipped with a low slip AC motor especially designed for elevator service and compatible with VVVF drives. The motor stator shall be dynamically balanced and supported by ball bearings. A 15 HP motor shall be provided at a minimum, or sized or configured as required for the duty specified. The motor stator shall be dynamically balanced and supported by ball bearings. A digital velocity encoder shall be mounted on the motor to give feedback to the controller on motor speed position.
2. DC MACHINE BRAKE: A disc type machine brake shall be spring applied and electrically released, and designed to hold the car at the floor with load up to 25% in excess of the rated load, after it has come to rest. The brake shall be designed to automatically apply in event of interruption of power supply from any cause, and be equipped with a brake switch. Control of the brake shall be digital. The setting and lifting of the brake shall be software based and all electronic.
3. DRIVE SHEAVE: The machine shall have a demountable traction sheave accurately turned and grooved for the quantity and size of hoist cables required for the duty specified. The drive sheave shall be equipped with suitable sheave guarding by Contractor.
4. DEFLECTOR SHEAVE: Install new steel overhead cable deflector sheave at the top of the hoistway with structural mounting for each elevator as required. Deflector sheaves shall be complete with new sheave guards.
5. EMERGENCY ROPE BRAKE: A new emergency "Rope Gripper" sized for the duty specified may be provided as an approved emergency braking means to prevent ascending car overspeed and unintended car movement in compliance with the ASME A17.1-2013 safety code. The device shall be mechanically activated and hydraulically reset, to stop the elevator in the event of a mechanical or electrical failure in both the upward or downward direction. Contractor shall provide structural mounting of rope gripping device independent from machine bedplate, mount "Rope Gripper" pumping unit within six feet of device, then wear in and test linings consistent with manufacturer's recommended procedures.

C. STRUCTURAL MOUNTING

1. New machine shall be installed over the hoistway and fastened directly to the existing machine beams. Furnish and install all required structural support or

modify existing supports as required for the new traction machine, emergency brake, and machine room or hoistway-mounted cable deflector sheaves.

2. The Contractor shall verify the adequacy of new or existing structural beams, structural slabs, supports, foundations, or building structure to support the loads. Provide any engineering or design services by a licensed professional engineer required by ASME A17.1-2013 section 2.9, the City of Madison Fire Department Elevator Inspector, or Wisconsin Department of Safety and Professional Services (DSPS). All costs shall be borne by the Contractor.
3. Provide bearing plates, anchors, shelf angles and blocking as required to support new equipment. Include all mounting hardware and related components.
4. The mounting of the machine shall incorporate the manufacturer's isolation assembly and/or other means to minimize the transmission of noise and/or vibration to the elevator car, building structure, or occupied areas of the building.
5. Where adjacent beams have greater than 5 deg sloping flanges of structural shapes, beveled steel washers shall be used.

D. EXISTING SELECTOR CABLE DEFLECTOR SHEAVES

Remove all existing selector cable sheaves and mounting brackets from the penthouse and pit.

E. SPEED GOVERNOR

A new Hollister-Whitney Model centrifugal overspeed governor or approved equal shall be provided, complete with new wire rope and tension weight assembly, and the applicable acceptance tests made.

F. TEMPERATURE/HUMIDITY SIGNAGE

The temperature and humidity range specified by the elevator controls manufacturer shall be permanently posted in the machine room.

G. CODE DATA PLATE

Provide metal plate on controller indicating A17.1 and IND4/SPS 318 codes under which the elevator was installed and modernized.

H. TEMPERATURE/HUMIDITY SIGNAGE

The temperature and humidity range specified by the elevator controls manufacturer shall be permanently posted in the machine room.

2.05 HOISTWAY EQUIPMENT

A. GUIDE RAILS

Reuse planed steel car and counterweight guide rails and rail brackets, provide additional supports or brackets as required. Tighten rail bracket, rail clip, fishplate and connection bolts, clean, shim and realign as required. Dress rail sections with belt sander as required to remove corrosion. Provide supplemental rail brackets and/or backing where required to enhance car ride.

B. HOISTWAY ACCESS

Hoistway access operation shall be provided from new keyed switches at the terminal landings in full compliance with A17.1-2013 Section 2.12.7.

C. TERMINAL-SLOWDOWN AND STOPPING DEVICES

New Terminal-Stopping Devices compatible with new controls shall be provided in compliance with A17.1-2013 Section 2.25.

D. COUNTERWEIGHT

1. Contractor shall insure that no defects exist or shall repair or replace; including frame, weights, and provide a minimum of 6" counterweight runby.
2. The existing counterweight roller guide assemblies may be reconditioned and retained. Any worn components shall be replaced.
3. Provide counterweight runby data plate in elevator pit per A17.1-2013 Section 2.4.5.
4. Elevator cars shall be suitably counter-balanced by adjusting the quantity of existing and/or new counterweight fillers to a 40-45% ratio per industry standards.
5. If the modernization results in an increase or decrease in the deadweight of the car that increases or decreases the sum of the deadweight and rated load, as originally installed, by more than 5%, the installation shall be made to conform to all applicable code requirements.

E. CAR AND COUNTERWEIGHT BUFFERS

Inspect, clean, and paint existing buffer equipment including springs, stands, and buffer support channels. Renew corroded fasteners as required.

F. DOOR OPERATOR EQUIPMENT

All new door operator equipment shall be provided and adjusted to comply with current elevator code and Part 3 Performance standards, including the maintenance standards contained in the NEII-1 Building Transportation Standards and Guidelines by the National Elevator Industry, Inc.

1. **DOOR OPERATOR:** A new closed loop, microprocessor based door operator shall be provided. The processor will monitor the door's actual position and velocity compared to its desired position and velocity. If variations are detected in the profile the command will be automatically corrected. A hand-held programmer used to adjust the operator shall be provided and is to be considered property of the Owner.
2. **CAR DOOR HANGARS:** Provide new center opening car door hangar with header, tracks, polyurethane rollers and cable relating.
3. **HOISTWAY DOOR HANGARS AND FASCIA:** Provide new center opening hoistway door hangars. Provide top safety retainers per A17.1-2013 2.11.11.8 for all hoistway hangars. Install all new hangar sheaves, sill-mounted closers, etc. Clean and paint dust covers and fascia plates, replace

guard below bottom floor and any other corroded, damaged or missing dust covers or fascia plates.

4. **HOISTWAY DOOR INTERLOCKS:** Provide complete new hoistway door interlocks, pickup assemblies, linkages, and mounting means. One hoistway door unlocking key shall be provided in the machine room with DPSP required signage.
5. **HOISTWAY DOORS AND FRAMES:** Retain and reuse all existing hoistway door panels and entrance frames. Wash inside of hoistway door panels to remove accumulated lint and spilled or caked on fluids. Paint inside of any corroded panels. Sight guards, door jamb bumpers, and escutcheon for door release keyway shall be provided where missing or damaged at any landing. Replace all bottom door guides and bottom fire retainers.
6. **CAR AND HOISTWAY DOOR SILLS:** All landing sills may be reused in place. Clean existing nickel silver car sill and aluminum landing sills, including ends inside hoistway.
7. **RUNNING CLEARANCE:** The horizontal clearance between the car and landing sills shall not exceed 1-1/4" at any landing, and shall not be less than 3/4", and the platform shall be level with the landings.
8. **CAR DOOR CLUTCH:** Furnish and install new LWZ retractable car door clutch assembly.
9. **DOOR RESTRICTOR:** Utilize new or existing robust hinged type. The car or hoistway doors shall not be opened more than 4 inches from inside the car when outside the unlocking zone; and the doors shall be unlocked when the car is within 3 inches (76 mm) above or below the new 7" unlocking zone.
10. **NEW DOOR REOPENING DEVICE:** Provide new electronic reopening devices with minimum of 40 beams that will stop and reopen the car and hoistway doors automatically without contact should the doors become obstructed. The Cedes GateKeeper Max or Formula Systems FCU47 entrance protections systems shall be considered acceptable. The use of other products shall first be approved in writing. The new door reopening devices and reduced speed door closing on Phase I and Phase II shall comply with Code requirements on Firefighters' Operation.

G. ELEVATOR IDENTIFICATION

1. **JAMB BRAILLE:** Retain and reuse existing Braille plates riveted to entrance jambs at each landing. Replace any worn, damaged, or missing Braille plates with matching riveted plates, providing both new plates for that landing.
2. **IN HOISTWAY:** Provide new hoistway floor number decals, not less than 4 inches in height, on the hoistway side of the enclosure and hoistway doors.

H. CAR ACCESSORIES

1. **WORK LIGHT AND RECEPTACLE ON CAR TOP:** Provide 120V 15 ampere utility outlet on the car top with ground-fault circuit-interrupter receptacle (GFCI). Two car top lights on each elevator activated by a single switch shall provide an illumination level of not less than 10 fc. One light shall be corded

retractable or magnetic base type. All light bulbs shall be externally guarded against breakage. Lighting shall not be connected to the load side of a GFCI.

2. EXHAUST FAN: A new Man-D-Tec MVS-12 or equivalent 2-speed fan shall be provided on the car top and operated by a key switch in the car station. Suitable guarding shall be provided below the fan to prevent objects inside the car enclosure from coming into contact with the fan blades.
 3. CAR TOP INSPECTION STATION: Furnish and install a new NEMA 1 rated top-of-car inspection station with light fixture, transfer switch, emergency stop switch, and constant pressure (up - down - enable) buttons. If the emergency stop switch is not located within 24" of the front landing sills an auxiliary stop switch shall be provided at the front of the car top.
 4. TOP OF CAR RAILING: A standard railing conforming to A17.1-2013 Section 2.14.1.7 shall be provided on the outside perimeter of the car top on all sides where the perpendicular distance between the edge of the car top and hoistway enclosure exceeds a 12 inch horizontal clearance.
 5. EXIT CONTACT: The new car top emergency exit cover shall be fastened in the closed position from the car top and provided with an electrical contact that must be manually reset from the top of the car after the exit cover is within 2 inches of the fully closed position.
- I. TAPE OR TAPELESS SELECTOR POSITIONING SYSTEM: A noiseless position/speed feedback system shall be provided, using dual independent means reading a fixed hoistway tape or guide rail, a motor or governor encoder, and multiple independent processors.
- J. LOADWEIGHING DEVICE: Provide a load weighing device under the isolated platform compatible with the controls manufacturer. When an elevator is filled to an adjustable percentage of the capacity load, the elevator shall bypasses hall calls but not car calls. The passed landing calls shall remain registered for the next elevator. The microprocessor control system shall compare the load on the elevator to the number of car calls registered. If the number of car calls exceeds the load by a field programmable value, the car calls shall be canceled after the first call has been answered. The loadweigher shall automatically recalibrate itself periodically.
- K. SUSPENSION ROPES
1. New traction steel wire suspension ropes shall be provided of the proper size, grade, construction, and breaking strength, as determined by the new traction machine manufacturer and by ASME A17.1 and ASME A17.6 requirements.
 2. New wire ropes shall be complete with new wedge clamp shackles at both rope terminations, rope data tag, and all mounting hardware, including two rope clips per shackle. Shackles shall be painted to prevent corrosion.
 3. A minimum of 6" counterweight runby shall be required at all times.
- L. TRAVELING CABLES

1. Provide new hoistway traveling cable with 4 spare 8 x 20AWG shielded pair communication wires between each car and controller for future access control or camera.

2.06 CAR FRAME AND PLATFORM REPAIRS

- A. After removal of the existing car enclosure, the existing platform flooring, subflooring, and sheet steel fireproofing shall be removed.
- B. Tighten car frame and platform fasteners as required. Remove corrosion from platform and car frame components then paint car frame and platform structure in black enamel or other approved color.
- C. Install new galvanized sheet steel fireproofing on the underside of the platform.
- D. Provide new platform subflooring, using ¾" fire rated exterior or marine grade plywood, with moisture resistant adhesives suitable for this application.

2.07 CAR FRAME AND PLATFORM EQUIPMENT

- A. SAFETY DEVICE: The existing safety device shall be inspected, cleaned, tested, and painted, or otherwise repaired to be in conformance to code requirements.
- B. PLATFORM GUARD (APRON): A complete new smooth metal guard plate shall be provided on the entrance side of the platform, minimum 14 gauge steel, reinforced and braced, extending below the surface of the platform a minimum of 48 inches, per 2.15.9. Provide galvanized or painted finish. Contractor shall take all measures necessary to obtain AHJ approval for reduced apron height where required, including modification of the existing car buffer assemblies.
- C. CAR ROLLER GUIDES: The existing Dover car roller guides may be retained. Recondition, and adjust to maintain roller contact with the guide rails regardless of load or position in the hoistway. Any worn rollers or other components shall be replaced.
- D. EMPTY CAR WEIGHT: Upon completion of the modernization the empty elevator car with new car enclosure shall be weighted, and the empty car weight recorded on a new metal data plate. Retain existing crosshead plate in place.

2.08 NEW CAR ENCLOSURE:

A. ENCLOSURE WALLS

1. New car enclosure shell shall have minimum 14 GA reinforced furniture steel formed panels with baked enamel interior finish. Apply sound-deadening mastic to exterior.
2. Side walls to have removable raised panels clad with Rigidized stainless steel, 6SL or other finish as selected from manufacturer's standard product line. Rigidized material shall wrap around sides and rear of panels.

3. Rear wall to contain 9/16" laminated clear glass panels above and below the handrail. Lower section to have .060" thick viracon #5006 1/8" grey dot frit pattern. Framing to be #4 satin stainless steel.
4. Provide #4 stainless steel reveals between panels, at the corners of the enclosure, and for frieze to canopy.
5. Base shall be heavy duty #4 satin stainless steel with 1/2" x 2" ventilation slots in sufficient quantity to satisfy code ventilation requirements. A black painted steel baffle shall be installed on the hoistway side of the vents to prevent objects from being inserted through the ventilation slots.

B. ENTRANCE RETURN/COLUMNS AND TRANSOM

1. Reinforced 14 gauge satin #4 satin stainless steel entrance columns extending to the canopy.
2. Satin #4 satin stainless steel transom shall be provided between the entrance columns.
3. Stationary return panels shall extend to the canopy and be clad with Rigidized stainless steel, 6SL or other finish as selected from manufacturer's standard product line.

C. CAR DOOR PANELS

1. New single speed center opening horizontal sliding door panels of furniture steel construction shall be provided for the existing car enclosures.
2. Each new door panel shall be covered with steel on both front and rear sides, with suitable reinforcement to ensure panel rigidity. New panels constructed without metal cladding on front and rear surface are not acceptable. Each panel shall be reinforced and drilled to accept new door operator equipment, and provided with two new hangar sheaves and door gibs.
3. The car enclosure side of the panels shall be clad with Rigidized stainless steel, 6SL or other finish as selected from manufacturer's standard product line. Exposed rivets on the car side or leading edge of the panels are not acceptable.

D. CEILING AND LIGHTING

1. Car Top: Reinforced 12 gauge furniture steel formed construction with concealed, hinged, lockable emergency exit and code compliant electrical contact. Interior finish shall be satin stainless steel, without welding marks. A minimum of 8'0" clear headroom shall be provided.
2. Provide four new Man-D-Tec Aerobeam rectangular LED lighting fixtures with #4 brushed stainless steel finish frame and dimmer control or approved equal. The new lighting shall be recessed into the car top and the illumination level provided shall be satisfactory to Owner.
3. Two recessed Aerobeam fixtures shall function as car emergency lighting upon loss of 110V car lighting power supply using ELS-LED-2C power supply.

4. Provide automatic operation of car lighting to control lights in an unoccupied cab in compliance with ASME A17.1-2013 req. 2.14.7.2.2 after an adjustable time interval.
5. Fan grille: Provide Chrome finish grille for new MVS-12 12" 2-speed fan, with metal covering to prevent inserting objects into the fan blades.

E. HANDRAIL

1. Provide a new single row of satin stainless steel handrails in the car enclosure on the side and rear walls.
2. The hand rails shall be 3/8" by 2" high and centered at approximately 35" high and spaced a minimum of 1-1/2" from the enclosure panels.
3. All rails shall be 2" solid flat bar with the ends bent or returned towards the wall.

2.09 SIGNAL FIXTURES – GENERAL

- A. COVERPLATES: Unless otherwise stated, all new signal fixture coverplates shall be #4 brushed stainless steel, approximately 1/8" thick with finished edges, and have tamperproof fasteners. Hall station coverplates shall be sized to cover the existing boxes without additional filler plates.
- B. PUSHBUTTONS: All new pushbuttons shall be Innovation Industries "Bruiser" series with PB-25 round projecting vandal resistant stainless steel call register pushbuttons with counter-bored stop.
- C. ILLUMINATION: All new signal fixtures, including car buttons, emergency light, position indicator, and car lanterns shall be provided with long-life LED illumination. Buttons shall have LED illumination in Owners choice of standard color. Position indicators shall have red segmented illumination. The visible button indication shall extinguish when the car arrives at the designated floor.
- D. KEYS: Two (2) keys shall be provided to the Owner for each key switch provided.
- E. FIREFIGHTERS' OPERATION KEY SWITCHES: Firefighters' Operation key switches shall be FEO-K1 as per section 2.27.8 of the ASME A17.1-2013 Safety Code for Elevators and Escalators.

2.09 CAR SIGNAL EQUIPMENT

- A. NEW CAR OPERATING STATION: Contractor shall provide a new car operating station, containing all specified devices in a single integral applied stainless steel coverplate.
 1. Elevator number and rated load near top of coverplate.
 2. Digital car position indicator with 2" high visible indicator and field replaceable vandal resistant lens. P/I to have sufficient character readout for existing floor designations.

3. Additional Firefighters' Operation visual signal above Fire Cabinet.
 4. Fire Cabinet: Fire Operation devices shall be grouped together near the upper section of the car operating panel behind a locked cover labeled 'Firefighters' Operation' in red letters and operable by a FEO-K1 switch. Devices behind the locked cover shall include: Fire Operation key switch, call cancel button, illuminated visual and audible signals, Firefighters' stop switch, additional door open and door close buttons, and operating instructions.
 5. Provide key switches for fan, light, inspection enable, independent service, and 1 spare key switch.
 6. Floor call buttons shall be arranged with numbers in ascending order between 35-48" high and shall read from left to right.
 7. Non-illuminated door open and door close buttons.
 8. Alarm button and new bell shall be provided, button shall illuminate when activated.
 9. Braille: Cast metal tactile characters and Braille, mechanically fastened and field replaceable integral designations substantially flush with the front of the coverplate. Painted or adhesive type plates are not acceptable
 10. Provide a self-dialing ADA compliant telephone in a push-to-open recessed telephone cabinet and compatible with customer's telephone system. Coordinate the programming and testing of instrument, which shall be ASME A117.1-2003 and ASME A17.1-2013 compliant. The phone shall be programmed to dial Owner's 24/7 call service. The two-way voice communication means within the building accessible to emergency personnel shall be provided and comply with ASME A17.1-2013 requirement 2.27.1.1.4. The means shall enable emergency personnel within the building to establish two-way voice communications to car.
 11. Support – Car station shall be provided with heavy duty hinges and swing open to the side.
 12. Company name or logo: None visible is permitted.
- B. CAR DIRECTION INDICATOR: New vandal resistant car direction indicator with multiple LED illuminated visual signals and double stroke ADA compliant gong shall be provided, recessed in both car entrance columns. Volume of gong shall be adjustable.

2.10 CORRIDOR SIGNAL FIXTURES

- A. CALL STATIONS: Provide one riser of new corridor call stations containing a single call register button at each terminal landing and up and down call register buttons at intermediate landings. New stations shall be sized to fit over the existing corridor call station recessed boxes.
- B. HOISTWAY ACCESS: Provide new constant pressure keyed access switch with labeled key core at both terminal landings. Key switch may be provided in the terminal hall stations. The same key shall activate the Enable switch in the car, if keyed.

- C. FIREFIGHTERS OPERATION/TELEPHONE MONITORING: A separate recessed station located above the call station at the lowest floor shall contain the Phase I switch and illuminated jewel, field replaceable Phase I operating procedures signage, communications failure jewel, audible signal, and keyed reset switch,
- D. KEY BOX: A metal vandal resistant key box for switch keys and elevator machine room key, located at the main landing, for fire department or other authorized personnel. Box shall be Quality Elevator Model SKB-2011 high security fire key box using 25460 flat key and securely fastened to the front hoistway wall as directed.
- E. CUTTING AND PATCHING: The Contractor shall design new corridor signal fixtures to cover old devices, and otherwise provide all cutting and patching for installation of all new signal fixtures.

PART 3 – EXECUTION

3.01 SITE CONDITIONS AND INSPECTION

The Contractor is responsible for inspecting the elevator equipment and verifying all critical dimensions, voltages, and calculations shown in specification or drawings prior to fabrication. Notify Consultant and Owner in writing of material discrepancies or other conditions detrimental to performance of work under this Section.

3.02 INSTALLATION

- A. Install all elevator components.
- B. Protection of floors, walls, and elevator entrances. Keep hoistway doors in the closed position or provide sufficient barricades to protect the Public from open hoistways during work activity per good industry standards and OSHA Regulations.
- C. A clear path shall be provided to all new components or equipment that require maintenance, of not less than 18 inches clearance in the direction(s) required for maintenance access.
- D. Sufficient hoistway clearances shall be provided and maintained per code requirements.
- E. All field wiring required to perform work under this Section shall be provided, and in compliance with NFPA 70.
- F. All car and hoistway wiring shall be replaced. Insulation on new wiring shall have flame retardant and moisture-proof outer covering and shall be run in conduit, tubing, or electrical raceways. Contractor may reuse existing raceways with the mutual consent of Consultant and Owner. All other existing elevator raceways not being reused shall be removed from the car and hoistway.
- G. All new flexible hoistway traveling cables shall be provided, suitably suspended to relieve strain on individual conductors. Elevator traveling cable shall be Type E, EO, ETP, or ETT. A minimum of 10% spare wires for future use shall be provided in both the traveling cables(s) and hoistway wiring. Tag conductors as 'spares'.
- H. AC motor encoder shall be electrically isolated from the motor.
- I. The new geared traction machine shall be properly installed, check and adjust the gear pattern and the hoist motor shall be aligned and accurately trammed with the machine brake pulley. The DC brake and brake monitor shall be adjusted per manufacturer's recommendations.
- J. The machine, drive sheave, and cable deflector sheave shall be equipped with guarding by Contractor. Guarding shall be galvanized or painted.

- K. Conduit shall not be used for bracing or mounting of material, equipment, or guards.
- L. Contractor shall be responsible for all rigging and hoisting required for installation of their equipment and removal of superseded equipment.
- M. Cutting and/or patching of hoistway walls and equipment room floor. Contractor shall provide any needed cutouts in walls and floors and shall patch and close up any existing openings no longer required.
- N. All proposed modifications to the building shall be approved in advance by the Owner. Any damage sustained to the building shall be repaired to the satisfaction of the Owner.
- O. Provide clearly visible warning and direction signs, temporary lighting, etc. All required safety signage shall be provided by Contractor. Temporary signage shall be subject to the approval of Owner. Permanent signage shall comply with ANSI Z535.2 (See ASME A17.1-2013 2.4.1.6 and 2.4.12.2).
- P. All welding shall comply with ASME A17.1-2013 section 8.8.

3.03 FIELD QUALITY CONTROL

Consultant will periodically check the jobsite during the course of installation to view execution of work. Full cooperation and communication with the Owner or their designee, who does NOT supervise or direct work, is mandatory.

3.04 PRODUCT DELIVERY, SITE ORGANIZATION AND CLEANUP

- A. Contractor shall take precautions to secure the elevator hoistway and construction tools and equipment from residents, contractors, and other personnel. Coordinate work with Owner's Contractors to minimize conflict with building operations.
- B. Deliver materials in original, unopened protective packaging. Space for temporary storage of materials, job boxes, etc. is quite limited. Contractor shall provide off-site storage at their own expense until components are needed, as required by Owner.
- C. Provide protective coverings, barriers, etc. to protect equipment and finishes from damage during transportation, storage, and construction.
- D. Contractor shall keep work areas orderly and free from debris during the course of installation, and clean up on a daily basis. If areas are not kept clean, Owner may clean those areas and deduct cost from contract.
- E. Contractor shall regularly remove trash, materials, cartons, etc. generated by their work from the premises. Contractor is also responsible for legally and properly disposing of elevator equipment that is replaced as part of the alterations. Disposal in Owner's dumpster is not permitted.

- F. All waste items including, but not limited to, cleaning compounds or fluids, waste cloths or wipers, lubricants, old parts, containers, oil absorbent or oil absorbent pads, and waste oil must be removed from the premises and disposed of offsite by Contractor of in full compliance with OSHA and EPA guidelines.
- G. Completely clean carbon dust from machine room and equipment. Paint the new traction machine base, motor, adaptor plates, guards, counterweight assembly, and the pit and machine room floors.
- H. Steel, such as new or existing platform guards, pit ladders, fascia, dust covers, or toe guards, and any other guards shall be painted or galvanized. All structural supports, guarding, etc. shall be painted by Contractor.
- I. Execute cleaning of Work before final inspection and acceptance for final payment. Final cleaning of work, as applicable, shall not be limited to the following:
 - 1. Clean surfaces exposed to view; remove protective coverings and clean surfaces at completion.
 - 2. Clean finishes free of dust, lint, stains, films, adhesives and other foreign substances. Remove excess lubrication.
 - 3. Remove construction debris trash, materials, cartons, etc. from the premises.
 - 4. Touch up or otherwise restore damaged factory-painted or exposed finishes and surfaces with original paint and color as required.
 - 5. Replace new or existing finishes and surfaces that cannot be repaired or restored to the Owner's satisfaction.
- J. The car top, hoistway, machine room, pit, and equipment located in these areas shall be thoroughly cleaned at completion of the modernization work and shall be maintained in clean condition to the Owner's satisfaction throughout and at the end of the one year warranty/maintenance period. Hoistway cleaning shall include guide rails and rail brackets, counterweights and shackles, platform apron and fascia, hoistway doors, hangars, headers, and hoistway sills.

3.05 ACCEPTANCE TESTS

- A. The Contractor shall make all acceptance or other tests required by the governing codes, and submit evidence of City of Madison Fire Department approval to Consultant.
- B. Advise Consultant and Owner in advance of dates and time acceptance tests are to be performed.
- C. Perform a full load test of the existing car safety and new speed governor. Governor adjustments shall be calibrated and sealed. Contractor shall provide test weights, including 125% load for brake.
- D. Perform testing of Phase I and Phase II Firefighters' Emergency Operation, including assisting the Fire Alarm vendor with testing of all heat and smoke detectors, prior to and at the inspection of the alterations.

- E. Load weighing shall be manually calibrated with test weights. Verify the zero calibration after the first 30 days of operation, and recalibrate as required per manufacturer's instructions.
- F. Rope Gripper shall be tested per manufacturer's instructions and ASME A17.1-2013 requirements.
- G. Contractor shall pay reinspection fees for deficiencies or violations of the initial inspection that are the responsibility of the Contractor, per terms of this Section.
- H. Work shall not be considered complete until accepted in writing by Owner or his designee, and then only after successful completion of all violations cited by the City of Madison Fire Department Elevator Inspector and completion of Consultant's punch list.
- I. Copies of all inspection and test reports and certificates shall be provided to Consultant.

3.06 PERFORMANCE AND DEMONSTRATION

- A. The Consultant and Owner shall have full access to inspect Contractor's work at any time. If corrections are deemed to be necessary, they shall be at the sole expense of the Contractor, and shall be completed prior to release of final payment.
- B. The Owner shall have the final determination of all performance standards, at its sole discretion.
- C. Demonstrate the operation of the elevator system to Owner and Consultant upon completion of installation and before final acceptance. Make necessary adjustments of operating devices and all equipment to ensure satisfactory elevator operation and performance without undue wear or excessive maintenance so that the operating times can be readily maintained over the life of the equipment. Demonstration shall include:
 - 1. Installation compliance with specifications.
 - 2. Demonstrate the elevator will lift the rated load at rated speed, record no load and full load speeds.
 - 3. Stopping accuracy, car ride, and floor-to-floor performance times in compliance with specifications.
 - 4. Check starting, acceleration, deceleration, and stopping g-forces.
 - 5. Door operation, closing force, opening and closing times specified.
 - 6. Load weighing shall be manually calibrated with test weights. Verify the zero calibration after the first 30 days of operation, and recalibrate as required per manufacturer's instructions.
 - 7. Operation of signal fixtures.
 - 8. Firefighters' Emergency Operation.

9. Promptly remove all work rejected by Consultant or Owner for failure to meet specifications and replace to comply with requirements, at no additional cost to the Owner. All expenses of repairing work of other trades damaged by this replacement shall be borne by Contractor.
 10. Rejected work which is not made good within a reasonable time, determined by the Owner, may be corrected by the Owner at Contractor's expense.
- D. Elevator and group performance: The Contractor agrees to provide elevator performance, meeting the standards listed below, at a minimum. The elevators shall be reconditioned and adjusted to meet maintenance standards as published in the NEII-1 Building Transportation Standards and Guidelines by the National Elevator Industry, Inc,. Compliance with these performance requirements shall be in addition to the City of Milwaukee elevator inspection and certification process. Elevators shall comply with the minimum performance standards at final acceptance and throughout maintenance and warranty periods.

Elevator Designation	Floor to Floor Performance Time	Door Open Time	Door Close Time	Stopping Accuracy
Elev #1	10.0 sec	2.1 sec	2.4 sec	1/4"

1. Speed – rated speed shall not vary more than + 3% for static control equipment, regardless of load.
2. Rated Capacity: Safely lower, stop, and hold 125% of rated load.
3. Stopping Accuracy: $\pm 1/8$ " under any loading condition or direction of travel.
4. Elevator Performance (Floor to Floor) Time – measured from the start of doors closing until the elevator is stopped level at the next successive floor, under any loading condition in either direction of travel, with the car doors approximately $3/4$ open. Times shall be increased by 0.3 seconds per foot for floor heights exceeding 12 feet.
5. Door Opening Time – measured from the start of doors opening until the doors are fully open, or nominally, until the door are approximately 2" from fully open.
6. Door Closing Time – measured from the start of doors closing until doors are fully closed. The door closing time shall not be less than the minimum permitted by the elevator code.
7. Door Closing Force – measured with the door at rest and between 1/3 and 2/3 closed. See inspector's manual for procedure. Door closing force shall not exceed 30 lbf.
8. Floor stops – The accessibility code requires that the car sill initially stop within $1/2$ " of the landing sill vertically. New equipment shall stop within $1/4$ ". Leveling accuracy should be measured under various loading conditions.
9. Ride Quality and Acceleration – Contractor shall maintain a comfortable elevator ride with smooth acceleration, deceleration, and final stop as measured with a Maxton SafeTach.

10. Noise – There should be no perceptible hoistway noises audible inside the car enclosure as the elevators move through the hoistway, within reason.
11. Door operators and associated equipment shall be adjusted to NEII Performance Standards.

3.07 ACCEPTANCE AND INSTRUCTIONS

- A. Upon notice from Contractor that all work is substantially complete and copies of all punch lists with date of corrections are provided to Consultant, Consultant and Owner will arrange to make a final inspection and acceptance.
- B. Contractor shall instruct Owner's personnel in the proper use and operation of all new devices. Review and demonstrate emergency procedures with Owner's personnel, including operational failures and Firefighters' Service Operation. Train Owner's representative in normal procedures to be followed. Such training shall include a familiarization with the elevator equipment, conducted for Owner's designated representative on one occasion.
- C. Switch keys shall be released to the Owner as coordinated by Consultant. A total of two (2) keys shall be provided for each and every key switch provided in the car and corridor stations. Each key number shall be on a separate ring, properly tagged and identified for function, and a separate listing of key number and function provided.
- D. One hand-held door operator parameter unit used to set door times and other variables shall be provided to and is to be considered property of Owner.
- E. One flat touch screen or 17" display desktop machine room monitor shall be provided for control system access, and is to be considered property of the Owner.
- F. One sensor installation tool for EMCO load weigher sensor installation (if applicable).
- G. All Maintenance Manuals, As Built Drawings, Wiring Diagrams, and Waivers of Lien shall be provided by Contractor prior to issue of final invoice.

**PROJECT 10403 - DIVISION 26 05 00
COMMON WORK RESULTS FOR ELECTRICAL**

PART 1 - GENERAL

1.01 SCOPE OF WORK

- A. Base Bid: Electrical Contractor provide: It is the intent of these specifications to provide complete and workable electrical systems as shown on the accompanying plans and as specified herein except such parts as are specifically exempted herein. Provide all necessary supervision, coordination, labor, materials, equipment, fixtures, dryage, hoisting, tools, transportation, plant services and facilities, machinery and connections to utilities for the installation of complete and operable electrical systems. If details or special conditions are required in addition to those shown on drawings, provide all material and equipment usually furnished with such systems or required to complete their installation, whether noted in plans and specification or not.
- B. Materials and labor shall be new (unless noted otherwise), first class and workmanlike and shall be subject at all times to the A/E's inspections, tests and approval from the commencement until the acceptance of the completed work.
- C. The layout shown on the drawings is necessarily diagrammatic but shall be followed as closely as other work will permit. The drawings provide design intent. The Contractor shall verify all dimensions at the site and be responsible for their accuracy.
- D. All sizes as given are minimum except as noted.
- E. Because of the scale of the Drawings, certain basic items, such as, pipe fittings, duct fittings, access panels, and sleeves, may not be shown. Where such items are required by Code or by other Sections, or where required for proper installation of the Work, such items shall be included, whether shown or not.
- F. In the event of any inconsistencies between the specifications, drawings, contract documents, applicable laws, statutes, ordinances, building codes, rules and regulations, the contractor shall provide the better quality or greater quantity of work and comply with or conform its work to the most stringent legal or contractual requirements.
- G. Changes from these drawings required to make this work conform to the building construction shall be made only with prior written approval of the Architect/Engineer. All proposed changes shall be shown on shop drawings. All measurements shall be verified by actual observation and all work shall fit in place meeting the approval of the Architect/Engineer.
- H. Equipment Specification may not deal individually with minute items required, such as, components, parts, controls, and devices which may be required to produce the equipment performance specified or as required to meet the equipment warranties. Where such items are required to make the system operational, they shall be included by the supplier of the equipment at no additional cost, whether or not specifically called for.

1.02 SECTION INCLUDES

- A. The work under this section includes basic electrical requirements, which are applicable to all Division 26 sections. This section includes information common to two or more technical specification sections or items that are of a general nature, not conveniently fitting into other technical sections.
 - 1. Submittals
 - 2. Construction Verification Checklists
 - 3. Functional Performance Tests
 - 4. Reference Standards
 - 5. Quality Assurance
 - 6. Guarantee
 - 7. Operation And Maintenance Instructions
 - 8. Record Documents
 - 9. Continuity Of Existing Services
 - 10. Sealing And Firestopping
 - 11. Off Site Storage
 - 12. Regulatory Requirements

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13. Certificates And Inspections
14. Coordination
15. Demolition And Existing Requirements
16. Approved Electrical Testing Laboratories
17. Sleeves And Openings
18. Omissions
19. Definitions
20. Project/Site Conditions
21. Work Sequence And Scheduling
22. Work by Other Trades
23. Salvage Materials
24. Identification
25. Demolition
26. Cutting And Patching
27. Building Access
28. Equipment Access
29. Housekeeping And Clean Up

1.03 **RELATED WORK**

- A. The electrical work included in all other divisions is the responsibility of the contractor performing the Division 26 work unless noted otherwise.

1.04 **SUBMITTALS**

- A. Submit shop drawings for equipment under each section per requirements listed in that section.
- B. Submit for all equipment and systems as indicated in the respective specification sections, marking each submittal with that specification section number. Mark general catalog sheets and drawings to indicate specific items being submitted and proper identification of equipment by name and/or number, as indicated in the contract documents. Failure to do this may result in the submittal(s) being returned to the Contractor for correction and resubmission. Do not submit hard copies of web pages. Failing to follow these instructions does not relieve the Contractor from the requirement of meeting the project schedule.
- C. On request from the A/E, the successful bidder shall furnish additional drawings, illustrations, catalog data, performance characteristics, etc.
- D. Submittals shall be grouped to include complete submittals of related systems, products, and accessories in a single submittal. Mark dimensions and values in units to match those specified. Include wiring diagrams of electrically powered equipment.
- E. The submittals must be approved before fabrication is authorized.
- F. Provide electronic copies of all submittals for review.

1.05 **CONSTRUCTION VERIFICATION CHECKLISTS**

- A. Contractor is responsible for utilizing the construction verification checklists supplied under these specifications in accordance with the procedures defined for construction verification checklists in Section 26 08 00 – Commissioning of Electrical.

1.06 **FUNCTIONAL PERFORMANCE TESTS**

- A. Contractor is responsible for utilizing the functional performance test procedures supplied under these specifications in accordance with the procedures defined for functional performance test procedures in Section 26 08 00 – Commissioning of Electrical.

1.07 **REFERENCE STANDARDS**

- A. Abbreviations of standards organizations referenced in this and other sections are as follows:
 1. ANSI American National Standards Institute
 2. ASTM American Society for Testing and Materials
 3. EPA Environmental Protection Agency
 4. ETL Electrical Testing Laboratories, Inc.
 5. IEEE Institute of Electrical and Electronics Engineers

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6. IES Illuminating Engineering Society
7. ISA Instrument Society of America
8. NBS National Bureau of Standards
9. NEC National Electric Code
10. NEMA National Electrical Manufacturers Association
11. NESC National Electrical Safety Code
12. NFPA National Fire Protection Association
13. UL Underwriters Laboratories Inc.

1.08 **QUALITY ASSURANCE**

A. Substitution of Materials:

1. If the Contractor wishes to submit an alternate to the named manufacturers for any equipment, he may submit a voluntary alternative minimum 7 days prior to bid, stating the manufacturer's name, model number, written, detailed product data.
 2. Where materials or equipment are specified by name the proposed material or equipment must be identical to the specified material or equipment in all characteristics of quality, function and serviceability, regardless of application in the Project and, in addition, when the Architect deems that aesthetic significance is important, the equal material or equipment must be identical in all characteristics of visual appearance, design, color and texture. Any proposed equal shall be submitted to Architect/Engineer for prior approval, which Architect/Engineer may approve or disapprove in its sole discretion. Work performed or constructed with unapproved equals is at Contractor's risk and any required correction of work incorporating unapproved equals shall be at Contractor's sole cost and expense.
 3. In all instances, Contractor shall assume full responsibility for proof of equality of the statute to the equipment hereinafter specified. All data and information necessary for proof of equality, function and space requirements shall be prepared and accompany the submittal of the substitution to the Architect/Engineer. Approval by the Architect/Engineer of equipment other than the specified does NOT relieve Contractor of this responsibility.
- B. All products and materials used are to be new, undamaged, clean and in good condition. Existing products and materials are not to be reused unless specifically indicated.
- C. Where equipment or accessories are used which differ in arrangement, configuration, dimensions, ratings, or engineering parameters from those indicated on the contract documents, the contractor is responsible for all costs involved in integrating the equipment or accessories into the system, including, but not limited to, coordination with other trades and any required changes by other trades and for obtaining the intended performance from the system into which these items are placed.
- D. All materials, except medium voltage equipment and components, shall be listed by and shall bear the label of an approved electrical testing laboratory. If none of the approved electrical testing laboratories has published standards for a particular item, then other national independent testing standards, if available, applicable, and approved by A/E, shall apply and such items shall bear those labels. Where one of the approved electrical testing laboratories has an applicable system listing and label, the entire system, except for medium voltage equipment and components, shall be so labeled.

1.09 **GUARANTEE**

- A. In entering into a contract covering this work, the contractor accepts the specifications and guarantees that the work will be carried out in accordance with the requirements of this specification or such modifications as may be made under the contract documents.
- B. Contractor further guarantees that the workmanship and material will be of the best procurable and that none but experienced workmen familiar with each particular class of work will be employed.
- C. Contractor further guarantees to replace and make good at his own expense, including travel time, all defects, which may develop within 1 year after final payment and acceptance by the Architect/Engineer, due to faulty workmanship or material, upon, receipt of written notification from the Owner.

1.10 **WORK BY OWNER**

- A. PCB equipment (other than light fixture ballasts) removal and disposal, if required, will be by the Owner under separate contract.

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- B. Electrical testing not described in these contract documents will be by the Owner under separate contract.

1.11 OPERATION AND MAINTENANCE INSTRUCTIONS

- A. Supply the following additional documentation:
 - 1. Manufacturer's wiring diagrams for electrically powered equipment.
 - 2. Copies of all approved submittals along with approval letters.

1.12 RECORD DOCUMENTS

- A. Follow the following procedures.
 - 1. During the progress of the work, Contractor shall maintain a current (daily) record set of the drawings and specifications, indicating thereon all work installed at variance with such Contract Documents including, without limitation, work covered by Addenda, Field Work Orders, Change Orders and Engineers additional instructions, interpretations and clarification. All changes or deviations from the original layout of the work and all critical dimensions of buried or concealed work shall be recorded. It shall be Contractor's responsibility to assure that said record sets are complete, accurate and up-to-date, Engineer shall have the right to inspect and review such record sets.
 - 2. At the completion of the work, Contractor shall indicated on record sets all record changes and such additional details necessary or appropriate to provide a complete reference document for use by Engineer. If variations and details cannot be shown clearly thereon, the Contractor shall prepare supplemental drawings adequate to impart the information. The foregoing drawings collectively shall constitute the "Record" drawings for the work.
 - 3. All indication on "Record" drawings shall be executed in a legible manner at Contractor's cost, using methods and legend presentations compatible with the overall scheme of the record drawings with respect to scale, drawing sheet sizes and sequential indexing. All changes shall be marked clearly in red and clouded.
 - 4. Engineer may review Contractor's "Record" drawings and notify Contractor of observed discrepancies or deviations. Contractor shall promptly correct discrepancies, deviations or illegible markups at Contractor's expense and resubmit revised drawings for Engineer review.
 - 5. Contractor shall provide final electronic record drawings to the Owner through the Engineer.
 - 6. Engineer will provide final electronic record drawings to the Owner based on Contractor's markups.

1.13 CONTINUITY OF EXISTING SERVICES

- A. Do not interrupt or change existing services without prior written approval from the Owner's Project Representative. When interruption is required, coordinate scheduling of down-time with the Owner to minimize disruption to his activities. Unless specifically stated, all work involved in interrupting or changing existing services is to be done during normal working hours.
- B. Each Contractor shall thoroughly familiarize himself with existing systems which will affect and be affected by relocation of existing equipment and installation of new lines and equipment. They shall plan installation of their work so that interruptions of services to any building or portion thereof will be a minimum and such interruptions shall occur only when system is not required, if possible. If not possible, each Contractor shall insure the operation of services by whatever means possible, such as, installing bypasses, capping of services or providing temporary service. Each interruption shall be for as short a duration as possible.
- C. No extra costs will be paid to the Contractor for such outages which must occur outside of regular weekly working hours.
- D. This Contractor shall restore any circuit interruption as a result of this work to proper operation as soon as possible. Note that institutional operations are on a seven day week schedule.

1.14 SEALING AND FIRESTOPPING

- A. Sealing and firestopping of sleeves/openings between conduits, cable trays, wireways, troughs, cablebus, busduct, etc. and the structural or partition opening shall be the responsibility of the contractor whose work penetrates the opening. The contractor responsible shall hire individuals skilled

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in such work to do the sealing and firestopping. These individuals hired shall normally and routinely be employed in the sealing and fireproofing occupation.

- B. Contractor shall request current life safety drawings from the Architect/Owner.

1.15 OFFSITE STORAGE

- A. If payment will be requested for approved offsite stored material, then the Contractor shall complete an "Off-site Storage Agreement" which is available from the Owner. Prior approval by Owner's personnel for offsite storage will be needed. No material will be accepted for offsite storage unless submittals for the material have been approved.

1.16 REGULATORY REQUIREMENTS

- A. All work and materials are to conform in every detail to applicable rules and requirements of the Wisconsin State Electrical Code Volumes 1 and 2, the National Electrical Code (ANSI/NFPA 70), other applicable National Fire Protection Association codes, the National Electrical Safety Code, present manufacturing standards (including NEMA) and the Authority Having Jurisdiction (AHJ).
- B. All Division 26 work shall be done under the direction of a currently certified State of Wisconsin Certified Master Electrician.

1.17 CERTIFICATES AND INSPECTIONS

- A. Obtain and pay for all required State or local installation inspections except those provided by the Architect/Engineer in accordance with State Code. Deliver originals of these certificates to the Owner. Include copies of the certificates in the Operating and Maintenance Instructions.
- B. Coordinate and provide inspections as required by the Authority Having Jurisdiction over the site.
- C. This contractor is responsible for coordination of Owner's electrical inspection. Inspection requirements will be issued at a pre-installation meeting, arranged by this contractor and the Owner's Electrical Inspector.

1.18 COORDINATION

- A. It shall be the responsibility of each Contractor to coordinate and consult with each other to determine space requirements and to determine that adequate space for servicing is provided for all equipment whether furnished by the Contractor or others. The General Contractor shall have final decision on all space priority conflicts among Contractors. All space priority conflicts shall be brought to the attention of the Architect/Engineer and Owner's Representative.
- B. Each Contractor shall thoroughly familiarize himself with existing systems which will affect and be affected by relocation of existing equipment and installation of new lines and equipment. They shall plan installation of their work so that interruptions of services to any building or portion thereof will be a minimum, and such interruptions shall occur only when system is not required, if possible. If not possible, each Contractor shall insure the operation of services by whatever means possible, such as, installing bypasses, or providing temporary service or circuits. Each interruption shall be for as short a duration as possible.
- C. Cooperation among all Contractors shall be required. Any Work that is installed without cooperating or coordinating with other Contractors and is in conflict shall be removed and reinstalled at that particular Contractor's cost. No cost additions to the Project will be considered due to a Contractor's lack of participation in the cooperation and coordination process. The following list of items of Work shall be the priority of order for all Contractors:
 1. Structure
 2. Gravity-flow systems for sanitary, storm, steam and steam condensate piping
 3. Ductwork and appurtenances
 4. Electrical primary and secondary feeder conduits
 5. Plumbing vent piping
 6. Fire protection (sprinkler system)
 7. HVAC piping
 8. Gas piping, process piping and domestic water
 9. Electrical branch circuit conduit and low voltage conduit
 10. Control air lines or conduit

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- D. The above list, in descending order, is the precedence assigned the Work items for space priority. Gravity-flow systems have first priority.
- E. Exception: Plumbing lines below or behind plumbing fixtures shall have precedence over all other work. Electrical conduit above or below switchgear, panelboards and control panels shall have precedence over all other work. Do not install any fluid conveying piping over electrical or elevator equipment.
- F. In the case of interconnection of the work of two or more contractors, verify at the site or on shop drawings all dimensions relating to such work. All errors due to the failure to so verify any such dimensions shall be promptly rectified.
Any installed work that is not coordinated and interferes with another contractor's work shall be removed or relocated at the installing contractor's expense.

1.19 DEMOLITION AND EXISTING REQUIREMENTS

- A. Existing active services: water, gas, ventilation, compressed or control air, sanitary waste, sanitary vent, storm electric, and any other building systems when encountered shall be protected against damage. Where existing services are to be abandoned, the services shall be removed back to the point of origin and removed from the site unless otherwise directed by the Owner's Representative.
- B. Submit a "Sequence of Work Schedule" in respect to all temporary and permanent utility and service cutovers after final determination. This schedule shall be submitted for approval to the Owner and Architect/Engineer. The submittal shall designate priority order, service or utility affected, date of cutover, and time of day to start and finish.
- C. Bidders should inspect the site to become familiar with conditions of the site which will affect the Work. Bidders should verify points of connection with utilities, routing of outside piping to include required clearances from any existing structures, or other obstacles.
- D. Extra payment will not be allowed for changes in the Work required because of the successful bidder's failure to make this inspection.

1.20 APPROVED ELECTRICAL TESTING LABORATORIES

- A. The following laboratories are approved for providing electrical product safety testing and listing services as required in these specifications:
 - 1. Underwriters Laboratories Inc.
 - 2. Electrical Testing Laboratories, Inc.

1.21 SLEEVES AND OPENINGS

- A. Openings required in new or existing construction that may be necessary for the installation of new work shall be provided by the respective contractor and all patching and repairing shall be done by workmen competent in the trade required, at the expense of the respective contractor. The respective contractor shall be responsible for arranging the work so that minimum cutting will be required. All rubbish and excess materials involved in such cutting shall be promptly removed from the site and disposed of by the contractor. Cutting through the floor or roof systems or load bearing walls shall be done only with the prior written approval of the Architect/Engineer so as to avoid damaging the structural system.

1.22 OMISSIONS

- A. No later than ten (10) days before bid opening, the Contractor shall call the attention of the A/E to any materials or apparatus the Contractor believes to be inadequate and to any necessary items of work omitted.

1.23 DEFINITIONS

- A. Wherever the words "the Contractor", "this Contractor" or "Electrical Contractor", appear in this section, they refer to the Contractor for Electrical Work.
- B. The term "provide" includes such labor, methods, materials, equipment and transportation or other facilities required to complete the Contract and the performance of all duties thereby upon the Contractor.

1.24 PROJECT/SITE CONDITIONS

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- A. Install Work in locations shown on Drawings, unless prevented by Project conditions.
- B. Prepare drawings showing proposed rearrangement of Work to meet Project conditions, including changes to Work specified in other Sections. Obtain permission of A/E before proceeding.
- C. Tools, materials and equipment shall be confined to areas designated by the Owner's project representative.

1.25 WORK SEQUENCE AND SCHEDULING

- A. Install work in phases to accommodate Owner's occupancy requirements. During the construction period coordinate schedule and operations with Owner's Construction Representatives.

1.26 WORK BY OTHER TRADES

- A. Every attempt has been made to indicate in this trade's specifications and drawings all work required of this Contractor. However, there may be additional specific paragraphs in other trade specifications and addenda, and additional notes on drawings for other trades which pertain to this Trade's work, and thus those additional requirements are hereby made a part of these specifications and drawings.
- B. Electrical details on drawings for equipment to be provided by others are based on preliminary design data only. This Contractor shall lay out the electrical work and shall be responsible for its correctness to match equipment actually provided by others.

1.27 SALVAGE MATERIALS

- A. No materials removed from this project shall be reused (except as specifically noted below). All materials removed shall become the property of and shall be disposed of by the Contractor.

PART 2 - PRODUCTS

2.01 IDENTIFICATION

- A. Refer to Electrical Section 26 05 53 – Identification for Electrical Systems.

2.02 SLEEVES AND OPENINGS

- A. General:
 - 1. Pipe sleeves shall be constructed of standard weight ASTM A53 or ASME B36.10 steel with an anchor plate constructed of A36/A36M steel welded to the pipe. The sleeve shall be sized a minimum of 1" larger than piping insulation diameter. The entire assembly shall be hot-dip galvanized after fabrication.
 - 2. Duct sleeves and piping sleeves passing through interior walls shall be constructed of 24 gauge galvanized steel minimum thickness.
- B. Sleeves Through Below Grade Walls:
 - 1. Provide steel pipe sleeve, ASTM A53, pressure sealing with membrane clamp ring, gasket, water stop ring, external rings, and nitrile rubber link seals. The assembly shall be hot-dip galvanized after fabrication.
 - a. Seals: Modular mechanical type seals, consisting of interlocking nitrile rubber links shaped to continuously fill the annular space between the pipe and the sleeve and electrically isolate the carrier pipe from the steel sleeve.
 - b. Sealing Element: Polychloroprene rubber material compounded to resist aging, ozone, sunlight, hydrocarbon gases, water, and chemical action.
 - c. Hardware: Type 300 series stainless steel fasteners. Threads rolled to produce smooth uniform threads and unbroken flow lines.
 - d. Compression Plates: Fiberglass-reinforced polyester plastic, injection molded for high physical properties, dielectric strength and non-cold flow creep characteristics, having high resistance to acidic and alkaline soils.
 - 2. For sleeves located 15 feet or more below grade provide cast iron sleeve ASTM A74 with compression seals.

2.03 SEALING AND FIRESTOPPING

- A. Fire And/Or Smoke Rated Penetrations:

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1. Manufacturers:
 - a. 3M, STI/SpecSeal, Tremco, Hilti
 - b. All firestopping systems shall be by the same manufacturer.
 2. Submittals:
 - a. Contractor shall submit product data for each firestop system. Submittals shall include product characteristics, performance and limitation criteria, test data, MSDS sheets, installation details and procedures for each method of installation applicable to this project. For non-standard conditions where no UL tested system exists, submit manufacturer's drawings for UL system with known performance for which an engineering judgment can be based upon.
 3. Product:
 - a. Firestop systems shall be UL listed or tested by an independent testing laboratory approved by the Owner and the Authority Having Jurisdiction (AHJ).
 - b. Use a product that has a rating not less than the rating of the wall or floor being penetrated. Reference architectural drawings for identification of fire and/or smoke rated walls and floors.
 - c. Contractor shall use firestop putty, caulk sealant, intumescent wrapstrips, intumescent firestop collars, firestop mortar or a combination of these products to provide a UL listed system for each application required for this project. Provide mineral wool backing where specified in manufacturer's application detail.
- B. Non-Rated Penetrations:
1. Conduit Penetrations Through Below Grade Walls:
 - a. In exterior wall openings below grade, use a modular mechanical type seal consisting of interlocking synthetic rubber links shaped to continuously fill the annular space between the uninsulated conduit and the cored opening or a water-stop type wall sleeve.
 2. Conduit and Cable Tray Penetrations:
 - a. At conduit and cable tray penetrations of non-rated interior partitions, floors and exterior walls above grade, use urethane caulk in annular space between conduit and sleeve, or the core drilled opening.

PART 3 – EXECUTION

3.01 DEMOLITION

- A. Perform all demolition as indicated on the drawings to accomplish new work. Where demolition work is to be performed adjacent to existing work that remains in an occupied area, construct temporary dust partition to minimize the amount of contamination of the occupied space. Where pipe is removed and not reconnected with new work, cap ends of existing services as if they were new work. Coordinate work with the Owner to minimize disruption to the existing building occupants.
- B. All devices, fixtures, equipment, wiring and associated conduit, insulation and similar items demolished, abandoned, or deactivated are to be removed from the site by the Contractor except as specifically noted otherwise. All designated equipment is to be turned over to the owner for their use at a place and time so designated. Maintain the condition of material and/or equipment that is indicated to be reused equal to that existing before work began.
- C. All contractors requiring the personnel/ material hoist and or temporary construction elevator (i.e. new elevators, temporarily protected) at times other than outlined in the temporary facilities specifications will make arrangements directly with the general contractor. The general contractor is responsible for all coordination and scheduling of the use of any hoisting equipment so the flow of the project is smoothly maintained and all workers have access to the work areas to perform their work and deliver material to the areas needed according to the project schedule.
- D. If any contractor's work requires the removal and replacement of any finished materials including but not limited to such materials as ceiling tiles, wall finishes, cabinets, doors, flooring, windows, etc. after those items are installed, each contractor will be responsible, at no additional cost to the owner, to replace any damaged, soiled or lost materials with new materials to match the existing materials and those materials damaged.

3.02 CUTTING AND PATCHING

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- A. Each Contractor shall coordinate the placing of openings in the new structure as required for the installation of each Contractor's work.
- B. Each Contractor shall furnish to the General Contractor the accurate locations and sizes for required openings in the new work, but this shall not relieve each Contractor of the responsibility of checking to assure that properly sized openings are provided. When additional patching is required due to the Contractor's failure to inspect this work, then the Contractor shall make arrangements for the patching required to properly close the openings to include patch painting, and the Contractor shall pay any additional cost incurred in this respect.
- C. If cutting and patching of the new structure is made necessary due to the Contractor's failure to install piping, ducts, sleeves, or equipment on schedule, or due to the Contractor's failure to furnish on schedule the information required for the leaving of openings, then it shall be the Contractor's responsibility to make arrangements and obtain approval from the General Contractor and Architect/Engineer for this cutting and patching, and the Contractor shall pay any additional cost incurred in this respect. The Contractor shall also reimburse the Owner for any additional costs incurred to the Architect/Engineer for additional services caused by the Contractor in this respect.
- D. The Contractor shall provide cutting and patching and patch painting in the existing structure as required for the installation of his Work and shall furnish lintels and supports as required for openings. Cutting of structural support members will not be permitted without prior approval of the Architect/Engineer. Extent of cutting shall be minimized; use core drills, power saws, or other machines which will provide neat, minimum openings. Patching shall match adjacent materials and surfaces and shall be performed by craftsmen skilled in the respective craft required.

3.03 **BUILDING ACCESS**

- A. Arrange for the necessary openings in the building to allow for admittance of all apparatus. When the building access was not previously arranged and must be provided by this contractor, restore any opening to its original condition after the apparatus has been brought into the building.

3.04 **EQUIPMENT ACCESS**

- A. Install all piping, conduit, ductwork, and accessories to permit access to equipment for maintenance. Coordinate the exact location of wall and ceiling access panels and doors with the General Contractor, making sure that access is available for all equipment and specialties. Where access is required in plaster or drywall walls or ceilings, furnish the access doors to the General Contractor and reimburse the General Contractor for installation of those access doors.
- B. The approximate location of all equipment and devices is shown on the drawings. The Architect/Engineer reserves the right to change the location of all equipment or devices 6 feet in any direction at no additional cost provided such changes are requested before final installation.
- C. Install all equipment with ample space allowed for removal and repair. Provide ready accessibility to removable parts of equipment and to all wiring without moving equipment which is installed or which is already in place.
- D. In mechanical and electrical equipment spaces, expose ceiling outlets and conduit with due consideration to ventilating ducts and mechanical piping. Where numerous ducts occur, install conduits and outlets after the ventilating ducts. Puncturing of ductwork or hanging equipment such as light fixtures, ceiling hangers and conduits from ductwork is prohibited unless specifically noted otherwise.
- E. Electrical equipment shall be installed to maintain minimum clearances per Article 110 of NEC and ANSI C2 (National Electrical Safety Code).
- F. No piping carrying fluids shall be installed directly over electrical equipment.
- G. Equipment shall be installed in accordance with manufacturer's recommendation. Where conflicts occur between Contract Document and these recommendations, a ruling shall be requested of the Architect for decision before proceeding with such work.

3.05 **COORDINATION**

- A. The Contractor shall cooperate with other trades in locating work in a proper manner. Should it be necessary to raise or lower or move longitudinally any part of the electrical work to better fit the general installation, such work shall be done at no extra cost to the Owner, provided such decision is

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reached prior to actual installation. The Contractor shall check location of electrical outlets with respect to other installations before installing.

- B. The Contractor shall verify that all devices are compatible for the surfaces on which they will be used. This includes, but is not limited to light fixtures, panelboards, devices, etc. and recessed or semi-recessed heating units installed in/on architectural surfaces. Coordinate installation of required supporting devices and set sleeves in cast-in-place concrete, masonry walls and other structural components as they are constructed.
- C. Coordinate all work with other contractors prior to installation. Any installed work that is not coordinated and that interferes with other contractor's work shall be removed or relocated at the installing contractor's expense.
- D. Coordinate arrangements, mounting and support of electrical equipment:
 - 1. To allow maximum possible headroom unless specific mounting heights that reduce headroom are indicated.
 - 2. To provide for ease of disconnecting the equipment with minimum interference to other installations.
 - 3. To allow right of way for piping and conduit installed at required slope.
 - 4. So connecting raceways, cables, wireways, cable trays and busways will be clear of obstructions and of the working and access space of other equipment.
- E. Cooperate with the testing consultant in ensuring Section 26 05 04 compliance. Verify system completion to the testing consultant. Demonstrate the starting, interlocking and control features of each system so the testing contractor can perform its work.

3.06 SLEEVES AND OPENINGS

- A. General:
 - 1. Sleeves are not required for piping and ducts passing through interior non-rated drywall, plaster, or wood partitions and interior poured concrete walls that have been saw cut or core drilled.
 - 2. Pack annular space between sleeves and pipe or ducts with fiberglass insulation and seal.
 - 3. Piping sleeves that pass through fire rated floors, walls, or ceilings shall be provided with a UL listed fire stop material meeting UL 1479 to seal the opening between the pipe and the pipe sleeve to maintain the fire rating.
 - 4. Provide escutcheon plates on piping to cover sleeve and insulation in finished areas.
- B. Sleeves Through Floors/Ceilings:
 - 1. Sleeves shall be installed to extend 1 inch above finished floor with a watertight sealant between floor and sleeve in all mechanical rooms and wet rooms listed below.
 - 2. If a sleeve is not provided, provide 1-1/2 inch angle ring with urethane caulk between the angle and the floor and seal at the corners to form a watertight seal.
 - 3. Wet Locations:
 - a. Mechanical Rooms
 - b. Parking Ramps
 - c. Sanitary/Storm pumping stations

3.07 SEALING AND FIRESTOPPING

- A. The Contractor shall refer to building life safety drawings for all smoke and fire rates in addition to the mechanical drawings. Any discrepancies shall be brought to the attention of the Architect/Engineer before final addendum.
- B. Fire and/or Smoke Penetrations:
 - 1. Install approved product in accordance with the manufacturer's instructions where a pipe (i.e. cable tray, bus, cable bus, conduit, wireway, trough, etc.) penetrates a fire rated surface.
 - 2. Where firestop mortar is used to infill large fire-rated floor openings that could be required to support weight, provide permanent structural forming. Firestop mortar alone is not adequate to support any substantial weight.
- C. Non-Rated Surfaces:
 - 1. When the opening is through a non-fire rated wall, floor, ceiling or roof the opening must be sealed using an approved type of material.

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2. Install escutcheons or floor/ceiling plates where conduit, penetrates non-fire rated surfaces in occupied spaces. Occupied spaces for this paragraph include only those rooms with finished ceilings and the penetration occurs below the ceiling.
 3. In exterior wall openings below grade, assemble rubber links of mechanical seal to the proper size for the conduit and tighten in place, in accordance with the manufacturer's instructions. Install so that the bolts used to tighten the seal are accessible from the interior of the building or vault.
 4. At interior partitions, conduit penetrations are required to be sealed for all clean rooms, laboratories, and most hospital spaces, computer rooms, dormitory rooms, tele/data/com rooms and similar spaces where the room pressure or odor transmission must be controlled. Apply sealant to both sides of the penetration in such a manner that the annular space between the conduit sleeve and the conduit is completely filled.
- 3.08 **HOUSEKEEPING AND CLEAN UP**
- A. The Contractor shall clean up and remove from the premises, on a daily basis, all debris and rubbish resulting from its work and shall repair all damage to new and existing equipment resulting from its work. When job is complete, this Contractor shall remove all tools, excess material and equipment, etc., from the site.

END OF SECTION

**PROJECT 10403 - DIVISION 26 05 02
ELECTRICAL DEMOLITION FOR REMODELING**

PART 1 – GENERAL

1.01 SCOPE OF WORK

- A. Base Bid: The work under this section includes selective and/or total demolition of all existing electrical equipment, devices, conduit, wiring, back boxes and supporting associated devices for the electrical systems as noted on the O.R. wings.

1.02 SECTION INCLUDES

- A. Materials and Equipment

1.03 RELATED WORK

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions, apply to this Section.

PART 2 - PRODUCTS

2.01 MATERIALS AND EQUIPMENT

- A. Materials and equipment for patching and extending work as specified in the individual Sections.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Verify field measurements and circuiting arrangements as shown on Drawings.
- B. Verify that abandoned wiring and equipment serve only abandoned facilities.
- C. Verify whether or not PCB ballasts exist in light fixtures which will be disposed of. If PCB light fixture ballasts exist, then follow requirements in PCB BALLAST HANDLING AND DISPOSAL below.
- D. Demolition Drawings are based on casual field observation and/or existing record documents. Report discrepancies to the Owner, Architect/Engineer and Owner's Field Representative before disturbing existing installation.
- E. Beginning of demolition means installer accepts existing conditions.

3.02 PREPARATION

- A. Disconnect electrical systems in walls, floors, and ceilings scheduled for removal.
- B. Coordinate utility service outages with the Owner, Owner's Field Representative, Architect, and Engineer. Also, if applicable, coordinate utility service outages with the local Utility Company.
- C. Provide temporary wiring and connections to maintain existing systems in service during construction. When work must be performed on energized equipment or circuits, use personnel experienced in such operations. In particular, all security and safety systems must be maintained in operation at all times as required by the Owner. This includes security and safety lighting.

3.03 DEMOLITION AND EXTENSION OF EXISTING ELECTRICAL WORK

- A. Demolish and extend existing electrical work to meet all requirements of these specifications.
- B. If certain raceways and boxes are abandoned but not scheduled for removal, those items must be shown on the "As Built Drawings".
- C. Remove, relocate, and extend existing installations to accommodate new construction.
- D. Remove abandoned wiring to source of supply.
- E. Remove exposed abandoned conduit.
- F. Cut conduit flush with walls and floors, and patch surfaces.
- G. Disconnect and remove abandoned panelboards and distribution equipment.

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- H. Disconnect and remove abandoned luminaires. Remove brackets, stems, hangers, and other accessories.
- I. Repair adjacent existing construction and finishes damaged during demolition and extension work to match adjacent existing surfaces.
- J. Maintain access to existing electrical installations which remain active. Modify installation or provide access panel as appropriate.
- K. Extend existing installations using materials and methods compatible with existing electrical installations, or as specified. This includes the extension of the circuit from the last active device to the next device in the system to be activated.

3.04 PCB BALLAST HANDLING AND DISPOSAL

- A. Generally, all high power factor fluorescent light ballasts manufactured before 1978 and some HID ballasts contain PCB compounds in their capacitors. The Contractor shall inspect all ballasts in all light fixtures and take the actions described below.
- B. All ballasts labeled as "NON-PCBs" or "NO PCBs" shall become the responsibility of the Contractor. If the PCB content is not stated on the ballast label, the ballast shall be handled as a PCB ballast.
- C. All PCB ballasts shall be removed from the light fixtures and shall have the wires clipped off. However, before removal, all PCB ballasts shall be carefully inspected for leaks. If a ballast appears to be leaking (evidenced by potting compound leaking out or by an oily film on the ballast surface) the ballast must be handled per EPA and DNR PCB regulations. Basically, this means the ballast is to be carefully removed from the fixture and placed in an approved drum. See paragraph below for the drum specifications. The person removing the ballast from the fixture shall wear protective gloves, eye protection, and protective clothing as necessary.
- D. If the fixture has also been contaminated, it must be cleaned to less than 10 micrograms/100 square centimeters contamination before disposal. This cleaning must be done by an approved PCB contractor and is not considered a part of this contract. Contact Owner for contractor approval before commencing with the cleanup.
- E. The ballasts shall then be placed in US DOT approved type 17C or type 17H drums (barrels) furnished by Veolia Environmental Services. The quantity and size of the drums will be determined by the contractor at the time of construction, - 30 and 55 gallon drums are typically available.
- F. These barrels shall be placed in storage with the cover that came with the barrels, in a location within a building, as designated by the Building Manager or Owner's project representative. The barrels are not to be placed outside where they are exposed to weather.
- G. THESE BALLASTS ARE NOT TO BE REMOVED FROM THE WORK SITE BY THE CONTRACTOR. To do so, would be a violation of DNR and DOT hazardous waste regulations and may result in a fine to the Contractor.
- H. The Contractor shall label and mark the PCB storage drums with EPA approved PCB labels and the storage area with signs, marks and lines to meet the regulations of Wisconsin Code NR 157.
- I. The Contractor shall also provide approved PCB absorbent materials to be stored immediately adjacent to the drum storage area. Do not place loose absorbent material in the drums.
- J. The Contractor shall provide to the Owner's Project representative, in written form, a total count of these ballasts (or their total weight by barrel) and where they are stored.
- K. See Lamp and Ballast Handling and Disposal instructions below.

3.05 LAMP AND BALLAST HANDLING AND DISPOSAL

- A. All lamps (fluorescent, incandescent, and HID) contain mercury and/or lead (in the base) as well as other heavy metals and compounds which are regulated by the EPA and DNR during the disposal process. As a result, regulations have been issued covering the handling and disposal of all lamps. Therefore, lamps which have been removed from service for disposal shall be handled as follows by the Contractor.
- B. The Contractor shall very carefully remove all lamps (fluorescent, incandescent, and HID) from light fixtures before removal of the fixture from its mounted position. This is to reduce the likelihood that the lamp(s) will be broken. If the Contractor breaks more than 1% of the total lamps removed for the project, the Contractor will be charged the cost difference between disposal of broken lamps and disposal of unbroken lamps for all lamps broken in excess of 1% of the total lamps removed in the project.

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- C. The contractor shall contact Veolia Environmental Services (1-800-358-9095 or 262-243-8917) to coordinate the storage and pickup of disposed lamps and ballasts. The contractor shall obtain containers from Veolia Environmental Services, for the storage of lamps and ballasts. Removed lamps and ballasts shall be placed in containers by the contractor, marked with the number and type of lamp and ballast, and placed in storage at a location on the Owner's property. The contractor shall label the area as "Hazardous Material Storage – Mercury". The contractor shall make arrangements for pickup of the lamps and ballasts with Veolia Environmental Services, shall provide a count of all stored lamps and ballasts, and shall fill out any required forms.
- D. When making disposal arrangements with Veolia Environmental Services, the contractor shall notify them of the Owner's project name and number, and the Owner's project manager, for invoicing purposes. Invoicing from Veolia Environmental Services shall be sent to the Owner's project manager for direct charge payment from that project (lamp and ballast disposal costs to be paid by Owner).
- E. The contractor shall coordinate the lamp and ballast disposal with the Owner's field representative.

3.06 CLEANING AND REPAIR

- A. Clean and repair existing materials and equipment which remain or are to be reused.
- B. Panelboards: Clean exposed surfaces and check tightness of electrical connections. Replace damaged circuit breakers and provide closure plates for vacant positions. Provide typed circuit directory showing revised circuiting arrangement.
- C. Luminaires: Remove existing luminaires for cleaning. Use mild detergent to clean all exterior and interior surfaces; rinse with clean water and wipe dry. Replace lamps, ballasts (if required) and broken electrical parts.

3.07 INSTALLATION

- A. Install relocated materials and equipment under the provisions of other sections.

END OF SECTION

**PROJECT 10403 - DIVISION 26 05 19
LOW-VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLE**

PART 1 – GENERAL

1.01 SCOPE OF WORK

- A. Base Bid: The work under this section includes furnishing and installing required wiring and cabling systems including pulling, terminating and splicing.

1.02 SECTION INCLUDES

- A. General
- B. Manufacturers
- C. Building Wire
- D. Wiring Connectors

1.03 RELATED WORK

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.
- B. Section 26 05 00 – Common Work Results for Electrical
- C. Section 26 05 33 – Raceway and Boxes for Electrical Systems.

1.04 SUBMITTALS

- A. Submit product data: Provide for each cable assembly type.
- B. Submit factory test reports: Indicate procedures and values obtained.
- C. Submit shop drawings for modular wiring system including layout of distribution devices, branch circuit conduit and cables, circuiting arrangement, and outlet devices.
- D. Submit manufacturer's installation instructions. Indicate application conditions and limitations of use stipulated by product testing agency specified under Regulatory Requirements.

1.05 REFERENCE STANDARDS

- A. NFPA 70 - National Electrical Code
- B. IPCEA S-61-402/NEMA WC-5 Thermoplastic Insulated Wire and Cable
- C. IPCEA S-66-524/NEMA WC-7 Cross-linked Thermosetting Polyethylene-Insulated Wire and Cable
- D. UL 83
- E. ASTM

1.06 PROJECT CONDITIONS

- A. Verify that field measurements are as shown on Drawings.
- B. Conductor sizes are based on copper.
- C. Wire and cable routing shown on Drawings is approximate unless dimensioned. Route wire and cable as required to meet project conditions.
- D. Where wire and cable routing is not shown, and destination only is indicated, determine exact routing and lengths required.

PART 2 – PRODUCTS

2.01 GENERAL

- A. All wire shall be new, delivered to the site in unbroken cartons and shall be less than one year old out of manufacturer's stock.
- B. All conductors shall be copper.
- C. All cable and wire shall have 600 volts insulation, have a conductivity of 98 percent, and shall be annealed coated copper per ASTM B33 or B189.
- D. Wire sizes No. 12 AWG and smaller shall be solid wire, and wire No. 10 AWG and larger shall be stranded, Class B, ASTM B8.

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- E. Stranded conductors may only be terminated with UL OR ETL Listed type terminations or methods: e.g. stranded conductors may not be wrapped around a terminal screw but must be terminated with a crimp type device or must be terminated in an approved back wired method.
- F. Minimum wire sizes shall be as follows:
 - 1. Power wiring- #12 AWG
 - 2. Control Wiring- #18 AWG
- G. All conductors shall be continuous without splices except at locations approved for the purpose.

2.02 MANUFACTURERS

- A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the work include, but are not limited to, the following:
 - 1. Alcan Products Corporation; Alcan Cable Division
 - 2. American Insulated Wire Corp.; a Leviton Company
 - 3. General Cable Corporation
 - 4. Senator Wire & Cable Company
 - 5. Southwire Company
 - 6. Houston Wire & Cable
 - 7. AFC Cable Systems, Inc.
 - 8. Hubbell Power Systems, Inc.
 - 9. O-Z/Gedney; EGS Electrical Group, LLC
 - 10. 3M; Electrical Products Division
 - 11. Tyco Electronics Corp.

2.03 BUILDING WIRE

- A. Description: Single conductor insulated wire.
- B. Insulation: Type THHN/THWN, for branch circuits.

2.04 WIRING CONNECTORS

- A. Split Bolt Connectors: Not acceptable.
- B. Solderless Pressure Connectors: High copper alloy terminal. May be used only for cable termination to equipment pads or terminals. Not approved for splicing.
- C. Spring Wire Connectors: Solderless spring type pressure connector with insulating covers for copper wire splices and taps. Use for conductor sizes 10 AWG and smaller.
- D. All wire connectors used in underground or exterior pull boxes shall be gel filled twist connectors or a connector designed for damp and wet locations.
- E. Mechanical Connectors: Bolted type tin-plated; high conductivity copper alloy; spacer between conductors; beveled cable entrances.
- F. Compression (crimp) Connectors: Long barrel; seamless, tin-plated electrolytic copper tubing; internally beveled barrel ends. Connector shall be clearly marked with the wire size and type and proper number and location of crimps.

PART 3 – EXECUTION

3.01 GENERAL WIRING METHODS

- A. All wire and cable shall be installed in conduit.
- B. Do not use wire smaller than 12 AWG for power and lighting circuits.
- C. All conductors shall be sized to prevent excessive voltage drop at rated circuit ampacity. As a minimum use 10 AWG conductor for 20 ampere, 120 volt branch circuit home runs longer than 100 feet (30 m), and for 20 ampere, 277 volt branch circuit home runs longer than 200 feet (61 m).
- D. Make conductor lengths for parallel conductors equal.
- E. Splice only in junction or outlet boxes.
- F. No conductor less than 10 AWG shall be installed in exterior underground conduit.
- G. Identify ALL low voltage, 600v and lower, wire per section 26 05 53.
- H. Neatly train and lace wiring inside boxes, equipment, and panelboards.

3.02 WIRING INSTALLATION IN RACEWAYS

- A. Pull all conductors into a raceway at the same time. Use Listed wire pulling lubricant for pulling 4 AWG and larger wires and for other conditions when necessary.
- B. Install wire in raceway after interior of building has been physically protected from the weather and all mechanical work likely to injure conductors has been completed.
- C. Completely and thoroughly swab raceway system before installing conductors. Place all conductors of a given circuit (this includes phase wires, neutral (if any), and ground conductor) in the same raceway. If parallel phase and/or neutral wires are used, then place an equal number of phase and neutral conductors in same raceway or cable.

3.03 WIRING CONNECTIONS AND TERMINATIONS

- A. Splice only in accessible junction boxes.
- B. Wire splices and taps shall be made firm, and adequate to carry the full current rating of the respective wire without soldering and without perceptible temperature rise.
- C. All splices shall be so made that they have an electrical resistance not in excess of two feet (600 mm) of the conductor.
- D. Use solderless spring type pressure connectors with insulating covers for wire splices and taps, 10 AWG and smaller.
- E. Use mechanical or compression connectors for wire splices and taps, 8 AWG and larger. Tape uninsulated conductors and connectors with electrical tape to 150 percent of the insulation value of conductor.
- F. Thoroughly clean wires before installing lugs and connectors.
- G. At all splices and terminations, leave tails long enough to cut splice out and completely re-splice.

3.04 FIELD QUALITY CONTROL

- A. Field inspection and testing will be performed under provisions of Section 26 05 04.
- B. Additional testing as follows shall be performed if aluminum conductors are used:
- C. Equipment terminated with aluminum conductors shall be tested with a thermal imager and recorded.
- D. Conductors shall be closely checked for loose or poor connections, and for signs of overheating or corrosion.
- E. Test procedures shall meet NETA guidelines.
- F. Test results and report shall be provided to the engineer.
- G. Contractor shall correct all deficiencies reported in the test report.

3.05 WIRE COLOR

- A. General:
 - 1. For wire sizes 10 AWG and smaller - Wire shall be colored as indicated below.
 - 2. For wire sizes 8 AWG and larger – Use colored wire, or identify wire with colored tape at all terminals, splices and boxes. Colors to be as indicated below.
 - 3. In existing facilities, use existing color scheme.
 - 4. All switch legs shall be the same color as their associated circuit. Traveler conductors run between 3 and 4 way switches shall be colored pink or purple.
- B. Neutral Conductors: White for 120/208V and 120/240V systems, Gray for 277/480V systems. Where there are two or more neutrals in one conduit, each shall be individually identified with a different stripe.
- C. Branch Circuit Conductors: Three or four wire home runs shall have each phase uniquely color coded.
- D. Feeder Circuit Conductors: Each phase shall be uniquely color coded.
- E. Ground Conductors: Green for 6 AWG and smaller. For 4 AWG and larger, identify with green colored wire, or with green tape at both ends and at all access points, such as panelboards, motor starters, disconnects and junction boxes. When isolated grounds are required, contractor shall provide green with yellow tracer.

3.06 BRANCH CIRCUITS

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- A. The use of single-phase, multi-wire branch circuits with a common neutral are not permitted. All branch circuits shall be furnished and installed with an individual accompanying neutral, sized the same as the phase conductors.

END OF SECTION

**PROJECT 10403 - DIVISION 26 05 26
GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS**

PART 1 – GENERAL

1.01 SCOPE OF WORK

- A. Base Bid: The work under this section includes grounding electrodes, connectors, equipment grounding conductors, bus and bonding.

1.02 SECTION INCLUDES

- A. Manufacturers
- B. Wire

1.03 RELATED WORK

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.
- B. Section 26 05 00 – Common Work Results for Electrical

1.04 REFERENCE STANDARDS

- A. NFPA 70 - National Electrical Code.
- B. ANSI/IEEE 142 (Latest edition) - Recommended Practice for Grounding of Industrial and Commercial Power Systems.

1.05 REGULATORY REQUIREMENTS

- A. Conform to requirements of NFPA 70.
- B. Furnish products listed and classified by Underwriters Laboratories, Inc. or testing firm acceptable to authority having jurisdiction as suitable for purpose specified and shown.
- C. Comply with UL 467 for grounding and bonding materials and equipment.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

- A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
- B. Manufacturers: Subject to compliance with requirements, provide by one of the following
 1. Burnoy
 2. Erico
 3. Schieder Sq. D
 4. Thomas Betts
 5. Panduit
 6. ILSCO.

2.02 MECHANICAL CONNECTORS

- A. The mechanical connector bodies shall be manufactured from high strength, high conductivity cast copper alloy material. Bolts, nuts, washers and lockwashers shall be made of Silicon Bronze and supplied as a part of the connector body and shall be of the two bolt type.
- B. Split bolt connector types are NOT allowed. Exception: the use of split bolts is acceptable for grounding of wire-basket type cable tray, and for cable shields/straps of medium voltage cable.
- C. The connectors shall meet or exceed UL 467 and be clearly marked with the catalog number, conductor size and manufacturer.

2.03 COMPRESSION CONNECTORS

- A. The compression connectors shall be manufactured from pure wrought copper. The conductivity of this material shall be no less than 99% by IACS standards.

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- B. The connectors shall meet or exceed the performance requirements of IEEE 837, latest revision.
- C. The installation of the connectors shall be made with a compression, tool and die system, as recommended by the manufacturer of the connectors.
- D. The connectors shall be clearly marked with the manufacturer, catalog number, conductor size and the required compression tool settings.
- E. Each connector shall be factory filled with an oxide-inhibiting compound.

2.04 WIRE

- A. Material: Stranded copper (aluminum not permitted).
- B. Grounding Electrode Conductor: Size as shown on drawings, specifications or as required by NFPA 70, whichever is larger.
- C. Feeder and Branch Circuit Equipment Ground: Size as shown on drawings, specifications or as required by NFPA 70, whichever is larger. Differentiate between the normal ground and the isolated ground when both are used on the same facility.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Verify that final backfill and compaction has been completed before driving rod electrodes.

3.02 GENERAL

- A. Install Products in accordance with manufacturer's instructions.
- B. Mechanical connections shall be accessible for inspection and checking. No insulation shall be installed over mechanical ground connections.
- C. Ground connection surfaces shall be cleaned and all connections shall be made so that it is impossible to move them.
- D. Attach grounds permanently before permanent building service is energized.

3.03 LESS THAN 600 VOLT SYSTEM GROUNDING

- A. Equipment Grounding Conductor: Provide separate, insulated equipment grounding conductor within each raceway. Terminate each end on suitable lug, bus, enclosure or bushing. Provide a ground wire from each device to the respective enclosure.

END OF SECTION

**PROJECT 10403 - DIVISION 26 05 29
HANGERS AND SUPPORTS FOR ELECTRICAL SYSTEMS**

PART 1 - GENERAL

1.01 SCOPE OF WORK

- A. Base Bid: The work under this section includes conduit and equipment supports, straps, clamps, steel channel, etc., and all required fastening hardware for supporting electrical work.

1.02 SECTION INCLUDES

- A. Support, Anchorage And Attachment Components
- B. Manufacturers

1.03 RELATED WORK

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions, apply to this Section
- B. Section 26 05 00 – Common Work Results for Electrical
- C. Section 26 05 19 – Low-Voltage Electrical Power Conductors and Cables
- D. Section 26 05 26 – Grounding and Bonding for Electrical Systems
- E. Section 26 05 33 – Raceway and Boxes for Electrical Systems
- F. Section 26 51 13 -Interior Lighting Fixtures, Lamps and Ballasts

1.04 SUBMITTALS

- A. Product Data: Provide data for support channel and equipment supports.

1.05 QUALITY ASSURANCE

- A. Support systems shall be adequate for weight of equipment and conduit, including wiring, which they carry.
- B. Welding: Qualify procedures and personnel according to AWS D1.1/D1.1M, “Structural Welding Code – Steel”.

1.06 PERFORMANCE REQUIREMENTS

- A. Delegated Design: Design supports for multiple raceways, including comprehensive engineering analysis by a qualified professional engineer, using performance requirements and design criteria indicated.
- B. Design supports for multiple raceways capable of supporting combined weight of supported systems and its contents.
- C. Design equipment supports capable of supporting combined operating weight of supported equipment and connected systems and components.

1.07 COORDINATION

- A. Coordinate size and location of concrete bases. Cast anchor-bolt inserts into bases. Concrete, reinforcement and formwork requirements are specified in Division 03.
- B. Coordinate installation of roof curbs, equipment supports and roof penetrations as specified in Division 07 Section “Roof Accessories”.

PART 2 - PRODUCTS

2.01 SUPPORT, ANCHORAGE AND ATTACHMENT COMPONENTS

- A. Support Channel: Steel, Galvanized, Enameled or other corrosion resistant.
- B. Hardware: Corrosion resistant.
- C. Minimum sized threaded rod for supports shall be 3/8” for trapezes and single conduits 1-1/4” and larger, and 1/4” for single conduits 1” and smaller.

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- D. Conduit clamps, straps, supports, etc., shall be steel or malleable iron. One-hole straps shall be heavy duty type. All straps shall have steel or malleable backing plates when rigid steel conduit is installed on the interior or exterior surface of any exterior building wall.
- E. Support for Conductors in Vertical Conduit: Factory-fabricated assembly consisting of threaded body and insulating wedging plug or plugs for non-armored electrical conductors or cables in riser conduits. Plugs shall have number, size and shape of conductor gripping pieces as required to suit individual conductors or cables supported. Body shall be malleable iron.
- F. Mechanical-Expansion Anchors: Insert-wedge-type, (zinc-coated) (stainless) steel, for use in hardened Portland cement concrete with tension, shear and pullout capacities appropriate for supported loads and building materials in which used.

2.02 MANUFACTURERS

- A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the work include, but are not limited to, the following:
 - 1. Allied Tube & Conduit
 - 2. Cooper B-Line, Inc.; a Division of Cooper Industries
 - 3. ERICO International Corporation
 - 4. GS Metals Corp.
 - 5. Thomas & Betts Corporation
 - 6. Unistrut; Tyco International, Ltd.
 - 7. Wesanco, Inc.
 - 8. Fabco Plastics Wholesale Limited
 - 9. Seasafe, Inc.
 - 10. Empire Tool & Manufacturing Co.
 - 11. Hilti, Inc.
 - 12. ITW Ramset/Red Head; a Division of Illinois Tool Works, Inc.
 - 13. MKT Fastening, LLC
 - 14. Simpson Strong-Tie Co., Inc.; Masterset Fastening Systems Unit

PART 3 - EXECUTION

3.01 INSTALLATION

- A. Fasten hanger rods, conduit clamps, outlet, junction and pull boxes to building structure using pre-cast insert system, preset inserts, beam clamps, expansion anchors, or spring steel clips (interior metal stud walls only).
- B. Use toggle bolts or hollow wall fasteners in hollow masonry, plaster, or gypsum board partitions and walls; expansion anchors or preset inserts in solid masonry walls; self-drilling anchors or expansion anchors on concrete surfaces; sheet metal screws in sheet metal studs and wood screws in wood construction. If nail-in anchors are used, they must be removable type anchors.
- C. Power-actuated fasteners and plastic wall anchors are not permitted.
- D. File and de-bur cut ends of support channel and spray paint with cold galvanized paint to prevent rusting.
- E. Do not fasten supports to piping, ductwork, mechanical equipment, cable tray or conduit. Do not fasten to suspended ceiling grid system.
- F. Do not drill structural steel members unless approved by Engineer.
- G. Fabricate supports from galvanized structural steel or steel channel, rigidly welded or bolted to present a neat appearance. Use hexagon head bolts with spring lock washers under all nuts.
- H. In wet locations, mechanical rooms and electrical rooms install free-standing electrical equipment on 3.5 inch (89 mm) concrete pads.
- I. Install surface-mounted cabinets and panelboards with minimum of four anchors. Provide steel channel supports to stand cabinet one inch (25 mm) off wall (7/8" Uni-strut or 3/4" painted, fire-retardant plywood is acceptable).
- J. Bridge studs top and bottom with channels to support flush-mounted cabinets and panelboards in stud walls.

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- K. Furnish and install all supports as required to fasten all electrical components required for the project, including free standing supports required for those items remotely mounted from the building structure, catwalks, walkways etc.

3.02 **INSTALLATION OF FABRICATED METAL SUPPORTS**

- A. Comply with installation requirements in Division 05 Section “Metal Fabrications” for site-fabricated metal supports.
- B. Cut, fit and place miscellaneous metal supports accurately in location, alignment and elevation to support and anchor electrical materials and equipment.
- C. Field Welding: Comply with AWS D1.1/D1.1M.

3.03 **PAINTING**

- A. Touchup: Clean field welds and abraded areas of shop paint. Paint exposed areas immediately after erecting hangers and supports. Use same materials as used for shop painting. Comply with SSPC-PA 1 requirements for touching up field painted surfaces.
 - 1. Apply paint by brush or spray to provide minimum dry film thickness of 2.0 mils (0.05 mm).
- B. Touchup: Comply with requirements in Division 09 (painting sections) (Section “High Performance Coating”) for cleaning and touchup painting of field welds, bolted connections and abraded areas of shop paint on miscellaneous metal.
- C. Galvanized Surfaces: Clean welds, bolted connections and abraded areas and apply galvanizing repair paint to comply with ASTM A 780.

END OF SECTION

**PROJECT 10403 - DIVISION 26 05 33
RACEWAY AND BOXES FOR ELECTRICAL SYSTEMS**

PART 1 – GENERAL

1.01 SCOPE OF WORK

- A. Base Bid:
 - 1. The work under this section includes conduits, fittings, boxes, surface raceways, multi-outlet assemblies, auxiliary gutters, and wall duct for electrical systems including wall and ceiling outlet boxes, floor boxes, and junction boxes.

1.02 SECTION INCLUDES

- A. General
- B. Manufacturers
- C. Electrical Metallic Tubing (EMT) and Fittings
- D. Liquidtight Flexible Metal Conduit and Fittings
- E. Rigid Nonmetallic Conduit and Fittings
- F. Conduit Supports
- G. Pull and Junction Boxes
- H. Hinged Cover Enclosures

1.03 RELATED WORK

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions, apply to this Section
- B. Section 26 05 00 – Common Work Results for Electrical
- C. Section 26 05 26 – Grounding and Bonding for Electrical Systems
- D. Section 26 05 29 – Hangers and Supports for Electrical Systems

1.04 SUBMITTALS

- A. Boxes - provide product data showing configurations, finishes, dimensions, and manufacturer's instructions.
- B. Product data for conduit, wireways, fittings, hinged-cover enclosures or cabinets.

1.05 QUALITY ASSURANCE

- A. Electrical Components, Devices and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction and marked for intended use.

PART 2 – PRODUCTS

2.01 GENERAL

- A. All steel fittings and conduit bodies shall be galvanized.
- B. No cast metal, or split-gland type fittings permitted.
- C. Mogul-type condulets larger than 2 inch (50 mm) not permitted except as approved or detailed.
- D. All condulet covers must be fastened to the condulet body with screws and be of the same manufacture.
- E. Wireways, gutters and c-condulets shall not be used in lieu of pull boxes and condulets.
- F. All boxes shall be of sufficient size to provide free space for all conductors enclosed in the box and shall comply with NEC requirements.

2.02 MANUFACTURERS

- A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the work include, but are not limited to, the following:
- B. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. AFC Cable Systems, Inc.

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2. Alflex Inc.
3. Allied Tube & Conduit; a Tyco International Ltd. Co
4. Anamet Electrical, Inc.; Anaconda Metal Hose
5. Armorcast Products Company
6. Arnco Corporation
7. CANTEX inc
8. Carson Industries LLC
9. CDR Systems Corporation
10. CertainTeed Corp.; Pipe & Plastics Group
11. Christy Concrete Products
12. Condux International, Inc
13. Cooper Crouse-Hinds; Div. of Cooper Industries, Inc.
14. EGS/Appleton Electric
15. ElecSYS, Inc
16. Electric-Flex Co.
17. Erickson Electrical Equipment Company
18. Hoffman
19. Hubbell Incorporated; Killark Electric Manufacturing Co. Division
20. Hubbell Incorporated; Quazite
21. Lamson & Sessions; Carlon Electrical Products
22. Manhattan/CDT/Cole-Flex
23. Maverick Tube Corporation
24. NewBasis
25. Nordic Fiberglass, Inc.
26. O-Z Gedney; a unit of General Signal
27. RACO; a Hubbell Company
28. Robroy Industries, Inc.; Enclosure Division
29. Scott Fetzer Co.; Adalet Division
30. Spring City Electrical Manufacturing Company
31. Synertech Moulded Products, Inc.; a division of Oldcastle Precast
32. Thomas & Betts Corporation
33. Walker Systems, Inc.; Wiremold Company (The)
34. Wheatland Tube Company
35. Woodhead, Daniel Company; Woodhead Industries, Inc. Subsidiary

2.03 **ELECTRICAL METALLIC TUBING (EMT) AND FITTINGS**

- A. Conduit: Steel, galvanized tubing. ANSI C80.3
- B. Fittings: All steel, set screw, concrete tight. No push-on or indenter types permitted.
- C. Conduit Bodies: All steel threaded conduit bodies.

2.04 **LIQUIDTIGHT FLEXIBLE METAL CONDUIT AND FITTINGS**

- A. Conduit: flexible, steel, galvanized, spiral strip with an outer Liquidtight, nonmetallic, sunlight-resistant jacket.
- B. Fittings and Conduit Bodies: ANSI/NEMA FB 1, compression type. There shall be a metallic cover/insert on the end of the conduit inside the connector housing to seal the cut conduit end.

2.05 **RIGID NONMETALLIC CONDUIT AND FITTINGS**

- A. Conduit: Schedule 40 PVC minimum, Listed, sunlight resistant, rated for 900 C conductors. NEMA TC2
- B. Fittings and Conduit Bodies: NEMA TC 2, Listed.

2.06 **CONDUIT SUPPORTS**

- A. See section 26 05 29.

2.07 **PULL AND JUNCTION BOXES**

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- A. Pull boxes and junction boxes shall be minimum 4 inch square (100 mm) by 2 1/8th inches (54 mm) deep for use with 1 inch (25 mm) conduit and smaller. On conduit systems using 1 1/4 inch (31.75 mm) conduit or larger, pull and junction boxes shall be sized per NEC but not less than 4 11/16 inch square (117 mm).
- B. Sheet Metal Boxes: code gauge galvanized steel, screw covers, flanged and spot welded joints and corners.
- C. Sheet Metal Boxes Larger Than 12 Inches (300 mm) in any dimension shall have a hinged cover or a chain installed between box and cover.
- D. Cast Metal Boxes for Outdoor and Wet Location Installations: Type 4 and Type 6, flat-flanged, surface-mounted junction box, UL listed as rain tight. Galvanized cast iron or aluminum box and cover with ground flange, neoprene gasket, and stainless steel cover screws.
- E. Box extensions and adjacent boxes within 48" of each other are not allowed for the purpose of creating more wire capacity.
- F. Junction boxes 6" x 6" or larger size shall be without stamped knock-outs.
- G. Wireways shall not be used in lieu of junction boxes.

2.08 HINGED COVER ENCLOSURES

- A. NEMA 250, Type 1, with continuous hinge cover with flush latch, unless otherwise indicated.
 - 1. Metal Enclosures: Steel, finished inside and out with manufacturer's standard enamel.
 - 2. Nonmetallic Enclosures: Plastic, finished inside with radio frequency resistant paint.

2.09 CABINETS

- A. NEMA 250, Type 1, galvanized steel box with removable interior panel and removable front, finished inside and out with manufacturer's standard enamel.
- B. Hinged door in front cover with flush latch and concealed hinges.
- C. Key latch to match panelboards.
- D. Metal barriers to separate wiring of different systems and voltage.
- E. Accessory feet where required for freestanding equipment.

PART 3 – EXECUTION

3.01 CONDUIT SIZING, ARRANGEMENT AND SUPPORT

- A. See CONDUIT INSTALLATION SCHEDULE below for other limitations for types of conduit.
- B. Size power conductor raceways for conductor type installed. Conduit size shall be 1/2 inch (13 mm) minimum except all homerun conduits shall be 3/4", or as specified elsewhere. Caution: Per the NEC, the allowable conductor ampacity is reduced when more than three current-carrying conductors are installed in a raceway. Contractor must take the NEC ampacity adjustment factors into account when sizing the raceway and wiring system.
- C. Size conduit for all other wiring, including but not limited to data, control, security, fire alarm, telecommunications, signal, video, etc. shall be sized per number of conductors pulled and their cross-section. 40% fill shall be maximum for all new conduit fills.
- D. Arrange conduit to maintain headroom and present a neat appearance.
- E. Route exposed conduit and conduit above accessible ceilings parallel and perpendicular to walls and adjacent piping.
- F. Maintain minimum 6 inch (150 mm) clearance between conduit and piping. Maintain 12 inch (300 mm) clearance between conduit and heat sources such as flues, steam pipes, and heating appliances.
- G. Arrange conduit supports to prevent distortion of alignment by wire pulling operations. Fasten conduit using galvanized pipe straps, conduit racks (lay-in adjustable hangers), clevis hangers, or bolted split stamped galvanized hangers.
- H. Group conduit in parallel runs where practical and use conduit rack (lay-in adjustable hangers) constructed of steel channel with conduit straps or clamps. Provide space for 25 percent additional conduit.
- I. Do not fasten conduit with wire or perforated pipe straps. Before conductors are pulled, remove all wire used for temporary conduit support during construction.
- J. Support and fasten metal conduit at a maximum of 8 feet (2.4 m) on center.

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- K. Supports shall be independent of the installations of other trades, e.g. ceiling support wires, HVAC pipes, other conduits, etc., unless so approved or detailed.
- L. In general, all conduit shall be concealed except where noted on the drawings or approved by the Architect/Engineer. Contractor shall verify with Architect/Engineer all surface conduit installations except in mechanical rooms.
- M. Changes in direction shall be made with symmetrical bends, cast steel boxes, stamped metal boxes or cast steel conduit bodies.
- N. For all conduits, no continuous conduit run shall exceed 100 feet (30 meters) without a junction box.
- O. All conduits installed in exposed areas shall be installed with a box offset before entering box.

3.02 CONDUIT INSTALLATION

- A. Cut conduit square; de-burr cut ends.
- B. Conduit shall not be fastened to the corrugated metal roof deck.
- C. Bring conduit to the shoulder of fittings and couplings and fasten securely.
- D. Use conduit hubs for fastening conduit to cast boxes. Use sealing locknuts or conduit hubs for fastening conduit to sheet metal boxes in damp or wet locations.
- E. All conduit terminations (except for terminations into conduit bodies) shall use conduit hubs, or connectors with one locknut, or shall use double locknuts (one each side of box wall) and insulated bushing. Provide bushings for the ends of all conduit not terminated in box walls. Refer to Section 26 05 26 – Grounding and Bonding for Electrical Systems for grounding bushing requirements.
- F. Install no more than the equivalent of three 90 degree bends between boxes.
- G. Use hydraulic one-shot conduit bender or factory elbows for bends in conduit larger than 2 inch (50 mm) size unless sweep elbows are required.
- H. Conduit shall be bent according to manufacturer's recommendations. Torches or open flame shall not be used to aid in bending of PVC conduit.
- I. Use suitable conduit caps or other approved seals to protect installed conduit against entrance of dirt and moisture.
- J. Provide 1/8 inch (3 mm) nylon pull string in empty conduit, except sleeves and nipples.
- K. Install expansion-deflection joints where conduit crosses building expansion joints. Note: expansion-deflection joints are not required where conduit crosses building control joints if the control joint does not act as an expansion joint. Install expansion fitting in PVC conduit runs as recommended by the manufacturer.
- L. Avoid moisture traps where possible. Where moisture traps are unavoidable, provide junction boxes with drain fittings at conduit low points.
- M. Where conduit passes between areas of differing temperatures such as into or out of cool rooms, freezers, unheated and heated spaces, buildings, etc., provide Listed conduit seals to prevent the passage of moisture and water vapor through the conduit.
- N. Ground and bond conduit under provisions of Section 26 05 26.
- O. PVC conduit shall transition to galvanized rigid metal conduit before it enters a concrete pole base, foundation, wall (where exposed) or up through a concrete floor.
- P. Identify conduit under provisions of Section 26 05 53.
- Q. PVC conduit shall be cleaned with solvent, and dried before application of glue. The temperature rating of glue/cement shall match weather condition. Apply full even coat of cement/glue to entire area that will be inserted into fitting. The entire installation shall meet manufacturer's recommendations.

3.03 CONDUIT INSTALLATION SCHEDULE

- A. Conduit other than that specified below for specific applications shall not be used.
- B. Exposed Outdoor Locations: Rigid steel conduit.
- C. Wet Interior Locations (Within parking, stairs and similar exposed spaces): Rigid steel conduit., Schedule 40 PVC conduit, PVC coated rigid steel conduit.
- D. Concealed Dry Interior Locations (Within interior conditions spaces similar to basement and office) : Rigid steel conduit. Intermediate metal conduit. Electrical metallic tubing.
- E. Equipment connections: Flexible PVC coated metal conduit (all locations). Minimum length shall be one foot (300 mm), maximum length shall be three feet (900 mm). Conduit must be installed perpendicular to direction of equipment vibration to allow conduit to freely flex.

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- F. Light fixtures: Direct box or conduit connection for surface mounted. Liquid tight flexible metal conduit from a J-box to light fixtures. Conduit size shall be 3/8" (10 mm) minimum diameter and six foot (1.8 M) maximum length. Conduit length shall allow movement of fixture for maintenance purposes.

3.04 COORDINATION OF BOX LOCATIONS

- A. Provide electrical boxes as shown on Drawings, and as required for splices, taps, wire pulling, equipment connections, and code compliance.
- B. Electrical box locations shown on Contract Drawings are approximate unless dimensioned. Verify location of floor boxes and outlets in offices and work areas prior to rough-in.
- C. No outlet, junction, or pull boxes shall be located where it will be obstructed by other equipment, piping, lockers, benches, counters, etc.
- D. It shall be the Contractor's responsibility to study drawings pertaining to other trades, to discuss location of outlets with workmen installing other piping and equipment and to fit all electrical outlets to job conditions.
- E. In case of any question or argument over the location of an outlet, the Contractor shall refer the matter to the Architect/Engineer and install outlet as instructed by the Architect/Engineer.
- F. The proper location of each outlet is considered a part of this contract and no additional compensation will be paid to the Contractor for moving outlets which were improperly located.
- G. Locate and install boxes to allow access to them. Where installation is inaccessible, coordinate locations and provide 18 inch (450 mm) by 24 inch (600 mm) access doors.
- H. Locate and install to maintain headroom and to present a neat appearance.
- I. Install boxes to preserve fire resistance rating of partitions and other elements, using approved materials and methods.

3.05 PULL AND JUNCTION BOX INSTALLATION

- A. Locate pull boxes and junction boxes above accessible ceilings, in unfinished areas or furnish and install Owner approved access panels in non-accessible ceilings where boxes are installed. All boxes are to be readily-accessible.
- B. Support pull and junction boxes independent of conduit.

3.06 EXPANSION JOINT FITTINGS FOR RNC

- A. Install in each run of above ground conduit that is routed across an existing structural expansion joint.
- B. Install in each run of aboveground conduit that is located where environmental temperature change may exceed 30° F (17° C) and that has straight run length that exceeds 25 feet (7.6 m).
- C. Install expansion joint fittings for each of the following locations and provide type and quantity of fittings that accommodate temperature change listed for location:
 - 1. Outdoor Locations not Exposed to Direct Sunlight: 125° F (70° C), , temperature change.
 - 2. Outdoor Locations Exposed to Direct Sunlight: 155° F (86° C), , temperature change.
 - 3. Indoor Spaces: Connected with the outdoors without physical separation: 125° F (70° C), , temperature change.
- D. Install fitting(s) that provide expansion and contraction for at least 0.00041 inch per foot of length of straight run per deg F (0.06 mm per meter of length of straight run per deg C) of temperature change.
- E. Install each expansion joint fitting with position, mounting and piston setting selected according to manufacturer's written instructions for conditions at specific location at the time of installation.

END OF SECTION

**PROJECT 10403 - DIVISION 26 51 13
LIGHTING FIXTURES, LAMPS, AND BALLASTS**

PART 1 – GENERAL

1.01 SCOPE OF WORK

- A. Base Bid: The work under this section includes interior luminaires and accessories, exit signs, lamps, and ballasts.

1.02 SECTION INCLUDES

- A. Interior Luminaires and Accessories
- B. LED Luminaires

1.03 RELATED WORK

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specifications Sections, apply to this section.

1.04 SUBMITTALS

- A. Include outline drawings, lamp and ballast data, support points, weights, accessory information and performance and photometric data for each luminaire type.
- B. For each luminaire type, submit luminaire information in the following example table format, and submit catalog cuts with highlighted catalog numbers and required accessories.

LUMINAIRE		BALLAST	LAMP	ANSI INPUT WATTS
Type	Manufacturer and Catalog No.	Manufacturer, Quantity per Fixture, and Catalog No.	Manufacturer, Quantity per Fixture, and Catalog No.	

1.05 QUALITY ASSURANCE

- A. Luminaire Photometric Data Testing Laboratory Qualifications: Provided by manufacturers’ laboratories that are accredited under the National Volunteer Laboratory Accreditation Program for Energy Efficiency Lighting Products
- B. Luminaire Photometric Data Testing Laboratory Qualifications: Provided by an independent agency, with the experience and capability to conduct the testing indicated, that is an NRTL as defined by OSHA in 29 CFR 1910.7.
- C. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.
- D. Comply with NFPA 70.

1.06 WARRANTY

- A. Warranty Period: One year(s) from date of Substantial Completion.

1.07 OPERATION AND MAINTENANCE DATA

- A. All operations and maintenance data shall comply with the submission and content requirements specified under section GENERAL REQUIREMENTS.

1.08 COORDINATION

- A. Coordinate layout and installation of lighting fixtures and suspension system with other construction that penetrates ceilings or is supported by them, including HVAC equipment, fire-suppression system, and partition assemblies.

PART 2 – PRODUCTS

2.01 INTERIOR LUMINAIRE AND ACCESSORIES

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- A. See notes on the drawings, for type of fixtures and catalog numbers. Catalog numbers are shown on the drawings for quality and performance requirements only. Fixtures manufactured by others are equally acceptable provided they meet or exceed the performance of the indicated fixtures, and meet the intent of the design.
- B. Provide with quick-connect disconnecting means, similar to Thomas & Betts Sta-Kon.
- C. Sheet metal components shall be steel unless otherwise noted, formed and supported to prevent warping or sagging. Metal shall be free of burrs, sharp corners, and edges.
- D. Doors, Frames and Other Internal Access: Smooth operating, free of light leakage under operating conditions, and designed to permit relamping without use of tools. Designed to prevent doors, frames, lenses, diffusers, and other components from falling accidentally during relamping and when secured in operating position.

2.02 LED LUMINAIRES

- A. The manufacturer offering this item shall have been in business for a minimum of 5 years and shall have successfully produced at least 1000 (one thousand) identical or similar models to that being tendered.
- B. Luminaire shall be certified by a Nationally Recognized Testing Laboratory (UL, ETL, or IEC).
- C. Luminaire shall be mercury-free, lead-free, and RoHS compliant.
- D. Luminaire shall comply with FCC 47 CFR part 15 non-consumer RFI/EMI standards.
- E. Luminaire shall maintain 70% lumen output (L70) for a minimum of 50,000 hours.
- F. Light output of the LED system shall be measured using the absolute photometry method following IES LM-79 and IES LM-80 requirements and guidelines.
- G. Driver shall have a rated life of 50,000 hours, minimum.
- H. Lumen output shall not depreciate more than 20% after 10,000 hours of use.
- I. The manufacturer of the Luminaire shall utilize high-brightness LEDs with proven quality. LED drivers to be compatible with LEDs. Driver and LEDs shall be furnished from a single manufacturer to ensure compatibility.
- J. Luminaire Color Rendering Index (CRI) shall be a minimum of 70.
- K. LED fixture shall be thermally designed as to not exceed the maximum junction temperature of the LED for the ambient temperature of the location the fixture is to be installed. Rated case temperature shall be suitable for operation in the ambient temperatures typically found for the intended installation. Exterior luminaires to operate in ambient temperatures of -20°F to 122°F (-29°C to 50°C).
- L. LED driver shall have a minimum power factor (pf) of 0.9 and a maximum crest factor (cf) of 1.5 at full input power and across specified voltage range.
- M. Luminaire shall operate normally for input voltage fluctuations of plus or minus 10 percent and shall have a maximum Total Harmonic Distortion (THD) of 20% at full input power and across specified voltage range.
- N. Electrical components of the LED lighting fixture (LED light engine/board array and driver(s)) shall be of modular construction so that each component is individually replaceable in the field for maintenance and repair purposes. Wiring connecting these components shall utilize polarized quick-disconnects.
- O. All connections to luminaires shall be reverse polarity protected and provide high voltage protection in the event connections are reversed or shorted during the installation process.
- P. Fuse Protections: All luminaires shall have built-in fuse protection. All power supply outputs shall be either fuse protected or be Polymeric Positive Temperature Coefficient (PTC)-protected as per Class 2 UL listing. All luminaires shall be provided with knockouts for conduit connections.
- Q. The LED lighting fixture shall carry a limited 5-year warranty minimum for LED light engine(s)/board array, and driver(s).

PART 3 – EXECUTION

3.01 INSTALLATION

- A. Install in accordance with manufacturer's instructions.
- B. Install suspended luminaires and exit signs using pendants supported from swivel hangers. Heavy duty jack chain supports may be used where indicated on the fixture schedule. Provide pendant or chain length required to suspend luminaire at indicated height.
- C. Support luminaires larger than 2 x 4 foot (600 x 1 200 mm) size independent of ceiling framing.
- D. Locate ceiling luminaires as indicated on reflected ceiling plan.

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- E. Install surface mounted luminaires and exit signs plumb and adjust to align with building lines and with each other. Secure to prohibit movement.
- F. The Contractor shall install fixture supports as required. Fixture installations with fixtures supported only by insecure boxes will be rejected. It shall be the Contractor's responsibility to support all lighting fixtures adequately, providing extra steel work for the support of fixtures if required. Any components necessary for mounting fixtures shall be provided by the Contractor. No plastic, composition or wood type anchors shall be used.
- G. Install wall mounted luminaires and exit signs at height as scheduled.
- H. Install accessories furnished with each luminaire.
- I. Make wiring connections to branch circuit using building wire with insulation suitable for temperature conditions within luminaire.
- J. Bond fixtures and metal accessories to branch circuit equipment grounding conductor.

3.02 FIELD QUALITY CONTROL

- A. Operate each luminaire after installation and connection. Inspect for proper connection and operation.

END OF SECTION

OVERTURE CENTER ELEVATOR UPGRADE

PROJECT 10403 - DIVISION 28 31 00 FIRE ALARM SYSTEMS

PART 1.0 - GENERAL

1.1. DESCRIPTION:

- A. This section of the specification includes the furnishing, installation, connection and testing of the microprocessor controlled, intelligent reporting fire alarm equipment required to form a complete, operative, coordinated system. It shall include, but not be limited to, alarm initiating devices, alarm notification appliances, Fire Alarm Control Panel (FACP), auxiliary control devices, annunciators, and wiring as shown on the drawings and specified herein.
- B. The fire alarm system shall comply with requirements of NFPA Standard No. 72 for Local Protected Premises Signaling Systems except as modified and supplemented by this specification. The system field wiring shall be supervised either electrically or by software-directed polling of field devices.
 - 1. The Secondary Power Source of the fire alarm control panel will be capable of providing at least 24 hours of backup power with the ability to sustain 5 minutes in alarm at the end of the backup period.

C. Underwriters Laboratories Inc. (UL) - USA:

UL 38 Manually Actuated Signaling Boxes
UL 268 Smoke Detectors for Fire Protective Signaling Systems
UL 521 Heat Detectors for Fire Protective Signaling Systems
UL 864 Standard for Control Units for Fire Protective Signaling Systems
UL 1481 Power Supplies for Fire Protective Signaling Systems

- 1. The FACP shall be ANSI 864, 9th Edition Listed. Systems listed to ANSI 864, 8th edition (or previous revisions) shall not be accepted.

1.2. SCOPE:

- A. An intelligent, microprocessor-controlled, fire alarm detection system shall be installed in accordance to the project specifications and drawings.
- B. Basic Performance:
 - 1. Initiation Device Circuits (IDC) shall be wired NFPA Style B (Class B) as part of an addressable device connected by the SLC Circuit.
 - 2. All circuits shall be power-limited, per UL864 requirements.
 - 3. A single ground fault or open circuit on the system Signaling Line Circuit shall not cause system malfunction, loss of operating power or the ability to report an alarm.
 - 4. Alarm signals arriving at the main FACP shall not be lost following a primary power failure or outage of any kind until the alarm signal is processed and recorded.
 - 5. Panel shall meet requirements of UL-864 Ninth Edition

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C. BASIC SYSTEM FUNCTIONAL OPERATION

When a fire alarm condition is detected and reported by one of the system initiating devices, the following functions shall immediately occur:

1. The Zone Alarm LED for the particular zone in alarm shall light.
2. A local sounder with the control panel shall sound.
3. In response to a fire alarm condition, the system will process all control programming and activate all system outputs (alarm notification appliances and/or relays) associated with the point(s) in alarm
4. In response to a fire alarm condition, the system will process all control programming and activate all system outputs (alarm notification appliances and/or relays) associated with the point(s) in alarm. Additionally, the system shall send events to a central alarm supervising station.

1.3. SUBMITTALS

A. General:

1. Two copies of all submittals shall be submitted to the Architect/Engineer for review.
2. All references to manufacturer's model numbers and other pertinent information herein is intended to establish minimum standards of performance, function and quality. Equivalent compatible UL-listed equipment from other manufacturers may be substituted for the specified equipment as long as the minimum standards are met.
3. For equipment other than that specified, the contractor shall supply proof that such substitute equipment equals or exceeds the features, functions, performance, and quality of the specified equipment.

B. Shop Drawings:

1. Sufficient information, clearly presented, shall be included to determine compliance with drawings and specifications.
2. Include manufacturer's name(s), model numbers, ratings, power requirements, equipment layout, device arrangement, complete wiring point-to-point diagrams, and conduit layouts.
3. Show system layout, configurations, and terminations.

C. Manuals:

1. Submit simultaneously with the shop drawings, complete operating and maintenance manuals listing the manufacturer's name(s), including technical data sheets.
2. Wiring diagrams shall indicate internal wiring for each device and the interconnections between the items of equipment.
3. Provide a clear and concise description of operation that gives, in detail, the information

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required to properly operate the equipment and system.

D. Software Modifications

1. Provide the services of a qualified technician to perform all system software modifications, upgrades or changes. Response time of the technician to the site shall not exceed 4 hours.
2. Provide all hardware, software, programming tools and documentation necessary to modify the fire alarm system on site. Modification includes addition and deletion of devices, circuits, zones and changes to system operation. The system structure and software shall place no limit on the type or extent of software modifications on-site. Modification of software shall not require power-down of the system or loss of system fire protection while modifications are being made.

1.4. GUARANTY:

All work performed and all material and equipment furnished under this contract shall be free from defects and shall remain so for a period of at least one (1) year from the date of acceptance. The full cost of maintenance, labor and materials required to correct any defect during this one year period shall be included in the submittal bid.

1.5. MAINTENANCE:

A. Maintenance and testing shall be on a semi-annual schedule or as required by the local AHJ. A preventive maintenance schedule shall be provided by the contractor describing the protocol for preventive maintenance. The schedule shall include:

1. Systematic examination, adjustment and cleaning of all detectors, manual fire alarm stations, control panels, power supplies, relays, waterflow switches and all accessories of the fire alarm system.
2. Each circuit in the fire alarm system shall be tested semiannually.
3. Each smoke detector shall be tested in accordance with the requirements of NFPA 72.

B. As part of the bid/proposal, include a quote for a maintenance contract to provide all maintenance, tests, and repairs described below. Include also a quote for unscheduled maintenance/repairs, including hourly rates for technicians trained on this equipment, and response travel costs for each year of the maintenance period. Submittals that do not identify all post contract maintenance costs will not be accepted. Rates and costs shall be valid for the period of five (5) years after expiration of the guaranty.

1.7. APPLICABLE STANDARDS AND SPECIFICATIONS:

The specifications and standards listed below form a part of this specification. The system shall fully comply with the latest issue of these standards, if applicable.

A. National Fire Protection Association (NFPA) - USA:

- No. 13 Sprinkler Systems
- No. 70 National Electric Code (NEC)

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No. 72 National Fire Alarm Code
No. 101 Life Safety Code

B. The system and its components shall be Underwriters Laboratories, Inc. listed under the appropriate UL testing standard as listed herein for fire alarm applications and the installation shall be in compliance with the UL listing.

C. Local and State Building Codes.

D. All requirements of the Authority Having Jurisdiction (AHJ).

1.8. APPROVALS:

A. The system shall have proper listing and/or approval from the following nationally recognized agencies:

ETL listed to ANSI/UL 864 9th Edition Standard

PART 2.0 PRODUCTS

2.1. EQUIPMENT AND MATERIAL, GENERAL:

A. All equipment and components shall be new, and the manufacturer's current model. The materials, appliances, equipment and devices shall be tested and listed by a nationally recognized approvals agency for use as part of a fire protective signaling system, meeting the National Fire Alarm Code.

B. All equipment and components shall be installed in strict compliance with manufacturers' recommendations. Consult the manufacturer's installation manuals for all wiring diagrams, schematics, physical equipment sizes, etc., before beginning system installation.

C. All equipment shall be attached to walls and ceiling/floor assemblies and shall be held firmly in place (e.g., detectors shall not be supported solely by suspended ceilings). Fasteners and supports shall be adequate to support the required load.

2.2. CONDUIT AND WIRE:

A. Conduit:

1. Conduit shall be in accordance with The National Electrical Code (NEC), local and state requirements.

2. All wiring shall be installed in conduit or raceway. Conduit fill shall not exceed 40 percent of interior cross sectional area where three or more cables are contained within a single conduit.

3. Cable must be separated from any open conductors of power, or Class 1 circuits, and shall not be placed in any conduit, junction box or raceway containing these conductors, per NEC Article 760-29.

4. With the exception of telephone connections, wiring for 24 volt DC control, alarm notification, emergency communication and similar power-limited auxiliary functions may be run in the same conduit as initiating and signaling line circuits. All circuits shall be provided with transient suppression devices and the system shall be designed to permit simultaneous operation of all circuits without interference or loss of signals.

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5. Conduit shall not enter the fire alarm control panel, or any other remotely mounted control panel equipment or backboxes, except where conduit entry is specified by the FACP manufacturer.
6. Conduit shall be 3/4 inch (19.1 mm) minimum.

B. Wire:

1. All fire alarm system wiring shall be new.
2. Wiring shall be in accordance with local, state and national codes (e.g., NEC Article 760) and as recommended by the manufacturer of the fire alarm system. Number and size of conductors shall be as recommended by the fire alarm system manufacturer, but not less than 18 AWG (1.02 mm) for Initiating Device Circuits and Signaling Line Circuits, and 14 AWG (1.63 mm) for Notification Appliance Circuits.
3. All wire and cable shall be listed and/or approved by a recognized testing agency for use with a protective signaling system.
5. Wiring used for the multiplex communication circuit (SLC) shall be twisted non-shielded and support a minimum wiring distance of 10,000 feet when sized at 12 AWG.
6. All field wiring shall be electrically supervised for open circuit and ground fault.
7. The fire alarm control panel shall be capable of T-tapping NFPA Style 4 (Class B) Signaling Line Circuits (SLCs). Systems which do not allow or have restrictions for the number of T-taps, length of T-taps etc., are not acceptable.

C. Terminal Boxes, Junction Boxes and Cabinets:

All boxes and cabinets shall be UL listed for their use and purpose.

- D. The fire alarm control panel shall be connected to a separate dedicated branch circuit, maximum 20 amperes. This circuit shall be labeled at the main power distribution panel as FIRE ALARM. Fire alarm control panel primary power wiring shall be 12 AWG. The control panel cabinet shall be grounded securely to either a cold water pipe or grounding rod.

1. The FACP shall be capable of coding Notification Appliance Circuits in Temporal (NFPA 72) or Constant On (24 VDC power). Main panel notification circuits (NACs 1 & 2) shall also automatically synchronize any of the following manufacturer's notification appliances connected to them

2.3. MAIN FIRE ALARM CONTROL PANEL:

A. The FACP shall contain a microprocessor- based Central Processing Unit (CPU). The CPU shall communicate with and control the following types of equipment used to make up the system: intelligent addressable smoke and thermal (heat) detectors, addressable modules.

B. Operator Control

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1. Acknowledge Switch:

- a. Activation of the control panel Acknowledge switch in response to new alarms, supervisory and/or troubles shall silence the local panel piezo electric signal and change the alarm, supervisory and trouble LEDs to steady-ON mode.

2. Alarm Silence Switch:

Activation of the alarm silence switch shall cause all programmed alarm notification appliances and relays to return to the normal condition after an alarm condition. The selection of notification circuits and relays that are silenceable by this switch shall be fully field programmable within the confines of all applicable standards. The FACP software shall include silence inhibit and auto-silence timers.

3. Alarm Activate (Drill) Switch:

The Alarm Activate switch shall activate all notification appliance circuits. The drill function shall latch until the panel is reset.

4. System Reset Switch:

Activation of the System Reset switch shall cause all electronically-latched initiating devices, appliances or software zones, as well as all associated output devices and circuits, to return to their normal condition.

5. Lamp Test:

The System RESET switch shall also function as a Lamp Test switch and shall activate all system LEDs and light each segment of the display.

C. System Capacity and General Operation

1. The control panel shall provide, or be capable of, expansion to 25 intelligent/addressable devices of any type, detector or module
2. The control panel shall include two Form-C programmable relays, which can be used for Alarm, and Supervisory and a fixed Trouble relay rated at a minimum of 2.5 amps @ 24 VDC. It shall also include 2 programmable Notification Appliance Circuits (NACs) capable of being wired as NFPA Style Y (Class B).
Either programmable Notification circuit shall also be capable of providing auxiliary power when programmed as such.
3. The control panel must have a built in annunciator with three characters of display each consisting of seven segments and feature LED's for AC, General Trouble, Silenced, Ground Fault, Low Battery, Walk Test, NAC 1 and 2 Active and Trouble, and Zones 1 through 5 Alarm, Supervisory, and Trouble. All control and programming keys are a membrane style buttons. The annunciator must be able to silence and reset alarms by opening the cabinet door and pressing SILENCE or RESET once. The annunciators must have an installer code that will allow the limitation of operating system programming to authorized individuals.
2. Modifications to the default panel program can only be accomplished using the embedded web server of the control panel. There are two ways to connect to the panel: connected to an existing network with a DHCP Dynamic Host Configuration Protocol server present or plugged in directly to a PC using a standard CAT5e Ethernet cable.

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5. The system shall allow the programming of any input to activate any output.
6. The FACP shall provide the following features:
 - a. Drift compensation to extend detector accuracy over life. Drift compensation shall also include a smoothing feature, allowing transient noise signals to be filtered out.
 - b. Detector sensitivity test, meeting requirements of NFPA 72, Maintenance alert, with two levels (maintenance alert/maintenance urgent), to warn of excessive smoke detector dirt or dust accumulation.
 - c. Alarm verification, with counters and a trouble indication to alert maintenance personnel when a detector enters verification an excessive number of times.
 - d. Periodic detector test, conducted automatically by the software.
 - e. Walk test mode shall be a standard feature of the fire alarm control panel. The walk test feature shall function so that each alarm input tested will operate the associated notification appliance for three seconds. The FACP will then automatically perform a reset and confirm normal device operation.

B. Central Microprocessor

1. The microprocessor shall be a state-of-the-art; it shall communicate with, monitor and control all external interfaces. It shall include non-volatile memory for building-specific program storage, and a "watch dog" timer circuit to detect and report microprocessor failure.
2. The microprocessor shall contain and execute all specific actions to be taken in the condition of an alarm. Control programming shall be held in non-volatile programmable memory, and shall not be lost even if system primary and secondary power failure occurs.
3. An auto-programming capability (JumpStart) shall be provided to quickly identify devices connected on the SLC and make the system operational.

C. Display

1. The display shall provide all the controls and indicators used by the system operator.
2. The display shall include status information for all intelligent detectors, addressable modules and zones.
3. The display shall contain dedicated LEDs for the annunciation of AC POWER, FIRE ALARM, SUPERVISORY, TROUBLE and GROUND FAULT, LOW BATTERY, WALKTEST, , , conditions.
4. The keypad shall be part of the standard system and have the capability to command all system functions. Installer password level shall be provided to prevent unauthorized system control or programming.

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5. The display shall include the following operator control switches:
ACKNOWLEDGE, ALARM SILENCE, DRILL (alarm activate), AALARM ID,
SUPERV ID, TROUBLE ID and SYSTEM RESET.

D. Signaling Line Circuit (SLC)

1. The SLC interface shall provide power to and communicate with up to 25 devices of any type including: intelligent detectors (photoelectric or thermal) addressable pull stations, intelligent modules (monitor control). Each SLC shall be capable of NFPA 72 Style 4 (Class B) wiring.
2. The CPU shall receive information from all intelligent detectors to be processed to determine whether normal, alarm or trouble conditions exist for each detector. The software shall automatically compensate for the accumulation of dust in each detector up to allowable limits. The information shall also be used for automatic detector testing and for the determination of detector maintenance conditions.
3. The detector software shall meet NFPA 72, requirements and be certified by UL as a calibrated sensitivity test instrument.

- E. The control panel will have the capability of Reverse Polarity Transmission or connection to a Municipal Box for compliance with applicable NFPA standards.

F. Wireless Fire Alarm Communicators for IntelliNet.

1. Communication shall include vital system status such as:
 - Independent Zone (Alarm, trouble, non-alarm, supervisory)
 - Independent Addressable Device Status
 - AC (Mains) Power Loss
 - Low Battery and Earth Fault
 - System Off Normal
 - 12 and 24 Hour Test Signal
 - Abnormal Test Signal (per UL requirements)
2. Provide AES Corporation #AES 7788 8 Zone UL/NFPA Transceiver, req's TXR MGE1640 Transformer; AES TXR MGE-1640 Plug-In 16.5VAC 40VA Transformer or similar meeting the requirements on Madison Fire Department.

G. Enclosures:

1. The control panel shall be housed in a UL-listed cabinet suitable for surface mounting. The cabinet and front shall be corrosion protected and painted red via the powder coat method with manufacturer's standard finish.
2. The back box and door shall be constructed of steel with provisions for electrical conduit connections into the sides and top.
3. The door shall provide a key lock and shall provide for the viewing of all indicators.

H. Field Charging Power Supply:

The FCPS is a device designed for use as either a remote 24-volt power supply or as a booster for powering Notification Appliances.

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1. The FCPS shall offer up to 8.0 amps (6.0 amps continuous) of regulated 24 volt power. It shall include an integral charger designed to charge 18.0 amp hour batteries.
2. The Field Charging Power Supply shall have two input triggers. The input trigger shall be a Notification Appliance Circuit (from the fire alarm control panel) or a control relay. Four NAC outputs, wired NFPA Style Y or Z, shall be available for connection to the Notification devices.
3. The FCPS shall optionally provide synchronization of all connected strobes or horn strobe combinations when System Sensor, Wheelock or Gentex devices are installed.
4. The FCPS shall function as a sync follower as well as a sync generator.
5. The FCPS shall include a surface mount backbox.
6. The Field Charging Power Supply shall include the ability to delay the reporting of an AC fail condition per NFPA requirements.
7. The FCPS shall provide 24 VDC regulated and power-limited circuitry per UL standards. Should this be updated to latest UL standard?

I. Power Supply:

1. The main power supply for the fire alarm control panel shall provide up to 2.0 amps of available power for the control panel and peripheral devices.
2. Provisions will be made to allow the audio-visual power to be increased as required by adding modular expansion audio-visual power supplies.
3. The power supply shall provide an integral battery charger or may be used with an external battery and charger systems. Battery arrangement may be configured in the field.
4. The main power supply shall continuously monitor all field wires for earth ground conditions.
5. The main power supply shall operate on 120 VAC, 60 Hz, and shall provide all necessary power for the FACP.

N. Specific System Operations

1. Alarm Verification: Each of the intelligent addressable smoke detectors in the system may be independently programmed for verification of alarm signals. The alarm verification time period shall not exceed 250 seconds.
2. Zone Disable: Any addressable device in the system may be enabled or disabled through the system keypad.
3. Zone Read: The system shall be able to display the following point status:
 - a. Alarm ID
 - b. Supervisory ID

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c. Trouble ID

4. Automatic Detector Maintenance Alert: The fire alarm control panel shall automatically interrogate each intelligent detector and shall analyze the detector responses over a period of time. If any intelligent detector in the system responds with a reading that is above or below normal limits, then the system will enter the trouble mode, and the particular detector will be annunciated on the system display. This feature shall in no way inhibit the receipt of alarm conditions in the system, nor shall it require any special hardware, special tools or computer expertise to perform.
5. The fire alarm control panel shall include Silent and Audible Walk Test functions – Silent and Audible. It shall include the ability to test initiating device circuits and Notification Appliance Circuits from the field without returning to the panel to reset the system. The operation shall be as follows:
 - a. Alarming an initiating device shall activate programmed outputs, which are selected to participate in Walk Test.
6. Supervisory Operation: An alarm from a supervisory device shall cause the appropriate indication on the control panel display, light a Zone supervisory LED.
7. Signal Silence Operation: The FACP shall have the ability to program each output circuit (notification circuit or relay) to deactivate upon depression of the Signal Silence switch.

1.9. SYSTEM COMPONENTS:

A. Addressable Pull Box (manual station)

1. Addressable pull boxes shall, on command from the control panel, send data to the panel representing the state of the manual switch and the addressable communication module status. They shall use a key operated test-reset lock, and shall be designed so that after actual emergency operation, they cannot be restored to normal use except by the use of a key.
2. All operated stations shall have a positive, visual indication of operation and utilize a key type reset.
3. Manual pull stations shall be constructed of Lexan with clearly visible operating instructions provided on the cover. The word FIRE shall appear on the front of the stations in raised letters, 1.75 inches (44 mm) or larger.

B. Intelligent Multi-Sensing Detector

1. The intelligent detector shall be an addressable device which is capable of detecting multiple threats by employing photoelectric and thermal technologies in a single unit. This detector shall utilize advanced electronics which react to slow smoldering fires (photoelectric) and heat (thermal) all within a single sensing device.
2. The multi-detector shall include LED for 360-degree viewing.
3. Automatically adjusts sensitivity levels without the need for operator intervention or

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programming. Sensitivity increases with heat.

C. Intelligent Photoelectric Smoke Detector

1. The detectors shall use the photoelectric (light-scattering) principal to measure smoke density and shall, on command from the control panel, send data to the panel representing the analog level of smoke density.
2. Detector shall be provided on a twist-lock base.
3. It shall be possible to perform a calibrated sensitivity and performance test on the detector without the need for the generation of smoke. The test method shall test all detector circuits.
4. A visual indication of an alarm shall be provided latching Light Emitting Diode (LED), on the detector, which may be seen from ground level over 360 degrees. These LED shall periodically flash to indicate that the detector is in communication with the control panel.
5. All field wire connections shall be made to the base through the use of a clamping plate and screw.

D. Intelligent Thermal Detector

1. Thermal detectors shall be intelligent addressable devices rated at 135 degrees Fahrenheit (58 degrees Celsius) and have a rate-of-rise element rated at 15 degrees F (9.4 degrees C) per minute. It shall connect via two wires to the fire alarm control panel signaling line circuit.

F. Addressable Dry Contact Monitor Module

1. Addressable monitor module shall be provided to connect one supervised IDC zone of conventional alarm initiating devices (any normally open dry contact device) to one of the fire alarm control panel SLCs.
2. The IDC zone shall be suitable for Style B (Class) operation. An LED shall be provided that shall flash under normal conditions, indicating that the monitor module is operational and in regular communication with the control panel.

G. Addressable Control Relay Module

1. Addressable control relay modules shall be provided to control the operation of fan shutdown and other auxiliary control functions.
2. The control module shall mount in a standard 4-inch square, 2-1/8 inch deep electrical box, or to a surface mounted backbox.
3. The control relay module will provide a dry contact, Form-C relay. The relay coil shall be magnetically latched to reduce wiring connection requirements, and to insure that 100% of all auxiliary relays may be energized at the same time on the same pair of wires.
4. The control relay module shall be suitable for pilot duty applications and rated for a minimum of 0.6 amps at 30 VDC.

I. Field Wiring Terminal Blocks

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For ease of connection for heavy solid gauge wire, all panel I/O wiring terminal blocks shall be screw type barrier strips and have sufficient capacity for #22 to #12 AWG wire.

1.10. SYSTEM COMPONENTS - ADDRESSABLE DEVICES

A. Addressable Devices - General

1. Addressable devices shall employ the simple-to-set decade addressing scheme. Addressable devices which use a binary-coded address setting method, such as a rotary dials.
2. Detectors shall be addressable and intelligent, and shall connect with two wires to the fire alarm control panel signaling line circuits.
3. The detectors shall be listed by UL as meeting the calibrated sensitivity test requirements of NFPA Standard 72.
4. Detectors shall be ceiling-mount and shall include a separate twist-lock base with tamper proof feature.
5. Detectors shall provide a test means whereby they will simulate an alarm condition and report that condition to the control panel.

1.11. BATTERIES:

- A. Upon loss of Primary (AC) power to the control panel, the batteries shall have sufficient capacity to power the fire alarm system for required standby time (24 or 60 hours) followed by 5 minutes of alarm.
- B. The batteries are to be completely maintenance free. No liquids are required. Fluid level checks for refilling, spills, and leakage shall not be required.

PART 3.0 - EXECUTION

3.1. INSTALLATION:

- A. Installation shall be in accordance with the NEC, NFPA 72, local and state codes, as shown on the drawings, and as recommended by the major equipment manufacturer.
- B. All conduit, junction boxes, conduit supports and hangers shall be concealed in finished areas and may be exposed in unfinished areas. Smoke detectors shall not be installed prior to the system programming and test period. If construction is ongoing during this period, measures shall be taken to protect smoke detectors from contamination and physical damage.
- C. Manual pull stations shall be suitable for surface mounting or semi-flush mounting as shown on the plans, and shall be installed not less than 42 inches (1067 mm), nor more than 48 inches (122 mm) above the finished floor.

3.2. TEST:

The service of a competent, NICET level II technician shall be provided to technically supervise and participate during all of the adjustments and tests for the system. All testing

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shall be in accordance with NFPA 72.

- A. Before energizing the cables and wires, check for correct connections and test for short circuits, ground faults, continuity, and insulation.
- B. Close each sprinkler system flow valve and verify proper supervisory alarm at the FACP.
- C. Verify activation of all waterflow switches.
- D. Open initiating device circuits and verify that the trouble signal actuates.
- E. Open and short signaling line circuits and verify that the trouble signal actuates.
- F. Open and short notification appliance circuits and verify that trouble signal actuates.
- G. Ground all circuits and verify response of trouble signals.
- H. Check presence and audibility of tone at all alarm notification devices.
- I. Check installation, supervision, and operation of all intelligent smoke detectors using the walk test.
- J. Each of the alarm conditions that the system is required to detect should be introduced on the system. Verify the proper receipt and the proper processing of the signal at the FACP and the correct activation of the control points.
- K. When the system is equipped with optional features, the manufacturer's manual shall be consulted to determine the proper testing procedures. This is intended to address such items as verifying controls performed by individually addressed or grouped devices, sensitivity monitoring, verification functionality and similar.

3.4. INSTRUCTION:

- A. Instruction shall be provided as required for operating the system. Hands-on demonstrations of the operation of all system components and the entire system including program changes and functions shall be provided.
- B. The contractor or installing dealer shall provide a user manual indicating "Sequence of Operation."

SECTION E: BIDDERS ACKNOWLEDGEMENT

**OVERTURE CENTER GARAGE ELEVATOR MODERNIZATION
CONTRACT NO. 7889**

Bidder must state a Unit Price and Total Bid for each item. The Total Bid for each item must be the product of quantity, by Unit Price. The Grand Total must be the sum of the Total Bids for the various items. In case of multiplication errors or addition errors, the Grand Total with corrected multiplication and/or addition shall determine the Grand Total bid for each contract. The Unit Price and Total Bid must be entered numerically in the spaces provided. All words and numbers shall be written in ink.

1. The undersigned having familiarized himself/herself with the Contract documents, including Advertisement for Bids, Instructions to Bidders, Form of Proposal, City of Madison Standard Specifications for Public Works Construction - 2016 Edition thereto, Form of Agreement, Form of Bond, and Addenda issued and attached to the plans and specifications on file in the office of the City Engineer, hereby proposes to provide and furnish all the labor, materials, tools, and expendable equipment necessary to perform and complete in a workmanlike manner the specified construction on this project for the City of Madison; all in accordance with the plans and specifications as prepared by the City Engineer, including Addenda to the Contract Nos. _____ through _____ issued thereto, at the prices for said work as contained in this proposal. (Electronic bids submittals shall acknowledge addendum under Section E and shall not acknowledge here)
2. If awarded the Contract, we will initiate action within seven (7) days after notification or in accordance with the date specified in the contract to begin work and will proceed with diligence to bring the project to full completion within the number of work days allowed in the Contract or by the calendar date stated in the Contract.
3. The undersigned Bidder or Contractor certifies that he/she is not a party to any contract, combination in form of trust or otherwise, or conspiracy in restraint of trade or commerce or any other violation of the anti-trust laws of the State of Wisconsin or of the United States, with respect to this bid or contract or otherwise.
4. I hereby certify that I have met the Bid Bond Requirements as specified in Section 102.5. *(IF BID BOND IS USED, IT SHALL BE SUBMITTED ON THE FORMS PROVIDED BY THE CITY. FAILURE TO DO SO MAY RESULT IN REJECTION OF THE BID).*
5. I hereby certify that all statements herein are made on behalf of _____ (name of corporation, partnership, or person submitting bid) a corporation organized and existing under the laws of the State of _____ a partnership consisting of _____; an individual trading as _____; of the City of _____ State of _____; that I have examined and carefully prepared this Proposal, from the plans and specifications and have checked the same in detail before submitting this Proposal; that I have fully authority to make such statements and submit this Proposal in (its, their) behalf; and that the said statements are true and correct.

SIGNATURE

TITLE, IF ANY

Sworn and subscribed to before me this _____ day of _____, 20_____.

(Notary Public or other officer authorized to administer oaths)
My Commission Expires _____

Bidders shall not add any conditions or qualifying statements to this Proposal.

SECTION F: BEST VALUE CONTRACTING
OVERTURE CENTER GARAGE ELEVATOR MODERNIZATION
CONTRACT NO. 7889

Best Value Contracting

1. The Contractor shall indicate the non-apprenticeable trades used on this contract.

2. Madison General Ordinance (M.G.O.), 33.07(7), does provide for some exemptions from the active apprentice requirement. Apprenticeable trades are those trades considered apprenticeable by the State of Wisconsin. Please check applicable box if you are seeking an exemption.

- Contractor has a total skilled workforce of four or less individuals in all apprenticeable trades combined.
- No available trade training program; The Contractor has been rejected by the only available trade training program, or there is no trade training program within 90 miles.
- Contractor is not using an apprentice due to having a journey worker on layoff status, provided the journey worker was employed by the contractor in the past six months.
- First-time Contractor on City of Madison Public Works contract requests a onetime exemption but intends to comply on all future contracts and is taking steps typical of a "good faith" effort.
- Contractor has been in business less than one year.
- Contractor doesn't have enough journeyman trade workers to qualify for a trade training program in that respective trade.
- An exemption is granted in accordance with a time period of a "Documented Depression" as defined by the State of Wisconsin.

3. The Contractor shall indicate on the following section which apprenticeable trades are to be used on this contract. Compliance with active apprenticeship, to the extent required by M.G.O. 33.07(7), shall be satisfied by documentation from an applicable trade training body; an apprenticeship contract with the Wisconsin Department of Workforce Development or a similar agency in another state; or the U.S Department of Labor. This documentation is required prior to the Contractor beginning work on the project site.

- The Contractor has reviewed the list and shall not use any apprenticeable trades on this project.

LIST APPRENTICABLE TRADES (check all that apply to your work to be performed on this contract)

- BRICKLAYER
- CARPENTER
- CEMENT MASON / CONCRETE FINISHER
- CEMENT MASON (HEAVY HIGHWAY)
- CONSTRUCTION CRAFT LABORER
- DATA COMMUNICATION INSTALLER
- ELECTRICIAN
- ENVIRONMENTAL SYSTEMS TECHNICIAN / HVAC SERVICE TECH/HVAC INSTALL / SERVICE
- GLAZIER
- HEAVY EQUIPMENT OPERATOR / OPERATING ENGINEER
- INSULATION WORKER (HEAT & FROST)
- IRON WORKER
- IRON WORKER (ASSEMBLER, METAL BLDGS)
- PAINTER & DECORATOR
- PLASTERER
- PLUMBER
- RESIDENTIAL ELECTRICIAN
- ROOFER & WATER PROOFER
- SHEET METAL WORKER
- SPRINKLER FITTER
- STEAMFITTER
- STEAMFITTER (REFRIGERATION)
- STEAMFITTER (SERVICE)
- TAPER & FINISHER
- TELECOMMUNICATIONS (VOICE, DATA & VIDEO) INSTALLER-TECHNICIAN
- TILE SETTER

SECTION G: BID BOND

KNOW ALL MEN BY THESE PRESENT, THAT Principal and Surety, as identified below, are held and firmly bound unto the City of Madison, (hereinafter referred to as the "Obligee"), in the sum of five per cent (5%) of the amount of the total bid or bids of the Principal herein accepted by the Obligee, for the payment of which the Principal and the Surety bind themselves, their heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

The conditions of this obligation are such that, whereas the Principal has submitted, to the City of Madison a certain bid, including the related alternate, and substitute bids attached hereto and hereby made a part hereof, to enter into a contract in writing for the construction of:

OVERTURE CENTER GARAGE ELEVATOR MODERNIZATION CONTRACT NO. 7889

1. If said bid is rejected by the Obligee, then this obligation shall be void.
2. If said bid is accepted by the Obligee and the Principal shall execute and deliver a contract in the form specified by the Obligee (properly completed in accordance with said bid) and shall furnish a bond for his/her faithful performance of said contract, and for the payment of all persons performing labor or furnishing materials in connection therewith, and shall in all other respects perform the agreement created by the acceptance of said bid, then this obligation shall be void.

If said bid is accepted by the Obligee and the Principal shall fail to execute and deliver the contract and the performance and payment bond noted in 2. above executed by this Surety, or other Surety approved by the City of Madison, all within the time specified or any extension thereof, the Principal and Surety agree jointly and severally to forfeit to the Obligee as liquidated damages the sum mentioned above, it being understood that the liability of the Surety for any and all claims hereunder shall in no event exceed the sum of this obligation as stated, and it is further understood that the Principal and Surety reserve the right to recover from the Obligee that portion of the forfeited sum which exceed the actual liquidated damages incurred by the Obligee.

The Surety, for value received, hereby stipulates and agrees that the obligations of said Surety and its bond shall be in no way impaired or affected by an extension of the time within which the Obligee may accept such bid, and said Surety does hereby waive notice of any such extension.

IN WITNESS WHEREOF, the Principal and the Surety have hereunto set their hands and seals, and such of them as are corporations have caused their corporate seals to be hereto affixed and these presents to be signed by their proper officers, on the day and year set forth below.

Seal PRINCIPAL

Name of Principal

By

Date

Name and Title

Seal SURETY

Name of Surety

By

Date

Name and Title

This certifies that I have been duly licensed as an agent for the above company in Wisconsin under National Provider No. _____ for the year _____, and appointed as attorney in fact with authority to execute this bid bond and the payment and performance bond referred to above, which power of attorney has not been revoked.

Date

Agent Signature

Address

City, State and Zip Code

Telephone Number

NOTE TO SURETY & PRINCIPAL

The bid submitted which this bond guarantees shall be rejected if the following instrument is not attached to this bond:

Power of Attorney showing that the agent of Surety is currently authorized to execute bonds on behalf of the Surety, and in the amounts referenced above.

Certificate of Biennial Bid Bond

TIME PERIOD - VALID (FROM/TO)
NAME OF SURETY
NAME OF CONTRACTOR
CERTIFICATE HOLDER <p style="text-align: center;">City of Madison, Wisconsin</p>

This is to certify that a biennial bid bond issued by the above-named Surety is currently on file with the City of Madison.

This certificate is issued as a matter of information and conveys no rights upon the certificate holder and does not amend, extend or alter the coverage of the biennial bid bond.

Cancellation: Should the above policy be cancelled before the expiration date, the issuing Surety will give thirty (30) days written notice to the certificate holder indicated above.

Signature of Authorized Contractor Representative

Date

SECTION H: AGREEMENT

THIS AGREEMENT made this _____ day of _____ in the year Two Thousand and Seventeen between _____ hereinafter called the Contractor, and the City of Madison, Wisconsin, hereinafter called the City.

WHEREAS, the Common Council of the said City of Madison under the provisions of a resolution adopted _____, and by virtue of authority vested in the said Council, has awarded to the Contractor the work of performing certain construction.

NOW, THEREFORE, the Contractor and the City, for the consideration hereinafter named, agree as follows:

1. **Scope of Work.** The Contractor shall, perform the construction, execution and completion of the following listed complete work or improvement in full compliance with the Plans, Specifications, Standard Specifications, Supplemental Specifications, Special Provisions and contract; perform all items of work covered or stipulated in the proposal; perform all altered or extra work; and shall furnish, unless otherwise provided in the contract, all materials, implements, machinery, equipment, tools, supplies, transportation, and labor necessary to the prosecution and completion of the work or improvements:

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2. **Completion Date/Contract Time.** Construction work must begin within seven (7) calendar days after the date appearing on mailed written notice to do so shall have been sent to the Contractor and shall be carried on at a rate so as to secure full completion SEE SPECIAL PROVISIONS, the rate of progress and the time of completion being essential conditions of this Agreement.
3. **Contract Price.** The City shall pay to the Contractor at the times, in the manner and on the conditions set forth in said specifications, the sum of _____ (\$ _____) Dollars being the amount bid by such Contractor and which was awarded to him/her as provided by law.
4. **Affirmative Action.** In the performance of the services under this Agreement the Contractor agrees not to discriminate against any employee or applicant because of race, religion, marital status, age, color, sex, disability, national origin or ancestry, income level or source of income, arrest record or conviction record, less than honorable discharge, physical appearance, sexual orientation, gender identity, political beliefs, or student status. The Contractor further agrees not to discriminate against any subcontractor or person who offers to subcontract on this contract because of race, religion, color, age, disability, sex, sexual orientation, gender identity or national origin.

The Contractor agrees that within thirty (30) days after the effective date of this agreement, the Contractor will provide to the City Affirmative Action Division certain workforce utilization statistics, using a form to be furnished by the City.

If the contract is still in effect, or if the City enters into a new agreement with the Contractor, within one year after the date on which the form was required to be provided, the Contractor will provide updated workforce information using a second form, also to be furnished by the City. The second form will be submitted to the City Affirmative Action Division no later than one year after the date on which the first form was required to be provided.

The Contractor further agrees that, for at least twelve (12) months after the effective date of this contract, it will notify the City Affirmative Action Division of each of its job openings at facilities in Dane County for which applicants not already employees of the Contractor are to be considered. The notice will include a job description, classification, qualifications and application procedures

and deadlines. The Contractor agrees to interview and consider candidates referred by the Affirmative Action Division if the candidate meets the minimum qualification standards established by the Contractor, and if the referral is timely. A referral is timely if it is received by the Contractor on or before the date started in the notice.

Articles of Agreement Article I

The Contractor shall take affirmative action in accordance with the provisions of this contract to insure that applicants are employed, and that employees are treated during employment without regard to race, religion, color, age, marital status, disability, sex, sexual orientation, gender identity or national origin and that the employer shall provide harassment free work environment for the realization of the potential of each employee. Such action shall include, but not be limited to, the following: employment, upgrading, demotion or transfer, recruitment or recruitment advertising, layoff or termination, rates of pay or other forms of compensation and selection for training including apprenticeship insofar as it is within the control of the Contractor. The Contractor agrees to post in conspicuous places available to employees and applicants notices to be provided by the City setting out the provisions of the nondiscrimination clauses in this contract.

Article II

The Contractor shall in all solicitations or advertisements for employees placed by or on behalf of the Contractors state that all qualified or qualifiable applicants will be employed without regard to race, religion, color, age, marital status, disability, sex, sexual orientation, gender identity or national origin.

Article III

The Contractor shall send to each labor union or representative of workers with which it has a collective bargaining agreement or other contract or understanding a notice to be provided by the City advising the labor union or worker's representative of the Contractor's equal employment opportunity and affirmative action commitments. Such notices shall be posted in conspicuous places available to employees and applicants for employment.

Article V

The Contractor agrees that it will comply with all provisions of the Affirmative Action Ordinance of the City of Madison, including the contract compliance requirements. The Contractor agrees to submit the model affirmative action plan for public works contractors in a form approved by the Affirmative Action Division Manager.

Article VI

The Contractor will maintain records as required by Section 39.02(9)(f) of the Madison General Ordinances and will provide the City Affirmative Action Division with access to such records and to persons who have relevant and necessary information, as provided in Section 39.02(9)(f). The City agrees to keep all such records confidential, except to the extent that public inspection is required by law.

Article VII

In the event of the Contractor's or subcontractor's failure to comply with the Equal Employment Opportunity and Affirmative Action Provisions of this contract or Section 39.03 and 39.02 of the Madison General Ordinances, it is agreed that the City at its option may do any or all of the following:

1. Cancel, terminate or suspend this Contract in whole or in part.

2. Declare the Contractor ineligible for further City contracts until the Affirmative Action requirements are met.
3. Recover on behalf of the City from the prime Contractor 0.5 percent of the contract award price for each week that such party fails or refuses to comply, in the nature of liquidated damages, but not to exceed a total of five percent (5%) of the contract price, or five thousand dollars (\$5,000), whichever is less. Under public works contracts, if a subcontractor is in noncompliance, the City may recover liquidated damages from the prime Contractor in the manner described above. The preceding sentence shall not be construed to prohibit a prime Contractor from recovering the amount of such damage from the non-complying subcontractor.

Article VIII

The Contractor shall include the above provisions of this contract in every subcontract so that such provisions will be binding upon each subcontractor. The Contractor shall take such action with respect to any subcontractor as necessary to enforce such provisions, including sanctions provided for noncompliance.

Article IX

The Contractor shall allow the maximum feasible opportunity to small business enterprises to compete for any subcontracts entered into pursuant to this contract. (In federally funded contracts the terms "DBE, MBE and WBE" shall be substituted for the term "small business" in this Article.)

5. Substance Abuse Prevention Program Required. Prior to commencing work on the Contract, the Contractor, and any Subcontractor, shall have in place a written program for the prevention of substance abuse among its employees as required under Wis. Stat. Sec. 103.503.
6. **Contractor Hiring Practices.**

Ban the Box - Arrest and Criminal Background Checks. (Sec. 39.08, MGO)

This provision applies to all prime contractors on contracts entered into on or after January 1, 2016, and all subcontractors who are required to meet prequalification requirements under MGO 33.07(7)(l), MGO as of the first time they seek or renew pre-qualification status on or after January 1, 2016. The City will monitor compliance of subcontractors through the pre-qualification process.

- a. **Definitions.** For purposes of this section, "Arrest and Conviction Record" includes, but is not limited to, information indicating that a person has been questioned, apprehended, taken into custody or detention, held for investigation, arrested, charged with, indicted or tried for any felony, misdemeanor or other offense pursuant to any law enforcement or military authority.

"Conviction record" includes, but is not limited to, information indicating that a person has been convicted of a felony, misdemeanor or other offense, placed on probation, fined, imprisoned or paroled pursuant to any law enforcement or military authority.

"Background Check" means the process of checking an applicant's arrest and conviction record, through any means.

- b. **Requirements.** For the duration of this Contract, the Contractor shall:

1. Remove from all job application forms any questions, check boxes, or other inquiries regarding an applicant's arrest and conviction record, as defined herein.

2. Refrain from asking an applicant in any manner about their arrest or conviction record until after conditional offer of employment is made to the applicant in question.
3. Refrain from conducting a formal or informal background check or making any other inquiry using any privately or publicly available means of obtaining the arrest or conviction record of an applicant until after a conditional offer of employment is made to the applicant in question.
4. Make information about this ordinance available to applicants and existing employees, and post notices in prominent locations at the workplace with information about the ordinance and complaint procedure using language provided by the City.
5. Comply with all other provisions of Sec. 39.08, MGO.

c. Exemptions: This section shall not apply when:

1. Hiring for a position where certain convictions or violations are a bar to employment in that position under applicable law, or
2. Hiring a position for which information about criminal or arrest record, or a background check is required by law to be performed at a time or in a manner that would otherwise be prohibited by this ordinance, including a licensed trade or profession where the licensing authority explicitly authorizes or requires the inquiry in question.

To be exempt, Contractor has the burden of demonstrating that there is an applicable law or regulation that requires the hiring practice in question, if so, the contractor is exempt from all of the requirements of this ordinance for the position(s) in question.

**OVERTURE CENTER GARAGE ELEVATOR MODERNIZATION
CONTRACT NO. 7889**

IN WITNESS WHEREOF, the Contractor has hereunto set his/her hand and seal and the City has caused these presents to be sealed with its corporate seal and to be subscribed by its Mayor and City Clerk the day and year first above written.

Countersigned:

		Company Name	
_____	Date	_____	Date
Witness		President	
_____	Date	_____	Date
Witness		Secretary	

CITY OF MADISON, WISCONSIN

Provisions have been made to pay the liability that will accrue under this contract.

Approved as to form:

_____		_____	
Finance Director		City Attorney	
Signed this _____ day of _____, 20_____			
_____		_____	Date
Witness		Mayor	
_____		_____	Date
Witness		City Clerk	

SECTION I: PAYMENT AND PERFORMANCE BOND

KNOW ALL MEN BY THESE PRESENTS, that we _____
as _____ principal, _____ and

Company of _____ as surety, are held and firmly bound unto the City of Madison, Wisconsin, in the sum of _____ (\$_____) Dollars, lawful money of the United States, for the payment of which sum to the City of Madison, we hereby bind ourselves and our respective executors and administrators firmly by these presents.

The condition of this Bond is such that if the above bounden shall on his/her part fully and faithfully perform all of the terms of the Contract entered into between him/herself and the City of Madison for the construction of:

**OVERTURE CENTER GARAGE ELEVATOR MODERNIZATION
CONTRACT NO. 7889**

in Madison, Wisconsin, and shall pay all claims for labor performed and material furnished in the prosecution of said work, and save the City harmless from all claims for damages because of negligence in the prosecution of said work, and shall save harmless the said City from all claims for compensation (under Chapter 102, Wisconsin Statutes) of employees and employees of subcontractor, then this Bond is to be void, otherwise of full force, virtue and effect.

Signed and sealed this _____ day of _____

Countersigned:

Company Name (Principal)

Witness

President Seal

Secretary

Approved as to form:

Surety Seal

Salary Employee Commission

City Attorney

By _____
Attorney-in-Fact

This certifies that I have been duly licensed as an agent for the above company in Wisconsin under National Producer Number _____ for the year _____, and appointed as attorney-in-fact with authority to execute this payment and performance bond which power of attorney has not been revoked.

Date

Agent Signature