HINDS COUNTY COURTHOUSE
JACKSON, MS
ELEVATOR REPLACEMENT/MODERNIZATION

PROJECT MANUAL
and
SPECIFICATIONS

Prepared by:

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TABLE OF CONTENTS

NOTICE TO BIDDERS

HINDS COUNTY BOARD OF SUPERVISORS
HINDS COUNTY, MISSISSIPPI

Bids will be received by Hinds County Board of Supervisors for Elevator Replacement/Modernization at the Hinds County Courthouse, Jackson, MS by a Sealed Bidding Process on November 20, 2013 at 10:00 AM CST in accordance with the specifications and procedures available with the Hinds County Chancery Clerks Office of Eddie Jean Carr, Chancery Clerk, 316 South President Street, Jackson, MS 39201.

Specifications entitled: Elevator Replacement/Modernization
Hinds County Courthouse
Jackson, MS

BID GUARANTEE:
Proposals shall be submitted with Proposal Security in the form of Certified Check or acceptable Bid Bond in an amount equal to at least five percent (5%) of the base bid. The Bid Bond, if used, shall be payable to the Hinds County Board of Supervisors. Bonds on the project must be received on or before the period scheduled for the project and no bid may be withdrawn after the scheduled closing time for the project. Bids must be firm for a period of forty-five (45) days after the scheduled time of opening.

PERFORMANCE-PAYMENT BOND:
A 100% Performance-Payment Bond on Public Work issued by a surety company authorized to do business in the State of Mississippi will be required within ten (10) days after the successful bidder has been notified of the award of the contract to him.

CERTIFICATE OF RESPONSIBILITY:
All bids submitted shall contain on the outside or exterior of the Specification Response envelope, or container of such bid, the contractor's current certificate number. No bid shall be considered unless such contractor's current certificate number appears on the outside or exterior of said envelope or container, or unless there appears a statement on the outside or exterior of such Specification Response envelope, or container to the effect that the bid enclosed therewith did not exceed fifty thousand dollars ($50,000).

MINORITY PARTICIPATION:
IT IS THE INTENT OF HINDS COUNTY, MISSISSIPPI, in the interest of providing equal opportunity and participation to all segments of the community, to achieve a goal of minority participation in all activities and projects constructed or sponsored by Hinds County. **In furtherance of this; (20%) minority/minority business participation is required in connection with all services/commodities provided in connection with this activity/project. It is the intent of Hinds County that this participation be construed to mean that at least twenty percent (20%) of the services and or commodities provided in this project shall be provided by a minority business and that said minority business shall receive at least twenty percent of the compensation paid by Hinds County for the services/commodities rendered in connection with this activity/project.**

Pursuant to State law, "minority business" is defined as a business which is owned by a person who is a citizen or lawful permanent resident of the United States and who is:

(i) Black: having origins in any of the black racial groups of Africa.
(ii) Hispanic: of Mexican, Puerto Rican, Central or South American, or other Spanish or Portuguese culture or origin, regardless of race.
(iii) Asian American: having origins in any of the original peoples of the Far East, Southeast Asia, the Indian subcontinent, or the Pacific Islands.
(iv) American Indian or Alaskan Native: having origins in any of the original people of North America.

All persons/entities wishing to provide services/commodities to Hinds County shall submit a specific hand written statement describing their status and the manner in which they propose to comply with this provision with their RFP Response Package.

Failure to demonstrate compliance to the satisfaction of Hinds County shall result in a proposal being deemed non-responsive to the specifications required by Hinds County for the fulfillment of this activity/project.

Following the acceptance of a proposal for services/commodities, the successful candidate shall, within fifteen (15) days of such acceptance, substantiate compliance with these provisions by submitting a second written statement delineating the specific method(s) of compliance, including identities and areas of participation of minority participants.

The Hinds County Board of Supervisors shall have the authority and discretion to determine whether a proposal is responsive to this statement of intent.

BID CONFORMATION

Any Bid package which fails to conform to the essential requirements of the specifications shall be rejected. In discretionary cases, the Hinds County Board of Supervisors shall be the determining factor in whether specifications are met. Sealed bid must be for exact quantities and as per plans and specifications or they will automatically be rejected. Bid price must include all shipping and freight costs. Bids must meet or exceed all plans and specifications.

It is the intention of the County to award this bid to the overall lowest and best bidder meeting specifications.

Sales Taxes and federal excise tax are not to be included in the bid price.

The Hinds County Board of Supervisors reserves the right to reject any and all bids.

HINDS COUNTY BOARD OF SUPERVISORS
PROPOSAL FORM

Failure to submit your Sealed Bid Package on or before November 20, 2013, 10:00 AM CST on this form will cause the County to reject you as a bidder in this project.

INSTRUCTIONS:

1. Submit the original and one copy of your proposal.
2. Address envelope to: Eddie Jean Carr, Chancery Clerk
   316 South President Street
   P.O. Box 686
   Jackson, MS 39205
3. Note the following in the lower left hand corner of the envelope:
   Elevator Replacement/Modernization of Hinds County Courthouse, Jackson, MS

The above item will be completed within _120_ working days after receipt of purchase order.

CONTACT INFORMATION:

Scott C. Woods & Associates, P.A.
112 Lone Wolf Drive
Madison, MS 39110
Scott Woods
swoods@scweng.com
Phone: 601-859-9864
Fax: 601-859-2564

Hinds County
Michael Harrington – Director of Maintenance
1296 Springridge Road
Clinton, MS 39056
mharrington@co.hinds.ms.us
Phone: 601-922-9828
Fax: 601-922-4160
Cell: 601-331-7061

BID FORM

(Submit in Duplicate)

BIDDER: _____

ADDRESS: _____

_____

DATE: _____

HINDS COUNTY BOARD OF SUPERVISORS
EDDIE JEAN CARR, CHANCERY CLERK
316 SOUTH PRESIDENT STREET
P.O. BOX 686
JACKSON, MS 39205

PROJECT: HINDS COUNTY COURTHOUSE
ELEVATOR REPLACEMENT/MODERNIZATION
JACKSON, MS

Having carefully examined the Contract Documents and all addenda for the referenced Project, as well as the premises and conditions affecting the work, I, the undersigned, propose to furnish all labor, materials and services required by the Contract Documents in accordance with the conditions of said Contract Documents for the sums set forth below:

BASE BID: _____

_____($_____).

ADD ALT #1: The elevator contractor shall provide a 2 year service agreement.
Add amount: _____
(Figures)
Amount: _____ Cents _____
(Words)
TOTAL AMOUNT BASE BID PLUS ADDITIVE ALT #1: _____

ADD ALT #2: The elevator contractor shall provide a 5 year service agreement.
Add amount: _____
(Figures)
Amount: _____ Cents _____
(Words)
TOTAL AMOUNT BASE BID PLUS ADDITIVE ALT #2: _____

ADD ALT #3: The elevator contractor shall provide a 10 year service agreement.
Add amount: _____
(Figures)
Amount: _____ Cents _____
(Words)
TOTAL AMOUNT BASE BID PLUS ADDITIVE ALT #3: _____

I (We) agree to hold out bid open for acceptance for forty-five (45) calendar days from the date of bid opening.

If awarded the Contract, I (We) agree to execute a Contract and start Work on a date to be set in a Notice to Proceed and to complete the entire work within 120 working days after receipt of purchase order. Notice to Proceed will not be unduly withheld.

As required by "Instructions to Bidders", a Bid Security in the form of a:

_____ Bid Bond _____ Cashiers Check

is attached hereto in the amount of not less than five percent (5%) of the base bid amount and shall become the property of the Owner in the event the Agreement and required Bonds are not executed within the time set forth hereinbefore as liquidated damages for the delay and additional expense to the Owner cause thereby.

DAMAGES: If Contractor is delinquent in substantially completing work to the Owner's satisfaction by the above mentioned date, unless amended by Owner approved Change Order, the appropriate Articles of the Contract Conditions shall be evoked to protect the Owner's interest and may result in the Contractor compensating the Owner for damages incurred.

ADDENDUM RECEIPT: The receipt of the following Addenda to the Bidding Documents is hereby acknowledged:

Addendum No.: _____ Dated: _____

Addendum No.: _____ Dated: _____

Addendum No.: _____ Dated: _____

Addendum No.: _____ Dated: _____

Addendum No.: _____ Dated: _____

Addendum No.: _____ Dated: _____

Addendum No.: _____ Dated: _____

SECTION 01010

SUMMARY OF WORK

1.1 WORK COVERED BY CONTRACT DOCUMENTS

Work covered by this contract is the replacement of two traction elevators in the Hinds County Circuit Court Building. This contract shall include all elated electrical and fire alarm work. A number of historical items must be re-conditioned and remain in place. Those items are described in Section 01940.

A. Start of Work: Work shall be started immediately upon issuance of a Notice to Proceed. Before issuing the Notice to Proceed, the Board President shall execute appropriate contracts and beginning documents and contractor must supply proof of insurance.

B. Time of Completion: The completion of this work is to be on or before the time indicated in the bid form, but no later than 120 days after Notice to Proceed.

C. Contractor's Duties:

1. Except as specifically noted, provide and pay for: labor, materials, equipment, tools, construction equipment, machinery, water, heat, and utilities required for construction. Other facilities and services necessary for proper execution and completion of work.

2. Pay legally required sales, consumer, use, payroll, privilege and other taxes, where required.

3. Secure and pay for, as necessary for proper execution and completion of work, and as applicable at time of receipt of bids:

   Permits
   Licenses

4. Give required notices.

5. Comply with codes, ordinances, rules, regulations, orders and other legal requirements of public authorities which bear on performance of work.

6. Promptly submit written notice to Engineer of observed variance of contract documents from legal requirements. It is not the contractor's responsibility to make certain that specifications comply with codes and regulations. Appropriate modifications to contract documents will adjust necessary changes. Assume responsibility for work known to be contrary to such requirements, without notice.

7. Enforce strict discipline and good order among employees. Do not employ unfit persons or persons not skilled in assigned task.

D. Sub-Contractors List: The prime/general contractor will submit a list of all sub-contractors to be used on the project within seven (7) days after written notice of contract award. Any sub-contractor listed must be acceptable to the Owner.

E. Coordination: The prime contractor is responsible for the coordination of the total project. All other contractors and all sub-contractors will cooperate with the prime contractor so as to facilitate the general progress of the work. Each trade shall afford all other trades every reasonable opportunity for the installation of their work.

1.2 WORK SEQUENCE

A. Owner will occupy the building during construction, coordinate with Owner's representatives in scheduling work. Any required shutdowns of equipment shall be at the convenience of the Owner.

1.3 CONTRACTOR USE OF PREMISES

A. Confine operations at site to areas permitted by:

1. Laws
2. Ordinances
3. Permits
4. Contract Documents
5. Owner

B. Do not unreasonably encumber site with materials or equipment.

C. Assume full responsibility for protection and safekeeping of products stored on premises.

D. Move any stored products which interfere with operations of Owner or other contractors.

E. Obtain and pay for use of additional storage of work areas needed for operations.

END OF SECTION

SECTION 01045

CUTTING AND PATCHING

PART 1 – GENERAL

1.1 DESCRIPTION

A. Scope: To set forth broad general conditions covering cutting and patching that apply to everyone and everything on the job.

B. In addition to contract requirements, upon Engineer's written instructions:

1. Uncover work for observation of covered work.

2. Remove samples of installed materials for testing.

3. Remove work to provide alteration of existing work.

C. Do not cut or alter work of another contractor without his consent.

D. Payment for Costs: Costs caused by ill-timed or defective work or work not conforming to contract documents will be borne by party responsible for ill-timed, rejected or non-conforming work.

PART 2 – PRODUCTS

Not applicable.

PART 3 – EXECUTION

3.1 GENERAL

A. Inspection: Inspect existing conditions of work, including elements subject to movement or damage during cutting and patching.

B. Performance:

1. Restore work which has been cut or removed; install new products to provide completed work in accordance with requirements of contract documents.

END OF SECTION

SECTION 01200

PROJECT MEETINGS

1.1 DESCRIPTION

A. Contractor's Responsibilities: The Contractor will schedule and administer the pre-construction meeting and all progress meetings. The responsibility will include the following:

1. Prepare agenda.

2. Distribute written notice of meetings, seven (7) days in advance.

3. Make physical arrangements for and preside at meetings.

4. Record minutes.

5. Distribute copies of minutes to participants within four (4) days.

B. Pre-Construction Meeting: Schedule a pre-construction meeting within fifteen (15) days after date of notice to proceed.

1. Attendance:

   a. Owner's Representative
   b. Engineer
   c. Contractor
   d. Electrical subcontractor

2. Minimum Agenda:

   a. Distribute and discuss list of major subcontractors and construction schedule.
   b. Critical work sequencing
   c. Designation of responsible personnel
   d. Procedures for maintaining record documents
   e. Use of premises, including office and storage area.
   f. Owner's requirements
   g. Security procedures
   h. Housekeeping procedures

C. Progress Meetings:

1. Schedule regular meetings once a month .

2. Hold called meetings as progress of work dictates.

3. Attendance:

   a. Owner's Representative
   b. Engineer
   c. Contractor
   d. Subcontractors as pertinent to the agenda

4. Minimum Agenda:

   a. Review, approve minutes of the previous meeting
   b. Review work progress since last meeting
   c. Note field observations, problems and decisions
   d. Identify problems which impede planned progress
   e. Revise construction schedule as indicated
   f. Plan progress during the next work period
   g. Review proposed changes
   h. Complete other current business.

END OF SECTION

SECTION 01310

CONSTRUCTION SCHEDULES

1.1 DESCRIPTION

A. Scope: Provide projected construction schedules for entire work and revise periodically. The following is a minimum requirement and other type schedules are acceptable with owner's approval.

B. Form of Schedules: Prepare in form of horizontal bar chart.

1. Provide separate horizontal bar column for each trade or operation.

2. Order: Table of Contents of Specifications.

3. Identify each column by major specification section number.

4. Horizontal Time Scale: Identify first work day of each week.

5. Scale and Spacing: To allow space for updating.

C. Content of Schedules:

1. Provide complete sequence of construction by activity.

2. Indicate dates for beginning and completion of each stage of construction.

3. Identify work of separate floors, separate phases, or other logically grouped activities.

4. Show projected percentage of completion for each item of work as of first day of each month.

D. Updating:

1. Show all changes occurring since previous submission of updated schedule.

2. Indicate progress of each activity and completion dates.

E. Submittals:

1. Submit initial schedules to the Engineer within fifteen (15) days after date of notice to proceed.

2. Submit to Engineer, periodically updated schedules accurately depicting progress to first day of each month.

3. Submit two (2) copies, one to be retained by the Engineer and the other forwarded to the owner.

END OF SECTION

SECTION 01370

SCHEDULE OF VALUES

1.1 DESCRIPTION

A. Scope: Submit a Schedule of Values to the Engineer at least ten days prior to submitting first Application for Payment. Upon Engineer's request, support the values given with data substantiating their correctness. List quantities of materials. Payment for materials stored on site will be limited to those listed in Schedule of Unit Material Values. Use Schedule of Values only as basis for contractor's Application for Payment.

B. Form of Submittal: Submit typewritten Schedule of Values on AIA Document G702A, using table of contents of this specification as basis for format for listing costs of work for sections under. Identify each line item with number and title as listed in table of contents of this specification.

C. Preparing Schedule of Values:

1. Itemize separate line item cost for each of the following general cost items: Performance and Payment Bonds, field supervision and layout, and temporary facilities and controls.

2. Itemize separate line item cost or work required by each section of this specification. Break down installed cost with overhead and profit.

3. For each line item which has installed value of more than $25,000, break down costs to list major products for operations under each item; rounding figures to nearest dollar. Make sum of total costs of all items listed in schedule equal to total contract sum.

D. Preparing Schedule of Unit Material Values:

1. Submit separate schedule of unit prices for material to be stored on which progress payments will be made. Make form of submittal parallel to Schedule of Values with each line item identified same as line item in Schedule of Values. Include in unit prices only: cost of material, delivery and unloading at site, and sales tax.

2. Make sure unit prices multiplied by quantities equal material cost of that item in schedule of values.

E. Review and Resubmittal: After Engineer's review, if requested, revise and resubmit schedule in same manner.

END OF SECTION

SECTION 01940

RESTORATION & RENOVATION REQUIREMENTS

PART 1 – GENERAL

1.1 GENERAL

A. This section specifies the particular procedures to be employed in the renovation of original building features, materials, surfaces and artifacts during the course of the work.

1.2 ENGINEER CONSULTATION

A. Notify Engineer immediately upon discovery of previously unknown conditions which are unsafe or might lead to defects in the finished work and of locations proposed for demonstration areas. Obtain approval before proceeding with the work.

1.3 ALTERNATE METHODS

A. Alternate techniques for specified renovation procedures may be submitted for review and approval by the Engineer. Provide detailed description of technique, including chemical composition of chemicals (if any) and list of projects at which procedure has been used successfully.

1.4 REQUIREMENTS TO MATCH EXISTING

A. Selection of materials for restoration, reconstruction and repair shall exactly match designated material or feature in type, form, construction, density, grain, surface texture, etc. When extant feature is to be reproduced remove intact sample of the existing feature or material and furnish to manufacturer as a template for fabrication, where possible.

1.5 ORIGINAL MATERIALS

A. Limit cutting and patching in original materials to the absolute minimum necessary to accomplish the work.

1.6 DEFINITIONS

A. WELL MAINTAINED CONDITION: Items indicated to be returned to a well maintained condition shall be repaired to a fully-functioning condition, with replacement of any damaged or deteriorated materials or components that interfere with the function of the item being restored – or elements that show visual signs of a lack of maintenance. Items are to appear as though they have been well maintained over their life, showing minor imperfections, scars and other signs of wear that do not interfere with the function of the item.

1.7 STANDARDS AND REGULATIONS

A. Comply with the standards of the U.S. Department of the Interior "Secretary of the Interior's Standards for Rehabilitation".

1.8 SUBMITTALS

A. Submit manufacturer's specifications, samples and other data as requested by the Engineer for each product, including certification that each product complies with specified requirements.

PART 2 – SCHEDULE OF TECHNIQUES

2.1 WOOD CLEANING

A. Scrape to remove loose paint, using tools ground to match fillets and grooves if required. Do not use open flames to soften paints. Acceptable paint softening methods are as follows:

1. Electric heat gun

2. Electric resistance radiant heater

3. Water-reducible paint stripping compound (protect surface below).

2.2 WOOD PATCHING

A. Caulk minor cracks and crevices. Fill defects up to 2" minimum width and depth with cellulose fiber wood filler, installed per manufacturer's recommendations. For larger defects, install matching wood patches cut to fit and glued in place using filled epoxy adhesives. Nail patch into place with counter-sunk galvanized finishing nails.

2.3 WOOD RECONSTRUCTION

A. Inspect wood artifacts to be reconstructed. Select materials to match profile, thickness, size, shape, surface texture and other characteristics of original materials. Reuse original materials in reconstruction to the extent possible. Reproduce connection systems accurately. Install reconstruction materials using same techniques as originals, except that concealed joints and fasteners may be installed where applicable.

B. Wood Reconstruction System:

1. Provide Abatron ALiquidWood@ or A Wood Epox@ system to restore deteriorated/damaged wood elements or approved equal.

2. Install per manufacturer's recommendations.

3. Provide accessory products as needed and as recommended by manufacturer.

2.4 GLASS REPAIRS

A. Protect existing historic glass for the duration of the project.

B. Clean glass and frame to remove any exposed putty surface. Add glazier's points to secure glass where required and paintable glazing compound to replace missing material.

2.5 DOOR REPAIRS

A. Inspect all doors, transoms, frames and moulding for water damage, structural damage or other damage. Return doors to well maintained condition. Clean and replace broken or irreparable parts as needed. Match existing parts, exactly on the elevator exterior doors on the first floor.

2.6 HARDWARE RENOVATION

A. Inspect original doors and hardware for type and condition. Remove hardware, clean, repair using parts from other defective sets and lubricate. Buff and clean hardware to approximate original finish to provide a well-maintained appearance. Provide dead-bolt lock if existing lock set does not lock properly. Match finish of existing hardware. Engineer will make final determination on hardware to be reused.

2.7 BEADED TONGUE AND GROOVE BOARD REPAIR

A. Repair beaded tongue and groove ceilings to match existing adjacent areas. Remove nails, fasteners, and other surface mounted elements from the face of all surfaces to be exposed to view. Fill and sand former nail holes and other imperfections. All new boards are to be fingered in a minimum of 8 inches. Paint as indicated.

2.8 SALVAGED ITEMS

A. Deliver salvaged items to the owner as directed. Salvaged items shall include brick masonry, hardware, light fixtures, and other removed original elements.

END OF SECTION

SECTION 14210

PASSENGER ELEVATORS

PART 1 - GENERAL

1.1 This specification covers the modernization of 2 traction elevators at Hinds County Courthouse; Jackson, MS. All work will be performed in a workmanlike manner and will include all work and material as specified herein. In all cases where a device or part of the equipment is herein referred to in the singular number, it is intended that such reference will apply to as many such devices as are required to complete the installation.

1.2 All work will be performed in accordance with the latest revised edition of the American National Standard Safety Code for Elevators, Dumbwaiters, Escalators, and Moving Walks (ANSI A17.1), ANSI A117.1 Barrier Free Code as pertaining to Passenger Elevators, the Americans with Disabilities Act (ADA), the National Electrical Code, and/or such State and Local elevator codes as may be applicable.

1.3 **PERMITS, TAXES AND LICENSES**: All applicable sales and use taxes, permit fees and licenses, as of the date bids are taken, will be paid for by the elevator contractor.

1.4 **STORAGE**: A dry and protected area, within the building, conveniently located to the elevator hoistways, will be assigned to ThyssenKrupp Elevator Corporation without cost, for storage of his material and tools.

1.5 **WARRANTY**: The elevator contractor will warranty equipment manufactured at their facility against defects in materials and workmanship and will correct any defects not due to ordinary wear or tear or improper use or care which may develop for a period of twelve (12) months for traction equipment from the Manufacturing ship date.

1.6 **WIRING DIAGRAMS**: Two (2) complete sets of "made final" wiring diagrams including input and output signals will be furnished to the Owner.

1.7 **KEYS**: Two (2) keys for each key switch specified will be furnished to the Owner.

PART 2 – TRACTION/HYDRAULIC DESCRIPTION OF EQUIPMENT:

TRACTION ELEVATORS -

TRACTION PASSENGER CARS # - 1-2

QUANTITY:	2
SPEED:	200FPM
CAPACITY:	2500LBS
STOPS:	4
OPENINGS:	4
TRAVEL:	RETAIN
CAR SIZE: PLATFORM:	REUSE EXISTING

CLEAR INSIDE:	REUSE EXISTING
POWER SUPPLY:	230V, 3Ph., 60Hz.
CONTROL:	NEW MICROPROCESSOR
OPERATION:	GROUP
WIRING:	NEW
MACHINE:	NEW
HOISTWAY ENTRANCES:	RETAIN
DOOR OPERATION:	NEW CLOSED LOOP
DOORS:	REUSE
CAR ENCLOSURE:	REUSE EXISTING/NEW CAR FRONTS AND CAR DOORS/#4 MUNTZ
SIGNAL FIXTURES:	NEW CAR AND HALL/COMBINATION HALL LANTERN & POSITION INDICATOR. AT FIRST FLOOR/NEW CAR RIDING LANTERNS/SURFACE MOUNTED HALL STATIONS.
CAB INTERIOR:	REFINISH WOOD TO ORIGINAL CONDITION

PART 3 - MODERNIZATION EQUIPMENT FEATURES:

3.1 **MACHINE/MOTORS** : The existing geared traction machines will be replaced.

The existing DC motor generator sets will be removed.

The existing DC hoist motor will be replaced with a NEW AC hoist motor for use with NEW VVVF drive system.

Motor: Totally enclosed, non-ventilated AC motor with Class F insulation. Motor armature shall be dynamically balanced and supported by ball bearings of ample capacity.

NEW motor mounts and coupling for machine will be provided.

Drive: Variable Voltage Variable Frequency (VVVF) type.

1. Motor: Totally enclosed, non-ventilated AC motor with class F insulation. Motor armature will be dynamically balanced and supported by ball bearings of ample capacity.

2. Control: Vector controlled pulse-width modulated AC drive. The variable voltage variable frequency drive will convert the AC power supply using a two step process to a variable voltage variable frequency power supply for use by the hoist motor. Speed control will be by means of vector control providing independent excitation and torque current. A digital velocity encoder will be mounted on the motor to give feedback to the controller on motor speed and position.

Rope Gripper (NEW): An emergency rope brake shall be furnished and installed by code to stop unintended motion of the elevator.

Rope Gripper (NEW): An emergency rope brake shall be furnished and installed by code to stop unintended motion of the elevator.

3.2 **HOIST CABLES**: The existing hoist cables will be replaced.

3.3 **SAFETY AND GOVERNOR**: The car safety will be reused in place and activated by a NEW centrifugal speed governor located over the hoistway. The governor will be designed to cut off power to the motor and apply the brake whenever the governor indicates the car has excessive speed. A NEW governor rope and encoder will be installed as part of the NEW car governor.

3.4 **ELEVATOR CONTROL SYSTEM**: Install NEW Microprocessor Control System. The elevator continuously analyzing the car (s) changing position, condition, and work load. All controller and operational circuits including the brake control and drive system shall be all digital. Control of the elevator shall be automatic in operation by means of push buttons in the car numbered to correspond to floors served, for registering car stops, and by "up-down" push buttons at each intermediate landing and "call" push buttons at terminal landings.

1. Momentary pressing of one or more buttons shall dispatch the car to the designated landings in the order in which the landings are reached by the car, irrespective of the sequence in which the buttons are pressed. Each landing call shall be canceled when answered.

2. When the car is traveling in the up direction, it shall stop at all floors for which car buttons or "up" hall pressed, unless the stop for that floor has been registered by a car button or unless the down call is at the highest floor for which any buttons have been pressed. Pressing the "up" button when the car is traveling in the down direction shall not intercept the travel unless the stop for that floor has been registered by a car button or unless the up call is the lowest for which any button has been pressed.

3. When the car has responded to its highest or lowest stop, and stops are registered for the opposite direction, its direction of travel shall reverse automatically and it shall then answer the calls registered for that direction. If both up and down calls are registered at an intermediate floor, only the call corresponding to the direction of car travel shall be canceled upon the stopping of the car at the landing.

4. A car that is stopping for the last hall call in the preference direction, and that hall call is for the opposite direction with no onward car calls, shall reverse preference when the selector position advances to the landing at which the car is committed to stop. A car that is stopping for the last hall call in the preference direction, and that hall call is for the same direction, shall hold its preference until the door is almost closed allowing time for a passenger to register an onward car call which will maintain the preference. If no car call is registered before the door is almost closed, the car will lose its preference and shall be available to accept calls in either direction.

A. Group Operation: The group supervisory operation shall be embedded within selected car controllers. No separate group controller shall be supplied. The microprocessor shall constantly scan the system for hall calls. When hall calls are registered, the control system shall instantly calculate the estimated time of arrival, number of floors to travel from the current position, the time it takes to travel one floor at top speed, calls assigned to a car, and car reversal time to respond to a call in the opposite direction of travel. An internal constant shall be set, requiring a maximum time for a car to respond to a call. When a car's status changes or additional hall calls are registered, the estimated time of arrival shall be recalculated and calls reassigned if necessary.

1. Traffic Pattern: The microprocessor shall provide flexibility to meet well defined patterns of traffic, including up peak, down peak, and heavy interfloor demands, and adjust for indeterminate variations in these patterns which occur in buildings.

2. Fuzzy logic: fuzzy logic shall be an integral part of the group control system software. The enhanced fuzzy logic will optimize the interfloor traffic performance. Inputs for the fuzzy logic shall include accurate passenger load from an electronic loadweigher, probable car calls generated from each hall call, type of building and observed traffic patterns.

B. SIMPLEX OPERATION: Not Applicable.

C. Load Weighing Device: Provide a load weighing device at each car which, when the particular car is filled to an adjustable percentage of the capacity load, shall cause the car to bypass landing calls but not car calls. The passed landing calls shall remain registered for the next following car. The device shall be unaffected by the action of compensating chain or rope. The device shall detect a 15 pound (7kg.) load change under all conditions.

1. The load sensor shall use a linear variable differential transformer to accurately measure the weight in the car. The information shall be transferred via a serial link to the elevator controller.

D. Anti-Nuisance Call Control: The microprocessor control system shall evaluate the number of people on the car and compare that value to the number of car calls registered. If the number of car calls exceeds the number of people by a field programmable value, the car calls shall be canceled after the first call has been answered.

E. Position Selector: The position selector shall be part of the microprocessor system. The car position in the hoistway shall be digitized through a primary position encoder. The microprocessor control system shall store the floor position and slow down points in memory.

F. Motion Control: The drive control system shall be dual-loop feedback system based primarily on car position. The velocity profile shall be calculated by the microprocessor control system producing extremely smooth and accurate stops. The velocity encoder shall permit continuous comparison of machine speed to velocity profile and to actual car speed. This accurate position/velocity feedback shall permit a fast and accurate control of acceleration and retardation.

G. Motor Pre-Torque: Current shall be applied to the elevator drive before the brake is released and the speed pattern is dictated to eliminate roll back and sling shot effects of unbalanced loads in the car. The electronic loadweigher shall determine the load on the car determining a pre-torque reference to send to the drive.

3.5 FIREMAN SERVICE AND OTHER STANDARD FEATURES: The Fireman Service Operation and normal operating features are to be incorporated in accordance with the American National Standard Safety Code (ANSI A17.1).

3.6 CAB ENCLOSURE:

1. Cab Shell Walls: Retain existing and refinish.

2. Canopy: Retain existing. Supply code compliant lighting system.

3. Ceiling: Retain existing.

4. Cab Columns, Front, and Transom: Replace/#4 Muntz Metal finish.

5. Doors: Replace/#4 Muntz Metal finish.

6. Door Finish: Replace/#4 Muntz Metal finish

7. Cab Sills: Retain existing.

8. Handrail: Install new #4 Muntz Metal finish 1-1/2 cylindrical.

9. Ventilation: Provide new.

10. Protection Pads and Buttons: Not Applicable

11. Base: Retain existing

12. Finished Floor: By others

13. Cab Interior: Retain existing rear and side walls. Retain existing ceiling.

3.7 **CAR PLATFORM**: Retain existing.

3.8 **CAR ROLLER GUIDES**: Replace.

3.9 **COUNTER WEIGHT ROLLER GUIDES**: Replace.

3.10 **DOOR OPERATION**: Provide a NEW GAL direct current motor driven by existing heavy duty operator designed to operate the car and hoistway doors simultaneously. The door control system shall be Closed Loop, all electronic and digital operation. The closed loop circuit shall give constant feedback on the position and velocity of the elevator door. The motor torque shall be constantly adjusted to maintain the correct door speed based on its position and load. All adjustments and setup shall be through the computer based service tool. Door movements shall be electrically cushioned at both limits of travel and the door operating mechanism shall be arranged for manual operation in event of power failure. Doors shall automatically open when the car arrives at the landing and automatically close after an adjustable time interval or when the car is dispatched to another landing.

1. No Unnecessary Door Operation: Car door shall open only if the car is stopping for a car or hall call, answering a car or hall call at the present or selected as the next car up.

2. Door Open Time Saver: If a car is stopping in response to a car call assignment only (no coincident hall call), the current door hold open time is changed to a shorter field programmable time when the electronic door protection device is activated.

3. Double Door Operation: When a car stops at a landing with concurrent up and down hall calls, no car calls, and no other hall call assignments, the car door opens to answer the hall call in the direction of the car's current travel. If an onward car call is not registered before the door closes to within 6 inches of fully closed, the travel will reverse and the door will reopen to answer the other call.

4. Nudging Operation: The doors shall remain open as long as the electronic detector senses the presence of a passenger or object in the door opening. If door movement is obstructed for a field programmable time, a buzzer will sound and the doors will close at reduced speed. If the infrared door protection system detects a person or object while closing, the doors will stop and resume closing after the obstruction has been removed.

5. Limited Door Reversal: If the doors are closing and an infrared beam is interrupted, the doors will reverse and reopen partially. After the obstruction is cleared, the doors will begin to close.

6. Door Open Watchdog: If the doors are opening, but do not fully open after a field adjustable time, the doors will recycle closed then open six times to try and correct the fault.

7. Door Close Watchdog: If the doors are closing, but do not fully close after a field adjustable time, the doors will recycle open then close six times to try and correct the fault.

8. Door Close Assist: When the doors have failed to fully close and are in the recycle mode, the door drive motor shall have increased torque applied to possibly overcome mechanical resistance or differential air pressure and allow the door to close.

9. Variable door time: The doors will remain open for an adjustable time for a stop in response to a car call and a second variable time for a stop in response to a hall call.

3.11 **CAR DOORS**: Replace

3.12 **CAR DOOR EQUIIPMENT**: Refurbish car header. Replace tracks, hangers, rollers, gate switch and clutch.

3.13 **DOOR PROTECTION DEVICE**: A door protection device using microprocessor controlled light beams/curtain will be retained. The beams/curtain shall project across the car opening detecting the presence of a passenger or object. If door movement is obstructed the doors shall immediately reopen.

3.14 **HOISTWAY ENTRA**NCES: Retain

3.15 **HOISTWAY ENTRANCE JAMB BRAILLE**: Retain

3.16 **HOISTWAY DOOR EQUIPMENT**: Retain hatch tracks, hangers, pickup rollers, interlocks, closers, and adjust as necessary for smooth operation.

3.17 **HOISTWAY DOORS**: The existing hoistway door panels on the first floor will be retained. Replace all others.

3.18 **DOOR RESTRICTORS**: Door restricting devices will be retained in accordance with ANSI A17.1 Code - Rule 111.12.

3.19 **EMERGENCY EXIT CAR TOP**: We will retain code compliant escape hatch electrical switch, that will be part of the elevator safety string. If the elevator cab escape hatch is opened, the switch will be activated and the car will make an emergency stop.

3.20 **MAIN CAR OPERATING PANELS**: The existing main car operating panel will be replaced with a NEW panel accommodating all features provided by the NEW Elevator Controls. The NEW car operating panel will be provided with traditional style push buttons, ADA compliant telephone, fire service signage, emergency lighting and Braille.

3.21 **CAR POSITION INDICATOR**: An electronic digital position indicator shall be provided. As the car travels its' position in the hoistway shall be indicated by the illumination of the Alpha/Numeric character corresponding to the landing which the elevator is stopped or passing. A stainless steel cover will be installed on the existing car position indicator over the car door entrance, if required.

3.22 **FLOOR PASSING SIGN**AL: An ADA compliant audible signal will be provided to indicate to a passenger on the elevator car that the car is stopping or passing a floor.

3.23 **ALARM BELL**: An emergency alarm bell will be connected to a plainly marked pushbutton in the car operating panel and to the battery operated emergency car light device.

3.24 **LANDING BUTTONS**: NEW Egress Hall Station shall be replaced with a NEW station of a similar design incorporating the Code required key switches, fire instructional signage and jewels. All other hall stations will be retained. Fixtures may be surfaced mounted

3.25 **HOISTWAY ACCESS**: Hoistway access keyed switches shall be installed at the top and bottom landings as required by ANSI A17.1.

3.26 **CAR RIDING LANTERN**: The existing car riding lantern will be replaced with a NEW code compliant lantern of similar design.

3.27 **COMBINATION HALL POSITION INDICATOR AND LANTERN**: New at first floor

3.28 **HALL LANTERNS**: None required.

3.29 **WIRING**: All hoistway, machine room and car wiring, including traveling cable will be replaced as necessary to fulfill the requirements of the NEW Controls. NEW duct and flexible connections for the proper installation of the NEW control equipment will be provided as necessary.

3.30 **AUTOMATIC TERMINAL LIMITS**: NEW electric limit switches will be placed in the hatchway near the terminal landings and be designed to cut off the electric current and stop the car should it run beyond either terminal landing.

3.31 **BUFFERS**: Existing car and counterweight buffers will be reused.

3.32 **CAR TOP INSPECTION STATION**: A NEW car top inspection station with an "emergency stop"

switch and constant pressure "up-down" direction buttons will be installed. This station will make the normal operating devices inoperative and give the inspector complete control of the elevator.

3.33 **TOE GUARDS**: NEW code compliant toe guards will be installed.

3.34 **BALANCE**: Static Balance elevator cars.

3.35 **COUNTERWEIGHT**: Add filler weights to counter weight system as necessary.

3.36 **CAR TOP RAILING**: NEW as per code.

3.37 **PIT LADDER**: Retain, Modify as per code.

3.38 **PIT STOP SWITCH**: NEW, add as necessary per code.

3.39 **SCREENING**: NEW screening between elevators in the hoistway will be installed for safety.

3.40 **SECURITY MONITORING SYSTEM**: Provide new at security desk located on first floor.

PART 4 - MISCELLANEOUS WORK AND SCHEDULE:

4.1 All work will be performed during regular working hours of regular working days as is customary in the elevator industry.

4.2 The elevator will be out of service in the performance of the work as specified.

4.3 Prior to commencing work, a work schedule will be submitted to the Owner.

4.4 The owner agrees to provide parking for modernization work crews free of charge during working hours.

4.5 The following common items may be required by the State Elevator Inspector which ***are included*** in this specification and are the contractor's responsibility to provide and pay for (unless otherwise stated):

- *Smoke Detector with an independent signal and other fire service related devices (2.27.3.2)*
- *Primary, Secondary, Fire Hat contacts for fire service operation in the machine room*
- *Class ABC fire extinguisher (8.6.1.6.5)*
- *3 Phase Disconnect per code (NEC 620-51)*
- *110 Volt Disconnect Per Code (NEC 620-53)*
- *Earth Ground as per Code*
- *Duplex Outlet in Machine room and pit with GFCI (2.7.5.1)*
- *Code compliant lighting in machine room (200lx (19fc) and pit (100lx 10 fc) with guards (2.7.9.1) (2.2.5) (NEC 620-24)*
- *HVAC or natural means to maintain elevator equipment 50-90 degrees Fahrenheit at all times (2.7.9.2)*
- *Each elevator to have designated telephone line that is connected to 24 hr maintained location (2.27.1)*
- *Machine room Doors per code (fire rating label) with self close and self lock (2.7.3.4)*

- *Machine Room Conditions-Water pipes, ALL non-elevator related equipment must be removed (2.7.2.1)(2.8.2.4)*
- *All holes in hoistway and equipment room must be patched (2.1.1.1)(2.7.1)*
- *Cutting and patching*
- *Hoistway projections over 4" must be beveled to 75 degrees (2.1.6.2)*
- *Non code compliant elevator doors - Typically post '84 doors do not have asbestos*
- *Removal of water in pit, and re-sealing (2.1.2.2)*

Other items may be required by the State Inspector. We suggest that the owner request a pre modernization survey to ensure that they are aware of all items that may be required by the State before the elevator can be returned to public operation.

PART 5 - TESTS:

5.1 **EMERGENCY FIRE SERVICE**: Perform Phase I and Phase II Fire Service tests to conform to applicable codes.

5.2 **TEST REPORTS**: Completed copies of test reports will be provided to the Owner.

5.3 All required tests are to be performed during the regular working hours of the elevator trade. Should the Owner require these test to be performed outside the regular working hours, there would be an add to the quoted contract amount.

PART 6 - CLEAN UP AND INSPECTION:

6.1 **CLEAN UP**: Contractor shall remove all debris resulting from work on this contract. In addition contractor will remove from project site all equipment and unused or removed materials and restore building and premises to neat, clean appearance.

6.2 **INSPECTION**: All materials and workmanship will be subject to inspection or testing. The Owner will have the right to reject defective or inferior material or workmanship and require correction of such without addition cost to the Owner.

PART 7 – ADDITIONAL WORK INCLUDED

It is agreed that in the event asbestos material is knowingly or unknowingly removed or disturbed in any manner at the jobsite, you will monitor our work place and prior to and during our manning of the job, you will certify that asbestos in the environment does not exceed .01 fibers per cc as tested by NIOSH 7400. In the event our employees or those of our subcontractors are exposed to an asbestos hazard, PCP's or other hazardous substances, you agree to indemnify, defend, and hold us harmless from all damages, claims, suits, expenses, and payments resulting from such exposure. Removal and disposal of asbestos containing material is the responsibility of the owner.

All sill supports, including steel angles where required, and sill recesses (if sill angles not supplies by Elevator Contractor) and the grouting of doorsills. Provide O.S.H.S compliant removable temporary enclosures or other protection (barricades and kickboards) from open hoistways during the time the elevator is being installed

(protection must allow clearance for installation of entrance frames). Cutting and patching of walls, floors, etc. and removal of such obstructions as may be necessary for proper installation of the elevator. Setting anchors and sleeves. Pockets or blockouts for signal fixtures. Structural steel
door frames with extensions to beam above if required on hoistway sides and sills for freight elevators, including finish painting of these items.

Suitable connections from the power main to each controller and signal equipment feeders as required, including necessary circuit breakers and fused mainline disconnect switches per N.E.C. Suitable power supply capable of operating the new elevator equipment under all conditions. Wiring to controller for car lighting. (Per N.E.C. Articles 620-22 and 620-51). Electric power without charge, for construction, testing and adjusting of the same characteristics as the permanent supply. A means to automatically disconnect the main line and the emergency power supply to the elevator prior to the application of water in the elevator machine room will be furnished by the electrical contractor. This means shall not be self-resetting. Wiring and conduit from life safety panel or any other monitor station to elevator machine room or suitable connection point in hoistway.

Heat and smoke sensing devices at elevator lobbies on each floor, machine room, and hoistways (where applicable), with normally open dry contacts terminating at a properly marked terminal in the elevator controller. Telephone connection to elevator controller (must be a dedicated line and monitored 24 hours. Instrument in cab by others). One additional telephone line per group of elevators for diagnostic capability wired to designated controller.

Emergency power supply with a dry set of contacts which close 20 seconds prior to the transfer from normal power to emergency power or from emergency power to normal power whether in test mode or normal operating conditions. Automatic time delay transfer switch and auxiliary contacts with wiring to the designated elevator controller. Electrical cross connections between elevator machine rooms for emergency power purposes are to be provided by others. Any governmentally required safety provisions not directly involved for elevator installation. All painting, except as otherwise specified. Temporary elevator service prior to completion and acceptance of complete installation. Furnishing, installing and maintaining the required fire rating of elevator hoistway walls, including the penetration of firewall by elevator fixture boxes, is not the responsibility of the elevator contractor. Flooring and/or installation of flooring by others.

Owner/General Contractor to provide a bonded ground wire, properly sized, from the elevator controller(s) to the primary building ground. Remote wiring to outside alarm bell as requested by the Safety Code for Elevators and Escalators (ASME 17.1) (where applicable). Cost for additional inspections of the elevator equipment by code authorities after the initial one fails due to items that are the responsibility of the contractor, or for assisting others inspecting equipment installed by others.

The owner agrees to provide a dry and secure area adjacent to the hoistway(s) at ground level for storage of the elevator equipment at the time of delivery. Adequate ingress and egress to this area will also be provided. Any relocation of the equipment as directed by the contractor after its initial delivery will be at contractor's expense.

Elevator contractor will be responsible for housekeeping.

All Existing equipment removed by company shall become the exclusive property of company.

PART 8 - SPECIAL CONDITIONS:

1. Unless otherwise agreed, it is understood that the work will be performed during regular working hours of the

trades involved. If overtime is mutually agreed upon, an additional charge at our usual rates for such work shall be added to the contract price.

2. The elevator contractor shall not be responsible in any way for the acts of others or for pro-rata expenses of any nature incurred by others in or about the building.

3. Certificates of Workmen's Compensation, Bodily Injury and Property Damage liability Insurance coverage will be furnished you upon request. The premium for any bonds or insurance beyond our standard coverage and limits will be an addition to the contract price.

PART 9 - TERMS AND CONDITIONS

All work shall be performed in accordance with the latest revised edition (as of the date of this proposal) of the United States of America Standard Safety Code for Elevators, Escalators, and Dumbwaiters, the National Electrical Code, and/or such State and Local Codes as may be applicable, as well as Company's Work-Not-Included form. Subsequent to the date of this proposal, should changes be made in any code, or should rulings by any code enforcing authorities extend the application of the code, the work and materials necessary to make the installation comply with such changes shall be performed as an addition to the contract price.

PERMITS, TAXES AND LICENSES: All applicable sales and use taxes, permit fees and licenses imposed shall be the responsibility of the elevator contractor. The owner agrees to pay, as an addition to the contract price, the amount of any additional taxes, fees or other charges exacted from the Purchaser or the Company on account thereof, by any law enacted after the date of this proposal.

TEMPORARY SERVICE: Should the service of any elevator be required before completion and final acceptance, the Purchaser agrees to sign our Construction Use form, Warranty Extension and Service Agreement (at an agreed to daily charge) and be bound by the terms and conditions thereof. A copy of this form will be furnished upon request.

WARRANTY: Elevator Contractor will warrant the equipment installed for a period of not less than one year from the date each elevator is completed and placed in operation.

PART 10 – ELEVATOR ADDITIONAL ELECTRICAL REQUIREMENTS

10.1 See Section 16050 for required electrical work.

PART 11 – EXTENDED SERVICE AGREEMENT

11.1 The elevator contractor shall include a one year service agreement with the base bid.

11.2 Additive Alternate #1: The elevator contractor shall provide a 2 year service agreement.

11.3 Additive Alternate #2: The elevator contractor shall provide a 5 year service agreement.

11.4 Additive Alternate #3: The elevator contractor shall provide a 10 year service agreement.

END OF SECTION

SECTION 16010

ELECTRICAL GENERAL

PART 1 – GENERAL

1.1 GENERAL

A. All work shall conform to the latest editions of the National Electrical Code (NEC) [National Fire Protection Agency (NFPA) 70], the Life-Safety Code (NFPA 101), the Standard Building Code, the Americans with Disabilities Act, and all other applicable federal, state, and local codes and regulations.

B. The contract documents are schematic in nature and are intended to convey the intent of the electrical work to be performed on this project. Provide all material, labor, equipment, etc., necessary to provide complete and operable electrical systems.

C. The General Conditions, Supplementary Conditions, General Requirements, Information to Bidders, and all other parts of this set of Contract Documents are hereby adopted and are applicable to the Division 16000 Contractor.

1.2 SCOPE OF WORK

A. Visit site prior to bid. Devise a plan for installation of complete and operable electrical systems meeting the requirements and intent of the Contract Documents. Submission of Bid stands as evidence that the Contractor accepts the Contract Documents as sufficient and complete for the work to be performed. Notify the engineer at least two weeks prior to bid of any discrepancies between the Contract Documents and actual field conditions. No change orders will be granted due to existing conditions that could have been observed during a site visit.

B. Provide temporary power and lighting during construction. Coordinate with the General Contractor for the exact requirements.

C. Relocate, or recircuit, all electrical equipment, conduit, and circuitry conflicting with or obstructing work on this project. Where the electrical systems are owned by other entities, pay them to relocate, or recircuit, their facilities.

D. Arrange for connection of service to all electrical systems by the appropriate utility company. Coordinate completely with all utility company requirements even if they are different than the contract documents. If utility company requirements are different from the contract documents, notify the engineer at least ten days prior to bid. Pay all utility company charges necessary for installation and connection of service. If the cost of the service is unavailable at the time of bid, submit a letter to the General Contractor, signed by the appropriate utility company official, stating that the cost has not been determined. The General Contractor shall submit this letter with his bid. The cost will then become the Owner's responsibility.

E. Provide all necessary equipment, raceway, circuitry, fittings, lugs, terminations, labor, etc. and connect to all equipment and appliances requiring electrical connections furnished herein, by the Owner, or by other Contractors. Prior to ordering electrical equipment and roughing in for equipment furnished by the Owner or other Contractors, verify all connection types, connection locations, connection heights, voltages, number of phases, conductor sizes, disconnecting means, breaker sizes, etc. Furnish the proper electrical equipment for the equipment actually being supplied.

1.3 SUBMITTALS AND SHOP DRAWINGS

A. Within 30 days after award of Contract and prior to beginning work, provide six bound copies of manufacturers' cut sheets containing information concerning each article of electrical equipment to be furnished on this project. These cut sheets shall contain sufficient information to prove compliance with the contract documents. Information addressing the requirements of the contract documents shall be highlighted. Each bound set shall bear the stamp of the Electrical Contractor as well as the General Contractor.

B. Within 30 days after award of Contract and prior to beginning work, provide six sets of full size shop drawings showing exact equipment locations with all equipment drawn to scale. Show all raceways with their junction boxes and pull boxes. Show all connection types, locations, and heights to equipment. Provide mounting and support details for all raceways and equipment. Coordinate with all other trades to ensure that there are no conflicts between systems. Each set of shop drawings shall bear the stamp of the Electrical Contractor, the General Contractor, and all Project Sub-Contractors. Failure to submit these Shop Drawings will render the Electrical Contractor responsible for resolving all conflicts between trades at his own expense.

C. Submittals and Shop Drawings are reviewed to determine quality of materials. Approval of submittals and shop drawings does not relieve the Contractor of meeting the requirements and intent of the Contract Documents.

PART 2 - PRODUCTS

2.1 All electrical equipment and materials shall be new. All equipment and materials shall be stored on the job site in weatherproof enclosures. Electronic equipment shall be stored in facilities where the temperature and humidity are controlled. In addition, comply completely with all manufacturers' requirements for storage and handling.

2.2 All equipment shall be UL listed for the application in which it is used and shall be labeled as evidence of its UL listing.

PART 3 – EXECUTION

3.1 WORKMANSHIP

All work shall be performed with an emphasis on neatness. The Engineer, Architect, and Owner retain the right to reject work that is, in their judgment, unsatisfactory.

3.2 EXPERIENCE

The Contractor shall have completed at least two jobs of similar size and scope within the past five years. The Engineer and Owner reserves the right to reject Contractors based on their inability to submit evidence of their experience, or based on experience with the Contractor on previous projects.

3.3 PERMITS

Obtain and pay for all permits required for work.

3.4 FLASHING

Provide all necessary equipment and flash all roof penetrations in such a manner to ensure that all penetrations are completely sealed and all roof warranties remain in effect. Where there are no roof warranties, the Electrical Contractor shall guarantee the electrical penetrations against leaking for a period of one year from project completion. Employ a professional roofing contractor to perform all flashing.

3.5 PROTECTION

A. Keep energized equipment covered during all phases of construction. Use enclosures, doors, covers, etc., to ensure that neither personnel nor machinery contact live electrical equipment.

B. Replace electrical equipment that is damaged during construction.

3.6 DAMAGED FACILITIES

Locate all existing site equipment and utilities prior to beginning construction. Repair all equipment and utilities damaged during construction, or pay for the repair of the equipment and utilities where required by the Owner of the damaged facilities.

3.7 IDENTIFICATION

A. Label all switchboards, panelboards, motor starters, disconnects, and motor control centers furnished under Division 16000 and other divisions of this contract with engraved rigid plastic nameplates having letters at least ¼ inch high. Nameplates shall be bolted to the enclosure. All labels shall indicate the voltage, number of phases, the AIC rating, and the panelboard and circuit number from which the device is fed.

B. All circuit breakers in Switchboards, Motor Control Centers, Square D I-Line, and similar panelboards shall be labeled with plastic nameplates (as described in Part A) providing the name of the load served and the ampacity and number of poles of the breaker.

C. All Square D NQOD, NF and similar panelboards shall have typewritten circuit directories.

D. Label all conductors at all junction boxes, pull boxes, and terminations with typewritten adhesive markers indicating the panelboard or switchboard name and circuit number of the conductor. Labels shall be Brady Datatab or approved equal.

E. Label all junction boxes and pull boxes with stenciled painted letters containing the name of the panelboard and circuit numbers of the circuits contained within. Use black paint for normal circuits, red paint for emergency circuits, and orange paint for fire alarm circuits. The Contractor may select other colors for junction boxes and pull boxes for auxiliary systems.

F. Label all conduits in the most likely direction of access and view every 50' and on both ends of each bend with stenciled painted letters containing the name of the panelboard and circuit numbers of the circuits contained within. Use black paint for normal circuits, red paint for emergency circuits, and orange paint for fire alarm circuits. The Contractor may select other colors for conduits for auxiliary systems.

3.8 AS-BUILT DRAWINGS

Maintain one set of drawings during construction for as-built markings. Mark these drawings in red to indicate field changes. Provide these drawings to the Engineer at the end of the construction process. Where required under the General Conditions, Special Conditions, or other portions of this contract, provide revised computer drawn as-built drawings to the Engineer at the end of construction.

3.9 TESTING

A. Test all systems, or pay testing agencies as required, for compliance with the requirements of all regulatory agencies.

B. Test the electrical power service ground using a Biddle Three-Terminal Ground Resistance Tester, or approved equal. Grounds shall meet the requirements of the NEC, or of Specification 16250, whichever is more stringent. Test grounds only when the earth is dry. Provide additional ground rods as necessary to achieve the required results.

C. Prior to making final equipment connections, test all service, feeder, and branch circuit conductors for continuity, phase-to-phase faults, and phase-to-ground faults using a Megger BM100 or approved equal test instrument generating 500 Vdc. Insulation resistance shall be a minimum of 500,000 Ohms between any conductor and ground and 1,000,000 Ohms between any two conductors.

D. Test other systems as required in their respective specifications.

E. Provide three bound copies of all test results to the Engineer at the end of the construction process. No Recommendation of Substantial Completion will be granted until all testing reports have been submitted.

3.10 WARRANTY

Provide the Owner a written guarantee to repair, or replace, all faulty equipment and systems for a period of not less than one year from date of Substantial Completion. During this one-year period, a representative of the Contractor shall be on the site actively working on the repairs within 24 hours of the Owner's telephone call. During this period of time, the Owner shall not be charged for any repair work or expenses related with the repair work unless the Contractor can prove that the Owner has damaged the equipment or system.

END OF SECTION

SECTION 16050

WORK IN EXISTING FACILITIES

PART 1 – GENERAL

1.1 GENERAL

A. All work shall be scheduled and coordinated through the General Contractor with the Owner. Provide necessary costs for all work during both normal and premium work hours in bid.

B. Provide continuous uninterrupted power to all existing facilities to remain during the entire construction process. Any required power outages must be scheduled and approved by the Owner in writing at least three days prior to the outage.

1.2 SCOPE OF WORK

A. Prior to beginning work, survey existing electrical systems. Document, in writing, signed by the Owner any portions of existing systems that are not operating properly before construction begins. Any electrical systems found inoperable at the end of the construction process that has not been so documented shall be repaired at the end of construction.

B. Remove electrical equipment in areas being demolished, and electrical equipment feeding other equipment being demolished. Remove raceways and circuitry back to the panel of origination. Where raceways are installed in inaccessible areas, remove conductors back to the panel of origination. Where circuits are not being completely demolished, remove conductors back to a junction box or other connection point outside of the renovated area and recircuit existing electrical equipment that is to remain as required. Where necessary, completely refeed existing electrical equipment that is to remain. It is the intent of this specification that all existing equipment to remain be left completely operable at the end of the construction process.

C. Survey existing panelboard circuitry and provide new typewritten directories giving complete as-built circuitry information for all panelboards affected by the construction on this project.

D. Where new circuit breakers are installed in existing equipment, the new circuit breakers shall be manufactured for installation in that equipment. The Amperes Interrupting Current (AIC) Rating shall equal the AIC rating of the existing equipment. A breaker with a lower AIC rating may be used if the contractor provides calculations showing that the breaker rating is sufficient to handle the available fault current. Submit these calculations for approval prior to ordering the breaker. An AIC rating on an existing breaker in the panelboard or switchboard does not demonstrate sufficient proof that the available fault current is less than that breaker's AIC rating.

E. Elevator Main Feeder Circuit Breakers shall be equipped with shunt trip coils.

F. Elevator Main Feeder Disconnects shall have a set of auxiliary contacts for the elevator vendor's use.

G. Elevators shall have a dedicated 30A circuit provided in the elevator equipment room for the elevator cab lights. A 30/1/1 fused disconnect (fused at 20A) shall be placed beside the main feeder disconnect for this circuit.

H. Elevators shall have a dedicated 30A circuit provided in the elevator equipment room for the elevator controls. A 30/1/1 fused disconnect (fused at 20A) shall be placed beside the elevator cab light disconnect for this circuit.

I. Provide a heat detector and smoke detector at the top of the elevator shaft within 24" of the sprinkler head, in the elevator equipment room, and in the elevator pit.

J. A 120V control circuit shall be provided and routed through the contacts of the heat detector at the top of the elevator shaft, the heat detector in the pit, and the heat detector in the elevator equipment room (all sets of contacts shall be wired in parallel) to shunt trip the breaker upon an alarm condition of any of these heat detectors.

K. A smoke detector shall be provided in front of the elevator (elevator lobby) on each floor. This detector is "Smoke Detector for Elevator Recall." The detector should be located within 21' of the centerline of each elevator door that is under the control of that detector.

L. A GFI receptacle and a fluorescent strip or vaportight fluorescent fixture shall be provided in the elevator pit. The elevator pit receptacle and light shall not be connected to any other devices (dedicated circuit for this equipment).

M. A GFI receptacle and fluorescent strips shall be provided in the elevator equipment room. The elevator equipment room receptacle and light shall not be connected to any other devices (dedicated circuit for this equipment).

N. Provide a telephone/data connection to the elevator controller.

O. All work shall conform to the latest editions of the National Electrical Code (NEC) [National Fire Protection Association (NFPA) 70], the Standard for Electrical Safety in the Workplace (NFPA 70E), the Life-Safety Code (NFPA 101), the International Building Code, the Americans with Disabilities Act, and all other applicable federal, state, and local codes and regulations.

PART 2 – PRODUCTS

2.1 Products shall be selected to maintain or improve the aesthetics of the facility. Gain approval of the Architect or Engineer prior to ordering or installing any electrical equipment or raceway.

PART 3 – EXECUTION

Coordinate the routing of all circuits and the locations of all devices with the Architect or Engineer and the Owner. Shop drawings shall describe completely the locations and elevations of all raceways, boxes, fittings, and equipment.

END OF SECTION

SECTION 16410

CONDUCTORS

PART 1 – GENERAL

Provide all circuitry, terminations, splices, connectors, lugs, and other equipment necessary for connection of all equipment requiring electrical connections.

PART 2 – PRODUCTS

2.1 All electrical conductors shall be soft-drawn annealed copper having 98% conductivity and an insulation rating of 600V.

2.2 Conductors shall be UL listed for installation in the raceway in which they are to be installed.

2.3 Conductors shall be rated 90 degrees C for use in residential, commercial, industrial, and institutional facilities, and shall be listed as 105 degrees C appliance wire. Conductors shall be listed under UL 83, UL 1063, and UL 758. If XLP or EPR insulation is used, conductors shall be listed under UL 44 and NEMA WC7.

2.4 Conductors used for branch circuits, feeders, auxiliary systems, and controls run in dry locations shall have PVC insulation and a Nylon outer jacket. They shall be THHN/THWN or XHHW-2.

2.5 Conductors used for branch circuits, feeders, auxiliary systems, and controls run in wet locations shall have XLP or EPR insulation and be type XHHW-2.

2.6 Conductors used for services shall be type SE for aerial services or type USE-2 for underground services.

2.7 Sizes #10 and #12 shall be solid conductors except where used for controls. All controls conductors shall be stranded.

2.8 Use minimum #14 AWG conductors for controls and auxiliary circuits. Use larger conductors as required to compensate for voltage drops exceeding 3% of the system voltage.

2.9 Conductors shall be furnished in the colors described below unless local ordinances require different colors. Conductors #8 and smaller shall be furnished with colored insulation; conductors larger than #8 shall be taped with the appropriately colored tape for a length of at least 2" at each panelboard, junction box, pull box, load, or other exposed location. Ground conductors shall be taped green for their entire exposed length.

System Voltage	208Y/120V, 3-Phase, 4-Wire	120/240V, 3-Phase, 4-Wire	480Y/277V, 3-Phase, 4-Wire

Phase A	Black	Black	Brown
Phase B	Red	Orange	Orange
Phase C	Blue	Purple	Yellow
Neutral	White	White	Gray
Ground	Green	Green	Green

PART 3 – EXECUTION

3.1 Install conductors carefully using a minimum of two tradesmen – one feeding the conductors into the conduit, and the other pulling the conductors into the conduit.

3.2 Join stranded conductors with appropriate mechanical or compression lugs. Wire nuts may be used for solid conductors only.

3.3 Splices shall only be made in approved enclosures. Splices shall not be pulled inside conduits.

3.4 Provide cable supports and strain relief connectors as required by the NEC.

3.5 Furnish junction boxes, pull boxes, handholes, manholes, etc. as required to ensure that the maximum number of bends allowed by the NEC are not exceeded and to ensure that the cables are not damaged during installation.

END OF SECTION

SECTION 16430

DISCONNECTS & SEPARATELY-MOUNTED CIRCUIT BREAKERS

PART 1 – GENERAL

Furnish and install all disconnects and separately mounted circuit breakers as shown on the drawings, specified herein, and required by the NEC.

PART 2 – PRODUCTS

2.1 GENERAL

A. Disconnects shall be of the heavy-duty type, and shall be UL listed for service entrance use. They shall meet or exceed the requirements of NEMA Standard KS1. Provide fuses sized to appropriately protect the load served. Equipment manufacturer's recommendations shall take precedence over the Contract Drawings.

B. Fuses shall be dual element, time-delay, Class J fuses. They shall be Bussman Low-Peak or approved equal.

C. Circuit breakers shall be thermal magnetic, molded-case with quick-make, quick-break contact action. They shall have thermal and magnetic tripping elements on each pole. Breakers with multiple poles shall have common tripping of all poles. Circuit breaker ampere ratings shall be stamped on the handle. Interrupting ratings of the circuit breakers shall be equivalent to the specified AIC rating of the panelboard. Breakers handles shall reside in a position between "ON" and "OFF" after a trip condition. Breakers shall be rated HACR when used for heating, air-conditioning, and refrigeration; HID when used with High Intensity Discharge fixtures; and shall be rated SWD when used for switching duty.

D. Circuit breaker sizes for motor loads are based on Square D recommendations for use of their breakers at the motor horsepowers listed on the mechanical drawings. If equipment is used other than Square D, adjust breaker sizes per the manufacturer's recommendations.

E. Disconnect and individually-mounted circuit breaker ampere interrupting current (AIC) ratings shall equal the rating of the panelboard from which they are fed unless otherwise noted.

F. Buses shall be constructed of 98% conductivity copper or equivalently rated aluminum.

G. Switches shall be horsepower rated where used to serve motors.

H. Enclosures shall be NEMA 1 when they are to be mounted indoors, NEMA 3R when they are to be mounted outdoors, and NEMA 4X where they are subject to washdown. Provide special enclosures where shown on the Contract Drawings.

2.2 ACCEPTABLE MANUFACTURERS

Disconnects and separately-mounted circuit breakers shall be manufactured by Siemens, Square D, General Electric, or Cutler Hammer.

PART 3 – EXECUTION

3.1 Install disconnects and individually-mounted circuit breakers in complete compliance with all manufacturers' installation instructions. Where necessary, provide structural supports and bracing for installation.

3.2 Disconnects are to be surface-mounted.

3.3 Individually-mounted circuit breakers are to be flush-mounted unless otherwise shown.

END OF SECTION