DIVISION 14

SECTION 142200

TRACTION SPECIFICATIONS FOR

ONE (1) ELEVATOR

AT

SCIENCE HALL

5045 CASS AVENUE

DETROIT, MI

DATE: March 27, 2014

SECTION 142200 –
ELECTRIC TRACTION ELEVATOR MODERNIZATION

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes modernization of traction elevator as follows:
   1. One (1) geared passenger elevator, Car #1.

B. Products Installed but Not Furnished Under This Section:
   1. CCTV camera provisions.
   2. Elevator security devices, control unit, mounting brackets, wiring materials, logic circuits, security system interface terminals, boxes, and relays.

1.2 DEFINITIONS

A. All technical terms in these Contract Documents are used as defined in the latest edition of American National Standard Safety Code for Elevators, Dumbwaiters, Escalators, and Moving Walks ASME A17.1. and A17.2.

B. ELEVATOR CONSULTANT or CONSULTANT refers to Lerch Bates Inc. (Lerch Bates).

C. PURCHASER refers to Wayne State University.

D. CONTRACT or CONTRACT DOCUMENTS consists of the Agreement, Conditions of Contract, Specifications, Addenda, Drawings if included, and Alternates if accepted.

E. CONTRACTOR or ELEVATOR CONTRACTOR refers to any persons, partners, firm, or corporation having a contract with Purchaser to furnish labor and materials for the execution of work required.

F. CONTRACT AWARD refers to Purchaser’s verbal or written award for work required.

G. SUBCONTRACTOR refers to any persons, partners, firm, or corporation having a contract with Contractor to furnish labor and materials for the execution of work required.

H. PROVIDE means “furnish and install.”

I. MANUFACTURER means either the Original Equipment Manufacturer (OEM) or the principal manufacturer of a component or system.

J. RETAIN means, unless otherwise specified, the existing equipment is to be left in place with no alterations and no change in the original manufacturer’s designed performance or functionality. Items that are “retained” shall be thoroughly cleaned in place and adjusted to achieve originally designed function.

K. REFURBISH means, unless otherwise specified, the existing equipment is to be cleaned, repainted, repaired, and parts replaced to put the equipment into a condition to provide the same appearance, performance, and functionality as the equipment provided when it was originally installed. Unless otherwise specified, the scope of replacement of components is limited to those items currently available for purchase as replacement parts from the manufacturer or after-market suppliers approved by the manufacturer.

L. REUSE means that the Contractor shall carefully remove equipment from the existing installation, avoiding any damage or additional wear. Store in a safe location to maintain equipment in its pre-removal condition. Reinstall and incorporate into the modernized elevator installation using the same procedures and recommendations provided by the manufacturer of the equipment.

M. INCLUDES or INCLUDING means including the items specified but not limited solely to those items if additional work or components are required to achieve the specified outcome.

N. CALL BACK means a request from the Purchaser to the Contractor to provide a technician on site to evaluate an elevator that is out of service or not functioning properly, rectify the root cause of the malfunction, and place the unit back into normal service.

O. Words in the singular shall include the plural whenever applicable or context so indicates.

1.3 WORK INCLUDED

A. Modernize one traction passenger elevator.

B. All engineering, equipment, labor, and permits required to satisfactorily complete elevator modernization required by Contract Documents.

C. Provide all required staging, hoisting, and movement of new equipment, reused equipment, or removal of existing equipment.

D. Applicable conditions of Purchaser's General, Special, and Supplemental Conditions.

E. Warranty maintenance as described herein.

F. Cartage and Hoisting: All required staging, hoisting, and movement to, on, and from the site including new equipment, retained equipment, or dismantling and removal of existing equipment.

G. Unless specifically identified as "Retain," "Reuse," or "Refurbish," provide new equipment. Contractor may, with approval prior to quotation, provide new equipment in lieu of refurbishing existing.

H. Reference to a device or a part of the equipment applies to the number of devices or parts required to complete the installation.

I. Provisions of this specification are applicable to all elevators unless identified otherwise.

J. Provide hoistway, pit, and machine room barricades.

K. Provide temporary and permanent pit ladders, working platforms, inspection platforms, and guard rails required to comply with applicable Building Code and AHJ requirements.

L. Scope of Contract includes, but is not limited to, the following:
1. Coordination, scheduling, and management of work of component suppliers and subcontractors.
2. Modernize or furnish and install equipment as specified utilizing existing and/or modified hoistways and machine rooms.

M. Specific item of required work which cannot be determined to be included in another contract is thereby determined to be included in prime contract.

1.4 CONSULTANT STATUS

A. Consultant shall act as Purchaser's and/or Building Management's representative on all matters pertaining to required work. Consultant shall interpret Contract Documents, analyze Contractor's quotations, review Contractor's suggested alternates, review all Contractor's submittals, approve billings, review technical details and construction procedure, perform work progress reviews, and review and test completed work for compliance with Contract Documents prior to acceptance of work by Purchaser.

B. Field Review Scheduling: Schedule progress and final work reviews with Consultant. Reply promptly, in writing, to corrective work indicated on Consultant's progress and/or final review reports, indicating status and schedule for completion. Consultant anticipates scheduled site review appointments will be met.

1.5 CODES AND ORDINANCES

A. All work covered by these Contract Documents is to be done in full accord with national code, state and local codes, ordinances, and elevator safety orders in effect at time elevator alteration permit issuance. All requirements of local Building Department and fire jurisdiction are to be fulfilled by Contractor and its Subcontractors.

1.6 PRIME CONTRACTOR'S DUTIES

A. Prime Contractor's duties include the following:
1. Provide and pay for labor, materials and equipment, tools, construction equipment and machinery, and other facilities and services necessary for proper execution and completion of required work.
2. Pay for legally required sales, consumer, and state remodel taxes.
3. Secure and pay for required permits, fees, and licenses necessary for proper execution and completion of required work, as applicable at time of quotation due date.
4. Give required notices.
5. Comply with codes, ordinances, rules, regulations, orders, and other legal requirements of public authorities which bear on performance of required work.
6. Promptly submit written notice to Consultant of observed variance of Contract Documents from legal requirements.
7. Enforce strict discipline and good order among employees. Do not employ persons unskilled in assigned task.

1.7 STAGING AREA

A. An equipment staging area will be available for use by Contractor. Contractor shall restrict usage to area designated and shall notify Purchaser prior to storing of any large equipment which will impose heavy concentrated loading on floor area. Do not store such equipment until approval is received.

1.8 WORK SEQUENCE

A. Construct work in stages.

1.9 WORKING HOURS

A. Unless otherwise stated below or elsewhere in the Contract Documents, Contractor shall have access to the building for work activities during the following regular building operating hours:

1. 8:00 a.m. to 5:00 p.m., Monday through Friday or as agreed upon by Wayne State University.

B. Contractor shall perform all work that has the potential to result in any of the following conditions outside of regular building operating hours at no additional cost to the Purchaser.
   1. Interruptions or changes in normal automatic operation.
   2. Activation of Firefighter's Emergency Operation Phase I.
   3. Noise levels in excess of 80 dBA measured in any occupied or public space.
   4. Transport of large equipment through public or tenant spaces.
   5. Coordination with WSU staff for planned events in the building.

1.10 CONTRACTOR USE OF PREMISES

A. Confine operations at site to areas permitted by law, ordinances, permits, Contract Documents, and Purchaser's specific instructions.

B. Do not unreasonably encumber site with materials or equipment. Staging area will be located as directed by Purchaser.

C. Do not load structure with weight that will endanger structure. Coordinate with Purchaser.

D. Assume full responsibility for protection and safekeeping of tools and products stored on or off premises.

E. Move stored products which interfere with operations of building or the operations of other trades.

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

1.11 CONCURRENT MODERNIZATION WORK AND BUILDING OPERATION

A. This project is a major elevator modernization in an existing building which is a private residence and open for public business. The building will continue to operate throughout all phases of required work. It is essential that Contractor give special attention and priority to all matters concerning project safety, protection from dust and loose materials, reduction of noise level, protection from water and air infiltration into building, and maintenance of neat, sightly conditions in and around work areas inside and outside of building. Packaging, scrap materials, and demolition debris shall be promptly removed from building and site on a daily basis.

B. At all times Contractor shall provide clearly visible warning and directions signs. At all times give special attention to building entrances, exits, and proper safe exiting through work areas as required by law.
   1. Barricade design must be approved by client prior to start of modernization work.
   2. Standard folding maintenance barricades are not acceptable.

C. Contractor shall consult Purchaser and other Contractors to establish and maintain safe temporary routes including, but not limited to, proper barricades, walking surfaces, lighting, fire protection, exiting, warning and directional signs, and general protection of persons from all hazards in accordance with OSHA Standards due wholly or partially to its operations.

1.12 ALTERNATES

A. Alternate: Battery Rescue Operation
   1. Upon loss of normal power automatically lower or raise the car to the nearest landing depending on the load in the car.

2. Upon arrival at the landing, the elevator doors shall open automatically and remain open until regular door time has expired; the elevator shall then be removed from service.
3. The auxiliary power source shall be provided via 12-volt D.C. battery units installed in machine room.
4. Include solid-state charger and testing means mounted in a common metal container.
5. Battery to be rechargeable lead acid or nickel cadmium with a ten-year life expectancy.
6. Upon restoration of normal power, the elevator shall automatically resume normal operation.

B. Alternate: Gearless Traction Hoist Machine:
1. Provide new gearless machine based on capacity, speed and duty designed to operate within specified machine room temperature range.
2. Provide motor, brake, and demountable drive sheave mounted in proper alignment on a common isolated bedplate. Provide bedplate blocking to elevate secondary or deflector sheave above machine room floor.
   a. Motor:
      1) AC induction or P.M.S.M. ACV³F gearless traction type motor
      2) Machine or motor mounted direct drive, digital, closed-loop velocity encoder.
   b. Electromechanical Brake:
      1) Spring applied and electrically released.
      2) Drum or disc type.
      3) Spring applied and electrically released with removable manual brake release.
      4) Brake shoes applied to the braking surface simultaneously and with equal pressure.
      5) Adjusted to minimize noise during lifting and setting of brake shoes.
      6) Prevent ascending car over-speed and unintended car movement via dual-redundant braking system.
   c. Drive Sheave:
      1) Machined with grooves, providing maximum traction with a minimum of cable and sheave wear.
      2) Sealed bearings.
   d. Deflector Sheave:
      1) Machine bedplate mounted deflector sheave.
      2) Machined grooves and sealed bearings.
      3) Maintainable from inside machine room.
3. Installation includes:
   a. Anti-friction bearings with easy access for lubrication.
   b. Means to access and maintain deflector sheave from machine room.
   c. Sheave guards to prevent ropes from leaving sheave grooves.
   d. Sound isolation pads shall be installed to reduce vibration and noise transmission to the building structure.

1.13 RELATED WORK BY ELEVATOR CONTRACTOR

A. Architectural and Structural, Hoistway and Hallway:
1. Wall blockouts and fire rated closure for control and signal fixture boxes which penetrate walls.
2. Cutting and patching walls and floors.
3. Decorating of walls and floors.
4. Lockable, self-closing, fire-rated pit door.
5. Protect open hoistways and entrances during construction per OSHA Regulations.
6. Protect car enclosure, hoistway entrance assemblies, and special metal finishes from damage.
7. Remove existing finished cab flooring. Install new flooring. Coordinate weight of flooring and sill height with elevator contractor.

B. Architectural and Structural, Machine Room:
   1. Self-closing and locking rated access door. Include Signage: “ELEVATOR MACHINE ROOM” and “AUTHORIZED PERSONNEL ONLY.”
   2. Paint walls and ceiling for improved light reflectivity.
   3. Class “ABC” fire extinguisher in each elevator machine room.
   4. Seal fireproofing to prevent flaking.
   5. Access for hoisting. Provide access for hoisting to machine room and repair same when complete.

C. Plumbing and Fire Protection:
   1. Pit Sump or Drain: Indirect waste drain or sump with flush grate and pump. Sump pump/drain capacity minimum 3,000 gallons per hour per elevator.

D. Mechanical:
   1. Machine Room: Ventilation and heating. Maintain temperature range of 55°-90° F. Maintain maximum 80% relative humidity, non-condensing.

E. Electrical Service, Conductors, and Devices:
   1. Machine Room Lighting: Guarded LED fixtures to provide minimum 19 footcandles average illumination. Provide toggle switch adjacent to strike side of machine room door. Occupancy sensor is not allowed.
   2. Pit Lighting: Guarded LED fixtures to provide minimum 10 footcandles average illumination.
   3. GFCI convenience outlets in pit.
   4. Non-GFCI convenience outlet in pit for sump pump.
   5. GFCI convenience outlets in machine room or control space.
   6. GFCI convenience outlets in machine space.
   7. Heavy-duty three-phase mainline copper power feeder to terminals of each elevator controller in the machine room with protected lockable “open” disconnecting means. Auxiliary contacts to disable emergency battery lowering.
   8. Single-phase copper power feeder to each elevator with individual protected lockable “open” disconnecting means located in machine room for utilization equipment:
      a. Car lighting and blower.
      b. Pit sump pump.
      c. CCTV camera.
      d. Card reader system.
      e. Firefighters’ control status panel.
   9. Emergency telephone line to each individual elevator control panel in elevator machine room.
   10. Provide a dedicated phone line at locations that call for Master Intercom Stations.
   11. Automatic Fire Recall System:
      a. Fire alarm initiating devices in each elevator lobby, for each group of elevators or single elevator.
      b. Fire alarm initiating devices in each elevator machine room.
      c. Fire alarm initiating devices at top of hoistway if sprinklered.
      d. Three Relay Activation Modules for each group of elevators or single elevator. Locate modules within three feet of controller designated by the Elevator Contractor to minimize un-supervised wiring. Program Modules as follows:
         1) PRIMARY: Activate when any hallway device, except primary floor, activates.
         2) ALTERNATE: Activate when hallway device at primary floor activates.
         3) FIRE HAT: Activate when machine room device activates.
      e. Device in machine room and at top of hoistway (if provided) to provide signal for general alarm.

f. Provide technician from fire alarm contractor for pre-test of system during normal working hours.
g. Provide technician from fire alarm contractor for acceptance test of system with AHJ during normal or overtime working hours.
h. Remove fire alarm devices from pit where not required.
i. Remove fire alarm devices from hoistway overhead where not required.

12. Internet access to each machine room for off-site web access to monitoring system.
13. Conduit from the closest hoistway of each elevator group or single elevator to the firefighters' control room and/or main control console. Coordinate size, number, and location of conduits with Elevator Contractor.
14. Wiring from building CCTV system to elevator controllers and all CCTV equipment.
15. CCTV Cameras, elevator contractor to coordinate and assist with installation of cameras in elevators.
16. Wiring from building security system to elevator controllers and all security system equipment.
17. Card or Proximity Readers, elevator contractor to coordinate and assist with installation of readers in car operating panels or hall stations.
18. Power for Mechanical Equipment: Provide power for HVAC and/or ventilation equipment where applicable.
19. Remove abandoned electrical equipment from machine room and hoistway.
20. Conduit from fire alarm panel to each fire alarm device location at each floor, hoistway, pit and machine room including three relay activation modules in machine room. Provide junction box at each location.
21. Verify electrical supply to the controllers meets the stated requirements. Where applicable, review standby power generator capability to meet stated requirements and absorb regenerated power.

F. Elevator Contractor Related Work
1. Pit access stationary ladder for each elevator. Retractable ladder if provided shall include an electrical contact conforming to ASME A17.1, Rule 2.2.2.4.2.7.

G. Under Car Access: Provide permanent ladder and platform for access to under car equipment as required by code.

1.14 ACTION AND INFORMATIONAL SUBMITTALS

A. Within sixty (60) calendar days after award of contract and before beginning equipment fabrication, submit shop drawings, and required material samples for review. Allow 30 days for response to initial submittal.
1. Scaled or Fully Dimensioned Layout: Plan of machine room indicating equipment arrangement, details of car enclosures, and car/hall signal fixtures.
2. Design Information: Indicate equipment lists, reactions, and design information on layouts.
3. Power Confirmation Information: Design for existing conditions.
4. Fixtures: Shop drawings.
5. Finish Material: If requested, submit 3" x 12" samples of actual finished material for review of color, pattern, and texture. Compliance with other requirements is the exclusive responsibility of the Contractor. Include, if requested, signal fixtures, lights, graphics, Braille plates, and detail of mounting provisions.
6. Design Information: Provide calculations verifying the following:
a. Adequacy of existing electrical provisions.
b. Machine room heat emissions in B.T.U.
c. Adequacy of existing car platform structure for intended loading.
d. Adequacy of plunger wall thickness for intended loading.

7. Written Maintenance Control Program (MCP) specifically designed for the equipment included under this contract. Include any unique or product specific procedures or methods required to inspect or test the equipment. In addition, identify weekly, bi-weekly, monthly, quarterly, and annual maintenance procedures, including statutory and other required equipment tests.

B. Submittal review shall not be construed as an indication that submittal is correct or suitable, or that the work represented by submittal complies with the Contract Documents. Compliance with Contract Documents, code requirements, dimensions, fit, and interface with other work is Contractor's responsibility.

C. Acknowledge and/or respond to review comments within 14 calendar days of return. Promptly incorporate required changes due to inaccurate data or incomplete definition so that delivery and installation schedules are not affected. Identify and cloud drawing revisions, including Contractor elective revisions on each re-submittal. Contractor's revision response time is not justification for equipment delivery or installation delay.

1.15 PURCHASER'S INFORMATION

A. Non-Proprietary Equipment Design: Provide two (2) sets of digital and three (3) sets of neatly bound written information necessary for proper maintenance and adjustment of equipment within 30 days following final acceptance. Final retention will be withheld until data is received by Purchaser and reviewed by Consultant. Include the following as minimums:

1. Straight-line wiring diagrams of "as-installed" elevator circuits with index of location and function of components. Mount one set wiring diagrams on panels, racked, or similarly protected, in elevator machine room. Provide remaining set rolled and in a protective drawing tube. Maintain all drawing sets with addition of all subsequent changes. These diagrams are Purchaser's property. A legend sheet shall be furnished with each set of drawings to provide the following information:
    a. Name and symbol of each relay, switch, or other apparatus.
    b. Location on drawings, drawing sheet number and area, and location of all contacts.
    c. Location of apparatus, whether on controller or on car.
2. Written Maintenance Control Program (MCP) specifically designed for the equipment included under this contract. Include any unique or product specific procedures or methods required to inspect or test the equipment. In addition, identify weekly, bi-weekly, monthly, quarterly, and annual maintenance procedures, including statutory and other required equipment tests.
3. Printed instructions explaining all operating features.
4. Complete software documentation for all installed equipment.
5. Lubrication instructions, including recommended grade of lubricants.
6. Parts catalogs listing all replaceable parts including Contractor's identifying numbers and ordering instructions.
7. Four sets of keys for all switches and control features properly tagged and marked.
8. Diagnostic test devices together with all supporting information necessary for interpretation of test data, troubleshooting of elevator system, and performance of routine safety tests.
9. The elevator installation shall be a design which can be maintained by any licensed elevator maintenance company employing journeymen mechanics, without the need to purchase or lease additional diagnostic devices, special tools, or instructions from the original equipment Contractor.
    a. Provide onsite capability to diagnose faults to the level of individual circuit boards and individual discrete components for the solid-state elevator controller.

b. Provide a separate, detachable device, as required, to the Purchaser as part of this installation if the equipment for fault diagnosis is not completely self-contained within the controller. Such device shall be in possession of and become property of the Purchaser.
c. Installed equipment not meeting this requirement shall be removed and replaced with conforming equipment at no cost to the Purchaser.

10. Provide upgrades and/or revisions of software during the progress of the work, warranty period and the term of the ongoing maintenance agreement between the Purchaser and Contractor.

1.16 PERMITS, TESTS, AND CERTIFICATES

A. Permits:
1. Secure and pay for all permits required for Work to be performed, including but not limited to:
a. Municipal and State permits.
b. Device or equipment removal permits.
c. Hot works permits.
d. Confined space access permits.
2. Post, maintain, and renew all permits in compliance with local governmental requirements.
3. Obtain documentation of final AHJ close-out of all permits. Provide copies to Purchaser.

B. Tests and Inspections:
1. Schedule and perform all tests required in accordance with procedure described in ASME A17.2 Guide for Inspection of Elevators, Escalators, and Moving Walks in the presence of Authorized Representative of the AHJ and Owner's representative.

C. Certificates: Obtain, pay for, and deliver to Purchaser with all temporary and final inspection certificates provided by proper governing authorities.

D. Violations: Resolve any outstanding violations on record with the AHJ on devices being removed prior to final acceptance by the Purchaser.

1.17 QUALITY ASSURANCE

A. Compliance with Regulatory Agencies: Comply with most stringent applicable provisions of currently enforced codes, laws, and/or authorities, including revisions and changes in effect.

B. Inspections: Provide access to areas where work is being performed for the Consultant at any time throughout the project.

1.18 WARRANTY

A. Material and workmanship of installation shall comply in every respect with Contract Documents. Correct defective material or workmanship which develops within one (1) year from date of final acceptance of all work to satisfaction of Purchaser and Consultant at no additional cost, unless due to ordinary wear and tear, or improper use or care by Purchaser. Perform maintenance in accordance with terms and conditions indicated in the Preventive Maintenance Agreement.

B. Defective is defined to include, but not be limited to operation or control system failures, car performance below required minimum, excessive wear, unusual deterioration, or aging of materials or finishes, unsafe conditions, the need for excessive maintenance, abnormal noise, or vibration, and similar unsatisfactory conditions.

C. Retained Equipment: All retained components, parts, and materials shall be cleaned, checked, modified, repaired, or replaced, so each component and its parts are in like new operating condition. Retained equipment must be compatible for integration with new systems. All retained equipment shall be covered under the warranty provisions, of Article 1.13, A. & B above. No prorations of equipment or parts shall be allowed on preventive maintenance contract between the Contractor and Purchaser.

D. Make modifications, requirements, adjustments, and improvements to meet performance requirements of Section 142200.

1.19 WARRANTY MAINTENANCE

A. Provide preventive maintenance and 24-hour emergency callback service for one (1) year commencing on date of final acceptance of modernized elevator by Purchaser. Systematically examine, adjust, clean, and lubricate all equipment. Repair or replace defective parts using parts produced by the Contractor of installed equipment. Maintain elevator machine room, hoistway, and pit in clean condition.

B. Use competent personnel, acceptable to Purchaser, employed and supervised by the Contractor.

C. Warranty Maintenance Hours: Contractor shall perform one (1) hour per unit per month for preventive maintenance.

D. All work, except as otherwise noted, including unlimited call-back service, shall be performed during the building's regular hours. These hours are 8:00 a.m. to 5:00 p.m.

E. Response Time for Callback Service:
1. During regular time hours, Contractor shall arrive at Property within 60 minutes from time of notification of equipment problem or failure by Purchaser.
2. Contractor shall arrive at Property in response to passenger entrapment calls within 30 minutes from time of notification by Purchaser.

F. Purchaser retains the option to delete cost of warranty maintenance from modernization equipment contract and remit twelve equal installments directly to Contractor during period in which maintenance is being performed.

1.20 DELIVERY, STORAGE, AND HOISTING

A. General:
1. Protect all equipment and exposed finishes during delivery, handling, and installation until completion of project.
2. Replace damaged materials with new, with no additional cost for material or labor to Purchaser.

B. Delivery and Storage:
1. Ensure manufacturers' original packing adequately protects materials during delivery.
2. Deliver materials, identical to accepted samples, to the site ready for use in the manufacturer's original and unopened containers and packaging, bearing labels as to type of material, brand name and manufacturer's name.
3. Store materials under cover in a secure, dry, and clean location, off the ground. Remove delivered materials that are damaged or otherwise not suitable for installation from the job site and replace with acceptable materials.
4. Store and protect all materials in space provided or designated by the Purchaser against damage, stains, scratches, corrosion, weather, construction debris, and other environmental conditions.

5. Comply with Purchaser's requirements for access to and use of any building loading docks, parking lots, parking garages, and any interior spaces required for delivery and storage.

C. Hoisting: Arrange and pay for all required hoisting and movement of equipment.

1.21 COORDINATION

A. Prime contracts are defined below, and each is recognized to be a major part of required work to be performed concurrently in close coordination with work of other Contractors.
1. This Contract: Elevator Modernization including associated related work specified herein.

B. Scope of Contract includes, but is not limited to, the following:
1. Coordination, scheduling, and management of work of component suppliers and subcontractors.
2. Modernize or furnish and install equipment as specified utilizing existing and/or modified hoistways and machine rooms.
3. Specific item of required work which cannot be determined to be included in another contract is thereby determined to be included in prime contract.

C. Inspections: Provide access to areas where work is being performed for the Consultant and Purchaser at any time throughout the project.

PART 2 - PRODUCTS

2.1 REFERENCES

A. American National Standard Institute (ANSI): A117.1, Accessible and Usable Buildings and Facilities.

B. American Society of Mechanical Engineers:
1. ASME A17.1, Safety Code for Elevators and Escalators.
2. ASME A17.2, Guide for Inspection of Elevators, Escalators, and Moving Walks.
3. ASME A17.5, Elevator and Escalator Electrical Equipment.
4. ASME A17.6, Standard for Elevator Suspension, Compensation, and Governor Systems.

C. National Fire Protection Association (NFPA):
1. NFPA 70, National Electric Code.
2. NFPA 80, Fire Doors and Windows.
3. NFPA 101, Life Safety Code.
4. NFPA 13, Installation of Sprinkler Systems.

D. International Building Code (IBC).

E. City of Detroit Elevator Code.

F. Accessibility:
1. American National Standard Institute (ANSI): A117.1, Accessible and Usable Buildings and Facilities.
2. ADAAG, Americans with Disabilities Act Accessibility Guidelines.

2.2 MANUFACTURERS AND PRODUCTS

A. Approved Elevator Contractors:
1. Approved subject to compliance with the requirements of the contract and specifications.
    a. KONE
    b. Lardner Elevator
    c. Otis Elevator
    d. Schindler Elevator Corporation
    e. TK Elevator
    f. Toledo Elevator
    g. Approved Equal

B. Approved Elevator Components:
The following Manufacturers/Assemblers are approved for the specific components listed below, subject to the requirements of the contract:
1. Car and Hall Signal Fixtures:
    a. Innovation
    b. MAD Fixtures
    c. Monitor
    d. PTL
2. Compensation Chains and Guides:
    a. Draka
3. Controllers:
    a. GAL GALaxy
    b. Elevator Controls Corporation
    c. Smart Rise
4. Door Protective Device:
    a. Adams
    b. GAL
    c. Janus
    d. T.L. Jones
    e. Tri-Tronics
5. Elevator Cab Interiors:
    a. Architectural Metals
    b. A Better Elevator Co.
    c. G&R
    d. Globe Architectural & Metals
    e. Snap Cab
    f. Weir Inc.
6. Guide Rails:
    a. AFD Industries
    b. Montefero
    c. Savero
7. Guide Shoes
    a. Delco
    b. ELSCO
    c. GAL
    d. Hollister-Whitney
8. Hoist Machines:
    a. Hollister Whitney
    b. Imperial Electric
    c. Titan

d. Torin

9. Hoist Motors:
   a. Baldor
   b. General Electric
   c. Imperial Electric
   d. Reuland Electric
10. Hoistway Entrances and Door Panels:
   a. Columbia
   b. EDI/ECI
   c. Elevator Products
   d. Gunderlin
   e. Tyler
   f. United Cab
11. Passenger Elevator Door Equipment (Operators, Tracks, Hangers, and Closers):
   a. ECI
   b. GAL
   c. Wittur
12. Rope Brake:
   a. Hollister Whitney
13. Two-Way Communication Device:
   a. Janus
   b. K-Tech
   c. Kings III
   d. Rath Microtec
   e. Wurtec
14. Traveling Cables:
   a. Draka
   b. James Monroe
15. VVVF Power Drives:
   a. KEB
   b. Magnetek
   c. Mitsubishi
   d. TorqMax
   e. Yaskawa
16. VVVF Emergency Power Systems:
   a. Reynolds & Reynolds
17. Wire Ropes:
   a. Bethlehem
   b. Draka
   c. Paulsen
   d. Wayland

2.3 PERFORMANCE REQUIREMENTS

A. Car Speed: ±3% of contract speed under any loading condition.

B. Car Capacity: Safely lower, stop, and hold 125% of rated load.

C. Car Stopping Zone: ±1/4" under any loading condition.

D. Door Times: Seconds from start to fully open or fully closed:
   1. Door Open: 2.3 seconds. Door Close: 4.1 seconds.

E. Car Floor-to-Floor Performance Time: Seconds from start of doors closing until doors are 3/4 open for center-opening doors or 1/2 open for side-opening doors, and car is level and stopped at next successive floor under any loading condition or travel direction:
   1. 14.4 seconds. Floor Height: 11’-0” between floors 2 and 3.

F. Noise and Vibration Control:
   1. Airborne Noise:
      a. Measured noise level of elevator equipment and its operation shall not exceed 60 dBA inside car under any condition including door operation and car ventilation exhaust blower on its highest speed.
      b. Limit noise level in the machine room relating to elevator equipment and its operation to no more than 80 dBA.
      c. All dBA readings to be taken 3'-0" off the floor and 3'-0" from the equipment using the “A” weighted scale.
   2. Vibration Control: Mechanically isolate all new elevator equipment from the building structure and other components. Minimize objectionable noise and transmission of vibrations to occupied areas of the building.

2.4 ELEVATOR DUTY ALTERATIONS PASSENGER ELEVATOR

ALTERATION SUMMARY		
CAR: SCIENCE HALL	**EXISTING INSTALLATION**	**MODERNIZED INSTALLATION**
Capacity:	4,000 lbs.	No Change
Class of Loading:	Class A	No Change
Contract Speed:	75 fpm	No Change
Roping Configuration:	2:1	No Change
Machine Type:	Geared	No Change; Alternate for AC Gearless
Machine Location:	Overhead	No Change
Motor Type:	DC	AC
Motion Control:	Generator Field	Static
Operation Control:	Two-Button Selective Collective Automatic	No Change
Floors Served:	Front: B, 1, 2, 3 Rear: 1, M, 2, 4	No Change
Total Entrances:	4 Front; 4 Rear	No Change
Entrance Type:	Two-Speed Side-Opening	No Change
Entrance Size:	3'-8" wide x 7'-0" high	No Change
Minimum Clear to Underside of Canopy:	8'-0" high	No Change

2.5 MATERIALS

A. All colors will be selected from the Manufacturer’s standard range unless custom colors are specified herein.

B. Steel:
   1. Sheet Steel (Furniture Steel for Exposed Work): Stretcher-leveled, cold-rolled, commercial quality carbon steel, complying with ASTM A366, matte finish.
   2. Sheet Steel (for Unexposed Work): Hot-rolled, commercial quality carbon steel, pickled and oiled, complying with ASTM A568/A568M-03.
   3. Structural Steel Shapes and Plates: ASTM A36.

C. Stainless Steel: Type 302 or 304 complying with ASTM A240, with standard tempers and hardness required for fabrication, strength, and durability. Apply mechanical finish on fabricated work in the locations shown or specified, Federal Standard and NAAMM nomenclature, with texture and reflectivity required to match Purchaser's sample. Protect with adhesive paper covering.
   1. No. 4 Satin: Directional polish finish. Graining directions as shown or, if not shown, in longest dimension.
   2. No. 8 Mirror: Reflective polish finish with no visible graining.
   3. Textured: 5WL as manufactured by Rigidized Metals or Windsor pattern 5-SM as manufactured by Rimex Metals or approved equal with .050 inches mean pattern depth with bright directional polish (satin finish).
   4. Burnished: Non-directional, random abrasion pattern.

D. Aluminum: Extrusions per ASTM B221; sheet and plate per ASTM B209.

E. Plastic Laminate: ASTM E84 Class A and NEMA LDI-1964, 1/16", Fire-Rated Grade (GP-50), Type1, 1/16" high pressure general purpose laminate, color and texture as follows:
   1. Exposed Surfaces: Color and texture selected by Purchaser.
   2. Concealed Surfaces: Contractor's standard color and finish.

F. Fire-Retardant Treated Particle Board Panels: Minimum 3/4" thick backup for natural finished wood and plastic laminate veneered panels, edged and faced as shown, provided with suitable anti-warp backing; meet ASTM E84 Class "I" rating with a flame-spread rating of 25 or less, registered with Local Authorities for elevator finish materials.

G. Natural Finish Wood Veneer: Standard thickness, 1/40" thoroughly dried conforming to ASME/HPMA HP-1983, Premium Grade. Place veneer, tapeless spliced with grain running in direction shown, belt and polish sanded, book matched. Species and finish designated and approved by Purchaser and/or Consultant.

H. Paint: Clean exposed metal parts and assemblies of oil, grease, scale, and other foreign matter and factory paint one shop coat of standard rust-resistant primer. After erection, provide one finish coat of industrial enamel paint. Galvanized metal need not be painted.

I. Prime Finish: Clean all metal surfaces receiving a baked enamel paint finish of oil, grease, and scale. Apply one coat of rust-resistant primer followed by a filler coat over uneven surfaces. Sand smooth and apply final coat of primer.

J. Baked Enamel Finish: Prime finish per above. Unless specified "prime finish" only, apply and bake three additional coats of enamel in the selected solid color.

K. Entrance Field Paint: Clean all surfaces to remove dirt and grease. Sand and finish surfaces as necessary to remove pits and scratches and prepare surface for painting. Apply filler to ensure smooth surface; sand and apply one coat of electrostatic enamel in the selected solid color.

L. Refinishing of natural metals: Remove existing protective finish. Buff as necessary to remove scratches. Regrain or finish as specified and protect as indicated for particular metal type.

M. Entrance Support Equipment within Hoistway: Include strut angles, headers, sill support angles, fascia, hanger covers, etc. Clean, remove, and check for corrosive activity. Replace components which exhibit severe deterioration. Tighten all fastenings.

2.6 OPERATION

A. General:
1. Cars automatically slow down and stop level at floors in response to car and landing calls with stops made in sequence in the established direction of travel, regardless of order in which buttons are pressed.
2. Landing calls are canceled when the assigned car arrives at the landing.
3. Automatic Dispatch Failure: Provide auxiliary dispatch system to automatically dispatch elevators in the event of failure of the primary control system.
4. Hall Call Button Failure: Should failure of hall call button system occur, initiate operation providing predetermined service to all landings; elevators respond normally to car calls.
5. Automatic Leveling:
   a. When arriving at a floor cars level to within 1/8” above or below the landing sill prior to opening doors, without travelling past the landing during leveling
   b. Maintain leveling accuracy regardless of carload, direction of travel, rope slippage or stretch.
6. Power Conservation:
   a. Shut off car interior illumination and ventilation after adjustable period (60-180 seconds) of no elevator demand.
   b. turn on prior to opening car doors when elevator demand returns.

B. Door Operation:
1. Automatically open doors when car arrives at a floor.
2. Stop and reopen doors or hold doors in open position upon activation of “door open” button.
3. At expiration of normal dwell time, or upon activation of “door close” button, close doors:
   a. Prevent doors from closing and reverse doors at normal opening speed if door reopening device beams are obstructed while doors are closing, except during nudging operation.
   b. In event of door reopening device failure, provide for automatic shutdown of car at floor level with doors open.
   c. Close cycle does not begin upon activation of “door close” button until normal door dwell time for a car or hall call has expired, except firefighters’ operation.
4. Nudging Operation:
   a. After beams of door reopening device are obstructed for a predetermined time interval (minimum 20.0-25.0 seconds), sound warning signal, and attempt to close doors with maximum of 2.5 foot-pounds kinetic energy.
   b. Activation of the door open button overrides nudging operation and reopens doors.
5. Interrupted Beam Time:
   a. When beams are interrupted during initial door opening, hold door open a minimum of 3.0 seconds.
   b. When beams are interrupted after the initial 3.0 second hold open time, reduce time doors remain open to an adjustable time of approximately 1.0-1.5 seconds after beams are reestablished.
6. Differential Door Time:
   a. Field adjustable time that doors remain open after stopping in response to calls.
   b. Car Call: Hold open time adjustable between 3.0 and 5.0 seconds.

c. Hall Call:
   1) Hold open time adjustable between 5.0 and 8.0 seconds.
   2) Use hall call time when car responds to coincidental calls.
d. Provide front or rear selective door operation.

C. Selective Collective Operation – Single Car:
1. Elevators operate via momentary pressure buttons to:
   a. Place hall call by selecting direction of travel at each hall landing (up and down buttons at each intermediate landing, single buttons at each terminal landing).
   b. Place car call by selecting destination floor from inside the car (individual buttons for each floor served).
2. Hall calls, other than calls placed at the landing at which car is standing, start car, and cause the car to stop at first landing for which a call is registered in the direction of travel.
3. Stops are made in order in which landings are reached, irrespective of sequence in which calls are registered.
4. Parked Car (No Demand):
   a. When feature is enabled elevator remains at landing of last assignment (if no further demand) with doors closed, for a predetermined amount of time (programmable for any amount of time). Upon expiration of time, the elevator returns to the main egress landing with the doors closed.
   b. If feature is disabled, if no further demand, the elevator remains at landing of last assignment with the doors closed until a hall call is registered.
5. Car Lanterns:
   a. Lanterns provide audio and visual signal upon each stop, regardless of responding to car or hall call.

D. Selective Leveling: Provide means to limit elevator car speed when traveling between adjacent floors Include distance between adjacent front and rear landings is less than 5'-0" and more than 2'-0".

E. Firefighters' Emergency Operation: Provide equipment and operation in accordance with code requirements. Replace all Firefighters Emergency Operation key switches that control non-modernized elevators in this building to match modernized elevators when first car in group is returned to service.

F. Battery Backup Operation for Emergency Lighting, Communication, and Alarm:
1. Car mounted battery unit with solid-state charger to operate alarm bell, car emergency lighting, and voice communication system.
   a. Car lighting and communication shall be provided with a minimum of 4 hours of operation on back-up power during a loss of normal power, and a minimum of 1 hour of operation for car-mounted alarm and any remote alarm mounted at the designated level.
   b. Battery to be rechargeable with minimum five-year life expectancy.
   c. Provide constant pressure test button in service compartment of car operating panel.

G. Emergency Car Communication System Operation:
1. Hands-Free Phone System:
   a. New two-way communication instrument in car to provide automatic dialing, tracking, and recall features.
      1) Automatic dialer to include automatic rollover capability with minimum two numbers:
   b. Activated by "Help" button in car or by external telephone call.
   c. Adjacent light jewel l illuminates and flashes when call is acknowledged.

2.7 MACHINE ROOM EQUIPMENT

A. Provide and arrange equipment in existing machine room spaces.

B. Identification: Permanently identify (painted on or securely attached) machine room equipment with minimum 3" characters corresponding to elevator identification.
   1. Driving machine.
   2. Motor drive, transformer, choke/filter.
   3. Controller.
   4. Selector.
   5. Governor.
   6. Main line disconnect switch.
   7. Elevator hoistway pit equipment.

C. Geared Traction Hoist Machine: New.
   1. Provide new geared machine based on specified capacity, speed, and duty.
   2. Provide motor, brake, gears, and demountable drive sheave mounted in proper alignment on a common bedplate.
      a. Motor:
         1) Permanent magnet or AC induction motor connected through worm and gear to drive sheave.
         2) Direct drive, digital, closed-loop velocity encoder.
         3) Include approved manufacturers label as required by the local Authority Having Jurisdiction.
      b. Electromechanical Brake:
         1) Drum or disc type.
         2) Spring applied and electrically released with removable manual brake release.
         3) Brake shoes apply to the braking surface simultaneously and with equal pressure.
         4) Minimize noise during lifting and setting of brake shoes to be undetectable inside any car or outside of the machine room or hoistway.
      c. Gears:
         1) Worm gear accurately machined from steel and provided with a single end double race ball bearing thrust.
         2) Gear housing with a gasketed port to inspect the gear.
      d. Drive Sheave:
         1) Machined with grooves, providing maximum traction with a minimum of cable and sheave wear.
         2) Sealed bearings.
   3. Installation Includes:
      a. Anti-friction bearings with easy access for lubrication.
      b. Drip pans to collect lubricant seepage.
      c. Sheave guards to prevent ropes from leaving sheave grooves.
      d. Sound isolation pads to reduce vibration and noise transmission to the building structure.

D. Solid State Power Conversion and Regulation Unit:
   1. Provide solid state, alternating current, variable voltage, variable frequency (ACV^3F), I.G.B.T. drive designed to operate with the power supply available at the main disconnect.
   2. Performance Requirements:
      a. Conform to IEEE standards 519-2014 for line harmonics and switching noise.
      b. Maximum audible noise in the machine room and surrounding areas not to exceed 80 dBA.
   3. Power Factor: >0.95.

4. Limit current suppress noise and radio frequency interference and prevent transient voltage feedback into main building power supply or emergency power source. Provide internal heat sink cooling fans for the power drive portion of the converter panels.
5. Provide isolation transformers, filters, and chokes to completely isolate the system from the normal building power supply.
6. Isolate unit to minimize noise and vibration transmission.
7. Direct-current power for the operation of hoist machine brake, door operator, dispatch processor, signal fixtures, etc., supplied from separate static power supply.

E. Regenerated Power
1. Provide resistor bank installed on the demand side of the elevator main disconnect to absorb the maximum sustained regenerated power from the motor drive during dynamic braking.
2. Provide resistor bank on the demand side of the elevator main disconnect to absorb and dissipate the maximum sustained regenerated power from the motor drive during dynamic braking.

F. Encoder: Direct drive, solid-state, digital type. Update car position at each floor and automatically restore after power loss.

G. Controller: UL/CSA labeled. New.
1. Compartment: Securely mount all assemblies, power supplies, chassis switches, relays, etc., on a substantial, self-supporting steel frame. Completely enclose equipment with covers. Provide means to prevent overheating.
2. Relay Design: Magnet operated with contacts of design and material to insure maximum conductivity, long life, and reliable operation without overheating or excessive wear. Provide wiping action and means to prevent sticking due to fusion. Contacts carrying high inductive currents shall be provided with arc deflectors or suppressors.
3. Microprocessor-Related Hardware:
   a. Provide built-in noise suppression devices providing a high level of noise immunity on all solid-state hardware and devices.
   b. Provide power supplies with noise suppression devices.
   c. Isolate inputs from external devices (such as pushbuttons) with opto-isolation modules.
   d. Design control circuits with one leg of power supply grounded.
   e. Safety circuits are not to be affected by accidental grounding of any part of the system.
   f. System automatically restarts when power is restored.
   g. System memory is retained in the event of power failure or disturbance.
   h. Equipment is provided with Electro Magnetic Interference (EMI) shielding within FCC guidelines.
4. Wiring: CSA labeled copper for factory wiring. Neatly route all wiring interconnections and securely attach wiring connections to studs or terminals.
5. Permanently mark components (relays, fuses, PC boards, etc.) with symbols shown on wiring diagrams.
6. Monitoring System Interface: Provide controller with serial data link through RJ45 Ethernet connection and install all devices necessary to monitor items outlined herein. Connect monitoring system interface to machine room monitoring compartment and LAN. Wiring from the LAN to the machine room monitoring compartment by others. Provide interface only.

H. Provide manual security override switch on the outside of the elevator controller to enable all car calls.

I. Provide minimum 14-gauge galvanized sheet metal enclosures over any holes or block outs, other than for hoist ropes, in machine room floor. Mount on underside of floor slab.

J. Sleeves and Guards: Provide 2" steel angle guards around cable or duct slots through floor slabs or grating. Provide rope and smoke guards for sheaves, cables, and cable slots in machine room.

K. Machine and Equipment Support Beams: Retain existing in place. Provide all required supplemental supports and attachments. Provide Structural Engineering certification validating size and location of all new support structure provided.

L. Governor, Car: New centrifugal-type, car driven with pull-through jaws and bi-directional shutdown switches. Calibrated and tested with manufacturers' certification data plate as required by code. Provide required bracketing and supports for attachment to building structure.

M. Emergency Brake: New.
1. Provide means to prevent ascending car over-speed and unintended car movement. Installation and operation to comply with Code requirements.
2. Install in compliance with approved drawings.
3. Mount on suitable structural steel supports in machine room.
4. Provide control circuits to enable the device to function as required by Code.

2.8 HOISTWAY EQUIPMENT

A. Provide and arrange equipment in existing hoistways.

B. Guide Rails: Retain main and counterweight guide rails in place.
1. Clean rails and brackets. Remove rust.
2. Check all rail and bracket fastenings and tighten.

C. Buffers, Car: Retain existing. Remove rust and repaint non-machined surfaces.

D. Buffers, Car: Retain existing. Remove rust and repaint non-machined surfaces.

E. Buffers, Counterweight: Retain existing. Remove rust and repaint non-machined surfaces.

F. Deflector, Car and Counterweight 2:1 Sheaves: Refurbish existing if compatible with new machine and hoist ropes. If not, provide new sheaves with machined grooves and sealed bearings. Provide mounting means to machine beams, machine bedplate, car and counterweight structural members, or building structure.

G. Counterweight Frame: Retain existing.
1. Replace any damaged frame sections. Steel members and fastenings to match original manufacturers' engineered specifications.
2. Counterweight Weight Sections:
   a. Adjust or repair retention means to keep existing weight sections and any added weight sections in place during buffer impact.
   b. Add or replace weight sections as required to provide overbalance necessary to comply with traction machine manufacturers' requirements.

H. Counterweight Guide Shoes:
1. New spring dampened roller guide shoes.

I. Counterweight Guard: Metal guard in pit. Retain existing.

J. Governor Rope Tension Sheave and Frame: New. Mount sheave and support frame on pit floor or guide rail. Provide frame with guides or pivot point to enable free vertical movement, required tension, and rope alignment. Adjust to provide quiet operation with no sound detectable from inside any car or outside of the hoistway.

K. Suspension Means: New Traction steel type wire ropes of type specified by machine or drive sheave manufacturer. Fasten with staggered length, adjustable, spring isolated wedge type shackles.

L. Governor Ropes: Governor rope of type specified by governor manufacturer.

M. Terminal Stopping: Provide normal and final devices.

N. Electrical Wiring and Wiring Connections: New.
   1. Conductors and Connections:
      a. Copper throughout with individual wires coded and connections on identified studs or terminal blocks.
      b. Use no splices or similar connections in wiring except at terminal blocks, control compartments, or junction boxes.
      c. Provide 10% spare conductors throughout.
      d. Run spare wires from car connection points to individual elevator controllers in the machine room.
   2. Conduit:
      a. Galvanized steel conduit, EMT, or duct.
      b. Flexible conduit length not to exceed 3’-0”.
   3. Traveling Cables:
      a. Flame and moisture-resistant outer cover. Prevent traveling cable from rubbing or chafing against hoistway or equipment within hoistway.
      b. Provide 12 twisted shielded pairs in addition to wires needed to connect specified items and code required spares.
      c. Tag spares in machine room.
      d. Provide cables from controller to car top.
   4. Auxiliary Wiring:
      a. Connect fire alarm initiating devices, emergency two-way communication system, CCTV, and card reader in each controller in machine room.
      b. Provide machine room demarcation junction boxes for the fire alarm initiating devices, CCTV, security system and card reader interface terminals and relays.
      c. Provide conduit, wiring and connections for the fire alarm initiating devices, emergency two-way communication system, CCTV, security system and card reader interface terminals and relays, from machine room junction box to car controller in machine room.

O. Hoistway Entrance Equipment:
   1. Door Hanger: Retain. Modify hangars to include door retainer mechanism to address failure of primary upper door panel guidance.
   2. Door Hanger Rollers: Replace.
   3. Door Track: Retain. Clean and sand for quiet operation.
   4. Door Interlocks: New. Operable without retiring cam.
   5. Door Closers: Retain: Clean and adjust for smooth and quiet mechanical close of doors.

P. Hoistway Door Unlocking Device: Provide unlocking device including new escutcheon.

Q. Hoistway Access Switches: Mount in wall at top and bottom floors. Provide switch with faceplate. Locate within easy reach to entrance so entrance can be guarded by one technician.

R. Floor Numbers: Stencil paint 4" high floor designations in contrasting color on inside face of hoistway doors or hoistway fascia in location visible from within car.

2.9 HOISTWAY ENTRANCES

A. Provide and arrange equipment in same location as existing entrances.

B. Frames: Retain existing. Professionally sand, fill and paint entrance frames, transoms, and strike jambs at all landings.
1. Provide new Arabic floor designation/tactile marking plates:
   a. Centered at 60" above finished floor.
   b. Located on both side jambs of all entrances.
   c. Minimum 4" high.
   d. Tactile marking indications shall be below Arabic floor designation.
2. Provide plates at main egress landing with “Star” designation.
3. Provide car identification label:
   a. Mounted directly below floor designation/tactile marking plates.
   b. Located on both side jambs at the following levels:
      1) Designated level.
      2) Alternate level.
   c. Finish and design to match floor designation/tactile marking plates.

C. Hoistway Door Panels:
1. New 16-gauge steel, sandwich or pressed with ribbed construction and without binder angles.
2. Provide one leading edge of doors with rubber astragal. Powder coat finish.
3. Provide a minimum of two gibs per panel, one at leading and one at trailing edge with gibs in the sill groove entire length of door travel.
4. Provide one separate 4” steel reinforcement safety gib mounted between door gibs, where not integrated with door gibs.

D. Sight Guards: New 14-gauge, same material and finish as hoistway entrance door panels. Construct without sharp edges.

E. Sills, Hoistway Entrance: Retain existing. Clean. Check and tighten all fastenings.

F. Sill Supports, Hoistway Entrance: Retain existing. Check and tighten all fastenings.

G. Fascia, Toe Guards, and Hanger Covers: Retain existing.
1. Provide as required where damaged or missing.
2. Check and tighten all fastenings.
3. Paint/Stencil floor number on fascia or hoistway wall all floors visible where car doors are initially opened.

H. Struts and Headers: Retain existing. Check and tighten all fastenings.

I. Finish of Frames and Doors: As selected by Purchaser.

2.10 CAR EQUIPMENT

A. Frame: Retain Existing. Check and tighten all fastenings. Adjust as required for plumb and square alignment.

B. Safety Device: Refurbish existing.
   1. Check and tighten all fastenings.
   2. Disassemble, clean, lubricate, and inspect components in compliance with manufacturer's recommended procedures.

C. Platform: Retain existing.
   1. Adjust as necessary for plumb and level alignment.
   2. Reinforce if required.
   3. Check and tighten all fastenings.
   4. Replace isolation pads.

D. Platform Guard:
   1. New extended platform guard to meet Code requirements.
   2. Minimum 0.059" (1.5 mm) thick steel, or material of equivalent strength and stiffness.
   3. Reinforced and braced to car platform front and rear.
   4. Contractor's standard finish.

E. Guide Shoes: Roller type, 6" with three or more spring dampened, sound-deadening rollers per shoe.

F. Finish Floor Covering: Seamless resilient non-slip rubber as approved by the Purchaser. Refer to Appendix A for approved material and finishes.

G. Car Sills: Retain existing. Clean full width. Check and tighten all fastenings.

H. Car Door Panels:
   1. New fully enclosed 16-gauge steel, sandwich construction without binder angles. Constructed with interlocking, stiffening ribs. Leading edges of center-opening doors equipped with rubber astragals full height of panel. Minimum of two gibs per panel, one at leading and one at trailing edge with gibs in the sill groove entire length of door travel. Satin finish stainless steel.

I. Door Hangers: New two-point hanger roller with neoprene roller surface and suspension with eccentric upthrust roller adjustment.

J. Door Track: New bar or formed, cold-drawn removable steel track with smooth roller contact surface.

K. Door Header: New. Construct of minimum 12-gauge steel, shape with stiffening flanges.

L. Car Door Electric Contact: Prohibit car operation unless car door is closed.

M. Door Clutch:
   1. New heavy-duty clutch, linkage arms, drive blocks and pickup rollers or cams to provide positive, smooth, quiet door operation.
   2. Design clutch so car doors can be closed, while hoistway doors remain open.

N. Restricted Opening Device:
   1. Restrict opening of car doors to Code required limit outside unlocking zone.
   2. Adjust for smooth and quiet operation with operating noise undetectable from inside any car or outside of the hoistway.
   3. Plunger type restrictors not acceptable.
   4. Utilize mechanical angle to prevent door opening.

O. Door Operator:
   1. New high-speed, heavy-duty door operator capable of opening doors at no less than 2.5 fps.
   2. Accomplish reversal in no more than 2½" of door movement.
   3. Solid-state door control with closed loop circuitry to constantly monitor and automatically adjust door operation based upon velocity, position, and motor current.
   4. Maintain consistent, smooth, and quiet car door operation at all floors, regardless of door weight or varying air pressure.

P. Door Reopening Device:
   1. New black fully enclosed infrared device with full screen infrared matrix or multiple beams extending vertically along leading edge of each door panel to minimum height of 7'-0" above finished floor.

Q. Car Operating Panel:
   1. One car operating panel with faceplate:
      a. Consisting of a metal box containing vandal resistant operating fixtures, mounted behind the car stationary front return panel.
      b. Faceplate shall be hinged and constructed of satin finish stainless steel.
   2. Provide Exposed Pushbuttons to Initiate:
      a. Car call registration.
      b. Alarm.
      c. Door open.
      d. Door close.
      e. Emergency push-to-call communication.
      f. Push/Pull stop switch.
   3. Pushbuttons:
      a. Provide minimum 3/4" diameter raised floor pushbuttons which illuminate to indicate call registration.
      b. Locate operating controls no higher than 48" above the car floor; no lower than 35" for emergency push-to-call button and alarm button.
      c. Identify buttons with cast tactile symbols rear mounted.
   4. Locked Firefighters' Emergency Operation Panel:
      a. Openable by the same key which operates the Fire Operation switch.
      b. Including the following features:
         1) Phase II fire access switch.
         2) Firefighters' visual indication.
         3) Call cancel button.
         4) Stop switch, manually operated.
         5) Door open button.
         6) Door close button.
         7) Floors served.
   5. Service Compartment:
      a. Provide lockable service compartment with recessed flush door.
      b. Door material and finish to match car return panel or car operating panel faceplate.
      c. Include the following controls in lockable service cabinet with function and operating positions identified by permanent signage or engraved legend:
         1) Access switch.
         2) Light switch.
         3) Four-position exhaust blower switch.
         4) Independent service switch.
         5) Constant pressure test button for battery pack emergency lighting.
         6) 120-volt, AC, GFCI protected electrical convenience duplex outlet.

7) Card reader override switch.
8) Switch to select either floor voice annunciation, floor passing tone, or chime.

6. Provide black paint filled (except as noted), engraved, or approved etched signage as follows with approved size and font:
   a. Phase II firefighters' operating instructions on inside face of firefighters' compartment door.
   b. Engrave filled red firefighters' operation on outside face of compartment door.
   c. Building identification car number on main car operating panel.
   d. "No Smoking" on main car operating panel.
   e. Car capacity in pounds on main car operating panel service compartment door.
   f. "Certificate of Inspection on File in Building Office" on main car operating panel.

R. Car Top Control Station: New.
1. Mount to provide safe access and utilization while standing on car top.
2. Operating device with Up and Down direction buttons, a Run button, an Inspection/Automatic switch and Emergency Stop switch.
3. Operating device provides an audible and visible indicator that fire recall has been initiated.
4. Fix station to the car crosshead or provide portable station provided the extension cord and housing is permanently attached to the car crosshead.
5. The car will be operated by constant pressure on the appropriate directional button and the Run button simultaneously.
6. Normal operating devices will be inoperative while this device is in use.

S. Car Top Emergency Audible Signal:
1. Provide on top of each elevator.
2. Activation of Alarm Button or Emergency Stop switch will cause Emergency Audible Signal.
3. Provide auxiliary power supply to provide 1-hr. power in the event of loss of normal power.

T. Work Light and Duplex Plug Receptacle:
1. New GFCI protected outlet at top and bottom of car.
2. Include on/off switch and lamp guard.
3. Provide additional GFCI protected outlet on car top for installation of car CCTV.

2.11 COMMUNICATION

A. Car Communication System:
1. Hands-Free Phone System:
   a. New two-way communication instrument in car with automatic dialing, tracking, and recall features, with shielded wiring to car controller in machine room. System includes:
      1) "Help" button on car operating panel to initiate two-way communication from Car. Button shall match car operating panel pushbutton design.
      2) Auto dialer with automatic rollover capability with minimum two numbers:
      3) Adjacent light jewel illuminates and flashes when call is acknowledged.
      4) "Help" button tactile symbol, engraved signage, and Tactile marking adjacent to button mounted integral with car front return panel.

2.12 CAR ENCLOSURE AND INTERIOR FINISHES

A. Unless specifically identified as "Retain," "Reuse," or "Refurbish," provide new equipment. Contractor may, with Consultant approval, provide new equipment in lieu of refurbishing existing.

B. Refer to Appendix A for approved material and finishes.

C. Car Enclosure and Interior Finishes Passenger Elevator:
1. Verify and document overall car weight prior to removal of any equipment from the existing car frame or car enclosure.
2. Remove all existing interior finishes and shell components, weigh, and document.
3. Provide complete new car enclosure and interior finishes as specified.
4. New cab weight including all new finishes to be verified following completion of modernization. Post modernization weight not to exceed code allowable limits.
5. Provide the following features:
   a. Enclosure Walls: Reinforced 14-gauge furniture textured stainless steel formed panels. Width of individual panels shall not exceed 18". Apply sound-deadening mastic to exterior.
   b. Enclosure Canopy: Reinforced 12-gauge furniture steel formed panels with lockable, hinged emergency exit. Interior finish white reflective baked enamel.
   c. Front and Rear Stationary Return Panels: Reinforced 14 gauge satin finish stainless steel with cutouts for car operating panels and other equipment.
   d. Entrance Columns: Reinforced 14 gauge satin finish stainless steel.
   e. Transom: Reinforced 14 gauge satin finish stainless steel full width of enclosure.
   f. Base: Stainless steel with concealed ventilation cutouts.
   g. Interior Wall Finish: Removable panels, faced and edged, with textured 5WL stainless steel finish.
   h. Ventilation: Two-speed type exhaust blower. Mount to car canopy on isolated rubber grommets. Exhaust blower shall meet noise requirements specified herein.
   i. Lighting: LED fixtures with wiring and hookup. Coordinate with emergency lighting requirements.
   j. Suspended Ceiling: Six-section satin finish stainless-steel panels with lighting cutouts in each panel.
   k. Handrails: Solid stainless steel flat stock bars, 4" x 3/8", across side walls. Return handrail ends to car walls.
   l. Guardrails:
      1) Solid stainless steel flat stock bars, 4" x 3/8", mounted across side walls.
      2) Locate guardrail line at 8" above car floor.
      3) Bolt rails through car walls from back and mount on 1½" deep solid round stainless steel standoff spacers no more than 18" O.C.
      4) Return guardrail ends to car walls.
6. Pads and Buttons: Provide hooks and three-piece removable pads. Two pads covering side walls and adjacent front and rear returns. Provide cutouts to access main car operating panel.

D. Top of Car Guardrail: Provide car top railings where fall hazard exceeds 12". Install guardrails, necessary hardware, and toe board to meet code requirements.

2.13 HALL CONTROL

A. Pushbuttons: New.
1. Provide one riser with surface mounted enlarged faceplate to cover existing wall block out. Provide any cutting and patching required.
2. Vandal resistant pushbuttons for each direction of travel which illuminate to indicate call registration. Provide LED illumination.
3. Approved engraved message and pictorial representation prohibiting use of elevator during fire or other emergency as part of faceplate.
4. Pushbutton design to match car operating panel pushbuttons.

2.14 SIGNALS

A. Hall Position Indicator:
1. New alpha-numeric digital indicator containing floor designations and direction arrows a minimum of 2½" high to indicate floor served and direction of car travel. Provide enlarged faceplate to cover existing wall block out. Provide any cutting and patching required.
2. Provide at the 1st floor.

B. Car Direction Lantern:
1. Provide new flush-mounted car lantern in all car entrance columns.
2. Illuminate up or down LED lights and sound tone once for up and twice for down direction.
3. Illuminate light until the car doors start to close.
4. Sound level shall be adjustable from 20-80 dBA measured at 5'-0" in front of hall control station and 3'-0" off floor.
5. Car direction lenses shall be arrow-shaped with faceplates.
6. Lenses shall be minimum 2½" in their smallest dimension.
7. Provide vandal resistant lantern and light assemblies consisting of series of dots or lines for maximum visibility.

C. Car Position Indicator:
1. New alpha-numeric digital indicator containing floor designations and direction arrows a minimum of 2" high to indicate floor served and direction of car travel.
2. Locate fixture in car operating panel.
3. When a car leaves or passes a floor, illuminate indication representing position of car in hoistway.
4. Illuminate proper direction arrow to indicate direction of travel.

D. Floor Passing Tone: Provide an audible tone of no less than 20 decibels and frequency of no higher than 1500 Hz, to sound as the car passes or stops at a floor served.

E. Voice Synthesizer:
1. New electronic device with easily reprogrammable message and voice to announce car direction, floor, emergency exiting instructions, etc.
2. Once the doors close, the destinations remain illuminated until the car approaches the next destination floor, whereupon the floor numeral or light flashes and the audible signal sounds to denote the next stopping floor.
3. When the doors open, Destination Indicator displays the next floors to be served.

F. Fixture Faceplate Material and Finish:
1. Satin finish stainless steel, all fixtures.
2. Tamper resistant fasteners for all public facing fastenings.

2.15 FIREFIGHTERS CONTROL AND EMERGENCY POWER PANEL

A. Provide and arrange new equipment as directed by Purchaser or Consultant.

B. Firefighters' Control Panel:
1. Locate in building fire control room or as directed by Contractor.
2. Fixture faceplate, satin finish stainless steel, including the following features:
   a. Car position and direction indicator, digital-readout, or LCD flat screen color monitor.
   b. Identify each position indicator with car number.
   c. Indicator showing operating status of car.

d. Two-position firefighters' emergency return switches and indicators with engraved instructions filled red.

3. Where applicable, identify all indicators and manual switches with appropriate engraving.
4. Provide wiring and conduit to control panel.
5. Provide all wiring and conduit (materials and labor) to interconnect elevator controls between machine rooms or controller rooms. Coordinate wiring routing path and logistics with Purchaser.

C. Firefighters' Key Box: Flush-mounted box with lockable hinged cover. Engrave instructions for use on cover per Local Fire Authority requirements.

PART 3 - EXECUTION

3.1 SITE CONDITION INSPECTION

A. Prior to beginning installation of equipment, examine hoistway and machine room areas. Verify no irregularities exist which affect execution of work specified.

B. Inform Purchaser and Consultant of any irregularities in writing prior to commencing work.

C. Do not proceed with installation until work in place conforms to project requirements.

3.2 INSTALLATION

A. Install all equipment as follows:
1. in accordance with Contractor's instructions, referenced codes, specifications, and approved submittals.
2. with clearances in accordance with referenced codes, and specifications.
3. to be easily maintained and/or removed.
4. to afford maximum accessibility, safety, and continuity of operation.

B. Remove oil, grease, scale, and other foreign matter from the following equipment and apply one coat of field-applied machinery enamel.
1. All exposed equipment and metal work installed as part of this work which does not have architectural finish.
2. Machine room equipment, and pit equipment.
3. Neatly touch up damaged factory-painted surfaces with original paint color.
4. Protect machine-finish surfaces against corrosion.

C. Paint machine room and pit floors.

3.3 FIELD QUALITY CONTROL

A. Work at jobsite will be checked during course of installation. Full cooperation with reviewing personnel is mandatory. Accomplish corrective work required prior to performing further installation.

B. Perform complete "Acceptance" level pre-testing as specified in the latest edition of ASME A17.2 "Guide for Inspection of Elevators, Escalators, and Moving Walks" prior to AHJ witnessed acceptance testing. Complete any adjustments, repairs, or replacements necessary to achieve code compliant operation including but not limited to:
1. Car safety.
2. Car emergency communications. Inform Purchaser and Consultant of any noted failures of Purchaser provided and maintained equipment or systems.

3. Car and counterweight buffers.
4. Phase I and II Firefighters' Emergency Operation. Phase I initiated by smoke sensing devices.
5. Power car door operation including door closing force, reopening device, and restricted opening.
6. Suspension members.
7. Compensation members.

C. Have Code Authority acceptance inspection performed and complete corrective work.

D. Provide access to installed equipment and elevator personnel assistance for Consultants final observation and review requirements.

3.4 ADJUSTING

A. Static balance car to equalize pressure of guide shoes on guide rails.

B. Verify that weights of existing or altered cars, counterweights, and compensation comply with traction machine manufacturers' requirements and do not exceed total weights indicated on approved submittals.

C. Lubricate all equipment in accordance with Contractor's instructions.

D. Adjust motors, power conversion units, brakes, controllers, leveling switches, limit switches, stopping switches, door operators, interlocks, and safety devices to achieve required performance levels.

3.5 CLEANUP

A. Keep work areas orderly and free from debris during progress of project. Remove packaging materials daily.

B. Remove all loose materials and filings resulting from work.

C. Clean machine room equipment and floor.

D. Clean hoistways, car, car enclosure, entrances, operating and signal fixtures.

END OF SECTION

Appendix A

Bldg. No.	WSU Bldg. ID	WSU Bldg. Address	WSU ID #	Elevator Type	Cab Flooring Material (per specifications)	Interior Wall Finishes (per specifications)
5	**Science Hall**	5045 Cass Avenue, Detroit, MI 48202	005 01	Traction	Seamless Resilient Rubber	5WL hanging panels ???
34	**Student Center Center**	5221 Gullen Mall Detroit, MI 48202	034 03	Traction	diamond plate	5WL hanging panels ???
36	**Reuther Library**	5401 Cass Avenue, Detroit, MI 48202	036 01	Hydraulic	Seamless Resilient Rubber	Plastic laminate panels
42	**Alumni House**	441 Gilmour Mall Detroit, MI 48202	042 01	Hydeaulic	Porcelain tile	Wood Veneer panels
45	**Parking Structure 5**	5501 Anthony Wayne Drive, Detroit, MI 48202	045 01	Hydraulic	Seamless Resilient Rubber	5WL hanging panels
			045 02	Hydraulic		5WL hanging panels
51	**Parking Structure 1**	450 West Palmer, Detroit, MI 48202	051 03	Traction	Seamless Resilient Rubber	5WL hanging panels
			051 04	Traction		5WL hanging panels
71	**5057 Woodward**	5057 Woodward, Detroit, MI 48202	071 01	Traction	Seamless Resilient Rubber	Plastic laminate panels
			071 02	Traction		Plastic laminate panels
			071 03	Traction		Plastic laminate panels
			071 03	Traction		Plastic laminate panels
			071 03	Traction		Plastic laminate panels
88	**Parking Structure 6**	61 Putnam Avenue, Detroit, MI 48202	088 01	Hydraulic	Seamless Resilient Rubber	5WL hanging panels
			088 03	Hydraulic		5WL hanging panels
			088 02	Hydraulic		5WL hanging panels
89	**Biological Sciences**	5047 Gullen Mall, Detroit, MI 48202	089 01	Traction	Seamless Resilient Rubber	Plastic laminate panels
			089 02	Traction	diamond plate (Service)	5WL hanging panels
130	**Faculty / Administration Building**	656 West Kirby Avenue, Detroit, MI 48202	130 03	Hydraulic	Existing to remain	Plastic laminate panels
			130 02	Hydraulic		Plastic laminate panels
			130 01	Hydraulic		Plastic laminate panels
629	**Elliman Clinical Research**	421 East Canfield Avenue	629 01	Hydraulic	Seamless Resilient Rubber	Plastic laminate panels
			629 02	Hydraulic	Seamless Resilient Rubber	Plastic laminate panels
			629 03	Hydraulic	diamond plate (Service)	5WL hanging panels

APPENDIX A

WAYNE STATE UNIVERSITY CAR ENCLOSURE AND INTERIOR FINISH STANDARDS

CAR ENCLOSURE AND INTERIOR FINISHES

A. Passenger Elevator: Retain existing car enclosure and provide new interior finishes.
   1. Check and tighten all fastenings.
   2. Provide new interior finishes as specified herein.
   3. Modify car enclosure for application of new signal and pushbutton fixtures.
   4. Post modernization weight not to exceed code allowable limits.
   5. Provide the following features:
      a. Enclosure: Retain. Apply sound-deadening mastic to exterior.
      b. Stationary Return Panels: Retain.
      c. Entrance Columns: Retain.
      d. Transom: Retain.
      e. Car Door Panels: Fully enclosed 16-gauge steel, sandwich construction without binder angles. Constructed with interlocking, stiffening ribs. Leading edges of center-opening doors equipped with rubber astragals full height of panel. Minimum of two gibs per panel, one at leading and one at trailing edge with gibs in the sill groove entire length of door travel. Satin finish stainless steel.
      f. Base: Stainless steel with concealed ventilation cutouts.
      g. Interior Wall Finish:
         1) Removable panels, faced and edged, with color core plastic laminate. Plastic laminate (HPDL) shall meet or exceed NEMA Standard LDI-1964 for Type 1, 1/16" high pressure general purpose laminate.
         2) Color and finish as selected by Purchaser.
         3) 5WL hanging panels with #4 stainless steel reveals between panels.

      h. Ventilation: Two-speed exhaust blower. Mount to car canopy on isolated rubber grommets. Exhaust blower shall meet noise requirements specified herein.
      i. Lighting: LED fixtures with wiring and hookup. Coordinate with emergency lighting requirements.
      j. Suspended Ceiling: Six-section satin finish stainless-steel panels with lighting cutouts in each panel.
      k. Handrails: Solid stainless steel flat stock bars, 4" x 3/8", across rear and side walls. Return handrail ends to car walls.
      l. Cab Flooring, provide floor covering per below:
         1) Porcelain tile, 12"x24"x3/8" running bond pattern, thin set mortar, 1/16" joints with non-sanded grout, final selection by Owner, provide allowance of $10/sf for tile cost with 10% waste.
         2) Luxury Vinyl Tile, 6"x36", random linear pattern, zero VOC adhesive as recommended by the manufacturer, final selection by Owner, provide allowance of $5/sf for tile cost with 10% waste.
         3) Diamond Plate, 1/8" thick aluminum, mill finish 6061, seamless where possible, minimal seams if cab width exceeds sheet width. Sand all edges smooth, secure with 1/8" self-tapping aluminum or stainless-steel fasteners ½" from edge of panel @ 10" oc along edges, and in field. Trowel zero VOC adhesive over 100% of cab floor prior to installation of diamond plate and roll 100 lb. roller over plate to ensure adhesion.
         4) Seamless resilient non-slip rubber or vinyl with sealed edges

5) Pads and Buttons: Where no service elevator available in the building, provide hooks and three-piece removable pads. Two pads covering side walls and adjacent front returns and one covering rear wall. Provide cutouts to access main car operating panel.

B. Service Elevator: Retain existing car shell enclosure and provide new interior finishes.
   1. Check and tighten all fastenings.
   2. Provide new interior finishes as specified herein.
   3. Modify car enclosure for application of new signal and pushbutton fixtures.
   4. Post modernization weight not to exceed code allowable limits.
   5. Provide the following features:
      a. Enclosure: Retain. Apply sound-deadening mastic to exterior.
      b. Stationary Return Panels: Retain.
      c. Entrance Columns: Retain.
      d. Transom: Retain.
      e. Car Door Panels: Fully enclosed 16-gauge steel, sandwich construction without binder angles. Constructed with interlocking, stiffening ribs. Leading edges of center-opening doors equipped with rubber astragals full height of panel. Minimum of two gibs per panel, one at leading and one at trailing edge with gibs in the sill groove entire length of door travel. Satin finish stainless steel.
      f. Base: Textured stainless steel with concealed ventilation cutouts.
      g. Interior Wall Finish: Removable panels made of 5WL.
      h. Ventilation: Two-speed exhaust blower. Mount to car canopy on isolated rubber grommets. Exhaust blower shall meet noise requirements specified herein.
      i. Lighting: LED fixtures with wiring and hookup. Coordinate with emergency lighting requirements.
      j. Suspended Ceiling: Six-section satin finish stainless-steel panels with lighting cutouts in each panel.
      k. Handrails: Solid stainless steel flat stock bars, 4" x 3/8", across rear and side walls. Return handrail ends to car walls.
      l. Cab Flooring: Provide a heavy vinyl cab floor covering as selected by the Purchaser.
      m. Pads and Buttons: Three-piece removable pads. Two pads covering side walls and adjacent front returns and one covering rear wall. Provide cutouts to access main car operating panel.

C. Passenger Elevator: New Car Enclosure and Interior Finishes.
   1. Remove all existing interior finishes and shell components, weigh, and document.
   2. Provide complete new car enclosure and interior finishes as specified herein.
   3. Post modernization weight not to exceed code allowable limits.
   4. Provide the following features:
      a. Enclosure Walls: Reinforced 14-gauge furniture steel stainless steel formed panels Width of individual panels shall not exceed 18". Apply sound-deadening mastic to exterior.
      b. Enclosure Canopy: Reinforced 12-gauge furniture steel formed panels with lockable, hinged emergency exit. Interior finish white reflective baked enamel.
      c. Stationary Return Panels: Reinforced 14 gauge satin finish stainless steel with cutouts for car operating panels and other equipment.
      d. Entrance Columns: Reinforced 14 gauge satin finish stainless steel.
      e. Transom: Reinforced 14 gauge satin finish stainless steel full width of enclosure.
      f. Car Door Panels: Fully enclosed 16-gauge steel, sandwich construction without binder angles. Constructed with interlocking, stiffening ribs. Leading edges of center-opening doors equipped with rubber astragals full height of panel. Minimum of two gibs per panel, one at leading and one at trailing edge with gibs in the sill groove entire length of door travel. Satin finish stainless steel.

g. Base: Stainless steel with concealed ventilation cutouts.
h. Interior Wall Finish: Removable panels, faced and edged, with color core plastic laminate. Color and finish as selected by Architect/Purchaser.
i. Ventilation: Two-speed exhaust blower. Mount to car canopy on isolated rubber grommets. Exhaust blower shall meet noise requirements specified herein.
j. Lighting: LED fixtures with wiring and hookup. Coordinate with emergency lighting requirements.
k. Suspended Ceiling: Six-section satin finish stainless-steel panels with lighting cutouts in each panel.
l. Subfloor; 5/8" thick marine grade plywood.
m. Cab Flooring: Provide floor covering per below:
    1) Porcelain tile, 12"x24"x3/8" running bond pattern, thin set mortar, 1/16" joints with non-sanded grout, final selection by Owner, provide allowance of $10/sf for tile cost with 10% waste.
    2) Luxury Vinyl Tile, 6"x36", random linear pattern, zero VOC adhesive as recommended by the manufacturer, final selection by Owner, provide allowance of $5/sf for tile cost with 10% waste.
    3) Diamond Plate, 1/8" thick aluminum, mill finish 6061, seamless where possible, minimal seams if cab width exceeds sheet width. Sand all edges smooth, secure with 1/8" self-tapping aluminum or stainless-steel fasteners ½" from edge of panel @ 10" oc along edges, and in field. Trowel zero VOC adhesive over 100% of cab floor prior to installation of diamond plate and roll 100 lb. roller over plate to ensure adhesion.
    4) Seamless resilient non-slip rubber or vinyl with sealed edges
n. Handrails: Solid stainless steel flat stock bars, 4" x 3/8", across rear and side walls. Return handrail ends to car walls.
o. Pads and Buttons: Where no service elevator available in the building, provide hooks and three-piece removable pads. Two pads covering side walls and adjacent front returns and one covering rear wall. Provide cutouts to access main car operating panel.

D. Service Elevator: New Car Enclosure and Interior Finishes.
1. Remove all existing interior finishes and shell components, weigh, and document.
2. Provide complete new car enclosure and interior finishes as specified herein.
3. Post modernization weight not to exceed code allowable limits.
4. Provide the following features:
    a. Enclosure Walls: Reinforced 14-gauge furniture steel textured stainless steel formed panels with baked enamel interior finish as selected. Width of individual panels shall not exceed 18". Apply sound-deadening mastic to exterior.
    b. Enclosure Canopy: Reinforced 12-gauge furniture steel formed panels with lockable, hinged emergency exit. Interior finish white reflective baked enamel.
    c. Car Sill:
    d. Stationary Return Panels: Reinforced 14 gauge satin finish stainless steel with cutouts for car operating panels and other equipment.
    e. Entrance Columns: Reinforced 14 gauge textured satin finish stainless steel.
    f. Transom: Reinforced 14 gauge textured satin finish stainless steel full width of enclosure.
    g. Car Door Panels: Fully enclosed 16-gauge steel, sandwich construction without binder angles. Constructed with interlocking, stiffening ribs. Leading edges of center-opening doors equipped with rubber astragals full height of panel. Minimum of two gibs per panel, one at leading and one at trailing edge with gibs in the sill groove entire length of door travel. Satin finish stainless steel.
    h. Base: Textured stainless steel with concealed ventilation cutouts.
    i. Ventilation: Two-speed exhaust blower. Mount to car canopy on isolated rubber grommets. Exhaust blower shall meet noise requirements specified herein.

j. Lighting: LED fixtures with wiring and hookup. Coordinate with emergency lighting requirements.
k. Suspended Ceiling: Six-section satin finish stainless-steel panels with lighting cutouts in each panel.
l. Handrails: Solid stainless steel flat stock bars, 4" x 3/8", across rear and side walls. Return handrail ends to car walls.
m. Guardrails:
    1) Solid stainless steel flat stock bars, 4" x 3/8", mounted across rear and side walls.
    2) Locate guardrail line at 8" above car floor.
    3) Bolt rails through car walls from back and mount on 1½" deep solid round stainless steel standoff spacers no more than 18" O.C.
    4) Return guardrail ends to car walls.
    5) Pads and Buttons: Three-piece removable pads. Two pads covering side walls and adjacent front returns and one covering rear wall. Provide cutouts to access main car operating panel.
n. Cab Flooring:
    1) Seamless resilient non-slip rubber or vinyl with sealed as selected by the Owner.

E. Freight Elevator Enclosure: Car weight to be verified prior to removal of interior cab finishes/cab enclosure. Post modernization weight not to exceed code allowable limits. Provide the following features:
1. Enclosure Walls: Reinforced 10-gauge furniture steel formed panels no more than 20" wide with light-proof joints.
    a. Baked enamel finish as selected.
    b. Provide recess in car side wall for recessed mounting of car operating panel.
2. Enclosure Canopy:
    a. Reinforced 12-gauge furniture steel formed panels no more than 20" wide with light-proof joints and Hinged emergency exit.
    b. Interior finish white reflective baked enamel.
    c. Lighting: Recessed LED down lights with on/off switch in car operating panel. Recess mount fixture flush with inside surface of car top. Provide steel guard on car top over fixture.
    d. Bumper Rails: Two rows of 2" x 12" oak or maple bumpers mounted on both sides and rear of the car.
        1) Locate bottom rail at floor level and top rail at 36" above the car floor.
        2) Bolt rails through car walls with bolt and captive nuts on exterior of wall panel sections on 18" centers.
        3) Finish both upper and lower top edges with a 45-degree chamfered edge to eliminate collection of trash.
        4) Finish ends of upper and lower bumpers on side walls to 45° chamfer to eliminate carts and people from hitting blunt ends.
        5) Flooring: Provide cab flooring which is 1/8” aluminum diamond plate.

DIVISION 14

SECTION 142201

TRACTION SPECIFICATIONS FOR

ONE (1) ELEVATOR

AT

STUDENT CENTER

5221 GULLEN MALL

DETROIT, MI

DATE: March 27, 2014

SECTION 142201 –
ELECTRIC TRACTION ELEVATOR MODERNIZATION

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes modernization of traction elevator as follows:
1. One (1) geared passenger elevator, Car #3.

B. Products Installed but Not Furnished Under This Section:
1. CCTV camera provisions.

1.2 DEFINITIONS

A. All technical terms in these Contract Documents are used as defined in the latest edition of American National Standard Safety Code for Elevators, Dumbwaiters, Escalators, and Moving Walks ASME A17.1. and A17.2.

B. ELEVATOR CONSULTANT or CONSULTANT refers to Lerch Bates Inc. (Lerch Bates).

C. PURCHASER refers to Wayne State University.

D. CONTRACT or CONTRACT DOCUMENTS consists of the Agreement, Conditions of Contract, Specifications, Addenda, Drawings if included, and Alternates if accepted.

E. CONTRACTOR or ELEVATOR CONTRACTOR refers to any persons, partners, firm, or corporation having a contract with Purchaser to furnish labor and materials for the execution of work required.

F. CONTRACT AWARD refers to Purchaser's verbal or written award for work required.

G. SUBCONTRACTOR refers to any persons, partners, firm, or corporation having a contract with Contractor to furnish labor and materials for the execution of work required.

H. PROVIDE means "furnish and install."

I. MANUFACTURER means either the Original Equipment Manufacturer (OEM) or the principal manufacturer of a component or system.

J. RETAIN means, unless otherwise specified, the existing equipment is to be left in place with no alterations and no change in the original manufacturer's designed performance or functionality. Items that are "retained" shall be thoroughly cleaned in place and adjusted to achieve originally designed function.

K. REFURBISH means, unless otherwise specified, the existing equipment is to be cleaned, repainted, repaired, and parts replaced to put the equipment into a condition to provide the same appearance, performance, and functionality as the equipment provided when it was originally installed. Unless otherwise specified, the scope of replacement of components is limited to those items currently available for purchase as replacement parts from the manufacturer or after-market suppliers approved by the manufacturer.

L. REUSE means that the Contractor shall carefully remove equipment from the existing installation, avoiding any damage or additional wear. Store in a safe location to maintain equipment in its pre-removal condition. Reinstall and incorporate into the modernized elevator installation using the same procedures and recommendations provided by the manufacturer of the equipment.

M. INCLUDES or INCLUDING means including the items specified but not limited solely to those items if additional work or components are required to achieve the specified outcome.

N. CALL BACK means a request from the Purchaser to the Contractor to provide a technician on site to evaluate an elevator that is out of service or not functioning properly, rectify the root cause of the malfunction, and place the unit back into normal service.

O. Words in the singular shall include the plural whenever applicable or context so indicates.

1.3 WORK INCLUDED

A. Modernize one traction passenger elevator.

B. All engineering, equipment, labor, and permits required to satisfactorily complete elevator modernization required by Contract Documents.

C. Provide all required staging, hoisting, and movement of new equipment, reused equipment, or removal of existing equipment.

D. Applicable conditions of Purchaser's General, Special, and Supplemental Conditions.

E. Warranty maintenance as described herein.

F. Cartage and Hoisting: All required staging, hoisting, and movement to, on, and from the site including new equipment, retained equipment, or dismantling and removal of existing equipment.

G. Unless specifically identified as "Retain," "Reuse," or "Refurbish," provide new equipment. Contractor may, with approval prior to quotation, provide new equipment in lieu of refurbishing existing.

H. Reference to a device or a part of the equipment applies to the number of devices or parts required to complete the installation.

I. Provisions of this specification are applicable to all elevators unless identified otherwise.

J. Provide hoistway, pit, and machine room barricades.

K. Provide temporary and permanent pit ladders, working platforms, inspection platforms, and guard rails required to comply with applicable Building Code and AHJ requirements.

L. Scope of Contract includes, but is not limited to, the following:
1. Coordination, scheduling, and management of work of component suppliers and subcontractors.
2. Modernize or furnish and install equipment as specified utilizing existing and/or modified hoistways and machine rooms.

M. Specific item of required work which cannot be determined to be included in another contract is thereby determined to be included in prime contract.

1.4 CONSULTANT STATUS

A. Consultant shall act as Purchaser's and/or Building Management's representative on all matters pertaining to required work. Consultant shall interpret Contract Documents, analyze Contractor's quotations, review Contractor's suggested alternates, review all Contractor's submittals, approve billings, review technical details and construction procedure, perform work progress reviews, and review and test completed work for compliance with Contract Documents prior to acceptance of work by Purchaser.

B. Field Review Scheduling: Schedule progress and final work reviews with Consultant. Reply promptly, in writing, to corrective work indicated on Consultant's progress and/or final review reports, indicating status and schedule for completion. Consultant anticipates scheduled site review appointments will be met.

1.5 CODES AND ORDINANCES

A. All work covered by these Contract Documents is to be done in full accord with national code, state and local codes, ordinances, and elevator safety orders in effect at time elevator alteration permit issuance. All requirements of local Building Department and fire jurisdiction are to be fulfilled by Contractor and its Subcontractors.

1.6 PRIME CONTRACTOR'S DUTIES

A. Prime Contractor's duties include the following:
1. Provide and pay for labor, materials and equipment, tools, construction equipment and machinery, and other facilities and services necessary for proper execution and completion of required work.
2. Pay for legally required sales, consumer, and state remodel taxes.
3. Secure and pay for required permits, fees, and licenses necessary for proper execution and completion of required work, as applicable at time of quotation due date.
4. Give required notices.
5. Comply with codes, ordinances, rules, regulations, orders, and other legal requirements of public authorities which bear on performance of required work.
6. Promptly submit written notice to Consultant of observed variance of Contract Documents from legal requirements.
7. Enforce strict discipline and good order among employees. Do not employ persons unskilled in assigned task.

1.7 STAGING AREA

A. An equipment staging area will be available for use by Contractor. Contractor shall restrict usage to area designated and shall notify Purchaser prior to storing of any large equipment which will impose heavy concentrated loading on floor area. Do not store such equipment until approval is received.

1.8 WORK SEQUENCE

A. Construct work in stages.

1.9 WORKING HOURS

A. Unless otherwise stated below or elsewhere in the Contract Documents, Contractor shall have access to the building for work activities during the following regular building operating hours:

1. 8:00 a.m. to 5:00 p.m., Monday through Friday or as agreed upon by Wayne State University.

B. Contractor shall perform all work that has the potential to result in any of the following conditions outside of regular building operating hours at no additional cost to the Purchaser.
   1. Interruptions or changes in normal automatic operation.
   2. Activation of Firefighter's Emergency Operation Phase I.
   3. Noise levels in excess of 80 dBA measured in any occupied or public space.
   4. Transport of large equipment through public or tenant spaces.
   5. Coordination with WSU staff for planned events in the building.

1.10 CONTRACTOR USE OF PREMISES

A. Confine operations at site to areas permitted by law, ordinances, permits, Contract Documents, and Purchaser's specific instructions.

B. Do not unreasonably encumber site with materials or equipment. Staging area will be located as directed by Purchaser.

C. Do not load structure with weight that will endanger structure. Coordinate with Purchaser.

D. Assume full responsibility for protection and safekeeping of tools and products stored on or off premises.

E. Move stored products which interfere with operations of building or the operations of other trades.

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

1.11 CONCURRENT MODERNIZATION WORK AND BUILDING OPERATION

A. This project is a major elevator modernization in an existing building which is a private residence and open for public business. The building will continue to operate throughout all phases of required work. It is essential that Contractor give special attention and priority to all matters concerning project safety, protection from dust and loose materials, reduction of noise level, protection from water and air infiltration into building, and maintenance of neat, sightly conditions in and around work areas inside and outside of building. Packaging, scrap materials, and demolition debris shall be promptly removed from building and site on a daily basis.

B. At all times Contractor shall provide clearly visible warning and directions signs. At all times give special attention to building entrances, exits, and proper safe exiting through work areas as required by law.
   1. Barricade design must be approved by client prior to start of modernization work.
   2. Standard folding maintenance barricades are not acceptable.

C. Contractor shall consult Purchaser and other Contractors to establish and maintain safe temporary routes including, but not limited to, proper barricades, walking surfaces, lighting, fire protection, exiting, warning and directional signs, and general protection of persons from all hazards in accordance with OSHA Standards due wholly or partially to its operations.

1.12 ALTERNATES

A. Alternate: Battery Rescue Operation
   1. Upon loss of normal power automatically lower or raise the car to the nearest landing depending on the load in the car.

2. Upon arrival at the landing, the elevator doors shall open automatically and remain open until regular door time has expired; the elevator shall then be removed from service.
3. Include solid-state charger and testing means mounted in a common metal container.
4. Battery to be rechargeable lead acid or nickel cadmium with a ten-year life expectancy.
5. Upon restoration of normal power, the elevator shall automatically resume normal operation.

1.13 RELATED WORK BY ELEVATOR CONTRACTOR

A. Architectural and Structural, Hoistway and Hallway:
1. Wall blockouts and fire rated closure for control and signal fixture boxes which penetrate walls.
2. Cutting and patching walls and floors.
3. Decorating of walls and floors.
4. Erect front hoistway wall after elevator entrances are installed.
5. Protect open hoistways and entrances during construction per OSHA Regulations.
6. Protect car enclosure, hoistway entrance assemblies, and special metal finishes from damage.
7. Where painted, professionally sand, fill and paint entrance frames, transoms, and strike jambs at all landings.
8. Where painted, professionally sand, fill and paint landing doors and sight guards at all landings.
9. Remove existing finished cab flooring. Install new flooring.

B. Architectural and Structural, Machine Room:
1. Self-closing and locking rated access door. Include Signage: “ELEVATOR MACHINE ROOM” and “AUTHORIZED PERSONNEL ONLY.”
2. Paint walls and ceiling for improved light reflectivity.
3. Class “ABC” fire extinguisher in each elevator machine room.
4. Seal fireproofing to prevent flaking.
5. Access for hoisting. Provide access for hoisting to machine room and repair same when complete.

C. Plumbing and Fire Protection:
1. Pit Sump or Drain: Indirect waste drain or sump with flush grate and pump. Sump pump/drain capacity minimum 3,000 gallons per hour per elevator.

D. Mechanical:
1. Machine Room: Ventilation and heating. Maintain temperature range of 55°-90° F. Maintain maximum 80% relative humidity, non-condensing.

E. Electrical Service, Conductors, and Devices:
1. Machine Room Lighting: Guarded LED fixtures to provide minimum 19 footcandles average illumination. Provide toggle switch adjacent to strike side of machine room door. Occupancy sensor is not allowed.
2. Pit Lighting: Guarded LED fixtures to provide minimum 10 footcandles average illumination.
3. GFCI convenience outlets in pit.
4. Non-GFCI convenience outlet in pit for sump pump.
5. GFCI convenience outlets in machine room or control space.
6. GFCI convenience outlets in machine space.
7. Heavy-duty three-phase mainline copper power feeder to terminals of each elevator controller in the machine room with protected lockable “open” disconnecting means. Auxiliary contacts to disable emergency battery lowering.
8. Single-phase copper power feeder to each elevator with individual protected lockable “open” disconnecting means located in machine room for utilization equipment:
   a. Car lighting and blower.

b. Pit sump pump.
c. CCTV camera.
d. Firefighters' control status panel.

9. Emergency telephone line to each individual elevator control panel in elevator machine room.
10. Provide a dedicated phone line at locations that call for Master Intercom Stations.
11. Automatic Fire Recall System:
    a. Fire alarm initiating devices in each elevator lobby, for each group of elevators or single elevator.
    b. Fire alarm initiating devices in each elevator machine room.
    c. Fire alarm initiating devices at top of hoistway if sprinklered.
    d. Three Relay Activation Modules for each group of elevators or single elevator. Locate modules within three feet of controller designated by the Elevator Contractor to minimize un-supervised wiring. Program Modules as follows:
        1) PRIMARY: Activate when any hallway device, except primary floor, activates.
        2) ALTERNATE: Activate when hallway device at primary floor activates.
        3) FIRE HAT: Activate when machine room device activates.
    e. Device in machine room and at top of hoistway (if provided) to provide signal for general alarm.
    f. Provide technician from fire alarm contractor for pre-test of system during normal working hours.
    g. Provide technician from fire alarm contractor for acceptance test of system with AHJ during normal or overtime working hours.
    h. Remove fire alarm devices from pit where not required.
    i. Remove fire alarm devices from hoistway overhead where not required.
12. Internet access to each machine room for off-site web access to monitoring system.
13. Conduit from the closest hoistway of each elevator group or single elevator to the firefighters' control room and/or main control console. Coordinate size, number, and location of conduits with Elevator Contractor.
14. Wiring from building CCTV system to elevator controllers and all CCTV equipment.
15. CCTV Cameras, elevator contractor to coordinate and assist with installation of cameras in elevators.
16. Wiring from building security system to elevator controllers and all security system equipment.
17. Card or Proximity Readers, elevator contractor to coordinate and assist with installation of readers in car operating panels or hall stations.
18. Power for Mechanical Equipment: Provide power for HVAC and/or ventilation equipment where applicable.
19. Remove abandoned electrical equipment from machine room and hoistway.
20. Conduit from fire alarm panel to each fire alarm device location at each floor, hoistway, pit and machine room including three relay activation modules in machine room. Provide junction box at each location.
21. Verify electrical supply to the controllers meets the stated requirements. Where applicable, review standby power generator capability to meet stated requirements and absorb regenerated power.

F. Elevator Contractor Related Work
1. Pit access stationary ladder for each elevator. Retractable ladder if provided shall include an electrical contact conforming to ASME A17.1, Rule 2.2.2.4.2.7.

1.14 ACTION AND INFORMATIONAL SUBMITTALS

A. Within sixty (60) calendar days after award of contract and before beginning equipment fabrication, submit shop drawings, and required material samples for review. Allow 30 days for response to initial submittal.
   1. Scaled or Fully Dimensioned Layout: Plan of machine room indicating equipment arrangement, details of car enclosures, and car/hall signal fixtures.
   2. Design Information: Indicate equipment lists, reactions, and design information on layouts.
   3. Power Confirmation Information: Design for existing conditions.
   4. Fixtures: Shop drawings.
   5. Finish Material: If requested, submit 3" x 12" samples of actual finished material for review of color, pattern, and texture. Compliance with other requirements is the exclusive responsibility of the Contractor. Include, if requested, signal fixtures, lights, graphics, Braille plates, and detail of mounting provisions.
   6. Design Information: Provide calculations verifying the following:
      a. Adequacy of existing electrical provisions.
      b. Machine room heat emissions in B.T.U.
      c. Adequacy of existing car platform structure for intended loading.
      d. Adequacy of plunger wall thickness for intended loading.
   7. Written Maintenance Control Program (MCP) specifically designed for the equipment included under this contract. Include any unique or product specific procedures or methods required to inspect or test the equipment. In addition, identify weekly, bi-weekly, monthly, quarterly, and annual maintenance procedures, including statutory and other required equipment tests.

B. Submittal review shall not be construed as an indication that submittal is correct or suitable, or that the work represented by submittal complies with the Contract Documents. Compliance with Contract Documents, code requirements, dimensions, fit, and interface with other work is Contractor's responsibility.

C. Acknowledge and/or respond to review comments within 14 calendar days of return. Promptly incorporate required changes due to inaccurate data or incomplete definition so that delivery and installation schedules are not affected. Identify and cloud drawing revisions, including Contractor elective revisions on each re-submittal. Contractor's revision response time is not justification for equipment delivery or installation delay.

1.15 PURCHASER'S INFORMATION

A. Non-Proprietary Equipment Design: Provide two (2) sets of digital and three (3) sets of neatly bound written information necessary for proper maintenance and adjustment of equipment within 30 days following final acceptance. Final retention will be withheld until data is received by Purchaser and reviewed by Consultant. Include the following as minimums:
   1. Straight-line wiring diagrams of "as-installed" elevator circuits with index of location and function of components. Mount one set wiring diagrams on panels, racked, or similarly protected, in elevator machine room. Provide remaining set rolled and in a protective drawing tube. Maintain all drawing sets with addition of all subsequent changes. These diagrams are Purchaser's property. A legend sheet shall be furnished with each set of drawings to provide the following information:
      a. Name and symbol of each relay, switch, or other apparatus.
      b. Location on drawings, drawing sheet number and area, and location of all contacts.
      c. Location of apparatus, whether on controller or on car.

2. Written Maintenance Control Program (MCP) specifically designed for the equipment included under this contract. Include any unique or product specific procedures or methods required to inspect or test the equipment. In addition, identify weekly, bi-weekly, monthly, quarterly, and annual maintenance procedures, including statutory and other required equipment tests.
3. Printed instructions explaining all operating features.
4. Complete software documentation for all installed equipment.
5. Lubrication instructions, including recommended grade of lubricants.
6. Parts catalogs listing all replaceable parts including Contractor's identifying numbers and ordering instructions.
7. Four sets of keys for all switches and control features properly tagged and marked.
8. Diagnostic test devices together with all supporting information necessary for interpretation of test data, troubleshooting of elevator system, and performance of routine safety tests.
9. The elevator installation shall be a design which can be maintained by any licensed elevator maintenance company employing journeymen mechanics, without the need to purchase or lease additional diagnostic devices, special tools, or instructions from the original equipment Contractor.
    a. Provide onsite capability to diagnose faults to the level of individual circuit boards and individual discrete components for the solid-state elevator controller.
    b. Provide a separate, detachable device, as required, to the Purchaser as part of this installation if the equipment for fault diagnosis is not completely self-contained within the controller. Such device shall be in possession of and become property of the Purchaser.
    c. Installed equipment not meeting this requirement shall be removed and replaced with conforming equipment at no cost to the Purchaser.
10. Provide upgrades and/or revisions of software during the progress of the work, warranty period and the term of the ongoing maintenance agreement between the Purchaser and Contractor.

1.16 PERMITS, TESTS, AND CERTIFICATES

A. Permits:
    1. Secure and pay for all permits required for Work to be performed, including but not limited to:
        a. Municipal and State permits.
        b. Device or equipment removal permits.
        c. Hot works permits.
        d. Confined space access permits.
    2. Post, maintain, and renew all permits in compliance with local governmental requirements.
    3. Obtain documentation of final AHJ close-out of all permits. Provide copies to Purchaser.

B. Tests and Inspections:
    1. Schedule and perform all tests required in accordance with procedure described in ASME A17.2 Guide for Inspection of Elevators, Escalators, and Moving Walks in the presence of Authorized Representative of the AHJ and Owner's representative.

C. Certificates: Obtain, pay for, and deliver to Purchaser with all temporary and final inspection certificates provided by proper governing authorities.

D. Violations: Resolve any outstanding violations on record with the AHJ on devices being removed prior to final acceptance by the Purchaser.

1.17 QUALITY ASSURANCE

A. Compliance with Regulatory Agencies: Comply with most stringent applicable provisions of currently enforced codes, laws, and/or authorities, including revisions and changes in effect.

B. Inspections: Provide access to areas where work is being performed for the Consultant at any time throughout the project.

1.18 WARRANTY

A. Material and workmanship of installation shall comply in every respect with Contract Documents. Correct defective material or workmanship which develops within one (1) year from date of final acceptance of all work to satisfaction of Purchaser and Consultant at no additional cost, unless due to ordinary wear and tear, or improper use or care by Purchaser. Perform maintenance in accordance with terms and conditions indicated in the Preventive Maintenance Agreement.

B. Defective is defined to include, but not be limited to operation or control system failures, car performance below required minimum, excessive wear, unusual deterioration, or aging of materials or finishes, unsafe conditions, the need for excessive maintenance, abnormal noise, or vibration, and similar unsatisfactory conditions.

C. Retained Equipment: All retained components, parts, and materials shall be cleaned, checked, modified, repaired, or replaced, so each component and its parts are in like new operating condition. Retained equipment must be compatible for integration with new systems. All retained equipment shall be covered under the warranty provisions, of Article 1.18, A. & B above. No prorations of equipment or parts shall be allowed on preventive maintenance contract between the Contractor and Purchaser.

D. Make modifications, requirements, adjustments, and improvements to meet performance requirements of Section 142201.

1.19 WARRANTY MAINTENANCE

A. Provide preventive maintenance and 24-hour emergency callback service for one (1) year commencing on date of final acceptance of modernized elevator by Purchaser. Systematically examine, adjust, clean, and lubricate all equipment. Repair or replace defective parts using parts produced by the Contractor of installed equipment. Maintain elevator machine room, hoistway, and pit in clean condition.

B. Use competent personnel, acceptable to Purchaser, employed and supervised by the Contractor.

C. Warranty Maintenance Hours: Contractor shall perform one (1) hour per unit per month for preventive maintenance.

D. All work, except as otherwise noted, including unlimited call-back service, shall be performed during the building's regular hours. These hours are 8:00 a.m. to 5:00 p.m.

E. Response Time for Callback Service:
1. During regular time hours, Contractor shall arrive at Property within 60 minutes from time of notification of equipment problem or failure by Purchaser.
2. Contractor shall arrive at Property in response to passenger entrapment calls within 30 minutes from time of notification by Purchaser.

F. Purchaser retains the option to delete cost of warranty maintenance from modernization equipment contract and remit twelve equal installments directly to Contractor during period in which maintenance is being performed.

1.20 DELIVERY, STORAGE, AND HOISTING

A. General:
1. Protect all equipment and exposed finishes during delivery, handling, and installation until completion of project.
2. Replace damaged materials with new, with no additional cost for material or labor to Purchaser.

B. Delivery and Storage:
1. Ensure manufacturers' original packing adequately protects materials during delivery.
2. Deliver materials, identical to accepted samples, to the site ready for use in the manufacturer's original and unopened containers and packaging, bearing labels as to type of material, brand name and manufacturer's name.
3. Store materials under cover in a secure, dry, and clean location, off the ground. Remove delivered materials that are damaged or otherwise not suitable for installation from the job site and replace with acceptable materials.
4. Store and protect all materials in space provided or designated by the Purchaser against damage, stains, scratches, corrosion, weather, construction debris, and other environmental conditions.
5. Comply with Purchaser's requirements for access to and use of any building loading docks, parking lots, parking garages, and any interior spaces required for delivery and storage.

C. Hoisting: Arrange and pay for all required hoisting and movement of equipment.

1.21 COORDINATION

A. Prime contracts are defined below, and each is recognized to be a major part of required work to be performed concurrently in close coordination with work of other Contractors.
1. This Contract: Elevator Modernization including associated related work specified herein.

B. Scope of Contract includes, but is not limited to, the following:
1. Coordination, scheduling, and management of work of component suppliers and subcontractors.
2. Modernize or furnish and install equipment as specified utilizing existing and/or modified hoistways and machine rooms.
3. Specific item of required work which cannot be determined to be included in another contract is thereby determined to be included in prime contract.

C. Inspections: Provide access to areas where work is being performed for the Consultant and Purchaser at any time throughout the project.

PART 2 - PRODUCTS

2.1 REFERENCES

A. American National Standard Institute (ANSI): A117.1, Accessible and Usable Buildings and Facilities.

B. American Society of Mechanical Engineers:
1. ASME A17.1, Safety Code for Elevators and Escalators.
2. ASME A17.2, Guide for Inspection of Elevators, Escalators, and Moving Walks.
3. ASME A17.5, Elevator and Escalator Electrical Equipment.
4. ASME A17.6, Standard for Elevator Suspension, Compensation, and Governor Systems.

C. National Fire Protection Association (NFPA):
1. NFPA 70, National Electric Code.

2. NFPA 80, Fire Doors and Windows.
3. NFPA 101, Life Safety Code.
4. NFPA 13, Installation of Sprinkler Systems.

D. International Building Code (IBC).

E. City of Detroit Elevator Code.

F. Accessibility:
1. American National Standard Institute (ANSI): A117.1, Accessible and Usable Buildings and Facilities.
2. ADAAG, Americans with Disabilities Act Accessibility Guidelines.

2.2 MANUFACTURERS AND PRODUCTS

A. Approved Elevator Contractors:
1. Approved subject to compliance with the requirements of the contract and specifications.
   a. KONE
   b. Lardner Elevator
   c. Otis Elevator
   d. Schindler Elevator Corporation
   e. TK Elevator
   f. Toledo Elevator
   g. Approved Equal

B. Approved Elevator Components:
The following Manufacturers/Assemblers are approved for the specific components listed below, subject to the requirements of the contract:
1. Car and Hall Signal Fixtures:
   a. Innovation
   b. MAD Fixtures
   c. Monitor
   d. PTL
2. Compensation Chains and Guides:
   a. Draka
3. Controllers:
   a. GAL GALaxy
   b. Elevator Controls Corporation
   c. Smart Rise
4. Door Protective Device:
   a. Adams
   b. GAL
   c. Janus
   d. T.L. Jones
   e. Tri-Tronics
5. Elevator Cab Interiors:
   a. Architectural Metals
   b. A Better Elevator Co.
   c. G&R
   d. Globe Architectural & Metals
   e. Snap Cab
   f. Weir Inc.

6. Guide Rails:
    a. AFD Industries
    b. Montefero
    c. Savero
7. Guide Shoes
    a. Delco
    b. ELSCO
    c. GAL
    d. Hollister-Whitney
8. Hoist Machines:
    a. Hollister Whitney
    b. Imperial Electric
    c. Titan
    d. Torin
9. Hoist Motors:
    a. Baldor
    b. General Electric
    c. Imperial Electric
    d. Reuland Electric
10. Hoistway Entrances and Door Panels:
    a. Columbia
    b. EDI/ECI
    c. Elevator Products
    d. Gunderlin
    e. Tyler
    f. United Cab
11. Passenger Elevator Door Equipment (Operators, Tracks, Hangers, and Closers):
    a. ECI
    b. GAL
    c. Wittur
12. Rope Brake:
    a. Hollister Whitney
13. Traveling Cables:
    a. Draka
    b. James Monroe
14. Two-Way Communication Device:
    a. Janus
    b. K-Tech
    c. Kings III
    d. Rath Microtec
    e. Wurtec
15. VVVF Power Drives:
    a. KEB
    b. Magnetek
    c. Mitsubishi
    d. TorqMax
    e. Yaskawa
16. VVVF Emergency Power Systems:
    a. Reynolds & Reynolds
17. Wire Ropes:
    a. Bethlehem
    b. Draka

c. Paulsen
d. Wayland

2.3 PERFORMANCE REQUIREMENTS

A. Car Speed: ±3% of contract speed under any loading condition.

B. Car Capacity: Safely lower, stop, and hold 125% of rated load.

C. Car Stopping Zone: ±1/4" under any loading condition.

D. Door Times: Seconds from start to fully open or fully closed:
1. Door Open: 2.4 seconds. Door Close: 4.2 seconds.

E. Car Floor-to-Floor Performance Time: Seconds from start of doors closing until doors are 3/4 open for center-opening doors or 1/2 open for side-opening doors, and car is level and stopped at next successive floor under any loading condition or travel direction:
1. 13.0 seconds. Floor Height: 12’-10” between floors 1 and 2.

F. Noise and Vibration Control:
1. Airborne Noise:
a. Measured noise level of elevator equipment and its operation shall not exceed 60 dBA inside car under any condition including door operation and car ventilation exhaust blower on its highest speed.
b. Limit noise level in the machine room relating to elevator equipment and its operation to no more than 80 dBA.
c. All dBA readings to be taken 3'-0" off the floor and 3'-0" from the equipment using the “A” weighted scale.
2. Vibration Control: Mechanically isolate all new elevator equipment from the building structure and other components. Minimize objectionable noise and transmission of vibrations to occupied areas of the building.

2.4 ELEVATOR DUTY ALTERATIONS PASSENGER ELEVATOR

ALTERATION SUMMARY		
STUDENT CENTER CAR #3	**EXISTING INSTALLATION**	**MODERNIZED INSTALLATION**
Capacity:	4000 lbs.	No Change
Class of Loading:	Class A	No Change
Contract Speed:	200 fpm	No Change
Roping Configuration:	2:1 Underslung	No Change
Machine Type:	Geared	No Change
Machine Location:	Offset at	No Change
Motor Type:	DC	AC
Motion Control:	Generator Field	VVVF
Operation Control:	Two-Button Selective Collective Automatic	No Change
Floors Served:	Front: B, 1, 2, 4	No Change
Total Entrances:	All Front	No Change
Entrance Type:	Two-Speed Side-Opening	No Change
Entrance Size:	3'-10" wide x 7'-0" high	No Change
Minimum Clear to Underside of Canopy:	8'-0" high	No Change

2.5 MATERIALS

A. All colors will be selected from the Manufacturer's standard range unless custom colors are specified herein.

B. Steel:
   1. Sheet Steel (Furniture Steel for Exposed Work): Stretcher-leveled, cold-rolled, commercial quality carbon steel, complying with ASTM A366, matte finish.
   2. Sheet Steel (for Unexposed Work): Hot-rolled, commercial quality carbon steel, pickled and oiled, complying with ASTM A568/A568M-03.
   3. Structural Steel Shapes and Plates: ASTM A36.

C. Stainless Steel: Type 302 or 304 complying with ASTM A240, with standard tempers and hardness required for fabrication, strength, and durability. Apply mechanical finish on fabricated work in the locations shown or specified, Federal Standard and NAAMM nomenclature, with texture and reflectivity required to match Purchaser's sample. Protect with adhesive paper covering.
   1. No. 4 Satin: Directional polish finish. Graining directions as shown or, if not shown, in longest dimension.
   2. No. 8 Mirror: Reflective polish finish with no visible graining.
   3. Textured: 5WL as manufactured by Rigidized Metals or Windsor pattern 5-SM as manufactured by Rimex Metals or approved equal with .050 inches mean pattern depth with bright directional polish (satin finish).
   4. Burnished: Non-directional, random abrasion pattern.

D. Aluminum: Extrusions per ASTM B221; sheet and plate per ASTM B209.

E. Plastic Laminate: ASTM E84 Class A and NEMA LDI-1964, 1/16", Fire-Rated Grade (GP-50), Type1, 1/16" high pressure general purpose laminate, color and texture as follows:
1. Exposed Surfaces: Color and texture selected by Purchaser.
2. Concealed Surfaces: Contractor's standard color and finish.

F. Fire-Retardant Treated Particle Board Panels: Minimum 3/4" thick backup for natural finished wood and plastic laminate veneered panels, edged and faced as shown, provided with suitable anti-warp backing; meet ASTM E84 Class "I" rating with a flame-spread rating of 25 or less, registered with Local Authorities for elevator finish materials.

G. Natural Finish Wood Veneer: Standard thickness, 1/40" thoroughly dried conforming to ASME/HPMA HP-1983, Premium Grade. Place veneer, tapeless spliced with grain running in direction shown, belt and polish sanded, book matched. Species and finish designated and approved by Purchaser and/or Consultant.

H. Paint: Clean exposed metal parts and assemblies of oil, grease, scale, and other foreign matter and factory paint one shop coat of standard rust-resistant primer. After erection, provide one finish coat of industrial enamel paint. Galvanized metal need not be painted.

I. Prime Finish: Clean all metal surfaces receiving a baked enamel paint finish of oil, grease, and scale. Apply one coat of rust-resistant primer followed by a filler coat over uneven surfaces. Sand smooth and apply final coat of primer.

J. Baked Enamel Finish: Prime finish per above. Unless specified "prime finish" only, apply and bake three additional coats of enamel in the selected solid color.

K. Entrance Field Paint: Clean all surfaces to remove dirt and grease. Sand and finish surfaces as necessary to remove pits and scratches and prepare surface for painting. Apply filler to ensure smooth surface; sand and apply one coat of electrostatic enamel in the selected solid color.

L. Refinishing of natural metals: Remove existing protective finish. Buff as necessary to remove scratches. Regrain or finish as specified and protect as indicated for particular metal type.

M. Entrance Support Equipment within Hoistway: Include strut angles, headers, sill support angles, fascia, hanger covers, etc. Clean, remove, and check for corrosive activity. Replace components which exhibit severe deterioration. Tighten all fastenings.

2.6 OPERATION

A. General:
1. Cars automatically slow down and stop level at floors in response to car and landing calls with stops made in sequence in the established direction of travel, regardless of order in which buttons are pressed.
2. Landing calls are canceled when the assigned car arrives at the landing.
3. Automatic Dispatch Failure: Provide auxiliary dispatch system to automatically dispatch elevators in the event of failure of the primary control system.
4. Hall Call Button Failure: Should failure of hall call button system occur, initiate operation providing predetermined service to all landings; elevators respond normally to car calls.
5. Automatic Leveling:

a. When arriving at a floor cars level to within 1/8" above or below the landing sill prior to opening doors, without travelling past the landing during leveling
b. Maintain leveling accuracy regardless of carload, direction of travel, rope slippage or stretch.

6. Power Conservation:
   a. Shut off car interior illumination and ventilation after adjustable period (60-180 seconds) of no elevator demand.
   b. turn on prior to opening car doors when elevator demand returns.

B. Door Operation:
1. Automatically open doors when car arrives at a floor.
2. Stop and reopen doors or hold doors in open position upon activation of "door open" button.
3. At expiration of normal dwell time, or upon activation of "door close" button, close doors:
   a. Prevent doors from closing and reverse doors at normal opening speed if door reopening device beams are obstructed while doors are closing, except during nudging operation.
   b. In event of door reopening device failure, provide for automatic shutdown of car at floor level with doors open.
   c. Close cycle does not begin upon activation of "door close" button until normal door dwell time for a car or hall call has expired, except firefighters' operation.
4. Nudging Operation:
   a. After beams of door reopening device are obstructed for a predetermined time interval (minimum 20.0-25.0 seconds), sound warning signal, and attempt to close doors with maximum of 2.5 foot-pounds kinetic energy.
   b. Activation of the door open button overrides nudging operation and reopens doors.
5. Interrupted Beam Time:
   a. When beams are interrupted during initial door opening, hold door open a minimum of 3.0 seconds.
   b. When beams are interrupted after the initial 3.0 second hold open time, reduce time doors remain open to an adjustable time of approximately 1.0-1.5 seconds after beams are reestablished.
6. Differential Door Time:
   a. Field adjustable time that doors remain open after stopping in response to calls.
   b. Car Call: Hold open time adjustable between 3.0 and 5.0 seconds.
   c. Hall Call:
      1) Hold open time adjustable between 5.0 and 8.0 seconds.
      2) Use hall call time when car responds to coincidental calls.

C. Selective Collective Operation – Single Car:
1. Elevators operate via momentary pressure buttons to:
   a. Place hall call by selecting direction of travel at each hall landing (up and down buttons at each intermediate landing, single buttons at each terminal landing).
   b. Place car call by selecting destination floor from inside the car (individual buttons for each floor served).
2. Hall calls, other than calls placed at the landing at which car is standing, start car, and cause the car to stop at first landing for which a call is registered in the direction of travel.
3. Stops are made in order in which landings are reached, irrespective of sequence in which calls are registered.
4. Parked Car (No Demand):
   a. When feature is enabled elevator remains at landing of last assignment (if no further demand) with doors closed, for a predetermined amount of time (programmable for any amount of time). Upon expiration of time, the elevator returns to the main egress landing with the doors closed.

b. If feature is disabled, if no further demand, the elevator remains at landing of last assignment with the doors closed until a hall call is registered.

5. Hall Lanterns:
   a. Lanterns provide audio and visual signal upon each stop, regardless of responding to car or hall call.

D. Firefighters' Emergency Operation: Provide equipment and operation in accordance with code requirements. Replace all Firefighters Emergency Operation key switches that control non-modernized elevators in this building to match modernized elevators when first car in group is returned to service.

E. Battery Backup Operation for Emergency Lighting, Communication, and Alarm:
1. Car mounted battery unit with solid-state charger to operate alarm bell, car emergency lighting, and voice communication system.
   a. Car lighting and communication shall be provided with a minimum of 4 hours of operation on back-up power during a loss of normal power, and a minimum of 1 hour of operation for car-mounted alarm.
   b. Battery to be rechargeable with minimum five-year life expectancy.
   c. Provide constant pressure test button in service compartment of car operating panel.

F. Emergency Car Communication System Operation:
1. Hands-Free Phone System:
   a. Two-way communication instrument in car to provide automatic dialing, tracking, and recall features.
      1) Automatic dialer to include automatic rollover capability with minimum two numbers:
   b. Activated by "Help" button in car or by external telephone call.
   c. Adjacent light jewel l illuminates and flashes when call is acknowledged.

2.7 MACHINE ROOM EQUIPMENT

A. Provide and arrange equipment in existing machine room spaces.

B. Identification: Permanently identify (painted on or securely attached) machine room equipment with minimum 3" characters corresponding to elevator identification.
1. Driving machine.
2. Motor drive, transformer, choke/filter.
3. Controller.
4. Selector.
5. Governor.
6. Main line disconnect switch.
7. Elevator hoistway pit equipment.

C. Geared Traction Hoist Machine:
1. Provide new geared machine based on specified capacity, speed, and duty.
2. Provide motor, brake, gears, and demountable drive sheave mounted in proper alignment on a common bedplate.
   a. Motor:
      1) Permanent magnet or AC induction motor connected through worm and gear to drive sheave.
      2) Direct drive, digital, closed-loop velocity encoder.
      3) Include approved manufacturers label as required by the local Authority Having Jurisdiction.

b. Electromechanical Brake:
   1) Drum or disc type.
   2) Spring applied and electrically released with removable manual brake release.
   3) Brake shoes apply to the braking surface simultaneously and with equal pressure.
   4) Minimize noise during lifting and setting of brake shoes to be undetectable inside any car or outside of the machine room or hoistway.

c. Gears:
   1) Worm gear accurately machined from steel and provided with a single end double race ball bearing thrust.
   2) Ring gear made from a phosphor bronze rim, accurately cut, fitted, and bolted to a cast iron spider.
   3) Gear housing with a gasketed port to inspect the gear.

d. Drive Sheave:
   1) Machined with grooves, providing maximum traction with a minimum of cable and sheave wear.
   2) Sealed bearings.

3. Installation Includes:
   a. Anti-friction bearings with easy access for lubrication.
   b. Drip pans to collect lubricant seepage.
   c. Sheave guards to prevent ropes from leaving sheave grooves.
   d. Sound isolation pads to reduce vibration and noise transmission to the building structure.
4. Provide machine bedplate mounted deflector sheave A-frame or supporting steel beams and fastenings to mount deflector sheaves to building structure. Provide minimum 16 gauge easily removable sound insulated sheet metal closures in hoistway wall opening around machine.

D. Solid State Power Conversion and Regulation Unit:
1. Provide solid state, alternating current, variable voltage, variable frequency (ACV³F), I.G.B.T. drive designed to operate with the power supply available at the main disconnect.
2. Performance Requirements:
   a. Conform to IEEE standards 519-2014 for line harmonics and switching noise.
   b. Maximum audible noise in the machine room and surrounding areas not to exceed 80 dBA.
3. Power Factor: >0.95.
4. Limit current suppress noise and radio frequency interference and prevent transient voltage feedback into main building power supply or emergency power source. Provide internal heat sink cooling fans for the power drive portion of the converter panels.
5. Provide isolation transformers, filters, and chokes to completely isolate the system from the normal building power supply.
6. Isolate unit to minimize noise and vibration transmission.
7. Direct-current power for the operation of hoist machine brake, door operator, dispatch processor, signal fixtures, etc., supplied from separate static power supply.

E. Regenerated Power
1. Provide resistor bank installed on the demand side of the elevator main disconnect to absorb the maximum sustained regenerated power from the motor drive during dynamic braking.
2. Provide resistor bank on the demand side of the elevator main disconnect to absorb and dissipate the maximum sustained regenerated power from the motor drive during dynamic braking.

F. Encoder: Direct drive, solid-state, digital type. Update car position at each floor and automatically restore after power loss.

G. Controller: UL/CSA labeled.
   1. Compartment: Securely mount all assemblies, power supplies, chassis switches, relays, etc., on a substantial, self-supporting steel frame. Completely enclose equipment with covers. Provide means to prevent overheating.
   2. Relay Design: Magnet operated with contacts of design and material to insure maximum conductivity, long life, and reliable operation without overheating or excessive wear. Provide wiping action and means to prevent sticking due to fusion. Contacts carrying high inductive currents shall be provided with arc deflectors or suppressors.
   3. Microprocessor-Related Hardware:
      a. Provide built-in noise suppression devices providing a high level of noise immunity on all solid-state hardware and devices.
      b. Provide power supplies with noise suppression devices.
      c. Isolate inputs from external devices (such as pushbuttons) with opto-isolation modules.
      d. Design control circuits with one leg of power supply grounded.
      e. Safety circuits are not to be affected by accidental grounding of any part of the system.
      f. System automatically restarts when power is restored.
      g. System memory is retained in the event of power failure or disturbance.
      h. Equipment is provided with Electro Magnetic Interference (EMI) shielding within FCC guidelines.
   4. Wiring: CSA labeled copper for factory wiring. Neatly route all wiring interconnections and securely attach wiring connections to studs or terminals.
   5. Permanently mark components (relays, fuses, PC boards, etc.) with symbols shown on wiring diagrams.
   6. Monitoring System Interface: Provide controller with serial data link through RJ45 Ethernet connection and install all devices necessary to monitor items outlined herein. Connect monitoring system interface to machine room monitoring compartment and LAN. Wiring from the LAN to the machine room monitoring compartment by others. Provide interface only.

H. Provide manual security override switch on the outside of the elevator controller to enable all car calls.

I. Provide minimum 14-gauge galvanized sheet metal enclosures over any holes or block outs, other than for hoist ropes, in machine room floor. Mount on underside of floor slab.

J. Sleeves and Guards: Provide 2" steel angle guards around cable or duct slots through floor slabs or grating. Provide rope and smoke guards for sheaves, cables, and cable slots in machine room.

K. Machine and Equipment Support Beams: Retain existing in place. Provide all required supplemental supports and attachments. Provide Structural Engineering certification validating size and location of all new support structure provided.

L. Governor, Car: New centrifugal-type, car driven with pull-through jaws and bi-directional shutdown switches. Calibrated and tested with manufacturers' certification data plate as required by code. Provide required bracketing and supports for attachment to building structure.

M. Emergency Brake: New.
   1. Provide means to prevent ascending car over-speed and unintended car movement. Installation and operation to comply with Code requirements.
   2. Install in compliance with approved drawings.
   3. Mount on suitable structural steel supports in machine room.
   4. Provide control circuits to enable the device to function as required by Code.

2.8 HOISTWAY EQUIPMENT

A. Provide and arrange equipment in existing hoistways.

B. Guide Rails: Retain main and counterweight guide rails in place.
   1. Clean rails and brackets. Remove rust and paint.
   2. Check all rail and bracket fastenings and tighten.

C. Buffers, Car: Retain existing. Remove rust and repaint non-machined surfaces.

D. Buffers, Counterweight: Retain existing. Remove rust and repaint non-machined surfaces.

E. Deflector and Overhead Sheaves: New. Machined grooves and sealed bearings. Provide mounting means to machine beams, machine bedplate, car and counterweight structural members, or building structure.

F. Counterweight Frame: Retain existing.
   1. Replace any damaged frame sections. Steel members and fastenings to match original manufacturers' engineered specifications.
   2. Refurbish or replace existing 2:1 sheaves, including:
      a. New bearings.
      b. Proper and equal sheave groove depth.
      c. Structurally sound fastenings.
      d. Rope retainers that prevent ropes from leaving sheave grooves during testing.
      e. Smooth and quiet operation with operating noise undetectable from inside any car or outside of the hoistway.
   3. Counterweight Weight Sections:
      a. Adjust or repair retention means to keep existing weight sections and any added weight sections in place during buffer impact.
      b. Add or replace weight sections as required to provide overbalance necessary to comply with traction machine manufacturers' requirements.

G. Counterweight Guide Shoes:
   1. New spring dampened roller guide shoes.

H. Counterweight Guard: Metal guard in pit. Retain existing.

I. Governor Rope Tension Sheave and Frame: New. Mount sheave and support frame on pit floor or guide rail. Provide frame with guides or pivot point to enable free vertical movement, required tension, and rope alignment. Adjust to provide quiet operation with no sound detectable from inside any car or outside of the hoistway.

J. Suspension Means: New Traction steel type wire ropes of type specified by machine or drive sheave manufacturer. Fasten with staggered length, adjustable, spring isolated wedge type shackles.

K. Governor Ropes: New governor rope of type specified by governor manufacturer.

L. Terminal Stopping: Provide normal and final devices.

M. Electrical Wiring and Wiring Connections:
   1. Conductors and Connections:

a. Copper throughout with individual wires coded and connections on identified studs or terminal blocks.
b. Use no splices or similar connections in wiring except at terminal blocks, control compartments, or junction boxes.
c. Provide 10% spare conductors throughout.
d. Run spare wires from car connection points to individual elevator controllers in the machine room.

2. Conduit:
a. Galvanized steel conduit, EMT, or duct.
b. Flexible conduit length not to exceed 3’-0”.

3. Traveling Cables:
a. Flame and moisture-resistant outer cover. Prevent traveling cable from rubbing or chafing against hoistway or equipment within hoistway.
b. Provide 12 twisted shielded pairs in addition to wires needed to connect specified items and code required spares.
c. Tag spares in machine room.
d. Provide cables from controller to car top.

4. Auxiliary Wiring:
a. Connect fire alarm initiating devices, emergency two-way communication system, CCTV, and card reader in each controller in machine room.
b. Provide machine room demarcation junction boxes for the fire alarm initiating devices, CCTV, security system and card reader interface terminals and relays.
c. Provide conduit, wiring and connections for the fire alarm initiating devices, emergency two-way communication system, CCTV, security system and card reader interface terminals and relays, from machine room junction box to car controller in machine room.

N. Hoistway Entrance Equipment:
1. Door Hanger: Retain. Modify hangars to include door retainer mechanism to address failure of primary upper door panel guidance.
2. Door Hanger Rollers: Replace.
3. Door Track: Retain. Clean and sand for quiet operation.
4. Door Interlocks: New. Operable without retiring cam.
5. Door Closers: Retain: Clean and adjust for smooth and quiet mechanical close of doors. Clean and adjust to insure smooth, quiet mechanical close of doors.

O. Hoistway Door Unlocking Device: Provide unlocking device including new escutcheon in door panel at all floors.

P. Hoistway Access Switches: Mount in wall at top and bottom floors. Provide switch with faceplate. Locate within easy reach to entrance so entrance can be guarded by one technician.

Q. Floor Numbers: Stencil paint 4" high floor designations in contrasting color on inside face of hoistway doors or hoistway fascia in location visible from within car.

2.9 HOISTWAY ENTRANCES

A. Provide and arrange equipment in same location as existing entrances.

B. Frames: Retain existing. . Professionally sand, fill and paint entrance frames, transoms, and strike jambs at all landings.
1. Provide new Arabic floor designation/tactile marking plates:
a. Centered at 60" above finished floor.

b. Located on both side jambs of all entrances.
c. Minimum 4" high.
d. Tactile marking indications shall be below Arabic floor designation.

2. Provide plates at main egress landing with “Star” designation.
3. Provide car identification label:
   a. Mounted directly below floor designation/tactile marking plates.
   b. Located on both side jambs at the following levels:
      1) Designated level.
      2) Alternate level.
   c. Finish and design to match floor designation/tactile marking plates.

C. Transom Panels: Retain existing. Refinish to match entrance frames and door panels.

D. Hoistway Door Panels: Retain existing. . Professionally sand, fill and paint door panels and sight guards at all landings.
1. Provide new door gibs with fire tabs at all floors.
2. Minimum two gibs per panel, one at leading edge, and one at trailing edge of each panel.
3. Provide code required door panel retainer mechanism on lower edge of door panel.

E. Sight Guards: Retain existing. Replace damaged or missing sight guards.

F. Sills, Hoistway Entrance: Retain existing. Clean. Check and tighten all fastenings.

G. Sill Supports, Hoistway Entrance: Retain existing. Check and tighten all fastenings.

H. Fascia, Toe Guards, and Hanger Covers: Retain existing.
1. Provide as required where damaged or missing.
2. Check and tighten all fastenings.
3. Paint/Stencil floor number on fascia or hoistway wall all floors visible where car doors are initially opened.

I. Struts and Headers: Retain existing. Check and tighten all fastenings.

J. Finish of Frames and Doors: Refinish. Paint entrance frames and doors at each floor. Color as selected by Purchaser.

2.10 CAR EQUIPMENT

A. Frame: Retain Existing. Check and tighten all fastenings. Adjust as required for plumb and square alignment.

B. Safety Device: Refurbish existing.
1. Check and tighten all fastenings.
2. Disassemble, clean, lubricate, and inspect components in compliance with manufacturer’s recommended procedures.

C. Platform: Retain existing.
1. Adjust as necessary for plumb and level alignment.
2. Reinforce if required.
3. Check and tighten all fastenings.

D. Platform Guard:
   1. New extended platform guard to meet Code requirements.
   2. Minimum 0.059" (1.5 mm) thick steel, or material of equivalent strength and stiffness.
   3. Reinforced and braced to car platform front.
   4. Contractor's standard finish.

E. Guide Shoes: Roller type, 6" with three or more spring dampened, sound-deadening rollers per shoe. Provide ELSCO Model B.

F. Finish Floor Covering: ¼" Thick aluminum diamond plate over ¾" thick marine sub-floor. Refer to Appendix A for approved material and finishes.

G. Car Sills: Retain existing. Clean full width. Check and tighten all fastenings.

H. Car Door Panels:
   1. New fully enclosed 16-gauge steel, sandwich construction without binder angles. Constructed with interlocking, stiffening ribs. Leading edges of center-opening doors equipped with rubber astragals full height of panel. Minimum of two gibs per panel, one at leading and one at trailing edge with gibs in the sill groove entire length of door travel. Satin finish stainless steel.
   2. Adjust vertical and horizontal clearances to meet Code requirements.

I. Door Hangers: New two-point hanger roller with neoprene roller surface and suspension with eccentric upthrust roller adjustment.

J. Door Track: New bar or formed, cold-drawn removable steel track with smooth roller contact surface.

K. Door Header: Construct of minimum 12-gauge steel, shape with stiffening flanges.

L. Car Door Electric Contact: Prohibit car operation unless car door is closed.

M. Door Clutch:
   1. New heavy-duty clutch, linkage arms, drive blocks and pickup rollers or cams to provide positive, smooth, quiet door operation.
   2. Design clutch so car doors can be closed, while hoistway doors remain open.

N. Restricted Opening Device:
   1. Restrict opening of car doors to Code required limit outside unlocking zone.
   2. Adjust for smooth and quiet operation with operating noise undetectable from inside any car or outside of the hoistway.
   3. Plunger type restrictors not acceptable.
   4. Utilize mechanical angle to prevent door opening.

O. Door Operator:
   1. New high-speed, heavy-duty door operator capable of opening doors at no less than 2.5 fps.
   2. Accomplish reversal in no more than 2½" of door movement.
   3. Solid-state door control with closed loop circuitry to constantly monitor and automatically adjust door operation based upon velocity, position, and motor current.
   4. Maintain consistent, smooth, and quiet car door operation at all floors, regardless of door weight or varying air pressure.

P. Door Reopening Device:
   1. New black fully enclosed infrared device with full screen infrared matrix or multiple beams extending vertically along leading edge of each door panel to minimum height of 7'-0" above finished floor.

Q. Car Operating Panel:
   1. One car operating panel with faceplate:
      a. Consisting of a metal box containing vandal resistant operating fixtures, mounted behind the car stationary front return panel.
      b. Faceplate shall be hinged and constructed of satin finish stainless steel.
   2. Provide Exposed Pushbuttons to Initiate:
      a. Car call registration.
      b. Alarm.
      c. Door open.
      d. Door close.
      e. Emergency push-to-call communication.
      f. Push/Pull stop switch.
   3. Pushbuttons:
      a. Provide minimum 3/4" diameter raised floor pushbuttons which illuminate to indicate call registration.
      b. Locate operating controls no higher than 48" above the car floor; no lower than 35" for emergency push-to-call button and alarm button.
      c. Identify buttons with cast tactile symbols rear mounted.
   4. Locked Firefighters' Emergency Operation Panel:
      a. Openable by the same key which operates the Fire Operation switch.
      b. Including the following features:
         1) Phase II fire access switch.
         2) Firefighters' visual indication.
         3) Call cancel button.
         4) Stop switch, manually operated.
         5) Door open button.
         6) Door close button.
         7) Floors served.
   5. Service Compartment:
      a. Provide lockable service compartment with recessed flush door.
      b. Door material and finish to match car return panel or car operating panel faceplate.
      c. Include the following controls in lockable service cabinet with function and operating positions identified by permanent signage or engraved legend:
         1) Access switch.
         2) Light switch.
         3) Four-position exhaust blower switch.
         4) Independent service switch.
         5) Constant pressure test button for battery pack emergency lighting.
         6) 120-volt, AC, GFCI protected electrical convenience duplex outlet.
         7) Card reader override switch.
         8) Switch to select either floor voice annunciation, floor passing tone, or chime.
   6. Provide black paint filled (except as noted), engraved, or approved etched signage as follows with approved size and font:
      a. Phase II firefighters' operating instructions on inside face of firefighters' compartment door.
      b. Engrave filled red firefighters' operation on outside face of compartment door.
      c. Building identification car number on main car operating panel.

d. "No Smoking" on main car operating panel.
e. Car capacity in pounds on main car operating panel service compartment door.
f. "Certificate of Inspection on File in Building Office" on main car operating panel.

R. Car Top Control Station:
1. Mount to provide safe access and utilization while standing on car top.
2. Operating device with Up and Down direction buttons, a Run button, an Inspection/Automatic switch and Emergency Stop switch.
3. Operating device provides an audible and visible indicator that fire recall has been initiated.
4. Fix station to the car crosshead or provide portable station provided the extension cord and housing is permanently attached to the car crosshead.
5. The car will be operated by constant pressure on the appropriate directional button and the Run button simultaneously.
6. Normal operating devices will be inoperative while this device is in use.

S. Car Top Emergency Audible Signal:
1. Provide on top of each elevator.
2. Activation of Alarm Button or Emergency Stop switch will cause Emergency Audible Signal.
3. Provide auxiliary power supply to provide 1-hr. power in the event of loss of normal power.

T. Work Light and Duplex Plug Receptacle:
1. GFCI protected outlet at top and bottom of car.
2. Include on/off switch and lamp guard.
3. Provide additional GFCI protected outlet on car top for installation of car CCTV.

2.11 COMMUNICATION

A. Car Communication System:
1. Hands-Free Phone System:
a. Two-way communication instrument in car with automatic dialing, tracking, and recall features, with shielded wiring to car controller in machine room.
b. System includes:
1) "Help" button on car operating panel to initiate two-way communication from Car. Button shall match car operating panel pushbutton design.
2) Auto dialer with automatic rollover capability with minimum two numbers:
3) Adjacent light jewel illuminates and flashes when call is acknowledged.
4) "Help" button tactile symbol, engraved signage, and Tactile marking adjacent to button mounted integral with car front return panel.

2.12 CAR ENCLOSURE AND INTERIOR FINISHES

A. Unless specifically identified as "Retain," "Reuse," or "Refurbish," provide new equipment. Contractor may, with Consultant approval, provide new equipment in lieu of refurbishing existing.

B. Refer to Appendix A for approved material and finishes.

C. Car Enclosure and Interior Finishes Passenger Elevator:
1. Verify and document overall car weight prior to removal of any equipment from the existing car frame or car enclosure.
2. Remove all existing interior finishes and shell components, weigh, and document.
3. Provide complete new car enclosure and interior finishes as specified.

4. New cab weight including all new finishes to be verified following completion of modernization. Post modernization weight not to exceed code allowable limits.
5. Provide the following features:
   a. Enclosure Walls: Reinforced 14-gauge furniture textured stainless steel formed panels. Width of individual panels shall not exceed 18". Apply sound-deadening mastic to exterior.
   b. Enclosure Canopy: Reinforced 12-gauge furniture steel formed panels with lockable, hinged emergency exit. Interior finish white reflective baked enamel.
   c. Front Stationary Return Panels: Reinforced 14 gauge satin finish stainless steel with cutouts for car operating panels and other equipment.
   d. Entrance Columns: Reinforced 14 gauge satin finish stainless steel.
   e. Transom: Reinforced 14 gauge satin finish stainless steel full width of enclosure.
   f. Base: Stainless steel with concealed ventilation cutouts.
   g. Interior Wall Finish: Removable panels, faced and edged, with textured 5WL stainless steel finish.
   h. Ventilation: Two-speed exhaust blower. Mount to car canopy on isolated rubber grommets. Exhaust blower shall meet noise requirements specified herein.
   i. Lighting: LED fixtures with wiring and hookup. Coordinate with emergency lighting requirements.
   j. Suspended Ceiling: Six-section satin finish stainless-steel panels with lighting cutouts in each panel.
   k. Handrails: Solid stainless steel flat stock bars, 4" x 3/8", across side and rear walls. Return handrail ends to car walls.
   l. Guardrails:
      1) Solid stainless steel flat stock bars, 4" x 3/8", mounted across rear and side walls.
      2) Locate guardrail line at 8" above car floor.
      3) Bolt rails through car walls from back and mount on 1½" deep solid round stainless steel standoff spacers no more than 18" O.C.
      4) Return guardrail ends to car walls.
6. Pads and Buttons: Provide hooks and three-piece removable pads. Two pads covering side walls and adjacent front returns and one covering rear wall. Provide cutouts to access main car operating panel.

D. Top of Car Guardrail: Provide car top railings where fall hazard exceeds 12". Install guardrails, necessary hardware, and toe board to meet code requirements.

2.13 HALL CONTROL

A. Pushbuttons: New.
1. Provide one riser with surface mounted enlarged faceplate to cover existing wall block out. Provide any cutting and patching required.
2. Vandal resistant Pushbuttons for each direction of travel which illuminate to indicate call registration. Provide LED illumination.
3. Approved engraved message and pictorial representation prohibiting use of elevator during fire or other emergency as part of faceplate.
4. Pushbutton design to match car operating panel pushbuttons.

2.14 SIGNALS

A. Hall Direction Lanterns:
1. Provide new at each entrance to indicate travel direction of arriving car.

2. Illuminate up or down LED lights and sound tone once for up and twice for down direction prior to car arrival at floor.
3. Illuminate light until the car doors start to close.
4. Sound level shall be adjustable from 20-80 dBA measured at 5'-0" in front of hall control station and 3'-0" off floor.
5. Provide advanced hall lantern notification to comply with ADA hall call notification time.
6. Provide advanced predictive hall lantern notification to comply with ADA hall call notification time.
7. Provide adjustable car door dwell time to comply with ADA requirements relative to hall call notification time.
8. Hall direction lenses shall be arrow-shaped without faceplates.
9. Lenses shall be minimum 2½" in their smallest dimension.

B. Car Position Indicator:
1. New alpha-numeric digital indicator containing floor designations and direction arrows a minimum of 2" high to indicate floor served and direction of car travel.
2. Locate fixture in car operating panel.
3. When a car leaves or passes a floor, illuminate indication representing position of car in hoistway.
4. Illuminate proper direction arrow to indicate direction of travel.

C. Floor Passing Tone: Provide an audible tone of no less than 20 decibels and frequency of no higher than 1500 Hz, to sound as the car passes or stops at a floor served.

D. Voice Synthesizer:
1. Provide new electronic device with easily reprogrammable message and voice to announce car direction, floor, emergency exiting instructions, etc.
2. Once the doors close, the destinations remain illuminated until the car approaches the next destination floor, whereupon the floor numeral or light flashes and the audible signal sounds to denote the next stopping floor.
3. When the doors open, Destination Indicator displays the next floors to be served.

E. Fixture Faceplate Material and Finish:
1. Satin finish stainless steel, all fixtures.
2. Tamper resistant fasteners for all public facing fastenings.

2.15 FIREFIGHTERS CONTROL PANEL

A. Provide and arrange new equipment as directed by Purchaser or Consultant.

B. If there is capacity in the existing building fire panel, modify/update to include elevator. Contractor to inspect and determine if there is sufficient room in the existing panel.

C. Firefighters' Control Panel:
1. Locate in building fire control room or as directed by Contractor.
2. Fixture faceplate, satin finish stainless steel, including the following features:
   a. Car position and direction indicator, digital-readout, or LCD flat screen color monitor.
   b. Identify each position indicator with car number.
   c. Indicator showing operating status of car.
   d. Two-position firefighters' emergency return switches and indicators with engraved instructions filled red.
3. Where applicable, identify all indicators and manual switches with appropriate engraving.

4. Provide wiring and conduit to control panel.

D. Firefighters' Key Box: Flush-mounted box with lockable hinged cover. Engrave instructions for use on cover per Local Fire Authority requirements.

PART 3 - EXECUTION

3.1 SITE CONDITION INSPECTION

A. Prior to beginning installation of equipment, examine hoistway and machine room areas. Verify no irregularities exist which affect execution of work specified.

B. Inform Purchaser and Consultant of any irregularities in writing prior to commencing work.

C. Do not proceed with installation until work in place conforms to project requirements.

3.2 INSTALLATION

A. Install all equipment as follows:
1. in accordance with Contractor's instructions, referenced codes, specifications, and approved submittals.
2. with clearances in accordance with referenced codes, and specifications.
3. to be easily maintained and/or removed.
4. to afford maximum accessibility, safety, and continuity of operation.

B. Remove oil, grease, scale, and other foreign matter from the following equipment and apply one coat of field-applied machinery enamel.
1. All exposed equipment and metal work installed as part of this work which does not have architectural finish.
2. Machine room equipment, and pit equipment.
3. Neatly touch up damaged factory-painted surfaces with original paint color.
4. Protect machine-finish surfaces against corrosion.

C. Paint machine room and pit floors.

3.3 FIELD QUALITY CONTROL

A. Work at jobsite will be checked during course of installation. Full cooperation with reviewing personnel is mandatory. Accomplish corrective work required prior to performing further installation.

B. Perform complete "Acceptance" level pre-testing as specified in the latest edition of ASME A17.2 "Guide for Inspection of Elevators, Escalators, and Moving Walks" prior to AHJ witnessed acceptance testing. Complete any adjustments, repairs, or replacements necessary to achieve code compliant operation including but not limited to:
1. Car safety.
2. Car emergency communications. Inform Purchaser and Consultant of any noted failures of Purchaser provided and maintained equipment or systems.
3. Car and counterweight buffers.
4. Phase I and II Firefighters' Emergency Operation. Phase I initiated by smoke sensing devices.
5. Power car door operation including door closing force, reopening device, and restricted opening.
6. Suspension members.
7. Compensation members.

C. Have Code Authority acceptance inspection performed and complete corrective work.

D. Provide access to installed equipment and elevator personnel assistance for Consultants final observation and review requirements.

E. ADJUSTMENTS

F. Static balance car to equalize pressure of guide shoes on guide rails.

G. Verify that weights of existing or altered cars, counterweights, and compensation comply with traction machine manufacturers' requirements and do not exceed total weights indicated on approved submittals.

H. Lubricate all equipment in accordance with Contractor's instructions.

I. Adjust motors, power conversion units, brakes, controllers, leveling switches, limit switches, stopping switches, door operators, interlocks, and safety devices to achieve required performance levels.

3.4 CLEANUP

A. Keep work areas orderly and free from debris during progress of project. Remove packaging materials daily.

B. Remove all loose materials and filings resulting from work.

C. Clean machine room equipment and floor.

D. Clean hoistways, car, car enclosure, entrances, operating and signal fixtures.

END OF SECTION

Appendix A

Bldg. No.	WSU Bldg. ID	WSU Bldg. Address	WSU ID #	Elevator Type	Cab Flooring Material (per specifications)	Interior Wall Finishes (per specifications)
5	**Science Hall**	5045 Cass Avenue, Detroit, MI 48202	005 01	Traction	Seamless Resilient Rubber	5WL hanging panels ???
34	**Student Center Center**	5221 Gullen Mall Detroit, MI 48202	034 03	Traction	diamond plate	5WL hanging panels ???
36	**Reuther Library**	5401 Cass Avenue, Detroit, MI 48202	036 01	Hydraulic	Seamless Resilient Rubber	Plastic laminate panels
42	**Alumni House**	441 Gilmour Mall Detroit, MI 48202	042 01	Hydeaulic	Porcelain tile	Wood Veneer panels
45	**Parking Structure 5**	5501 Anthony Wayne Drive, Detroit, MI 48202	045 01	Hydraulic	Seamless Resilient Rubber	5WL hanging panels
			045 02	Hydraulic		5WL hanging panels
51	**Parking Structure 1**	450 West Palmer, Detroit, MI 48202	051 03	Traction	Seamless Resilient Rubber	5WL hanging panels
			051 04	Traction		5WL hanging panels
71	**5057 Woodward**	5057 Woodward, Detroit, MI 48202	071 01	Traction	Seamless Resilient Rubber	Plastic laminate panels
			071 02	Traction		Plastic laminate panels
			071 03	Traction		Plastic laminate panels
			071 03	Traction		Plastic laminate panels
			071 03	Traction		Plastic laminate panels
88	**Parking Structure 6**	61 Putnam Avenue, Detroit, MI 48202	088 01	Hydraulic	Seamless Resilient Rubber	5WL hanging panels
			088 03	Hydraulic		5WL hanging panels
			088 02	Hydraulic		5WL hanging panels
89	**Biological Sciences**	5047 Gullen Mall, Detroit, MI 48202	089 01	Traction	Seamless Resilient Rubber	Plastic laminate panels
			089 02	Traction	diamond plate (Service)	5WL hanging panels
130	**Faculty / Administration Building**	656 West Kirby Avenue, Detroit, MI 48202	130 03	Hydraulic	Existing to remain	Plastic laminate panels
			130 02	Hydraulic		Plastic laminate panels
			130 01	Hydraulic		Plastic laminate panels
629	**Elliman Clinical Research**	421 East Canfield Avenue	629 01	Hydraulic	Seamless Resilient Rubber	Plastic laminate panels
			629 02	Hydraulic	Seamless Resilient Rubber	Plastic laminate panels
			629 03	Hydraulic	diamond plate (Service)	5WL hanging panels

APPENDIX A

WAYNE STATE UNIVERSITY CAR ENCLOSURE AND INTERIOR FINISH STANDARDS

CAR ENCLOSURE AND INTERIOR FINISHES

A. Passenger Elevator: Retain existing car enclosure and provide new interior finishes.
   1. Check and tighten all fastenings.
   2. Provide new interior finishes as specified herein.
   3. Modify car enclosure for application of new signal and pushbutton fixtures.
   4. Post modernization weight not to exceed code allowable limits.
   5. Provide the following features:
      a. Enclosure: Retain. Apply sound-deadening mastic to exterior.
      b. Stationary Return Panels: Retain.
      c. Entrance Columns: Retain.
      d. Transom: Retain.
      e. Car Door Panels: Fully enclosed 16-gauge steel, sandwich construction without binder angles. Constructed with interlocking, stiffening ribs. Leading edges of center-opening doors equipped with rubber astragals full height of panel. Minimum of two gibs per panel, one at leading and one at trailing edge with gibs in the sill groove entire length of door travel. Satin finish stainless steel.
      f. Base: Stainless steel with concealed ventilation cutouts.
      g. Interior Wall Finish:
         1) Removable panels, faced and edged, with color core plastic laminate. Plastic laminate (HPDL) shall meet or exceed NEMA Standard LDI-1964 for Type 1, 1/16" high pressure general purpose laminate.
         2) Color and finish as selected by Purchaser.
         3) 5WL hanging panels with #4 stainless steel reveals between panels.

      h. Ventilation: Two-speed exhaust blower. Mount to car canopy on isolated rubber grommets. Exhaust blower shall meet noise requirements specified herein.
      i. Lighting: LED fixtures with wiring and hookup. Coordinate with emergency lighting requirements.
      j. Suspended Ceiling: Six-section satin finish stainless-steel panels with lighting cutouts in each panel.
      k. Handrails: Solid stainless steel flat stock bars, 4" x 3/8", across rear and side walls. Return handrail ends to car walls.
      l. Cab Flooring, provide floor covering per below:
         1) Porcelain tile, 12"x24"x3/8" running bond pattern, thin set mortar, 1/16" joints with non-sanded grout, final selection by Owner, provide allowance of $10/sf for tile cost with 10% waste.
         2) Luxury Vinyl Tile, 6"x36", random linear pattern, zero VOC adhesive as recommended by the manufacturer, final selection by Owner, provide allowance of $5/sf for tile cost with 10% waste.
         3) Diamond Plate, 1/8" thick aluminum, mill finish 6061, seamless where possible, minimal seams if cab width exceeds sheet width. Sand all edges smooth, secure with 1/8" self-tapping aluminum or stainless-steel fasteners ½" from edge of panel @ 10" oc along edges, and in field. Trowel zero VOC adhesive over 100% of cab floor prior to installation of diamond plate and roll 100 lb. roller over plate to ensure adhesion.
         4) Seamless resilient non-slip rubber or vinyl with sealed edges

5) Pads and Buttons: Where no service elevator available in the building, provide hooks and three-piece removable pads. Two pads covering side walls and adjacent front returns and one covering rear wall. Provide cutouts to access main car operating panel.

B. Service Elevator: Retain existing car shell enclosure and provide new interior finishes.
   1. Check and tighten all fastenings.
   2. Provide new interior finishes as specified herein.
   3. Modify car enclosure for application of new signal and pushbutton fixtures.
   4. Post modernization weight not to exceed code allowable limits.
   5. Provide the following features:
      a. Enclosure: Retain. Apply sound-deadening mastic to exterior.
      b. Stationary Return Panels: Retain.
      c. Entrance Columns: Retain.
      d. Transom: Retain.
      e. Car Door Panels: Fully enclosed 16-gauge steel, sandwich construction without binder angles. Constructed with interlocking, stiffening ribs. Leading edges of center-opening doors equipped with rubber astragals full height of panel. Minimum of two gibs per panel, one at leading and one at trailing edge with gibs in the sill groove entire length of door travel. Satin finish stainless steel.
      f. Base: Textured stainless steel with concealed ventilation cutouts.
      g. Interior Wall Finish: Removable panels made of 5WL.
      h. Ventilation: Two-speed exhaust blower. Mount to car canopy on isolated rubber grommets. Exhaust blower shall meet noise requirements specified herein.
      i. Lighting: LED fixtures with wiring and hookup. Coordinate with emergency lighting requirements.
      j. Suspended Ceiling: Six-section satin finish stainless-steel panels with lighting cutouts in each panel.
      k. Handrails: Solid stainless steel flat stock bars, 4" x 3/8", across rear and side walls. Return handrail ends to car walls.
      l. Cab Flooring: Provide a heavy vinyl cab floor covering as selected by the Purchaser.
      m. Pads and Buttons: Three-piece removable pads. Two pads covering side walls and adjacent front returns and one covering rear wall. Provide cutouts to access main car operating panel.

C. Passenger Elevator: New Car Enclosure and Interior Finishes.
   1. Remove all existing interior finishes and shell components, weigh, and document.
   2. Provide complete new car enclosure and interior finishes as specified herein.
   3. Post modernization weight not to exceed code allowable limits.
   4. Provide the following features:
      a. Enclosure Walls: Reinforced 14-gauge furniture steel stainless steel formed panels Width of individual panels shall not exceed 18". Apply sound-deadening mastic to exterior.
      b. Enclosure Canopy: Reinforced 12-gauge furniture steel formed panels with lockable, hinged emergency exit. Interior finish white reflective baked enamel.
      c. Stationary Return Panels: Reinforced 14 gauge satin finish stainless steel with cutouts for car operating panels and other equipment.
      d. Entrance Columns: Reinforced 14 gauge satin finish stainless steel.
      e. Transom: Reinforced 14 gauge satin finish stainless steel full width of enclosure.
      f. Car Door Panels: Fully enclosed 16-gauge steel, sandwich construction without binder angles. Constructed with interlocking, stiffening ribs. Leading edges of center-opening doors equipped with rubber astragals full height of panel. Minimum of two gibs per panel, one at leading and one at trailing edge with gibs in the sill groove entire length of door travel. Satin finish stainless steel.

g. Base: Stainless steel with concealed ventilation cutouts.
h. Interior Wall Finish: Removable panels, faced and edged, with color core plastic laminate. Color and finish as selected by Architect/Purchaser.
i. Ventilation: Two-speed exhaust blower. Mount to car canopy on isolated rubber grommets. Exhaust blower shall meet noise requirements specified herein.
j. Lighting: LED fixtures with wiring and hookup. Coordinate with emergency lighting requirements.
k. Suspended Ceiling: Six-section satin finish stainless-steel panels with lighting cutouts in each panel.
l. Subfloor; 5/8" thick marine grade plywood.
m. Cab Flooring: Provide floor covering per below:
    1) Porcelain tile, 12"x24"x3/8" running bond pattern, thin set mortar, 1/16" joints with non-sanded grout, final selection by Owner, provide allowance of $10/sf for tile cost with 10% waste.
    2) Luxury Vinyl Tile, 6"x36", random linear pattern, zero VOC adhesive as recommended by the manufacturer, final selection by Owner, provide allowance of $5/sf for tile cost with 10% waste.
    3) Diamond Plate, 1/8" thick aluminum, mill finish 6061, seamless where possible, minimal seams if cab width exceeds sheet width. Sand all edges smooth, secure with 1/8" self-tapping aluminum or stainless-steel fasteners ½" from edge of panel @ 10" oc along edges, and in field. Trowel zero VOC adhesive over 100% of cab floor prior to installation of diamond plate and roll 100 lb. roller over plate to ensure adhesion.
    4) Seamless resilient non-slip rubber or vinyl with sealed edges
n. Handrails: Solid stainless steel flat stock bars, 4" x 3/8", across rear and side walls. Return handrail ends to car walls.
o. Pads and Buttons: Where no service elevator available in the building, provide hooks and three-piece removable pads. Two pads covering side walls and adjacent front returns and one covering rear wall. Provide cutouts to access main car operating panel.

D. Service Elevator: New Car Enclosure and Interior Finishes.
1. Remove all existing interior finishes and shell components, weigh, and document.
2. Provide complete new car enclosure and interior finishes as specified herein.
3. Post modernization weight not to exceed code allowable limits.
4. Provide the following features:
    a. Enclosure Walls: Reinforced 14-gauge furniture steel textured stainless steel formed panels with baked enamel interior finish as selected. Width of individual panels shall not exceed 18". Apply sound-deadening mastic to exterior.
    b. Enclosure Canopy: Reinforced 12-gauge furniture steel formed panels with lockable, hinged emergency exit. Interior finish white reflective baked enamel.
    c. Car Sill:
    d. Stationary Return Panels: Reinforced 14 gauge satin finish stainless steel with cutouts for car operating panels and other equipment.
    e. Entrance Columns: Reinforced 14 gauge textured satin finish stainless steel.
    f. Transom: Reinforced 14 gauge textured satin finish stainless steel full width of enclosure.
    g. Car Door Panels: Fully enclosed 16-gauge steel, sandwich construction without binder angles. Constructed with interlocking, stiffening ribs. Leading edges of center-opening doors equipped with rubber astragals full height of panel. Minimum of two gibs per panel, one at leading and one at trailing edge with gibs in the sill groove entire length of door travel. Satin finish stainless steel.
    h. Base: Textured stainless steel with concealed ventilation cutouts.
    i. Ventilation: Two-speed exhaust blower. Mount to car canopy on isolated rubber grommets. Exhaust blower shall meet noise requirements specified herein.

j. Lighting: LED fixtures with wiring and hookup. Coordinate with emergency lighting requirements.
k. Suspended Ceiling: Six-section satin finish stainless-steel panels with lighting cutouts in each panel.
l. Handrails: Solid stainless steel flat stock bars, 4" x 3/8", across rear and side walls. Return handrail ends to car walls.
m. Guardrails:
    1) Solid stainless steel flat stock bars, 4" x 3/8", mounted across rear and side walls.
    2) Locate guardrail line at 8" above car floor.
    3) Bolt rails through car walls from back and mount on 1½" deep solid round stainless steel standoff spacers no more than 18" O.C.
    4) Return guardrail ends to car walls.
    5) Pads and Buttons: Three-piece removable pads. Two pads covering side walls and adjacent front returns and one covering rear wall. Provide cutouts to access main car operating panel.
n. Cab Flooring:
    1) Seamless resilient non-slip rubber or vinyl with sealed as selected by the Owner.

E. Freight Elevator Enclosure: Car weight to be verified prior to removal of interior cab finishes/cab enclosure. Post modernization weight not to exceed code allowable limits. Provide the following features:
1. Enclosure Walls: Reinforced 10-gauge furniture steel formed panels no more than 20" wide with light-proof joints.
    a. Baked enamel finish as selected.
    b. Provide recess in car side wall for recessed mounting of car operating panel.
2. Enclosure Canopy:
    a. Reinforced 12-gauge furniture steel formed panels no more than 20" wide with light-proof joints and Hinged emergency exit.
    b. Interior finish white reflective baked enamel.
    c. Lighting: Recessed LED down lights with on/off switch in car operating panel. Recess mount fixture flush with inside surface of car top. Provide steel guard on car top over fixture.
    d. Bumper Rails: Two rows of 2" x 12" oak or maple bumpers mounted on both sides and rear of the car.
        1) Locate bottom rail at floor level and top rail at 36" above the car floor.
        2) Bolt rails through car walls with bolt and captive nuts on exterior of wall panel sections on 18" centers.
        3) Finish both upper and lower top edges with a 45-degree chamfered edge to eliminate collection of trash.
        4) Finish ends of upper and lower bumpers on side walls to 45° chamfer to eliminate carts and people from hitting blunt ends.
        5) Flooring: Provide cab flooring which is 1/8” aluminum diamond plate.

DIVISION 14

SECTION 142400

HYDRAULIC SPECIFICATIONS FOR

ONE (1) ELEVATOR

AT

REUTHER LIBRARY

5401 CASS AVENUE

DETROIT, MI

DATE: March 27, 2014

SECTION 142400 –
HYDRAULIC ELEVATOR MODERNIZATION

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes modernization of hydraulic elevator:
   1. One (1) passenger elevator, Car #1.

B. Products Installed but Not Furnished Under This Section:
   1. CCTV camera provisions.
   2. Elevator security devices, control unit, mounting brackets, wiring materials, logic circuits, security system interface terminals, boxes, and relays.

1.2 DEFINITIONS

A. All technical terms in these Contract Documents are used as defined in the latest edition of American National Standard Safety Code for Elevators, Dumbwaiters, Escalators, and Moving Walks ASME A17.1. and A17.2.

B. ELEVATOR CONSULTANT or CONSULTANT refers to Lerch Bates Inc. (Lerch Bates).

C. PURCHASER refers to Wayne State University.

D. CONTRACT or CONTRACT DOCUMENTS consists of the Agreement, Conditions of Contract, Specifications, Addenda, Drawings if included, and Alternates if accepted.

E. CONTRACTOR or ELEVATOR CONTRACTOR refers to any persons, partners, firm, or corporation having a contract with Purchaser to furnish labor and materials for the execution of work required.

F. CONTRACT AWARD refers to Purchaser's verbal or written award for work required.

G. SUBCONTRACTOR refers to any persons, partners, firm, or corporation having a contract with Contractor to furnish labor and materials for the execution of work required.

H. PROVIDE means "furnish and install."

I. MANUFACTURER means either the Original Equipment Manufacturer (OEM) or the principal manufacturer of a component or system.

J. RETAIN means, unless otherwise specified, the existing equipment is to be left in place with no alterations and no change in the original manufacturer's designed performance or functionality. Items that are "retained" shall be thoroughly cleaned in place and adjusted to achieve originally designed function.

K. REFURBISH means, unless otherwise specified, the existing equipment is to be cleaned, repainted, repaired, and parts replaced to put the equipment into a condition to provide the same appearance, performance, and functionality as the equipment provided when it was originally installed. Unless otherwise specified, the scope of replacement of components is limited to those items currently available for purchase as replacement parts from the manufacturer or after-market suppliers approved by the manufacturer.

L. REUSE means that the Contractor shall carefully remove equipment from the existing installation, avoiding any damage or additional wear. Store in a safe location to maintain equipment in its pre-removal condition. Reinstall and incorporate into the modernized elevator installation using the same procedures and recommendations provided by the manufacturer of the equipment.

M. INCLUDES or INCLUDING means including the items specified but not limited solely to those items if additional work or components are required to achieve the specified outcome.

N. CALL BACK means a request from the Purchaser to the Contractor to provide a technician on site to evaluate an elevator that is out of service or not functioning properly, rectify the root cause of the malfunction, and place the unit back into normal service.

O. Words in the singular shall include the plural whenever applicable or context so indicates.

1.3 WORK INCLUDED

A. Modernize one hydraulic passenger elevator.

B. All labor, engineering, tools, transportation, services, supervision, materials, and equipment necessary for and incidental to satisfactory completion of required work as indicated in Contract Documents.

C. Provide all required staging, hoisting, and movement of new equipment, reused equipment, or removal of existing equipment.

D. Applicable conditions of Purchaser's General, Special, and Supplemental Conditions.

E. Warranty maintenance as described herein.

F. Cartage and Hoisting: All required staging, hoisting, and movement to, on, and from the site including new equipment, retained equipment, or dismantling and removal of existing equipment.

G. Unless specifically identified as "Retain," "Reuse," or "Refurbish," provide new equipment. Contractor may, with approval prior to quotation, provide new equipment in lieu of refurbishing existing.

H. Reference to a device or a part of the equipment applies to the number of devices or parts required to complete the installation.

I. Provisions of this specification are applicable to all elevators unless identified otherwise.

J. Provide hoistway, pit, and machine room barricades.

K. Provide temporary and permanent pit ladders, working platforms, inspection platforms, and guard rails required to comply with applicable Building Code, work safety standards, and AHJ requirements.

L. Scope of Contract includes, but is not limited to, the following:
1. Coordination, scheduling, and management of work of component suppliers and subcontractors.
2. Modernize or furnish and install equipment as specified utilizing existing and/or modified hoistways and machine rooms.

M. Specific item of required work which cannot be determined to be included in another contract is thereby determined to be included in prime contract.

1.4 CONSULTANT STATUS

A. Consultant shall act as Purchaser's and/or Building Management's representative on all matters pertaining to required work. Consultant shall interpret Contract Documents, analyze Contractor's quotations, review Contractor's suggested alternates, review all Contractor's submittals, approve billings, review technical details and construction procedure, perform work progress reviews, and review and test completed work for compliance with Contract Documents prior to acceptance of work by Purchaser.

B. Field Review Scheduling: Schedule progress and final work reviews with Consultant. Reply promptly, in writing, to corrective work indicated on Consultant's progress and/or final review reports, indicating status and schedule for completion. Consultant anticipates scheduled site review appointments will be met.

1.5 CODES AND ORDINANCES

A. All work covered by these Contract Documents is to be done in full accord with national code, state and local codes, ordinances, and elevator safety orders in effect at time elevator alteration permit issuance. All requirements of local Building Department and fire jurisdiction are to be fulfilled by Contractor and its Subcontractors.

1.6 PRIME CONTRACTOR'S DUTIES

A. Prime Contractor's duties include the following:
1. Provide and pay for labor, materials and equipment, tools, construction equipment and machinery, and other facilities and services necessary for proper execution and completion of required work.
2. Pay for legally required sales, consumer, and state remodel taxes.
3. Secure and pay for required permits, fees, and licenses necessary for proper execution and completion of required work, as applicable at time of quotation due date.
4. Give required notices.
5. Comply with codes, ordinances, rules, regulations, orders, and other legal requirements of public authorities which bear on performance of required work.
6. Promptly submit written notice to Consultant of observed variance of Contract Documents from legal requirements.
7. Enforce strict discipline and good order among employees. Do not employ persons unskilled in assigned task.

1.7 STAGING AREA

A. An equipment staging area will be available for use by Contractor. Contractor shall restrict usage to area designated and shall notify Purchaser prior to storing of any large equipment which will impose heavy concentrated loading on floor area. Do not store such equipment until approval is received.

1.8 WORK SEQUENCE

A. Construct work in stages.

1.9 WORKING HOURS

A. Unless otherwise stated below or elsewhere in the Contract Documents, Contractor shall have access to the building for work activities during the following regular building operating hours:
1. 8:00 a.m. to 5:00 p.m., Monday through Friday or as agreed upon by Wayne State University.

B. Contractor shall perform all work that has the potential to result in any of the following conditions outside of regular building operating hours at no additional cost to the Purchaser.
   1. Interruptions or changes in normal automatic operation.
   2. Activation of Firefighter's Emergency Operation Phase I.
   3. Noise levels in excess of 80 dBA measured in any occupied or public space.
   4. Transport of large equipment through public or tenant spaces.
   5. Coordination with WSU staff for planned events in the building.

1.10 CONTRACTOR USE OF PREMISES

A. Confine operations at site to areas permitted by law, ordinances, permits, Contract Documents, and Purchaser's specific instructions.

B. Do not unreasonably encumber site with materials or equipment. Staging area will be located as directed by Purchaser.

C. Do not load structure with weight that will endanger structure. Coordinate with Purchaser.

D. Assume full responsibility for protection and safekeeping of tools and products stored on or off premises.

E. Move stored products which interfere with operations of building or the operations of other trades.

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

1.11 CONCURRENT MODERNIZATION WORK AND BUILDING OPERATION

A. This project is a major elevator modernization in an existing building which is a private residence and open for public business. The building will continue to operate throughout all phases of required work. It is essential that Contractor give special attention and priority to all matters concerning project safety, protection from dust and loose materials, reduction of noise level, protection from water and air infiltration into building, and maintenance of neat, sightly conditions in and around work areas inside and outside of building. Packaging, scrap materials, and demolition debris shall be promptly removed from building and site on a daily basis.

B. At all times Contractor shall provide clearly visible warning and directions signs. At all times give special attention to building entrances, exits, and proper safe exiting through work areas as required by law.
   1. Barricade design must be approved by client prior to start of modernization work.
   2. Standard folding maintenance barricades are not acceptable.

C. Contractor shall consult Purchaser and other Contractors to establish and maintain safe temporary routes including, but not limited to, proper barricades, walking surfaces, lighting, fire protection, exiting, warning and directional signs, and general protection of persons from all hazards in accordance with OSHA Standards due wholly or partially to its operations.

1.12 ALTERNATES

A. Alternate: Battery Lowering Operation
   1. Upon loss of normal power automatically lower car to the nearest landing depending on position at time of power outage.
   2. Upon arrival at the landing, the elevator doors shall open automatically and remain open until regular door time has expired; the elevator shall then be removed from service.
   3. Include solid-state charger and testing means mounted in a common metal container.

4. Battery to be rechargeable lead acid or nickel cadmium with a ten-year life expectancy.
5. Upon restoration of normal power, the elevator shall automatically resume normal operation.
6. Disable if normal power switched off.

B. Alternate: New Car Door Panels
1. New fully enclosed 16-gauge steel, sandwich construction without binder angles. Constructed with interlocking, stiffening ribs. Leading edges of center-opening doors equipped with rubber astragals full height of panel. Minimum of two gibs per panel, one at leading and one at trailing edge with gibs in the sill groove entire length of door travel. Satin finish stainless steel.

1.13 RELATED WORK PROVIDED BY ELEVATOR CONTRACTOR

A. Hoistway and Pit:
1. Wall blockouts and fire rated closure for control and signal fixture boxes which penetrate walls.
2. Cutting and patching walls and floors.
3. Opening in hoistway wall or pit wall for hydraulic piping. Trench and backfill underground piping.
4. Erect front hoistway wall after elevator entrances are installed.
5. Pit access stationary ladder for each elevator.
6. Structural support at pit floor for buffer impact loads, guide rail loads, and cylinder loads.
7. Waterproof pit. Indirect waste drain or sump with flush grate and pump. Sump pump/drain capacity minimum 3,000 gallons per hour, per elevator. Coordinate installation of sump pump and/or drain with plumbing code.
8. Provide oil separator per Michigan Plumbing Code.
9. Protect open hoistways and entrances during construction per OSHA Regulations.
10. Protect car enclosure, hoistway entrance assemblies, and special metal finishes from damage.
11. Hoistway venting per building code.

B. Machine Room and Machinery Spaces:
1. Ventilation and heating. Maintain minimum temperature of 55° F, maximum 90° F. Maintain maximum 80% relative humidity, non-condensing.
2. Paint walls and ceiling.
3. Class “ABC” fire extinguisher in each elevator machine room.
4. Provide drip pan, as required, beneath pipe running through upper portion of machine room.

C. Electrical Service, Conductors, and Devices:
1. Lighting and GFCI convenience outlets in pit and machine room. Provide one additional non-GFCI convenience outlet in pit for sump pump and oil return pump.
2. Provide guarded lighting with an illumination level of not less than 100 lx (10 fc) at the pit floor.
3. Provide guarded lighting with an illumination level of 200 lx (19 fc) at the machine room floor.
4. Three-phase mainline copper power feeder with true earthen grounding to terminals of each elevator controller in the machine room with protected lockable “open” disconnecting means with auxiliary contacts to allow Elevator Contractor to electrically interlock battery power lowering unit.
5. Single-phase copper power feeder to each elevator controller for car lighting and exhaust blower with individual protected lockable “open” disconnecting means located in machine room.
6. Emergency telephone line to each individual elevator control panel in elevator machine room.
7. Install automatic Fire Recall System:
   a. Fire alarm initiating devices in each elevator lobby.
   b. Fire alarm initiating devices in elevator machine room.
   c. Three Relay Activation Modules for single elevator. Locate modules within three feet of controller designated by the Elevator Contractor to minimize un-supervised wiring. Program Modules as follows:
      1) PRIMARY: Activate when any hallway device, except primary floor, activates.

2) ALTERNATE: Activate when hallway device at primary floor activates.
3) FIRE HAT: Activate when machine room device activates.

d. Device in machine room and at top of hoistway to provide signal for general alarm.
e. Provide technician from fire alarm contractor for pre-test of system during normal working hours.
f. Provide technician from fire alarm contractor for acceptance test of system with AHJ during normal working hours.
g. Fire alarm contractor to submit drawings to the State and Purchaser for review and approval.
h. Apply for and obtain variance with Fire Protection Department. Since the building does not currently contain sprinklers, it is not feasible to add sprinklers to the building.

8. Conduit from the closest hoistway of each elevator group or single elevator to the firefighters' control room and/or main control console. Coordinate size, number, and location of conduits with Elevator Contractor.
9. Single-phase power feeders to firefighters' control panel.
10. Three-phase power feeder to each freight elevator power door controller in machine room with protected lockable "open" disconnecting means.
11. Card or Proximity Readers, elevator contractor to coordinate and assist with installation of readers in car operating panel or hall stations.

1.14 ACTION AND INFORMATIONAL SUBMITTALS

A. Within sixty (60) calendar days after award of contract and before beginning equipment fabrication, submit shop drawings, and required material samples for review. Allow 30 days for response to initial submittal.
1. Scaled or Fully Dimensioned Layout: Plan of machine room indicating equipment arrangement, details of car enclosures, and car/hall signal fixtures.
2. Design Information: Indicate equipment lists, reactions, and design information on layouts.
3. Power Confirmation Information: Design for existing conditions.
4. Fixtures: Shop drawings.
5. Finish Material: If requested, submit 3" x 12" samples of actual finished material for review of color, pattern, and texture. Compliance with other requirements is the exclusive responsibility of the Contractor. Include, if requested, signal fixtures, lights, graphics, Braille plates, and detail of mounting provisions.
6. Design Information: Provide calculations verifying the following:
a. Adequacy of existing electrical provisions.
b. Machine room heat emissions in B.T.U.
c. Adequacy of existing car platform structure for intended loading.
d. Adequacy of plunger wall thickness for intended loading.
7. Written Maintenance Control Program (MCP) specifically designed for the equipment included under this contract. Include any unique or product specific procedures or methods required to inspect or test the equipment. In addition, identify weekly, bi-weekly, monthly, quarterly, and annual maintenance procedures, including statutory and other required equipment tests.

B. Submittal review shall not be construed as an indication that submittal is correct or suitable, or that the work represented by submittal complies with the Contract Documents. Compliance with Contract Documents, code requirements, dimensions, fit, and interface with other work is Contractor's responsibility.

C. Acknowledge and/or respond to review comments within 14 calendar days of return. Promptly incorporate required changes due to inaccurate data or incomplete definition so that delivery and installation schedules are not affected. Identify and cloud drawing revisions, including Contractor

elective revisions on each re-submittal. Contractor's revision response time is not justification for equipment delivery or installation delay.

1.15 PURCHASER'S INFORMATION

A. Non-Proprietary Equipment Design: Provide two (2) sets of digital and three (3) sets of neatly bound written information necessary for proper maintenance and adjustment of equipment within 30 days following final acceptance. Final retention will be withheld until data is received by Purchaser and reviewed by Consultant. Include the following as minimums:
   1. Straight-line wiring diagrams of "as-installed" elevator circuits with index of location and function of components. Mount one set wiring diagrams on panels, racked, or similarly protected, in elevator machine room. Provide remaining set rolled and in a protective drawing tube. Maintain all drawing sets with addition of all subsequent changes. These diagrams are Purchaser's property. A legend sheet shall be furnished with each set of drawings to provide the following information:
      a. Name and symbol of each relay, switch, or other apparatus.
      b. Location on drawings, drawing sheet number and area, and location of all contacts.
      c. Location of apparatus, whether on controller or on car.
   2. Written Maintenance Control Program (MCP) specifically designed for the equipment included under this contract. Include any unique or product specific procedures or methods required to inspect or test the equipment. In addition, identify weekly, bi-weekly, monthly, quarterly, and annual maintenance procedures, including statutory and other required equipment tests.
   3. Printed instructions explaining all operating features.
   4. Complete software documentation for all installed equipment.
   5. Lubrication instructions, including recommended grade of lubricants.
   6. Parts catalogs listing all replaceable parts including Contractor's identifying numbers and ordering instructions.
   7. Four sets of keys for all switches and control features properly tagged and marked.
   8. Diagnostic test devices together with all supporting information necessary for interpretation of test data, troubleshooting of elevator system, and performance of routine safety tests.
   9. The elevator installation shall be a design which can be maintained by any licensed elevator maintenance company employing journeymen mechanics, without the need to purchase or lease additional diagnostic devices, special tools, or instructions from the original equipment Contractor.
      a. Provide onsite capability to diagnose faults to the level of individual circuit boards and individual discrete components for the solid-state elevator controller.
      b. Provide a separate, detachable device, as required, to the Purchaser as part of this installation if the equipment for fault diagnosis is not completely self-contained within the controller. Such device shall be in possession of and become property of the Purchaser.
      c. Installed equipment not meeting this requirement shall be removed and replaced with conforming equipment at no cost to the Purchaser.
   10. Provide upgrades and/or revisions of software during the progress of the work, warranty period and the term of the ongoing maintenance agreement between the Purchaser and Contractor.

1.16 PERMITS, TESTS, AND CERTIFICATES

A. Permits:
   1. Secure and pay for all permits required for Work to be performed, including but not limited to:
      a. Municipal and State permits.
      b. Device or equipment removal permits.
      c. Hot works permits.

d. Confined space access permits.

2. Post, maintain, and renew all permits in compliance with local governmental requirements.
3. Obtain documentation of final AHJ close-out of all permits. Provide copies to Purchaser.

B. Tests and Inspections:
1. Schedule and perform all tests required in accordance with procedure described in ASME A17.2 Guide for Inspection of Elevators, Escalators, and Moving Walks in the presence of Authorized Representative of the AHJ and Owner's representative.

C. Certificates: Obtain, pay for, and deliver to Purchaser with all temporary and final inspection certificates provided by proper governing authorities.

D. Violations: Resolve any outstanding violations on record with the AHJ on devices being removed prior to final acceptance by the Purchaser.

1.17 QUALITY ASSURANCE

A. Compliance with Regulatory Agencies: Comply with most stringent applicable provisions of currently enforced codes, laws, and/or authorities, including revisions and changes in effect.

B. Inspections: Provide access to areas where work is being performed for the Consultant at any time throughout the project.

1.18 WARRANTY

A. Material and workmanship of installation shall comply in every respect with Contract Documents. Correct defective material or workmanship which develops within one (1) year from date of final acceptance of all work to satisfaction of Purchaser and Consultant at no additional cost, unless due to ordinary wear and tear, or improper use or care by Purchaser. Perform maintenance in accordance with terms and conditions indicated in the Preventive Maintenance Agreement.

B. Defective is defined to include, but not be limited to operation or control system failures, car performance below required minimum, excessive wear, unusual deterioration, or aging of materials or finishes, unsafe conditions, the need for excessive maintenance, abnormal noise, or vibration, and similar unsatisfactory conditions.

C. Retained Equipment: All retained components, parts, and materials shall be cleaned, checked, modified, repaired, or replaced, so each component and its parts are in like new operating condition. Retained equipment must be compatible for integration with new systems. All retained equipment shall be covered under the warranty provisions, of Article 1.13, A. & B above. No prorations of equipment or parts shall be allowed on preventive maintenance contract between the Contractor and Purchaser.

D. Make modifications, requirements, adjustments, and improvements to meet performance requirements of Section 142400.

1.19 WARRANTY MAINTENANCE

A. Provide preventive maintenance and 24-hour emergency callback service for one (1) year commencing on date of final acceptance of modernized elevator by Purchaser. Systematically examine, adjust, clean, and lubricate all equipment. Repair or replace defective parts using parts produced by the Contractor of installed equipment. Maintain elevator machine room, hoistway, and pit in clean condition.

B. Use competent personnel, acceptable to Purchaser, employed and supervised by the Contractor.

C. Warranty Maintenance Hours: Contractor shall perform one (1) hour per unit per month for preventive maintenance.

D. All work, except as otherwise noted, including unlimited call-back service, shall be performed during the building's regular hours. These hours are 8:00 a.m. to 5:00 p.m.

E. Response Time for Callback Service:
1. During regular time hours, Contractor shall arrive at Property within 60 minutes from time of notification of equipment problem or failure by Purchaser.
2. Contractor shall arrive at Property in response to passenger entrapment calls within 30 minutes from time of notification by Purchaser.

F. Purchaser retains the option to delete cost of warranty maintenance from modernization equipment contract and remit twelve equal installments directly to Contractor during period in which maintenance is being performed.

1.20 DELIVERY, STORAGE, AND HOISTING

A. General:
1. Protect all equipment and exposed finishes during delivery, handling, and installation until completion of project.
2. Replace damaged materials with new, with no additional cost for material or labor to Purchaser.

B. Delivery and Storage:
1. Ensure manufacturers' original packing adequately protects materials during delivery.
2. Deliver materials, identical to accepted samples, to the site ready for use in the manufacturer's original and unopened containers and packaging, bearing labels as to type of material, brand name and manufacturer's name.
3. Store materials under cover in a secure, dry, and clean location, off the ground. Remove delivered materials that are damaged or otherwise not suitable for installation from the job site and replace with acceptable materials.
4. Store and protect all materials in space provided or designated by the Purchaser against damage, stains, scratches, corrosion, weather, construction debris, and other environmental conditions.
5. Comply with Purchaser's requirements for access to and use of any building loading docks, parking lots, parking garages, and any interior spaces required for delivery and storage.

C. Hoisting: Arrange and pay for all required hoisting and movement of equipment.

1.21 COORDINATION

A. Prime contracts are defined below, and each is recognized to be a major part of required work to be performed concurrently in close coordination with work of other Contractors.
1. This Contract: Elevator Modernization including associated related work specified herein.

B. Scope of Contract includes, but is not limited to, the following:
1. Coordination, scheduling, and management of work of component suppliers and subcontractors.
2. Modernize or furnish and install equipment as specified utilizing existing and/or modified hoistways and machine rooms.
3. Specific item of required work which cannot be determined to be included in another contract is thereby determined to be included in prime contract.

PART 2 - PRODUCTS

2.1 REFERENCES

A. American National Standard Institute (ANSI): A117.1, Accessible and Usable Buildings and Facilities.

B. American Society of Mechanical Engineers:
1. ASME A17.1, Safety Code for Elevators and Escalators.
2. ASME A17.2, Guide for Inspection of Elevators, Escalators, and Moving Walks.
3. ASME A17.5, Elevator and Escalator Electrical Equipment.
4. ASME A17.6, Standard for Elevator Suspension, Compensation, and Governor Systems.

C. National Fire Protection Association (NFPA):
1. NFPA 70, National Electric Code.
2. NFPA 80, Fire Doors and Windows.
3. NFPA 101, Life Safety Code.
4. NFPA 13, Installation of Sprinkler Systems.

D. International Building Code (IBC).

E. City of Detroit Elevator Code.

F. Accessibility:
1. American National Standard Institute (ANSI): A117.1, Accessible and Usable Buildings and Facilities.
2. ADAAG, Americans with Disabilities Act Accessibility Guidelines.

2.2 MANUFACTURERS AND PRODUCTS

A. Approved Elevator Contractors:
1. Approved subject to compliance with the requirements of the contract and specifications.
    a. KONE
    b. Lardner Elevator
    c. Otis Elevator
    d. Schindler Elevator Corporation
    e. TK Elevator
    f. Toledo Elevator
    g. Approved Equal

B. Approved Elevator Components:
The following Manufacturers/Assemblers are approved for the specific components listed below, subject to the requirements of the contract:
1. Car and Hall Signal Fixtures:
    a. Innovation
    b. MAD Fixtures
    c. Monitor
    d. PTL
2. Controllers:
    a. GAL (GALaxy)
    b. Elevator Controls Corporation
    c. Smart Rise
3. Door Protective Device:
    a. Janus

b. T.L. Jones
c. Tri-Tronics

4. Elevator Cab Interiors:
   a. Architectural Metals
   b. A Better Elevator Co.
   c. G&R
   d. Globe Architectural & Metals
   e. Snap Cab
   f. Weir Inc.
5. Guide Rails:
   a. AFD Industries
   b. Montefero
   c. Savero
6. Guide Shoes
   a. Delco
   b. ELSCO
   c. GAL
   d. Hollister-Whitney
7. Hoistway Entrances and Door Panels:
   a. Columbia
   b. EDI/ECI
   c. Elevator Products
   d. Gunderlin
   e. Tyler
   f. United Cab
8. Hydraulic Elevator Systems and Components:
   a. Canton
   b. EECO
   c. MEI
   d. Schumacher
9. Hydraulic Jack Assemblies
   a. EECO
   b. Bore-Max
   c. Canton Elevator
10. Passenger Elevator Door Equipment (Operators, Tracks, Hangers, and Closers):
    a. ECI
    b. GAL
    c. Wittur
11. Traveling Cables:
    a. Draka
    b. James Monroe
12. Two-Way Emergency Communication Device:
    a. Janus
    b. K-Tech
    c. Kings III
    d. Rath Microtec
    e. Wurtec

2.3 PERFORMANCE REQUIREMENTS

A. Car Speed: ± 10% of contract speed in up direction, ± 20% of contract speed in down direction.

B. Car Capacity: Safely lower, stop, and hold rated load.

C. Car Stopping Zone: ± 1/4" under any loading condition.

D. Door Times: Seconds from start to fully open or fully closed:
   1. Door Open: 2.1 seconds. Door Close: 3.2 seconds.

E. Car Floor-to-Floor Performance Time: Seconds from start of doors closing until doors are 3/4 open for center-opening doors or 1/2 open for side-opening doors, and car is level and stopped at next successive floor under any loading condition or travel direction:
   1. 17.5 seconds. Floor Height: 12’-0” between floors 2 and 3.

F. Noise and Vibration Control:
   1. Airborne Noise:
      a. Measured noise level of elevator equipment and its operation shall not exceed 60 dBA inside car under any condition including door operation and car ventilation exhaust blower on its highest speed.
      b. Limit noise level in the machine room relating to elevator equipment and its operation to no more than 80 dBA.
      c. All dBA readings to be taken 3'-0" off the floor and 3'-0" from the equipment using the “A” weighted scale.
   2. Vibration Control: Mechanically isolate all new elevator equipment from the building structure and other components. Minimize objectionable noise and transmission of vibrations to occupied areas of the building. All elevator equipment provided under this contract, including power unit, controller, oil supply lines, and their support shall be mechanically isolated from the building structure and electrically isolated from the building power supply and to each other to minimize the possibility of objectionable noise and vibrations being transmitted to occupied areas of the building.

2.4 ELEVATOR DUTY ALTERATIONS PASSENGER ELEVATOR:

ALTERATION SUMMARY		
CAR #1	**EXISTING INSTALLATION**	**MODERNIZED INSTALLATION**
Capacity:	1500 lbs.	No Change
Class of Loading:	Class A	No Change
Contract Speed:	75 fpm	No Change
Hydraulic Power Unit Location:	Adjacent	No Change
Operation Control:	Selective Collective Automatic	No Change
Floors Served:	Front: 1-4	No Change
Total Entrances:	All Front	No Change
Entrance Type:	Single-Speed Side-Opening	No Change
Entrance Size:	2'-8" wide x 7'-0" high	No Change
Minimum Clear to Underside of Canopy:	8'-0" high	No Change

2.5 MATERIALS

A. All colors will be selected from the Manufacturer's standard range unless custom colors are specified herein.

B. Steel:
1. Sheet Steel (Furniture Steel for Exposed Work): Stretcher-leveled, cold-rolled, commercial quality carbon steel, complying with ASTM A366, matte finish.
2. Sheet Steel (for Unexposed Work): Hot-rolled, commercial quality carbon steel, pickled and oiled, complying with ASTM A568/A568M-03.
3. Structural Steel Shapes and Plates: ASTM A36.

C. Stainless Steel: Type 302 or 304 complying with ASTM A240, with standard tempers and hardness required for fabrication, strength, and durability. Apply mechanical finish on fabricated work in the locations shown or specified, Federal Standard and NAAMM nomenclature, with texture and reflectivity required to match Purchaser's sample. Protect with adhesive paper covering.
1. No. 4 Satin: Directional polish finish. Graining directions as shown or, if not shown, in longest dimension.
2. No. 8 Mirror: Reflective polish finish with no visible graining.
3. Textured: 5WL as manufactured by Rigidized Metals or Windsor pattern 5-SM as manufactured by Rimex Metals or approved equal with .050 inches mean pattern depth with bright directional polish (satin finish).
4. Burnished: Non-directional, random abrasion pattern.

D. Aluminum: Extrusions per ASTM B221; sheet and plate per ASTM B209.

E. Plastic Laminate: ASTM E84 Class A and NEMA LDI-1964, 1/16", Fire-Rated Grade (GP-50), Type1, 1/16" high pressure general purpose laminate, color and texture as follows:
1. Exposed Surfaces: Color and texture selected by Purchaser.
2. Concealed Surfaces: Contractor's standard color and finish.

F. Fire-Retardant Treated Particle Board Panels: Minimum 3/4" thick backup for natural finished wood and plastic laminate veneered panels, edged and faced as shown, provided with suitable anti-warp backing; meet ASTM E84 Class "I" rating with a flame-spread rating of 25 or less, registered with Local Authorities for elevator finish materials.

G. Natural Finish Wood Veneer: Standard thickness, 1/40" thoroughly dried conforming to ASME/HPMA HP-1983, Premium Grade. Place veneer, tapeless spliced with grain running in direction shown, belt and polish sanded, book matched. Species and finish designated and approved by Purchaser and/or Consultant.

H. Paint: Clean exposed metal parts and assemblies of oil, grease, scale, and other foreign matter and factory paint one shop coat of standard rust-resistant primer. After erection, provide one finish coat of industrial enamel paint. Galvanized metal need not be painted.

I. Prime Finish: Clean all metal surfaces receiving a baked enamel paint finish of oil, grease, and scale. Apply one coat of rust-resistant primer followed by a filler coat over uneven surfaces. Sand smooth and apply final coat of primer.

J. Baked Enamel Finish: Prime finish per above. Unless specified "prime finish" only, apply and bake three additional coats of enamel in the selected solid color.

K. Entrance Field Paint: Clean all surfaces to remove dirt and grease. Sand and finish surfaces as necessary to remove pits and scratches and prepare surface for painting. Apply filler to ensure smooth surface; sand and apply one coat of electrostatic enamel in the selected solid color.

L. Refinishing of natural metals: Remove existing protective finish. Buff as necessary to remove scratches. Regrain or finish as specified and protect as indicated for particular metal type.

M. Entrance Support Equipment within Hoistway: Include strut angles, headers, sill support angles, fascia, hanger covers, etc. Clean, remove, and check for corrosive activity. Replace components which exhibit severe deterioration. Tighten all fastenings.

2.6 OPERATION

A. General:
1. Cars automatically slow down and stop level at floors in response to car and landing calls with stops made in sequence in the established direction of travel, regardless of order in which buttons are pressed.
2. Landing calls are canceled when the assigned car arrives at the landing.
3.
4. Automatic Leveling:
   a. When arriving at a floor cars level to within 1/4” above or below the landing sill prior to opening doors, without travelling past the landing during leveling
   b. Maintain leveling accuracy regardless of carload, direction of travel.
5. Power Conservation:
   a. Car interior illumination and ventilation turns off after adjustable period (60-180 seconds) of no elevator demand and turns on prior to opening car doors when elevator demand returns.

B. Door Operation:
1. Automatically open doors when car arrives at a floor.
2. Stop and reopen doors or hold doors in open position upon activation of “door open” button.
3. At expiration of normal dwell time, or upon activation of “door close” button, close doors:
   a. Prevent doors from closing and reverse doors at normal opening speed if door reopening device beams are obstructed while doors are closing, except during nudging operation.
4. Nudging Operation:
   a. After beams of door reopening device are obstructed for a predetermined time interval (minimum 20.0-25.0 seconds), sound warning signal, and attempt to close doors with maximum of 2.5 foot-pounds kinetic energy.
   b. Activation of the door open button overrides nudging operation and reopens doors.
5. Interrupted Beam Time:
   a. When beams are interrupted during initial door opening, hold door open a minimum of 3.0 seconds.
   b. When beams are interrupted after the initial 3.0 second hold open time, reduce time doors remain open to an adjustable time of approximately 1.0-1.5 seconds after beams are reestablished.
6. Differential Door Time:
   a. Field adjustable time doors remain open after stopping in response to calls.
   b. Car Call: Hold open time adjustable between 3.0 and 5.0 seconds.
   c. Hall Call:
      1) Hold open time adjustable between 5.0 and 8.0 seconds.
      2) Use hall call time when car responds to coincidental calls.

C. Selective Collective Operation – Single Car:
   1. Elevators operate via momentary pressure buttons to:
      a. Place hall call by selecting direction of travel at each hall landing (up and down buttons at each intermediate landing, single buttons at each terminal landing).
      b. Place car call by selecting destination floor from inside the car (individual buttons for each floor served).
   2. Hall calls, other than calls placed at the landing at which car is standing, start car, and cause the car to stop at first landing for which a call is registered in the direction of travel.
   3. Stops are made in order in which landings are reached, irrespective of sequence in which calls are registered.
   4. Parked Car (No Demand):
      a. When feature is enabled, elevator remains at landing of last assignment (if no further demand) with doors closed, for a predetermined amount of time (programmable for any amount of time). Upon expiration of time, the elevator returns to the main egress landing with the doors closed.
      b. If feature is disabled, if no further demand, the elevator remains at landing of last assignment with the doors closed until a hall call is registered.
   5. Car Lanterns:
      a. Lanterns provide audio and visual signal upon each stop, regardless of responding to car or hall call.

D. Firefighters' Emergency Operation: Provide equipment and operation in accordance with code requirements. Replace all Firefighters Emergency Operation key switches that control non-modernized elevators in this building to match modernized elevators when first car in group is returned to service.

E. Battery Operation of Emergency Lighting, Communications, and Alarm:
   1. Car mounted battery unit with solid-state charger to operate alarm bell, car emergency lighting, and voice communication system.
      a. Car lighting and communication shall be provided with a minimum of 4 hours of operation on back-up power during a loss of normal power, and a minimum of 1 hour of operation for car-mounted alarm and any remote alarm mounted at the designated level.
      b. Battery to be rechargeable with minimum five-year life expectancy.
      c. Provide constant pressure test button in service compartment of car operating panel.

F. Emergency Car Communication System Operation:
   1. Hands-Free Phone System:
      a. New two-way communication instrument in car to provide automatic dialing, tracking, and recall features.
         1) Automatic dialer to include automatic rollover capability with minimum two numbers:
      b. Activated by "Help" button in car or by external telephone call.
      c. Adjacent light jewel l illuminates and flashes when call is acknowledged.

G. Electrical Wiring and Wiring Connections:
   1. Conductors and Connections:
      a. Copper throughout with individual wires coded and connections on identified studs or terminal blocks.
      b. Use no splices or similar connections in wiring except at terminal blocks, control compartments, or junction boxes.
   2. Conduit:
      a. Galvanized steel conduit, EMT, or duct.
      b. Flexible conduit length not to exceed 3'-0".

3. Traveling Cables:
   a. Provide 12 twisted shielded pairs in addition to wires needed to connect specified items and code required spares.
   b. Tag spares in machine room.
   c. Provide cables from controller to car top.
4. Auxiliary Wiring:
   a. Connect fire alarm initiating devices, emergency two-way communication system, CCTV, and card reader in each controller in machine room.
   b. Provide machine room demarcation junction boxes for the fire alarm initiating devices, emergency two-way communication system, CCTV, security system and card reader interface terminals and relays.
   c. Provide conduit, wiring and connections for the fire alarm initiating devices, emergency two-way communication system, CCTV, security system and card reader interface terminals and relays, from machine room junction box to each car controller in machine room.

2.7 MACHINE ROOM EQUIPMENT

A. Provide and arrange equipment in existing machine room spaces.

B. Identification: Permanently identify (painted on or securely attached) machine room equipment with minimum 3" characters corresponding to elevator identification.
1. Hydraulic Machine (Power Unit)
2. Controller.
3. Main line disconnect switch.
4. Pit equipment.

C. Hydraulic Machine (Power Unit):
1. New assembled unit consisting of submersible positive displacement pump, induction motor, master-type control valves combining safety features, holding, direction, bypass, stopping, manual lowering functions, shut off valve, oil reservoir with protected vent opening, oil level gauge, outlet strainer, drip pan, muffler. Mount power unit on isolating pads.
1. Submersible pump motor shall be permitted up to 50 HP.

B. Controller: New.
1. Compartment:
   a. UL/CSA labeled.
   b. Securely mount all assemblies, power supplies, chassis switches, relays, etc., on a substantial, self-supporting steel frame.
   c. Completely enclose equipment with covers.
   d. Provide means to prevent overheating.
2. Relay Design:
   a. Magnet operated with contacts of design and material to insure maximum conductivity, long life, and reliable operation without overheating or excessive wear.
   b. Provide wiping action and means to prevent sticking due to fusion.
   c. Contacts carrying high inductive currents shall be provided with arc deflectors or suppressors.
3. Microprocessor Hardware:
   a. Provide built-in noise suppression devices that provide a high level of noise immunity on all solid-state hardware and devices.
   b. Provide power supplies with noise suppression devices.
   c. Isolate inputs from external devices (such as pushbuttons) with opto-isolation modules.

d. Design control circuits with one leg of power supply grounded.
e. Safety circuits shall not be affected by accidental grounding of any part of the system.
f. System shall automatically restart when power is restored.
g. System memory shall be retained in the event of power failure or disturbance.
h. Equipment shall be provided with Electro Magnetic Interference (EMI) shielding within FCC guidelines.

4. Wiring:
   a. CSA labeled copper for factory wiring.
   b. Neatly route all wiring interconnections and securely attach wiring connections to studs or terminals.
   c. Provide labels for all extra or spare wires, neatly organized at base of controller cabinet.
5. Permanently mark components (relays, fuses, PC boards, etc.) with symbols shown on wiring diagrams.
6. Provide electrical design compliant with UL 508A SB.SCCR of 5000A required.

C. Muffler: New.
1. Provide in discharge oil line near pump unit.
   a. Design shall dampen and absorb pulsation and noise in the flow of hydraulic fluid.

D. Piping and Oil: New.
1. Provide piping, connections, and oil for the system.
2. A minimum of two sound isolation couplings shall be provided between the pump unit and oil line and the oil line and jack unit.
3. Provide 2-90°joints to reduce vibration and create wave diffraction.
4. Provide isolated pipe stands or hangers.

E. Shut-Off Valve: New.
1. Provide oil line shut off valve in the machine room or accessible from outside the hoistway.
2. Provide second valve in pit adjacent to jack unit.

2.8 HOISTWAY EQUIPMENT

A. Provide and arrange equipment in existing hoistways.

B. Guide Rails: Retain main guide rails in place.
1. Clean rails and brackets. Remove rust.
2. Check all rail and bracket fastenings and tighten.

C. Terminal Stopping: Provide normal and final devices.

D. Hoistway Entrance Equipment:
1. Door Hanger: New two-point hanger roller with neoprene roller surface and suspension with eccentric upthrust roller adjustment.
2. Door Hanger Rollers: New.
3. Door Track: New bar or formed, cold-drawn removable steel tracks with smooth roller contact surface.
4. Door Interlocks: New. Operable without retiring cam.
5. Door Closers: New spring-activated spirator. Install and adjust to insure smooth, quiet mechanical close of doors.

E. Hoistway Door Unlocking Device: Provide unlocking device including new escutcheon in door panel at all floors.

F. Hoistway Access Switches: Mount in wall at top and bottom floors. Provide switch with faceplate. Locate within easy reach to entrance so entrance can be guarded by one technician.

G. Floor Numbers: Stencil paint 4" high floor designations in contrasting color on inside face of hoistway doors or hoistway fascia in location visible from within car.

2.9 PIT EQUIPMENT

A. Buffers: Retain existing. Remove rust and repaint non-machined surfaces.

B. Access Ladders and Platforms: Provide permanent buffer and car safety access ladders and platforms to comply with Code requirements.

C. Hydraulic Jack Assembly: Retain Existing. Replace gland packing.

D. Jack Support and Shut-Off Valves: Retain Existing.

2.10 HOISTWAY ENTRANCES

A. Provide and arrange equipment in same location as existing entrances.

B. Frames: Retain existing. Professionally sand, fill and paint entrance frames, transoms, and strike jambs at all landings.
1. Provide new Arabic floor designation/tactile marking plates:
    a. Centered at 60" above finished floor.
    b. Located on both side jambs of all entrances.
    c. Minimum 4" high.
    d. Tactile marking indications shall be below Arabic floor designation.
2. Provide plates at main egress landing with “Star” designation.
3. Provide car identification label:
    a. Mounted directly below floor designation/tactile marking plates.
    b. Located on both side jambs at the following levels:
        1) Designated level.
        2) Alternate level.
    c. Finish and design to match floor designation/tactile marking plates.

C. Hoistway Door Panels:
1. New 16-gauge steel, sandwich or pressed with ribbed construction and without binder angles.
2. Provide one leading edge of doors with rubber astragal. Powder coat finish.
3. Provide a minimum of two gibs per panel, one at leading and one at trailing edge with gibs in the sill groove entire length of door travel.
4. Provide one separate 4” steel reinforcement safety gib mounted between door gibs, where not integrated with door gibs.

D. Sight Guards: New 14-gauge, same material and finish as hoistway entrance door panels. Construct without sharp edges.

E. Sills, Hoistway Entrance: Retain existing. Clean. Check and tighten all fastenings.

F. Sill Supports, Hoistway Entrance: Retain existing. Check and tighten all fastenings.

G. Fascia, Toe Guards, and Hanger Covers: Retain existing.
1. Provide as required where damaged or missing.

2. Check and tighten all fastenings.
3. Paint/Stencil floor number on fascia or hoistway wall all floors visible where car doors are initially opened.

H. Struts and Headers: Retain existing. Check and tighten all fastenings.

I. Finish of Entrance Frames and Doors: As selected by purchaser.

2.11 CAR EQUIPMENT

A. Frame: Retain Existing. Check and tighten all fastenings. Adjust as required for plumb and square alignment.

B. Platform: Retain existing.
1. Adjust as necessary for plumb and level alignment.
2. Reinforce if required.
3. Check and tighten all fastenings.

C. Platform Guard:
1. New extended platform guard to meet Code requirements.
2. Minimum 0.059" (1.5 mm) thick steel, or material of equivalent strength and stiffness.
3. Reinforced and braced to car platform front.
4. Contractor's standard finish.

D. Passenger Elevator Car Guides:
1. New roller type with three or more spring dampened sound-deadening rollers per shoe. Minimum 3 1/4" outside diameter.

E. Finish Floor Covering: Seamless resilient non-slip rubber as approved by the Purchaser. Refer to Appendix A for approved material and finishes.

F. Car Sills: Retain existing. Clean full width. Check and tighten all fastenings.

G. Car Door Panels:
1. New fully enclosed 16-gauge steel, sandwich construction without binder angles. Constructed with interlocking, stiffening ribs. Leading edges of center-opening doors equipped with rubber astragals full height of panel. Minimum of two gibs per panel, one at leading and one at trailing edge with gibs in the sill groove entire length of door travel. Satin finish stainless steel.
2. Adjust vertical and horizontal clearances to meet Code requirements.

H. Door Hangers: New two-point hanger roller with eccentric upthrust roller adjustment and Manufacturer's recommended roller surface

I. Door Track: New bar or formed, cold-drawn removable steel track with smooth roller contact surface.

J. Door Header: New. Construct of minimum 12-gauge steel, shape with stiffening flanges.

K. Car Door Electric Contact: Prohibit car operation unless car door is closed.

L. Door Clutch:
1. New heavy-duty clutch, linkage arms, drive blocks and pickup rollers or cams to provide positive, smooth, quiet door operation.
2. Design clutch so car doors can be closed, while hoistway doors remain open.

M. Restricted Opening Device:
1. Restrict opening of car doors to Code required limit outside unlocking zone.
2. Adjust for smooth and quiet operation with operating noise undetectable from inside any car or outside of the hoistway.
3. Plunger type restrictors not acceptable.
4. Utilize mechanical angle to prevent door opening.

N. Door Operator:
1. New , high-speed, harmonic drive, heavy-duty door operator capable of opening doors at no less than 2.5 fps.
2. Accomplish reversal in no more than 2½" of door movement.
3. Solid-state door control with closed loop circuitry to constantly monitor and automatically adjust door operation based upon velocity, position, and motor current.
4. Maintain consistent, smooth, and quiet car door operation at all floors, regardless of door weight or varying air pressure.

O. Door Reopening Device:
1. New black fully enclosed infrared device with full screen infrared matrix or multiple beams extending vertically along leading edge of each door panel to minimum height of 7'-0" above finished floor. 3D beam device to detect approach from elevator lobby.

P. Car Operating Panel:
1. One car operating panel with faceplate:
   a. Consisting of a metal box containing vandal resistant operating fixtures, mounted behind the car stationary front return panel.
   b. Faceplate shall be hinged and constructed of satin finish stainless steel.
2. Provide Exposed Pushbuttons to Initiate:
   a. Car call registration.
   b. Alarm.
   c. Door open.
   d. Door close.
   e. Emergency push-to-call communication.
   f. Push/Pull stop switch.
3. Pushbuttons:
   a. Provide minimum 3/4" diameter raised floor pushbuttons which illuminate to indicate call registration.
   b. Locate operating controls no higher than 48" above the car floor; no lower than 35" for emergency push-to-call button and alarm button.
   c. Identify buttons with cast tactile symbols rear mounted.
4. Locked Firefighters' Emergency Operation Panel:
   a. Openable by the same key which operates the Fire Operation switch.
   b. Including the following features:
      1) Phase II fire access switch.
      2) Firefighters' visual indication.
      3) Call cancel button.
      4) Stop switch, manually operated.
      5) Door open button.
      6) Door close button.
      7) Floors served.
5. Service Compartment:
   a. Provide lockable service compartment with recessed flush door.
   b. Door material and finish to match car return panel or car operating panel faceplate.

c. Include the following controls in lockable service cabinet with function and operating positions identified by permanent signage or engraved legend:
   1) Access switch.
   2) Light switch.
   3) Four-position exhaust blower switch.
   4) Independent service switch.
   5) Constant pressure test button for battery pack emergency lighting.
   6) 120-volt, AC, GFCI protected electrical convenience duplex outlet.
   7) Card reader override switch.
   8) Switch to select either floor voice annunciation, floor passing tone, or chime.
   9) Keyed stop switch.

6. Provide black paint filled (except as noted), engraved, or approved etched signage as follows with approved size and font:
   a. Phase II firefighters' operating instructions on inside face of firefighters' compartment door.
   b. Engrave filled red firefighters' operation on outside face of compartment door.
   c. Building identification car number on main car operating panel.
   d. "No Smoking" on main car operating panel.
   e. Car capacity in pounds on main car operating panel.
   f. "Certificate of Inspection on File in Building Office" on main car operating panel.

Q. Car Top Control Station:
1. Mount to provide safe access and utilization while standing on car top.
2. Operating device with Up and Down direction buttons, a Run button, an Inspection/Automatic switch and Emergency Stop switch.
3. Operating device provides an audible and visible indicator that fire recall has been initiated.
4. Fix station to the car crosshead or provide portable station provided the extension cord and housing is permanently attached to the car crosshead.
5. The car will be operated by constant pressure on the appropriate directional button and the Run button simultaneously.
6. Normal operating devices will be inoperative while this device is in use.

R. Car Top Emergency Audible Signal:
1. Provide on top of each elevator.
2. Activation of Alarm Button or Emergency Stop switch will cause Emergency Audible Signal.
3. Provide auxiliary power supply to provide 1-hr. power in the event of loss of normal power.

S. Work Light and Duplex Plug Receptacle: New.
1. GFCI protected outlet at top and bottom of car.
2. Include on/off switch and lamp guard.
3. Provide additional GFCI protected outlet on car top for installation of car CCTV.

2.12 COMMUNICATION

A. Car Communication System:
1. Hands-Free Phone System:
   a. New two-way communication instrument in car with automatic dialing, tracking, and recall features, with shielded wiring to car controller in machine room System includes:
      1) "Help" button on car operating panel to initiate two-way communication from Car. Button shall match car operating panel pushbutton design.
      2) Auto dialer with automatic rollover capability with minimum two numbers:
      3) Adjacent light jewel illuminates and flashes when call is acknowledged.

4) "Help" button tactile symbol, engraved signage, and Tactile marking adjacent to button mounted integral with car front return panel.

2.13 CAR ENCLOSURE AND INTERIOR FINISHES

A. Unless specifically identified as "Retain," "Reuse," or "Refurbish," provide new equipment. Contractor may, with Consultant approval, provide new equipment in lieu of refurbishing existing.

B. Refer to Appendix A for approved material and finishes.

C. Car Enclosure and Interior Finishes, Passenger Elevator: Retain existing car enclosure and provide new interior finishes.
1. Verify and document overall car weight prior to removal of any equipment from the existing car frame or car enclosure.
2. Check and tighten all fastenings.
3. Provide new interior finishes as specified herein.
4. Modify car enclosure for application of new signal and pushbutton fixtures.
5. New cab weight including all new finishes to be verified following completion of modernization. Post modernization weight not to exceed code allowable limits.
6. Provide the following features:
   a. Enclosure: Retain existing. Apply sound-deadening mastic to exterior.
   b. Stationary Return Panels: Retain existing.
   c. Entrance Columns: Retain existing.
   d. Transom: Retain existing.
   e. Base: Stainless steel with concealed ventilation cutouts.
   f. Interior Wall Finish: Removable panels, faced and edged, with color core plastic laminate. Plastic laminate (HPDL) shall meet or exceed NEMA Standard LDI-1964 for Type 1, 1/16" high pressure general purpose laminate. Color and finish as selected by Purchaser.
   g. Ventilation: Two-speed exhaust blower. Mount to car canopy on isolated rubber grommets. Exhaust blower shall meet noise requirements specified herein.
   h. Lighting: LED fixtures with wiring and hookup. Coordinate with emergency lighting requirements.
   i. Suspended Ceiling: Six-section satin finish stainless-steel panels with lighting cutouts in each panel.
   j. Handrails: Solid stainless steel flat stock bars, 4" x 3/8", across rear wall. Return handrail ends to car wall.
7. Pads and Buttons: Where no service elevator available in the building, provide hooks and three-piece removable pads. Two pads covering side walls and adjacent front returns and one covering rear wall. Provide cutouts to access main car operating panel.

D. Top of Car Guardrail: Provide car top railings where fall hazard exceeds 12". Install guardrails, necessary hardware, and toe board to meet code requirements.

2.14 HALL CONTROL STATIONS

A. Pushbuttons: New.
1. Provide one riser with surface mounted enlarged faceplate to cover existing wall block out. Provide any cutting and patching required.
2. Vandal resistant pushbuttons for each direction of travel which illuminate to indicate call registration. Provide LED illumination.
3. Approved engraved message and pictorial representation prohibiting use of elevator during fire or other emergency as part of faceplate.
4. Pushbutton design to match car operating panel pushbuttons.

2.15 SIGNALS

A. Car Direction Lantern:
1. Provide new flush-mounted car lantern in all car entrance columns.
2. Illuminate up or down LED lights and sound tone once for up and twice for down direction.
3. Illuminate light until the car doors start to close.
4. Sound level shall be adjustable from 20-80 dBA measured at 5'-0" in front of hall control station and 3'-0" off floor.
5. Car direction lenses shall be arrow-shaped with faceplates.
6. Lenses shall be minimum 2½" in their smallest dimension.

B. Car Position Indicator:
1. New alpha-numeric digital indicator containing floor designations and direction arrows a minimum of 2" high to indicate floor served and direction of car travel.
2. Locate fixture in car operating panel.
3. When a car leaves or passes a floor, illuminate indication representing position of car in hoistway.
4. Illuminate proper direction arrow to indicate direction of travel.

C. Floor Passing Tone: Provide an audible tone of no less than 20 decibels and frequency of no higher than 1500 Hz, to sound as the car passes or stops at a floor served.

D. Voice Synthesizer:
1. Provide new electronic device with easily reprogrammable message and voice to announce car direction, floor, emergency exiting instructions, etc.
2. Once the doors close, the destinations remain illuminated until the car approaches the next destination floor, whereupon the floor numeral or light flashes and the audible signal sounds to denote the next stopping floor.
3. When the doors open, Destination Indicator displays the next floors to be served.

E. Fixture Faceplate Material and Finish:
1. Satin finish stainless steel, all fixtures.

2.16 FIREFIGHTERS CONTROL AND EMERGENCY POWER PANEL

A. Provide and arrange new equipment as directed by Purchaser or Consultant.

B. Firefighters' Control Panel:
1. Locate in building fire control room.
2. Fixture faceplate, satin finish stainless steel, including the following features:
   a. Car position and direction indicator, digital-readout, or LCD flat screen color monitor.
   b. Identify each position indicator with car number.
   c. Indicator showing operating status of car.
   d. Two-position firefighters' emergency return switches and indicators with engraved instructions filled red.
3. Where applicable, identify all indicators and manual switches with appropriate engraving.
4. Provide wiring and conduit to control panel.
5. Provide all wiring and conduit (materials and labor) to interconnect elevator controls between machine rooms or controller rooms. Coordinate wiring routing path and logistics with Purchaser.
6. Provide intergroup communications wiring or cable specifications and other requirements to Purchaser for installation by others for wiring outside of the machine rooms or control rooms.

C. Firefighters' Key Box: Flush-mounted box with lockable hinged cover. Engrave instructions for use on cover per Local Fire Authority requirements.

PART 3 - EXECUTION

3.1 SITE CONDITION INSPECTION

A. Prior to beginning installation of equipment, examine hoistway and machine room areas. Verify no irregularities exist which affect execution of work specified.

B. Inform Purchaser and Consultant of any irregularities in writing prior to commencing work.

C. Do not proceed with installation until work in place conforms to project requirements.

3.2 INSTALLATION

A. Install all equipment as follows:
1. in accordance with Contractor's instructions, referenced codes, specifications, and approved submittals.
2. with clearances in accordance with referenced codes, and specifications.
3. to be easily maintained and/or removed.
4. to afford maximum accessibility, safety, and continuity of operation.

B. Remove oil, grease, scale, and other foreign matter from the following equipment and apply one coat of field-applied machinery enamel.
1. All exposed equipment and metal work installed as part of this work which does not have architectural finish.
2. Machine room equipment, and pit equipment.
3. Neatly touch up damaged factory-painted surfaces with original paint color.
4. Protect machine-finish surfaces against corrosion.

C. Paint machine room and pit floors.

3.3 FIELD QUALITY CONTROL

A. Work at jobsite will be checked during course of installation. Full cooperation with reviewing personnel is mandatory. Accomplish corrective work required prior to performing further installation.

B. Perform complete "Acceptance" level pre-testing as specified in the latest edition of ASME A17.2 "Guide for Inspection of Elevators, Escalators, and Moving Walks" prior to AHJ witnessed acceptance testing. Complete any adjustments, repairs, or replacements necessary to achieve code compliant operation including but not limited to:
1. Hydraulic pressure relief valve.
2. Car emergency communications. Inform Purchaser and Consultant of any noted failures of Purchaser provided and maintained equipment or systems.
3. Car buffers.
4. Phase I and II Firefighters' Emergency Operation. Phase I initiated by smoke sensing devices.
5. Power car door operation including door closing force, reopening device, and restricted opening.

C. Have Code Authority acceptance inspection performed and complete corrective work.

D. Provide access to installed equipment and elevator personnel assistance for Consultants final observation and review requirements.

3.4 ADJUSTING

A. Static balance car to equalize pressure of guide shoes on guide rails.

B. Verify that weights of existing or altered cars, counterweights, and compensation comply with traction machine manufacturers' requirements and do not exceed total weights indicated on approved submittals.

C. Lubricate all equipment in accordance with Contractor's instructions.

D. Adjust motors, power conversion units, brakes, controllers, leveling switches, limit switches, stopping switches, door operators, interlocks, and safety devices to achieve required performance levels.

3.5 CLEANUP

A. Keep work areas orderly and free from debris during progress of project. Remove packaging materials daily.

B. Remove all loose materials and filings resulting from work.

C. Clean machine room equipment and floor.

D. Clean hoistways, car, car enclosure, entrances, operating and signal fixtures.

END OF SECTION

Appendix A

Bldg. No.	WSU Bldg. ID	WSU Bldg. Address	WSU ID #	Elevator Type	Cab Flooring Material (per specifications)	Interior Wall Finishes (per specifications)
5	**Science Hall**	5045 Cass Avenue, Detroit, MI 48202	005 01	Traction	Seamless Resilient Rubber	5WL hanging panels ???
34	**Student Center Center**	5221 Gullen Mall Detroit, MI 48202	034 03	Traction	diamond plate	5WL hanging panels ???
36	**Reuther Library**	5401 Cass Avenue, Detroit, MI 48202	036 01	Hydraulic	Seamless Resilient Rubber	Plastic laminate panels
42	**Alumni House**	441 Gilmour Mall Detroit, MI 48202	042 01	Hydeaulic	Porcelain tile	Wood Veneer panels
45	**Parking Structure 5**	5501 Anthony Wayne Drive, Detroit, MI 48202	045 01	Hydraulic	Seamless Resilient Rubber	5WL hanging panels
			045 02	Hydraulic		5WL hanging panels
51	**Parking Structure 1**	450 West Palmer, Detroit, MI 48202	051 03	Traction	Seamless Resilient Rubber	5WL hanging panels
			051 04	Traction		5WL hanging panels
71	**5057 Woodward**	5057 Woodward, Detroit, MI 48202	071 01	Traction	Seamless Resilient Rubber	Plastic laminate panels
			071 02	Traction		Plastic laminate panels
			071 03	Traction		Plastic laminate panels
			071 03	Traction		Plastic laminate panels
			071 03	Traction		Plastic laminate panels
88	**Parking Structure 6**	61 Putnam Avenue, Detroit, MI 48202	088 01	Hydraulic	Seamless Resilient Rubber	5WL hanging panels
			088 03	Hydraulic		5WL hanging panels
			088 02	Hydraulic		5WL hanging panels
89	**Biological Sciences**	5047 Gullen Mall, Detroit, MI 48202	089 01	Traction	Seamless Resilient Rubber	Plastic laminate panels
			089 02	Traction	diamond plate (Service)	5WL hanging panels
130	**Faculty / Administration Building**	656 West Kirby Avenue, Detroit, MI 48202	130 03	Hydraulic	Existing to remain	Plastic laminate panels
			130 02	Hydraulic		Plastic laminate panels
			130 01	Hydraulic		Plastic laminate panels
629	**Elliman Clinical Research**	421 East Canfield Avenue	629 01	Hydraulic	Seamless Resilient Rubber	Plastic laminate panels
			629 02	Hydraulic	Seamless Resilient Rubber	Plastic laminate panels
			629 03	Hydraulic	diamond plate (Service)	5WL hanging panels

APPENDIX A

WAYNE STATE UNIVERSITY CAR ENCLOSURE AND INTERIOR FINISH STANDARDS

CAR ENCLOSURE AND INTERIOR FINISHES

A. Passenger Elevator: Retain existing car enclosure and provide new interior finishes.
   1. Check and tighten all fastenings.
   2. Provide new interior finishes as specified herein.
   3. Modify car enclosure for application of new signal and pushbutton fixtures.
   4. Post modernization weight not to exceed code allowable limits.
   5. Provide the following features:
      a. Enclosure: Retain. Apply sound-deadening mastic to exterior.
      b. Stationary Return Panels: Retain.
      c. Entrance Columns: Retain.
      d. Transom: Retain.
      e. Car Door Panels: Fully enclosed 16-gauge steel, sandwich construction without binder angles. Constructed with interlocking, stiffening ribs. Leading edges of center-opening doors equipped with rubber astragals full height of panel. Minimum of two gibs per panel, one at leading and one at trailing edge with gibs in the sill groove entire length of door travel. Satin finish stainless steel.
      f. Base: Stainless steel with concealed ventilation cutouts.
      g. Interior Wall Finish:
         1) Removable panels, faced and edged, with color core plastic laminate. Plastic laminate (HPDL) shall meet or exceed NEMA Standard LDI-1964 for Type 1, 1/16" high pressure general purpose laminate.
         2) Color and finish as selected by Purchaser.
         3) 5WL hanging panels with #4 stainless steel reveals between panels.

      h. Ventilation: Two-speed exhaust blower. Mount to car canopy on isolated rubber grommets. Exhaust blower shall meet noise requirements specified herein.
      i. Lighting: LED fixtures with wiring and hookup. Coordinate with emergency lighting requirements.
      j. Suspended Ceiling: Six-section satin finish stainless-steel panels with lighting cutouts in each panel.
      k. Handrails: Solid stainless steel flat stock bars, 4" x 3/8", across rear and side walls. Return handrail ends to car walls.
      l. Cab Flooring, provide floor covering per below:
         1) Porcelain tile, 12"x24"x3/8" running bond pattern, thin set mortar, 1/16" joints with non-sanded grout, final selection by Owner, provide allowance of $10/sf for tile cost with 10% waste.
         2) Luxury Vinyl Tile, 6"x36", random linear pattern, zero VOC adhesive as recommended by the manufacturer, final selection by Owner, provide allowance of $5/sf for tile cost with 10% waste.
         3) Diamond Plate, 1/8" thick aluminum, mill finish 6061, seamless where possible, minimal seams if cab width exceeds sheet width. Sand all edges smooth, secure with 1/8" self-tapping aluminum or stainless-steel fasteners ½" from edge of panel @ 10" oc along edges, and in field. Trowel zero VOC adhesive over 100% of cab floor prior to installation of diamond plate and roll 100 lb. roller over plate to ensure adhesion.
         4) Seamless resilient non-slip rubber or vinyl with sealed edges

5) Pads and Buttons: Where no service elevator available in the building, provide hooks and three-piece removable pads. Two pads covering side walls and adjacent front returns and one covering rear wall. Provide cutouts to access main car operating panel.

B. Service Elevator: Retain existing car shell enclosure and provide new interior finishes.
   1. Check and tighten all fastenings.
   2. Provide new interior finishes as specified herein.
   3. Modify car enclosure for application of new signal and pushbutton fixtures.
   4. Post modernization weight not to exceed code allowable limits.
   5. Provide the following features:
      a. Enclosure: Retain. Apply sound-deadening mastic to exterior.
      b. Stationary Return Panels: Retain.
      c. Entrance Columns: Retain.
      d. Transom: Retain.
      e. Car Door Panels: Fully enclosed 16-gauge steel, sandwich construction without binder angles. Constructed with interlocking, stiffening ribs. Leading edges of center-opening doors equipped with rubber astragals full height of panel. Minimum of two gibs per panel, one at leading and one at trailing edge with gibs in the sill groove entire length of door travel. Satin finish stainless steel.
      f. Base: Textured stainless steel with concealed ventilation cutouts.
      g. Interior Wall Finish: Removable panels made of 5WL.
      h. Ventilation: Two-speed exhaust blower. Mount to car canopy on isolated rubber grommets. Exhaust blower shall meet noise requirements specified herein.
      i. Lighting: LED fixtures with wiring and hookup. Coordinate with emergency lighting requirements.
      j. Suspended Ceiling: Six-section satin finish stainless-steel panels with lighting cutouts in each panel.
      k. Handrails: Solid stainless steel flat stock bars, 4" x 3/8", across rear and side walls. Return handrail ends to car walls.
      l. Cab Flooring: Provide a heavy vinyl cab floor covering as selected by the Purchaser.
      m. Pads and Buttons: Three-piece removable pads. Two pads covering side walls and adjacent front returns and one covering rear wall. Provide cutouts to access main car operating panel.

C. Passenger Elevator: New Car Enclosure and Interior Finishes.
   1. Remove all existing interior finishes and shell components, weigh, and document.
   2. Provide complete new car enclosure and interior finishes as specified herein.
   3. Post modernization weight not to exceed code allowable limits.
   4. Provide the following features:
      a. Enclosure Walls: Reinforced 14-gauge furniture steel stainless steel formed panels Width of individual panels shall not exceed 18". Apply sound-deadening mastic to exterior.
      b. Enclosure Canopy: Reinforced 12-gauge furniture steel formed panels with lockable, hinged emergency exit. Interior finish white reflective baked enamel.
      c. Stationary Return Panels: Reinforced 14 gauge satin finish stainless steel with cutouts for car operating panels and other equipment.
      d. Entrance Columns: Reinforced 14 gauge satin finish stainless steel.
      e. Transom: Reinforced 14 gauge satin finish stainless steel full width of enclosure.
      f. Car Door Panels: Fully enclosed 16-gauge steel, sandwich construction without binder angles. Constructed with interlocking, stiffening ribs. Leading edges of center-opening doors equipped with rubber astragals full height of panel. Minimum of two gibs per panel, one at leading and one at trailing edge with gibs in the sill groove entire length of door travel. Satin finish stainless steel.

g. Base: Stainless steel with concealed ventilation cutouts.
h. Interior Wall Finish: Removable panels, faced and edged, with color core plastic laminate. Color and finish as selected by Architect/Purchaser.
i. Ventilation: Two-speed exhaust blower. Mount to car canopy on isolated rubber grommets. Exhaust blower shall meet noise requirements specified herein.
j. Lighting: LED fixtures with wiring and hookup. Coordinate with emergency lighting requirements.
k. Suspended Ceiling: Six-section satin finish stainless-steel panels with lighting cutouts in each panel.
l. Subfloor; 5/8" thick marine grade plywood.
m. Cab Flooring: Provide floor covering per below:
    1) Porcelain tile, 12"x24"x3/8" running bond pattern, thin set mortar, 1/16" joints with non-sanded grout, final selection by Owner, provide allowance of $10/sf for tile cost with 10% waste.
    2) Luxury Vinyl Tile, 6"x36", random linear pattern, zero VOC adhesive as recommended by the manufacturer, final selection by Owner, provide allowance of $5/sf for tile cost with 10% waste.
    3) Diamond Plate, 1/8" thick aluminum, mill finish 6061, seamless where possible, minimal seams if cab width exceeds sheet width. Sand all edges smooth, secure with 1/8" self-tapping aluminum or stainless-steel fasteners ½" from edge of panel @ 10" oc along edges, and in field. Trowel zero VOC adhesive over 100% of cab floor prior to installation of diamond plate and roll 100 lb. roller over plate to ensure adhesion.
    4) Seamless resilient non-slip rubber or vinyl with sealed edges
n. Handrails: Solid stainless steel flat stock bars, 4" x 3/8", across rear and side walls. Return handrail ends to car walls.
o. Pads and Buttons: Where no service elevator available in the building, provide hooks and three-piece removable pads. Two pads covering side walls and adjacent front returns and one covering rear wall. Provide cutouts to access main car operating panel.

D. Service Elevator: New Car Enclosure and Interior Finishes.
1. Remove all existing interior finishes and shell components, weigh, and document.
2. Provide complete new car enclosure and interior finishes as specified herein.
3. Post modernization weight not to exceed code allowable limits.
4. Provide the following features:
    a. Enclosure Walls: Reinforced 14-gauge furniture steel textured stainless steel formed panels with baked enamel interior finish as selected. Width of individual panels shall not exceed 18". Apply sound-deadening mastic to exterior.
    b. Enclosure Canopy: Reinforced 12-gauge furniture steel formed panels with lockable, hinged emergency exit. Interior finish white reflective baked enamel.
    c. Car Sill:
    d. Stationary Return Panels: Reinforced 14 gauge satin finish stainless steel with cutouts for car operating panels and other equipment.
    e. Entrance Columns: Reinforced 14 gauge textured satin finish stainless steel.
    f. Transom: Reinforced 14 gauge textured satin finish stainless steel full width of enclosure.
    g. Car Door Panels: Fully enclosed 16-gauge steel, sandwich construction without binder angles. Constructed with interlocking, stiffening ribs. Leading edges of center-opening doors equipped with rubber astragals full height of panel. Minimum of two gibs per panel, one at leading and one at trailing edge with gibs in the sill groove entire length of door travel. Satin finish stainless steel.
    h. Base: Textured stainless steel with concealed ventilation cutouts.
    i. Ventilation: Two-speed exhaust blower. Mount to car canopy on isolated rubber grommets. Exhaust blower shall meet noise requirements specified herein.

j. Lighting: LED fixtures with wiring and hookup. Coordinate with emergency lighting requirements.
k. Suspended Ceiling: Six-section satin finish stainless-steel panels with lighting cutouts in each panel.
l. Handrails: Solid stainless steel flat stock bars, 4" x 3/8", across rear and side walls. Return handrail ends to car walls.
m. Guardrails:
    1) Solid stainless steel flat stock bars, 4" x 3/8", mounted across rear and side walls.
    2) Locate guardrail line at 8" above car floor.
    3) Bolt rails through car walls from back and mount on 1½" deep solid round stainless steel standoff spacers no more than 18" O.C.
    4) Return guardrail ends to car walls.
    5) Pads and Buttons: Three-piece removable pads. Two pads covering side walls and adjacent front returns and one covering rear wall. Provide cutouts to access main car operating panel.
n. Cab Flooring:
    1) Seamless resilient non-slip rubber or vinyl with sealed as selected by the Owner.

E. Freight Elevator Enclosure: Car weight to be verified prior to removal of interior cab finishes/cab enclosure. Post modernization weight not to exceed code allowable limits. Provide the following features:
1. Enclosure Walls: Reinforced 10-gauge furniture steel formed panels no more than 20" wide with light-proof joints.
    a. Baked enamel finish as selected.
    b. Provide recess in car side wall for recessed mounting of car operating panel.
2. Enclosure Canopy:
    a. Reinforced 12-gauge furniture steel formed panels no more than 20" wide with light-proof joints and Hinged emergency exit.
    b. Interior finish white reflective baked enamel.
    c. Lighting: Recessed LED down lights with on/off switch in car operating panel. Recess mount fixture flush with inside surface of car top. Provide steel guard on car top over fixture.
    d. Bumper Rails: Two rows of 2" x 12" oak or maple bumpers mounted on both sides and rear of the car.
        1) Locate bottom rail at floor level and top rail at 36" above the car floor.
        2) Bolt rails through car walls with bolt and captive nuts on exterior of wall panel sections on 18" centers.
        3) Finish both upper and lower top edges with a 45-degree chamfered edge to eliminate collection of trash.
        4) Finish ends of upper and lower bumpers on side walls to 45° chamfer to eliminate carts and people from hitting blunt ends.
        5) Flooring: Provide cab flooring which is 1/8” aluminum diamond plate.

DIVISION 14

SECTION 142402

HYDRAULIC SPECIFICATIONS FOR

ONE (1) ELEVATOR

AT

ALUMNI HOUSE

441 GILMOUR MALL

DETROIT, MI

DATE: March 27, 2014

SECTION 142402 –
HYDRAULIC ELEVATOR MODERNIZATION

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes modernization of hydraulic elevator:
   1. One (1) passenger elevator, Car #1.

B. Products Installed but Not Furnished Under This Section:
   1. CCTV camera provisions.
   2. Elevator security devices, control unit, mounting brackets, wiring materials, logic circuits, security system interface terminals, boxes, and relays.

1.2 DEFINITIONS

A. All technical terms in these Contract Documents are used as defined in the latest edition of American National Standard Safety Code for Elevators, Dumbwaiters, Escalators, and Moving Walks ASME A17.1. and A17.2.

B. ELEVATOR CONSULTANT or CONSULTANT refers to Lerch Bates Inc. (Lerch Bates).

C. PURCHASER refers to Wayne State University.

D. CONTRACT or CONTRACT DOCUMENTS consists of the Agreement, Conditions of Contract, Specifications, Addenda, Drawings if included, and Alternates if accepted.

E. CONTRACTOR or ELEVATOR CONTRACTOR refers to any persons, partners, firm, or corporation having a contract with Purchaser to furnish labor and materials for the execution of work required.

F. CONTRACT AWARD refers to Purchaser's verbal or written award for work required.

G. SUBCONTRACTOR refers to any persons, partners, firm, or corporation having a contract with Contractor to furnish labor and materials for the execution of work required.

H. PROVIDE means "furnish and install."

I. MANUFACTURER means either the Original Equipment Manufacturer (OEM) or the principal manufacturer of a component or system.

J. RETAIN means, unless otherwise specified, the existing equipment is to be left in place with no alterations and no change in the original manufacturer's designed performance or functionality. Items that are "retained" shall be thoroughly cleaned in place and adjusted to achieve originally designed function.

K. REFURBISH means, unless otherwise specified, the existing equipment is to be cleaned, repainted, repaired, and parts replaced to put the equipment into a condition to provide the same appearance, performance, and functionality as the equipment provided when it was originally installed. Unless otherwise specified, the scope of replacement of components is limited to those items currently available for purchase as replacement parts from the manufacturer or after-market suppliers approved by the manufacturer.

L. REUSE means that the Contractor shall carefully remove equipment from the existing installation, avoiding any damage or additional wear. Store in a safe location to maintain equipment in its pre-removal condition. Reinstall and incorporate into the modernized elevator installation using the same procedures and recommendations provided by the manufacturer of the equipment.

M. INCLUDES or INCLUDING means including the items specified but not limited solely to those items if additional work or components are required to achieve the specified outcome.

N. CALL BACK means a request from the Purchaser to the Contractor to provide a technician on site to evaluate an elevator that is out of service or not functioning properly, rectify the root cause of the malfunction, and place the unit back into normal service.

O. Words in the singular shall include the plural whenever applicable or context so indicates.

1.3 WORK INCLUDED

A. Modernize one hydraulic passenger elevator.

B. All labor, engineering, tools, transportation, services, supervision, materials, and equipment necessary for and incidental to satisfactory completion of required work as indicated in Contract Documents.

C. Provide all required staging, hoisting, and movement of new equipment, reused equipment, or removal of existing equipment.

D. Applicable conditions of Purchaser's General, Special, and Supplemental Conditions.

E. Warranty maintenance as described herein.

F. Cartage and Hoisting: All required staging, hoisting, and movement to, on, and from the site including new equipment, retained equipment, or dismantling and removal of existing equipment.

G. Unless specifically identified as "Retain," "Reuse," or "Refurbish," provide new equipment. Contractor may, with approval prior to quotation, provide new equipment in lieu of refurbishing existing.

H. Reference to a device or a part of the equipment applies to the number of devices or parts required to complete the installation.

I. Provide hoistway, pit, and machine room barricades.

J. Provide temporary and permanent pit ladders, working platforms, inspection platforms, and guard rails required to comply with applicable Building Code, work safety standards, and AHJ requirements.

K. Scope of Contract includes, but is not limited to, the following:
1. Coordination, scheduling, and management of work of component suppliers and subcontractors.
2. Modernize or furnish and install equipment as specified utilizing existing and/or modified hoistways and machine rooms or
3. Specific item of required work which cannot be determined to be included in another contract is thereby determined to be included in prime contract.

1.4 CONSULTANT'S STATUS

A. Consultant shall act as Purchaser's and/or Building Management's representative on all matters pertaining to required work. Consultant shall interpret Contract Documents, analyze Contractor's

quotations, review Contractor's suggested alternates, review all Contractor's submittals, approve billings, review technical details and construction procedure, perform work progress reviews, and review and test completed work for compliance with Contract Documents prior to acceptance of work by Purchaser.

B. Field Review Scheduling: Schedule progress and final work reviews with Consultant. Reply promptly, in writing, to corrective work indicated on Consultant's progress and/or final review reports, indicating status and schedule for completion. Consultant anticipates scheduled site review appointments will be met.

1.5 CODES AND ORDINANCES

A. All work covered by these Contract Documents is to be done in full accord with national code, state and local codes, ordinances, and elevator safety orders in effect at time elevator alteration permit issuance. All requirements of local Building Department and fire jurisdiction are to be fulfilled by Contractor and its Subcontractors.

1.6 PRIME CONTRACTOR'S DUTIES

A. Prime Contractor's duties include the following:
1. Provide and pay for labor, materials and equipment, tools, construction equipment and machinery, and other facilities and services necessary for proper execution and completion of required work.
2. Pay for legally required sales, consumer, and state remodel taxes.
3. Secure and pay for required permits, fees, and licenses necessary for proper execution and completion of required work, as applicable at time of quotation due date.
4. Give required notices.
5. Comply with codes, ordinances, rules, regulations, orders, and other legal requirements of public authorities which bear on performance of required work.
6. Promptly submit written notice to Consultant of observed variance of Contract Documents from legal requirements.
7. Enforce strict discipline and good order among employees. Do not employ persons unskilled in assigned task.

1.7 STAGING AREA

A. An equipment staging area will be available for use by Contractor. Contractor shall restrict usage to area designated and shall notify Purchaser prior to storing of any large equipment which will impose heavy concentrated loading on floor area. Do not store such equipment until approval is received.

B. Staging area will be located in the basement.

1.8 WORK SEQUENCE

A. Construct work in stages.

1.9 WORKING HOURS

A. Unless otherwise stated below or elsewhere in the Contract Documents, Contractor shall have access to the building for work activities during the following regular building operating hours:
1. 8:00 a.m. to 5:00 p.m., Monday through Friday or as agreed upon by Wayne State University.

B. Contractor shall perform all work that has the potential to result in any of the following conditions outside of regular building operating hours at no additional cost to the Purchaser:
   1. Interruptions or changes in normal automatic operation.
   2. Activation of Firefighter's Emergency Operation Phase I.
   3. Noise levels in excess of 80 dBA measured in any occupied or public space.
   4. Transport of large equipment through public or tenant spaces.
   5. Coordination with WSU staff for planned events in the residence.

1.10 CONTRACTOR USE OF PREMISES

A. Confine operations at site to areas permitted by law, ordinances, permits, Contract Documents, and Purchaser's specific instructions.

B. Do not unreasonably encumber site with materials or equipment. Staging area will be located as directed by Purchaser.

C. Do not load structure with weight that will endanger structure. Coordinate with Purchaser.

D. Assume full responsibility for protection and safekeeping of tools and products stored on or off premises.

E. Move stored products which interfere with operations of building or the operations of other trades.

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

1.11 CONCURRENT MODERNIZATION WORK AND BUILDING OPERATION

A. This project is a major elevator modernization in an existing building which is a private residence and open for public business. The building will continue to operate throughout all phases of required work. It is essential that Contractor give special attention and priority to all matters concerning project safety, protection from dust and loose materials, reduction of noise level, protection from water and air infiltration into building, and maintenance of neat, sightly conditions in and around work areas inside and outside of building. Packaging, scrap materials, and demolition debris shall be promptly removed from building and site on a daily basis.

B. At all times Contractor shall provide clearly visible warning and directions signs. At all times give special attention to building entrances, exits, and proper safe exiting through work areas as required by law.
   1. Barricade design must be approved by client prior to start of modernization work.
   2. Standard folding maintenance barricades are not acceptable.

C. Contractor shall consult Purchaser and other Contractors to establish and maintain safe temporary routes including, but not limited to, proper barricades, walking surfaces, lighting, fire protection, exiting, warning and directional signs, and general protection of persons from all hazards in accordance with OSHA Standards due wholly or partially to its operations.

1.12 ALTERNATES

A. Not applicable.

1.13 RELATED WORK PROVIDED BY ELEVATOR CONTRACTOR

A. Hoistway and Pit:
1. Provide wall blockouts and fire rated closure for control and signal fixture boxes which penetrate walls.
2. Perform any cutting and patching of walls and floors.
3. Provide new fire-rated pit door with self-closing hardware. Replace existing pit access door with new 90-minute fire rated door and add switch to remove car from service if door is opened.
4. Pit Door: Include signage: “RESTRICTED” and “ELEVATOR HOISTWAY”.
5. Install Pit Sump or Drain: Indirect waste drain or sump with flush grate and pump. Sump pump/drain capacity minimum 3,000 gallons per hour per elevator.
6. Furnish and install oil separator adjacent to elevator hoistway.
7. Provide permanent buffer and hydraulic jack assembly access ladder to comply with Code requirements.

B. Machine Room:
1. Expand existing machine room enclosure with metal stud and drywall construction to include new elevator equipment. Provide detailed construction plan.
2. Install new fire-rated access machine room door with self-closing door hardware complete with door hinges, door closer, locks, latching devices, etc. Coordinate hardware acceptable manufacturer with Purchaser.
3. Ventilation and heating. Provide split A/C unit to maintain minimum temperature of 55° F, maximum 90° F. Maintain maximum 80% relative humidity, non-condensing.
4. Paint walls and floor.
5. Box in pipe located in rear of machine room. Provide details to Purchaser prior to constructing.
6. Provide lock box for machine room key.
7. Provide drip pan beneath pipes running through upper portion of machine room.
8. Include Signage: “ELEVATOR MACHINE ROOM” and “AUTHORIZED PERSONNEL ONLY”.

C. Electrical Service, Conductors, and Devices:
1. Install lighting and GFCI convenience outlets in pit and machine room. Provide one additional non-GFCI convenience outlet in pit for sump pump and oil return pump.
2. Install guarded lighting with an illumination level of not less than 100 lx (10 fc) at the pit floor.
3. Install guarded lighting with an illumination level of 200 lx (19 fc) at the machine room floor.
4. Install new three-phase mainline copper power feeder with true earthen grounding to terminals of each elevator controller in the machine room with protected lockable “open” disconnecting means with auxiliary contacts to allow Elevator Contractor to electrically interlock battery power lowering unit.
5. Install new single-phase copper power feeder to each elevator controller for car lighting and exhaust blower with individual protected lockable “open” disconnecting means located in machine room.
6. Emergency telephone line to designated elevator control panel in elevator machine room. Existing can be reused.
7. Install conduit from the hoistway of the elevator to the firefighters’ control panel.
8. Install new single-phase copper power feeder to each elevator with individual protected lockable “open” disconnecting means located in machine room for utilization equipment:
    a. Pit sump pump.
    b. CCTV camera.
    c. Card reader system.
9. Install automatic Fire Recall System:
    a. Fire alarm initiating devices in each elevator lobby.
    b. Fire alarm initiating devices in elevator machine room.

c. Three Relay Activation Modules for single elevator. Locate modules within three feet of controller designated by the Elevator Contractor to minimize un-supervised wiring. Program Modules as follows:
   1) PRIMARY: Activate when any hallway device, except primary floor, activates.
   2) ALTERNATE: Activate when hallway device at primary floor activates.
   3) FIRE HAT: Activate when machine room device activates.
d. Device in machine room and at top of hoistway to provide signal for general alarm.
e. Provide technician from fire alarm contractor for pre-test of system during normal working hours.
f. Provide technician from fire alarm contractor for acceptance test of system with AHJ during normal working hours.
g. Fire alarm contractor to submit drawings to the State and Purchaser for review and approval.
h. Apply for and obtain variance with Fire Protection Department. Since the building does not currently contain sprinklers, it is not feasible to add sprinklers to the building.

10. Provide necessary electrical inspections during normal working hours.
11. Install conduit from fire alarm panel to each fire alarm device location at each floor, hoistway, pit and machine room including three relay activation modules in machine room. Provide junction box at each location.
12. Card or Proximity Readers, elevator contractor to coordinate and assist with installation of readers in car operating panel or hall stations.

1.14 ACTION AND INFORMATIONAL SUBMITTALS

A. Within sixty (60) calendar days after award of contract and before beginning equipment fabrication, submit shop drawings, and required material samples for review. Allow 30 days for response to initial submittal.
   1. Scaled or Fully Dimensioned Layout: Plan of machine room indicating equipment arrangement, details of car enclosures, and car/hall signal fixtures.
   2. Design Information: Indicate equipment lists, reactions, and design information on layouts.
   3. Power Confirmation Information: Design for existing conditions.
   4. Fixtures: Shop drawings.
   5. Finish Material: If requested, submit 3" x 12" samples of actual finished material for review of color, pattern, and texture. Compliance with other requirements is the exclusive responsibility of the Contractor. Include, if requested, signal fixtures, lights, graphics, Braille plates, and detail of mounting provisions.
   6. Design Information: Provide calculations verifying the following:
      a. Adequacy of existing electrical provisions.
      b. Machine room heat emissions in B.T.U.
      c. Adequacy of existing car platform structure for intended loading.
      d. Adequacy of plunger wall thickness for intended loading.
   7. Written Maintenance Control Program (MCP) specifically designed for the equipment included under this contract. Include any unique or product specific procedures or methods required to inspect or test the equipment. In addition, identify weekly, bi-weekly, monthly, quarterly, and annual maintenance procedures, including statutory and other required equipment tests.

B. Submittal review shall not be construed as an indication that submittal is correct or suitable, or that the work represented by submittal complies with the Contract Documents. Compliance with Contract Documents, code requirements, dimensions, fit, and interface with other work is Contractor's responsibility.

C. Acknowledge and/or respond to review comments within 14 calendar days of return. Promptly incorporate required changes due to inaccurate data or incomplete definition so that delivery and

installation schedules are not affected. Identify and cloud drawing revisions, including Contractor elective revisions on each re-submittal. Contractor's revision response time is not justification for equipment delivery or installation delay.

1.15 PURCHASER'S INFORMATION

A. Non-Proprietary Equipment Design: Provide two (2) sets of digital and three (3) sets of neatly bound written information necessary for proper maintenance and adjustment of equipment within 30 days following final acceptance. Final retention will be withheld until data is received by Purchaser and reviewed by Consultant. Include the following as minimums:
   1. Straight-line wiring diagrams of "as-installed" elevator circuits with index of location and function of components. Mount one set wiring diagrams on panels, racked, or similarly protected, in elevator machine room. Provide remaining set rolled and in a protective drawing tube. Maintain all drawing sets with addition of all subsequent changes. These diagrams are Purchaser's property. A legend sheet shall be furnished with each set of drawings to provide the following information:
      a. Name and symbol of each relay, switch, or other apparatus.
      b. Location on drawings, drawing sheet number and area, and location of all contacts.
      c. Location of apparatus, whether on controller or on car.
   2. Written Maintenance Control Program (MCP) specifically designed for the equipment included under this contract. Include any unique or product specific procedures or methods required to inspect or test the equipment. In addition, identify weekly, bi-weekly, monthly, quarterly, and annual maintenance procedures, including statutory and other required equipment tests.
   3. Printed instructions explaining all operating features.
   4. Complete software documentation for all installed equipment.
   5. Lubrication instructions, including recommended grade of lubricants.
   6. Parts catalogs listing all replaceable parts including Contractor's identifying numbers and ordering instructions.
   7. Four sets of keys for all switches and control features properly tagged and marked.
   8. Diagnostic test devices together with all supporting information necessary for interpretation of test data, troubleshooting of elevator system, and performance of routine safety tests.
   9. The elevator installation shall be a design which can be maintained by any licensed elevator maintenance company employing journeymen mechanics, without the need to purchase or lease additional diagnostic devices, special tools, or instructions from the original equipment Contractor.
      a. Provide onsite capability to diagnose faults to the level of individual circuit boards and individual discrete components for the solid-state elevator controller.
      b. Provide a separate, detachable device, as required, to the Purchaser as part of this installation if the equipment for fault diagnosis is not completely self-contained within the controller. Such device shall be in possession of and become property of the Purchaser.
      c. Installed equipment not meeting this requirement shall be removed and replaced with conforming equipment at no cost to the Purchaser.
   10. Provide upgrades and/or revisions of software during the progress of the work, warranty period and the term of the ongoing maintenance agreement between the Purchaser and Contractor.

B. Acceptance of such records by Purchaser/Consultant shall not be a waiver of any Contractor deviation from Contract Documents or shop drawings or in any way relieve Contractor from his responsibility to perform work in accordance with Contract Documents.

1.16 PERMITS, TESTS, AND CERTIFICATES

A. Permits:
1. Secure and pay for all permits required for Work to be performed, including but not limited to:
a. Municipal and State permits.
b. Device or equipment removal permits.
c. Hot works permits.
2. Post, maintain, and renew all permits in compliance with local governmental requirements.
3. Obtain documentation of final AHJ close-out of all permits. Provide copies to Purchaser.

B. Tests and Inspections:
1. Schedule and perform all tests required in accordance with procedure described in ASME A17.2 Guide for Inspection of Elevators, Escalators, and Moving Walks in the presence of Authorized Representative of the AHJ.

1.17 QUALITY ASSURANCE

A. Compliance with Regulatory Agencies: Comply with most stringent applicable provisions of currently enforced codes, laws, and/or authorities, including revisions and changes in effect.

B. Inspections: Provide access to areas where work is being performed for the Consultant and Purchaser at any time throughout the project.

1.18 WARRANTY

A. Material and workmanship of installation shall comply in every respect with Contract Documents. Correct defective material or workmanship which develops within one (1) year from date of final acceptance of all work to satisfaction of Purchaser and Consultant at no additional cost, unless due to ordinary wear and tear, or improper use or care by Purchaser. Perform maintenance in accordance with terms and conditions indicated in the Preventive Maintenance Agreement.

B. Defective is defined to include, but not be limited to operation or control system failures, car performance below required minimum, excessive wear, unusual deterioration, or aging of materials or finishes, unsafe conditions, the need for excessive maintenance, abnormal noise, or vibration, and similar unsatisfactory conditions.

C. Retained Equipment: All retained components, parts, and materials shall be cleaned, checked, modified, repaired, or replaced, so each component and its parts are in like new operating condition. Retained equipment must be compatible for integration with new systems. All retained equipment shall be covered under the warranty provisions, of Article 1.13, A. & B above. No prorations of equipment or parts shall be allowed on preventive maintenance contract between the Contractor and Purchaser.

D. Make modifications, requirements, adjustments, and improvements to meet performance requirements of Section 142402.

1.19 WARRANTY MAINTENANCE

A. Provide preventive maintenance and 24-hour emergency callback service for one (1) year commencing on date of final acceptance of modernized elevator by Purchaser. Systematically examine, adjust, clean, and lubricate all equipment. Repair or replace defective parts using parts produced by the Contractor of installed equipment. Maintain elevator machine room, hoistway, and pit in clean condition.

B. Use competent personnel, acceptable to Purchaser, employed and supervised by the Contractor.

C. Warranty Maintenance Hours: Contractor shall perform one (1) hour per month for preventive maintenance.

D. All work, except as otherwise noted, including unlimited call-back service, shall be performed during the building's regular hours. These hours are 8:00 a.m. to 5:00 p.m.

E. Response Time for Callback Service:
1. During regular time hours, Contractor shall arrive at Property within 60 minutes from time of notification of equipment problem or failure by Purchaser.
2. Contractor shall arrive at Property in response to passenger entrapment calls within 30 minutes from time of notification by Purchaser.

F. Purchaser retains the option to delete cost of warranty maintenance from new equipment contract and remit twelve (12) equal installments directly to Contractor during period in which maintenance is being performed.

1.20 DELIVERY, STORAGE, AND HOISTING

A. General:
1. The protection of all equipment and exposed finishes shall be the responsibility of the Contractor during delivery, handling, and installation until completion of project.
2. The Elevator Contractor shall replace damaged materials with new at no additional cost for material and labor to Purchaser.

B. Delivery and Storage:
1. Manufacturers' original packing must adequately protect materials during delivery.
2. Deliver materials to the site ready for use in the accepted manufacturer's original and unopened containers and packaging, bearing labels as to type of material, brand name, and manufacturer's name. Delivered materials shall be identical to accepted samples.
3. Store materials in original protective packaging under cover in a dry and clean location off the ground. Remove delivered materials that are damaged or otherwise not suitable for installation from the job site and replace with acceptable materials.
4. It is the responsibility of the Contractor to properly store and protect all materials in space provided or designated by the Purchaser against damage, stains, scratches, corrosion, weather, construction debris, and environmental conditions.
5. Comply with Purchaser's requirements for access to and use of any building loading docks, parking lots, parking garages, and any interior spaces required for delivery and storage.

C. Hoisting: Arrange and pay for all required hoisting and movement of equipment.

1.21 COORDINATION

A. Prime contracts are defined below, and each is recognized to be a major part of required work to be performed concurrently in close coordination with work of other Contractors.
1. This Contract: Elevator Modernization including associated related work specified herein.

B. Scope of Contract includes, but is not limited to, the following:
1. Coordination, scheduling, and management of work of component suppliers and subcontractors.
2. Modernize or furnish and install equipment as specified utilizing existing and/or modified hoistways and machine rooms or
3. Specific item of required work which cannot be determined to be included in another contract is thereby determined to be included in prime contract.

PART 2 - PRODUCTS

2.1 REFERENCES

A. American National Standard Institute (ANSI): A117.1, Accessible and Usable Buildings and Facilities.

B. American Society of Mechanical Engineers:
1. ASME A17.1, Safety Code for Elevators and Escalators.
2. ASME A17.2, Guide for Inspection of Elevators, Escalators, and Moving Walks.
3. ASME A17.5, Elevator and Escalator Electrical Equipment.
4. ASME A17.6, Standard for Elevator Suspension, Compensation, and Governor Systems.

C. National Fire Protection Association (NFPA):
1. NFPA 70, National Electric Code.
2. NFPA 80, Fire Doors and Windows.
3. NFPA 101, Life Safety Code.
4. NFPA 13, Installation of Sprinkler Systems.

D. City of Detroit Elevator Code.

E. International Building Code (IBC).

F. Accessibility:
1. American National Standard Institute (ANSI): A117.1, Accessible and Usable Buildings and Facilities.
2. ADAAG, Americans with Disabilities Act Accessibility Guidelines.

2.2 MANUFACTURERS AND PRODUCTS

A. Approved Elevator Contractors:
1. Approved subject to compliance with the requirements of the contract and specifications.
    a. KONE
    b. Lardner Elevator
    c. Otis Elevator
    d. Schindler Elevator Corporation
    e. TK Elevator
    f. Toledo Elevator
    g. Approved Equal

B. Approved Elevator Components:
The following Manufacturers/Assemblers are approved for the specific components listed below, subject to the requirements of the contract:
1. Car and Hall Signal Fixtures:
    a. Innovation
    b. MAD Fixtures
    c. Monitor
    d. PTL
2. Controllers:
    a. GAL (GALaxy)
    b. Elevator Controls Corporation
    c. Smart Rise
3. Door Protective Device:
    a. Janus

b. T.L. Jones
c. Tri-Tronics

4. Elevator Cab Interiors:
   a. Architectural Metals
   b. A Better Elevator Co.
   c. G&R
   d. Globe Architectural & Metals
   e. Snap Cab
   f. Weir Inc.
5. Guide Rails:
   a. AFD Industries
   b. Montefero
   c. Savero
6. Guide Shoes
   a. Delco
   b. ELSCO
   c. GAL
   d. Hollister-Whitney
7. Hoistway Entrances and Door Panels:
   a. Columbia
   b. EDI/ECI
   c. Elevator Products
   d. Gunderlin
   e. Tyler
   f. United Cab
8. Hydraulic Elevator Systems and Components:
   a. Canton
   b. EECO
   c. MEI
   d. Schumacher
9. Hydraulic Jack Assemblies
   a. EECO
   b. Bore-Max
   c. Canton Elevator
10. Passenger Elevator Door Equipment (Operators, Tracks, Hangers, and Closers):
    a. ECI
    b. GAL
    c. Wittur
11. Traveling Cables:
    a. Draka
    b. James Monroe
12. Two-Way Emergency Communication Device:
    a. Janus
    b. K-Tech
    c. Kings III
    d. Rath Microtec
    e. Wurtec

2.3 PERFORMANCE REQUIREMENTS

A. Car Speed: ± 10% of contract speed in up direction, ± 20% of contract speed in down direction.

B. Car Capacity: Safely lower, stop, and hold rated load.

C. Car Stopping Zone: ± 1/4" under any loading condition.

D. Door Times: Seconds from start to fully open or fully closed:
   1. Door Open: 2.6 seconds. Door Close: 4.1 seconds.

E. Car Floor-to-Floor Performance Time: Seconds from start of doors closing until doors are 3/4 open for center-opening doors or 1/2 open for side-opening doors, and car is level and stopped at next successive floor under any loading condition or travel direction:
   1. 17.5 seconds. Floor Height: 12’-3” between floors 1 and 2.

F. Noise and Vibration Control:
   1. Airborne Noise:
      a. Measured noise level of elevator equipment and its operation shall not exceed 60 dBA inside car under any condition including door operation and car ventilation exhaust blower on its highest speed.
      b. Limit noise level in the machine room relating to elevator equipment and its operation to no more than 80 dBA.
      c. All dBA readings to be taken 3'-0" off the floor and 3'-0" from the equipment using the “A” weighted scale.
   2. Vibration Control: Mechanically isolate all new elevator equipment from the building structure and other components. Minimize objectionable noise and transmission of vibrations to occupied areas of the building. All elevator equipment provided under this contract, including power unit, controller, oil supply lines, and their support shall be mechanically isolated from the building structure and electrically isolated from the building power supply and to each other to minimize the possibility of objectionable noise and vibrations being transmitted to occupied areas of the building.

2.4 ELEVATOR DUTY ALTERATIONS PASSENGER ELEVATOR:

ALTERATION SUMMARY		
CAR #1	**EXISTING INSTALLATION**	**MODERNIZED INSTALLATION**
Capacity:	1000 lbs.	No Change
Class of Loading:	Class A	No Change
Contract Speed:	100 fpm	No Change
Hydraulic Power Unit Location:	Adjacent	No Change
Operation Control:	2-Landing Collective, Automatic	No Change
Floors Served:	Front: 1st Rear: 2nd	No Change
Total Entrances:	Front: 1 Rear: 1	No Change
Entrance Type:	Two-speed side-opening	No Change
Entrance Size:	3'-4" wide x 6'-8" high	No Change

2.5 MATERIALS AND FINISHES

A. All colors will be selected from the Manufacturer's standard range unless custom colors are specified herein.

B. Steel:
1. Sheet Steel (Furniture Steel for Exposed Work): Stretcher-leveled, cold-rolled, commercial quality carbon steel, complying with ASTM A366, matte finish.
2. Sheet Steel (for Unexposed Work): Hot-rolled, commercial quality carbon steel, pickled and oiled, complying with ASTM A568/A568M-03.
3. Structural Steel Shapes and Plates: ASTM A36.

C. Stainless Steel: Type 302 or 304 complying with ASTM A240, with standard tempers and hardness required for fabrication, strength, and durability. Apply mechanical finish on fabricated work in the locations shown or specified, Federal Standard and NAAMM nomenclature, with texture and reflectivity required to match Purchaser's sample. Protect with adhesive paper covering.
1. No. 4 Satin: Directional polish finish. Graining directions as shown or, if not shown, in longest dimension.
2. No. 8 Mirror: Reflective polish finish with no visible graining.
3. Textured: 5WL as manufactured by Rigidized Metals or Windsor pattern 5-SM as manufactured by Rimex Metals or approved equal with .050 inches mean pattern depth with bright directional polish (satin finish).
4. Burnished: Non-directional, random abrasion pattern.

D. Aluminum: Extrusions per ASTM B221; sheet and plate per ASTM B209.

E. Plastic Laminate: ASTM E84 Class A and NEMA LDI-1964, 1/16", Fire-Rated Grade (GP-50), Type1, 1/16" high pressure general purpose laminate, color and texture as follows:
1. Exposed Surfaces: Color and texture selected by Purchaser.
2. Concealed Surfaces: Contractor's standard color and finish.

F. Fire-Retardant Treated Particle Board Panels: Minimum 3/4" thick backup for natural finished wood and plastic laminate veneered panels, edged and faced as shown, provided with suitable anti-warp backing; meet ASTM E84 Class "I" rating with a flame-spread rating of 25 or less, registered with Local Authorities for elevator finish materials.

G. Natural Finish Wood Veneer: Standard thickness, 1/40" thoroughly dried conforming to ASME/HPMA HP-1983, Premium Grade. Place veneer, tapeless spliced with grain running in direction shown, belt and polish sanded, book matched. Species and finish designated and approved by Purchaser and/or Consultant.

H. Paint: Clean exposed metal parts and assemblies of oil, grease, scale, and other foreign matter and factory paint one shop coat of standard rust-resistant primer. After erection, provide one finish coat of industrial enamel paint. Galvanized metal need not be painted.

I. Prime Finish: Clean all metal surfaces receiving a baked enamel paint finish of oil, grease, and scale. Apply one coat of rust-resistant primer followed by a filler coat over uneven surfaces. Sand smooth and apply final coat of primer.

J. Baked Enamel Finish: Prime finish per above. Unless specified "prime finish" only, apply and bake three additional coats of enamel in the selected solid color.

K. Entrance Field Paint: Clean all surfaces to remove dirt and grease. Sand and finish surfaces as necessary to remove pits and scratches and prepare surface for painting. Apply filler to ensure smooth surface; sand and apply one coat of electrostatic enamel in the selected solid color.

L. Refinishing of natural metals: Remove existing protective finish. Buff as necessary to remove scratches. Regrain or finish as specified and protect as indicated for particular metal type.

M. Entrance Support Equipment within Hoistway: Include strut angles, headers, sill support angles, fascia, hanger covers, etc. Clean, remove, and check for corrosive activity. Replace components which exhibit severe deterioration. Tighten all fastenings.

2.6 OPERATION

A. General:
1. Cars automatically slow down and stop level at floors in response to car and landing calls with stops made in sequence in the established direction of travel, regardless of order in which buttons are pressed.
2. Landing calls are canceled when the assigned car arrives at the landing.
3. Automatic Leveling:
   a. When arriving at a floor cars level to within 1/4” above or below the landing sill prior to opening doors, without travelling past the landing during leveling
   b. Maintain leveling accuracy regardless of carload, direction of travel.

4. Power Conservation:
   a. Car interior illumination and ventilation turns off after adjustable period (60-180 seconds) of no elevator demand and turns on prior to opening car doors when elevator demand returns.

B. Door Operation:
1. Automatically open doors when car arrives at a floor.
2. Stop and reopen doors or hold doors in open position upon activation of “door open” button.
3. At expiration of normal dwell time, or upon activation of “door close” button, close doors:
   a. Prevent doors from closing and reverse doors at normal opening speed if door reopening device beams are obstructed while doors are closing, except during nudging operation.
4. Nudging Operation:
   a. After beams of door reopening device are obstructed for a predetermined time interval (minimum 20.0-25.0 seconds), sound warning signal, and attempt to close doors with maximum of 2.5 foot-pounds kinetic energy.
   b. Activation of the door open button overrides nudging operation and reopens doors.
5. Interrupted Beam Time:
   a. When beams are interrupted during initial door opening, hold door open a minimum of 3.0 seconds.
   b. When beams are interrupted after the initial 3.0 second hold open time, reduce time doors remain open to an adjustable time of approximately 1.0-1.5 seconds after beams are reestablished.
6. Differential Door Time:
   a. Field adjustable time doors remain open after stopping in response to calls.
   b. Car Call: Hold open time adjustable between 3.0 and 5.0 seconds.
   c. Hall Call:
      1) Hold open time adjustable between 5.0 and 8.0 seconds.
      2) Use hall call time when car responds to coincidental calls.

C. 2-Landing Collective Operation – Single Car:
   1. Elevator operates via momentary pressure buttons to:
      a. Place hall call by selecting direction of travel at each hall landing (single buttons at each terminal landing).
      b. Place car call by selecting destination floor from inside the car (individual buttons for each floor served).
   2. Hall calls, other than calls placed at the landing at which car is standing, start car, and cause the car to stop at first landing for which a call is registered in the direction of travel.
   3. Stops are made in order in which landings are reached.
   4. Parked Car (No Demand):
      a. Elevator remains at the 2nd floor with doors closed.
      b. If elevator is at the 1st floor, it shall return to the 2nd floor and remains at landing with the doors closed until a hall call is registered.
   5. Car Lanterns:
      a. Lanterns provide audio and visual signal upon each stop, regardless of responding to car or hall call.

D. Car Lanterns:
      a. Car Riding Lanterns provide audio and visual signal upon each stop, regardless of responding to car or hall call.
      b. Car Riding Lanterns visual signal remains illuminated from commencement of door opening until doors are completely closed.

E. Auxiliary Power Lowering Operation:
   1. Upon loss of normal power automatically lower car to the nearest landing depending on position at time of power outage.
   2. Upon arrival at the landing, the elevator doors shall open automatically and remain open until regular door time has expired; the elevator shall then be removed from service.
   3. The auxiliary power source shall be provided via 12-volt D.C. battery units installed in machine room.
   4. Include solid-state charger and testing means mounted in a common metal container.
   5. Battery to be rechargeable lead acid or nickel cadmium with a ten-year life expectancy.
   6. Upon restoration of normal power, the elevator shall automatically resume normal operation.
   7. Disable if normal power switched off.

F. Firefighters' Emergency Operation: Provide equipment and operation in accordance with code requirements.

G. Battery Operation of Emergency Lighting, Communications, and Alarm:
   1. Car mounted battery unit with solid-state charger to operate alarm bell, car emergency lighting, and voice communication system.
      a. Car lighting and communication shall be provided with a minimum of 4 hours of operation on back-up power during a loss of normal power, and a minimum of 1 hour of operation for car-mounted alarm.
      b. Battery to be rechargeable with minimum five-year life expectancy.
      c. Provide constant pressure test button in service compartment of car operating panel.
      d. Provide lighting integral with portion of normal car lighting system.

H. Emergency Car Communication System Operation:
   1. Hands-Free Phone System:
      a. Two-way communication instrument in car to provide automatic dialing, tracking, and recall features.

1) Automatic dialer to include automatic rollover capability with minimum two numbers:

b. Activated by “Help” button in car or by external telephone call.

c. Adjacent light jewel l illuminates and flashes when call is acknowledged.

I. Electrical Wiring and Wiring Connections: New.

1. Conductors and Connections:
   a. Copper throughout with individual wires coded and connections on identified studs or terminal blocks.
   b. Use no splices or similar connections in wiring except at terminal blocks, control compartments, or junction boxes.
   c. Provide 10% spare conductors throughout.
   d. Run spare wires from car connection points to individual elevator controllers in the machine room.
2. Conduit:
   a. Galvanized steel conduit, EMT, or duct.
   b. Flexible conduit length not to exceed 3’-0”.
3. Traveling Cables:
   a. Flame and moisture-resistant outer cover. Prevent traveling cable from rubbing or chafing against hoistway or equipment within hoistway.
   b. Provide 12 twisted shielded pairs in addition to wires needed to connect specified items and code required spares.
   c. Tag spares in machine room.
   d. Provide cables from controller to car top.
4. Auxiliary Wiring:
   a. Connect fire alarm initiating devices, emergency two-way communication system, CCTV, and card reader in each controller in machine room.
   b. Provide machine room demarcation junction boxes for the fire alarm initiating devices, CCTV, security system and card reader interface terminals and relays.
   c. Provide conduit, wiring and connections for the fire alarm initiating devices, emergency two-way communication system, CCTV, security system and card reader interface terminals and relays, from machine room junction box to car controller in machine room.

2.7 MACHINE ROOM EQUIPMENT

A. Provide and arrange equipment in existing machine room spaces.

B. Identification: Permanently identify (painted on or securely attached) machine room equipment with minimum 3" characters corresponding to elevator identification.
1. Hydraulic Machine (Power Unit)
2. Controller.
3. Main line disconnect switch.
4. Pit equipment.

C. Hydraulic Machine (Power Unit):
1. New assembled unit consisting of submersible positive displacement pump, induction motor, master-type control valves combining safety features, holding, direction, bypass, stopping, manual lowering functions, shut off valve, oil reservoir with protected vent opening, oil level gauge, outlet strainer, drip pan, muffler. Mount power unit on isolating pads.
2. Submersible pump motor shall be permitted up to 50 HP.

B. Controller: New.
   1. Compartment:
      a. UL/CSA labeled.
      b. Securely mount all assemblies, power supplies, chassis switches, relays, etc., on a substantial, self-supporting steel frame.
      c. Completely enclose equipment with covers.
      d. Provide means to prevent overheating.
   2. Relay Design:
      a. Magnet operated with contacts of design and material to insure maximum conductivity, long life, and reliable operation without overheating or excessive wear.
      b. Provide wiping action and means to prevent sticking due to fusion.
      c. Contacts carrying high inductive currents shall be provided with arc deflectors or suppressors.
   3. Microprocessor Hardware:
      a. Provide built-in noise suppression devices that provide a high level of noise immunity on all solid-state hardware and devices.
      b. Provide power supplies with noise suppression devices.
      c. Isolate inputs from external devices (such as pushbuttons) with opto-isolation modules.
      d. Design control circuits with one leg of power supply grounded.
      e. Safety circuits shall not be affected by accidental grounding of any part of the system.
      f. System shall automatically restart when power is restored.
      g. System memory shall be retained in the event of power failure or disturbance.
      h. Equipment shall be provided with Electro Magnetic Interference (EMI) shielding within FCC guidelines.
   4. Wiring:
      a. CSA labeled copper for factory wiring.
      b. Neatly route all wiring interconnections and securely attach wiring connections to studs or terminals.
      c. Provide labels for all extra or spare wires, neatly organized at base of controller cabinet.
   5. Permanently mark components (relays, fuses, PC boards, etc.) with symbols shown on wiring diagrams.
   6. Provide electrical design compliant with UL 508A SB.SCCR of 5000A required.

C. Muffler: New.
   1. Provide in discharge oil line near pump unit.
      a. Design shall dampen and absorb pulsation and noise in the flow of hydraulic fluid.

D. Piping and Oil: New.
   1. Provide piping, connections, and oil for the system.
   2. A minimum of two sound isolation couplings shall be provided between the pump unit and oil line and the oil line and jack unit.
   3. Provide 2-90°joints to reduce vibration and create wave diffraction.
   4. Provide isolated pipe stands or hangers.

E. Shut-Off Valve: New.
   1. Provide oil line shut off valve in the machine room or accessible from outside the hoistway.
   2. Provide second valve in pit adjacent to jack unit.

F. Pressure Switch: New.
   1. Provide oil pressure sensitive switch to automatically close and prevent loss of oil in cylinder upon loss of pressure in oil supply line.

2.8 HOISTWAY EQUIPMENT

A. Provide and arrange equipment in existing hoistways.

B. Guide Rails: Retain main guide rails in place.
1. Clean rails and brackets. Remove rust.
2. Check all rail and bracket fastenings and tighten.

C. Terminal Stopping: Provide new normal and final devices.

D. Hoistway Entrance Equipment:
1. Door Hanger: New hangers to include door retainer mechanism to address failure of primary upper door panel guidance.
2. Door Hanger Rollers: New two-point hanger roller with neoprene roller surface and suspension with eccentric upthrust roller adjustment .
3. Door Track: New bar or formed, cold-drawn removable steel tracks with smooth roller contact surface.
4. Door Interlocks: New. Operable without retiring cam.
5. Door Closers: New spring-activated spirator or sill mounted. Install and adjust to insure smooth, quiet mechanical close of doors.

E. Hoistway Door Unlocking Device: Provide unlocking device including new escutcheon. Finish to match adjacent surface.

F. Hoistway Access Switches: New. Mount in wall top and bottom floors. Provide switch with faceplate. Locate within easy reach to entrance so entrance can be guarded by one technician.

G. Floor Numbers: Stencil paint 4" high floor designations in contrasting color on inside face of hoistway doors or hoistway fascia in location visible from within car.

2.9 PIT EQUIPMENT

A. Buffers, Car: New spring type with blocking and support channels. Provide sign in pit indicating designed counterweight runby.

B. Access Ladders and Platforms: Provide permanent buffer and car safety access ladders and platforms to comply with Code requirements.

C. Hydraulic Jack Assembly: New.
1. Cylinders:
   a. Seamless steel pipe.
   b. Design head to receive unit-type packing and provide means to collect oil at cylinder head and return automatically to oil reservoir.
   c. Paint exposed portion with 2 coats of rust inhibitive paint. Color black.
2. Plungers:
   a. Polished seamless steel tubing or pipe.
   b. If plunger length exceeds 24'-0", provide two or more sections not exceeding 16'-0" in length, or coordinate installation of longer unit at the jobsite.
   c. Join sections by internal threaded couplings.
   d. Multiple section jack units shall be factory polished while assembled and marked.
   e. Isolate plunger from car frame.

D. Jack Support: New.
1. Provide steel pit channels to support jack assembly and transmit loads to building structure.
2. Provide intermediate stabilizers as required.
3. Provide manual on/off valves in oil lines adjacent to pump unit and jack unit in pit.

2.10 HOISTWAY ENTRANCES

A. Provide and arrange equipment in same location as existing entrances.

B. Frames: Retain existing.
1. Provide new Arabic floor designation/tactile marking plates:
   a. Centered at 60" above finished floor.
   b. Located on both side jambs of all entrances.
   c. Minimum 4" high.
   d. Tactile marking indications shall be below Arabic floor designation.
2. Provide plates at main egress landing with “Star” designation.
3. Provide car identification label:
   a. Mounted directly below floor designation/tactile marking plates.
   b. Located on both side jambs at the following levels:
      1) Designated level.
      2) Alternate level.
   c. Finish and design to match floor designation/tactile marking plates.

C. Hoistway Door Panels:
1. New 16-gauge steel, sandwich or pressed with ribbed construction and without binder angles.
2. Provide one leading edge of doors with rubber astragal.
3. Provide a minimum of two gibs per panel, one at leading and one at trailing edge with gibs in the sill groove entire length of door travel.
4. Provide one separate 4” steel reinforcement safety gib mounted between door gibs, where not integrated with door gibs.

D. Sight Guards: New 14-gauge, same material and finish as hoistway entrance door panels. Construct without sharp edges.

E. Sills, Hoistway Entrance: Retain existing. Clean. Check and tighten all fastenings.

F. Sill Supports, Hoistway Entrance: Retain existing. Check and tighten all fastenings.
1. Paint/Stencil floor number on fascia or hoistway wall all floors visible where car doors are initially opened.

G. Fascia, Platform Guards, and Hanger Covers:
1. New 14-gauge furniture steel with Contractor’s standard finish.
2. Paint/Stencil floor number on fascia or hoistway wall all floors visible where car doors are initially opened.

H. Struts and Headers: Retain existing. Check and tighten all fastenings.

I. Finish of Door Panels and Sight Guards:
1. Satin finish stainless steel.

2.11 CAR EQUIPMENT

A. Frame: Retain Existing. Check and tighten all fastenings. Adjust as required for plumb and square alignment.

B. Platform: Retain existing.
1. Adjust as necessary for plumb and level alignment.
2. Reinforce if required.
3. Check and tighten all fastenings.
4. Inspect after existing finished flooring is removed. Immediately notify Purchaser and Consultant if any damage or deterioration requiring repairs is observed.

C. Platform Guard:
1. New extended platform guard to meet Code requirements.
2. Minimum 0.059" (1.5 mm) thick steel, or material of equivalent strength and stiffness.
3. Reinforced and braced to car platform front and rear.
4. Black enamel finish.

D. Passenger Elevator Car Guides:
1. Roller type with three or more spring dampened sound-deadening rollers per shoe. Minimum 3 1/4" outside diameter.

E. Finish Floor Covering: New porcelain tile, 12”x24”x3/8” running bond pattern, thin set mortar, 1/16” joints with non-sanded grout, final selection by Owner, provide allowance of $10/sf for tile cost with 10% waste. Refer to Appendix A for approved material and finishes.

F. Car Sills: Retain existing. Clean full width. Check and tighten all fastenings.

G. Car Door Panels:
1. New fully enclosed 16-gauge steel, sandwich construction without binder angles. Constructed with interlocking, stiffening ribs. Leading edges of center-opening doors equipped with rubber astragals full height of panel. Minimum of two gibs per panel, one at leading and one at trailing edge with gibs in the sill groove entire length of door travel. Satin finish stainless steel.
2. Adjust vertical and horizontal clearances to meet Code requirements.

H. Door Hangers: New two-point hanger roller with eccentric upthrust roller adjustment and neoprene roller surface

I. Door Track: New bar or formed, cold-drawn removable steel track with smooth roller contact surface.

J. Door Header: New. Construct of minimum 12-gauge steel, shape with stiffening flanges.

K. Car Door Electric Contact: New. Prohibit car operation unless car door is closed.

L. Door Clutch:
1. New heavy-duty clutch, linkage arms, drive blocks and pickup rollers or cams to provide positive, smooth, quiet door operation.
2. Design clutch so car doors can be closed, while hoistway doors remain open.

M. Restricted Opening Device: New.
1. Restrict opening of car doors to Code required limit outside unlocking zone.
2. Adjust for smooth and quiet operation with operating noise undetectable from inside any car or outside of the hoistway.

3. Plunger type restrictors not acceptable.
4. Utilize mechanical angle to prevent door opening.

N. Door Operator:
1. New high-speed, heavy-duty door operator capable of opening doors at no less than 2.5 fps.
2. Accomplish reversal in no more than 2½" of door movement.
3. Solid-state door control with closed loop circuitry to constantly monitor and automatically adjust door operation based upon velocity, position, and motor current.
4. Maintain consistent, smooth, and quiet car door operation at all floors, regardless of door weight or varying air pressure.

O. Door Reopening Device:
1. New black fully enclosed infrared device with full screen infrared matrix or multiple beams extending vertically along leading edge of each door panel to minimum height of 7'-0" above finished floor.

P. Car Operating Panel: New.
1. One car operating panel with faceplate:
   a. Consisting of a metal box containing operating fixtures, mounted behind the car stationary front return panel.
   b. Faceplate shall be hinged and constructed of satin finish stainless steel.
2. Provide Exposed Pushbuttons to Initiate:
   a. Car call registration.
   b. Alarm.
   c. Door open.
   d. Door close.
   e. Emergency push-to-call communication.
3. Pushbuttons:
   a. Provide minimum 3/4" diameter raised floor pushbuttons which illuminate to indicate call registration.
   b. Locate operating controls no higher than 48" above the car floor; no lower than 35" for emergency push-to-call button and alarm button.
   c. Identify buttons with flat stainless tactile symbols rear mounted.
   d. Arrange manually operated stop switch to sound group control panel distress signal when actuated.
4. Locked Firefighters' Emergency Operation Panel:
   a. Openable by the same key which operates the Fire Operation switch.
   b. Including the following features:
      1) Phase II fire access switch.
      2) Firefighters' visual indication.
      3) Call cancel button.
      4) Stop switch, manually operated.
      5) Door open button.
      6) Door close button.
      7) Floors served.
5. Service Compartment:
   a. Provide lockable service compartment with recessed flush door.
   b. Door material and finish to match car return panel or car operating panel faceplate.
   c. Include the following controls in lockable service cabinet with function and operating positions identified by permanent signage or engraved legend:
      1) Access switch.
      2) Light switch.

3) Four-position exhaust blower switch.
4) Independent service switch.
5) Constant pressure test button for battery pack emergency lighting.
6) 120-volt, AC, GFCI protected electrical convenience duplex outlet.
7) Card reader override switch.

6. Provide black paint filled (except as noted), engraved, or approved etched signage as follows with approved size and font:
   a. Phase II firefighters' operating instructions on inside face of firefighters' compartment door.
   b. Engrave filled red firefighters' operation on outside face of compartment door.
   c. Building identification car number on main car operating panel.
   d. "No Smoking" on main car operating panel.
   e. Car capacity in pounds on main car operating panel service compartment door.
   f. "Certificate of Inspection on File in Building Office" on main car operating panel.

Q. Car Top Control Station: New.
1. Mount to provide safe access and utilization while standing on car top.
2. Operating device with Up and Down direction buttons, a Run button, an Inspection/Automatic switch and Emergency Stop switch.
3. Operating device provides an audible and visible indicator that fire recall has been initiated.
4. Fix station to the car crosshead or provide portable station provided the extension cord and housing is permanently attached to the car crosshead.
5. The car will be operated by constant pressure on the appropriate directional button and the Run button simultaneously.
6. Normal operating devices will be inoperative while this device is in use.

R. Car Top Emergency Audible Signal: New.
1. Provide on top of each elevator.
2. Activation of Alarm Button or Emergency Stop switch will cause Emergency Audible Signal.
3. Provide auxiliary power supply to provide 1-hr. power in the event of loss of normal power.

S. Work Light and Duplex Plug Receptacle:
1. New GFCI protected outlet at top and bottom of car.
2. Include on/off switch and lamp guard.
3. Provide additional GFCI protected outlet on car top for installation of car CCTV.

2.12 COMMUNICATION

A. Car Communication System:
1. Hands-Free Phone System:
   a. New two-way communication instrument in car with automatic dialing, tracking, and recall features, with shielded wiring to car controller in machine room. System includes:
      1) "Help" button on car operating panel to initiate two-way communication from Car. Button shall match car operating panel pushbutton design
      2) Auto dialer with automatic rollover capability with minimum two numbers:
      3) Adjacent light jewel illuminates and flashes when call is acknowledged.
      4) "Help" button tactile symbol, engraved signage, and Tactile marking adjacent to button mounted integral with car front return panel.

2.13 CAR ENCLOSURE AND INTERIOR FINISHES

A. Unless specifically identified as “Retain,” “Reuse,” or “Refurbish,” provide new equipment. Contractor may, with Consultant approval, provide new equipment in lieu of refurbishing existing. See Section 008000, Supplemental Conditions.

B. Refer to Appendix A for approved material and finishes.

C. Car Enclosure and Interior Finishes Passenger Elevator :
1. Verify and document overall car weight prior to removal of any equipment from the existing car frame or car enclosure.
2. Remove all existing interior finishes and shell components, weigh, and document.
3. Provide complete new car enclosure and interior finishes as specified.
4. New cab weight including all new finishes to be verified following completion of modernization. Post modernization weight not to exceed code allowable limits.
5. Provide the following features:
   a. Enclosure Walls: Reinforced 14-gauge furniture steel stainless steel formed panels. Width of individual panels shall not exceed 18". Apply sound-deadening mastic to exterior.
   b. Enclosure Canopy: Reinforced 12-gauge furniture steel formed panels with lockable, hinged emergency exit. Interior finish white reflective baked enamel.
   c. Front and Rear Stationary Return Panels: Reinforced 14-gauge satin finish stainless steel with cutouts for car operating panel and other equipment.
   d. Entrance Columns: Reinforced 14-gauge satin finish stainless steel.
   e. Transom: Reinforced 14-gauge satin finish stainless steel full width of enclosure.
   f. Base: Stainless steel with concealed ventilation cutouts.
   g. Interior Wall Finish: Faced and edged with wood veneer, solid appearance, without trim or reveals exposed. Wall-to-wall installation. Finish as selected by Purchaser.
   h. Ventilation: Two-speed type OE exhaust blower. Mount to car canopy on isolated rubber grommets. Exhaust blower shall meet noise requirements specified herein.
   i. Lighting: LED downlight fixtures with wiring and hookup. Coordinate with emergency lighting requirements. Provide emergency lighting integral with portion of normal car lighting system.
   j. Suspended Ceiling: Four-section satin finish stainless-steel panels with lighting cutouts in each panel.
   k. Handrails: Solid stainless steel flat stock bars, 4" x 3/8", across side wall. Return handrail ends to car wall.
6. Pads and Buttons: Three-piece removable pads. Two pads covering side walls and adjacent front and rear returns. Provide cutout to access main car operating panel.

D. Top of Car Guardrail: Provide car top railings where fall hazard exceeds 12". Install guardrails, necessary hardware, and toe board to meet code requirements.

E. Card/Proximity Reader Security Provisions:
1. Mount reader as directed by Purchaser, and cross connect from car pushbuttons to control module in machine room.
2. Reader control unit, mounting brackets, wiring materials, logic circuits, etc., provided by others.

2.14 HALL CONTROL STATIONS

A. Pushbuttons: New.
1. Provide one (1) riser with flush mounted enlarged faceplate to cover existing wall block out. Provide any cutting and patching required.

2. Approved engraved message and pictorial representation prohibiting use of elevator during fire or other emergency as part of faceplate.
3. Pushbutton design to match car operating panel pushbuttons.

2.15 SIGNALS

A. Car Direction Lanterns:
1. Provide new flush-mounted car lantern in front and rear car entrance columns.
2. Illuminate up or down LED lights and sound tone once for up and twice for down direction.
3. Illuminate light until the car doors start to close.
4. Sound level shall be adjustable from 20-80 dBA measured at 5'-0" in front of hall control station and 3'-0" off floor.
5. Car direction lenses shall be arrow-shaped with faceplates.
6. Lenses shall be minimum 2½" in their smallest dimension.

B. Car Position Indicator:
1. New alpha-numeric digital indicator containing floor designations and direction arrows a minimum of 2" high to indicate floor served and direction of car travel.
2. Locate fixture in car operating panel.
3. When a car leaves or passes a floor, illuminate indication representing position of car in hoistway.
4. Illuminate proper direction arrow to indicate direction of travel.

C. Floor Passing Tone: Provide an audible tone of no less than 20 decibels and frequency of no higher than 1500 Hz, to sound as the car passes or stops at a floor served.

D. Fixture Faceplate Material and Finish:
1. Satin finish stainless steel, all fixtures.
2. Tamper resistant fasteners for all public facing fastenings.

2.16 FIREFIGHTERS CONTROL PANEL

A. Provide and arrange new equipment in existing panel. Coordinate the addition of new modules with fire alarm contractor.

B. Firefighters' Key Box: Flush-mounted box with lockable hinged cover. Engrave instructions for use on cover per Local Fire Authority requirements.

PART 3 - EXECUTION

3.1 SITE CONDITION INSPECTION

A. Prior to beginning installation of equipment, examine hoistway and machine room areas. Verify no irregularities exist which affect execution of work specified.

B. Inform Purchaser of any irregularities in writing prior to commencing work.

C. Do not proceed with installation until work in place conforms to project requirements.

3.2 INSTALLATION REQUIREMENTS

A. Install all equipment as follows:

1. In accordance with Contractor's instructions, referenced codes, specifications, and approved submittals.
2. With clearances in accordance with referenced codes, and specifications.
3. To be easily maintained and/or removed.
4. To afford maximum accessibility, safety, and continuity of operation.

B. Remove oil, grease, scale, and other foreign matter from the following equipment and apply one coat of field-applied machinery enamel.
1. All exposed equipment and metal work installed as part of this work which does not have architectural finish.
2. Machine room equipment, and pit equipment.
3. Neatly touch up damaged factory-painted surfaces with original paint color.
4. Protect machine-finish surfaces against corrosion.

C. Paint machine room and pit floors.

3.3 MANUFACTURER'S NAMEPLATES

A. Manufacturer's name plates and other identifying markings shall not be affixed on surfaces exposed to public view. This requirement does not apply to Underwriter's Laboratories and code required labels.

B. Each major component of mechanical and electrical equipment shall have identification plate with the Manufacturer's name, address, model number rating, and any other information required by governing codes.

3.4 FIELD QUALITY CONTROL

A. Work at jobsite will be checked during course of installation. Full cooperation with reviewing personnel is mandatory. Accomplish corrective work required prior to performing further installation.

B. Perform complete "Acceptance" level pre-testing as specified in the latest edition of ASME A17.2 "Guide for Inspection of Elevators, Escalators, and Moving Walks" prior to AHJ witnessed acceptance testing. Complete any adjustments, repairs, or replacements necessary to achieve code compliant operation including but not limited to:
1. Hydraulic pressure relief valve.
2. Car emergency communications. Inform Purchaser and Consultant of any noted failures of Purchaser provided and maintained equipment or systems.
3. Car buffers.
4. Phase I and II Firefighters' Emergency Operation. Phase I initiated by smoke sensing devices.
5. Power car door operation including door closing force, reopening device, and restricted opening.

C. Have Code Authority acceptance inspection performed and complete corrective work.

D. Provide access to installed equipment and elevator personnel assistance for Consultants final observation and review requirements. See Section 017000, Final Compliance Review.

3.5 ADJUSTING

A. Install hydraulic jack assembly and align vertically with tolerance of 1/16" in 100'-0". Secure piston joints without gaps and file any irregularities to a smooth surface.

B. Static balance car to equalize pressure of guide shoes on guide rails.

C. Verify that weights of existing or altered cars, counterweights, and compensation comply with traction machine manufacturers' requirements and do not exceed total weights indicated on approved submittals.

D. Lubricate all equipment in accordance with Contractor's instructions.

E. Adjust motors, power conversion units, brakes, controllers, leveling switches, limit switches, stopping switches, door operators, interlocks, and safety devices to achieve required performance levels.

3.6 FINAL CLEANING

A. As a minimum:
1. Elevator hoistways and all equipment therein shall be cleaned and left free of rust, filings, welding slag, rubbish, loose plaster, mortar drippings, extraneous construction materials, dirt, and dust, including walls, building beams, sill ledges, and hoistway divider beams.
2. Care shall be to not to mark, soil, or otherwise deface existing or new surfaces. Clean and restore such surfaces to their original condition.
3. Clean down surfaces and areas which require final painting and finishing work. Cleaning includes removal of rubbish, broom cleaning of floors, removal of any loose plaster or mortar, dust, and other extraneous materials from finish surfaces, and surfaces which will remain visible after the work is complete.
4. Keep work areas orderly and free from debris during progress of project. Remove packaging materials daily.
5. Remove all loose materials and filings resulting from work.
6. Clean machine room equipment and floor.
7. Clean hoistways, car, car enclosure, entrances, operating and signal fixtures.

3.7 CONSULTANT'S FINAL OBSERVATION AND REVIEW REQUIREMENTS

A. Review procedure shall apply for the elevator accepted on an interim basis, or elevator completed, accepted, and placed in operation.

B. Contractor shall perform review and evaluation of all aspects of its work prior to requesting Consultant's final review. Work shall be considered ready for Consultant's final contract compliance review when all Contractor's tests are complete, all deficiencies noted by the AHJ have been rectified, and all elements of work or a designated portion thereof are in place and elevator is deemed ready for service as intended.

C. Contractor shall perform review and evaluation of all aspects of its work prior to requesting consultant's review.

D. Furnish labor, materials, and equipment necessary for Consultant's review. Notify Consultant five working days in advance when ready for final review of elevator.

E. Consultant's written list of observed deficiencies of materials, equipment, and operating systems will be submitted to Contractor for corrective action. Consultant's review shall include as a minimum:
1. Workmanship and equipment compliance with Contract Documents.
2. Contract speed, capacity, floor-to-floor times, and door performance compliance with Contract Documents.
3. Performance of following is satisfactory.
   a. Starting, accelerating, running.

b. Decelerating, stopping accuracy.
c. Door operation and closing force.
d. Equipment noise levels.
e. Signal fixture utility.
f. Overall ride quality.
g. Performance of door control devices.
h. Operations of emergency two-way communication device.
i. Operations of firefighters' service.
j. Operations of special security features and floor lock-off provisions.

4. Test Results:
   a. In all test conditions, obtain specified contract speed, performance times, stopping accuracy without re-leveling, and ride quality to satisfaction of Purchaser and Consultant. Tests will be conducted under both no load and full load condition.

F. Performance Guarantee: Should Consultant's review identify defects, poor workmanship, variance, or noncompliance with requirements of specified codes and/or ordinances, or variance or noncompliance with the requirements of Contract Documents, Contractor shall complete corrective work in an expedient manner to satisfaction of Purchaser and Consultant at no cost as follows:
   1. Replace equipment which does not meet code or Contract Document requirements.
   2. Perform work and furnish labor, materials, and equipment necessary to meet specified operation and performance.
   3. Perform retesting required by governing code authority, Purchaser, and Consultant.

G. A follow-up final contract compliance review shall be performed by Consultant after notification by Contractor that all deficiencies have been corrected. Provide Consultant with copies of the initial deficiency report marked to indicate items which Contractor considers complete.

3.8 MANUFACTURER'S WARRANTY

A. Manufacturer agrees to repair, restore, or replace elevator equipment that fails due to defective materials or poor workmanship within specified warranty period.

B. Warranty Period: Twelve (12) months from date of Substantial Completion.

C. The Elevator Contractor guarantees that the materials and workmanship of the apparatus installed by them and any subcontractor, under this contract, is first class in every respect and that they will make good on any defects not due to ordinary wear and tear or improper use, which may develop within one year from the date of final acceptance of all equipment.

D. Manufacturer's warranty to repair or replace defective products or their components in the event of defects within a specified period.

E. Neither the final payment nor any provisions of the contract documents relieve the Elevator Contractor of any obligation provided by law. They shall remedy any defects and pay all expenses for any damage to other work.

F. The warranty as outlined above, for all devices, starts from the date of final acceptance of each device, by the Consultant and the Owner, of all work specified and intended under these contract documents.

END OF SECTION

Appendix A

Bldg. No.	WSU Bldg. ID	WSU Bldg. Address	WSU ID #	Elevator Type	Cab Flooring Material (per specifications)	Interior Wall Finishes (per specifications)
5	**Science Hall**	5045 Cass Avenue, Detroit, MI 48202	005 01	Traction	Seamless Resilient Rubber	5WL hanging panels ???
34	**Student Center Center**	5221 Gullen Mall Detroit, MI 48202	034 03	Traction	diamond plate	5WL hanging panels ???
36	**Reuther Library**	5401 Cass Avenue, Detroit, MI 48202	036 01	Hydraulic	Seamless Resilient Rubber	Plastic laminate panels
42	**Alumni House**	441 Gilmour Mall Detroit, MI 48202	042 01	Hydeaulic	Porcelain tile	Wood Veneer panels
45	**Parking Structure 5**	5501 Anthony Wayne Drive, Detroit, MI 48202	045 01	Hydraulic	Seamless Resilient Rubber	5WL hanging panels
			045 02	Hydraulic		5WL hanging panels
51	**Parking Structure 1**	450 West Palmer, Detroit, MI 48202	051 03	Traction	Seamless Resilient Rubber	5WL hanging panels
			051 04	Traction		5WL hanging panels
71	**5057 Woodward**	5057 Woodward, Detroit, MI 48202	071 01	Traction	Seamless Resilient Rubber	Plastic laminate panels
			071 02	Traction		Plastic laminate panels
			071 03	Traction		Plastic laminate panels
			071 03	Traction		Plastic laminate panels
			071 03	Traction		Plastic laminate panels
88	**Parking Structure 6**	61 Putnam Avenue, Detroit, MI 48202	088 01	Hydraulic	Seamless Resilient Rubber	5WL hanging panels
			088 03	Hydraulic		5WL hanging panels
			088 02	Hydraulic		5WL hanging panels
89	**Biological Sciences**	5047 Gullen Mall, Detroit, MI 48202	089 01	Traction	Seamless Resilient Rubber	Plastic laminate panels
			089 02	Traction	diamond plate (Service)	5WL hanging panels
130	**Faculty / Administration Building**	656 West Kirby Avenue, Detroit, MI 48202	130 03	Hydraulic	Existing to remain	Plastic laminate panels
			130 02	Hydraulic		Plastic laminate panels
			130 01	Hydraulic		Plastic laminate panels
629	**Elliman Clinical Research**	421 East Canfield Avenue	629 01	Hydraulic	Seamless Resilient Rubber	Plastic laminate panels
			629 02	Hydraulic	Seamless Resilient Rubber	Plastic laminate panels
			629 03	Hydraulic	diamond plate (Service)	5WL hanging panels

APPENDIX A

WAYNE STATE UNIVERSITY CAR ENCLOSURE AND INTERIOR FINISH STANDARDS

CAR ENCLOSURE AND INTERIOR FINISHES

A. Passenger Elevator: Retain existing car enclosure and provide new interior finishes.
   1. Check and tighten all fastenings.
   2. Provide new interior finishes as specified herein.
   3. Modify car enclosure for application of new signal and pushbutton fixtures.
   4. Post modernization weight not to exceed code allowable limits.
   5. Provide the following features:
      a. Enclosure: Retain. Apply sound-deadening mastic to exterior.
      b. Stationary Return Panels: Retain.
      c. Entrance Columns: Retain.
      d. Transom: Retain.
      e. Car Door Panels: Fully enclosed 16-gauge steel, sandwich construction without binder angles. Constructed with interlocking, stiffening ribs. Leading edges of center-opening doors equipped with rubber astragals full height of panel. Minimum of two gibs per panel, one at leading and one at trailing edge with gibs in the sill groove entire length of door travel. Satin finish stainless steel.
      f. Base: Stainless steel with concealed ventilation cutouts.
      g. Interior Wall Finish:
         1) Removable panels, faced and edged, with color core plastic laminate. Plastic laminate (HPDL) shall meet or exceed NEMA Standard LDI-1964 for Type 1, 1/16" high pressure general purpose laminate.
         2) Color and finish as selected by Purchaser.
         3) 5WL hanging panels with #4 stainless steel reveals between panels.

      h. Ventilation: Two-speed exhaust blower. Mount to car canopy on isolated rubber grommets. Exhaust blower shall meet noise requirements specified herein.
      i. Lighting: LED fixtures with wiring and hookup. Coordinate with emergency lighting requirements.
      j. Suspended Ceiling: Six-section satin finish stainless-steel panels with lighting cutouts in each panel.
      k. Handrails: Solid stainless steel flat stock bars, 4" x 3/8", across rear and side walls. Return handrail ends to car walls.
      l. Cab Flooring, provide floor covering per below:
         1) Porcelain tile, 12"x24"x3/8" running bond pattern, thin set mortar, 1/16" joints with non-sanded grout, final selection by Owner, provide allowance of $10/sf for tile cost with 10% waste.
         2) Luxury Vinyl Tile, 6"x36", random linear pattern, zero VOC adhesive as recommended by the manufacturer, final selection by Owner, provide allowance of $5/sf for tile cost with 10% waste.
         3) Diamond Plate, 1/8" thick aluminum, mill finish 6061, seamless where possible, minimal seams if cab width exceeds sheet width. Sand all edges smooth, secure with 1/8" self-tapping aluminum or stainless-steel fasteners ½" from edge of panel @ 10" oc along edges, and in field. Trowel zero VOC adhesive over 100% of cab floor prior to installation of diamond plate and roll 100 lb. roller over plate to ensure adhesion.
         4) Seamless resilient non-slip rubber or vinyl with sealed edges

5) Pads and Buttons: Where no service elevator available in the building, provide hooks and three-piece removable pads. Two pads covering side walls and adjacent front returns and one covering rear wall. Provide cutouts to access main car operating panel.

B. Service Elevator: Retain existing car shell enclosure and provide new interior finishes.
   1. Check and tighten all fastenings.
   2. Provide new interior finishes as specified herein.
   3. Modify car enclosure for application of new signal and pushbutton fixtures.
   4. Post modernization weight not to exceed code allowable limits.
   5. Provide the following features:
      a. Enclosure: Retain. Apply sound-deadening mastic to exterior.
      b. Stationary Return Panels: Retain.
      c. Entrance Columns: Retain.
      d. Transom: Retain.
      e. Car Door Panels: Fully enclosed 16-gauge steel, sandwich construction without binder angles. Constructed with interlocking, stiffening ribs. Leading edges of center-opening doors equipped with rubber astragals full height of panel. Minimum of two gibs per panel, one at leading and one at trailing edge with gibs in the sill groove entire length of door travel. Satin finish stainless steel.
      f. Base: Textured stainless steel with concealed ventilation cutouts.
      g. Interior Wall Finish: Removable panels made of 5WL.
      h. Ventilation: Two-speed exhaust blower. Mount to car canopy on isolated rubber grommets. Exhaust blower shall meet noise requirements specified herein.
      i. Lighting: LED fixtures with wiring and hookup. Coordinate with emergency lighting requirements.
      j. Suspended Ceiling: Six-section satin finish stainless-steel panels with lighting cutouts in each panel.
      k. Handrails: Solid stainless steel flat stock bars, 4" x 3/8", across rear and side walls. Return handrail ends to car walls.
      l. Cab Flooring: Provide a heavy vinyl cab floor covering as selected by the Purchaser.
      m. Pads and Buttons: Three-piece removable pads. Two pads covering side walls and adjacent front returns and one covering rear wall. Provide cutouts to access main car operating panel.

C. Passenger Elevator: New Car Enclosure and Interior Finishes.
   1. Remove all existing interior finishes and shell components, weigh, and document.
   2. Provide complete new car enclosure and interior finishes as specified herein.
   3. Post modernization weight not to exceed code allowable limits.
   4. Provide the following features:
      a. Enclosure Walls: Reinforced 14-gauge furniture steel stainless steel formed panels Width of individual panels shall not exceed 18". Apply sound-deadening mastic to exterior.
      b. Enclosure Canopy: Reinforced 12-gauge furniture steel formed panels with lockable, hinged emergency exit. Interior finish white reflective baked enamel.
      c. Stationary Return Panels: Reinforced 14 gauge satin finish stainless steel with cutouts for car operating panels and other equipment.
      d. Entrance Columns: Reinforced 14 gauge satin finish stainless steel.
      e. Transom: Reinforced 14 gauge satin finish stainless steel full width of enclosure.
      f. Car Door Panels: Fully enclosed 16-gauge steel, sandwich construction without binder angles. Constructed with interlocking, stiffening ribs. Leading edges of center-opening doors equipped with rubber astragals full height of panel. Minimum of two gibs per panel, one at leading and one at trailing edge with gibs in the sill groove entire length of door travel. Satin finish stainless steel.

g. Base: Stainless steel with concealed ventilation cutouts.
h. Interior Wall Finish: Removable panels, faced and edged, with color core plastic laminate. Color and finish as selected by Architect/Purchaser.
i. Ventilation: Two-speed exhaust blower. Mount to car canopy on isolated rubber grommets. Exhaust blower shall meet noise requirements specified herein.
j. Lighting: LED fixtures with wiring and hookup. Coordinate with emergency lighting requirements.
k. Suspended Ceiling: Six-section satin finish stainless-steel panels with lighting cutouts in each panel.
l. Subfloor; 5/8" thick marine grade plywood.
m. Cab Flooring: Provide floor covering per below:
    1) Porcelain tile, 12"x24"x3/8" running bond pattern, thin set mortar, 1/16" joints with non-sanded grout, final selection by Owner, provide allowance of $10/sf for tile cost with 10% waste.
    2) Luxury Vinyl Tile, 6"x36", random linear pattern, zero VOC adhesive as recommended by the manufacturer, final selection by Owner, provide allowance of $5/sf for tile cost with 10% waste.
    3) Diamond Plate, 1/8" thick aluminum, mill finish 6061, seamless where possible, minimal seams if cab width exceeds sheet width. Sand all edges smooth, secure with 1/8" self-tapping aluminum or stainless-steel fasteners ½" from edge of panel @ 10" oc along edges, and in field. Trowel zero VOC adhesive over 100% of cab floor prior to installation of diamond plate and roll 100 lb. roller over plate to ensure adhesion.
    4) Seamless resilient non-slip rubber or vinyl with sealed edges
n. Handrails: Solid stainless steel flat stock bars, 4" x 3/8", across rear and side walls. Return handrail ends to car walls.
o. Pads and Buttons: Where no service elevator available in the building, provide hooks and three-piece removable pads. Two pads covering side walls and adjacent front returns and one covering rear wall. Provide cutouts to access main car operating panel.

D. Service Elevator: New Car Enclosure and Interior Finishes.
1. Remove all existing interior finishes and shell components, weigh, and document.
2. Provide complete new car enclosure and interior finishes as specified herein.
3. Post modernization weight not to exceed code allowable limits.
4. Provide the following features:
    a. Enclosure Walls: Reinforced 14-gauge furniture steel textured stainless steel formed panels with baked enamel interior finish as selected. Width of individual panels shall not exceed 18". Apply sound-deadening mastic to exterior.
    b. Enclosure Canopy: Reinforced 12-gauge furniture steel formed panels with lockable, hinged emergency exit. Interior finish white reflective baked enamel.
    c. Car Sill:
    d. Stationary Return Panels: Reinforced 14 gauge satin finish stainless steel with cutouts for car operating panels and other equipment.
    e. Entrance Columns: Reinforced 14 gauge textured satin finish stainless steel.
    f. Transom: Reinforced 14 gauge textured satin finish stainless steel full width of enclosure.
    g. Car Door Panels: Fully enclosed 16-gauge steel, sandwich construction without binder angles. Constructed with interlocking, stiffening ribs. Leading edges of center-opening doors equipped with rubber astragals full height of panel. Minimum of two gibs per panel, one at leading and one at trailing edge with gibs in the sill groove entire length of door travel. Satin finish stainless steel.
    h. Base: Textured stainless steel with concealed ventilation cutouts.
    i. Ventilation: Two-speed exhaust blower. Mount to car canopy on isolated rubber grommets. Exhaust blower shall meet noise requirements specified herein.

j. Lighting: LED fixtures with wiring and hookup. Coordinate with emergency lighting requirements.
k. Suspended Ceiling: Six-section satin finish stainless-steel panels with lighting cutouts in each panel.
l. Handrails: Solid stainless steel flat stock bars, 4" x 3/8", across rear and side walls. Return handrail ends to car walls.
m. Guardrails:
    1) Solid stainless steel flat stock bars, 4" x 3/8", mounted across rear and side walls.
    2) Locate guardrail line at 8" above car floor.
    3) Bolt rails through car walls from back and mount on 1½" deep solid round stainless steel standoff spacers no more than 18" O.C.
    4) Return guardrail ends to car walls.
    5) Pads and Buttons: Three-piece removable pads. Two pads covering side walls and adjacent front returns and one covering rear wall. Provide cutouts to access main car operating panel.
n. Cab Flooring:
    1) Seamless resilient non-slip rubber or vinyl with sealed as selected by the Owner.

E. Freight Elevator Enclosure: Car weight to be verified prior to removal of interior cab finishes/cab enclosure. Post modernization weight not to exceed code allowable limits. Provide the following features:
1. Enclosure Walls: Reinforced 10-gauge furniture steel formed panels no more than 20" wide with light-proof joints.
    a. Baked enamel finish as selected.
    b. Provide recess in car side wall for recessed mounting of car operating panel.
2. Enclosure Canopy:
    a. Reinforced 12-gauge furniture steel formed panels no more than 20" wide with light-proof joints and Hinged emergency exit.
    b. Interior finish white reflective baked enamel.
    c. Lighting: Recessed LED down lights with on/off switch in car operating panel. Recess mount fixture flush with inside surface of car top. Provide steel guard on car top over fixture.
    d. Bumper Rails: Two rows of 2" x 12" oak or maple bumpers mounted on both sides and rear of the car.
        1) Locate bottom rail at floor level and top rail at 36" above the car floor.
        2) Bolt rails through car walls with bolt and captive nuts on exterior of wall panel sections on 18" centers.
        3) Finish both upper and lower top edges with a 45-degree chamfered edge to eliminate collection of trash.
        4) Finish ends of upper and lower bumpers on side walls to 45° chamfer to eliminate carts and people from hitting blunt ends.
        5) Flooring: Provide cab flooring which is 1/8” aluminum diamond plate.

DIVISION 14

SECTION 142401

HYDRAULIC SPECIFICATIONS FOR

THREE (3) ELEVATORS

AT

FACULTY / ADMINISTRATION BUILDING

656 WEST KIRBY AVENUE

DETROIT, MI

DATE: March 27 2014

SECTION 142401 –
HYDRAULIC ELEVATOR MODERNIZATION

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes modernization of hydraulic elevators:
   1. Three (3) passenger elevators, Cars #1-3.

B. Products Installed but Not Furnished Under This Section:
   1. CCTV camera provisions.
   2. Elevator security devices, control unit, mounting brackets, wiring materials, logic circuits, security system interface terminals, boxes, and relays.

1.2 DEFINITIONS

A. All technical terms in these Contract Documents are used as defined in the latest edition of American National Standard Safety Code for Elevators, Dumbwaiters, Escalators, and Moving Walks ASME A17.1. and A17.2.

B. ELEVATOR CONSULTANT or CONSULTANT refers to Lerch Bates Inc. (Lerch Bates).

C. PURCHASER refers to Wayne State University.

D. CONTRACT or CONTRACT DOCUMENTS consists of the Agreement, Conditions of Contract, Specifications, Addenda, Drawings if included, and Alternates if accepted.

E. CONTRACTOR or ELEVATOR CONTRACTOR refers to any persons, partners, firm, or corporation having a contract with Purchaser to furnish labor and materials for the execution of work required.

F. CONTRACT AWARD refers to Purchaser's verbal or written award for work required.

G. SUBCONTRACTOR refers to any persons, partners, firm, or corporation having a contract with Contractor to furnish labor and materials for the execution of work required.

H. PROVIDE means "furnish and install."

I. MANUFACTURER means either the Original Equipment Manufacturer (OEM) or the principal manufacturer of a component or system.

J. RETAIN means, unless otherwise specified, the existing equipment is to be left in place with no alterations and no change in the original manufacturer's designed performance or functionality. Items that are "retained" shall be thoroughly cleaned in place and adjusted to achieve originally designed function.

K. REFURBISH means, unless otherwise specified, the existing equipment is to be cleaned, repainted, repaired, and parts replaced to put the equipment into a condition to provide the same appearance, performance, and functionality as the equipment provided when it was originally installed. Unless otherwise specified, the scope of replacement of components is limited to those items currently available for purchase as replacement parts from the manufacturer or after-market suppliers approved by the manufacturer.

L. REUSE means that the Contractor shall carefully remove equipment from the existing installation, avoiding any damage or additional wear. Store in a safe location to maintain equipment in its pre-removal condition. Reinstall and incorporate into the modernized elevator installation using the same procedures and recommendations provided by the manufacturer of the equipment.

M. INCLUDES or INCLUDING means including the items specified but not limited solely to those items if additional work or components are required to achieve the specified outcome.

N. CALL BACK means a request from the Purchaser to the Contractor to provide a technician on site to evaluate an elevator that is out of service or not functioning properly, rectify the root cause of the malfunction, and place the unit back into normal service.

O. Words in the singular shall include the plural whenever applicable or context so indicates.

1.3 WORK INCLUDED

A. Modernize three hydraulic passenger elevators.

B. All labor, engineering, tools, transportation, services, supervision, materials, and equipment necessary for and incidental to satisfactory completion of required work as indicated in Contract Documents.

C. Provide all required staging, hoisting, and movement of new equipment, reused equipment, or removal of existing equipment.

D. Applicable conditions of Purchaser's General, Special, and Supplemental Conditions.

E. Warranty maintenance as described herein.

F. Cartage and Hoisting: All required staging, hoisting, and movement to, on, and from the site including new equipment, retained equipment, or dismantling and removal of existing equipment.

G. Unless specifically identified as "Retain," "Reuse," or "Refurbish," provide new equipment. Contractor may, with approval prior to quotation, provide new equipment in lieu of refurbishing existing.

H. Reference to a device or a part of the equipment applies to the number of devices or parts required to complete the installation.

I. Provisions of this specification are applicable to all elevators unless identified otherwise.

J. Provide hoistway, pit, and machine room barricades.

K. Provide temporary and permanent pit ladders, working platforms, inspection platforms, and guard rails required to comply with applicable Building Code, work safety standards, and AHJ requirements.

L. Protective barriers between cars in normal operation and adjacent cars in the modernization process, full depth and height of hoistway.

M. Scope of Contract includes, but is not limited to, the following:
1. Coordination, scheduling, and management of work of component suppliers and subcontractors.
2. Modernize or furnish and install equipment as specified utilizing existing and/or modified hoistways and machine rooms.

N. Specific item of required work which cannot be determined to be included in another contract is thereby determined to be included in prime contract.

1.4 CONSULTANT STATUS

A. Consultant shall act as Purchaser's and/or Building Management's representative on all matters pertaining to required work. Consultant shall interpret Contract Documents, analyze Contractor's quotations, review Contractor's suggested alternates, review all Contractor's submittals, approve billings, review technical details and construction procedure, perform work progress reviews, and review and test completed work for compliance with Contract Documents prior to acceptance of work by Purchaser.

B. Field Review Scheduling: Schedule progress and final work reviews with Consultant. Reply promptly, in writing, to corrective work indicated on Consultant's progress and/or final review reports, indicating status and schedule for completion. Consultant anticipates scheduled site review appointments will be met.

1.5 CODES AND ORDINANCES

A. All work covered by these Contract Documents is to be done in full accord with national code, state and local codes, ordinances, and elevator safety orders in effect at time elevator alteration permit issuance. All requirements of local Building Department and fire jurisdiction are to be fulfilled by Contractor and its Subcontractors.

1.6 PRIME CONTRACTOR'S DUTIES

A. Prime Contractor's duties include the following:
1. Provide and pay for labor, materials and equipment, tools, construction equipment and machinery, and other facilities and services necessary for proper execution and completion of required work.
2. Pay for legally required sales, consumer, and state remodel taxes.
3. Secure and pay for required permits, fees, and licenses necessary for proper execution and completion of required work, as applicable at time of quotation due date.
4. Give required notices.
5. Comply with codes, ordinances, rules, regulations, orders, and other legal requirements of public authorities which bear on performance of required work.
6. Promptly submit written notice to Consultant of observed variance of Contract Documents from legal requirements.
7. Enforce strict discipline and good order among employees. Do not employ persons unskilled in assigned task.

1.7 STAGING AREA

A. An equipment staging area will be available for use by Contractor. Contractor shall restrict usage to area designated and shall notify Purchaser prior to storing of any large equipment which will impose heavy concentrated loading on floor area. Do not store such equipment until approval is received.

1.8 WORK SEQUENCE

A. Construct work in stages.

1.9 WORKING HOURS

A. Unless otherwise stated below or elsewhere in the Contract Documents, Contractor shall have access to the building for work activities during the following regular building operating hours:
   1. 8:00 a.m. to 5:00 p.m., Monday through Friday or as agreed upon by Wayne State University.

B. Contractor shall perform all work that has the potential to result in any of the following conditions outside of regular building operating hours at no additional cost to the Purchaser.
   1. Interruptions or changes in normal automatic operation.
   2. Activation of Firefighter's Emergency Operation Phase I.
   3. Noise levels in excess of 80 dBA measured in any occupied or public space.
   4. Transport of large equipment through public or tenant spaces.
   5. Coordination with WSU staff for planned events in the building.

1.10 CONTRACTOR USE OF PREMISES

A. Confine operations at site to areas permitted by law, ordinances, permits, Contract Documents, and Purchaser's specific instructions.

B. Do not unreasonably encumber site with materials or equipment. Staging area will be located as directed by Purchaser.

C. Do not load structure with weight that will endanger structure. Coordinate with Purchaser.

D. Assume full responsibility for protection and safekeeping of tools and products stored on or off premises.

E. Move stored products which interfere with operations of building or the operations of other trades.

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

1.11 CONCURRENT MODERNIZATION WORK AND BUILDING OPERATION

A. This project is a major elevator modernization in an existing building which is a private residence and open for public business. The building will continue to operate throughout all phases of required work. It is essential that Contractor give special attention and priority to all matters concerning project safety, protection from dust and loose materials, reduction of noise level, protection from water and air infiltration into building, and maintenance of neat, sightly conditions in and around work areas inside and outside of building. Packaging, scrap materials, and demolition debris shall be promptly removed from building and site on a daily basis.

B. At all times Contractor shall provide clearly visible warning and directions signs. At all times give special attention to building entrances, exits, and proper safe exiting through work areas as required by law.
   1. Barricade design must be approved by client prior to start of modernization work.
   2. Standard folding maintenance barricades are not acceptable.

C. Contractor shall consult Purchaser and other Contractors to establish and maintain safe temporary routes including, but not limited to, proper barricades, walking surfaces, lighting, fire protection, exiting, warning and directional signs, and general protection of persons from all hazards in accordance with OSHA Standards due wholly or partially to its operations.

1.12 ALTERNATES

A. Alternate: Battery Lowering Operation
1. Upon loss of normal power automatically lower car to the nearest landing depending on position at time of power outage.
2. Upon arrival at the landing, the elevator doors shall open automatically and remain open until regular door time has expired; the elevator shall then be removed from service.
3. The auxiliary power source shall be provided via 12-volt D.C. battery units installed in machine room.
4. Include solid-state charger and testing means mounted in a common metal container.
5. Battery to be rechargeable lead acid or nickel cadmium with a ten-year life expectancy.
6. Upon restoration of normal power, the elevator shall automatically resume normal operation.
7. Disable if normal power switched off.

B. Alternate: New Car Door Panels
1. New fully enclosed 16-gauge steel, sandwich construction without binder angles. Constructed with interlocking, stiffening ribs. Leading edges of center-opening doors equipped with rubber astragals full height of panel. Minimum of two gibs per panel, one at leading and one at trailing edge with gibs in the sill groove entire length of door travel. Satin finish stainless steel.
2. Adjust vertical and horizontal clearances to meet Code requirements.

1.13 RELATED WORK PROVIDED BY ELEVATOR CONTRACTOR

A. Hoistway and Pit:
1. Wall blockouts and fire rated closure for control and signal fixture boxes which penetrate walls.
2. Cutting and patching walls and floors.
3. Opening in hoistway wall or pit wall for hydraulic piping. Trench and backfill underground piping.
4. Erect front hoistway wall after elevator entrances are installed.
5. Pit access stationary ladder for each elevator.
6. Structural support at pit floor for buffer impact loads, guide rail loads, and cylinder loads.
7. Waterproof pit. Indirect waste drain or sump with flush grate and pump. Sump pump/drain capacity minimum 3,000 gallons per hour, per elevator. Coordinate installation of sump pump and/or drain with plumbing code.
8. Provide oil separator per Michigan Plumbing Code.
9. Protect open hoistways and entrances during construction per OSHA Regulations.
10. Protect car enclosure, hoistway entrance assemblies, and special metal finishes from damage.
11. Hoistway venting per building code.

B. Machine Room and Machinery Spaces:
1. Ventilation and heating. Maintain minimum temperature of 55° F, maximum 90° F. Maintain maximum 80% relative humidity, non-condensing.
2. Paint walls and ceiling.
3. Class “ABC” fire extinguisher in each elevator machine room.
4. Fire sprinklers where required.

C. Electrical Service, Conductors, and Devices:
1. Lighting and GFCI convenience outlets in pit and machine room. Provide one additional non-GFCI convenience outlet in pit for sump pump and oil return pump.
2. Provide guarded lighting with an illumination level of not less than 100 lx (10 fc) at the pit floor.
3. Provide guarded lighting with an illumination level of 200 lx (19 fc) at the machine room floor.
4. Three-phase mainline copper power feeder with true earthen grounding to terminals of each elevator controller in the machine room with protected lockable “open” disconnecting means

with auxiliary contacts to allow Elevator Contractor to electrically interlock battery power lowering unit.

5. Single-phase copper power feeder to each elevator controller for car lighting and exhaust blower with individual protected lockable “open” disconnecting means located in machine room.
6. Emergency telephone line to each individual elevator control panel in elevator machine room.
7. Install automatic Fire Recall System:
   a. Fire alarm initiating devices in each elevator lobby.
   b. Fire alarm initiating devices in elevator machine room.
   c. Three Relay Activation Modules for single elevator. Locate modules within three feet of controller designated by the Elevator Contractor to minimize un-supervised wiring. Program Modules as follows:
      1) PRIMARY: Activate when any hallway device, except primary floor, activates.
      2) ALTERNATE: Activate when hallway device at primary floor activates.
      3) FIRE HAT: Activate when machine room device activates.
   d. Device in machine room and at top of hoistway to provide signal for general alarm.
   e. Provide technician from fire alarm contractor for pre-test of system during normal working hours.
   f. Provide technician from fire alarm contractor for acceptance test of system with AHJ during normal working hours.
   g. Fire alarm contractor to submit drawings to the State and Purchaser for review and approval.
   h. Apply for and obtain variance with Fire Protection Department. Since the building does not currently contain sprinklers, it is not feasible to add sprinklers to the building.
8. Conduit from the closest hoistway of each elevator group or single elevator to the firefighters’ control room and/or main control console. Coordinate size, number, and location of conduits with Elevator Contractor.
9. Means to automatically disconnect power to affected elevator pump unit and controller prior to activation of machine room fire sprinkler system, and/or hoistway fire sprinkler system. Manual shut-off means shall be located outside bounds of machine room.
10. When sprinklers are provided in the hoistway all electrical equipment, located less than 4'-0" above the pit floor shall be identified for use in wet locations. Exception, seismic protection devices.
11. Single-phase power feeders to firefighters’ control panel.
12. Three-phase power feeder to each freight elevator power door controller in machine room with protected lockable “open” disconnecting means.
13. Card or Proximity Readers, elevator contractor to coordinate and assist with installation of readers in car operating panel or hall stations.

1.14 ACTION AND INFORMATIONAL SUBMITTALS

A. Within sixty (60) calendar days after award of contract and before beginning equipment fabrication, submit shop drawings, and required material samples for review. Allow 30 days for response to initial submittal.
   1. Scaled or Fully Dimensioned Layout: Plan of machine room indicating equipment arrangement, details of car enclosures, and car/hall signal fixtures.
   2. Design Information: Indicate equipment lists, reactions, and design information on layouts.
   3. Power Confirmation Information: Design for existing conditions.
   4. Fixtures: Shop drawings.
   5. Finish Material: If requested, submit 3" x 12" samples of actual finished material for review of color, pattern, and texture. Compliance with other requirements is the exclusive responsibility of the Contractor. Include, if requested, signal fixtures, lights, graphics, Braille plates, and detail of mounting provisions.

6. Design Information: Provide calculations verifying the following:
   a. Adequacy of existing electrical provisions.
   b. Machine room heat emissions in B.T.U.
   c. Adequacy of existing car platform structure for intended loading.
   d. Adequacy of plunger wall thickness for intended loading.
7. Written Maintenance Control Program (MCP) specifically designed for the equipment included under this contract. Include any unique or product specific procedures or methods required to inspect or test the equipment. In addition, identify weekly, bi-weekly, monthly, quarterly, and annual maintenance procedures, including statutory and other required equipment tests.

B. Submittal review shall not be construed as an indication that submittal is correct or suitable, or that the work represented by submittal complies with the Contract Documents. Compliance with Contract Documents, code requirements, dimensions, fit, and interface with other work is Contractor's responsibility.

C. Acknowledge and/or respond to review comments within 14 calendar days of return. Promptly incorporate required changes due to inaccurate data or incomplete definition so that delivery and installation schedules are not affected. Identify and cloud drawing revisions, including Contractor elective revisions on each re-submittal. Contractor's revision response time is not justification for equipment delivery or installation delay.

1.15 PURCHASER'S INFORMATION

A. Non-Proprietary Equipment Design: Provide two (2) sets of digital and three (3) sets of neatly bound written information necessary for proper maintenance and adjustment of equipment within 30 days following final acceptance. Final retention will be withheld until data is received by Purchaser and reviewed by Consultant. Include the following as minimums:
   1. Straight-line wiring diagrams of "as-installed" elevator circuits with index of location and function of components. Mount one set wiring diagrams on panels, racked, or similarly protected, in elevator machine room. Provide remaining set rolled and in a protective drawing tube. Maintain all drawing sets with addition of all subsequent changes. These diagrams are Purchaser's property. A legend sheet shall be furnished with each set of drawings to provide the following information:
      a. Name and symbol of each relay, switch, or other apparatus.
      b. Location on drawings, drawing sheet number and area, and location of all contacts.
      c. Location of apparatus, whether on controller or on car.
   2. Written Maintenance Control Program (MCP) specifically designed for the equipment included under this contract. Include any unique or product specific procedures or methods required to inspect or test the equipment. In addition, identify weekly, bi-weekly, monthly, quarterly, and annual maintenance procedures, including statutory and other required equipment tests.
   3. Printed instructions explaining all operating features.
   4. Complete software documentation for all installed equipment.
   5. Lubrication instructions, including recommended grade of lubricants.
   6. Parts catalogs listing all replaceable parts including Contractor's identifying numbers and ordering instructions.
   7. Four sets of keys for all switches and control features properly tagged and marked.
   8. Diagnostic test devices together with all supporting information necessary for interpretation of test data, troubleshooting of elevator system, and performance of routine safety tests.
   9. The elevator installation shall be a design which can be maintained by any licensed elevator maintenance company employing journeymen mechanics, without the need to purchase or

lease additional diagnostic devices, special tools, or instructions from the original equipment Contractor.

a. Provide onsite capability to diagnose faults to the level of individual circuit boards and individual discrete components for the solid-state elevator controller.
b. Provide a separate, detachable device, as required, to the Purchaser as part of this installation if the equipment for fault diagnosis is not completely self-contained within the controller. Such device shall be in possession of and become property of the Purchaser.
c. Installed equipment not meeting this requirement shall be removed and replaced with conforming equipment at no cost to the Purchaser.

10. Provide upgrades and/or revisions of software during the progress of the work, warranty period and the term of the ongoing maintenance agreement between the Purchaser and Contractor.

1.16 PERMITS, TESTS, AND CERTIFICATES

A. Permits:
1. Secure and pay for all permits required for Work to be performed, including but not limited to:
a. Municipal and State permits.
b. Device or equipment removal permits.
c. Hot works permits.
d. Confined space access permits.
2. Post, maintain, and renew all permits in compliance with local governmental requirements.
3. Obtain documentation of final AHJ close-out of all permits. Provide copies to Purchaser.

B. Tests and Inspections:
1. Schedule and perform all tests required in accordance with procedure described in ASME A17.2 Guide for Inspection of Elevators, Escalators, and Moving Walks in the presence of Authorized Representative of the AHJ and Owner's representative.

C. Certificates: Obtain, pay for, and deliver to Purchaser with all temporary and final inspection certificates provided by proper governing authorities.

D. Violations: Resolve any outstanding violations on record with the AHJ on devices being removed prior to final acceptance by the Purchaser.

1.17 QUALITY ASSURANCE

A. Compliance with Regulatory Agencies: Comply with most stringent applicable provisions of currently enforced codes, laws, and/or authorities, including revisions and changes in effect.

B. Inspections: Provide access to areas where work is being performed for the Consultant at any time throughout the project.

1.18 WARRANTY

A. Material and workmanship of installation shall comply in every respect with Contract Documents. Correct defective material or workmanship which develops within one (1) year from date of final acceptance of all work to satisfaction of Purchaser and Consultant at no additional cost, unless due to ordinary wear and tear, or improper use or care by Purchaser. Perform maintenance in accordance with terms and conditions indicated in the Preventive Maintenance Agreement.

B. Defective is defined to include, but not be limited to operation or control system failures, car performance below required minimum, excessive wear, unusual deterioration, or aging of materials or

finishes, unsafe conditions, the need for excessive maintenance, abnormal noise, or vibration, and similar unsatisfactory conditions.

C. Retained Equipment: All retained components, parts, and materials shall be cleaned, checked, modified, repaired, or replaced, so each component and its parts are in like new operating condition. Retained equipment must be compatible for integration with new systems. All retained equipment shall be covered under the warranty provisions, of Article 1.13, A. & B above. No prorations of equipment or parts shall be allowed on preventive maintenance contract between the Contractor and Purchaser.

D. Make modifications, requirements, adjustments, and improvements to meet performance requirements of Section 142401.

1.19 WARRANTY MAINTENANCE

A. Provide preventive maintenance and 24-hour emergency callback service for one (1) year commencing on date of final acceptance of modernized elevator by Purchaser. Systematically examine, adjust, clean, and lubricate all equipment. Repair or replace defective parts using parts produced by the Contractor of installed equipment. Maintain elevator machine room, hoistway, and pit in clean condition.

B. Use competent personnel, acceptable to Purchaser, employed and supervised by the Contractor.

C. Warranty Maintenance Hours: Contractor shall perform one (1) hour per unit per month for preventive maintenance.

D. All work, except as otherwise noted, including unlimited call-back service, shall be performed during the building's regular hours. These hours are 8:00 a.m. to 5:00 p.m.

E. Response Time for Callback Service:
1. During regular time hours, Contractor shall arrive at Property within 60 minutes from time of notification of equipment problem or failure by Purchaser.
2. Contractor shall arrive at Property in response to passenger entrapment calls within 30 minutes from time of notification by Purchaser.

F. Purchaser retains the option to delete cost of warranty maintenance from modernization equipment contract and remit twelve equal installments directly to Contractor during period in which maintenance is being performed.

1.20 DELIVERY, STORAGE, AND HOISTING

A. General:
1. Protect all equipment and exposed finishes during delivery, handling, and installation until completion of project.
2. Replace damaged materials with new, with no additional cost for material or labor to Purchaser.

B. Delivery and Storage:
1. Ensure manufacturers' original packing adequately protects materials during delivery.
2. Deliver materials, identical to accepted samples, to the site ready for use in the manufacturer's original and unopened containers and packaging, bearing labels as to type of material, brand name and manufacturer's name.
3. Store materials under cover in a secure, dry, and clean location, off the ground. Remove delivered materials that are damaged or otherwise not suitable for installation from the job site and replace with acceptable materials.

4. Store and protect all materials in space provided or designated by the Purchaser against damage, stains, scratches, corrosion, weather, construction debris, and other environmental conditions.
5. Comply with Purchaser's requirements for access to and use of any building loading docks, parking lots, parking garages, and any interior spaces required for delivery and storage.

C. Hoisting: Arrange and pay for all required hoisting and movement of equipment.

1.21 COORDINATION

A. Prime contracts are defined below, and each is recognized to be a major part of required work to be performed concurrently in close coordination with work of other Contractors.
1. This Contract: Elevator Modernization including associated related work specified herein.

B. Scope of Contract includes, but is not limited to, the following:
1. Coordination, scheduling, and management of work of component suppliers and subcontractors.
2. Modernize or furnish and install equipment as specified utilizing existing and/or modified hoistways and machine rooms.
3. Specific item of required work which cannot be determined to be included in another contract is thereby determined to be included in prime contract.

PART 2 - PRODUCTS

2.1 REFERENCES

A. American National Standard Institute (ANSI): A117.1, Accessible and Usable Buildings and Facilities.

B. American Society of Mechanical Engineers:
1. ASME A17.1, Safety Code for Elevators and Escalators.
2. ASME A17.2, Guide for Inspection of Elevators, Escalators, and Moving Walks.
3. ASME A17.5, Elevator and Escalator Electrical Equipment.
4. ASME A17.6, Standard for Elevator Suspension, Compensation, and Governor Systems.

C. National Fire Protection Association (NFPA):
1. NFPA 70, National Electric Code.
2. NFPA 80, Fire Doors and Windows.
3. NFPA 101, Life Safety Code.
4. NFPA 13, Installation of Sprinkler Systems.

D. International Building Code (IBC).

E. City of Detroit Elevator Code.

F. Accessibility:
1. American National Standard Institute (ANSI): A117.1, Accessible and Usable Buildings and Facilities.
2. ADAAG, Americans with Disabilities Act Accessibility Guidelines.

2.2 MANUFACTURERS AND PRODUCTS

A. Approved Elevator Contractors:
1. Approved subject to compliance with the requirements of the contract and specifications.
a. KONE
b. Lardner Elevator

c. Otis Elevator
d. Schindler Elevator Corporation
e. TK Elevator
f. Toledo Elevator
g. Approved Equal

B. Approved Elevator Components:
The following Manufacturers/Assemblers are approved for the specific components listed below, subject to the requirements of the contract:

1. Car and Hall Signal Fixtures:
   a. Innovation
   b. MAD Fixtures
   c. Monitor
   d. PTL
2. Controllers:
   a. GAL GALaxy
   b. Elevator Controls Corporation
   c. Smart Rise
3. Door Protective Device:
   a. Janus
   b. T.L. Jones
   c. Tri-Tronics
4. Elevator Cab Interiors:
   a. Architectural Metals
   b. A Better Elevator Co.
   c. G&R
   d. Globe Architectural & Metals
   e. Snap Cab
   f. Weir Inc.
5. Guide Shoes
   a. Delco
   b. ELSCO
   c. GAL
   d. Hollister-Whitney
6. Hydraulic Elevator Systems and Components:
   a. Canton
   b. EECO
   c. MEI
   d. Schumacher
7. Hydraulic Jack Assemblies
   a. EECO
   b. Bore-Max
   c. Canton Elevator
8. Hoistway Entrances and Door Panels:
   a. Columbia
   b. EDI/ECI
   c. Elevator Products
   d. Gunderlin
   e. Tyler
   f. United Cab
9. Passenger Elevator Door Equipment (Operators, Tracks, Hangers, and Closers):
   a. ECI

b. GAL
c. Wittur

10. Traveling Cables:
    a. Draka
    b. James Monroe
11. Two-Way Emergency Communication Device:
    a. Janus
    b. K-Tech
    c. Kings III
    d. Rath Microtec
    e. Wurtec

2.3 PERFORMANCE REQUIREMENTS

A. Car Speed: ± 10% of contract speed in up direction, ± 20% of contract speed in down direction.

B. Car Capacity: Safely lower, stop, and hold rated load.

C. Car Stopping Zone: ± 1/4" under any loading condition.

D. Door Times: Seconds from start to fully open or fully closed:
1. Cars #1-3: Door Open: 1.7 seconds. Door Close: 2.4 seconds.

E. Car Floor-to-Floor Performance Time: Seconds from start of doors closing until doors are 3/4 open for center-opening doors or 1/2 open for side-opening doors, and car is level and stopped at next successive floor under any loading condition or travel direction:
1. Cars #1-3: 13.0 seconds. Floor Height: 12’-10” between floors 2 and 3.

F. Noise and Vibration Control:
1. Airborne Noise:
    a. Measured noise level of elevator equipment and its operation shall not exceed 60 dBA inside car under any condition including door operation and car ventilation exhaust blower on its highest speed.
    b. Limit noise level in the machine room relating to elevator equipment and its operation to no more than 80 dBA.
    c. All dBA readings to be taken 3'-0" off the floor and 3'-0" from the equipment using the “A” weighted scale.
2. Vibration Control: Mechanically isolate all new elevator equipment from the building structure and other components. Minimize objectionable noise and transmission of vibrations to occupied areas of the building. All elevator equipment provided under this contract, including power unit, controller, oil supply lines, and their support shall be mechanically isolated from the building structure and electrically isolated from the building power supply and to each other to minimize the possibility of objectionable noise and vibrations being transmitted to occupied areas of the building.

2.4 ELEVATOR DUTY ALTERATIONS

A. Passenger Elevator

ALTERATION SUMMARY		
CARS #1-3	**EXISTING INSTALLATION**	**MODERNIZED INSTALLATION**
Capacity:	2500 lbs.	No Change
Class of Loading:	Class A	No Change
Contract Speed:	150 fpm	No Change
Hydraulic Power Unit Location:	Adjacent at 1st Floor	No Change
Operation Control:	Group automatic	No Change
Floors Served:	Front: 1 - 4	No Change
Total Entrances:	All Front	No Change
Entrance Type:	Single-Speed Center-Opening	No Change
Entrance Size:	3'-6" wide x 7'-0" high	No Change
Minimum Clear to Underside of Canopy:	8'-0" high	No Change

2.5 MATERIALS

A. All colors will be selected from the Manufacturer's standard range unless custom colors are specified herein.

B. Steel:
1. Sheet Steel (Furniture Steel for Exposed Work): Stretcher-leveled, cold-rolled, commercial quality carbon steel, complying with ASTM A366, matte finish.
2. Sheet Steel (for Unexposed Work): Hot-rolled, commercial quality carbon steel, pickled and oiled, complying with ASTM A568/A568M-03.
3. Structural Steel Shapes and Plates: ASTM A36.

C. Stainless Steel: Type 302 or 304 complying with ASTM A240, with standard tempers and hardness required for fabrication, strength, and durability. Apply mechanical finish on fabricated work in the locations shown or specified, Federal Standard and NAAMM nomenclature, with texture and reflectivity required to match Purchaser's sample. Protect with adhesive paper covering.
1. No. 4 Satin: Directional polish finish. Graining directions as shown or, if not shown, in longest dimension.
2. No. 8 Mirror: Reflective polish finish with no visible graining.
3. Textured: 5WL as manufactured by Rigidized Metals or Windsor pattern 5-SM as manufactured by Rimex Metals or approved equal with .050 inches mean pattern depth with bright directional polish (satin finish).
4. Burnished: Non-directional, random abrasion pattern.

D. Aluminum: Extrusions per ASTM B221; sheet and plate per ASTM B209.

E. Plastic Laminate: ASTM E84 Class A and NEMA LDI-1964, 1/16", Fire-Rated Grade (GP-50), Type1, 1/16" high pressure general purpose laminate, color and texture as follows:

1. Exposed Surfaces: Color and texture selected by Purchaser.
2. Concealed Surfaces: Contractor's standard color and finish.

F. Fire-Retardant Treated Particle Board Panels: Minimum 3/4" thick backup for natural finished wood and plastic laminate veneered panels, edged and faced as shown, provided with suitable anti-warp backing; meet ASTM E84 Class "I" rating with a flame-spread rating of 25 or less, registered with Local Authorities for elevator finish materials.

G. Natural Finish Wood Veneer: Standard thickness, 1/40" thoroughly dried conforming to ASME/HPMA HP-1983, Premium Grade. Place veneer, tapeless spliced with grain running in direction shown, belt and polish sanded, book matched. Species and finish designated and approved by Purchaser and/or Consultant.

H. Paint: Clean exposed metal parts and assemblies of oil, grease, scale, and other foreign matter and factory paint one shop coat of standard rust-resistant primer. After erection, provide one finish coat of industrial enamel paint. Galvanized metal need not be painted.

I. Prime Finish: Clean all metal surfaces receiving a baked enamel paint finish of oil, grease, and scale. Apply one coat of rust-resistant primer followed by a filler coat over uneven surfaces. Sand smooth and apply final coat of primer.

J. Baked Enamel Finish: Prime finish per above. Unless specified "prime finish" only, apply and bake three additional coats of enamel in the selected solid color.

K. Entrance Field Paint: Clean all surfaces to remove dirt and grease. Sand and finish surfaces as necessary to remove pits and scratches and prepare surface for painting. Apply filler to ensure smooth surface; sand and apply one coat of electrostatic enamel in the selected solid color.

L. Refinishing of natural metals: Remove existing protective finish. Buff as necessary to remove scratches. Regrain or finish as specified and protect as indicated for particular metal type.

M. Entrance Support Equipment within Hoistway: Include strut angles, headers, sill support angles, fascia, hanger covers, etc. Clean, remove, and check for corrosive activity. Replace components which exhibit severe deterioration. Tighten all fastenings.

2.6 OPERATION

A. General:
1. Cars automatically slow down and stop level at floors in response to car and landing calls with stops made in sequence in the established direction of travel, regardless of order in which buttons are pressed.
2. Landing calls are canceled when the assigned car arrives at the landing.
3.
4. Automatic Leveling:
   a. When arriving at a floor cars level to within 1/4" above or below the landing sill prior to opening doors, without travelling past the landing during leveling
   b. Maintain leveling accuracy regardless of carload, direction of travel, <>rope slippage or stretch.
5. Power Conservation:
   a. Car interior illumination and ventilation turns off after adjustable period (60-180 seconds) of no elevator demand and turns on prior to opening car doors when elevator demand returns.

B. Door Operation:
1. Automatically open doors when car arrives at a floor.
2. Stop and reopen doors or hold doors in open position upon activation of “door open” button.
3. At expiration of normal dwell time, or upon activation of “door close” button, close doors:
   a. Prevent doors from closing and reverse doors at normal opening speed if door reopening device beams are obstructed while doors are closing, except during nudging operation.
4. Nudging Operation:
   a. After beams of door reopening device are obstructed for a predetermined time interval (minimum 20.0-25.0 seconds), sound warning signal, and attempt to close doors with maximum of 2.5 foot-pounds kinetic energy.
   b. Activation of the door open button overrides nudging operation and reopens doors.
5. Interrupted Beam Time:
   a. When beams are interrupted during initial door opening, hold door open a minimum of 3.0 seconds.
   b. When beams are interrupted after the initial 3.0 second hold open time, reduce time doors remain open to an adjustable time of approximately 1.0-1.5 seconds after beams are reestablished.
6. Differential Door Time:
   a. Field adjustable time doors remain open after stopping in response to calls.
   b. Car Call: Hold open time adjustable between 3.0 and 5.0 seconds.
   c. Hall Call:
      1) Hold open time adjustable between 5.0 and 8.0 seconds.
      2) Use hall call time when car responds to coincidental calls.

A. Group Operation
1. General:
   a. Arrange for automatic operation through car and landing buttons in conjunction with a microprocessor-based group supervisory system.
2. Group Supervisory System - Passenger Elevators:
   a. The supervisory system shall, through a dispatching algorithm, continually measure the number of corridor calls, their duration, their direction, distance, service to previously assigned car and hall calls, carload, door and car motion status, coincidence of car and hall calls, etc., to determine the intensity of traffic and its direction. The supervisory system shall automatically adjust to all demands with preference given to the registered calls in the following order:
      1) Main Landing Calls
      2) Long wait Down calls.
      3) Long wait Up calls.
      4) Up calls.
   b. Long wait calls shall be considered those that have been registered for over 30 seconds.
   c. Dynamic zoning strategies may be employed to provide shortened wait times.
3. Hall Call Assignment:
   a. Assign registered hall calls to car that will provide the fastest possible response time.
   b. Car assignment and response time determined by evaluating factors such as distance from demand, service to previously assigned car and hall calls, carload, direction, door and car motion status, and coincident car and hall calls. Continuously assign car available to answer call in the shortest amount of time.
   c. A car without registered car calls arriving at a floor, where both up and down hall calls are registered, initially responds to the hall call in the direction that car was traveling. If no car call is registered for further travel in that direction, lantern immediately indicates change of direction without closing and reopening doors.
4. Delayed Car:

a. If, for any reason, a car is delayed after it receives a start signal, system transfers the call to another car.
a. When cause of delay is corrected car automatically returns to normal operation.

B. Firefighters' Emergency Operation: Provide equipment and operation in accordance with code requirements. Replace all Firefighters Emergency Operation key switches at the 1st and 3rd floors that control non-modernized elevators in this building to match modernized elevators when first car in group is returned to service.

C. Battery Operation of Emergency Lighting, Communications, and Alarm:
1. Car mounted battery unit with solid-state charger to operate alarm bell, car emergency lighting, and voice communication system.
a. Car lighting and communication shall be provided with a minimum of 4 hours of operation on back-up power during a loss of normal power, and a minimum of 1 hour of operation for car-mounted alarm and any remote alarm mounted at the designated level.
b. Battery to be rechargeable with minimum five-year life expectancy.
c. Provide constant pressure test button in service compartment of car operating panel.

D. Emergency Car Communication System Operation:
1. Hands-Free Phone System:
a. New two-way communication instrument in car to provide automatic dialing, tracking, and recall features.
1) Automatic dialer to include automatic rollover capability with minimum two numbers:
b. Activated by "Help" button in car or by external telephone call.
c. Adjacent light jewel l illuminates and flashes when call is acknowledged.

E. Electrical Wiring and Wiring Connections: New.
1. Conductors and Connections:
a. Copper throughout with individual wires coded and connections on identified studs or terminal blocks.
b. Use no splices or similar connections in wiring except at terminal blocks, control compartments, or junction boxes.
c. Provide 10% spare conductors throughout.
d. Run spare wires from car connection points to individual elevator controllers in the machine room.
2. Conduit:
a. Galvanized steel conduit, EMT, or duct.
b. Flexible conduit length not to exceed 3'-0".
3. Traveling Cables:
a. Flame and moisture-resistant outer cover. Prevent traveling cable from rubbing or chafing against hoistway or equipment within hoistway.
b. Provide 12 twisted shielded pairs in addition to wires needed to connect specified items and code required spares.
c. Tag spares in machine room.
d. Provide cables from controller to car top.
4. Auxiliary Wiring:
a. Connect fire alarm initiating devices, emergency two-way communication system, CCTV, and card reader in each controller in machine room.
b. Provide machine room demarcation junction boxes for the fire alarm initiating devices, CCTV, security system and card reader interface terminals and relays.

c. Provide conduit, wiring and connections for the fire alarm initiating devices, emergency two-way communication system, CCTV, security system and card reader interface terminals and relays, from machine room junction box to car controller in machine room.

2.7 MACHINE ROOM EQUIPMENT

A. Provide and arrange equipment in existing machine room spaces.

B. Identification: Permanently identify (painted on or securely attached) machine room equipment with minimum 3" characters corresponding to elevator identification.
1. Hydraulic Machine (Power Unit)
2. Controller.
3. Main line disconnect switch.
4. Pit equipment.

C. Hydraulic Machine (Power Unit):
1. New assembled unit consisting of submersible positive displacement pump, induction motor, master-type control valves combining safety features, holding, direction, bypass, stopping, manual lowering functions, shut off valve, oil reservoir with protected vent opening, oil level gauge, outlet strainer, drip pan, muffler. Mount power unit on isolating pads.
2. Submersible pump motor shall be permitted up to 50 HP.

B. Controller: New.
1. Compartment:
a. UL/CSA labeled.
b. Securely mount all assemblies, power supplies, chassis switches, relays, etc., on a substantial, self-supporting steel frame.
c. Completely enclose equipment with covers.
d. Provide means to prevent overheating.
2. Relay Design:
a. Magnet operated with contacts of design and material to insure maximum conductivity, long life, and reliable operation without overheating or excessive wear.
b. Provide wiping action and means to prevent sticking due to fusion.
c. Contacts carrying high inductive currents shall be provided with arc deflectors or suppressors.
3. Microprocessor Hardware:
a. Provide built-in noise suppression devices that provide a high level of noise immunity on all solid-state hardware and devices.
b. Provide power supplies with noise suppression devices.
c. Isolate inputs from external devices (such as pushbuttons) with opto-isolation modules.
d. Design control circuits with one leg of power supply grounded.
e. Safety circuits shall not be affected by accidental grounding of any part of the system.
f. System shall automatically restart when power is restored.
g. System memory shall be retained in the event of power failure or disturbance.
h. Equipment shall be provided with Electro Magnetic Interference (EMI) shielding within FCC guidelines.
4. Wiring:
a. CSA labeled copper for factory wiring.
b. Neatly route all wiring interconnections and securely attach wiring connections to studs or terminals.
c. Provide labels for all extra or spare wires, neatly organized at base of controller cabinet.
5. Permanently mark components (relays, fuses, PC boards, etc.) with symbols shown on wiring diagrams.

6. Provide electrical design compliant with UL 508A SB.SCCR of 5000A required.

C. Muffler: New.
1. Provide in discharge oil line near pump unit.
   a. Design shall dampen and absorb pulsation and noise in the flow of hydraulic fluid.

D. Piping and Oil: New.
1. Provide piping, connections and oil for the system.
2. A minimum of two sound isolation couplings shall be provided between the pump unit and oil line and the oil line and jack unit.
3. Provide 2-90° joints to reduce vibration and create wave diffraction.
4. Provide isolated pipe stands or hangers.

E. Shut-Off Valve: New.
1. Provide oil line shut off valve in the machine room or accessible from outside the hoistway.
2. Provide second valve in pit adjacent to jack unit.

2.8 HOISTWAY EQUIPMENT

A. Provide and arrange equipment in existing hoistways.

B. Guide Rails: Retain main guide rails in place.
1. Clean rails and brackets. Remove rust.
2. Check all rail and bracket fastenings and tighten.

C. Terminal Stopping: Provide normal and final devices.

D. Hoistway Entrance Equipment:
1. Door Hanger: New two-point hanger roller with neoprene roller surface and suspension with eccentric upthrust roller adjustment.
2. Door Hanger Rollers: Replace.
3. Door Track: New bar or formed, cold-drawn removable steel tracks with smooth roller contact surface.
4. Door Interlocks: New. Operable without retiring cam.
5. Door Closers: New spring-activated spirator. Install and adjust to insure smooth, quiet mechanical close of doors.

E. Hoistway Door Unlocking Device: Provide unlocking device including new escutcheon in door panel at all floors.

F. Hoistway Access Switches: Mount in wall at top and bottom floors. Provide switch with faceplate. Locate within easy reach to entrance so entrance can be guarded by one technician.

G. Floor Numbers: Stencil paint 4" high floor designations in contrasting color on inside face of hoistway doors or hoistway fascia in location visible from within car.

2.9 PIT EQUIPMENT

A. Buffers: Retain existing. Remove rust and repaint non-machined surfaces.

B. Hydraulic Jack Assembly: Retain Existing. Provide new gland packing.

C. Jack Support: Retain Existing.

2.10 HOISTWAY ENTRANCES

A. Provide and arrange equipment in same location as existing entrances.

B. Frames: Retain existing.
1. Provide new Arabic floor designation/tactile marking plates:
   a. Centered at 60" above finished floor.
   b. Located on both side jambs of all entrances.
   c. Minimum 4" high.
   d. Tactile marking indications shall be below Arabic floor designation.
2. Provide plates at main egress landing with “Star” designation.
3. Provide car identification label:
   a. Mounted directly below floor designation/tactile marking plates.
   b. Located on both side jambs at the following levels:
      1) Designated level.
      2) Alternate level.
   c. Finish and design to match floor designation/tactile marking plates.

C. Hoistway Door Panels: Retain existing.
1. Provide new door gibs with fire tabs at all floors.
2. Minimum two gibs per panel, one at leading edge, and one at trailing edge of each panel.
3. Provide door panel retainer mechanism on lower edge of door panel.

D. Sight Guards: Retain existing. Replace any damaged or missing sight guards.

E. Sills, Hoistway Entrance: Retain existing. Clean. Check and tighten all fastenings.

F. Sill Supports, Hoistway Entrance: Retain existing. Check and tighten all fastenings.

G. Fascia, Toe Guards, and Hanger Covers: Retain existing.
1. Provide as required where damaged or missing.
2. Check and tighten all fastenings.
3. Paint/Stencil floor number on fascia or hoistway wall all floors visible where car doors are initially opened.

H. Struts and Headers: Retain existing. Check and tighten all fastenings.

I. Finish of Frames and Doors: Retain existing.

2.11 CAR EQUIPMENT

A. Frame: Retain Existing. Check and tighten all fastenings. Adjust as required for plumb and square alignment.

B. Platform: Retain existing.
1. Adjust as necessary for plumb and level alignment.
2. Reinforce if required.
3. Check and tighten all fastenings.

C. Platform Guard:
1. New extended platform guard to meet Code requirements.
2. Minimum 0.059" (1.5 mm) thick steel, or material of equivalent strength and stiffness.
3. Reinforced and braced to car platform front.

4. Contractor's standard finish.

D. Passenger Elevator Car Guides:
1. New roller type with three or more spring dampened sound-deadening rollers per shoe. Minimum 3 1/4" outside diameter.

E. Finish Floor Covering: Retain existing.

F. Car Sills: Retain existing. Clean full width. Check and tighten all fastenings.

G. Car Door Panels:
1. Retain existing. Alternate to provide new.
   a. Retrofit dual gibs, one at trailing edge and one at leading edge of each panel, removable without panel displacement.
   b. Adjust vertical and horizontal clearances to meet Code requirements.

H. Door Hangers: New two-point hanger roller with eccentric upthrust roller adjustment and Manufacturer's recommended neoprene roller surface

I. Door Track: New bar or formed, cold-drawn removable steel track with smooth roller contact surface.

J. Door Header: New. Construct of minimum 12-gauge steel, shape with stiffening flanges.

K. Car Door Electric Contact: Prohibit car operation unless car door is closed.

L. Door Clutch:
1. New heavy-duty clutch, linkage arms, drive blocks and pickup rollers or cams to provide positive, smooth, quiet door operation.
2. Design clutch so car doors can be closed, while hoistway doors remain open.

M. Restricted Opening Device:
1. Restrict opening of car doors to Code required limit outside unlocking zone.
2. Adjust for smooth and quiet operation with operating noise undetectable from inside any car or outside of the hoistway.
3. Plunger type restrictors not acceptable.
4. Utilize mechanical angle to prevent door opening.

N. Door Operator:
1. New high-speed, harmonic drive, heavy-duty door operator capable of opening doors at no less than 2.5 fps.
2. Accomplish reversal in no more than 2½" of door movement.
3. Solid-state door control with closed loop circuitry to constantly monitor and automatically adjust door operation based upon velocity, position, and motor current.
4. Maintain consistent, smooth, and quiet car door operation at all floors, regardless of door weight or varying air pressure.

O. Door Reopening Device:
1. New black fully enclosed infrared device with full screen infrared matrix or multiple beams extending vertically along leading edge of each door panel to minimum height of 7'-0" above finished floor. 3D beam device to detect approach from elevator lobby.

P. Car Operating Panel:
1. One car operating panel with faceplate:
   a. Consisting of a metal box containing vandal resistant operating fixtures, mounted behind the car stationary front return panel.
   b. Faceplate shall be hinged and constructed of satin finish stainless steel.
2. Provide Exposed Pushbuttons to Initiate:
   a. Car call registration.
   b. Alarm.
   c. Door open.
   d. Door close.
   e. Emergency push-to-call communication.
   f. Push/Pull stop switch.
3. Pushbuttons:
   a. Provide minimum 3/4" diameter raised floor pushbuttons which illuminate to indicate call registration.
   b. Locate operating controls no higher than 48" above the car floor; no lower than 35" for emergency push-to-call button and alarm button.
   c. Identify buttons with cast tactile symbols rear mounted.
4. Locked Firefighters' Emergency Operation Panel:
   a. Openable by the same key which operates the Fire Operation switch.
   b. Including the following features:
      1) Phase II fire access switch.
      2) Firefighters' visual indication.
      3) Call cancel button.
      4) Stop switch, manually operated.
      5) Door open button.
      6) Door close button.
      7) Floors served.
5. Service Compartment:
   a. Provide lockable service compartment with recessed flush door.
   b. Door material and finish to match car return panel or car operating panel faceplate.
   c. Include the following controls in lockable service cabinet with function and operating positions identified by permanent signage or engraved legend:
      1) Access switch.
      2) Light switch.
      3) Four-position exhaust blower switch.
      4) Independent service switch.
      5) Constant pressure test button for battery pack emergency lighting.
      6) 120-volt, AC, GFCI protected electrical convenience duplex outlet.
      7) Card reader override switch.
      8) Switch to select either floor voice annunciation, floor passing tone, or chime.
      9) Keyed stop switch.
6. Provide black paint filled (except as noted), engraved, or approved etched signage as follows with approved size and font:
   a. Phase II firefighters' operating instructions on inside face of firefighters' compartment door.
   b. Engrave filled red firefighters' operation on outside face of compartment door.
   c. Building identification car number on main car operating panel.
   d. "No Smoking" over on main car operating panel.
   e. Car capacity in pounds on main car operating panel service compartment door.
   f. "Certificate of Inspection on File in Building Office" on main car operating panel.

Q. Car Top Control Station:
1. Mount to provide safe access and utilization while standing on car top.
2. Operating device with Up and Down direction buttons, a Run button, an Inspection/Automatic switch and Emergency Stop switch.
3. Operating device provides an audible and visible indicator that fire recall has been initiated.
4. Fix station to the car crosshead or provide portable station provided the extension cord and housing is permanently attached to the car crosshead.
5. The car will be operated by constant pressure on the appropriate directional button and the Run button simultaneously.
6. Normal operating devices will be inoperative while this device is in use.

R. Car Top Emergency Audible Signal:
1. Provide on top of each elevator.
2. Activation of Alarm Button or Emergency Stop switch will cause Emergency Audible Signal.
3. Provide auxiliary power supply to provide 1-hr. power in the event of loss of normal power.

S. Work Light and Duplex Plug Receptacle:
1. GFCI protected outlet at top and bottom of car.
2. Include on/off switch and lamp guard.
3. Provide additional GFCI protected outlet on car top for installation of car CCTV.

2.12 COMMUNICATION

A. Car Communication System:
1. Hands-Free Phone System:
a. New two-way communication instrument in car with automatic dialing, tracking, and recall features, with shielded wiring to car controller in machine room. System includes:
1) “Help” button on car operating panel to initiate two-way communication from Car. Button shall match car operating panel pushbutton design.
2) Auto dialer with automatic rollover capability with minimum two numbers:
3) Adjacent light jewel illuminates and flashes when call is acknowledged.
4) “Help” button tactile symbol, engraved signage, and Tactile marking adjacent to button mounted integral with car front return panel.

2.13 CAR ENCLOSURE AND INTERIOR FINISHES

A. Unless specifically identified as “Retain,” “Reuse,” or “Refurbish,” provide new equipment. Contractor may, with Consultant approval, provide new equipment in lieu of refurbishing existing.

B. Refer to Appendix A for approved material and finishes.

C. Car Enclosure and Interior Finishes, Passenger Elevators: Retain existing car enclosure and provide new interior finishes.
1. Verify and document overall car weight prior to removal of any equipment from the existing car frame or car enclosure.
2. Check and tighten all fastenings.
3. Provide new interior finishes as specified herein and/or detailed on architectural drawings.
4. Modify car enclosure for application of new signal and pushbutton fixtures.
5. New cab weight including all new finishes to be verified following completion of modernization. Post modernization weight not to exceed code allowable limits.
6. Provide the following features:
a. Enclosure: Retain existing. Apply sound-deadening mastic to exterior.
b. Stationary Return Panels: Retain existing.

c. Entrance Columns: Retain existing.
d. Transom: Retain existing. Provide blank satin finish stainless steel faceplate to cover existing cutout in transom.
e. Base: Stainless steel with concealed ventilation cutouts.
f. Interior Wall Finish: Removable panels, faced and edged, with color core plastic laminate. Plastic laminate (HPDL) shall meet or exceed NEMA Standard LDI-1964 for Type 1, 1/16" high pressure general purpose laminate. Color and finish as selected by Purchaser.
g. Ventilation: Two-speed exhaust blower. Mount to car canopy on isolated rubber grommets. Exhaust blower shall meet noise requirements specified herein.
h. Lighting: LED fixtures with wiring and hookup. Coordinate with emergency lighting requirements.
i. Suspended Ceiling: Six-section satin finish stainless-steel panels with lighting cutouts in each panel.
j. Handrails: Solid stainless steel flat stock bars, 4" x 3/8", across side and rear walls. Return handrail ends to car walls.

7. Pads and Buttons: Provide hooks and three-piece removable pads. Two pads covering side walls and adjacent front returns and one covering rear wall. Provide cutouts to access main car operating panel.

D. Top of Car Guardrail: Provide car top railings where fall hazard exceeds 12". Install guardrails, necessary hardware, and toe board to meet code requirements.

2.14 HALL CONTROL STATIONS

A. Pushbuttons: New.
1. Provide one riser with surface mounted enlarged faceplate to cover existing wall block out. Provide any cutting and patching required.
2. Vandal resistant pushbuttons for each direction of travel which illuminate to indicate call registration. Provide LED illumination.
3. Approved engraved message and pictorial representation prohibiting use of elevator during fire or other emergency as part of faceplate.
4. Pushbutton design to match car operating panel pushbuttons.

2.15 SIGNALS

A. Hall Direction Lantern, All Cars at 1st Floor:
1. Provide new at each entrance to indicate travel direction of arriving car. Faceplate to cover existing wall block out. Provide any cutting and patching required.
2. Illuminate up or down LED lights and sound tone once for up and twice for down direction prior to car arrival at floor.
3. Illuminate light until the car doors start to close.
4. Sound level shall be adjustable from 20-80 dBA measured at 5'-0" in front of hall control station and 3'-0" off floor.
5. Provide advanced hall lantern notification to comply with ADA hall call notification time.
6. Provide advanced predictive hall lantern notification to comply with ADA hall call notification time.
7. Provide adjustable car door dwell time to comply with ADA requirements relative to hall call notification time.
8. Hall direction lenses shall be arrow-shaped with faceplates.
9. Lenses shall be minimum 2½" in their smallest dimension.

B. Hall Position Indicator, All Cars at 1st Floor:

New alpha-numeric digital indicator containing floor designations and direction arrows a minimum of 2½" high to indicate floor served and direction of car travel.

1. Mount integral with hall lanterns at 1st floor.

C. Car Position Indicator:
1. New alpha-numeric digital indicator containing floor designations and direction arrows a minimum of 2" high to indicate floor served and direction of car travel.
2. Locate fixture in each car operating panel.
3. When a car leaves or passes a floor, illuminate indication representing position of car in hoistway.
4. Illuminate proper direction arrow to indicate direction of travel.

D. Floor Passing Tone: Provide an audible tone of no less than 20 decibels and frequency of no higher than 1500 Hz, to sound as the car passes or stops at a floor served.

E. Voice Synthesizer:
1. New electronic device with easily reprogrammable message and voice to announce car direction, floor, emergency exiting instructions, etc.
2. Once the doors close, the destinations remain illuminated until the car approaches the next destination floor, whereupon the floor numeral or light flashes and the audible signal sounds to denote the next stopping floor.
3. When the doors open, Destination Indicator displays the next floors to be served.

F. Fixture Faceplate Material and Finish:
1. Satin finish stainless steel, all fixtures.
2. Tamper resistant fasteners for all public facing fastenings.

2.16 FIREFIGHTERS CONTROL AND EMERGENCY POWER PANEL

A. Provide and arrange new equipment as directed by Purchaser or Consultant.

B. Firefighters' Control Panel:
1. Locate in building as directed by Contractor.
2. Fixture faceplate, satin finish stainless steel, including the following features:
   a. Car position and direction indicator, digital-readout, or LCD flat screen color monitor.
   b. Identify each position indicator with car number.
   c. Indicator showing operating status of car.
   d. Two-position firefighters' emergency return switches and indicators with engraved instructions filled red.
3. Where applicable, identify all indicators and manual switches with appropriate engraving.
4. Provide wiring and conduit to control panel.

C. Firefighters' Key Box: Flush-mounted box with lockable hinged cover. Engrave instructions for use on cover per Local Fire Authority requirements.

PART 3 - EXECUTION

3.1 SITE CONDITION INSPECTION

A. Prior to beginning installation of equipment, examine hoistway and machine room areas. Verify no irregularities exist which affect execution of work specified.

B. Inform Purchaser and Consultant of any irregularities in writing prior to commencing work.

C. Do not proceed with installation until work in place conforms to project requirements.

3.2 INSTALLATION

A. Install all equipment as follows:
1. in accordance with Contractor's instructions, referenced codes, specifications, and approved submittals.
2. with clearances in accordance with referenced codes, and specifications.
3. to be easily maintained and/or removed.
4. to afford maximum accessibility, safety, and continuity of operation.

B. Remove oil, grease, scale, and other foreign matter from the following equipment and apply one coat of field-applied machinery enamel.
1. All exposed equipment and metal work installed as part of this work which does not have architectural finish.
2. Machine room equipment, and pit equipment.
3. Neatly touch up damaged factory-painted surfaces with original paint color.
4. Protect machine-finish surfaces against corrosion.

C. Paint machine room and pit floors.

3.3 FIELD QUALITY CONTROL

A. Work at jobsite will be checked during course of installation. Full cooperation with reviewing personnel is mandatory. Accomplish corrective work required prior to performing further installation.

B. Perform complete "Acceptance" level pre-testing as specified in the latest edition of ASME A17.2 "Guide for Inspection of Elevators, Escalators, and Moving Walks" prior to AHJ witnessed acceptance testing. Complete any adjustments, repairs, or replacements necessary to achieve code compliant operation including but not limited to:
1. Hydraulic pressure relief valve.
2. Car emergency communications. Inform Purchaser and Consultant of any noted failures of Purchaser provided and maintained equipment or systems.
3. Car buffers.
4. Phase I and II Firefighters' Emergency Operation. Phase I initiated by smoke sensing devices.
5. Power car door operation including door closing force, reopening device, and restricted opening.

C. Have Code Authority acceptance inspection performed and complete corrective work.

D. Provide access to installed equipment and elevator personnel assistance for Consultants final observation and review requirements.

E. ADJUSTMENTS

F. Static balance car to equalize pressure of guide shoes on guide rails.

G. Verify that weights of existing or altered cars, counterweights, and compensation comply with traction machine manufacturers' requirements and do not exceed total weights indicated on approved submittals.

H. Lubricate all equipment in accordance with Contractor's instructions.

I. Adjust motors, power conversion units, brakes, controllers, leveling switches, limit switches, stopping switches, door operators, interlocks, and safety devices to achieve required performance levels.

3.4 CLEANUP

A. Keep work areas orderly and free from debris during progress of project. Remove packaging materials daily.

B. Remove all loose materials and filings resulting from work.

C. Clean machine room equipment and floor.

D. Clean hoistways, car, car enclosure, entrances, operating and signal fixtures.

END OF SECTION

Appendix A

Bldg. No.	WSU Bldg. ID	WSU Bldg. Address	WSU ID #	Elevator Type	Cab Flooring Material (per specifications)	Interior Wall Finishes (per specifications)
5	**Science Hall**	5045 Cass Avenue, Detroit, MI 48202	005 01	Traction	Seamless Resilient Rubber	5WL hanging panels ???
34	**Student Center Center**	5221 Gullen Mall Detroit, MI 48202	034 03	Traction	diamond plate	5WL hanging panels ???
36	**Reuther Library**	5401 Cass Avenue, Detroit, MI 48202	036 01	Hydraulic	Seamless Resilient Rubber	Plastic laminate panels
42	**Alumni House**	441 Gilmour Mall Detroit, MI 48202	042 01	Hydeaulic	Porcelain tile	Wood Veneer panels
45	**Parking Structure 5**	5501 Anthony Wayne Drive, Detroit, MI 48202	045 01	Hydraulic	Seamless Resilient Rubber	5WL hanging panels
			045 02	Hydraulic		5WL hanging panels
51	**Parking Structure 1**	450 West Palmer, Detroit, MI 48202	051 03	Traction	Seamless Resilient Rubber	5WL hanging panels
			051 04	Traction		5WL hanging panels
71	**5057 Woodward**	5057 Woodward, Detroit, MI 48202	071 01	Traction	Seamless Resilient Rubber	Plastic laminate panels
			071 02	Traction		Plastic laminate panels
			071 03	Traction		Plastic laminate panels
			071 03	Traction		Plastic laminate panels
			071 03	Traction		Plastic laminate panels
88	**Parking Structure 6**	61 Putnam Avenue, Detroit, MI 48202	088 01	Hydraulic	Seamless Resilient Rubber	5WL hanging panels
			088 03	Hydraulic		5WL hanging panels
			088 02	Hydraulic		5WL hanging panels
89	**Biological Sciences**	5047 Gullen Mall, Detroit, MI 48202	089 01	Traction	Seamless Resilient Rubber	Plastic laminate panels
			089 02	Traction	diamond plate (Service)	5WL hanging panels
130	**Faculty / Administration Building**	656 West Kirby Avenue, Detroit, MI 48202	130 03	Hydraulic	Existing to remain	Plastic laminate panels
			130 02	Hydraulic		Plastic laminate panels
			130 01	Hydraulic		Plastic laminate panels
629	**Elliman Clinical Research**	421 East Canfield Avenue	629 01	Hydraulic	Seamless Resilient Rubber	Plastic laminate panels
			629 02	Hydraulic	Seamless Resilient Rubber	Plastic laminate panels
			629 03	Hydraulic	diamond plate (Service)	5WL hanging panels

APPENDIX A

WAYNE STATE UNIVERSITY CAR ENCLOSURE AND INTERIOR FINISH STANDARDS

CAR ENCLOSURE AND INTERIOR FINISHES

A. Passenger Elevator: Retain existing car enclosure and provide new interior finishes.
   1. Check and tighten all fastenings.
   2. Provide new interior finishes as specified herein.
   3. Modify car enclosure for application of new signal and pushbutton fixtures.
   4. Post modernization weight not to exceed code allowable limits.
   5. Provide the following features:
      a. Enclosure: Retain. Apply sound-deadening mastic to exterior.
      b. Stationary Return Panels: Retain.
      c. Entrance Columns: Retain.
      d. Transom: Retain.
      e. Car Door Panels: Fully enclosed 16-gauge steel, sandwich construction without binder angles. Constructed with interlocking, stiffening ribs. Leading edges of center-opening doors equipped with rubber astragals full height of panel. Minimum of two gibs per panel, one at leading and one at trailing edge with gibs in the sill groove entire length of door travel. Satin finish stainless steel.
      f. Base: Stainless steel with concealed ventilation cutouts.
      g. Interior Wall Finish:
         1) Removable panels, faced and edged, with color core plastic laminate. Plastic laminate (HPDL) shall meet or exceed NEMA Standard LDI-1964 for Type 1, 1/16" high pressure general purpose laminate.
         2) Color and finish as selected by Purchaser.
         3) 5WL hanging panels with #4 stainless steel reveals between panels.

      h. Ventilation: Two-speed exhaust blower. Mount to car canopy on isolated rubber grommets. Exhaust blower shall meet noise requirements specified herein.
      i. Lighting: LED fixtures with wiring and hookup. Coordinate with emergency lighting requirements.
      j. Suspended Ceiling: Six-section satin finish stainless-steel panels with lighting cutouts in each panel.
      k. Handrails: Solid stainless steel flat stock bars, 4" x 3/8", across rear and side walls. Return handrail ends to car walls.
      l. Cab Flooring, provide floor covering per below:
         1) Porcelain tile, 12"x24"x3/8" running bond pattern, thin set mortar, 1/16" joints with non-sanded grout, final selection by Owner, provide allowance of $10/sf for tile cost with 10% waste.
         2) Luxury Vinyl Tile, 6"x36", random linear pattern, zero VOC adhesive as recommended by the manufacturer, final selection by Owner, provide allowance of $5/sf for tile cost with 10% waste.
         3) Diamond Plate, 1/8" thick aluminum, mill finish 6061, seamless where possible, minimal seams if cab width exceeds sheet width. Sand all edges smooth, secure with 1/8" self-tapping aluminum or stainless-steel fasteners ½" from edge of panel @ 10" oc along edges, and in field. Trowel zero VOC adhesive over 100% of cab floor prior to installation of diamond plate and roll 100 lb. roller over plate to ensure adhesion.
         4) Seamless resilient non-slip rubber or vinyl with sealed edges

5) Pads and Buttons: Where no service elevator available in the building, provide hooks and three-piece removable pads. Two pads covering side walls and adjacent front returns and one covering rear wall. Provide cutouts to access main car operating panel.

B. Service Elevator: Retain existing car shell enclosure and provide new interior finishes.
   1. Check and tighten all fastenings.
   2. Provide new interior finishes as specified herein.
   3. Modify car enclosure for application of new signal and pushbutton fixtures.
   4. Post modernization weight not to exceed code allowable limits.
   5. Provide the following features:
      a. Enclosure: Retain. Apply sound-deadening mastic to exterior.
      b. Stationary Return Panels: Retain.
      c. Entrance Columns: Retain.
      d. Transom: Retain.
      e. Car Door Panels: Fully enclosed 16-gauge steel, sandwich construction without binder angles. Constructed with interlocking, stiffening ribs. Leading edges of center-opening doors equipped with rubber astragals full height of panel. Minimum of two gibs per panel, one at leading and one at trailing edge with gibs in the sill groove entire length of door travel. Satin finish stainless steel.
      f. Base: Textured stainless steel with concealed ventilation cutouts.
      g. Interior Wall Finish: Removable panels made of 5WL.
      h. Ventilation: Two-speed exhaust blower. Mount to car canopy on isolated rubber grommets. Exhaust blower shall meet noise requirements specified herein.
      i. Lighting: LED fixtures with wiring and hookup. Coordinate with emergency lighting requirements.
      j. Suspended Ceiling: Six-section satin finish stainless-steel panels with lighting cutouts in each panel.
      k. Handrails: Solid stainless steel flat stock bars, 4" x 3/8", across rear and side walls. Return handrail ends to car walls.
      l. Cab Flooring: Provide a heavy vinyl cab floor covering as selected by the Purchaser.
      m. Pads and Buttons: Three-piece removable pads. Two pads covering side walls and adjacent front returns and one covering rear wall. Provide cutouts to access main car operating panel.

C. Passenger Elevator: New Car Enclosure and Interior Finishes.
   1. Remove all existing interior finishes and shell components, weigh, and document.
   2. Provide complete new car enclosure and interior finishes as specified herein.
   3. Post modernization weight not to exceed code allowable limits.
   4. Provide the following features:
      a. Enclosure Walls: Reinforced 14-gauge furniture steel stainless steel formed panels Width of individual panels shall not exceed 18". Apply sound-deadening mastic to exterior.
      b. Enclosure Canopy: Reinforced 12-gauge furniture steel formed panels with lockable, hinged emergency exit. Interior finish white reflective baked enamel.
      c. Stationary Return Panels: Reinforced 14 gauge satin finish stainless steel with cutouts for car operating panels and other equipment.
      d. Entrance Columns: Reinforced 14 gauge satin finish stainless steel.
      e. Transom: Reinforced 14 gauge satin finish stainless steel full width of enclosure.
      f. Car Door Panels: Fully enclosed 16-gauge steel, sandwich construction without binder angles. Constructed with interlocking, stiffening ribs. Leading edges of center-opening doors equipped with rubber astragals full height of panel. Minimum of two gibs per panel, one at leading and one at trailing edge with gibs in the sill groove entire length of door travel. Satin finish stainless steel.

g. Base: Stainless steel with concealed ventilation cutouts.
h. Interior Wall Finish: Removable panels, faced and edged, with color core plastic laminate. Color and finish as selected by Architect/Purchaser.
i. Ventilation: Two-speed exhaust blower. Mount to car canopy on isolated rubber grommets. Exhaust blower shall meet noise requirements specified herein.
j. Lighting: LED fixtures with wiring and hookup. Coordinate with emergency lighting requirements.
k. Suspended Ceiling: Six-section satin finish stainless-steel panels with lighting cutouts in each panel.
l. Subfloor; 5/8" thick marine grade plywood.
m. Cab Flooring: Provide floor covering per below:
    1) Porcelain tile, 12"x24"x3/8" running bond pattern, thin set mortar, 1/16" joints with non-sanded grout, final selection by Owner, provide allowance of $10/sf for tile cost with 10% waste.
    2) Luxury Vinyl Tile, 6"x36", random linear pattern, zero VOC adhesive as recommended by the manufacturer, final selection by Owner, provide allowance of $5/sf for tile cost with 10% waste.
    3) Diamond Plate, 1/8" thick aluminum, mill finish 6061, seamless where possible, minimal seams if cab width exceeds sheet width. Sand all edges smooth, secure with 1/8" self-tapping aluminum or stainless-steel fasteners ½" from edge of panel @ 10" oc along edges, and in field. Trowel zero VOC adhesive over 100% of cab floor prior to installation of diamond plate and roll 100 lb. roller over plate to ensure adhesion.
    4) Seamless resilient non-slip rubber or vinyl with sealed edges
n. Handrails: Solid stainless steel flat stock bars, 4" x 3/8", across rear and side walls. Return handrail ends to car walls.
o. Pads and Buttons: Where no service elevator available in the building, provide hooks and three-piece removable pads. Two pads covering side walls and adjacent front returns and one covering rear wall. Provide cutouts to access main car operating panel.

D. Service Elevator: New Car Enclosure and Interior Finishes.
1. Remove all existing interior finishes and shell components, weigh, and document.
2. Provide complete new car enclosure and interior finishes as specified herein.
3. Post modernization weight not to exceed code allowable limits.
4. Provide the following features:
    a. Enclosure Walls: Reinforced 14-gauge furniture steel textured stainless steel formed panels with baked enamel interior finish as selected. Width of individual panels shall not exceed 18". Apply sound-deadening mastic to exterior.
    b. Enclosure Canopy: Reinforced 12-gauge furniture steel formed panels with lockable, hinged emergency exit. Interior finish white reflective baked enamel.
    c. Car Sill:
    d. Stationary Return Panels: Reinforced 14 gauge satin finish stainless steel with cutouts for car operating panels and other equipment.
    e. Entrance Columns: Reinforced 14 gauge textured satin finish stainless steel.
    f. Transom: Reinforced 14 gauge textured satin finish stainless steel full width of enclosure.
    g. Car Door Panels: Fully enclosed 16-gauge steel, sandwich construction without binder angles. Constructed with interlocking, stiffening ribs. Leading edges of center-opening doors equipped with rubber astragals full height of panel. Minimum of two gibs per panel, one at leading and one at trailing edge with gibs in the sill groove entire length of door travel. Satin finish stainless steel.
    h. Base: Textured stainless steel with concealed ventilation cutouts.
    i. Ventilation: Two-speed exhaust blower. Mount to car canopy on isolated rubber grommets. Exhaust blower shall meet noise requirements specified herein.

j. Lighting: LED fixtures with wiring and hookup. Coordinate with emergency lighting requirements.
k. Suspended Ceiling: Six-section satin finish stainless-steel panels with lighting cutouts in each panel.
l. Handrails: Solid stainless steel flat stock bars, 4" x 3/8", across rear and side walls. Return handrail ends to car walls.
m. Guardrails:
    1) Solid stainless steel flat stock bars, 4" x 3/8", mounted across rear and side walls.
    2) Locate guardrail line at 8" above car floor.
    3) Bolt rails through car walls from back and mount on 1½" deep solid round stainless steel standoff spacers no more than 18" O.C.
    4) Return guardrail ends to car walls.
    5) Pads and Buttons: Three-piece removable pads. Two pads covering side walls and adjacent front returns and one covering rear wall. Provide cutouts to access main car operating panel.
n. Cab Flooring:
    1) Seamless resilient non-slip rubber or vinyl with sealed as selected by the Owner.

E. Freight Elevator Enclosure: Car weight to be verified prior to removal of interior cab finishes/cab enclosure. Post modernization weight not to exceed code allowable limits. Provide the following features:
1. Enclosure Walls: Reinforced 10-gauge furniture steel formed panels no more than 20" wide with light-proof joints.
    a. Baked enamel finish as selected.
    b. Provide recess in car side wall for recessed mounting of car operating panel.
2. Enclosure Canopy:
    a. Reinforced 12-gauge furniture steel formed panels no more than 20" wide with light-proof joints and Hinged emergency exit.
    b. Interior finish white reflective baked enamel.
    c. Lighting: Recessed LED down lights with on/off switch in car operating panel. Recess mount fixture flush with inside surface of car top. Provide steel guard on car top over fixture.
    d. Bumper Rails: Two rows of 2" x 12" oak or maple bumpers mounted on both sides and rear of the car.
        1) Locate bottom rail at floor level and top rail at 36" above the car floor.
        2) Bolt rails through car walls with bolt and captive nuts on exterior of wall panel sections on 18" centers.
        3) Finish both upper and lower top edges with a 45-degree chamfered edge to eliminate collection of trash.
        4) Finish ends of upper and lower bumpers on side walls to 45° chamfer to eliminate carts and people from hitting blunt ends.
        5) Flooring: Provide cab flooring which is 1/8” aluminum diamond plate.

DIVISION 14

SECTION 142403

HYDRAULIC SPECIFICATIONS FOR

THREE (3) ELEVATORS

AT

ELLIMAN CLINICAL RESEARCH

421 EAST CANFIELD AVENUE

DETROIT, MI

DATE: March 27, 2024

SECTION 142403 –
HYDRAULIC ELEVATOR MODERNIZATION

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes modernization of hydraulic elevators:
1. Two (2) passenger elevators, Cars #1 and #2.
2. One (1) service elevator, Car #3.

B. Products Installed but Not Furnished Under This Section:
1. CCTV camera provisions.
2. Elevator security devices, control unit, mounting brackets, wiring materials, logic circuits, security system interface terminals, boxes, and relays.

1.2 DEFINITIONS

A. All technical terms in these Contract Documents are used as defined in the latest edition of American National Standard Safety Code for Elevators, Dumbwaiters, Escalators, and Moving Walks ASME A17.1. and A17.2.

B. ELEVATOR CONSULTANT or CONSULTANT refers to Lerch Bates Inc. (Lerch Bates).

C. PURCHASER refers to Wayne State University.

D. CONTRACT or CONTRACT DOCUMENTS consists of the Agreement, Conditions of Contract, Specifications, Addenda, Drawings if included, and Alternates if accepted.

E. CONTRACTOR or ELEVATOR CONTRACTOR refers to any persons, partners, firm, or corporation having a contract with Purchaser to furnish labor and materials for the execution of work required.

F. CONTRACT AWARD refers to Purchaser’s verbal or written award for work required.

G. SUBCONTRACTOR refers to any persons, partners, firm, or corporation having a contract with Contractor to furnish labor and materials for the execution of work required.

H. PROVIDE means “furnish and install.”

I. MANUFACTURER means either the Original Equipment Manufacturer (OEM) or the principal manufacturer of a component or system.

J. RETAIN means, unless otherwise specified, the existing equipment is to be left in place with no alterations and no change in the original manufacturer’s designed performance or functionality. Items that are “retained” shall be thoroughly cleaned in place and adjusted to achieve originally designed function.

K. REFURBISH means, unless otherwise specified, the existing equipment is to be cleaned, repainted, repaired, and parts replaced to put the equipment into a condition to provide the same appearance, performance, and functionality as the equipment provided when it was originally installed. Unless otherwise specified, the scope of replacement of components is limited to those items currently available for purchase as replacement parts from the manufacturer or after-market suppliers approved by the manufacturer.

L. REUSE means that the Contractor shall carefully remove equipment from the existing installation, avoiding any damage or additional wear. Store in a safe location to maintain equipment in its pre-removal condition. Reinstall and incorporate into the modernized elevator installation using the same procedures and recommendations provided by the manufacturer of the equipment.

M. INCLUDES or INCLUDING means including the items specified but not limited solely to those items if additional work or components are required to achieve the specified outcome.

N. CALL BACK means a request from the Purchaser to the Contractor to provide a technician on site to evaluate an elevator that is out of service or not functioning properly, rectify the root cause of the malfunction, and place the unit back into normal service.

O. Words in the singular shall include the plural whenever applicable or context so indicates.

1.3 WORK INCLUDED

A. Modernize two hydraulic passenger elevators and one hydraulic service elevator.

B. All labor, engineering, tools, transportation, services, supervision, materials, and equipment necessary for and incidental to satisfactory completion of required work as indicated in Contract Documents.

C. Provide all required staging, hoisting, and movement of new equipment, reused equipment, or removal of existing equipment.

D. Applicable conditions of Purchaser's General, Special, and Supplemental Conditions.

E. Warranty maintenance as described herein.

F. Cartage and Hoisting: All required staging, hoisting, and movement to, on, and from the site including new equipment, retained equipment, or dismantling and removal of existing equipment.

G. Unless specifically identified as "Retain," "Reuse," or "Refurbish," provide new equipment. Contractor may, with approval prior to quotation, provide new equipment in lieu of refurbishing existing.

H. Reference to a device or a part of the equipment applies to the number of devices or parts required to complete the installation.

I. Provisions of this specification are applicable to all elevators unless identified otherwise.

J. Provide hoistway, pit, and machine room barricades.

K. Provide temporary and permanent pit ladders, working platforms, inspection platforms, and guard rails required to comply with applicable Building Code, work safety standards, and AHJ requirements.

L. Protective barriers between cars in normal operation and adjacent cars in the modernization process, full depth and height of hoistway.

M. Scope of Contract includes, but is not limited to, the following:
1. Coordination, scheduling, and management of work of component suppliers and subcontractors.
2. Modernize or furnish and install equipment as specified utilizing existing and/or modified hoistways and machine rooms.

N. Specific item of required work which cannot be determined to be included in another contract is thereby determined to be included in prime contract.

1.4 CONSULTANT STATUS

A. Consultant shall act as Purchaser's and/or Building Management's representative on all matters pertaining to required work. Consultant shall interpret Contract Documents, analyze Contractor's quotations, review Contractor's suggested alternates, review all Contractor's submittals, approve billings, review technical details and construction procedure, perform work progress reviews, and review and test completed work for compliance with Contract Documents prior to acceptance of work by Purchaser.

B. Field Review Scheduling: Schedule progress and final work reviews with Consultant. Reply promptly, in writing, to corrective work indicated on Consultant's progress and/or final review reports, indicating status and schedule for completion. Consultant anticipates scheduled site review appointments will be met.

1.5 CODES AND ORDINANCES

A. All work covered by these Contract Documents is to be done in full accord with national code, state and local codes, ordinances, and elevator safety orders in effect at time elevator alteration permit issuance. All requirements of local Building Department and fire jurisdiction are to be fulfilled by Contractor and its Subcontractors.

1.6 PRIME CONTRACTOR'S DUTIES

A. Prime Contractor's duties include the following:
1. Provide and pay for labor, materials and equipment, tools, construction equipment and machinery, and other facilities and services necessary for proper execution and completion of required work.
2. Pay for legally required sales, consumer, and state remodel taxes.
3. Secure and pay for required permits, fees, and licenses necessary for proper execution and completion of required work, as applicable at time of quotation due date.
4. Give required notices.
5. Comply with codes, ordinances, rules, regulations, orders, and other legal requirements of public authorities which bear on performance of required work.
6. Promptly submit written notice to Consultant of observed variance of Contract Documents from legal requirements.
7. Enforce strict discipline and good order among employees. Do not employ persons unskilled in assigned task.

1.7 STAGING AREA

A. An equipment staging area will be available for use by Contractor. Contractor shall restrict usage to area designated and shall notify Purchaser prior to storing of any large equipment which will impose heavy concentrated loading on floor area. Do not store such equipment until approval is received.

1.8 WORK SEQUENCE

A. Construct work in stages.

1.9 WORKING HOURS

A. Unless otherwise stated below or elsewhere in the Contract Documents, Contractor shall have access to the building for work activities during the following regular building operating hours:
   1. 8:00 a.m. to 5:00 p.m., Monday through Friday or as agreed upon by Wayne State University.

B. Contractor shall perform all work that has the potential to result in any of the following conditions outside of regular building operating hours at no additional cost to the Purchaser.
   1. Interruptions or changes in normal automatic operation.
   2. Activation of Firefighter's Emergency Operation Phase I.
   3. Noise levels in excess of 80 dBA measured in any occupied or public space.
   4. Transport of large equipment through public or tenant spaces.
   5. Coordination with WSU staff for planned events in the building.

1.10 CONTRACTOR USE OF PREMISES

A. Confine operations at site to areas permitted by law, ordinances, permits, Contract Documents, and Purchaser's specific instructions.

B. Do not unreasonably encumber site with materials or equipment. Staging area will be located as directed by Purchaser.

C. Do not load structure with weight that will endanger structure. Coordinate with Purchaser.

D. Assume full responsibility for protection and safekeeping of tools and products stored on or off premises.

E. Move stored products which interfere with operations of building or the operations of other trades.

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

1.11 CONCURRENT MODERNIZATION WORK AND BUILDING OPERATION

A. This project is a major elevator modernization in an existing building which is a private residence and open for public business. The building will continue to operate throughout all phases of required work. It is essential that Contractor give special attention and priority to all matters concerning project safety, protection from dust and loose materials, reduction of noise level, protection from water and air infiltration into building, and maintenance of neat, sightly conditions in and around work areas inside and outside of building. Packaging, scrap materials, and demolition debris shall be promptly removed from building and site on a daily basis.

B. At all times Contractor shall provide clearly visible warning and directions signs. At all times give special attention to building entrances, exits, and proper safe exiting through work areas as required by law.
   1. Barricade design must be approved by client prior to start of modernization work.
   2. Standard folding maintenance barricades are not acceptable.

C. Contractor shall consult Purchaser and other Contractors to establish and maintain safe temporary routes including, but not limited to, proper barricades, walking surfaces, lighting, fire protection, exiting, warning and directional signs, and general protection of persons from all hazards in accordance with OSHA Standards due wholly or partially to its operations.

1.12 ALTERNATES
   1. None.

1.13 RELATED WORK PROVIDED BY ELEVATOR CONTRACTOR

A. Hoistway and Pit:
1. Wall blockouts and fire rated closure for control and signal fixture boxes which penetrate walls.
2. Cutting and patching walls and floors.
3. Opening in hoistway wall or pit wall for hydraulic piping. Trench and backfill underground piping.
4. Pit access stationary ladder for each elevator.
5. Waterproof pit. Indirect waste drain or sump with flush grate and pump. Sump pump/drain capacity minimum 3,000 gallons per hour, per elevator. Coordinate installation of sump pump and/or drain with plumbing code.
6. Provide oil separator per Michigan Plumbing Code.
7. Protect open hoistways and entrances during construction per OSHA Regulations.
8. Protect car enclosure, hoistway entrance assemblies, and special metal finishes from damage.
9. Hoistway venting per building code.

B. Machine Room and Machinery Spaces:
1. Retain existing ventilation and heating. Maintain minimum temperature of 55° F, maximum 90° F. Maintain maximum 80% relative humidity, non-condensing.
2. Repair damaged ceiling in the machine room for Elevators #1 and #2.

C. Electrical Service, Conductors, and Devices:
1. Lighting and GFCI convenience outlets in pit and machine room. Provide one additional non-GFCI convenience outlet in pit for sump pump and oil return pump.
2. Provide guarded lighting with an illumination level of not less than 100 lx (10 fc) at the pit floor.
3. Provide guarded lighting with an illumination level of 200 lx (19 fc) at the machine room floor.
4. Three-phase mainline copper power feeder with true earthen grounding to terminals of each elevator controller in the machine room with protected lockable “open” disconnecting means with auxiliary contacts to allow Elevator Contractor to electrically interlock battery power lowering unit.
5. Single-phase copper power feeder to each elevator controller for car lighting and exhaust blower with individual protected lockable “open” disconnecting means located in machine room.
6. Emergency telephone line to each individual elevator control panel in elevator machine room.
7. Upgrade existing automatic Fire Recall System:
    a. Fire alarm initiating devices in each elevator lobby.
    b. Fire alarm initiating devices in elevator machine room.
    c. Three Relay Activation Modules for single elevator. Locate modules within three feet of controller designated by the Elevator Contractor to minimize un-supervised wiring. Program Modules as follows:
        1) PRIMARY: Activate when any hallway device, except primary floor, activates.
        2) ALTERNATE: Activate when hallway device at primary floor activates.
        3) FIRE HAT: Activate when machine room device activates.
    d. Device in machine room and at top of hoistway to provide signal for general alarm.
    e. Provide technician from fire alarm contractor for pre-test of system during normal working hours.
    f. Provide technician from fire alarm contractor for acceptance test of system with AHJ during normal working hours.
    g. Fire alarm contractor to submit drawings to the State and Purchaser for review and approval.
    h. Apply for and obtain variance with Fire Protection Department. Since the building does not currently contain sprinklers, it is not feasible to add sprinklers to the building.

8. Conduit from the closest hoistway of each elevator group or single elevator to the firefighters' control room and/or main control console. Coordinate size, number, and location of conduits with Elevator Contractor.
9. Means to automatically disconnect power to affected elevator pump unit and controller prior to activation of machine room fire sprinkler system, and/or hoistway fire sprinkler system. Manual shut-off means shall be located outside bounds of machine room.
10. When sprinklers are provided in the hoistway all electrical equipment, located less than 4'-0" above the pit floor shall be identified for use in wet locations. Exception, seismic protection devices.
11. Single-phase power feeders to firefighters' control panel.
12. Three-phase power feeder to each freight elevator power door controller in machine room with protected lockable "open" disconnecting means.
13. Card or Proximity Readers, elevator contractor to coordinate and assist with installation of readers in car operating panel or hall stations.

1.14 ACTION AND INFORMATIONAL SUBMITTALS

A. Within sixty (60) calendar days after award of contract and before beginning equipment fabrication, submit shop drawings, and required material samples for review. Allow 30 days for response to initial submittal.
   1. Scaled or Fully Dimensioned Layout: Plan of machine room indicating equipment arrangement, details of car enclosures, and car/hall signal fixtures.
   2. Design Information: Indicate equipment lists, reactions, and design information on layouts.
   3. Power Confirmation Information: Design for existing conditions.
   4. Fixtures: Shop drawings.
   5. Finish Material: If requested, submit 3" x 12" samples of actual finished material for review of color, pattern, and texture. Compliance with other requirements is the exclusive responsibility of the Contractor. Include, if requested, signal fixtures, lights, graphics, Braille plates, and detail of mounting provisions.
   6. Design Information: Provide calculations verifying the following:
      a. Adequacy of existing electrical provisions.
      b. Machine room heat emissions in B.T.U.
      c. Adequacy of existing car platform structure for intended loading.
      d. Adequacy of plunger wall thickness for intended loading.
   7. Written Maintenance Control Program (MCP) specifically designed for the equipment included under this contract. Include any unique or product specific procedures or methods required to inspect or test the equipment. In addition, identify weekly, bi-weekly, monthly, quarterly, and annual maintenance procedures, including statutory and other required equipment tests.

B. Submittal review shall not be construed as an indication that submittal is correct or suitable, or that the work represented by submittal complies with the Contract Documents. Compliance with Contract Documents, code requirements, dimensions, fit, and interface with other work is Contractor's responsibility.

C. Acknowledge and/or respond to review comments within 14 calendar days of return. Promptly incorporate required changes due to inaccurate data or incomplete definition so that delivery and installation schedules are not affected. Identify and cloud drawing revisions, including Contractor elective revisions on each re-submittal. Contractor's revision response time is not justification for equipment delivery or installation delay.

1.15 PURCHASER'S INFORMATION

A. Non-Proprietary Equipment Design: Provide two (2) sets of digital and three (3) sets of neatly bound written information necessary for proper maintenance and adjustment of equipment within 30 days following final acceptance. Final retention will be withheld until data is received by Purchaser and reviewed by Consultant. Include the following as minimums:
   1. Straight-line wiring diagrams of "as-installed" elevator circuits with index of location and function of components. Mount one set wiring diagrams on panels, racked, or similarly protected, in elevator machine room. Provide remaining set rolled and in a protective drawing tube. Maintain all drawing sets with addition of all subsequent changes. These diagrams are Purchaser's property. A legend sheet shall be furnished with each set of drawings to provide the following information:
      a. Name and symbol of each relay, switch, or other apparatus.
      b. Location on drawings, drawing sheet number and area, and location of all contacts.
      c. Location of apparatus, whether on controller or on car.
   2. Written Maintenance Control Program (MCP) specifically designed for the equipment included under this contract. Include any unique or product specific procedures or methods required to inspect or test the equipment. In addition, identify weekly, bi-weekly, monthly, quarterly, and annual maintenance procedures, including statutory and other required equipment tests.
   3. Printed instructions explaining all operating features.
   4. Complete software documentation for all installed equipment.
   5. Lubrication instructions, including recommended grade of lubricants.
   6. Parts catalogs listing all replaceable parts including Contractor's identifying numbers and ordering instructions.
   7. Four sets of keys for all switches and control features properly tagged and marked.
   8. Diagnostic test devices together with all supporting information necessary for interpretation of test data, troubleshooting of elevator system, and performance of routine safety tests.
   9. The elevator installation shall be a design which can be maintained by any licensed elevator maintenance company employing journeymen mechanics, without the need to purchase or lease additional diagnostic devices, special tools, or instructions from the original equipment Contractor.
      a. Provide onsite capability to diagnose faults to the level of individual circuit boards and individual discrete components for the solid-state elevator controller.
      b. Provide a separate, detachable device, as required, to the Purchaser as part of this installation if the equipment for fault diagnosis is not completely self-contained within the controller. Such device shall be in possession of and become property of the Purchaser.
      c. Installed equipment not meeting this requirement shall be removed and replaced with conforming equipment at no cost to the Purchaser.
   10. Provide upgrades and/or revisions of software during the progress of the work, warranty period and the term of the ongoing maintenance agreement between the Purchaser and Contractor.

1.16 PERMITS, TESTS, AND CERTIFICATES

A. Permits:
   1. Secure and pay for all permits required for Work to be performed, including but not limited to:
      a. Municipal and State permits.
      b. Device or equipment removal permits.
      c. Hot works permits.
      d. Confined space access permits.
   2. Post, maintain, and renew all permits in compliance with local governmental requirements.

3. Obtain documentation of final AHJ close-out of all permits. Provide copies to Purchaser.

B. Tests and Inspections:
1. Schedule and perform all tests required in accordance with procedure described in ASME A17.2 Guide for Inspection of Elevators, Escalators, and Moving Walks in the presence of Authorized Representative of the AHJ and Owner's representative.

C. Certificates: Obtain, pay for, and deliver to Purchaser with all temporary and final inspection certificates provided by proper governing authorities.

D. Violations: Resolve any outstanding violations on record with the AHJ on devices being removed prior to final acceptance by the Purchaser.

1.17 QUALITY ASSURANCE

A. Compliance with Regulatory Agencies: Comply with most stringent applicable provisions of currently enforced codes, laws, and/or authorities, including revisions and changes in effect.

B. Inspections: Provide access to areas where work is being performed for the Consultant at any time throughout the project.

1.18 WARRANTY

A. Material and workmanship of installation shall comply in every respect with Contract Documents. Correct defective material or workmanship which develops within one (1) year from date of final acceptance of all elevators to satisfaction of Purchaser and Consultant at no additional cost, unless due to ordinary wear and tear, or improper use or care by Purchaser. Perform maintenance in accordance with terms and conditions indicated in the Preventive Maintenance Agreement.

B. Defective is defined to include, but not be limited to operation or control system failures, car performance below required minimum, excessive wear, unusual deterioration, or aging of materials or finishes, unsafe conditions, the need for excessive maintenance, abnormal noise, or vibration, and similar unsatisfactory conditions.

C. Retained Equipment: All retained components, parts, and materials shall be cleaned, checked, modified, repaired, or replaced, so each component and its parts are in like new operating condition. Retained equipment must be compatible for integration with new systems. All retained equipment shall be covered under the warranty provisions, of Article 1.18, A. & B above. No prorations of equipment or parts shall be allowed on preventive maintenance contract between the Contractor and Purchaser.

D. Make modifications, requirements, adjustments, and improvements to meet performance requirements of Section 142403.

1.19 WARRANTY MAINTENANCE

A. Provide preventive maintenance and 24-hour emergency callback service for one (1) year commencing on date of final acceptance of modernized elevator by Purchaser. Systematically examine, adjust, clean, and lubricate all equipment. Repair or replace defective parts using parts produced by the Contractor of installed equipment. Maintain elevator machine room, hoistway, and pit in clean condition.

B. Use competent personnel, acceptable to Purchaser, employed and supervised by the Contractor.

C. Warranty Maintenance Hours: Contractor shall perform one (1) hour per unit per month for preventive maintenance.

D. All work, except as otherwise noted, including unlimited call-back service, shall be performed during the building's regular hours. These hours are 8:00 a.m. to 5:00 p.m.

E. Response Time for Callback Service:
1. During regular time hours, Contractor shall arrive at Property within 60 minutes from time of notification of equipment problem or failure by Purchaser.
2. Contractor shall arrive at Property in response to passenger entrapment calls within 30 minutes from time of notification by Purchaser.

F. Purchaser retains the option to delete cost of warranty maintenance from modernization equipment contract and remit twelve equal installments directly to Contractor during period in which maintenance is being performed.

1.20 DELIVERY, STORAGE, AND HOISTING

A. General:
1. Protect all equipment and exposed finishes during delivery, handling, and installation until completion of project.
2. Replace damaged materials with new, with no additional cost for material or labor to Purchaser.

B. Delivery and Storage:
1. Ensure manufacturers' original packing adequately protects materials during delivery.
2. Deliver materials, identical to accepted samples, to the site ready for use in the manufacturer's original and unopened containers and packaging, bearing labels as to type of material, brand name and manufacturer's name.
3. Store materials under cover in a secure, dry, and clean location, off the ground. Remove delivered materials that are damaged or otherwise not suitable for installation from the job site and replace with acceptable materials.
4. Store and protect all materials in space provided or designated by the Purchaser against damage, stains, scratches, corrosion, weather, construction debris, and other environmental conditions.
5. Comply with Purchaser's requirements for access to and use of any building loading docks, parking lots, parking garages, and any interior spaces required for delivery and storage.

C. Hoisting: Arrange and pay for all required hoisting and movement of equipment.

1.21 COORDINATION

A. Prime contracts are defined below, and each is recognized to be a major part of required work to be performed concurrently in close coordination with work of other Contractors.
1. This Contract: Elevator Modernization including associated related work specified herein.

B. Scope of Contract includes, but is not limited to, the following:
1. Coordination, scheduling, and management of work of component suppliers and subcontractors.
2. Modernize or furnish and install equipment as specified utilizing existing and/or modified hoistways and machine rooms.
3. Specific item of required work which cannot be determined to be included in another contract is thereby determined to be included in prime contract.

PART 2 - PRODUCTS

2.1 REFERENCES

A. American National Standard Institute (ANSI): A117.1, Accessible and Usable Buildings and Facilities.

B. American Society of Mechanical Engineers:
1. ASME A17.1, Safety Code for Elevators and Escalators.
2. ASME A17.2, Guide for Inspection of Elevators, Escalators, and Moving Walks.
3. ASME A17.5, Elevator and Escalator Electrical Equipment.
4. ASME A17.6, Standard for Elevator Suspension, Compensation, and Governor Systems.

C. National Fire Protection Association (NFPA):
1. NFPA 70, National Electric Code.
2. NFPA 80, Fire Doors and Windows.
3. NFPA 101, Life Safety Code.
4. NFPA 13, Installation of Sprinkler Systems.

D. International Building Code (IBC).

E. City of Detroit Elevator Code.

F. Accessibility:
1. American National Standard Institute (ANSI): A117.1, Accessible and Usable Buildings and Facilities.
2. ADAAG, Americans with Disabilities Act Accessibility Guidelines.

2.2 MANUFACTURERS AND PRODUCTS

A. Approved Elevator Contractors:
1. Approved subject to compliance with the requirements of the contract and specifications.
    a. KONE
    b. Lardner Elevator
    c. Otis Elevator
    d. Schindler Elevator Corporation
    e. TK Elevator
    f. Toledo Elevator
    g. Approved Equal

B. Approved Elevator Components:
The following Manufacturers/Assemblers are approved for the specific components listed below, subject to the requirements of the contract:
1. Car and Hall Signal Fixtures:
    a. Innovation
    b. MAD Fixtures
    c. Monitor
    d. PTL
2. Controllers:
    a. GAL GALaxy
    b. Elevator Controls Corporation
    c. Smart Rise
3. Door Protective Device:
    a. Janus

b. T.L. Jones
c. Tri-Tronics

4. Elevator Cab Interiors:
   a. Architectural Metals
   b. A Better Elevator Co.
   c. G&R
   d. Globe Architectural & Metals
   e. Snap Cab
   f. Weir Inc.
5. Guide Shoes
   a. Delco
   b. ELSCO
   c. GAL
   d. Hollister-Whitney
6. Hydraulic Elevator Systems and Components:
   a. Canton
   b. EECO
   c. MEI
   d. Schumacher
7. Hydraulic Jack Assemblies
   a. EECO
   b. Bore-Max
   c. Canton Elevator
8. Hoistway Entrances and Door Panels:
   a. Columbia
   b. EDI/ECI
   c. Elevator Products
   d. Gunderlin
   e. Tyler
   f. United Cab
9. Passenger Elevator Door Equipment (Operators, Tracks, Hangers, and Closers):
   a. ECI
   b. GAL
   c. Wittur
10. Traveling Cables:
    a. Draka
    b. James Monroe
11. Two-Way Emergency Communication Device:
    a. Janus
    b. K-Tech
    c. Kings III
    d. Rath Microtec
    e. Wurtec

2.3 PERFORMANCE REQUIREMENTS

A. Car Speed: ± 10% of contract speed in up direction, ± 20% of contract speed in down direction.

B. Car Capacity: Safely lower, stop, and hold rated load.

C. Car Stopping Zone: ± 1/4" under any loading condition.

D. Door Times: Seconds from start to fully open or fully closed:
   1. Cars #1 and #2: Door Open: 1.7 seconds. Door Close: 2.4 seconds.
   2. Car #3: Door Open: 2.7 seconds. Door Close: 4.6 seconds

E. Car Floor-to-Floor Performance Time: Seconds from start of doors closing until doors are 3/4 open for center-opening doors or 1/2 open for side-opening doors, and car is level and stopped at next successive floor under any loading condition or travel direction:
   1. Cars #1 and #2: 14.0 seconds. Floor Height: 14’-0” between floors 2 and 3.
   2. Car #3: 14.0 seconds. Floor Height: 20’-5” between floors B and 1

F. Noise and Vibration Control:
   1. Airborne Noise:
      a. Measured noise level of elevator equipment and its operation shall not exceed 60 dBA inside car under any condition including door operation and car ventilation exhaust blower on its highest speed.
      b. Limit noise level in the machine room relating to elevator equipment and its operation to no more than 80 dBA.
      c. All dBA readings to be taken 3'-0" off the floor and 3'-0" from the equipment using the “A” weighted scale.
   2. Vibration Control: Mechanically isolate all new elevator equipment from the building structure and other components. Minimize objectionable noise and transmission of vibrations to occupied areas of the building. All elevator equipment provided under this contract, including power unit, controller, oil supply lines, and their support shall be mechanically isolated from the building structure and electrically isolated from the building power supply and to each other to minimize the possibility of objectionable noise and vibrations being transmitted to occupied areas of the building.

2.4 ELEVATOR DUTY ALTERATIONS

A. Passenger Elevator

ALTERATION SUMMARY		
CAR #1	**EXISTING INSTALLATION**	**MODERNIZED INSTALLATION**
Capacity:	2500 lbs.	No Change
Class of Loading:	Class A	No Change
Contract Speed:	125 fpm	No Change
Hydraulic Power Unit Location:	At Floor B	No Change
Operation Control:	Duplex Selective Collective	No Change
Floors Served:	Front: B, 1 - 3	No Change
Total Entrances:	All Front	No Change
Entrance Type:	Single-Speed Center-Opening	No Change
Entrance Size:	3'-6" wide x 7'-0" high	No Change
Minimum Clear to Underside of Canopy:	8'-0" high	No Change

ALTERATION SUMMARY		
CAR #2	**EXISTING INSTALLATION**	**MODERNIZED INSTALLATION**
Capacity:	4500 lbs.	No Change
Class of Loading:	Class A	No Change
Contract Speed:	125 fpm	No Change
Hydraulic Power Unit Location:	At Floor B	No Change
Operation Control:	Duplex Selective Collective	No Change
Floors Served:	Front: B, 1 - 3	No Change
Total Entrances:	All Front	No Change
Entrance Type:	Single-Speed Center-Opening	No Change
Entrance Size:	3'-6" wide x 7'-0" high	No Change
Minimum Clear to Underside of Canopy:	8'-0" high	No Change

ALTERATION SUMMARY		
CAR #3	**EXISTING INSTALLATION**	**MODERNIZED INSTALLATION**
Capacity:	4500 lbs.	No Change
Class of Loading:	Class A	No Change
Contract Speed:	100 fpm	No Change
Hydraulic Power Unit Location:	At Floor B	No Change
Operation Control:	Two-Landing Collective	No Change
Floors Served:	Front: B, 1	No Change
Total Entrances:	All Front	No Change
Entrance Type:	Two-Speed Side-Opening	No Change
Entrance Size:	4'-0" wide x 7'-0" high	No Change
Minimum Clear to Underside of Canopy:	8'-0" high	No Change

2.5 MATERIALS

A. All colors will be selected from the Manufacturer's standard range unless custom colors are specified herein.

B. Steel:
1. Sheet Steel (Furniture Steel for Exposed Work): Stretcher-leveled, cold-rolled, commercial quality carbon steel, complying with ASTM A366, matte finish.

2. Sheet Steel (for Unexposed Work): Hot-rolled, commercial quality carbon steel, pickled and oiled, complying with ASTM A568/A568M-03.
3. Structural Steel Shapes and Plates: ASTM A36.

C. Stainless Steel: Type 302 or 304 complying with ASTM A240, with standard tempers and hardness required for fabrication, strength, and durability. Apply mechanical finish on fabricated work in the locations shown or specified, Federal Standard and NAAMM nomenclature, with texture and reflectivity required to match Purchaser's sample. Protect with adhesive paper covering.
1. No. 4 Satin: Directional polish finish. Graining directions as shown or, if not shown, in longest dimension.
2. No. 8 Mirror: Reflective polish finish with no visible graining.
3. Textured: 5WL as manufactured by Rigidized Metals or Windsor pattern 5-SM as manufactured by Rimex Metals or approved equal with .050 inches mean pattern depth with bright directional polish (satin finish).
4. Burnished: Non-directional, random abrasion pattern.

D. Aluminum: Extrusions per ASTM B221; sheet and plate per ASTM B209.

E. Plastic Laminate: ASTM E84 Class A and NEMA LDI-1964, 1/16", Fire-Rated Grade (GP-50), Type1, 1/16" high pressure general purpose laminate, color and texture as follows:
1. Exposed Surfaces: Color and texture selected by Purchaser.
2. Concealed Surfaces: Contractor's standard color and finish.

F. Fire-Retardant Treated Particle Board Panels: Minimum 3/4" thick backup for natural finished wood and plastic laminate veneered panels, edged and faced as shown, provided with suitable anti-warp backing; meet ASTM E84 Class "I" rating with a flame-spread rating of 25 or less, registered with Local Authorities for elevator finish materials.

G. Natural Finish Wood Veneer: Standard thickness, 1/40" thoroughly dried conforming to ASME/HPMA HP-1983, Premium Grade. Place veneer, tapeless spliced with grain running in direction shown, belt and polish sanded, book matched. Species and finish designated and approved by Purchaser and/or Consultant.

H. Paint: Clean exposed metal parts and assemblies of oil, grease, scale, and other foreign matter and factory paint one shop coat of standard rust-resistant primer. After erection, provide one finish coat of industrial enamel paint. Galvanized metal need not be painted.

I. Prime Finish: Clean all metal surfaces receiving a baked enamel paint finish of oil, grease, and scale. Apply one coat of rust-resistant primer followed by a filler coat over uneven surfaces. Sand smooth and apply final coat of primer.

J. Baked Enamel Finish: Prime finish per above. Unless specified "prime finish" only, apply and bake three additional coats of enamel in the selected solid color.

K. Entrance Field Paint: Clean all surfaces to remove dirt and grease. Sand and finish surfaces as necessary to remove pits and scratches and prepare surface for painting. Apply filler to ensure smooth surface; sand and apply one coat of electrostatic enamel in the selected solid color.

L. Refinishing of natural metals: Remove existing protective finish. Buff as necessary to remove scratches. Regrain or finish as specified and protect as indicated for particular metal type.

M. Entrance Support Equipment within Hoistway: Include strut angles, headers, sill support angles, fascia, hanger covers, etc. Clean, remove, and check for corrosive activity. Replace components which exhibit severe deterioration. Tighten all fastenings.

2.6 OPERATION

A. General, All Cars:
1. Cars automatically slow down and stop level at floors in response to car and landing calls with stops made in sequence in the established direction of travel, regardless of order in which buttons are pressed.
2. Landing calls are canceled when the assigned car arrives at the landing.
3. Automatic Leveling:
   a. When arriving at a floor cars level to within 1/4" above or below the landing sill prior to opening doors, without travelling past the landing during leveling
   b. Maintain leveling accuracy regardless of carload, direction of travel, <>rope slippage or stretch.
4. Power Conservation:
   a. Car interior illumination and ventilation turns off after adjustable period (60-180 seconds) of no elevator demand and turns on prior to opening car doors when elevator demand returns.

B. Door Operation, All Cars:
1. Automatically open doors when car arrives at a floor.
2. Stop and reopen doors or hold doors in open position upon activation of "door open" button.
3. At expiration of normal dwell time, or upon activation of "door close" button, close doors:
   a. Prevent doors from closing and reverse doors at normal opening speed if door reopening device beams are obstructed while doors are closing, except during nudging operation.
4. Nudging Operation:
   a. After beams of door reopening device are obstructed for a predetermined time interval (minimum 20.0-25.0 seconds), sound warning signal, and attempt to close doors with maximum of 2.5 foot-pounds kinetic energy.
   b. Activation of the door open button overrides nudging operation and reopens doors.
5. Interrupted Beam Time:
   a. When beams are interrupted during initial door opening, hold door open a minimum of 3.0 seconds.
   b. When beams are interrupted after the initial 3.0 second hold open time, reduce time doors remain open to an adjustable time of approximately 1.0-1.5 seconds after beams are reestablished.
6. Differential Door Time:
   a. Field adjustable time doors remain open after stopping in response to calls.
   b. Car Call: Hold open time adjustable between 3.0 and 5.0 seconds.
   c. Hall Call:
      1) Hold open time adjustable between 5.0 and 8.0 seconds.
      2) Use hall call time when car responds to coincidental calls.

A. Group Operation (Cars #1 and #2):
1. General:
   a. Arrange for automatic operation through car and landing buttons in conjunction with a microprocessor-based group supervisory system.
2. Group Supervisory System - Passenger Elevators:
   a. The supervisory system shall, through a dispatching algorithm, continually measure the number of corridor calls, their duration, their direction, distance, service to previously assigned car and hall calls, carload, door and car motion status, coincidence of car and hall

calls, etc., to determine the intensity of traffic and its direction. The supervisory system shall automatically adjust to all demands with preference given to the registered calls in the following order:
1) Main Landing Calls
2) Long wait Down calls.
3) Long wait Up calls.
4) Up calls.

b. Long wait calls shall be considered those that have been registered for over 30 seconds.
c. Dynamic zoning strategies may be employed to provide shortened wait times.

3. Hall Call Assignment:
a. Assign registered hall calls to car that will provide the fastest possible response time.
b. Car assignment and response time determined by evaluating factors such as distance from demand, service to previously assigned car and hall calls, carload, direction, door and car motion status, and coincident car and hall calls. Continuously assign car available to answer call in the shortest amount of time.
c. A car without registered car calls arriving at a floor, where both up and down hall calls are registered, initially responds to the hall call in the direction that car was traveling. If no car call is registered for further travel in that direction, lantern immediately indicates change of direction without closing and reopening doors.

4. Delayed Car:
a. If, for any reason, a car is delayed after it receives a start signal, system transfers the call to another car.
a. When cause of delay is corrected car automatically returns to normal operation.

B. 2-Landing Collective Operation, Car #3:
1. Elevator operates via momentary pressure buttons to:
a. Place hall call by selecting direction of travel at each hall landing (single buttons at each terminal landing).
b. Place car call by selecting destination floor from inside the car (individual buttons for each floor served).
2. Hall calls, other than calls placed at the landing at which car is standing, start car, and cause the car to stop at first landing for which a call is registered in the direction of travel.
3. Stops are made in order in which landings are reached.
4. Parked Car (No Demand):
a. Elevator remains at the 2nd floor with doors closed.
b. If elevator is at the 1st floor, it shall return to the 2nd floor and remains at landing with the doors closed until a hall call is registered.
5. Hall Lanterns:
a. Lanterns provide audio and visual signal upon each stop, regardless of responding to car or hall call.

C. Auxiliary Power Lowering Operation (All Cars):
1. Upon loss of normal power automatically lower car to the nearest landing depending on position at time of power outage.
2. Upon arrival at the landing, the elevator doors shall open automatically and remain open until regular door time has expired; the elevator shall then be removed from service.
3. Include solid-state charger and testing means mounted in a common metal container.
4. Battery to be rechargeable lead acid or nickel cadmium with a ten-year life expectancy.
5. Upon restoration of normal power, the elevator shall automatically resume normal operation.
6. Disable if normal power switched off.

D. Firefighters' Emergency Operation, All Cars: Provide equipment and operation in accordance with code requirements.

E. Battery Operation of Emergency Lighting, Communications, and Alarm: All Cars.
1. Car mounted battery unit with solid-state charger to operate alarm bell, car emergency lighting, and voice communication system.
   a. Car lighting and communication shall be provided with a minimum of 4 hours of operation on back-up power during a loss of normal power, and a minimum of 1 hour of operation for car-mounted alarm and any remote alarm mounted at the designated level.
   b. Battery to be rechargeable with minimum five-year life expectancy.
   c. Provide constant pressure test button in service compartment of car operating panel.

F. Emergency Car Communication System Operation, All Cars:
1. Hands-Free Phone System:
   a. New two-way communication instrument in car to provide automatic dialing, tracking, and recall features.
      1) Automatic dialer to include automatic rollover capability with minimum two numbers:
   b. Activated by "Help" button in car or by external telephone call.
   c. Adjacent light jewel l illuminates and flashes when call is acknowledged.

G. Electrical Wiring and Wiring Connections: New, All Cars.
1. Conductors and Connections:
   a. Copper throughout with individual wires coded and connections on identified studs or terminal blocks.
   b. Use no splices or similar connections in wiring except at terminal blocks, control compartments, or junction boxes.
   c. Provide 10% spare conductors throughout.
   d. Run spare wires from car connection points to individual elevator controllers in the machine room.
2. Conduit:
   a. Galvanized steel conduit, EMT, or duct.
   b. Flexible conduit length not to exceed 3'-0".
3. Traveling Cables:
   a. Flame and moisture-resistant outer cover. Prevent traveling cable from rubbing or chafing against hoistway or equipment within hoistway.
   b. Provide 12 twisted shielded pairs in addition to wires needed to connect specified items and code required spares.
   c. Tag spares in machine room.
   d. Provide cables from controller to car top.
4. Auxiliary Wiring:
   a. Connect fire alarm initiating devices, emergency two-way communication system, CCTV, and card reader in each controller in machine room.
   b. Provide machine room demarcation junction boxes for the fire alarm initiating devices, CCTV, security system and card reader interface terminals and relays.
   c. Provide conduit, wiring and connections for the fire alarm initiating devices, emergency two-way communication system, CCTV, security system and card reader interface terminals and relays, from machine room junction box to car controller in machine room.

2.7 MACHINE ROOM EQUIPMENT

A. Provide and arrange equipment in existing machine room spaces.

B. Identification: Permanently identify (painted on or securely attached) machine room equipment for each elevator with minimum 3" characters corresponding to elevator identification.
   1. Hydraulic Machine (Power Unit)
   2. Controller.
   3. Main line disconnect switch.
   4. Pit equipment.

C. Hydraulic Machine (Power Unit), All Cars:
   1. New assembled unit consisting of submersible positive displacement pump, induction motor, master-type control valves combining safety features, holding, direction, bypass, stopping, manual lowering functions, shut off valve, oil reservoir with protected vent opening, oil level gauge, outlet strainer, drip pan, muffler. Mount power unit on isolating pads.
   2. Submersible pump motor shall be permitted up to 50 HP.

B. Controller: New, All Cars.
   1. Compartment:
      a. UL/CSA labeled.
      b. Securely mount all assemblies, power supplies, chassis switches, relays, etc., on a substantial, self-supporting steel frame.
      c. Completely enclose equipment with covers.
      d. Provide means to prevent overheating.
   2. Relay Design:
      a. Magnet operated with contacts of design and material to insure maximum conductivity, long life, and reliable operation without overheating or excessive wear.
      b. Provide wiping action and means to prevent sticking due to fusion.
      c. Contacts carrying high inductive currents shall be provided with arc deflectors or suppressors.
   3. Microprocessor Hardware:
      a. Provide built-in noise suppression devices that provide a high level of noise immunity on all solid-state hardware and devices.
      b. Provide power supplies with noise suppression devices.
      c. Isolate inputs from external devices (such as pushbuttons) with opto-isolation modules.
      d. Design control circuits with one leg of power supply grounded.
      e. Safety circuits shall not be affected by accidental grounding of any part of the system.
      f. System shall automatically restart when power is restored.
      g. System memory shall be retained in the event of power failure or disturbance.
      h. Equipment shall be provided with Electro Magnetic Interference (EMI) shielding within FCC guidelines.
   4. Wiring:
      a. CSA labeled copper for factory wiring.
      b. Neatly route all wiring interconnections and securely attach wiring connections to studs or terminals.
      c. Provide labels for all extra or spare wires, neatly organized at base of controller cabinet.
   5. Permanently mark components (relays, fuses, PC boards, etc.) with symbols shown on wiring diagrams.
   6. Provide electrical design compliant with UL 508A SB.SCCR of 5000A required.

C. Muffler: New, All Cars.
   1. Provide in discharge oil line near pump unit.
      a. Design shall dampen and absorb pulsation and noise in the flow of hydraulic fluid.

D. Piping and Oil: New, All Cars.
   1. Provide piping, connections and oil for the system.

2. Provide isolated pipe stands or hangers.

E. Shut-Off Valves: New, All Cars.
1. Provide oil line shut off valve in the machine room.
2. Provide second valve in pit adjacent to jack unit.

2.8 HOISTWAY EQUIPMENT

A. Provide and arrange equipment in existing hoistways.

B. Guide Rails: Retain main guide rails in place for each elevator.
1. Clean rails and brackets. Remove rust.
2. Check all rail and bracket fastenings and tighten.

C. Terminal Stopping: Provide normal and final devices.

D. Hoistway Entrance Equipment, All Cars:
1. Door Hanger: New two-point hanger roller with neoprene roller surface and suspension with eccentric upthrust roller adjustment.
2. Door Hanger Rollers: Replace.
3. Door Track: New bar or formed, cold-drawn removable steel tracks with smooth roller contact surface.
4. Door Interlocks: New. Operable without retiring cam.
5. Door Closers: New spring-activated spirator. Install and adjust to insure smooth, quiet mechanical close of doors.

E. Hoistway Door Unlocking Device, All Cars: Provide unlocking device including new escutcheon in door panel at all floors.

F. Hoistway Access Switches, All Cars: Mount in wall at top and bottom floors. Provide switch with faceplate. Locate within easy reach to entrance so entrance can be guarded by one technician.

G. Floor Numbers, All Cars: Stencil paint 4" high floor designations in contrasting color on inside face of hoistway doors or hoistway fascia in location visible from within car.

2.9 PIT EQUIPMENT

A. Buffers: Retain existing, All Cars. Remove rust and repaint non-machined surfaces.

B. Hydraulic Jack Assembly, All Cars: Retain Existing. Provide new gland packing for each elevator.

C. Jack Support, All Cars: Retain Existing.

2.10 HOISTWAY ENTRANCES

A. Provide and arrange equipment in same location as existing entrances.

B. Frames: Retain existing, All Cars.
1. Paint existing door frames at each floor. Color as selected by Purchaser.
2. Provide new Arabic floor designation/tactile marking plates:
a. Centered at 60" above finished floor.
b. Located on both side jambs of all entrances.
c. Minimum 4" high.

d. Tactile marking indications shall be below Arabic floor designation.

3. Provide plates at main egress landing with “Star” designation.
4. Provide car identification label:
   a. Mounted directly below floor designation/tactile marking plates.
   b. Located on both side jambs at the following levels:
      1) Designated level.
      2) Alternate level.
   c. Finish and design to match floor designation/tactile marking plates.

C. Hoistway Door Panels: Retain existing, All Cars.
1. Paint existing door frames at each floor. Color as selected by Purchaser.
2. Provide new door gibs with fire tabs at all floors.
3. Minimum two gibs per panel, one at leading edge, and one at trailing edge of each panel.
4. Provide door panel retainer mechanism on lower edge of door panel.

D. Sight Guards: Retain existing. Replace any damaged or missing sight guards.

E. Sills, Hoistway Entrance: Retain existing. Clean. Check and tighten all fastenings.

F. Sill Supports, Hoistway Entrance: Retain existing. Check and tighten all fastenings.

G. Fascia, Toe Guards, and Hanger Covers: Retain existing, All Cars.
1. Provide as required where damaged or missing.
2. Check and tighten all fastenings.
3. Paint/Stencil floor number on fascia or hoistway wall all floors visible where car doors are initially opened.

H. Struts and Headers: Retain existing. Check and tighten all fastenings.

I. Finish of Frames and Doors: Retain existing.

2.11 CAR EQUIPMENT

A. Frame: Retain Existing, All Cars. Check and tighten all fastenings. Adjust as required for plumb and square alignment.

B. Platform: Retain existing, All Cars.
1. Adjust as necessary for plumb and level alignment.
2. Reinforce if required.
3. Check and tighten all fastenings.

C. Platform Guard, All Cars:
1. New extended platform guard to meet Code requirements.
2. Minimum 0.059" (1.5 mm) thick steel, or material of equivalent strength and stiffness.
3. Reinforced and braced to car platform front.
4. Contractor’s standard finish.

D. Passenger Elevator Car Guides, All Cars:
1. New roller type with three or more spring dampened sound-deadening rollers per shoe. Minimum 3 1/4" outside diameter.

E. Finish Floor Covering:

1. Car #1: New Seamless resilient non-slip rubber as approved by the Purchaser. Refer to Appendix A for approved material and finishes.
2. Cars #2 and #3: Retain existing.

F. Car Sills: Retain existing. Clean full width. Check and tighten all fastenings.

G. Car Door Panels, All Cars:
1. New fully enclosed 16-gauge steel, sandwich construction without binder angles. Constructed with interlocking, stiffening ribs. Leading edges of center-opening doors equipped with rubber astragals full height of panel. Minimum of two gibs per panel, one at leading and one at trailing edge with gibs in the sill groove entire length of door travel. Satin finish stainless steel.
2. Adjust vertical and horizontal clearances to meet Code requirements.

H. Door Hangers, All Cars: New two-point hanger roller with eccentric upthrust roller adjustment and Manufacturer's recommended neoprene roller surface

I. Door Track, All Cars: New bar or formed, cold-drawn removable steel track with smooth roller contact surface.

J. Door Header, All Cars: New. Construct of minimum 12-gauge steel, shape with stiffening flanges.

K. Car Door Electric Contact, All Cars: Prohibit car operation unless car door is closed.

L. Door Clutch, All Cars:
1. New heavy-duty clutch, linkage arms, drive blocks and pickup rollers or cams to provide positive, smooth, quiet door operation.
2. Design clutch so car doors can be closed, while hoistway doors remain open.

M. Restricted Opening Device, All Cars:
1. Restrict opening of car doors to Code required limit outside unlocking zone.
2. Adjust for smooth and quiet operation with operating noise undetectable from inside any car or outside of the hoistway.
3. Plunger type restrictors not acceptable.
4. Utilize mechanical angle to prevent door opening.

N. Door Operator, All Cars:
1. New high-speed, harmonic drive, heavy-duty door operator capable of opening doors at no less than 2.5 fps.
2. Accomplish reversal in no more than 2½" of door movement.
3. Solid-state door control with closed loop circuitry to constantly monitor and automatically adjust door operation based upon velocity, position, and motor current.
4. Maintain consistent, smooth, and quiet car door operation at all floors, regardless of door weight or varying air pressure.

O. Door Reopening Device, All Cars:
1. New black fully enclosed infrared device with full screen infrared matrix or multiple beams extending vertically along leading edge of each door panel to minimum height of 7'-0" above finished floor.

P. Car Operating Panel, All Cars:
1. One car operating panel with faceplate:
   a. Consisting of a metal box containing vandal resistant operating fixtures, mounted behind the car stationary front return panel.

b. Faceplate shall be hinged and constructed of satin finish stainless steel.

2. Provide Exposed Pushbuttons to Initiate:
   a. Car call registration.
   b. Alarm.
   c. Door open.
   d. Door close.
   e. Emergency push-to-call communication.
   f. Push/Pull stop switch.
3. Pushbuttons:
   a. Provide minimum 3/4" diameter raised floor pushbuttons which illuminate to indicate call registration.
   b. Locate operating controls no higher than 48" above the car floor; no lower than 35" for emergency push-to-call button and alarm button.
   c. Identify buttons with cast tactile symbols rear mounted.
4. Locked Firefighters' Emergency Operation Panel:
   a. Openable by the same key which operates the Fire Operation switch.
   b. Including the following features:
      1) Phase II fire access switch.
      2) Firefighters' visual indication.
      3) Call cancel button.
      4) Stop switch, manually operated.
      5) Door open button.
      6) Door close button.
      7) Floors served.
5. Service Compartment:
   a. Provide lockable service compartment with recessed flush door.
   b. Door material and finish to match car return panel or car operating panel faceplate.
   c. Include the following controls in lockable service cabinet with function and operating positions identified by permanent signage or engraved legend:
      1) Access switch.
      2) Light switch.
      3) Four-position exhaust blower switch.
      4) Independent service switch.
      5) Constant pressure test button for battery pack emergency lighting.
      6) 120-volt, AC, GFCI protected electrical convenience duplex outlet.
      7) Card reader override switch.
      8) Switch to select either floor voice annunciation, floor passing tone, or chime.
      9) Keyed stop switch.
6. Provide black paint filled (except as noted), engraved, or approved etched signage as follows with approved size and font:
   a. Phase II firefighters' operating instructions on inside face of firefighters' compartment door.
   b. Engrave filled red firefighters' operation on outside face of compartment door.
   c. Building identification car number on main car operating panel.
   d. "No Smoking" over on main car operating panel.
   e. Car capacity in pounds on main car operating panel service compartment door.
   f. "Certificate of Inspection on File in Building Office" on main car operating panel.

Q. Car Top Control Station, All Cars:
   1. Mount to provide safe access and utilization while standing on car top.
   2. Operating device with Up and Down direction buttons, a Run button, an Inspection/Automatic switch and Emergency Stop switch.

3. Operating device provides an audible and visible indicator that fire recall has been initiated.
4. Fix station to the car crosshead or provide portable station provided the extension cord and housing is permanently attached to the car crosshead.
5. The car will be operated by constant pressure on the appropriate directional button and the Run button simultaneously.
6. Normal operating devices will be inoperative while this device is in use.

R. Car Top Emergency Audible Signal:
1. Provide on top of each elevator.
2. Activation of Alarm Button or Emergency Stop switch will cause Emergency Audible Signal.
3. Provide auxiliary power supply to provide 1-hr. power in the event of loss of normal power.

S. Work Light and Duplex Plug Receptacle:
1. GFCI protected outlet at top and bottom of each car.
2. Include on/off switch and lamp guard.
3. Provide additional GFCI protected outlet on car top for installation of car CCTV.

2.12 COMMUNICATION

A. Car Communication System, All Cars:
1. Hands-Free Phone System:
a. New two-way communication instrument in car with automatic dialing, tracking, and recall features, with shielded wiring to car controller in machine room. System includes:
1) “Help” button on car operating panel to initiate two-way communication from Car. Button shall match car operating panel pushbutton design.
2) Auto dialer with automatic rollover capability with minimum two numbers:
3) Adjacent light jewel illuminates and flashes when call is acknowledged.
4) “Help” button tactile symbol, engraved signage, and Tactile marking adjacent to button mounted integral with car front return panel.

2.13 CAR ENCLOSURE AND INTERIOR FINISHES

A. Unless specifically identified as “Retain,” “Reuse,” or “Refurbish,” provide new equipment. Contractor may, with Consultant approval, provide new equipment in lieu of refurbishing existing.

B. Refer to Appendix A for approved material and finishes.

C. Car Enclosure and Interior Finishes, All Cars: Retain existing car enclosure and provide new interior finishes.
1. Verify and document overall car weight prior to removal of any equipment from the existing car frame or car enclosure.
2. Check and tighten all fastenings.
3. Provide new interior finishes as specified herein.
4. Modify car enclosure for application of new signal and pushbutton fixtures.
5. New cab weight including all new finishes to be verified following completion of modernization. Post modernization weight not to exceed code allowable limits.
6. Provide the following features:
a. Enclosure: Retain existing. Apply sound-deadening mastic to exterior.
b. Stationary Return Panels: Retain existing.
c. Entrance Columns: Retain existing.
d. Transom: Retain existing.
e. Base: New for Car #1. Stainless steel with concealed ventilation cutouts. Retain existing for Cars #2 and #3.

f. Interior Wall Finish: Retain existing.
g. Ventilation: Two-speed exhaust blower. Mount to car canopy on isolated rubber grommets. Exhaust blower shall meet noise requirements specified herein.
h. Lighting: New for all cars. LED fixtures with wiring and hookup. Coordinate with emergency lighting requirements.
i. Suspended Ceiling: New for all cars. Six-section satin finish stainless-steel panels with lighting cutouts in each panel.
j. Handrails: Retain existing.

7. Pads and Buttons: Provide hooks and three-piece removable pads. Two pads covering side walls and adjacent front returns and one covering rear wall. Provide cutouts to access main car operating panel.

D. Top of Car Guardrail: Provide car top railings where fall hazard exceeds 12". Install guardrails, necessary hardware, and toe board to meet code requirements.

E. Card/Proximity Reader Security Provisions, Cars #1 and #2:
1. Mount reader unit inside car as directed by Purchaser, and cross connect from car pushbuttons to control module in machine room.
2. Reader control unit, mounting brackets, wiring materials, logic circuits, etc., provided by others.
3. Elevator control systems shall facilitate system tracking of persons accessing secure floors via printout by passenger I.D. number, floor accessed, and time of entry.

2.14 HALL CONTROL STATIONS

A. Pushbuttons: New.
1. Provide single riser for each group with flush mounted enlarged faceplate to cover existing wall block out. Provide any cutting and patching required.
2. Vandal resistant pushbuttons for each direction of travel which illuminate to indicate call registration. Provide LED illumination.
3. Approved engraved message and pictorial representation prohibiting use of elevator during fire or other emergency as part of faceplate.
4. Pushbutton design to match car operating panel pushbuttons.
5. For Car #3, make necessary wire connections to existing card/proximity reader at the 1st floor.

2.15 SIGNALS

A. Hall Direction Lanterns, All Cars:
1. Provide new at each entrance to indicate travel direction of arriving car. Faceplate to cover existing wall block out. Provide any cutting and patching required.
2. Illuminate up or down LED lights and sound tone once for up and twice for down direction prior to car arrival at floor.
3. Illuminate light until the car doors start to close.
4. Sound level shall be adjustable from 20-80 dBA measured at 5'-0" in front of hall control station and 3'-0" off floor.
5. Provide advanced hall lantern notification to comply with ADA hall call notification time.
6. Provide advanced predictive hall lantern notification to comply with ADA hall call notification time.
7. Provide adjustable car door dwell time to comply with ADA requirements relative to hall call notification time.
8. Hall direction lenses shall be arrow-shaped with faceplates.
9. Lenses shall be minimum 2½" in their smallest dimension.

B. Hall Position Indicator, All Cars at 1st Floor:
New alpha-numeric digital indicator containing floor designations and direction arrows a minimum of 2½" high to indicate floor served and direction of car travel.
1. Mount integral with hall lanterns at 1st floor.

C. Car Position Indicator, All Cars:
1. New alpha-numeric digital indicator containing floor designations and direction arrows a minimum of 2" high to indicate floor served and direction of car travel.
2. Locate fixture in each car operating panel.
3. When a car leaves or passes a floor, illuminate indication representing position of car in hoistway.
4. Illuminate proper direction arrow to indicate direction of travel.

D. Floor Passing Tone, All Cars: Provide an audible tone of no less than 20 decibels and frequency of no higher than 1500 Hz, to sound as the car passes or stops at a floor served.

E. Voice Synthesizer, All Cars:
1. New electronic device with easily reprogrammable message and voice to announce car direction, floor, emergency exiting instructions, etc.
2. Once the doors close, the destinations remain illuminated until the car approaches the next destination floor, whereupon the floor numeral or light flashes and the audible signal sounds to denote the next stopping floor.
3. When the doors open, Destination Indicator displays the next floors to be served.

F. Fixture Faceplate Material and Finish:
1. Satin finish stainless steel, all fixtures.
2. Tamper resistant fasteners for all public facing fastenings.

2.16 FIREFIGHTERS CONTROL AND EMERGENCY POWER PANEL

A. Provide and arrange new equipment as directed by Purchaser or Consultant.

B. Firefighters' Control Panel, All Cars:
1. Locate in building as directed by Purchaser.
2. Fixture faceplate, satin finish stainless steel, including the following features:
a. Car position and direction indicator, digital-readout, or LCD flat screen color monitor.
b. Identify each position indicator with car number.
c. Indicator showing operating status of car.
d. Two-position firefighters' emergency return switches and indicators with engraved instructions filled red.
3. Where applicable, identify all indicators and manual switches with appropriate engraving.
4. Provide wiring and conduit to control panel.

C. Firefighters' Key Box: Flush-mounted box with lockable hinged cover. Engrave instructions for use on cover per Local Fire Authority requirements.

PART 3 - EXECUTION

3.1 SITE CONDITION INSPECTION

A. Prior to beginning installation of equipment, examine hoistway and machine room areas. Verify no irregularities exist which affect execution of work specified.

B. Inform Purchaser and Consultant of any irregularities in writing prior to commencing work.

C. Do not proceed with installation until work in place conforms to project requirements.

3.2 INSTALLATION

A. Install all equipment as follows:
1. in accordance with Contractor's instructions, referenced codes, specifications, and approved submittals.
2. with clearances in accordance with referenced codes, and specifications.
3. to be easily maintained and/or removed.
4. to afford maximum accessibility, safety, and continuity of operation.

B. Remove oil, grease, scale, and other foreign matter from the following equipment and apply one coat of field-applied machinery enamel.
1. All exposed equipment and metal work installed as part of this work which does not have architectural finish.
2. Machine room equipment, and pit equipment.
3. Neatly touch up damaged factory-painted surfaces with original paint color.
4. Protect machine-finish surfaces against corrosion.

C. Paint machine room and pit floors.

3.3 FIELD QUALITY CONTROL

A. Work at jobsite will be checked during course of installation. Full cooperation with reviewing personnel is mandatory. Accomplish corrective work required prior to performing further installation.

B. Perform complete "Acceptance" level pre-testing as specified in the latest edition of ASME A17.2 "Guide for Inspection of Elevators, Escalators, and Moving Walks" prior to AHJ witnessed acceptance testing. Complete any adjustments, repairs, or replacements necessary to achieve code compliant operation including but not limited to:
1. Hydraulic pressure relief valve.
2. Car emergency communications. Inform Purchaser and Consultant of any noted failures of Purchaser provided and maintained equipment or systems.
3. Car buffers.
4. Phase I and II Firefighters' Emergency Operation. Phase I initiated by smoke sensing devices.
5. Power car door operation including door closing force, reopening device, and restricted opening.

C. Have Code Authority acceptance inspection performed and complete corrective work.

D. Provide access to installed equipment and elevator personnel assistance for Consultants final observation and review requirements.

E. ADJUSTMENTS

F. Static balance car to equalize pressure of guide shoes on guide rails.

G. Verify that weights of existing or altered cars, counterweights, and compensation comply with traction machine manufacturers' requirements and do not exceed total weights indicated on approved submittals.

H. Lubricate all equipment in accordance with Contractor's instructions.

I. Adjust motors, power conversion units, brakes, controllers, leveling switches, limit switches, stopping switches, door operators, interlocks, and safety devices to achieve required performance levels.

3.4 CLEANUP

A. Keep work areas orderly and free from debris during progress of project. Remove packaging materials daily.

B. Remove all loose materials and filings resulting from work.

C. Clean machine room equipment and floor.

D. Clean hoistways, car, car enclosure, entrances, operating and signal fixtures.

END OF SECTION

Appendix A

Bldg. No.	WSU Bldg. ID	WSU Bldg. Address	WSU ID #	Elevator Type	Cab Flooring Material (per specifications)	Interior Wall Finishes (per specifications)
5	**Science Hall**	5045 Cass Avenue, Detroit, MI 48202	005 01	Traction	Seamless Resilient Rubber	5WL hanging panels ???
34	**Student Center Center**	5221 Gullen Mall Detroit, MI 48202	034 03	Traction	diamond plate	5WL hanging panels ???
36	**Reuther Library**	5401 Cass Avenue, Detroit, MI 48202	036 01	Hydraulic	Seamless Resilient Rubber	Plastic laminate panels
42	**Alumni House**	441 Gilmour Mall Detroit, MI 48202	042 01	Hydeaulic	Porcelain tile	Wood Veneer panels
45	**Parking Structure 5**	5501 Anthony Wayne Drive, Detroit, MI 48202	045 01	Hydraulic	Seamless Resilient Rubber	5WL hanging panels
			045 02	Hydraulic		5WL hanging panels
51	**Parking Structure 1**	450 West Palmer, Detroit, MI 48202	051 03	Traction	Seamless Resilient Rubber	5WL hanging panels
			051 04	Traction		5WL hanging panels
71	**5057 Woodward**	5057 Woodward, Detroit, MI 48202	071 01	Traction	Seamless Resilient Rubber	Plastic laminate panels
			071 02	Traction		Plastic laminate panels
			071 03	Traction		Plastic laminate panels
			071 03	Traction		Plastic laminate panels
			071 03	Traction		Plastic laminate panels
88	**Parking Structure 6**	61 Putnam Avenue, Detroit, MI 48202	088 01	Hydraulic	Seamless Resilient Rubber	5WL hanging panels
			088 03	Hydraulic		5WL hanging panels
			088 02	Hydraulic		5WL hanging panels
89	**Biological Sciences**	5047 Gullen Mall, Detroit, MI 48202	089 01	Traction	Seamless Resilient Rubber	Plastic laminate panels
			089 02	Traction	diamond plate (Service)	5WL hanging panels
130	**Faculty / Administration Building**	656 West Kirby Avenue, Detroit, MI 48202	130 03	Hydraulic	Existing to remain	Plastic laminate panels
			130 02	Hydraulic		Plastic laminate panels
			130 01	Hydraulic		Plastic laminate panels
629	**Elliman Clinical Research**	421 East Canfield Avenue	629 01	Hydraulic	Seamless Resilient Rubber	Plastic laminate panels
			629 02	Hydraulic	Seamless Resilient Rubber	Plastic laminate panels
			629 03	Hydraulic	diamond plate (Service)	5WL hanging panels

APPENDIX A

WAYNE STATE UNIVERSITY CAR ENCLOSURE AND INTERIOR FINISH STANDARDS

CAR ENCLOSURE AND INTERIOR FINISHES

A. Passenger Elevator: Retain existing car enclosure and provide new interior finishes.
   1. Check and tighten all fastenings.
   2. Provide new interior finishes as specified herein.
   3. Modify car enclosure for application of new signal and pushbutton fixtures.
   4. Post modernization weight not to exceed code allowable limits.
   5. Provide the following features:
      a. Enclosure: Retain. Apply sound-deadening mastic to exterior.
      b. Stationary Return Panels: Retain.
      c. Entrance Columns: Retain.
      d. Transom: Retain.
      e. Car Door Panels: Fully enclosed 16-gauge steel, sandwich construction without binder angles. Constructed with interlocking, stiffening ribs. Leading edges of center-opening doors equipped with rubber astragals full height of panel. Minimum of two gibs per panel, one at leading and one at trailing edge with gibs in the sill groove entire length of door travel. Satin finish stainless steel.
      f. Base: Stainless steel with concealed ventilation cutouts.
      g. Interior Wall Finish:
         1) Removable panels, faced and edged, with color core plastic laminate. Plastic laminate (HPDL) shall meet or exceed NEMA Standard LDI-1964 for Type 1, 1/16" high pressure general purpose laminate.
         2) Color and finish as selected by Purchaser.
         3) 5WL hanging panels with #4 stainless steel reveals between panels.

      h. Ventilation: Two-speed exhaust blower. Mount to car canopy on isolated rubber grommets. Exhaust blower shall meet noise requirements specified herein.
      i. Lighting: LED fixtures with wiring and hookup. Coordinate with emergency lighting requirements.
      j. Suspended Ceiling: Six-section satin finish stainless-steel panels with lighting cutouts in each panel.
      k. Handrails: Solid stainless steel flat stock bars, 4" x 3/8", across rear and side walls. Return handrail ends to car walls.
      l. Cab Flooring, provide floor covering per below:
         1) Porcelain tile, 12"x24"x3/8" running bond pattern, thin set mortar, 1/16" joints with non-sanded grout, final selection by Owner, provide allowance of $10/sf for tile cost with 10% waste.
         2) Luxury Vinyl Tile, 6"x36", random linear pattern, zero VOC adhesive as recommended by the manufacturer, final selection by Owner, provide allowance of $5/sf for tile cost with 10% waste.
         3) Diamond Plate, 1/8" thick aluminum, mill finish 6061, seamless where possible, minimal seams if cab width exceeds sheet width. Sand all edges smooth, secure with 1/8" self-tapping aluminum or stainless-steel fasteners ½" from edge of panel @ 10" oc along edges, and in field. Trowel zero VOC adhesive over 100% of cab floor prior to installation of diamond plate and roll 100 lb. roller over plate to ensure adhesion.
         4) Seamless resilient non-slip rubber or vinyl with sealed edges

5) Pads and Buttons: Where no service elevator available in the building, provide hooks and three-piece removable pads. Two pads covering side walls and adjacent front returns and one covering rear wall. Provide cutouts to access main car operating panel.

B. Service Elevator: Retain existing car shell enclosure and provide new interior finishes.
   1. Check and tighten all fastenings.
   2. Provide new interior finishes as specified herein.
   3. Modify car enclosure for application of new signal and pushbutton fixtures.
   4. Post modernization weight not to exceed code allowable limits.
   5. Provide the following features:
      a. Enclosure: Retain. Apply sound-deadening mastic to exterior.
      b. Stationary Return Panels: Retain.
      c. Entrance Columns: Retain.
      d. Transom: Retain.
      e. Car Door Panels: Fully enclosed 16-gauge steel, sandwich construction without binder angles. Constructed with interlocking, stiffening ribs. Leading edges of center-opening doors equipped with rubber astragals full height of panel. Minimum of two gibs per panel, one at leading and one at trailing edge with gibs in the sill groove entire length of door travel. Satin finish stainless steel.
      f. Base: Textured stainless steel with concealed ventilation cutouts.
      g. Interior Wall Finish: Removable panels made of 5WL.
      h. Ventilation: Two-speed exhaust blower. Mount to car canopy on isolated rubber grommets. Exhaust blower shall meet noise requirements specified herein.
      i. Lighting: LED fixtures with wiring and hookup. Coordinate with emergency lighting requirements.
      j. Suspended Ceiling: Six-section satin finish stainless-steel panels with lighting cutouts in each panel.
      k. Handrails: Solid stainless steel flat stock bars, 4" x 3/8", across rear and side walls. Return handrail ends to car walls.
      l. Cab Flooring: Provide a heavy vinyl cab floor covering as selected by the Purchaser.
      m. Pads and Buttons: Three-piece removable pads. Two pads covering side walls and adjacent front returns and one covering rear wall. Provide cutouts to access main car operating panel.

C. Passenger Elevator: New Car Enclosure and Interior Finishes.
   1. Remove all existing interior finishes and shell components, weigh, and document.
   2. Provide complete new car enclosure and interior finishes as specified herein.
   3. Post modernization weight not to exceed code allowable limits.
   4. Provide the following features:
      a. Enclosure Walls: Reinforced 14-gauge furniture steel stainless steel formed panels Width of individual panels shall not exceed 18". Apply sound-deadening mastic to exterior.
      b. Enclosure Canopy: Reinforced 12-gauge furniture steel formed panels with lockable, hinged emergency exit. Interior finish white reflective baked enamel.
      c. Stationary Return Panels: Reinforced 14 gauge satin finish stainless steel with cutouts for car operating panels and other equipment.
      d. Entrance Columns: Reinforced 14 gauge satin finish stainless steel.
      e. Transom: Reinforced 14 gauge satin finish stainless steel full width of enclosure.
      f. Car Door Panels: Fully enclosed 16-gauge steel, sandwich construction without binder angles. Constructed with interlocking, stiffening ribs. Leading edges of center-opening doors equipped with rubber astragals full height of panel. Minimum of two gibs per panel, one at leading and one at trailing edge with gibs in the sill groove entire length of door travel. Satin finish stainless steel.

g. Base: Stainless steel with concealed ventilation cutouts.
h. Interior Wall Finish: Removable panels, faced and edged, with color core plastic laminate. Color and finish as selected by Architect/Purchaser.
i. Ventilation: Two-speed exhaust blower. Mount to car canopy on isolated rubber grommets. Exhaust blower shall meet noise requirements specified herein.
j. Lighting: LED fixtures with wiring and hookup. Coordinate with emergency lighting requirements.
k. Suspended Ceiling: Six-section satin finish stainless-steel panels with lighting cutouts in each panel.
l. Subfloor; 5/8" thick marine grade plywood.
m. Cab Flooring: Provide floor covering per below:
    1) Porcelain tile, 12"x24"x3/8" running bond pattern, thin set mortar, 1/16" joints with non-sanded grout, final selection by Owner, provide allowance of $10/sf for tile cost with 10% waste.
    2) Luxury Vinyl Tile, 6"x36", random linear pattern, zero VOC adhesive as recommended by the manufacturer, final selection by Owner, provide allowance of $5/sf for tile cost with 10% waste.
    3) Diamond Plate, 1/8" thick aluminum, mill finish 6061, seamless where possible, minimal seams if cab width exceeds sheet width. Sand all edges smooth, secure with 1/8" self-tapping aluminum or stainless-steel fasteners ½" from edge of panel @ 10" oc along edges, and in field. Trowel zero VOC adhesive over 100% of cab floor prior to installation of diamond plate and roll 100 lb. roller over plate to ensure adhesion.
    4) Seamless resilient non-slip rubber or vinyl with sealed edges
n. Handrails: Solid stainless steel flat stock bars, 4" x 3/8", across rear and side walls. Return handrail ends to car walls.
o. Pads and Buttons: Where no service elevator available in the building, provide hooks and three-piece removable pads. Two pads covering side walls and adjacent front returns and one covering rear wall. Provide cutouts to access main car operating panel.

D. Service Elevator: New Car Enclosure and Interior Finishes.
1. Remove all existing interior finishes and shell components, weigh, and document.
2. Provide complete new car enclosure and interior finishes as specified herein.
3. Post modernization weight not to exceed code allowable limits.
4. Provide the following features:
    a. Enclosure Walls: Reinforced 14-gauge furniture steel textured stainless steel formed panels with baked enamel interior finish as selected. Width of individual panels shall not exceed 18". Apply sound-deadening mastic to exterior.
    b. Enclosure Canopy: Reinforced 12-gauge furniture steel formed panels with lockable, hinged emergency exit. Interior finish white reflective baked enamel.
    c. Car Sill:
    d. Stationary Return Panels: Reinforced 14 gauge satin finish stainless steel with cutouts for car operating panels and other equipment.
    e. Entrance Columns: Reinforced 14 gauge textured satin finish stainless steel.
    f. Transom: Reinforced 14 gauge textured satin finish stainless steel full width of enclosure.
    g. Car Door Panels: Fully enclosed 16-gauge steel, sandwich construction without binder angles. Constructed with interlocking, stiffening ribs. Leading edges of center-opening doors equipped with rubber astragals full height of panel. Minimum of two gibs per panel, one at leading and one at trailing edge with gibs in the sill groove entire length of door travel. Satin finish stainless steel.
    h. Base: Textured stainless steel with concealed ventilation cutouts.
    i. Ventilation: Two-speed exhaust blower. Mount to car canopy on isolated rubber grommets. Exhaust blower shall meet noise requirements specified herein.

j. Lighting: LED fixtures with wiring and hookup. Coordinate with emergency lighting requirements.
k. Suspended Ceiling: Six-section satin finish stainless-steel panels with lighting cutouts in each panel.
l. Handrails: Solid stainless steel flat stock bars, 4" x 3/8", across rear and side walls. Return handrail ends to car walls.
m. Guardrails:
    1) Solid stainless steel flat stock bars, 4" x 3/8", mounted across rear and side walls.
    2) Locate guardrail line at 8" above car floor.
    3) Bolt rails through car walls from back and mount on 1½" deep solid round stainless steel standoff spacers no more than 18" O.C.
    4) Return guardrail ends to car walls.
    5) Pads and Buttons: Three-piece removable pads. Two pads covering side walls and adjacent front returns and one covering rear wall. Provide cutouts to access main car operating panel.
n. Cab Flooring:
    1) Seamless resilient non-slip rubber or vinyl with sealed as selected by the Owner.

E. Freight Elevator Enclosure: Car weight to be verified prior to removal of interior cab finishes/cab enclosure. Post modernization weight not to exceed code allowable limits. Provide the following features:
1. Enclosure Walls: Reinforced 10-gauge furniture steel formed panels no more than 20" wide with light-proof joints.
    a. Baked enamel finish as selected.
    b. Provide recess in car side wall for recessed mounting of car operating panel.
2. Enclosure Canopy:
    a. Reinforced 12-gauge furniture steel formed panels no more than 20" wide with light-proof joints and Hinged emergency exit.
    b. Interior finish white reflective baked enamel.
    c. Lighting: Recessed LED down lights with on/off switch in car operating panel. Recess mount fixture flush with inside surface of car top. Provide steel guard on car top over fixture.
    d. Bumper Rails: Two rows of 2" x 12" oak or maple bumpers mounted on both sides and rear of the car.
        1) Locate bottom rail at floor level and top rail at 36" above the car floor.
        2) Bolt rails through car walls with bolt and captive nuts on exterior of wall panel sections on 18" centers.
        3) Finish both upper and lower top edges with a 45-degree chamfered edge to eliminate collection of trash.
        4) Finish ends of upper and lower bumpers on side walls to 45° chamfer to eliminate carts and people from hitting blunt ends.
        5) Flooring: Provide cab flooring which is 1/8” aluminum diamond plate.