

Project Manual

Volume 3 – Divisions 12 - 14

PROJECT NO. 151036-00

PROJECT TITLE: Upstate Health and Wellness Center
Issued for Bid

DATE:

April 20, 2020

State University of New York

at

Upstate Medical University

State University Construction Fund
State University Plaza
353 Broadway
Albany, New York 12246

*Stantec Architecture
722 12th St., NW
Washington, DC 20005*

VOLUME 3

DIVISION 12 FURNISHINGS

12 24 00	WINDOW SHADES	April 20, 2020
12 25 09	WINDOW SHADE CONTROL SYSTEM	April 20, 2020
12 36 00	COUNTERTOPS	April 20, 2020
12 48 13	ENTRANCE FLOOR MATS AND FRAMES	April 20, 2020
12 55 00	DETENTION FURNITURE	April 20, 2020
12 93 00	SITE FURNISHINGS	April 20, 2020

DIVISION 13 SPECIAL CONSTRUCTION

13 49 05	X-RAY RADIATION PROTECTION	April 20, 2020
13 49 41	RFI/EM SHIELDING	April 20, 2020

DIVISION 14 CONVEYING SYSTEMS

14 21 00	ELECTRIC TRACTION ELEVATORS	April 20, 2020
----------	-----------------------------	----------------

VOLUME 4 – Bound as a separate volume and containing technical specification sections in the following divisions:

DIVISION 21 FIRE SUPPRESSION

DIVISION 22 PLUMBING

DIVISION 23 HEATING VENTILATING AND AIR CONDITIONING

DIVISION 25 INTEGRATED AUTOMATION

DIVISION 26 ELECTRICAL

DIVISION 27 COMMUNICATIONS

DIVISION 28 ELECTRONIC SAFETY AND SECURITY

DIVISION 29 PREFABRICATED MODULAR MECHANICAL SYSTEMS

DIVISION 31 EARTHWORK

DIVISION 32 EXTERIOR IMPROVEMENTS

DIVISION 33 UTILITIES

VOLUME 5 – Bound as a separate volume and containing available project information in the following division:

DIVISION 0 PROCUREMENT AND CONTRACTING REQUIREMENTS

END OF VOLUME 3 - TABLE OF CONTENTS

SECTION 12 24 00 - WINDOW SHADES

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Window shades and accessories.
- B. Electric motor operators.
- C. Motor controls.

1.2 RELATED REQUIREMENTS

- A. Leadership in Energy and Environmental Design (LEED) v2009/v3 BD+C for Major Renovations and New Construction, including addenda.
- B. Section 06 10 00 - Rough Carpentry: Concealed wood blocking for attachment of headrail brackets.
- C. Section 09 21 16 - Gypsum Board Assemblies: Substrate for window shade systems.
- D. Section 12 25 09 - Window Shade Control System: Automated solar adaptive control system for motorized window shades.

1.3 REFERENCE STANDARDS

- A. ASTM D4674 - Standard Practice for Accelerated Testing for Color Stability of Plastics Exposed to Indoor Office Environments; 2002a (Reapproved 2010).
- B. ASTM G21 - Standard Practice for Determining Resistance of Synthetic Polymeric Materials to Fungi; 2015.
- C. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
- D. NFPA 701 - Standard Methods of Fire Tests for Flame Propagation of Textiles and Films; 2015.
- E. UL 325 - Standard for Door, Drapery, Gate, Louver, and Window Operators and Systems; Current Edition, Including All Revisions.

1.4 ADMINISTRATIVE REQUIREMENTS

- A. Coordination:
 - 1. Where motorized shades are to be controlled by control systems provided under other sections, coordinate the work with other trades to provide compatible products.

2. Coordinate the work with other trades to provide rough-in of electrical wiring as required for installation of hardwired motorized shades.

B. Preinstallation Meeting: Convene one week prior to commencing work related to products of this section; require attendance of all affected installers.

C. Sequencing:

1. Do not fabricate shades until field dimensions for each opening have been taken.
2. Do not install shades until final surface finishes and painting are complete.

1.5 SUBMITTALS

A. See Section 01 33 23 – Shop Drawings and Samples for additional submittal procedures.

B. Product Data: Provide manufacturer's standard catalog pages and data sheets including materials, finishes, fabrication details, dimensions, profiles, mounting requirements, and accessories.

1. Motorized Shades: Include power requirements and standard wiring diagrams.

C. Shop Drawings: Include shade schedule indicating size, location and keys to details, head, jamb and sill details, mounting dimension requirements for each product and condition, and operation direction.

D. Shop Drawings - Motorized Shades: Provide schematic system riser diagram indicating component interconnections. Include requirements for interface with other systems.

E. Certificates: Manufacturer's documentation that line voltage components are UL listed or UL recognized.

F. Source Quality Control Submittals: Provide test reports indicating compliance with specified fabric properties.

G. Verification Samples: Minimum size 6 inches square, representing actual materials, color and pattern.

H. Manufacturer's Instructions: Include instructions for storage, handling, protection, examination, preparation, and installation of product.

I. Project Record Documents: Record actual locations of control systems and show interconnecting wiring.

J. Operation and Maintenance Data: List of all components with part numbers, sources of supply, and operation and maintenance instructions; include copy of shop drawings.

K. Warranty: Submit sample of manufacturer's warranty and documentation of final executed warranty completed in Owner's name and registered with manufacturer.

1.6 LEED SUBMITTAL REQUIREMENTS:

A. Submit the following information as applicable to products in this section.

1. Credit MR 4: Product data and certification letter from product manufacturers indicating percentages by weight of post-consumer and pre-consumer recycled content for products having recycled content.
 - a. Include statement indicating material cost for each product having recycled content.
2. Credit MR 5: Product data from manufacturer for regional materials indicating location and distance from Project of material manufacturer and point of extraction, harvest, or recovery for each raw material.
 - a. Include statement indicating cost for each regional material and the fraction by weight that is considered regional. For materials with recycled content, the extraction location of the recycled portion can be the recycling facility, scrapyard, depository, stockpile, or another location where the material was collected and packaged for market purchase before manufacture. It is not necessary to track the raw material back to its original point of extraction.
3. Credit MR 7: The invoice for wood products sold to the project contractors or subcontractors who do not modify the product off-site. Invoices should indicate % of new wood in product, % of new wood that is FSC certified, the cost for each certified new wood product, and the COC certification number.
4. Credit IEQ 4.1: Product data from manufacturer for adhesives and sealants used inside the weatherproofing system indicating VOC content of each product used. VOC content to be provided in g/l.
5. Credit IEQ 4.2: Product data from manufacturer for paints and coatings used inside the weatherproofing system indicating VOC content of each product used. VOC content to be provided in g/l.
6. Credit IEQc4.3:
 - a. Product data from manufacturer for carpets installed inside the weatherproofing membrane indicating that products meet the testing and product requirements of the Carpet and Rug Institute Green Label Plus program.
 - b. Product data from manufacturer for carpet pads installed inside the weatherproofing membrane indicating that products meet the testing and product requirements of the Carpet and Rug Institute Green Label program.
 - c. Product data from manufacturer for all hard surface flooring products installed inside the weatherproofing membrane indicating that they are either Floor Score Certified OR meet the testing and product requirements of the California Department of Health Services Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers, including 2004 Addenda.
7. Credit IEQ 4.4:
 - a. Product data from manufacturer for products containing composite wood or agrifiber products installed inside the weatherproofing membrane indicating that they are either NAUF (no added urea formaldehyde) or are ULEF (Ultra low emitting formaldehyde) products. Laminates are exempt.
 - b. Product data from manufacturer for laminating adhesives used on-site or off-site in conjunction with composite wood and/ or agrifiber products indicating that they are either NAUF (no added urea formaldehyde) or are ULEF (Ultra low emitting formaldehyde) products.
8. Credit IDc1.2: Product data from manufacturer for ceiling and wall systems installed inside the weatherproofing membrane indicating that they are either GreenGuard Gold certified, or meet the requirements of the California Department of Health Services Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers, including 2004 addenda.

1.7 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section, with not less than five years of documented experience.
- B. Installer Qualifications: Company specializing in performing work of this type with minimum five years of documented experience.
 - 1. Factory training and demonstrated experience.

1.8 MOCK-UP

- A. Mock-Up: Provide full size mock-up of window shade complete with selected shade fabric including sample of seam when applicable.
 - 1. Obtain Architect's approval of light and privacy characteristics of fabric prior to fabrication.
 - 2. Full-sized mock-up may become part of the final installation.

1.9 DELIVERY, STORAGE, AND HANDLING

- A. Deliver shades in manufacturer's unopened packaging, labeled to identify each shade for each opening.
- B. Handle and store shades in accordance with manufacturer's recommendations.
- C. Window shade components shall be stored in dry locations away from sources of dust, fumes, and odors.

1.10 FIELD CONDITIONS

- A. Do not install products under environmental conditions outside manufacturer's absolute limits.

1.11 WARRANTY

- A. See Section 01 78 00 - Closeout Submittals, for additional warranty requirements.
- B. Provide manufacturer's warranty from Date of Substantial Completion, covering the following:
 - 1. Shade Hardware: One year.
 - 2. Electric Motors: One year.
 - 3. Electronic Control Equipment: One year.
 - 4. Fabric: One year.
 - 5. Aluminum and Steel Coatings: One year.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Manually Operated Roller Shades:

1. Basis of Design:
 - a. Draper, Inc; Clutch Operated FlexShade: www.draperinc.com/#sle.
2. Other acceptable manufacturers:
 - a. Lutron Electronics Co., Inc: www.lutron.com.
 - b. Hunter Douglas Architectural: www.hunterdouglasarchitectural.com/#sle.
- B. Motorized Roller Shades, Motors and Motor Controls:
 1. Draper, Inc; Motorized FlexShade: www.draperinc.com/#sle.
 2. Lutron Electronics Co., Inc; Sivoia QS Roller Shades: www.lutron.com.
 3. Hunter Douglas Architectural; RB500 Motorized Roller Shades: www.hunterdouglasarchitectural.com/#sle.
- C. Shade Fabric:
 1. Basis of Design Manufacturer:
 - a. As indicated on drawings.
- D. Shade Pockets: Manufacturer's standard recessed head pocket, sized for window size and number of shades at each window lite.
- E. Source Limitations: Furnish products produced by a single manufacturer and obtained from a single supplier.

2.2 WINDOW SHADE APPLICATIONS

- A. Shades: Translucent shades.
 1. Type: Roller shades.
 2. Color: As indicated on Drawings.
 3. Mounting: Inside (between jambs).
 4. Operation: Manual and motorized, in locations indicated.

2.3 ROLLER SHADES

- A. Roller Shades: Fabric roller shades complete with mounting brackets, roller tubes, hembars, hardware and accessories; fully factory-assembled.
 1. Drop: Regular and reverse roll.
 2. Size: As indicated on drawings.
- B. Fabric: Non-flammable, color-fast, impervious to heat and moisture, and able to retain its shape under normal operation; PVC-free; 100 percent recycled.
 1. Translucent Shades: Soften the light and reveal only shadow-like outlines to the outside; substantial privacy; Openness Factor less than 1 percent.
 2. Blackout Shades: Block virtually all the light; Openness Factor equal to zero (0).
 3. Flammability: Pass 1 large and small tests.
 4. Fungal Resistance: No growth, tested to 1.
- C. Roller Tube: As required for type of operation, extruded aluminum with end caps.
 1. Dimensions: Manufacturer's standard, selected for suitability for installation conditions, span, and weight of shades.
 2. Fabric Attachment: Utilize extruded channel in tube to accept vinyl spline welded to fabric edge.
 3. Finish: Clear anodized.

- D. Hembars and Hembar Pockets: Wall thickness designed for weight requirements and adaptation to uneven surfaces, to maintain bottom of shade straight and flat.
 - 1. Style: Thermally sealed fabric pocket covering rectangular aluminum hembar.
 - 2. Finish: Baked enamel.
 - 3. Color: White.
 - 4. Blackout Shades: Provide a slot in bottom bar with wool-pile light seal.
- E. Manual Operation: Clutch operated continuous loop; beaded ball chain.
- F. Motor Operation: Motor system housed inside roller tube, controlling shade movement via motor controls indicated; listed to 1.
 - 1. Audible Noise: Maximum 39 dBA measured 3 feet from the motor unit; no audible clicks when motor starts and stops.
 - 2. Motors: Size and configuration as recommended by manufacturer for the type, size, and arrangement of shades to be operated; integrated into shade operating components and concealed from view.
 - 3. Motor Type: Both AC and DC motors are acceptable; provide required transformers for DC motors.
 - 4. Coupling of Multiple Shades: Where possible, minimize number of motors by coupling adjacent shades.
 - 5. Control Compatibility: Fully compatible with the controls to be installed.

2.4 MOTOR CONTROLS

- A. Motorized shades to be controlled by automated solar adaptive window shade control system and associated control devices as specified in Section 12 25 09.
- B. Control Requirements:
 - 1. Unless specifically indicated to be excluded, provide all required equipment, conduit, boxes, wiring, connectors, hardware, supports, accessories, software, system programming, etc. as necessary for a complete operating system that provides the control intent indicated.
 - 2. Capable of controlling shade speed for tracking within plus or minus 0.125 inch throughout entire travel.
 - 3. Capable of stopping within accuracy of 0.125 inch at any point between open and close limits.
 - 4. Capable of assigning shades to groups and subgroups without rewiring.
 - 5. Capable of storing up to 250 programmable stop points, including open, close, and any other position.
 - 6. Provide 10 year power failure memory for preset stops, open and close limits, shade grouping and subgrouping and system configuration.
 - 7. Capable of synchronizing multiple units of the same size to start, stop and move in unison.
- C. Wall-Mounted Controls: UV stabilized visible parts meeting 1; furnished with backlit buttons; provided by shade manufacturer.
 - 1. Control Functions:
 - a. Open: Automatically open controlled shade(s) to fully open position when button is pressed.
 - b. Close: Automatically close controlled shade(s) to fully closed position when button is pressed.
 - c. Raise: Raise controlled shade(s) only while button is pressed.
 - d. Lower: Lower controlled shade(s) only while button is pressed.

- e. Stop shade(s) in motion by tap on any button.
 - f. Presets: Provide three buttons for selection of programmable scenes.
 - g. Multiple Shade Groups: Provide individual controls for each shade group as indicated.
2. Button Engraving: Manufacturer's standard engraving, unless otherwise indicated.
- D. Automatic Solar-Tracking Controls:
1. Calculates the sun's position in the sky relative to the building and then calculates when shade movement is necessary by facade.
 2. Calculates the position of the shade to limit direct sunlight penetration to a predetermined limit.
 3. Shades along same facade to start, stop and track in unison to maintain a consistent exterior aesthetic.
 4. Provides a preset, also referred to as visor position, to limit maximum amount of light entering a space.
 5. Uses the following inputs for startup:
 - a. Building location.
 - b. Facade orientation.
 - c. Window dimensions.
 - d. Solar depth of penetration.
 - e. Number of shade movements per day.
 - f. Visor position of shades.
 6. Requires minimal long term maintenance and service. Does not require user to make daily changes to programming or overall system functionality, unless desired by owner.
 7. Override Capability:
 - a. Manual: Temporary override, using wall controls as specified above.
 - b. Automatic: When sensors detect dark cloudy conditions, shades to go to predetermined visor position to maximize view and available daylight.
 8. Basis of Design: Lutron Electronics, Inc; Quantum/Hyperion Solar-Adaptive Shading: www.lutron.com/#sle.

2.5 ACCESSORIES

- A. Brackets and Mounting Hardware: As recommended by manufacturer for mounting configuration and span indicated.
- B. Interior Side Channels: As required for light sealing blackout shade applications.
- C. Lifting Cables: Nylon coated cable for lifting bottom-up type shades.
- D. Number Plates: Number each opening and shade. Provide aluminum number plates for each shade unit and each opening. Fasten shade plate to the back of roller. Fasten opening plate on unexposed surface of the opening.
- E. Fasteners: Non-corrosive, and as recommended by shade manufacturer.

2.6 FABRICATION

- A. Field measure finished openings prior to ordering or fabrication.
- B. Fabricate shades to fit openings within specified tolerances.

1. Vertical Dimensions: Fill openings from head to sill with 1/2 inch space between bottom bar and window stool.
 2. Horizontal Dimensions - Inside Mounting: Fill openings from jamb to jamb.
 3. Horizontal Dimensions - Outside Mounting: Cover window frames, trim, and casings completely.
- C. Dimensional Tolerances: As recommended in writing by manufacturer.
- D. At openings requiring continuous multiple shade units with separate rollers, locate roller joints at window mullion centers; butt rollers end-to-end.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Examine finished openings for deficiencies that may preclude satisfactory installation.
- B. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.
- C. Start of installation shall be considered acceptance of substrates.

3.2 PREPARATION

- A. Prepare surfaces using methods recommended by manufacturer for achieving best result for substrate under the project conditions.
- B. Coordinate with window installation and placement of concealed blocking to support shades.

3.3 INSTALLATION

- A. Install in accordance with manufacturer's instructions and approved shop drawings, using mounting devices as indicated.
- B. Installation Tolerances:
 1. Inside Mounting: Maximum space between shade and jamb when closed of 1/16 inch.
 2. Maximum Offset From Level: 1/16 inch.
- C. Replace shades that exceed specified dimensional tolerances at no extra cost to Owner.
- D. Adjust level, projection and shade centering from mounting bracket. Verify there is no telescoping of shade fabric. Ensure smooth shade operation.

3.4 SYSTEM STARTUP

- A. Motorized Shade System: Provide services of a manufacturer's authorized representative to perform system startup.

3.5 CLEANING

- A. Clean soiled shades and exposed components as recommended by manufacturer.
- B. Replace shades that cannot be cleaned to "like new" condition.
- C. See Section 01 74 19 - Construction Waste Management and Disposal for additional requirements.

3.6 CLOSEOUT ACTIVITIES

- A. See Section 01 78 00 - Closeout Submittals, for closeout submittals.
- B. See Section 01 79 00 - Demonstration and Training, for additional requirements.
- C. Demonstration: Demonstrate operation and maintenance of window shade system to Owner's personnel.
- D. Training: Train Owner's personnel on operation and maintenance of system.
 - 1. Use operation and maintenance manual as training reference, supplemented with additional training materials as required.
 - 2. Provide minimum of two hours training by manufacturer's authorized personnel at location designated by the Owner.

3.7 PROTECTION

- A. Protect installed products from subsequent construction operations.
- B. Touch-up, repair or replace damaged products before Substantial Completion.

3.8 MAINTENANCE

- A. See Section 01 70 00 - Execution and Closeout Requirements, for additional requirements relating to maintenance service.
- B. Include one year of maintenance in the contract, with six two hour visits upon request of the Owner to perform adjustments and refresher training.

END OF SECTION 12 24 00

SECTION 12 25 09 - WINDOW SHADE CONTROL SYSTEM

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Motors, controls and automatic devices for the following applications:
 - 1. Interior solar shades.
 - 2. Motorized window operators.

1.2 RELATED SECTIONS

- A. Section 12 24 00 - Window Shades.
- B. Division 25 - Integrated Automation.
- C. Division 26 - Electrical.
- D. Division 27 - Communications.

1.3 REFERENCES

- A. Underwriters Laboratories (UL).
- B. Canadian Standards Association (CSA).
- C. European CE Marking System (CE).
- D. The International Organization for Standardization (ISO): ISO 9001 - Quality Management Standards.

1.4 SUBMITTALS

- A. Product Data: Include system performance criteria, controls, characteristics, limitations and trouble-shooting protocol. Include transportation, storage, handling and installation requirements.
- B. Shop Drawings: Include sections, details, materials, operating components, dimensions, gauges, finishes and relationship to operating components and adjacent construction. Include typical system single-line control wiring diagrams and typical sequence of operation.

1.5 QUALITY ASSURANCE

- A. Convene a pre-submittal review meeting prior to finalizing shop drawings for this section and the shop drawings of the related sections listed in 1.2. Manufacturers technical representative shall attend. Agenda will include review of details for work of this section that interfaces with the

work of related sections and confirmation that proper coordination will be shown in the submittals.

- B. Manufacturer's Qualifications: Manufacturer should have at least 25 years experience making roller shade for the commercial market.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Deliver, store and handle materials and products in strict compliance with manufacturer's instructions and recommendations and industry standards.
- B. Store materials in manufacturer's original sealed, labeled packaging until ready for installation and in accordance with manufacturer's instructions. Protect from damage.

1.7 PROJECT CONDITIONS

- A. Maintain environmental conditions (temperature, humidity and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits.

1.8 WARRANTY

- A. Manufacturers Standard Warranty Statement. 5/25 year warranty.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Basis of Design Manufacturer: Draper Inc.
- B. Other acceptable manufacturers:
 1. Lutron Electronics Co., Inc.: www.lutron.com.
 2. Hunter Douglas Architectural: www.hunterdouglasarchitectural.com/#sle.

2.2 SYSTEM DESCRIPTION

- A. Provide systems based on the Draper Digital Network (DDN). The DDN system architecture shall consist entirely of a digital network of serial interconnected intelligent devices to include motors with both line and low voltage power options rated for interior and exterior applications, wired and wireless intelligent keypads, sun sensors and timers. DDN also supports an advanced layer of natural light control, Animeo IP Solar Automation Control, described herein.
 1. DDN shall exchange digital messages on a twisted pair bus line using the differential signaling method defined by the RS-485 standard.
 2. DDN Differential signaling, low data speed communication and high impedance devices shall result in a single bus segment that can be up to 4000 feet long with 255 devices. Minimize noise and interference by using capacitance controlled, unshielded twisted pair cable.

3. System shall allow for unlimited; large networks can be built using RS485 or IP, and then operated as stand-alone system or integrated into building management system.

- B. Animeo IP Total Solar Management system provides a layer of advanced control built on the DDN serial backbone. Animeo IP provides advanced solar automation features such as sun tracking, solar entrance depth management, auto discovery of components, time/calendar event scheduling, comfort timers, facility manager graphical user interface for global system status updates and control, self-contained weather station, virtual keypads, remote management for configuration and control and BMS system integration.

2.3 INTELLIGENT MOTORS

- A. AC Line Voltage Motors: AC Line Voltage. Provide tubular, asynchronous motor, built in reversible capacitor, brushless 110V AC (60 Hz) single-phase motor, thermally protected, permanently lubricated gearbox, maintenance free, providing a range of torque lifting capacity from a minimum of 4Nm to a maximum of 35Nm. Motors must have embedded microprocessor-based controller and onboard serial communications port.
- B. Motor Characteristics:
 1. Motor lifting capacity shall be a minimum of 2Nm torque or greater for low voltage motors and a minimum of 4 Nm torque or greater for line voltage motors without the need for any external mechanical components (springs).
 2. Intelligent motors shall be available in both AC line voltage and DC low voltage power options, with wired and wireless communication options.
 3. Digital encoder delivering precise alignment of +/- 2mm accuracy.
 4. Operating sound level from 3 feet away rated at 38 dBA or better.
 5. Each motor shall be capable of being positioned at fully-up, fully-down or any position between 0-100 percent in 0.5 percent increments.
 6. Each motor shall be UL, CUL recognized, and meet CSA standards.
 7. Each motor's electrical components shall be tested to withstand a 15 kV electrostatic discharge without damage or loss of memory.
 8. Motors shall have factory-assigned individual unique addresses and can be individually configurable over the network without needing to physically access motor.
 9. Motor shall have an onboard communication port for bi-directional communication allowing for status updates, configuration and operation from a PC with the applicable system software.

2.4 SYSTEM COMPONENTS

- A. The Draper Digital Network system shall be able to operate with or without a system-wide master controller.
 1. A scalable shading system, with a system-wide master controller (animeo IP), comprised of intelligent motors and controls utilizing Somfy Digital Network shall have the ability to:
 - a. Network Characteristics:
 - 1) Allow the operation of both AC Line Voltage Motors and DC Low Voltage DDN motors on a single common intelligent shade network without requiring gateway devices.
 - 2) Allow for upper and lower limits to be pre-set by shade manufacturer and adjustable on site via handheld device or PC, without the need to access the roller assembly or external mechanical limit wheels or buttons.

- 3) Allow for intelligent keypads, schedules, motor grouping and virtual switches to be configurable and managed from its own internal IP network, from the building's internal network, or remotely over the internet.
 - 4) Provide an isolated RS485 communication bus input for sensor information to ensure motor and keypad data integrity
 - 5) Include integrated IP networking infrastructure hardware to allow for stand-alone operation, separated from building IP network.
 - 6) Be comprised of multiple bus segments, with each segment up to 4000 feet long with up to 255 devices.
 - 7) Expand system capacity from one bus segment to multiple through the use of system repeaters, or animeo® IP Sub Controllers.
 - 8) Allow for each motor to automatically align itself to a referenced shade position upon receiving a command from the network.
- b. Automated direction of system components
- 1) Solar Entrance Depth Management: Automatic management of light entrance into the building space. Move solar shading system based on the following user-defined parameters, including but not limited to the following:
 - (a) Building location, precise longitude/latitude.
 - (b) Window's cardinal direction.
 - (c) Time of year.
 - (d) Time of day.
 - (e) Size of window.
 - (f) Allowable distance of sunlight entrance into the space.
 - (g) Portion of window that should be un-shaded at all times.
 - (h) Shade position if light level drops below programmed threshold.
 - (i) Sun position based on astronomic time clock with programmable offset.
 - 2) Automated sun-based control shall provide for on and off delays to account for momentary changes of cloud cover.
 - 3) Perform astronomic and real-time scheduled events.
 - (a) Keeps precise time using a self-calibrating real-time clock (RTC) with battery backup.
 - (b) Provide the ability to cascade multiple events for the same motor or group.
- c. Integration of system with other building systems.
- 1) Communicate to Building Management Systems through BACNET IP, BACnet MSTP or MODBUS.
 - 2) Communicate to third party automation systems through HTTP commands via IP and dry relay closure, with the ability to:
 - (a) Enact an event within the automation system.
 - (b) Have the automation system directly control a single motor.
 - (c) Have the automation system simultaneously control a pre-programmed group of motors.
 - 3) Provide a master input from alarm system to position shades in a predetermined position.
- d. Provide a graphical user interface (GUI) for motor commissioning and system configuration.
- 1) Allow for the auto discovery of motors, intelligent keypads and weather sensors present on the DDN Network.
 - 2) Allow visual identification and assignment of motor location to specific window location within a building.

- 3) Have a graphical user interface allowing for “drag and drop” programming of the system based on Microsoft Windows 7 programming conventions.
- 4) Provide setting of parameters in US or Metric units of measurement.
- e. Provide a graphical user interface (GUI) for system building management operation and maintenance.
 - 1) Multilevel administrator system account access allowing building management control without the ability to adjust system configuration
 - 2) Provide status and real-time values for all weather sensors.
 - 3) Provide visual status of motor position and status in both graphical and tabular formats.
 - 4) Provide real-time status for system’s current mode of control: auto, timer, manual, or system override.
 - 5) Provide an optional floor plan view of motor placement and status, with the ability to import standard AutoCAD files.
 - 6) Provide the ability to lock shades at specific position for maintenance.
 - 7) Provide a lock-out timer to disable local control overrides during periods where energy saving performance is a priority.
- f. Provide graphical user interface (GUI) for user operation.
 - 1) Allow for account-based end user password access that provides each individual user a customized virtual keypad for pre-assigned shades and zones.
 - 2) Allow user access from most popular web browsers on a PC, Mac, smartphone, or tablet.

2.5 FABRICATION

- A. Verify dimensions of existing Work before commencing fabrication and report discrepancies to Architect.
- B. Fabricate Work in accordance with Contract Drawings and reviewed shop drawings. Fabricate, fit and assemble Work in shop where possible. Where shop fabrication is not possible, make trial assembly in shop.

PART 3 EXECUTION

3.1 EXAMINATION AND PREPARATION

- A. Prepare substrates using the methods recommended by the manufacturer for achieving best result for the substrates under project conditions.
- B. Do not proceed with installation until substrates have been prepared using the methods recommended by the manufacturer and deviations from manufacturer’s recommended tolerances are corrected. Commencement of installation constitutes acceptance of conditions.
- C. If preparation is the responsibility of another installer, notify Architect in writing of deviations from manufacturer’s recommended installation tolerances and conditions.

3.2 INSTALLATION

- A. Install systems in accordance with approved submittals and manufacturer's written instructions. Install in proper relationship to adjacent construction.
- B. Test for operation as recommended by manufacturer. Repair or replace units until satisfactory results are obtained.

3.3 CLOSEOUT ACTIVITIES

- A. See Section 01 78 00 - Closeout Submittals, for closeout submittals.
- B. See Section 01 79 00 - Demonstration and Training, for additional requirements.
- C. Demonstration: Demonstrate operation and maintenance of window shade system to Owner's personnel.
- D. Training: Train Owner's personnel on operation and maintenance of system.
 - 1. Use operation and maintenance manual as training reference, supplemented with additional training materials as required.
 - 2. Provide minimum of two hours training by manufacturer's authorized personnel at location designated by the Owner.

3.4 CLEANING AND PROTECTION

- A. Clean installed products in accordance with manufacturer's recommendations. Touch-up, repair or replace damaged products before Substantial Completion.
- B. Protect installed products until completion of project.

3.5 MAINTENANCE

- A. See Section 01 70 00 - Execution and Closeout Requirements, for additional requirements relating to maintenance service.
- B. Include one year of maintenance in the contract, with six two hour visits upon request of the Owner to perform adjustments, reprogramming, refresher training, and seasonal readjustment of solar shading system.

END OF SECTION 12 25 09

SECTION 12 36 00 - COUNTERTOPS

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Countertops for architectural cabinet work.
- B. Sinks molded into countertops.

1.2 RELATED REQUIREMENTS

- A. Section 06 41 00 - Architectural Wood Casework.

1.3 REFERENCE STANDARDS

- A. Leadership in Energy and Environmental Design (LEED) v2009/v3 BD+C for Major Renovations and New Construction, including addenda.
- B. ANSI A161.2 - Performance Standards for Fabricated High Pressure Decorative Laminate Countertops; 1998.
- C. ANSI A208.2 - American National Standard for Medium Density Fiberboard for Interior Use; 2009.
- D. ASTM A666 - Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar; 2015.
- E. ASTM D635 - Standard Test Method for Rate of Burning and/or Extent and Time of Burning of Plastics in a Horizontal Position; 2018.
- F. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2018b.
- G. AWI (QCP) - Quality Certification Program; Current Edition.
- H. AWI/AWMAC/WI (AWS) - Architectural Woodwork Standards; 2014, with Errata (2016).
- I. IAPMO Z124 - Plastic Plumbing Fixtures; 2017.
- J. ISFA 2-01 - Classification and Standards for Solid Surfacing Material; 2013.
- K. NEMA LD 3 - High-Pressure Decorative Laminates; 2005.

1.4 SUBMITTALS

- A. See Section 01 33 23 – Shop Drawings and Samples for additional submittal procedures.

- B. Product Data: Manufacturer's data sheets on each product to be used, including:
 - 1. Preparation instructions and recommendations.
 - 2. Storage and handling requirements and recommendations.
 - 3. Specimen warranty.
- C. Shop Drawings: Complete details of materials and installation; combine with shop drawings of cabinets and casework specified in other sections.
- D. Seaming diagrams.
- E. Verification Samples: For each finish product specified, minimum size 6 inches square, representing actual product, color, and patterns.
- F. Seam Sample: For each finish product specified, provide a 6" long seam sample.
- G. Test Reports: Chemical resistance testing, showing compliance with specified requirements.
- H. Installation Instructions: Manufacturer's installation instructions and recommendations.
- I. Maintenance Data: Manufacturer's instructions and recommendations for maintenance and repair of countertop surfaces.

1.5 LEED SUBMITTAL REQUIREMENTS:

- A. Submit the following information as applicable to products in this section.
 - 1. Credit MR 4: Product data and certification letter from product manufacturers indicating percentages by weight of post-consumer and pre-consumer recycled content for products having recycled content.
 - a. Include statement indicating material cost for each product having recycled content.
 - 2. Credit MR 5: Product data from manufacturer for regional materials indicating location and distance from Project of material manufacturer and point of extraction, harvest, or recovery for each raw material.
 - a. Include statement indicating cost for each regional material and the fraction by weight that is considered regional. For materials with recycled content, the extraction location of the recycled portion can be the recycling facility, scrapyard, depository, stockpile, or another location where the material was collected and packaged for market purchase before manufacture. It is not necessary to track the raw material back to its original point of extraction.
 - 3. Credit MR 7: The invoice for wood products sold to the project contractors or subcontractors who do not modify the product off-site. Invoices should indicate % of new wood in product, % of new wood that is FSC certified, the cost for each certified new wood product, and the COC certification number.
 - 4. Credit IEQ 4.1: Product data from manufacturer for adhesives and sealants used inside the weatherproofing system indicating VOC content of each product used. VOC content to be provided in g/l.
 - 5. Credit IEQ 4.2: Product data from manufacturer for paints and coatings used inside the weatherproofing system indicating VOC content of each product used. VOC content to be provided in g/l.
 - 6. Credit IEQc4.3:
 - a. Product data from manufacturer for carpets installed inside the weatherproofing membrane indicating that products meet the testing and product requirements of the Carpet and Rug Institute Green Label Plus program.

- b. Product data from manufacturer for carpet pads installed inside the weatherproofing membrane indicating that products meet the testing and product requirements of the Carpet and Rug Institute Green Label program.
 - c. Product data from manufacturer for all hard surface flooring products installed inside the weatherproofing membrane indicating that they are either Floor Score Certified OR meet the testing and product requirements of the California Department of Health Services Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers, including 2004 Addenda.
7. Credit IEQ 4.4:
- a. Product data from manufacturer for products containing composite wood or agrifiber products installed inside the weatherproofing membrane indicating that they are either NAUF (no added urea formaldehyde) or are ULEF (Ultra low emitting formaldehyde) products. Laminates are exempt.
 - b. Product data from manufacturer for laminating adhesives used on-site or off-site in conjunction with composite wood and/ or agrifiber products indicating that they are either NAUF (no added urea formaldehyde) or are ULEF (Ultra low emitting formaldehyde) products.
8. Credit IDc1.2: Product data from manufacturer for ceiling and wall systems installed inside the weatherproofing membrane indicating that they are either GreenGuard Gold certified, or meet the requirements of the California Department of Health Services Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers, including 2004 addenda.

1.6 QUALITY ASSURANCE

- A. Installer Qualifications: Company specializing in performing work of the type specified in this section, with not less than three years of documented experience.
- B. Fabricator Qualifications: Same fabricator as for cabinets on which tops are to be installed.
- C. Quality Certification: Provide AWI Quality Certification Program (QCP) inspection report and quality certification of completed work.
 - 1. Comply with AWI (QCP) woodwork association quality certification service/program in accordance with requirements for work specified in this section.
 - 2. Provide labels or certificates indicating that the work complies with requirements of AWI/AWMAC/WI (AWS) grade or grades specified.
 - 3. Prior to delivery to the site provide shop drawings with certification labels.
 - 4. Provide labels on each product when required by certification program.
 - 5. Upon completion of installation provide certificate certifying that the installation and products meet the specified requirements.
 - 6. Arrange and pay for inspections required for certification.
 - 7. Replace, repair, or rework all work for which certification is refused.
- D. Installer Qualifications: Fabricator.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Store products in manufacturer's unopened packaging until ready for installation.
- B. Store and dispose of solvent-based materials, and materials used with solvent-based materials, in accordance with requirements of local authorities having jurisdiction.

1.8 FIELD CONDITIONS

- A. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits.

PART 2 PRODUCTS

2.1 COUNTERTOP ASSEMBLIES

- A. Quality Standard: Premium Grade, in accordance with AWI/AWMAC/WI (AWS).
 - 1. Loading requirement: 300 pounds concentrated load, plus dead load.
- B. Plastic Laminate Countertops: High pressure decorative laminate sheet bonded to substrate.
 - 1. Laminate Sheet, Unless Otherwise Indicated: NEMA LD 3, Grade HGP, for postforming, 0.039 inch nominal thickness.
 - a. Manufacturers:
 - 1) Bases of Design: As indicated on Drawings.
 - 2) Other acceptable manufacturers:
 - (a) LG Hi-Macs: www.lghimacsusa.com.
 - (b) Wilsonart, LLC: www.wilsonart.com.
 - b. Surface Burning Characteristics: Flame spread 25, maximum; smoke developed 450, maximum; when tested in accordance with ASTM E84.
 - c. NSF approved for food contact.
 - d. Wear Resistance: In addition to specified grade, comply with NEMA LD 3 High Wear Grade requirements for wear resistance.
 - e. Laminate Core Color: Same as decorative surface.
 - f. Finish: Matte or suede, gloss rating of 5 to 20.
 - g. Surface Color and Pattern: As indicated on drawings.
 - 2. Exposed Edge Treatment: Postformed laminate; front edge substrate built up to minimum 1-1/2 inch thick with radiused edge, integral coved backsplash with radiused top edge.
 - 3. Back and End Splashes: Same material, same construction.
 - 4. Fabricate in accordance with 1, Section 11 - Countertops, Premium Grade.
- C. Solid Surfacing Countertops: Solid surfacing sheet or plastic resin casting over continuous substrate.
 - 1. Flat Sheet Thickness: 1/2 inch, minimum.
 - 2. Solid Surfacing Sheet and Plastic Resin Castings: Complying with ISFA 2-01 and NEMA LD 3; acrylic or polyester resin, mineral filler, and pigments; homogenous, non-porous and capable of being worked and repaired using standard woodworking tools; no surface coating; color and pattern consistent throughout thickness.
 - a. Manufacturers:
 - 1) Basis of Design: www.corian.com.
 - 2) Formica Corporation: www.formica.com.
 - 3) Wilsonart: www.wilsonart.com.
 - b. Surface Burning Characteristics: Flame spread 25, maximum; smoke developed 450, maximum; when tested in accordance with ASTM E84.
 - c. NSF approved for food contact.
 - d. Sinks and Bowls: Integral castings; minimum 3/4 inch wall thickness; comply with IAPMO Z124.

- e. Finish on Exposed Surfaces: Matte, gloss rating of 5 to 20.
- f. Color and Pattern: As indicated on drawings.
- 3. Other Components Thickness: 1/2 inch, minimum.
- 4. Exposed Edge Treatment: Built up to minimum 1-1/2 inch thick; square edge; use marine edge at sinks.
- 5. Back and End Splashes: Same sheet material, square top; minimum 4 inches high.
- 6. Skirts: As indicated on drawings.
- 7. Fabricate in accordance with AWI/AWMAC/WI (AWS), Section 11 - Countertops, Premium Grade.

2.2 ACCESSORY MATERIALS

- A. Wood-Based Components:
 - 1. Wood fabricated from old growth timber is not permitted.
 - 2. Provide sustainably harvested wood, certified or labeled as specified in Section 01 60 00.
 - 3. Provide wood harvested within a 500 mile radius of the project site.
 - 4. Wood fabricated from timber recovered from riverbeds or otherwise abandoned is permitted, unless otherwise noted, provided it is clean and free of contamination; identify source; provide lumber re-graded by an inspection service accredited by the American Lumber Standard Committee, Inc.
- B. Medium Density Fiberboard for Supporting Substrate: ANSI A208.2.
- C. Adhesives: Chemical resistant waterproof adhesive as recommended by manufacturer of materials being joined.
- D. Joint Sealant: Mildew-resistant silicone sealant, color to match adjacent surface.

2.3 FABRICATION

- A. Fabricate tops and splashes in the largest sections practicable, with top surface of joints flush.
 - 1. Join lengths of tops using best method recommended by manufacturer.
 - 2. Fabricate to overhang fronts and ends of cabinets 1 inch except where top butts against cabinet or wall.
 - 3. Prepare all cutouts accurately to size; replace tops having improperly dimensioned or unnecessary cutouts or fixture holes.
- B. Provide back/end splash wherever counter edge abuts vertical surface unless otherwise indicated.
 - 1. Secure to countertop with concealed fasteners and with contact surfaces set in waterproof glue.
 - 2. Height: 4 inches, unless otherwise indicated.
- C. Solid Surfacing: Fabricate tops up to 144 inches long in one piece; join pieces with adhesive sealant in accordance with manufacturer's recommendations and instructions.
 - 1. For areas larger than 144 inches provide seaming diagram for approval by Architect.
- D. Wall-Mounted Counters: Provide skirts, aprons, brackets, and braces as indicated on drawings, finished to match.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Do not begin installation until substrates have been properly prepared.
- B. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.
- C. Verify that wall surfaces have been finished and mechanical and electrical services and outlets are installed in proper locations.

3.2 PREPARATION

- A. Clean surfaces thoroughly prior to installation.
- B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

3.3 INSTALLATION

- A. Securely attach countertops to cabinets using concealed fasteners. Make flat surfaces level; shim where required.
- B. Attach plastic laminate countertops using screws with minimum penetration into substrate board of 5/8 inch.
- C. Seal joint between back/end splashes and vertical surfaces, and between field joints.

3.4 TOLERANCES

- A. Variation From Horizontal: 1/8 inch in 10 feet, maximum.
- B. Offset From Wall, Countertops: 1/8 inch maximum; 1/16 inch minimum.
- C. Field Joints: 1/32 inch wide, maximum.

3.5 CLEANING

- A. Clean countertops surfaces thoroughly.

3.6 PROTECTION

- A. Protect installed products until completion of project.

- B. Touch-up, repair or replace damaged products before Date of Substantial Completion.

END OF SECTION 12 36 00

SECTION 12 48 13 - ENTRANCE FLOOR MATS AND FRAMES

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Extruded aluminum entrance floor grilles.
- B. Vinyl floor mat.

1.2 SUBMITTALS

- A. See Section 01 33 23 – Shop Drawings and Samples for additional submittal procedures.
- B. Product Data: Provide data indicating properties of walk-off surface, component dimensions and recessed frame characteristics.
- C. Shop Drawings: Indicate dimensions and details for recessed frame.
 - 1. For recessed frames located within a dimensionally restricted area, show dimensions of space within which the frame will be installed.
- D. Samples: Submit two samples, 12 x 12 inch in size illustrating pattern, color, finish, edging .
- E. Maintenance Data: Include cleaning instructions, stain removal procedures.

1.3 LEED SUBMITTAL REQUIREMENTS:

- A. Submit the following information as applicable to products in this section.
 - 1. Credit MR 4: Product data and certification letter from product manufacturers indicating percentages by weight of post-consumer and pre-consumer recycled content for products having recycled content.
 - a. Include statement indicating material cost for each product having recycled content.
 - 2. Credit MR 5: Product data from manufacturer for regional materials indicating location and distance from Project of material manufacturer and point of extraction, harvest, or recovery for each raw material.
 - a. Include statement indicating cost for each regional material and the fraction by weight that is considered regional. For materials with recycled content, the extraction location of the recycled portion can be the recycling facility, scrapyard, depository, stockpile, or another location where the material was collected and packaged for market purchase before manufacture. It is not necessary to track the raw material back to its original point of extraction.
 - 3. Credit MR 7: The invoice for wood products sold to the project contractors or subcontractors who do not modify the product off-site. Invoices should indicate % of new wood in product, % of new wood that is FSC certified, the cost for each certified new wood product, and the COC certification number.

4. Credit IEQ 4.1: Product data from manufacturer for adhesives and sealants used inside the weatherproofing system indicating VOC content of each product used. VOC content to be provided in g/l.
5. Credit IEQ 4.2: Product data from manufacturer for paints and coatings used inside the weatherproofing system indicating VOC content of each product used. VOC content to be provided in g/l.
6. Credit IEQc4.3:
 - a. Product data from manufacturer for carpets installed inside the weatherproofing membrane indicating that products meet the testing and product requirements of the Carpet and Rug Institute Green Label Plus program.
 - b. Product data from manufacturer for carpet pads installed inside the weatherproofing membrane indicating that products meet the testing and product requirements of the Carpet and Rug Institute Green Label program.
 - c. Product data from manufacturer for all hard surface flooring products installed inside the weatherproofing membrane indicating that they are either Floor Score Certified OR meet the testing and product requirements of the California Department of Health Services Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers, including 2004 Addenda.
7. Credit IEQ 4.4:
 - a. Product data from manufacturer for products containing composite wood or agrifiber products installed inside the weatherproofing membrane indicating that they are either NAUF (no added urea formaldehyde) or are ULEF (Ultra low emitting formaldehyde) products. Laminates are exempt.
 - b. Product data from manufacturer for laminating adhesives used on-site or off-site in conjunction with composite wood and/ or agrifiber products indicating that they are either NAUF (no added urea formaldehyde) or are ULEF (Ultra low emitting formaldehyde) products.
8. Credit IDc1.2: Product data from manufacturer for ceiling and wall systems installed inside the weatherproofing membrane indicating that they are either GreenGuard Gold certified, or meet the requirements of the California Department of Health Services Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers, including 2004 addenda.

PART 2 PRODUCTS

2.1 ENTRANCE FLOOR GRILLES AND GRATINGS

- A. Bases of Design:
 1. WM1: Nystrom, Inc.; GD74-FLBM: www.nystrom.com.
 2. WM2: Mats Inc.; Soft Grid SB: www.matsinc.com
- B. Other acceptable manufacturers:
 1. C/S Group: www.c-sgroup.com
 2. Kadee Industries, Inc.: www.kadeeindustries.com.
- C. Entrance Floor Grilles: Recessed extruded aluminum grille assembly with nominal 1 inch wide tread strips running perpendicular to traffic flow, slots between treads, and perimeter frame forming sides of recess; grille hinged for access to recess.
 1. Recess Depth: 1-3/4 inches.
 2. Tread Surfaces: Alternating serrated anodized aluminum and nylon carpet.
 3. Colors: As indicated on drawings.

4. Length in Direction of Traffic Flow: 72 inches, minimum and as shown on Drawings.
5. Width Perpendicular to Traffic Flow: Full width of entrance door opening.
6. Frame: Anodized aluminum for embedding in concrete; minimal exposed trim; stud or hook concrete anchors.

- D. Mounting: Top of non-resilient members level with adjacent floor.
1. Provide non-metallic shims as needed.
- E. Structural Capacity: Capable of supporting a rolling load of 1000 pounds without permanent deformation or noticeable deflection.
- F. Vibration Resistant Fabrication: All members welded, riveted, or bolted; no snap or friction connections.

2.2 MATS

- A. Vinyl Floor Mat: Constructed from up to 100% post-industrial recycled PVC. Welded in a non-hinged, grille design with an embossed non-skid surface, (non-embossed surfaces not acceptable) to sizes indicated with the following characteristics:
1. Extruded PVC Grid, black.
- B. Framing and Nosing Accessories for Vinyl Foot Grille:
1. Surface Mounted Application: 1/4" inches grid and beveled, heavy-duty attached nosing.
- C. Product Testing for Vinyl Mat:
1. ASTM C1028 Static Coefficient of Friction: Wet .54; Dry .66
 2. ASTM E648 Critical Radiant Flux: Class 1
 3. ASTM D3884 Abrasion Resistance: 0.4% loss after 1,000 cycles (Taber abrader)

2.3 FABRICATION

- A. Construct recessed mat frames square, tight joints at corners, rigid. Coat surfaces with protective coating where in contact with cementitious materials.
- B. Fabricate mats in single unit sizes; fabricate multiple mats where indicated.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify that floor opening for mats are ready to receive work.

3.2 PREPARATION

- A. Mats: Verify size of floor recess before fabricating mats.
- B. Vacuum clean floor recess.

3.3 INSTALLATION

- A. Install frames to achieve flush plane with finished floor surface.
- B. Install walk-off surface in floor recess flush with finish floor after cleaning of finish flooring.

3.4 TOLERANCES

- A. Maximum Gap Formed at Recessed Frame From Mat Size: 1/8 inch.

END OF SECTION 12 48 13

SECTION 12 55 00 - DETENTION FURNITURE

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Detention seat.
- B. Related Requirements:
 - 1. Section 10 28 13.63 "Detention Toilet Accessories" for detention toilet and bath accessories.

1.2 REFERENCE STANDARDS

- A. Leadership in Energy and Environmental Design (LEED) v2009/v3 BD+C for Major Renovations and New Construction, including addenda.

1.3 COORDINATION

- A. Coordinate installation of anchorages for detention furniture. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors that are to be embedded in adjacent construction. Deliver such items to Project site in time for installation.
- B. Coordinate size and location of recesses in wall construction to receive detention furniture.

1.4 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at Project site.

1.5 ACTION SUBMITTALS

- A. See Section 01 33 23 – Shop Drawings and Samples for additional submittal procedures.
- B. Product Data: For each type of product.
 - 1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for detention furniture.
- C. Sustainable Design Submittals:
 - 1. Product Data: For recycled content, indicating post-consumer and preconsumer recycled content and cost.
 - 2. Product Data: For sealants, indicating VOC content.
 - 3. Laboratory Test Reports: For sealants, indicating compliance with requirements for low-emitting materials.

4. Laboratory Test Reports: For sealants, indicating compliance with requirements for low-emitting materials.

D. Shop Drawings: For detention furniture.

1. Include plans, elevations, sections, and attachment details.
2. Indicate locations, dimensions, and profiles of wall and floor reinforcements.
3. Indicate locations and installation details of built-in anchors.
4. Show elevations of detention furniture and indicate dimensions of furniture, preparations for receiving anchors, and locations of anchorage.
5. Show details of attachment of detention furniture to built-in anchors.

1.6 INFORMATIONAL SUBMITTALS

- A. Welding certificates.
- B. Examination reports, documenting inspections of substrates, areas, and conditions.
- C. Anchor inspection reports, documenting inspections of built-in and cast-in anchors.
- D. Field quality-control reports, documenting inspections of installed products.
 1. Field quality-control certification, signed by Contractor.

1.7 MAINTENANCE MATERIAL SUBMITTALS

- A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
 1. Security Fasteners: Furnish not less than one box for every 50 boxes or fraction thereof, of each type and size of security fastener installed.
 2. Tools: Provide two sets of tools for installing and removing security fasteners.

1.8 QUALITY ASSURANCE

- A. Welding Qualifications: Qualify procedures and personnel according to the following:
 1. AWS D1.1/D1.1M, "Structural Welding Code - Steel."
 2. AWS D1.3/D1.3M, "Structural Welding Code - Sheet Steel."

PART 2 PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Recycled Content: Postconsumer recycled content plus one-half of preconsumer recycled content not less than 25 percent.

2.2 DETENTION SEAT

- A. Single Seat:

1. Basis-of-Design Product: Subject to compliance with requirements, provide product indicated on Drawings, or comparable product by one of the following:
 - a. American Jail Products, LLC.
 - b. Maximum Security Products Corp.
 2. Pan: Formed from 12-gauge nominal-thickness steel sheet.
 - a. Size: Minimum 18 inches wide by 48 inches long with pan 18 inches above floor.
 3. Legs and Frames: Formed from 2-by-2-by-3/16-inch steel angle welded at connections to each other and to pan; provide four legs for each seat.
 4. Mounting Plates: Formed from 1/4-inch-thick, steel plate punched with one hole for floor anchorage; provide one mounting plate for each leg.
 5. Cuff Rings: Formed from 3/8" diameter steel, welded to frame.
- B. Materials:
1. Steel Plates, Shapes, and Bars: ASTM A36/A36M.
 2. Cold-Rolled Steel Sheet: ASTM A1008/A1008M, CS (Commercial Steel), Type B; suitable for exposed applications.
 3. Hot-Rolled Steel Sheet: ASTM A1011/A1011M, CS (Commercial Steel), Type B; free of scale, pitting, or surface defects; pickled and oiled.
- C. Finishes:
1. Steel Factory Prime Finish: Clean, pretreat, and apply manufacturer's standard primer.
 2. Steel Baked-Enamel or Powder-Coat Finish: Clean, pretreat, and apply manufacturer's standard two-coat, baked-on finish consisting of prime coat and thermosetting topcoat to a minimum dry film thickness of 2 mils.
 - a. Color and Gloss: As selected by Architect from manufacturer's full range.

2.3 FABRICATION

- A. Shop Assembly: Preassemble items in shop to greatest extent possible to minimize field splicing and assembly. Disassemble units only as necessary for shipping and handling limitations. Use connections that maintain structural value of joined pieces. Clearly mark units for reassembly and coordinated installation.
- B. Coordinate dimensions and attachment methods of detention furniture with those of adjoining construction to produce integrated assemblies with closely fitting joints and with edges and surfaces aligned unless otherwise indicated.
- C. Shear and punch metals cleanly and accurately. Remove burrs.
- D. Form and grind edges and corners to be free of sharp edges or rough areas.
 1. Fabricate detention furniture with no more than 1/32-inch gap between component materials. Weld edges that cannot be crimped to meet tolerance so as to provide a seamless joint with no place for concealment of contraband.
- E. Form metal in maximum lengths to minimize joints. Form bent-metal corners to smallest radius possible without causing grain separation or otherwise impairing the Work.
- F. Weld corners and seams continuously to comply with referenced AWS standard and the following:
 1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
 2. Obtain fusion without undercut or overlap.
 3. Remove welding flux immediately.

4. Finish exposed welds and surfaces smooth and blended at exposed connections so that no roughness shows after finishing and contour of welded surface matches that of adjacent surface.
 5. Weld before finishing components to greatest extent possible. Remove weld spatter and welding oxides from exposed surfaces by descaling or grinding.
- G. Provide for anchorage of type indicated; coordinate with supporting structure. Fabricate and space anchoring devices to secure detention furniture rigidly in place and to support expected loads. Build in straps, plates, and brackets as needed to support and anchor fabricated items to adjoining construction. Reinforce formed-metal units as needed to attach and support other construction.
- H. Cut, reinforce, drill, and tap detention furniture as indicated to receive hardware, security fasteners, and similar items.
- I. Form exposed work true to line and level with accurate angles, surfaces, and straight sharp edges.
- J. Form exposed connections with hairline joints, flush and smooth using concealed fasteners where possible. Use exposed security fasteners of type indicated or, if not indicated, flat-head (countersunk) security fasteners. Locate joints where least conspicuous.

2.4 SECURITY FASTENERS

- A. Operable only by tools produced by fastener manufacturer or other licensed fabricator for use on specific type of fastener. Drive-system type, head style, material, and protective coating as required for assembly, installation, and strength, and as follows:
1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
 - a. Acument Global Technologies; Acument Intellectual Properties, LLC.
 - b. Bryce Fastener.
 - c. Safety Sock, LLC.
 - d. Tamper-Pruf Screws.
 2. Drive-System Type: Pinned Torx-Plus.
 3. Fastener Strength: 120,000 psi.

2.5 SECURITY SEALANTS

- A. Epoxy Security Sealants: Manufacturer's standard, non-sag, tamper-resistant sealant for joints with no movement.
1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
 - a. BASF Corp. - Construction Chemicals
 - b. Euclid Chemical Company (The); an RPM company.
 - c. Pecora Corporation.
 2. Sealant shall have a VOC content of 250 g/L or less.

2.6 ACCESSORIES

- A. Welding Rods and Bare Electrodes: Select according to AWS specifications for metal alloy welded.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of detention furniture.
- B. Prepare written report, endorsed by Installer, listing conditions detrimental to performance of detention furniture.
- C. Verify locations of detention furniture with those indicated on Shop Drawings.
- D. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. Cutting, Fitting, and Placement: Obtain manufacturer's written approval for cutting, drilling, and fitting required for installing detention furniture. Set detention furniture accurately in location, alignment, and elevation; with edges and surfaces level, plumb, true, and free of rack; and measured from established lines and levels.
- B. Anchor furniture with security fasteners to floors and walls at intervals required by expected loads, but not more than 12 inches o.c.
 - 1. Use security fasteners with head styles appropriate for installation requirements, strength, and finish of adjacent materials, except that a maximum of two different sets of tools shall be required to operate security fasteners for Project.
 - 2. Weld nuts onto cast-in-place anchors after installation so as to be nonremovable.
- C. Apply epoxy security sealant at all exposed gaps between detention furniture and adjacent construction greater than 1/16 inch.

3.3 FIELD QUALITY CONTROL

- A. Inspect installed products to verify compliance with requirements. Prepare inspection reports and indicate compliance with and deviations from the Contract Documents.
- B. Remove and replace detention work if inspections indicate that work does not comply with specified requirements. Remove malfunctioning units; replace with new units.
- C. Perform additional inspections to determine compliance of replaced or additional work. Prepare inspection reports.

- D. Prepare field quality-control certification that states installed products and their installation comply with requirements in the Contract Documents.

3.4 CLEANING AND PROTECTION

- A. Touchup Painting: Immediately after erection, clean bolted connections and abraded areas of shop paint, and paint exposed areas with same material used for shop painting to comply with SSPC-PA 1 for touching up shop-painted surfaces.

END OF SECTION 12 55 00

SECTION 12 93 00 – SITE FURNISHINGS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section Includes:

1. Bicycle racks.
2. Trash receptacles.
3. Bollards.
4. Lighted bollards.
5. Rectangular tree grate
6. Heavy duty bollards
7. Concrete bench wall wood slat seating

- B. Related Requirements:

1. Section 03 30 53 "Miscellaneous Cast-in-Place Concrete" for installing anchor bolts cast in concrete footings.
2. Section 03 30 60 "Integrally Colored Concrete" for concrete linear bench walls and curvilinear bench walls.
3. Section 31 20 00 "Earth Moving" for excavation for installing concrete footings.
4. Section 26 20 10 – "Low Voltage Distribution" for power to exterior lighting.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product.

- B. LEED Submittals:

1. Product Data for Credit MR 4.1: For products having recycled content, documentation indicating percentages by weight of postconsumer and preconsumer recycled content. Include statement indicating cost for each product having recycled content.
Product Certificates for Credit MR 5: For products and materials required to comply with requirements for regional materials, certificates indicating location of material manufacturer and point of extraction, harvest, or recovery for each raw material. Include statement indicating distance to Project, cost for each regional material, and fraction by weight that is considered regional.
2. Certificates for Credit MR 6: Chain-of-custody certificates indicating that wood components of site furnishings comply with forest certification requirements. Include

documentation that manufacturer is certified for chain of custody by an FSC-accredited certification body. Include statement indicating cost for each certified wood product.

- C. Samples: For each exposed product and for each color and texture specified.
- D. Samples for Initial Selection: For units with factory-applied finishes.

1.4 INFORMATIONAL SUBMITTALS

- A. Material Certificates: For site furnishings.
 - 1. Wood Preservative Treatment: Include certification by treating plant stating type of preservative solution and pressure process used, net amount of preservative retained, and compliance with applicable standards.

1.5 CLOSEOUT SUBMITTALS

- A. Maintenance Data: For site furnishings to include in maintenance manuals.

1.6 MAINTENANCE MATERIAL SUBMITTALS

- A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
 - 1. Trash Receptacle Inner Containers: Two full-size units for each size indicated.

PART 2 - PRODUCTS

2.1 SITE FURNISHINGS

- A. Provide site furnishings, including bike racks, trash receptacles, bollards, lighted bollards, in the quantity, and with the installation method as indicated on the Documents.
- B. Finish: Manufacturer's powder coat. Standard of quality: Pangard II Polyester Powder coat system, minimum thickness 2.5 mils, or approved equal.
 - 1. Color: As selected by the Architect from the manufacturer's full range of standard and custom colors; Finish color shall match, "Stormcloud", standard powder coat finish color, offered by Landscape Forms, Inc.
- C. Supply all site furnishings from a single source, single manufacturer, except as indicated for Site Furnishings palette-type C.
- D. Site Furnishings: Subject to compliance with the requirements, provide site furnishings from one of the following Palette-Types:
 - 1. Palette-Type A - Manufacturer: Landscape Forms, Inc.; 7800 E. Michigan Avenue, Kalamzoo, Michigan 49048. Phone: (800) 521-2546. Fax: (269) 381-3455. Website: www.landscapeforms.com. Email: specify@landscapeforms.com

- a. Bike Racks:
 - 1) Model: "Ride"
 - 2) Mounting: Surface-mounted.
 - b. Trash Receptacles:
 - 1) Model: "Pitch"
 - 2) Style: Side-opening.
 - 3) Mounting: Surface-mounted.
 - c. Bollards:
 - 1) Model: "Stop".
 - 2) Mounting: Embedded.
 - 3) Tube color: Black.
 - 4) Casting color: "Stormcloud".
 - 5) Option: Without optional LED lighting.
 - d. Lighted Bollards:
 - 1) Model: "Stop".
 - 2) Mounting: Embedded.
 - 3) Tube color: Black.
 - 4) Casting color: "Stormcloud"
 - 5) Option: With optional LED lighting.
2. Palette-Type B - Manufacturer: Forms + Surfaces; US location: 30 Pine Street Pittsburgh, PA 152237 Phone: (800) 451-0410. Fax: (412) 871-7840. Website: www.forms-surfaces.com.
- a. Bike Racks:
 - 1) Model: "Cordia"
 - 2) Mounting: Surface-mounted.
 - b. Trash Receptacles:
 - 1) Model: "Orbit"
 - 2) Mounting: Surface-mounted.
 - c. Bollards:
 - 1) Model: "Aptos".
 - 2) Mounting: Embedded.
 - 3) Option: Without light fixture; unlit.
 - d. Lighted Bollards:
 - 1) Model: "Aptos".
 - 2) Mounting: Embedded.
3. Palette-Type C - Manufacturers: As listed for site furnishing type.
- a. Bike Racks: Maglin Site Furniture; 3-468 Innovation Way Woodstock, ON N4V 0B9 Phone (800) 716-550 Fax (877) 260-9393 Website: www.maglin.com
 - 1) Model: "Cordia"
 - 2) Mounting: Surface-mounted.
 - b. Trash Receptacles: Canterbury Designs 6195 Maywood Ave Huntington Park, CA 90255 Phone: (800) 935-7111 Fax: (323) 936-7115 Website: www.canterbury-designs.com
 - 1) Model: "Silhouette".
 - 2) Mounting: Surface-mounted.
 - c. Bollards: BEGA-US; 1000 BEGA Way Carpentaria, CA 93013 Phone: (805) 684-0533 Website: www.bega-us.com
 - 1) Model: "System bollard head" with system bollard tube to match Lighted Bollards.
 - 2) Mounting: Embedded.

- d. Lighted Bollards: BEGA-US; 1000 BEGA Way Carpenteria, CA 93013 Phone: (805) 684-0533 Website: www.bega-us.com
 - 1) Model: "99-570 Express".
 - 2) Mounting: Embedded.
 - 3) Lighting: 14.4 W LED; 360° output.

2.2 RECTANGULAR TREE GRATES

- A. Meet current City of Syracuse Standards.
- B. Gravel: Graded, round, washed clean gravel, ½" – ¾" in size,
- C. Aggregate bonding material: Single polymer component, moisture-curing liquid aggregate binder. Gravel-lok as manufactured by Cel-tek Geosynthetics or approved equal. Color: clear.

2.3 HEAVY DUTY BOLLARDS

- A. Refer to site details.
 1. Mounting: Embedded, as detailed.
 2. Material: 6" Diameter Steel, Schedule 80.
 3. Finish: Painted; 1 coat primer, 2 coats topcoat.
 4. Color: To match site furnishings; 'Stormcloud'.
 5. Height: As indicated.

2.4 CONCRETE BENCH WALL WOOD SLAT SEATING

- A. Refer to site details.
 1. Mounting: Embedded and anchored, as detailed.
 2. Material: 3"x4" Black Locust
 3. Color: Natural finish.
 4. Height: As indicated.

2.5 MISCELLANEOUS MATERIALS

- A. Epoxy Zinc-Rich Primer: Complying with MPI#20 and compatible with topcoat.
 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. 3M Specified Construction Products Division.
- B. Polyurethane Topcoat: Complying with MPI #72 and compatible with undercoat.
 - a. 3M Specified Construction Products Division.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine areas and conditions, with Installer present, for compliance with requirements for correct and level finished grade, mounting surfaces, installation tolerances, and other conditions affecting performance of the Work.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION, GENERAL

- A. Comply with manufacturer's written installation instructions unless more stringent requirements are indicated. Complete field assembly of site furnishings where required.
 - 1. Rectangular Tree Grates: Comply with City of Syracuse Standards.
- B. Unless otherwise indicated, install site furnishings after landscaping and paving have been completed.
- C. Install site furnishings level, plumb, true, and securely anchored positioned at locations indicated on Drawings.
- D. Post Setting: Set cast-in support posts in concrete footing with smooth top, shaped to shed water. Protect portion of posts above footing from concrete splatter. Verify that posts are set plumb or at correct angle and are aligned and at correct height and spacing. Hold posts in position during placement and finishing operations until concrete is sufficiently cured.
- E. Posts Set into Voids in Concrete: Form or core-drill holes for installing posts in concrete to depth recommended in writing by manufacturer of site furnishings and 3/4 inch larger than OD of post. Clean holes of loose material, insert posts, and fill annular space between post and concrete with nonshrink, nonmetallic grout, mixed and placed to comply with anchoring material manufacturer's written instructions, with top smoothed and shaped to shed water.

END OF SECTION

SECTION 13 49 05 - X-RAY RADIATION PROTECTION

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Construction of lead enclosure around x-ray treatment rooms and control rooms.
- B. Sheet lead applied to gypsum board.
- C. Radiation treatment room view window frames.
- D. Leaded glass.

1.2 RELATED REQUIREMENTS

- A. Section 08 11 13 - Hollow Metal Doors and Frames: Lead-lined hollow metal doors and frames.
- B. Section 08 14 16 - Flush Wood Doors: Lead-lined flush wood doors.
- C. Section 08 71 00 - Door Hardware: Lead-lined door hardware.
- D. Section 09 21 16 - Gypsum Board Assemblies: Joint taping over lead lined gypsum board.
- E. Section 09 91 23 - Interior Painting: Field painting.

1.3 REFERENCE STANDARDS

- A. Leadership in Energy and Environmental Design (LEED) v2009/v3 BD+C for Major Renovations and New Construction, including addenda.
- B. APA E30 - Engineered Wood Construction Guide; 2016.
- C. ASTM B749 - Standard Specification for Lead and Lead Alloy Strip, Sheet, and Plate Products; 2014.
- D. ASTM C1036 - Standard Specification for Flat Glass; 2016.
- E. ASTM C1048 - Standard Specification for Heat-Strengthened and Fully Tempered Flat Glass; 2018.
- F. ASTM C1396/C1396M - Standard Specification for Gypsum Board; 2017.
- G. NCRP Report 147 - Structural Shielding Design and Evaluation for Medical Uses of X Rays and Gamma Rays of Energies up to 10 MeV; 2004.
- H. PS 1 - Structural Plywood; 2009.

1.4 SYSTEM DESCRIPTION

- A. Radiation Protection: Contain, without leakage, emitted radiation, measured at wall surface with measuring device simulating the emitting equipment.
 - 1. Refer to the shielding report and the drawings for additional information.
- B. Protection: Walls, floor, including wall interruptions for doors.

1.5 ADMINISTRATIVE REQUIREMENTS

- A. Coordinate this work with the construction of the building elements that x-ray protection is applied to or installed in.
- B. Preinstallation Meeting: Convene one week prior to commencing work of this section.

1.6 SUBMITTALS

- A. See Section 01 33 23 – Shop Drawings and Samples for additional submittal procedures.
- B. Product Data: Provide data on leaded glass.
- C. Shop Drawings: Indicate layout, details, dimensions, interface with adjoining work .
- D. Manufacturer's Certificate: Certify that leaded glazing capabilities proposed by manufacturer meet or exceed specified requirements.

1.7 LEED SUBMITTAL REQUIREMENTS:

- A. Submit the following information as applicable to products in this section.
 - 1. Credit MR 4: Product data and certification letter from product manufacturers indicating percentages by weight of post-consumer and pre-consumer recycled content for products having recycled content.
 - a. Include statement indicating material cost for each product having recycled content.
 - 2. Credit MR 5: Product data from manufacturer for regional materials indicating location and distance from Project of material manufacturer and point of extraction, harvest, or recovery for each raw material.
 - a. Include statement indicating cost for each regional material and the fraction by weight that is considered regional. For materials with recycled content, the extraction location of the recycled portion can be the recycling facility, scrapyard, depository, stockpile, or another location where the material was collected and packaged for market purchase before manufacture. It is not necessary to track the raw material back to its original point of extraction.
 - 3. Credit MR 7: The invoice for wood products sold to the project contractors or subcontractors who do not modify the product off-site. Invoices should indicate % of new wood in product, % of new wood that is FSC certified, the cost for each certified new wood product, and the COC certification number.
 - 4. Credit IEQ 4.1: Product data from manufacturer for adhesives and sealants used inside the weatherproofing system indicating VOC content of each product used. VOC content to be provided in g/l.

5. Credit IEQ 4.2: Product data from manufacturer for paints and coatings used inside the weatherproofing system indicating VOC content of each product used. VOC content to be provided in g/l.
6. Credit IEQc4.3:
 - a. Product data from manufacturer for carpets installed inside the weatherproofing membrane indicating that products meet the testing and product requirements of the Carpet and Rug Institute Green Label Plus program.
 - b. Product data from manufacturer for carpet pads installed inside the weatherproofing membrane indicating that products meet the testing and product requirements of the Carpet and Rug Institute Green Label program.
 - c. Product data from manufacturer for all hard surface flooring products installed inside the weatherproofing membrane indicating that they are either Floor Score Certified OR meet the testing and product requirements of the California Department of Health Services Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers, including 2004 Addenda.
7. Credit IEQ 4.4:
 - a. Product data from manufacturer for products containing composite wood or agrifiber products installed inside the weatherproofing membrane indicating that they are either NAUF (no added urea formaldehyde) or are ULEF (Ultra low emitting formaldehyde) products. Laminates are exempt.
 - b. Product data from manufacturer for laminating adhesives used on-site or off-site in conjunction with composite wood and/ or agrifiber products indicating that they are either NAUF (no added urea formaldehyde) or are ULEF (Ultra low emitting formaldehyde) products.
8. Credit IDc1.2: Product data from manufacturer for ceiling and wall systems installed inside the weatherproofing membrane indicating that they are either GreenGuard Gold certified, or meet the requirements of the California Department of Health Services Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers, including 2004 addenda.

1.8 QUALITY ASSURANCE

- A. Perform Work in accordance with NCRP Report 147 .
- B. Manufacturer Qualifications: Company specializing in manufacturing the Products specified in this section with minimum five years documented experience.
- C. Installer Qualifications: Company specializing in performing the work of this section with minimum five years documented experience.

1.9 REGULATORY REQUIREMENTS

- A. Conform to applicable health and occupation code for integrity of radiation protection and continuity of protected construction.

1.10 MOCK-UP

- A. Provide lead-lined wall mock-up, 10 feet long by full height (slab to deck above), illustrating leaded door, leaded glass and frame, and lead-lined wall.

- B. Use mock-up for testing purposes to verify protection integrity of work of this section.
- C. Locate where directed.
- D. Mock-up may remain as part of the Work, if testing is successfully passed.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. X-Ray Radiation Protection:
 - 1. A & L Shielding Inc: www.alshielding.com.
 - 2. Mayco Industries, Inc: www.maycoindustries.com/#sle.
 - 3. Radiation Protection Products: www.radiationproducts.com.

2.2 SHEET LEAD AND ASSOCIATED MATERIALS

- A. Sheet Lead: ASTM B749, Type alloy UNS No. L51121 (chemical-copper lead), 1/16 inch thick.
- B. Gypsum Board: ASTM C1396/C1396M, paper/paper faced, square edges and square ends; 48 x 96 inch size, 1/2 inch thick.
- C. Plywood: PS 1 Structural I Grade C-C or better, sanded; APA span rated to suit application.
- D. Nails: Lead headed to twice thickness of sheet lead.

2.3 FABRICATION

- A. Lead Laminated Gypsum Board: Fabricate with monolithic sheet lead bonded to one surface of board, extend lead sheet 1 inch beyond one side and one end of board.
- B. Lead Lined Wood Doors: Specified in Section 08 14 16.
- C. Lead Lined Door and Glazed Frames: Specified in Section 08 11 13.
- D. Hardware: Specified in Section 08 71 00.
- E. Threshold: Formed lead, channel shape, to receive grout fill, four inch wide x width of door opening plus 4 inches to fit under frame section.

2.4 COMPONENTS AND ACCESSORIES

- A. Leaded Glass: ASTM C1036, clear, lead content equivalent to protection requirements of adjacent lead sheet protection.
- B. Control Windows: Prefabricated lead frame, as indicated x as indicated inch size, thickness to suit wall; included with lead glass glazing strips, anchors and fasteners.

- C. Window Glazing Screws: Leaded lined, #10x1 inches size.
- D. Radiation Protection Plaque: Wall mounted, designating lead thickness in wall, degree of continuity, exceptions.

2.5 FINISHES

- A. Field Painted Surfaces: As specified in Section 09 91 23.
- B. Prefinished Surfaces: color as selected.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify that substrate construction are ready to receive work and opening dimensions are as indicated on shop drawings.

3.2 INSTALLATION - SHEET LEAD

- A. Install lead sheets to wall substrate by mechanical attachments; lead headed fasteners spaced at 4 inches to framing members. Install lead laminated products with lead face against supports.
- B. Lap edges and ends of lead sheets 1 inch. Apply lead patches, same thickness as lead sheet, over penetrations, to achieve continuity of protection.
- C. Extend lead protection from finished floor to a height of 96 inches.
- D. Apply lead sheet patches around penetrations to sheet lead protection, extending 6 inches beyond penetration.

3.3 INSTALLATION - COMPONENTS AND ACCESSORIES

- A. Install components and accessories in accordance with manufacturer's instructions.
- B. Install lead lined glazed frames as specified in the section where the frames are specified and in accordance with the lead lining fabricator's instructions.
- C. Install lead lined doors as specified in the section where the doors are specified; coordinate installation of door hardware.
- D. Install leaded glass in prepared frames in accordance with "wet method" described in Section 08 80 00.

3.4 FIELD QUALITY CONTROL

- A. Field inspection and testing will be performed under provisions of Section 01 40 00.
- B. Inspection and testing will be performed by a licensed radiologist technician in coordination with regulatory agency requirements, to ascertain conformance of installation regarding radiation passage or leakage.
 - 1. The radiologist will be hired by the owner.
- C. Cooperate and offer assistance in such work. Execute instructions given.

END OF SECTION 13 49 05

SECTION 13 49 41 - RFI/EM SHIELDING

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Architecturally integrated shielding.
- B. Accessory components.
- C. Field testing.

1.2 RELATED REQUIREMENTS

- A. Section 03 30 00 - Cast-in-Place Concrete: Finish concrete slab over underfloor shielding.
- B. Section 08 11 13 - Hollow Metal Doors and Frames: Hollow metal doors and frames.
- C. Section 08 14 16 - Flush Wood Doors.
- D. Section 08 71 00 - Door Hardware: Hardware for shielded doors other than that specified in this section.
- E. Section 09 21 16 - Gypsum Board Assemblies: Interior finish of shielding surfaces.
- F. Section 23 31 00 - Sheet Metal Work and Accessories: Ducts connecting to or penetrating shielding.
- G. Section 26 50 10 - Lighting Fixtures: Light fixtures inside shielded volume.

1.3 REFERENCE STANDARDS

- A. Leadership in Energy and Environmental Design (LEED) v2009/v3 BD+C for Major Renovations and New Construction, including addenda.
- B. ANSI/SDI A250.4 - Test Procedure and Acceptance Criteria for Physical Endurance for Steel Doors, Frames and Frame Anchors; 2011.
- C. ASTM A568/A568M - Standard Specification for Steel, Sheet, Carbon, Structural, and High-Strength, Low-Alloy, Hot-Rolled and Cold-Rolled, General Requirements For; 2017a.
- D. ASTM A1008/A1008M - Standard Specification for Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, Solution Hardened, and Bake Hardenable; 2018.
- E. ASTM A1011/A1011M - Standard Specification for Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, and Ultra-High Strength; 2018a.

- F. ASTM B194 - Standard Specification for Copper-Beryllium Alloy Plate, Sheet, Strip, and Rolled Bar; 2015.
- G. AWS A5.8M/A5.8 - Specification for Filler Metals for Brazing and Braze Welding; 2011 (Amended 2012).
- H. AWS D1.1/D1.1M - Structural Welding Code - Steel; 2015, with Errata (2016).
- I. AWS D9.1M/D9.1 - Sheet Metal Welding Code; 2012.
- J. IEEE 299 - IEEE Standard Method for Measuring the Effectiveness of Electromagnetic Shielding Enclosures; 2006 (Reaffirmed 2012).

1.4 ADMINISTRATIVE REQUIREMENTS

- A. Coordinate this work with the construction of the building elements that RFI/EM protection is applied to or installed in.
- B. Presubmittal conference: Convene prior to preparing required submittals of this section.
- C. Preinstallation Meeting: Convene one week prior to commencing work of this section.

1.5 SUBMITTALS

- A. See Section 01 33 23 – Shop Drawings and Samples for additional submittal procedures.
- B. Product Data: Manufacturer's data sheets on each product to be used, including:
 - 1. Preparation instructions and recommendations.
 - 2. Storage and handling requirements and recommendations.
 - 3. Installation methods.
- C. Shop Drawings: Show complete floor plans, wall sections, corner details, and penetration details.
- D. Certifications: For waveguide products and fabrications, certify compliance with specified performance.
- E. Field Testing Agency Qualifications.
- F. Field Test Plan.
- G. Field Test Reports: Indicate frequencies at which tests were made, location of each test, and results.
- H. Operation and Maintenance Data.
- I. Project Record Documents: Record actual locations of penetrations through shielding.

1.6 LEED SUBMITTAL REQUIREMENTS:

- A. Submit the following information as applicable to products in this section.
1. Credit MR 4: Product data and certification letter from product manufacturers indicating percentages by weight of post-consumer and pre-consumer recycled content for products having recycled content.
 - a. Include statement indicating material cost for each product having recycled content.
 2. Credit MR 5: Product data from manufacturer for regional materials indicating location and distance from Project of material manufacturer and point of extraction, harvest, or recovery for each raw material.
 - a. Include statement indicating cost for each regional material and the fraction by weight that is considered regional. For materials with recycled content, the extraction location of the recycled portion can be the recycling facility, scrapyard, depository, stockpile, or another location where the material was collected and packaged for market purchase before manufacture. It is not necessary to track the raw material back to its original point of extraction.
 3. Credit MR 7: The invoice for wood products sold to the project contractors or subcontractors who do not modify the product off-site. Invoices should indicate % of new wood in product, % of new wood that is FSC certified, the cost for each certified new wood product, and the COC certification number.
 4. Credit IEQ 4.1: Product data from manufacturer for adhesives and sealants used inside the weatherproofing system indicating VOC content of each product used. VOC content to be provided in g/l.
 5. Credit IEQ 4.2: Product data from manufacturer for paints and coatings used inside the weatherproofing system indicating VOC content of each product used. VOC content to be provided in g/l.
 6. Credit IEQc4.3:
 - a. Product data from manufacturer for carpets installed inside the weatherproofing membrane indicating that products meet the testing and product requirements of the Carpet and Rug Institute Green Label Plus program.
 - b. Product data from manufacturer for carpet pads installed inside the weatherproofing membrane indicating that products meet the testing and product requirements of the Carpet and Rug Institute Green Label program.
 - c. Product data from manufacturer for all hard surface flooring products installed inside the weatherproofing membrane indicating that they are either Floor Score Certified OR meet the testing and product requirements of the California Department of Health Services Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers, including 2004 Addenda.
 7. Credit IEQ 4.4:
 - a. Product data from manufacturer for products containing composite wood or agrifiber products installed inside the weatherproofing membrane indicating that they are either NAUF (no added urea formaldehyde) or are ULEF (Ultra low emitting formaldehyde) products. Laminates are exempt.
 - b. Product data from manufacturer for laminating adhesives used on-site or off-site in conjunction with composite wood and/ or agrifiber products indicating that they are either NAUF (no added urea formaldehyde) or are ULEF (Ultra low emitting formaldehyde) products.
 8. Credit Idc1.2: Product data from manufacturer for ceiling and wall systems installed inside the weatherproofing membrane indicating that they are either GreenGuard Gold certified, or meet the requirements of the California Department of Health Services Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers, including 2004 addenda.

1.7 QUALITY ASSURANCE

- A. Designer/Installer Qualifications: Firm with at least ten years documented experience designing and installing shielding of type specified.
- B. Field Testing Agency Qualifications: Independent testing agency having staff experienced in field testing of shielding who conducts such testing as a normal service and who maintains equipment required for testing.
 - 1. Approved by Owner.
 - 2. Able to provide data showing at least 5 successfully tested installations.

1.8 REGULATORY REQUIREMENTS

- A. Conform to applicable health and occupation code for integrity of RFI/EM protection and continuity of protected construction.

1.9 MOCK-UP

- A. Provide RFI/EM wall mock-up, 10 feet long by full height (slab to deck above), illustrating RFI/EM protected wall.
- B. Use mock-up for testing purposes to verify protection integrity of work of this section.
- C. Locate where directed.
- D. Mock-up may remain as part of the Work, if testing is successfully passed.

1.10 DELIVERY, STORAGE, AND HANDLING

- A. Store products in manufacturer's unopened packaging until ready for installation.

PART 2 PRODUCTS

2.1 RFI/EM SHIELDING

- A. Architect has designed certain aspects of the shielding. Contractor is responsible for completing the design and furnishing and installing a continuous shielding enclosure meeting the requirements of the Contract Documents.
 - 1. Alternative solutions will be considered at no extra cost to Owner; comply with requirements specified for substitution review.
- B. Design Requirements: Building volume to be shielded is indicated on drawings; provide continuous shielding without holes, gaps, or unshielded penetrations.
 - 1. Certain aspects of the design are shown on drawings.
 - 2. Design to comply with applicable building codes.
 - 3. Overhead Shielding: Suspended from structure above.

4. Modifications necessary to achieve required performance may be made to components that are not exposed to view without prior approval; obtain approval of all modifications to components exposed to view in the finished work.
- C. Shielding Performance: The following minimum performance is required when tested as specified:
 1. Magnetic Attenuation: 20 dB at 14 kHz increasing linearly to 50 dB at 200 kHz.
 2. Electric Attenuation: 50 dB from one kHz to 50 kHz.
 3. Plane Wave Attenuation: 50 dB from 14 kHz to 1 GHz.
- D. Acceptable Shielding Designer/Installers:
 1. Braden Shielding Systems: www.bradenshielding.com.
 2. ETS-Lindgren: www.ets-lindgren.com.
 3. Universal Shielding Corporation: www.universalshielding.com.

2.2 SHIELDING COMPONENTS

- A. Steel Sheet: ASTM A568/A568M, ASTM A1008/A1008M, or ASTM A1011/A1011M.
 1. Thickness: 14 gage, 0.0747 inch, minimum; thicker members may be used at Contractor's option if approved by Architect.
 2. Finish: Free of oil, dents, rust, and other defects; suitable for painting.
 3. Welding Materials: Comply with applicable requirements of AWS D1.1/D1.1M and AWS D9.1M/D9.1; use MIG welding and AWS A5.8M/A5.8 weld filler metal.
- B. Fasteners: Except where bolting is specifically permitted, weld all connections.
 1. Do not use self-tapping screws for attachment of shielding.
 2. Powder-actuated drive pins may be used to attach to concrete.
 3. Bolted Connections: Accurately drill or punch holes.
 4. Use materials that are galvanically similar to the material being fastened.
- C. Doors and Frames: Steel facing with full perimeter steel knife edge interlocking with steel frame, including at sill, achieving electrical contact by means of metallic spring gaskets.
 1. Shielding Effectiveness: Equal to that specified for primary shielding, when closed.
 2. Door Construction: As specified in Section 08 11 13.
 3. Durability: Maintain fit of door to frame when tested in accordance with ANSI/SDI A250.4 or approved equivalent.
 4. Spring Gaskets: ASTM B194 copper-beryllium spring "finger" strips, two rows, mounted in concealed location in knife edge perimeter, for metal-to-metal contact without requiring closing or opening pressure in excess of 20 pounds-force.
 5. Latching/Locking: As specified in Section 08 71 00.
 6. Hinges: As specified in Section 08 71 00.
 7. Other Hardware: As specified in Section 08 71 00.
 8. Width: As indicated on drawings.
- D. Windows: Steel frame; two layers clear float glass enclosing wire mesh, with mesh electrically and mechanically joined to frame; frame welded to primary shielding.

2.3 SHIELDING ACCESSORIES

- A. Service Entrance Plates: Steel sheet or plate; mounted in plane of primary shielding, continuously electrically bonded to shielding; for mounting of conductor penetrations.

1. Thickness: At least as thick as primary shielding.
 2. Size: 12 by 12 inches.
 3. Size: Providing at least 6 inches space between penetrations and edge of plate.
 4. Size: As indicated on drawings.
 5. Frame for Welding: Steel or extruded brass, 1/4 inch thick, minimum.
 6. Location: As indicated on drawings.
- B. Air Vents: Honeycomb waveguide-below-cutoff type, of brass or steel, with all components continuously electrically and mechanically bonded to each other and to shielding.
1. Shielding Effectiveness: Equal to that specified for primary shielding, with cutoff frequencies not less than 1.5 times that specified for primary shielding.
 2. Static Pressure Drop: Not more than 0.02 inch water gage at air velocity of 600 feet per minute.
 3. Frame for Welding: Steel or extruded brass, 1/4 inch thick, minimum.
- C. Grounding Stud: Permanently installed, solid brass or bronze, double-threaded, 1/2 inch diameter bolt with full 2 inches of thread exposed on each side of shielding.
1. Locate in service entrance plate.
 2. Provide washers and nuts for attachment of grounding cables.
- D. Conductor Penetrations: Rigid steel conduit from filter to shielding.
- E. Pipe Penetrations: Fabricated steel plate or sheet, configured as indicated on drawings to achieve cutoff frequencies not less than 1.5 times that specified for primary shielding; continuously welded or brazed to primary shielding.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Do not begin installation until substrates have been properly prepared.
- B. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

3.2 PREPARATION

- A. Clean surfaces thoroughly prior to installation.
- B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

3.3 INSTALLATION

- A. Install in accordance with manufacturer's instructions.

3.4 FIELD QUALITY CONTROL

- A. Perform preliminary inspections and tests as required to ensure that completed shielding will achieve specified performance when field tested as specified; retesting due to failures will be at Contractor's expense.
- B. Seam leak testing during fabrication is required, using Shielded Enclosure Leak Detector System (SELDS) to detect abrupt change in shielding level requiring repair; seam leak testing does not substitute for final attenuation testing.
- C. Field Testing: Comply with requirements of Section 01 40 00.
- D. Attenuation Testing: Testing as specified by IEEE 299 will be performed by testing agency or other entity employed by Owner ; in addition to the IEEE 299 test points, test points will include perimeters of doors, penetrations, and other points recommended by testing agency.
- E. Repair, modify, or replace defective components and portions of shielding at no extra cost to Owner; retest at Contractor's expense.

3.5 CLEANING

- A. Clean completed products of dirt, grease, and other contaminants.

3.6 CLEANING AND PROTECTION

- A. Protect installed products until completion of project.
- B. Touch-up, repair, or replace damaged products before Date of Substantial Completion.

END OF SECTION 13 49 41

SECTION 14 21 00 - ELECTRIC TRACTION ELEVATORS

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Complete electric traction elevator systems.
 - 1. Passenger type.
- B. Elevator Maintenance Contract.

1.2 RELATED REQUIREMENTS

- A. Section 01 54 13 - Use of Elevator(s) for Construction: Provide elevator operators during construction.
- B. Section 03 30 00 - Concrete Work: Includes elevator pit, grouting thresholds, and grouting hoistway entrance frames.
- C. Section 05 12 00 - Structural Steel: Includes divider beams, overhead hoist beams, and steel for guide rail support.
- D. Section 05 50 00 - Metal Fabrications: Includes elevator pit ladder and sill supports.
- E. Section 05 70 00 - Decorative Metal: Custom metal fabrications for call buttons and hall lanterns.
- F. Section 07 16 16 - Crystalline Waterproofing: Waterproofing of elevator pit walls and floor.
- G. Section 07 81 00 - Applied Fireproofing: Fireproofing of guide rail brackets where attached to building structural members.
- H. Section 07 84 00 - Firestopping: Fire rated sealant in hoistway.
- I. Section 09 21 16 - Gypsum Board Assemblies: Gypsum shaft walls.
- J. Section 09 65 00 - Resilient Flooring: Floor finish in car.
- K. Section Tiling: Floor finish in car.
- L. Section 10 22 13 - Wire Mesh Partitions: Wire mesh partition at elevator pit.
- M. Section 10 44 00 - Fire Protection Specialties: Fire extinguisher in elevator machine room.
- N. Section 28 23 00 - Video Surveillance: Installation of video camera in car interior for security monitoring.
- O. Section 28 31 00 - Fire Detection and Alarm:
 - 1. Fire and smoke detectors and interconnecting devices.

2. Fire alarm signal lines to elevator controller cabinet.

- P. Section 28 31 10 - Fire Alarm and Emergency Communications System:
1. Audible notification circuits for elevators.

1.3 REFERENCE STANDARDS

- A. Leadership in Energy and Environmental Design (LEED) v2009/v3 BD+C for Major Renovations and New Construction, including addenda.
- B. ADA Standards - Americans with Disabilities Act (ADA) Standards for Accessible Design; 2010.
- C. AISC 360 - Specification for Structural Steel Buildings; 2016.
- D. ASCE 7 - Minimum Design Loads and Associated Criteria for Buildings and Other Structures; Most Recent Edition Cited by Referring Code or Reference Standard.
- E. ASME A17.1 - Safety Code for Elevators and Escalators; 2016.
- F. ASME A17.2 - Guide for Inspection of Elevators, Escalators, and Moving Walks; 2017.
- G. ASTM A36/A36M - Standard Specification for Carbon Structural Steel; 2014.
- H. ASTM A276/A276M - Standard Specification for Stainless Steel Bars and Shapes; 2017.
- I. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2018.
- J. ASTM A666 - Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar; 2015.
- K. ASTM A1008/A1008M - Standard Specification for Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, Solution Hardened, and Bake Hardenable; 2018.
- L. ASTM B209 - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate; 2014.
- M. ASTM B221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes; 2014.
- N. ASME A17.1 - Safety Code for Elevators and Escalators; 2013.
- O. ASME A17.2 - Guide for Inspection of Elevators, Escalators, and Moving Walks; 2014.
- P. ASME QEI-1 - Standard for the Qualification of Elevator Inspectors; 2013.
- Q. AWS D1.1/D1.1M - Structural Welding Code - Steel; 2015, with Errata (2016).
- R. NEMA LD 3 - High-Pressure Decorative Laminates; 2005.
- S. NEMA MG 1 - Motors and Generators; 2017.

- T. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
- U. NFPA 80 - Standard for Fire Doors and Other Opening Protectives; 2019.
- V. PS 1 - Structural Plywood; 2009.
- W. SSPC-Paint 20 - Zinc-Rich Primers (Type I, "Inorganic," and Type II, "Organic"); 2002 (Ed. 2004).
- X. UL (DIR) - Online Certifications Directory; Current Edition.

1.4 ADMINISTRATIVE REQUIREMENTS

- A. Coordination:
 - 1. Coordinate the work with other installers to provide conduits necessary for installation of wiring including but not limited to:
 - a. To elevator equipment devices remote from elevator machine room or hoistway.
 - b. Remote group automatic panel in lobby from controller cabinet.
 - c. To machine room for telephone service.
 - d. To elevator pit for lighting and sump pump.
 - e. To automatic transfer switch from controller cabinet.
 - f. To fire alarm panel from controller cabinet.
 - 1) Traveling cable for the fire alarm speaker.
 - 2. Coordinate the work with other installers for equipment provisions necessary for proper elevator operation including but not limited to:
 - a. Automatic transfer switches with auxiliary contacts for emergency power transfer status indication.
 - b. Shunt trip devices for automatic disconnection of elevator power prior to fire suppression system activation; include provisions for shunt trip power monitoring.
 - c. Overcurrent protection devices selected to achieve required selective coordination.
- B. Preinstallation Meeting: Convene a meeting one week prior to starting work.
 - 1. Review schedule of installation, installation procedures and conditions, and coordination with related work.
 - 2. Review use of elevator for construction purposes, hours of use, scheduling of use, cleanliness of car, employment of operator, and maintenance of system.
- C. Construction Use of Elevator: Provide elevator for transport of construction personnel and materials in compliance with ASME A17.1.
 - 1. Contractor to negotiate with manufacturer/installer for construction use of elevator in accordance with terms and conditions of manufacturer's temporary acceptance form.
 - 2. Make elevator available for construction use as early as possible.
 - 3. Enclose car with protective plywood on floor, walls, and ceiling.
 - 4. Provide temporary lighting.
 - 5. Provide control panel with manual and emergency operation.
 - 6. Owner shall share construction use of the elevator as needed to move furniture, fixtures, and equipment into the building prior to substantial completion of the building.
- D. Provide qualified staff to meet at the site as follows:

1. Prior to submission of structural steel shop drawings, meet to confirm openings, member locations and other portions of the work provided in 05 12 00.
2. Prior to submission of submittals required to construct the elevators, meet to confirm the related work provided by other trades, to coordinate the location, timing and sequence of the related work.
3. Prior to and periodically during the field work, meet to confirm installation requirements, timing and sequence of work.
4. Thirty (30) days or greater prior to substantial completion of the building, meet to confirm the status of all close out submittals, maintenance schedule, certificates, test results and other information required to complete the work and turnover operation to the Owner.

1.5 SUBMITTALS

- A. See Section 01 33 23 – Shop Drawings and Samples for additional submittal procedures.
- B. Product Data: Provide data on the following items.
 1. Signal and operating fixtures, operating panels, and indicators.
 2. Car design, dimensions, layout, and components.
 3. Car and hoistway door and frame details.
 4. Electrical characteristics and connection requirements.
- C. Shop Drawings: Provide drawings on the following items.
 1. Locations of Elevator Machine Equipment: Driving machines, power units, controllers, governors and other components.
 2. Hoistway Components: Car machine beams, guide rails, buffers, ropes, and other components.
 3. Rail bracket spacing; maximum loads imposed on guide rails requiring load transfer to building structural framing.
 4. Individual weight of principal components; load reaction at points of support.
 5. Loads on hoisting beams.
 6. Clearances and over-travel of car and counterweight.
 7. Locations in hoistway and machine room of traveling cables and connections for car lighting, telephone, and CCTV camera and card reader.
 8. Location and sizes of doors and frames.
 9. Calculated heat dissipation of elevator equipment in machine room.
 10. Interface with building security system.
 11. Electrical characteristics and connection requirements.
 12. Show arrangement of elevator equipment and allow for clear passage of equipment through access openings.
- D. Coordinate with Section 05 12 00 - Structural Steel Framing and provide hoistway framing, hoist beam, tie off beam, divider beams, and other steel members that are not provided by Section 05 12 00.
- E. Samples: Submit samples illustrating car interior finishes, car and hoistway door and frame finishes, and handrail material and finish in the form of physical samples.
- F. Warranty Documentation: Submit manufacturer warranty and ensure that forms have been completed in Owner's name and registered with manufacturer.
- G. Temporary Service: Place the elevators into temporary service as early as practical during the work.

- H. Immediately prior to the end of the maintenance period, clean all portions of the shafts, exterior of hoists, machine rooms and other areas accessible only to elevator technicians.
- I. Prior to the end of the maintenance period, inspect all portions of the elevator systems, shafts and other work required for proper elevator operation in the presence of staff from the firm providing future maintenance and perform corrective work, if any, identified during this inspection prior to the end of the maintenance period.
- J. Update operating system firmware and other software to the latest applicable versions.
- K. Operation and Maintenance Data:
 - 1. Parts catalog with complete list of equipment replacement parts; identify each entry with equipment description and identifying code.
 - 2. Operation and maintenance manual.
 - 3. Schematic drawings and wiring diagrams.

1.6 QUALITY ASSURANCE

- A. Designer Qualifications: Perform design under direct supervision of a licensed Professional Structural Engineer experienced in design of this type of work and licensed in the State of New York.
- B. Manufacturer Qualifications: Company specializing in manufacturing the Products specified in this section with minimum ten years documented experience.
- C. Installer Qualifications: Company specializing in performing the work of this section and approved by elevator equipment manufacturer.
- D. Testing Agency Qualifications: Independent firm specializing in performing testing and inspections of the type specified in this section.
- E. Products Requiring Fire Resistance Rating: Listed and classified by UL (BMD).
- F. Products Requiring Electrical Connection: Listed and classified by UL (BMD) as suitable for the purpose indicated in construction documents.

1.7 MAINTENANCE SERVICE

- A. Initial Maintenance Service: Beginning at the time of acceptance of the building by the owner for the intended use, (Not temporary contractor use) provide one year's full maintenance service by skilled employees of elevator Installer. Include monthly preventive maintenance, repair or replacement of worn or defective components, lubrication, cleaning, and adjusting as required for proper elevator operation at rated speed and capacity. Provide parts and supplies same as those used in the manufacture and installation of original equipment.
 - 1. Perform maintenance, during normal working hours.
 - 2. Include 24-hour-per-day, 7-day-per-week emergency callback service.
 - a. Response Time: Two hours or less.
- B. Continuing Maintenance Proposal: Provide a continuing maintenance proposal from Installer to Owner, in the form of a standard five-year maintenance agreement, starting on date initial

maintenance service is concluded. State services, obligations, conditions, and terms for agreement period and for future renewal options.

1.8 WARRANTY

- A. See Section 01 78 00 - Closeout Submittals, for additional warranty requirements.
- B. Provide 12 month manufacturer warranty for elevator operating equipment and devices from Date of Substantial Completion.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Electric Traction Elevators - Basis of Design: Kone; Monospace 500: www.kone.com.
- B. Electric Traction Elevators - Other Acceptable Manufacturers:
 - 1. Otis Elevator Company: www.otis.com.
- C. Products other than Basis of Design are subject to compliance with specified requirements and prior approval of Architect. By using products other than Basis of Design, the Contractor accepts responsibility for costs associated with any necessary modifications to related work, including any design fees.
 - 1. Hoistway dimensions: Indicated hoistway dimensions are not changeable.
- D. Source Limitations: Provide elevator and associated equipment and components produced by the same manufacturer as the other elevator equipment used for this project and obtained from a single supplier .

2.2 ELECTRIC TRACTION ELEVATORS

- A. Electric Traction Passenger Elevator, No. A:
 - 1. Electric Traction Elevator Equipment:
 - a. Gearless Traction Machine: Double wrapped traction driving sheave, with dual brake.
 - 2. Drive System:
 - a. Variable voltage alternating current (AC).
 - 3. Operation Control Type:
 - a. Selective Collective Automatic Operation Control.
 - 4. Service Control Type: Provide standard service control for elevators, in addition to the following.
 - a. Independent Service Control.
 - 5. Interior Car Height: 108 inch.
 - 6. Electrical Power: 480 volts; alternating current (AC); three phase; 60 Hz.
 - 7. Rated Net Capacity: 5000 lbs.
 - 8. Rated Speed: 350 ft per minute.
 - 9. Hoistway Size: 93 inch wide by 124-1/2 inch deep, minimum.
 - 10. Interior Car Platform Size: 68-9-16" inch wide by 115-1/4 inch deep.
 - 11. Elevator Pit Depth: 67 inch, minimum.

12. Overhead Clearance at Top Floor: 176 inch, minimum.
 13. Travel Distance: As indicated on drawings.
 14. Number of Stops: 6.
 15. Number of Openings: 6 Front; 1 Rear.
 16. Traction Machine Location: At top of shaft against hoistway wall.
- B. Electric Traction Passenger Elevator, No. B1 and C1:
1. Electric Traction Elevator Equipment:
 - a. Gearless Traction Machine: Double wrapped traction driving sheave, with dual brake.
 2. Drive System:
 - a. Variable voltage alternating current (AC).
 3. Operation Control Type:
 - a. Group Automatic Operation Control.
 4. Service Control Type: Provide standard service control for elevators, in addition to the following.
 - a. Hospital Service Control.
 5. Interior Car Height: 96 inch.
 6. Electrical Power: 480 volts; alternating current (AC); three phase; 60 Hz.
 7. Rated Net Capacity: 3500 pounds.
 8. Rated Speed: 350 feet per minute.
 9. Hoistway Size: 208 inches wide by 85 inches deep.
 10. Interior Car Platform Size: 79-1/16 inch wide by 74-3/4 inch deep.
 11. Elevator Pit Depth: 67 inch, minimum.
 12. Overhead Clearance at Top Floor: 164 inch.
 13. Travel Distance: As indicated on drawings.
 14. Number of Stops: 5.
 15. Number of Openings: 5 Front.
 16. Traction Machine Location: As indicated on drawings.
- C. Electric Traction Passenger Elevator, No. D and E:
1. Electric Traction Elevator Equipment:
 - a. Gearless Traction Machine: Double wrapped traction driving sheave, with dual brake.
 2. Drive System:
 - a. Variable voltage alternating current (AC).
 3. Operation Control Type:
 - a. Group Automatic Operation Control.
 4. Service Control Type: Provide standard service control for elevators, in addition to the following.
 - a. Hospital Service Control.
 5. Interior Car Height: 96 inch.
 6. Electrical Power: 480 volts; alternating current (AC); three phase; 60 Hz.
 7. Rated Net Capacity: 3500 pounds.
 8. Rated Speed: 350 feet per minute.
 9. Hoistway Size: 102 inches wide by 85 inches deep.
 10. Interior Car Platform Size: 79-1/16 inch wide by 74-3/4 inch deep.
 11. Elevator Pit Depth: 67 inch, minimum.
 12. Overhead Clearance at Top Floor: 164 inch.
 13. Travel Distance: As indicated on drawings.
 14. Number of Stops: 5.
 15. Number of Openings: 5 Front.
 16. Traction Machine Location: As indicated on drawings.

2.3 COMPONENTS

- A. Elevator Equipment:
 - 1. Motors, Controllers, Controls, Buttons, Wiring, Devices, and Indicators: Comply with NFPA 70.
 - 2. Guide Rails, Cables, Counterweights, Sheaves, Buffers, Attachment Brackets and Anchors: Design criteria for components includes safety factors in accordance with applicable requirements of Elevator Code.
 - 3. Buffers:
 - a. Spring type for elevators with speed less than 200 ft per minute.
 - b. Oil type for elevators with speed greater than 200 feet per minute.
 - 4. Lubrication Equipment:
 - a. Provide grease fittings for periodic lubrication of bearings.
 - b. Grease Cups: Automatic feed type.
 - c. Lubrication Points: Visible and easily accessible.

- B. Electrical Equipment:
 - 1. Motors: NEMA MG 1.
 - 2. Boxes, Conduit, Wiring, and Devices: As required by NFPA 70.
 - 3. Sump Pump in Pit: Refer to Division 22.
 - 4. Spare Conductors: Include 10 percent extra conductors and two pairs of shielded audio cables in traveling cables.
 - 5. Include wiring and connections to elevator devices remote from hoistway and between elevator machine rooms. Provide additional components and wiring to suit machine room layout.

2.4 PERFORMANCE REQUIREMENTS

- A. Regulatory Requirements: Comply with ASME A17.1, applicable local codes, and authorities having jurisdiction (AHJ).
- B. Accessibility Requirements: Comply with ADA Standards.
- C. Perform structural steel design, fabrication, and installation in accordance with AISC 360.
- D. Perform welding of steel in accordance with AWS D1.1/D1.1M.
- E. Fabricate and install door and frame assemblies in accordance with NFPA 80 and in compliance with requirements of authorities having jurisdiction.
- F. Perform electrical work in accordance with NFPA 70.
- G. Comply with venting or pressurization of the hoistway design in accordance with HVAC system requirements and the authorities having jurisdiction.
- H. Comply with fire protection sprinkler system of the hoistway design in accordance with NFPA 13 requirements and the authorities having jurisdiction. Refer to Section 21 10 00.

2.5 MATERIALS

- A. Rolled Steel Sections, Shapes, Rods: 1.

- B. Steel Sheet: 1, Designation CS (commercial steel), with matte finish.
- C. Stainless Steel Sheet: 1, Type 304; No. 4 Brushed finish unless otherwise indicated.
- D. Plywood: 1, Structural I, Grade C-D or better, sanded.
- E. Baked Enamel on Steel: Clean and degrease metal surface; apply one coat of primer sprayed and baked; two coats of enamel sprayed and baked.

2.6 OPERATION CONTROLS

- A. Elevator Controls: Provide landing operating panels and landing indicator panels.
 - 1. Landing Operating Panels: Metallic type, one for originating "Up" and one for originating "Down" calls, one button only at terminating landings; with illuminating indicators.
 - 2. Landing Indicator Panels: Illuminating.
 - 3. Comply with ADA Standards for elevator controls.
- B. Interconnect elevator control system with building security, fire alarm, card access, smoke alarm, and building management control systems.
- C. Door Operation Controls:
 - 1. Program door control to open doors automatically when car arrives at floor landing.
 - 2. Render "Door Close" button inoperative when car is standing at dispatch landing with doors open.
 - 3. Door Safety Devices: Moveable, retractable safety edges, quiet in operation; equipped with photo-electric light rays.
- D. Lobby Monitoring Panel:
 - 1. Locate status indicator and control panel for each individual elevator and group of elevators in Fire Command Center.
 - 2. Etch face plate markings in panel, and fill with paint of contrasting color.
 - 3. Include direction indicator displaying landing "Up" and "Down" calls registered at each landing floor.
 - 4. Include position and motion display for direction of travel of each elevator. Display appropriate graphic characters on non-glare screen. Indicate position of cars at rest and in motion.
 - 5. Include illuminated signal that indicates when elevator is operational and when it is at the designated emergency return level with doors open.
 - 6. Include a "Remove From In Service" switch for each elevator that then calls car to ground floor and parks car with doors open.
 - 7. Include emergency power selector switch for each group of elevators that overrides automatic emergency power selection.
 - 8. Include "Firefighter's Service Switch" that manually recalls each elevator to 1st floor.
 - 9. Contractor to provide the conduit and cabling from each elevator control room to the Fire Command Center.
- E. Provide "Firefighter's Emergency Operation" in accordance with ASME A17.1, applicable building codes, and authorities having jurisdiction (AHJ).
 - 1. Designated Landing: At First floor.

2.7 OPERATION CONTROL TYPE

- A. Selective Collective Automatic Operation Control: Applies to car in single elevator shaft.
1. Refer to description provided in ASME A17.1.
 2. Automatic operation by means of one button in the car for each landing served and by "UP" and "DOWN" buttons at the landings.
 3. Stops are registered by momentary actuation of landing car buttons without consideration of the number of buttons actuated or the sequence buttons are actuated, but the stops are made in the order that landings are reached in each direction of travel.
 4. All "UP" landing calls are made when car is traveling in the up direction.
 5. All "DOWN" landing calls are made when car is traveling in the down direction.
 6. The uppermost and lowermost calls are answered as soon as they are reached without consideration of the car travel direction.
- B. Two-Car Selective Collective Automatic (Duplex Collective Automatic) Operation Control: Applies to cars in two elevator shafts.
1. Park one car at main floor and designate other as free car, at landing last served or at a predetermined upper floor landing.
 2. Arrange free car to answer landing calls either above or below landing where car is standing except main floor and basement landing calls.
 3. When free car is answering calls, automatically start an alternate car to answer landing calls under any of the following conditions:
 - a. Registration of up calls from landings below the free car while it is traveling up by alternate car below.
 - b. Registration of up or down calls from landings above the free car while it is traveling down by alternate car.
 - c. Free car fails to clear registered landing calls within 40 seconds, or to move alternate car in response to registered landing calls within this time frame.
 4. Register and answer calls by momentary pressure on one or more car buttons; cause car to respond.
 5. Once started, either in response to car button calls, or to landing button calls, respond to calls registered for the direction of the traveling car in the order that landings are reached, regardless of sequence that calls were registered.
 6. Allow only one car to stop in response to any one landing call.
 7. Return first free car to main floor after answering landing calls.
 8. Should both cars finish their calls at main floor, designate one car as the free car.
 9. If no car buttons are pressed and car starts up in response to several landing down calls, proceed first to the highest landing down call, then reverse to collect other landing down calls. Collect up calls similarly when car starts down in response to such calls.
 10. If a car stops for a landing call, and car button matching direction the car was traveling is pressed within a predetermined time interval after a landing stop, proceed in the same direction regardless of other landing calls that are registered.
 11. If down landing buttons are pressed while car is traveling up, do not stop at those landings but allow those calls to remain registered for answering by the next down traveling car.
 12. After the highest car has responded to up landing calls, reverse car automatically and respond to down landing calls.
 13. When traveling down, a car will not respond to up calls. Allow those up calls to remain registered to be answered by next available car on an up trip.
 14. Include a time delay to hold car for an adjustable time interval at landings where stops are made to enable passengers to enter or leave the car. Cancel the time interval upon registration of a car call or pressure on the car door close button.
 15. Permit a registered car call to establish the direction of travel when a car has answered the farthest car call, even if other landing calls are registered.

16. Answer calls to the basement landing with the car that is normally parked at the main floor unless the free car is at the basement.
 17. If a car is removed from service, the other car shall answer landing calls.
- C. Group Automatic Operation Control: Applies to cars in two or more elevator shafts, with microprocessor and multicar operation.
1. Refer to description provided in ASME A17.1.
 2. Include group automatic operation controls responsive to variations of traffic demand.
 3. Provide system in car so that momentary pressure on one or more of car buttons causes car to start moving in direction of registered call.
 4. Allow only one car to stop in response to any one landing call.
 5. If a car stops for a landing call, and car button matching direction the car was traveling is pressed within a predetermined time interval after a landing stop, proceed in same direction regardless of other landing calls that are registered.
 6. Automatically separate car from group service if it is delayed for predetermined time period, and automatically restore car to group service when delay is corrected.
 7. Hold car for a predetermined time interval at landings when stops are made to enable passengers to enter or leave the car.
 8. Program system to minimize delays caused by registration of car calls disproportionate to number of persons in car.
 9. When a car without any registered car calls arrives at a landing where both up and down calls are registered, initially respond to the landing call in the current direction of travel.
 10. If a car is removed from service, the other cars shall answer car and landing calls.
 11. When car, without registered car calls, arrives at floor landing where both up and down calls are registered, initially respond to landing call in direction of travel.
 - a. If no car or landing call is registered for future travel in that direction, respond to landing call in opposite direction.
 12. Operate landing lanterns to correspond with next direction of travel, and when responding to landing call, operate landing lantern to match direction of call being answered.
 13. Program door operating sequence to minimize car and landing door open and close time periods.
 14. Include independent service control where indicated, as follows:
 - a. Provide a switch in the car control cabinet to allow removal of a designated car from group service; car to operate in response to car calls only.
 - b. Doors open automatically upon arrival at landing.
 - c. Set landing indicator panels as inoperative when in independent service mode.

2.8 SERVICE CONTROL TYPE

- A. Hospital Service Control:
1. Incorporate a spring return key operated switch in the car operating panel labeled "Hospital Service" that performs the following when activated:
 - a. Causes the nearest available elevator to travel directly to that landing and open doors.
 - b. Cancels car calls registered for that car.
 - c. Renders the hold door open switch and door edge protective devices inoperative only while responding to "Hospital Service" switch.
 2. Incorporate a key operated switch in each car labeled "Hospital Service" that performs the following when activated:
 - a. Disconnects that car from group control.

- b. Programs up traveling cars to stop at main floor landing prior to proceeding to a designated higher landing.
 - c. Do not stop a down traveling car with a registered car button call for landing below the lower dispatch landing, unless the call in that car or a down button call at lower dispatch landing is in registration.
 - d. Incorporate in each car, a flashing sign "Emergency Exit" activated immediately when car stops at selected landing. Include buzzer to attract attention to sign.
3. Design "Hospital Service" operation to override and be compatible with emergency power and Independent Service control operation.

B. Independent Service Control:

1. Provide key operated "Independent Service" on car operating panel. Key activation will remove that car from normal operation and cancel pre-registered car calls.
2. Car will respond to selected floor. Car will not respond to any calls from landing call buttons. Car will only respond to calls placed on the car operating panel. Doors will remain open at last landing requested. Doors will close with a constant pressure on "Door Close" button.
3. Key activation to normal operation will return car to normal operation.

2.9 EMERGENCY POWER

- A. Set-up elevator operation to run with elevator emergency power supply when the normal building power supply fails.
- B. Emergency Lighting: Comply with ASME A17.1 elevator lighting requirements.
- C. Provide operational control circuitry for adapting the change from normal to emergency power.
- D. Upon transfer to emergency power, advance one elevator at a time to a pre-selected landing, stop car, open doors, disable operating circuits, and hold in standby condition.
- E. Emergency Annunciation: Provide an illuminated signal marked "ELEVATOR EMERGENCY POWER" at each elevator lobby per ASME A17.1 Part 2.27.2.3. Signal shall indicate that the normal power supply has failed and the emergency or standby power is in effect.
 1. Control wiring: Contractor to provide the control wiring and conduit from the emergency generator to the elevator controller and from the elevator controller to the illuminated signal at each elevator lobby.

2.10 MATERIALS

- A. Rolled Steel Sections, Shapes, Rods: ASTM A36/A36M.
- B. Steel Sheet: ASTM A1008/A1008M, Designation CS (commercial steel), with matte finish.
- C. Sheet Steel: Hot-dipped galvanized steel sheet, ASTM A653/A653M, with G90/Z275 coating.
- D. Stainless Steel Sheet: ASTM A666, Type 304; No. 4 Brushed finish unless otherwise indicated.
- E. Stainless Steel Diamond Plate: ASTM A666, Type 304; No. 4 Brushed finish.
- F. Stainless Steel Bars, Shapes and Moldings: ASTM A276/A276M, Type 304.

- G. Extruded Aluminum: ASTM B221 (ASTM B221M), natural anodized finish unless otherwise indicated.
- H. Aluminum Sheet: ASTM B209 (ASTM B209M), 3105 alloy, O temper.
- I. Plywood: PS 1, Structural I, Grade C-D or better, sanded.
- J. Tile Flooring: Tile flooring, as specified in Section 09 30 00.
- K. Resilient Flooring: Vinyl tile flooring and Tile flooring, as specified in Section 09 65 00.
- L. Plastic Laminate: NEMA LD 3, Type HPL, color as indicated on Drawings.

2.11 CAR AND HOISTWAY ENTRANCES

- A. Elevator, No. A:
 - 1. Car and Hoistway Entrances:
 - a. Hoistway Fire Rating: As indicated on drawings.
 - b. Elevator Door Fire Rating: 1-1/2 Hours.
 - c. Framed Opening Finish and Material: Brushed stainless steel.
 - d. Car Door Material: Stainless steel, with rigid sandwich panel construction.
 - e. Hoistway Door Material: Stainless steel, with rigid sandwich panel construction.
 - f. Door Type: Double leaf.
 - g. Door Operation: Side opening, two speed.
 - h. Finish: Stainless steel.
 - i. Door Width: 48 inch.
 - j. Door Height: 96 inch.
 - k. Sills: Stainless steel.
- B. Elevator, No. B1, C1, D , and E:
 - 1. Car and Hoistway Entrances:
 - a. Hoistway Fire Rating: As indicated on drawings.
 - b. Elevator Door Fire Rating: 1-1/2 Hours.
 - c. Framed Opening Finish and Material: Brushed stainless steel.
 - d. Car Door Material: Stainless steel, with rigid sandwich panel construction.
 - e. Hoistway Door Material: Stainless steel, with rigid sandwich panel construction.
 - f. Door Type: Single leaf.
 - g. Door Operation: Single speed side opening.
 - h. Finish: Stainless steel.
 - i. Door Width: 42 inch.
 - j. Door Height: 84 inch.
 - k. Sills: Stainless steel.
- C. Sills/Thresholds: Configure to align with frame return and coordinate with floor finish.

2.12 CAR EQUIPMENT AND MATERIALS

- A. Elevator Car, A:
 - 1. Car Operating Panel: Provide main; flush-mounted applied face plate, with illuminated call buttons corresponding to floors served with "Door Open" button, "Door Close" button, and alarm button.

- a. Panel Material: Stainless steel; one per car.
 - b. Car Floor Position Indicator: Above car operating panel with illuminating position indicators.
 - c. Locate alarm button where it is unlikely to be accidentally actuated; not more than 54 inch above car finished floor.
 - d. Provide matching service cabinet integral with front return panel, with hinged door and keyed lock in each car.
 - e. Provide following within service cabinet as part of car operating panel:
 - 1) Switch for each auxiliary operational control, keyed.
 - 2) Switches for fan, light, and inspection control.
 - 3) Emergency light.
 - 4) Telephone cabinet and hard-wired connection with telephone.
 - 5) Convenience outlet receptacle; 110 VAC, 15 Amps.
2. Ventilation: Single speed fan with grille above ceiling.
 3. Flooring: Resilient flooring.
 4. Wall Base: Recessed stainless steel, 3 inch high.
 5. Front Return Panel: Stainless steel.
 6. Door Wall: Stainless steel.
 7. Side Walls: Stainless steel diamond plate.
 8. Rear Wall: Stainless steel diamond plate.
 9. Hand Rail: Stainless steel, at walls indicated on Drawings. Provide open clearance space 1-1/2 inch (38 mm) wide to face of wall.
 - a. Flat Bar Stock, Solid: 1/2 inch thick by 2 inch high.
 - b. Stainless Steel Finish: No. 4 Brushed.
 10. Bottom Rail: Stainless steel, at walls indicated on Drawings. Provide open clearance space 1-1/2 inch (38 mm) wide to face of wall.
 - a. Flat Bar Stock, Solid: 1/2 inch thick by 4 inch high.
 11. Ceiling:
 - a. Canopy Ceiling: Stainless steel.
 - b. Panel Finish: No. 4 Brushed stainless steel.
 - c. Lighting: Round LED spotlights.
 - d. Provide emergency access panel for egress from car at ceiling.
- B. Elevator Car, B1, C1, D, and E:
1. Car Operating Panel: Provide main; flush-mounted applied face plate, with illuminated call buttons corresponding to floors served with "Door Open" button, "Door Close" button, and alarm button.
 - a. Panel Material: Stainless steel; two per car.
 - b. Car Floor Position Indicator: Above car operating panel with illuminating position indicators.
 - c. Locate alarm button where it is unlikely to be accidentally actuated; not more than 54 inch above car finished floor.
 - d. Provide matching service cabinet integral with front return panel, with hinged door and keyed lock in each car.
 - e. Provide following within service cabinet as part of car operating panel:
 - 1) Switch for each auxiliary operational control, keyed.
 - 2) Switches for fan, light, and inspection control.
 - 3) Emergency light.
 - 4) Telephone cabinet and hard-wired connection with telephone.
 - 5) Convenience outlet receptacle; 110 VAC, 15 Amps.
 2. Ventilation: Single speed fan with grille above ceiling.
 3. Flooring: Porcelain tile.
 4. Wall Base: Recessed stainless steel, 3 inch high.

5. Front Return Panel: Stainless steel.
 6. Door Wall: Stainless steel.
 7. Side Walls: Plastic laminate on MDF.
 8. Rear Wall: Plastic laminate on MDF.
 9. Hand Rail: Stainless steel, at walls indicated on Drawings. Provide open clearance space 1-1/2 inch (38 mm) wide to face of wall.
 - a. Stainless Steel Finish: No. 4 Brushed.
 10. Bottom Rail: Stainless steel, at walls indicated on Drawings. Provide open clearance space 1-1/2 inch (38 mm) wide to face of wall.
 - a. Flat Bar Stock, Solid: 1/2 inch thick by 4 inch high.
 11. Ceiling:
 - a. Canopy Ceiling: Stainless steel.
 - b. Panel Finish: No. 4 Brushed stainless steel.
 - c. Lighting: Round LED spotlights.
 12. Provide emergency access panel for egress from car at ceiling.
- C. Car Accessories:
1. Certificate Frame: Stainless steel frame glazed with clear tempered glass, and attached with tamper-proof screws.
 2. Protective Pads: Canvas cover, padded with impact-resistant fill material, sewn with piping edges; fire resistant in compliance with ASME A17.1; brass grommets for supports, covering side and rear walls and front return, with cut-out for control panel; provide one set for each elevator.
 - a. Color: Grey.
 - b. Provide at least 4 inch clearance from bottom of pad to finished floor.
 - c. Pad Supports: Stainless steel studs, and mounted from top of wall panels.

2.13 HOISTWAY ENTRANCES

- A. Hoistway Entrances; Each Floor Elevator Landing:
1. Framed Opening Material and Finish: Brushed stainless steel.
 2. Door Material and Finish: Brushed stainless steel.
 3. Hoistway Fire Rating: As indicated on drawings.
 4. Door Fire Rating: 1-1/2 Hours.
 5. Sills: Stainless steel.
 - a. Sill manufacturer:
 - 1) Basis of Design:
 - (a) Archi-Tread, Inc.: www.archi-tread.com.
 - (1) 3/16" solid stainless steel heavy capacity sill, #4 finish.
 - 2) Other acceptable manufacturers:
 - (a) Deeco Metals: www.deecometals.com.
 - (b) Plymouth Tube Co.: www.plymouth.com.
- B. Car Doors:
1. Car Door Material and Finish: Brushed stainless steel.
 2. Car Doors: 18 gage, 0.0478 inch minimum sheet thickness, rigid sandwich panel construction.
 3. Door Fire Rating: 1-1/2 Hours.
 4. Sills: Stainless steel.
 - a. Sill manufacturer:
 - 1) Basis of Design:
 - (a) Archi-Tread, Inc.: www.archi-tread.com.

- (1) 3/16" solid stainless steel heavy capacity sill, #4 finish.
- 2) Other acceptable manufacturers:
 - (a) Deeco Metals: www.deecometals.com.
 - (b) Plymouth Tube Co.: www.plymouth.com.
- C. Thresholds: Configure to align with frame return and coordinate with floor finish.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify existing conditions before starting this work.
- B. Verify that hoistway, pit, and machine room are ready for work of this section.
- C. Verify hoistway shaft and openings are of correct size and within tolerance.
- D. Verify location and size of machine foundation and position of machine foundation bolts.
- E. Verify that electrical power is available and of correct characteristics.

3.2 PREPARATION

- A. Arrange for temporary electrical power for installation work and testing of elevator components. Comply with requirements of Section 01 50 00 - Temporary Facilities and Controls.
- B. Maintain elevator pit excavation free of water.

3.3 INSTALLATION

- A. Coordinate this work with installation of hoistway wall construction.
- B. Install system components, and connect equipment to building utilities.
- C. Provide conduit, electrical boxes, wiring, and accessories.
- D. Mount machines on vibration and acoustic isolators.
 - 1. Place on structural supports and bearing plates.
 - 2. Securely fasten to building supports.
 - 3. Prevent lateral displacement.
- E. Size hoistway and machine room in accordance with approved shop drawings.
- F. Install guide rails to allow for expansion and contraction movement of guide rails.
- G. Accurately machine and align guide rails, forming smooth joints with machined splice plates.
- H. Bolt or weld brackets directly to structural steel hoistway framing.

- I. Field Welds: Chip and clean away oxidation and residue with wire brush; spot prime with two coats.
- J. Install hoistway door sills, frames, and headers in hoistway walls; grout sills in place, set hoistway floor entrances in alignment with car openings, and align plumb with hoistway.
- K. Fill hoistway door frames solid with grout in accordance with Section 04 20 00.
- L. Structural Metal Surfaces: Clean surfaces of rust, oil or grease; wipe clean with solvent; prime two coats.
- M. Machine Room Components: Clean and degrease; prime one coat, finish with two coats of enamel.
- N. Adjust equipment for smooth and quiet operation.
- O. Install beveled metal on all offsets, ledges or projections within the hoistway greater than 4 inches, if any, to taper of not less than 75 degrees (ASME A17.1/CSA B44 sec 2.1.6.2).

3.4 ERECTION TOLERANCES

- A. Guide Rail Alignment: Plumb and parallel to each other in accordance with ASME A17.1 and ASME A17.2.
- B. Car Movement on Aligned Guide Rails: Smooth movement, without any objectionable lateral or oscillating movement or vibration.

3.5 FIELD QUALITY CONTROL

- A. See Section 01 40 00 - Quality Requirements, for additional requirements.
- B. Testing and inspection by regulatory agencies certified in accordance with ASME QEI-1 will be performed at their discretion.
 - 1. Schedule tests with agencies and notify Owner and Architect.
 - 2. Obtain permits as required to perform tests.
 - 3. Document regulatory agency tests and inspections in accordance with requirements.
 - 4. Perform tests required by regulatory agencies.
 - 5. Furnish test and approval certificates issued by authorities having jurisdiction.
- C. Perform testing and inspection in accordance with requirements.
 - 1. Inspectors shall be certified in accordance with ASME QEI-1.
 - 2. Perform tests in accordance with ASME A17.2.
 - 3. Provide at least two weeks written notice of date and time of tests and inspections.
 - 4. Supply instruments and execute specific tests.
- D. Operational Tests:
 - 1. Perform operational tests in the presence of Owner and Architect.
 - 2. Test each elevator system by transporting at least 10 persons up from main floor to top floor landings during a five minute period.

3. Test multiple elevator system by transporting at least 30 persons up from main floor during a five minute period with maximum average time interval of 10 seconds between cars, with 2 cars leaving main floor during same five minute period.
4. At an agreed time, and the building occupied with normal building traffic, conduct tests to verify performance.
 - a. Furnish event recording of each landing call registrations, time initiated, and response time throughout entire working day.
5. Set period of time elevator takes to travel between typical floor landings at not more than 10 seconds.
 - a. Measure time from moment doors start to close until car has stopped level at next floor landing and doors are opening.

3.6 ADJUSTING

- A. Adjust for smooth acceleration and deceleration of car so not to cause passenger discomfort.
- B. Adjust with automatic floor leveling feature at each floor landing to reach 1/4 inch maximum from flush with sill.

3.7 CLEANING

- A. Remove protective coverings from finished surfaces.
- B. Clean surfaces and components and make ready for inspection.
- C. See Section 01 74 19 - Construction Waste Management and Disposal, for additional requirements.

3.8 CLOSEOUT ACTIVITIES

- A. See Section 01 78 00 - Closeout Submittals, for closeout submittals.
- B. See Section 01 79 00 - Demonstration and Training, for additional requirements.
- C. Demonstrate proper operation of equipment to Owner's designated representative.
- D. Demonstration: Demonstrate operation of system to Owner's personnel.
 1. Use operation and maintenance data as reference during demonstration.
 2. Conduct walking tour of project.
 3. Briefly describe function, operation, cleaning and maintenance of each component.
- E. Training: Train Owner's personnel on cleaning and operation and maintenance of system.
 1. Use operation and maintenance manual as training reference, supplemented with additional training materials as required.
 2. Provide minimum of two hours of training.
 3. Instructor: Manufacturer's training personnel.
 4. Location: At project site, unless noted otherwise.

3.9 PROTECTION

- A. Do not permit construction traffic within car after cleaning.
- B. Protect installed products until date as established by Owner.
- C. Touch-up, repair, or replace damaged products and materials before Date of Substantial Completion.

3.10 MAINTENANCE

- A. Refer to Section 01 70 00 - Execution and Closeout Requirements, for additional requirements relating to initial maintenance service.
- B. Provide Initial Maintenance Contract of elevator system and components in accordance with 1 and requirements as indicated for 12 months from Date of Substantial Completion.
- C. Submit proposal for continuation of Maintenance Contract in accordance with ASME A17.1 and requirements as indicated for installed elevator equipment.
- D. Perform maintenance contract services using competent and qualified personnel under the supervision and direct employ of the elevator manufacturer or installer.
- E. Maintenance contract services shall not be assigned or transferred to any agent or other entity without prior written consent of Owner.
- F. Examine system components monthly.
- G. Include systematic examination, adjustment, and lubrication of elevator equipment. Maintain and repair or replace parts whenever required using parts produced by the original equipment manufacturer.
- H. Maintain and repair or replace parts, whenever required, using parts produced by original equipment manufacturer.
- I. Replace wire ropes when necessary to maintain the required factor of safety.
- J. Perform work without removing cars from use during peak traffic periods.
- K. Provide emergency call back service during regular working hours throughout period of this maintenance contract.
- L. Maintain an adequate stock of parts for replacement or emergency purposes, and have personnel available to ensure the fulfillment of this maintenance contract without unreasonable loss of time.

END OF SECTION 14 21 00

