

ADDENDUM #3
Hillsborough County Sheriff's Office -
Pinebrooke Building 4 Interior Renovation
1/29/2020

This addendum is made and hereby becomes a part of the Construction Documents for this project dated September 20, 2019 as prepared by Long & Associates Architects/Engineers, Inc., 4525 S. Manhattan Avenue, Tampa, FL 33611.

Changes to Drawings:

1.01 Refer to revised Sheets E0.1, E3.4, E3.5

- A. See clouded areas of attached revised drawing (E0.1) for related drawing revisions. Drawing was revised to add additional prior approved light fixtures to the light fixture schedule.
- B. See clouded areas of attached revised drawings (E3.4, E3.5) for related drawing revisions. Drawings were revised to reflect and match data outlet locations as shown in Power and Signal Sheets (E3.1 and E3.2). Drawings were revised (E3.4, E3.5) to edit keynote E334.

1.02 Refer to revised Sheets E3.1 and E3.2

- A. See clouded areas of attached drawing (E3.1 and E3.2) for related drawing revisions. Drawing was revised to change keynote E321 and E327.

1.03 Refer to revised Sheet A8.1

- A. See clouded areas of attached revised drawing (A8.1) for related drawing revisions. Drawing was revised to show the new GL-2 Type glazing.

1.04 Refer to revised Sheet A7.4

- A. See clouded areas of attached revised drawing (A7.4) for related drawing revisions. Drawing was revised to show note #13.

1.05 Refer to revised Sheets A1.2 and A1.3

- A. See clouded areas of attached revised drawings (A1.2 and A1.3) for related drawing revisions. Drawing was revised to show Talk-thru Intercom provided by Contractor.

1.06 Refer to revised Sheet P3.2

- A. See clouded areas of attached revised drawing (P3.2) for related drawing revisions. Drawing was revised to show different Electric Water Cooler and revised Acceptable Manufacturers for the Urinal.

Changes to Specifications:

1.07 Refer to Specification 262727-3

- A. Delete Section "E" and add the following:
"E. All switched receptacles shall be wired type. See drawing E7.3 for switched receptacle requirements."

1.08 Refer to Specification 093013-1 Ceramic Tiling

- A. Revise Section 1.2 line item A to read:
 - a. "1. Unglazed Ceramic Tile"
 - b. "2. Glazed Wall Tile"
 - c. "3. Glazed Wall Tile Trim Units"
- B. Add the following to Section 2.1 to read:
 - a. "Acceptable Manufacturers: Daltile or equal"
 - b. "A. Unglazed Ceramic Tile: Provide factory-mounted flat tile complying with the following requirements:
 - 1. Composition: Porcelain.
 - 2. Module Size: 12 by 12 inches.
 - 3. Nominal Thickness: 1/4 inch.
 - 4. Face: Plain with cushion edges.
 - B. Glazed Wall Tile: Provide flat tile complying with the following requirements:
 - 1. Module Size: 4-1/4 by 4-1/4 inches.
 - 2. Thickness: 5/16 inch.
 - 3. Face: Plain with cushion edges.
 - 4. Finish: Bright, opaque glaze.
 - 5. Mounting: Factory back-mounted.
 - C. Glazed Wall Tile Trim Units: Matching characteristics of adjoining flat tile and coordinated with sizes and coursing of adjoining flat tile where applicable. Provide shapes as follows, selected from manufacturer's standard shapes:
 - 1. Base for Thin-Set Mortar Installations: Straight, module size 4-1/4 by 4-1/4.
 - 2. Wainscot Cap for Thin-Set Mortar Installations: Surface bullnose, module size 4-1/4 by 4-1/4 inches.
 - 3. External Corners for Thin-Set Mortar Installations: Surface bullnose, module size 4-1/4 by 4-1/4 inches.
 - 4. Internal Corners: Field-buttet square corners except with coved base and cap angle pieces designed to fit with stretcher shapes."

1.09 Refer to Specification 092500-7 Gypsum Drywall Systems

- A. Revise Section 3.7 to add the following:
 - a. "F. Wall Texture: Orange Peel"

1.10 Refer to Specification 099113-1 Painting

- A. Revise Section 2.1 line item A to delete manufacturer's #1-4.
- B. Sherwin-Williams Company (The) is to be the only manufacturer listed

1.11 Refer to Specification 095113-3 Acoustical Panel Ceilings

- A. Revise Section 2.3 line item B to read:
 - a. "1. Acoustical Ceiling Panel (ACT #1): Restrooms only"
 - b. "2. Acoustical Ceiling Panel (ACT #2): Typical throughout facility
 - a. Armstrong: Cortega Fire Guard
 - b. Edge: Square
 - c. Size: 24" x 24"
 - d. Thickness: 7/8"
 - e. Color: White"

1.12 Refer to Specification 102800-1 Toilet and Bath Accessories

- A. Revise Section 1.2 line item A to read the following:

"TOILET AND BATH ACCESSORY SCHEDULE

A. **Paper Towel Dispenser:** Where this designation is indicated, provide stainless-steel paper towel dispenser complying with the following:

- 1. American Specialties, Model 8522
- 2. Surface-Mounted Roll Paper Towel Type, lever operated, to hold 9" wide, 800' long standard towels.

C. **Toilet Tissue Dispenser:** Where this designation is indicated, provide toilet tissue dispenser complying with the following:

- 1. Tough Guy, Model #3P914.
 - a. Type: Triple-post
 - b. Mounting: Surface mounted with concealed anchorage.
 - c. Material: heavy-gauge chrome-plated steel with bright polished finish.
 - d. Capacity: Designed for 4-1/2- diameter-core tissue rolls.

D. **Waste Receptacle:** Where this designation is indicated, provide stainless-steel seat cover dispenser complying with the following:

- 1. Basis of Design: Bobrick B-221
- 2. Open-front, surface mount.

E. **Soap Dispenser:** Where this designation is indicated, provide soap dispenser complying with the following:

- 1. Palmer Fixture Company, Model SD0030-01
- 2. Liquid Soap Dispenser, Vertical-Tank Type: Surface-mounted type, minimum 30-oz. capacity tank.
 - a. Translucent body.
 - b. Mount above hand sink or lavatory.

F. **Grab Bar:** Where this designation is indicated, provide stainless-steel grab bar complying with the following:

- 1. Basis of Design: Bobrick Series B-6806 at accessible toilet rooms.
 - a. Length: 36", B6806x36.

- b. Length: 42", B6806x42.
- 2. Basis of Design: Bobrick Series B-6861 at accessible (36" x 36") showers.
- 3. Stainless-Steel Nominal Thickness: Minimum 0.05 inch
- 4. Mounting: Concealed with manufacturer's standard flanges and anchors.
- 5. Gripping Surfaces: Smooth, satin finish.
- 6. Outside Diameter: 1-1/2 inches for heavy-duty applications.

H. Sanitary Napkin Disposal Unit: Where this designation is indicated, provide stainless-steel sanitary napkin disposal unit complying with the following:

- 1. Surface-Mounted Type, TBA-10C: With seamless exposed walls; self-closing top cover; locking bottom panel with stainless-steel, continuous hinge; and removable, reusable receptacle.
- a. Basis of Design: Bobrick B-270

J. Mirror Unit: Where this designation is indicated, provide mirror unit complying with the following:

- 1. Basis of Design: Bobrick B-165.
- 2. Stainless-Steel, Channel-Framed Mirror: Fabricate frame from stainless-steel channels in manufacturer's standard satin or bright finish with square corners mitered to hairline joints and mechanically interlocked.

K. Mop and Broom Holder: Where this designation is indicated, provide mop and broom holder complying with the following:

- 1. Basis of Design: Bobrick B-223-24.
- 2. Mop and Broom Holder: 24-inch long unit fabricated of minimum nominal 0.0375-inch thick, stainless-steel hat channel with four spring-loaded, rubber, cam-type, mop/broom holders.

L. Underlavatory Guard: Where this designation is indicated, provide underlavatory guard complying with the following:

- 1. Insulating Piping Coverings: White, antimicrobial, molded-vinyl covering for supply and drain piping assemblies intended for use at accessible lavatories to prevent direct contact with and burns from piping. Provide components as required for applications."

M. Toilet Seat Cover Dispenser:

- 1. Bobrick B-221

N. Toilet Partition Type:

- 1. Plastic Laminate

O. Floor Mounted Mop Sinks:

- 1. Provide Stainless Steel splash guard plates on adjacent walls. Locate Mop Holders above sink edge so mop can drain into sinks.

1.13 Refer to Specification 064023-8 Interior Architectural Woodwork

- A. Section 2.8 to be revised to read: "Solid-Surfacing-Material Countertops (Restrooms)"

1.14 Refer to Specification 087101-4 Door Hardware

- A. Section Part 2 – Products, Locks & Latches, Manufacturer to read: "Schlage AL Series Neptune Design 626 Finish (Satin Chrome) – Acceptable Substitute, None"
- B. Section Part 2 – Products, Keying, Manufacturer to read: "Schlage "C" keyway 6-pin, construction keys only – Acceptable Substitute, None"

1.15 Add Specification 122116 – Vertical Louver Blinds

1.16 Refer to revised Table of Contents

- A. Table of Contents is revised to show added Specification 122116 – Vertical Louver Blinds
- B. Table of Contents is revised to show removed Specifications from Addendum #2
- C. Table of Contents is revised inserting SECTION 260936. Said specification was included as part of the Contract Documents but not listed in the original Table of Contents.

1.17 Refer to revised Specification 260936 – Modular Dimming Controls

- A. Specification is revised to remove references to Section 260943

1.18 Refer to revised Specification 265119 – LED Interior Lighting

- A. Specification is revised to remove references to Section 260943

1.19 Refer to revised Specification 260519 – Low-Voltage Electrical Power Conductors and Cables

- A. Specification is revised to remove line item “G” from Section 3.3.

Attachments: Added Sheets: N/A

Revised Sheets: A1.2, A1.3, A7.4, A8.1, P3.2, E0.1, E3.1, E3.2, E3.4, E3.5

Added Specifications: 122116

Revised Specifications: Table of Contents, 260936, 265119, 260519

END OF ADDENDUM #3

SECTION 122116 - VERTICAL LOUVER BLINDS

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. Vertical louver blinds with PVC vanes for exterior windows.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Shop Drawings: For vertical louver blinds, include fabrication and installation details.
- C. Samples: For each exposed product and for each color and texture specified, 12 inches long.
- D. Samples for Initial Selection: For each type of vertical louver blind.
 - 1. Include Samples of accessories involving color selection.
- E. Samples for Verification: For each type of vertical louver blind.
 - 1. Vane: Not less than 12 inches long.
 - 2. Vertical Louver Blind: Full-size unit, not less than 36 inches wide by 36 inches long.
 - 3. Valance: Full-size unit, not less than 12 inches wide.
- F. Product Schedule: For vertical louver blinds. Use same designations indicated on Drawings.

1.4 INFORMATIONAL SUBMITTALS

- A. Product Test Reports: For vertical louver blinds with polymer vanes that have been tested for compliance with NFPA 701 for tests performed by manufacturer and witnessed by a qualified testing agency.

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1.5 CLOSEOUT SUBMITTALS

- A. Maintenance Data: For vertical louver blinds to include in maintenance manuals.

1.6 MAINTENANCE MATERIAL SUBMITTALS

- A. Furnish extra materials, from the same product run, that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
 - 1. Vertical Louver Blinds: Full-size units equal to 5 percent of quantity installed for each size, color, texture, pattern, and finish indicated, but no fewer than two units.
 - 2. Vanes: Furnish quantity of full-size units equal to 5 percent of quantity installed for each type, size, texture, pattern, and finish indicated, but no fewer than two units.

1.7 QUALITY ASSURANCE

- A. Mockups: Build mockups to verify selections made under Sample submittals, to demonstrate aesthetic effects, and to set quality standards for fabrication and installation.
 - 1. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.
 - 2. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.8 DELIVERY, STORAGE, AND HANDLING

- A. Deliver vertical louver blinds in factory packages, marked with manufacturer and product name, and location of installation using same designations indicated on Drawings.

1.9 FIELD CONDITIONS

- A. Environmental Limitations: Do not install vertical louver blinds until construction and wet-work and finish work in spaces, including painting, is complete and dry and ambient temperature and humidity conditions are maintained at the levels indicated for Project when occupied for its intended use.
- B. Field Measurements: Where vertical louver blinds are indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication and indicate measurements on Shop Drawings. Allow clearances for operating hardware of operable glazed units through entire operating range. Notify Architect of installation conditions that vary from Drawings. Coordinate fabrication schedule with construction progress to avoid delaying the Work.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Source Limitations: Obtain vertical louver blinds from single source from single manufacturer.

2.2 VERTICAL LOUVER BLINDS, PVC VANES

- A. Basis-of-Design Product: Subject to compliance with requirements, provide product by levelor as "Basis of Design":

1. Levolor Contract; a Newell Rubbermaid company: White verticals.

- B. Vanes: Lead-free, UV-stabilized, integrally colored, opaque, permanently flexible, extruded PVC 100% GEON, 0030' inch thick that will not crack or yellow; with not less than 3/8-inch overlap when vanes are rotated fully closed.

1. Width: 2 inches, 3-1/2 inches.
2. Profile: Flat.

- C. Headrail: Channel, formed extruded aluminum alloy 1-3/16 inch x 1 inch with long edges returned or rolled and ends capped. Headrail encloses operating mechanisms including carrier-spacing mechanism that provides uniform vane spacing when blinds are traversed fully across headrail (closed).

1. Manual Traverse Control: Nickel-plated, metal bead chain.
2. Manual Rotation Control: Nickel-plated, metal bead chain.
3. Manual Control Locations: As indicated on Drawings.
4. Draw and Stack: As indicated on Drawings.
5. Stack Release: Permitting stacked vanes to be moved away from stacking position for access to glazed opening.

- D. Carriers: Engineered plastic with gears to align and synchronize vane rotation and stems that allow vane removal and replacement. Lead carriers have self-lubricating wheels or elongated bearing surfaces; remaining carriers have self-lubricating wheels.

- E. Valance: Manufacturer's standard with vane insert.

- F. Mounting Brackets: With spacers and shims required for blind placement and alignment indicated.

1. Type: As indicated.
2. Intermediate Support: Provide intermediate support brackets to produce support spacing recommended by blind manufacturer for weight and size of blind.

- G. Colors, Textures, and Patterns:

1. Vanes: As selected by Architect from manufacturer's full range.
2. Components: Provide materials exposed to view matching or coordinating with vanes unless otherwise indicated.

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2.3 VERTICAL LOUVER BLIND FABRICATION

- A. Unit Sizes: Fabricate units in sizes to cover window and other openings as follows, measured at 74 deg F:
 - 1. Between (Inside) Jamb Installation: Width equal to jamb-to-jamb dimension of opening in which blind is installed less 1/4 inch per side or 1/2 inch total, plus or minus 1/8 inch . Length equal to head-to-sill or -floor dimension of opening in which blind is installed less 1/4 inch , plus or minus 1/8 inch.
 - 2. Outside of Jamb Installation: Width and length as indicated, with terminations between blinds of end-to-end installations at centerlines of mullion or other defined vertical separations between openings.
- B. Concealed Components: Noncorrodible or corrosion-resistant-coated materials.
 - 1. Rotation-and-Traverse Mechanisms: With permanently lubricated moving parts.
- C. Installation Brackets: Designed for easy removal and reinstallation of blind, for supporting headrail, valance, and operating hardware and for bracket positions and blind mounting method indicated.
- D. Installation Fasteners: No fewer than two fasteners per bracket, fabricated from metal noncorrosive to brackets and adjoining construction; type designed for securing to supporting substrate; and supporting blinds and accessories under conditions of normal use.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances, operational clearances, and other conditions affecting performance of the Work.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. Install vertical louver blinds level and plumb, aligned and centered on openings, and aligned with adjacent units according to manufacturer's written instructions.
 - 1. Locate so exterior vane edges are not closer than 2 inches from interior faces of glass and not closer than 1-1/2 inches from interior faces of glazing frames through full operating ranges of blinds.
 - 2. Install mounting and intermediate brackets to prevent deflection of headrails.
 - 3. Install with clearances that prevent interference with adjacent blinds, adjacent construction, and operating hardware of glazed openings, other window treatments, and similar building components and furnishings.

3.3 ADJUSTING

- A. Adjust vertical louver blinds to operate free of binding or malfunction through full operating ranges.

3.4 CLEANING AND PROTECTION

- A. Clean vertical louver blind surfaces after installation according to manufacturer's written instructions.
- B. Provide final protection and maintain conditions in a manner acceptable to manufacturer and Installer that ensures that vertical louver blinds are without damage or deterioration at time of Substantial Completion.
- C. Replace damaged vertical louver blinds that cannot be repaired in a manner approved by Architect before time of Substantial Completion.

3.5 DEMONSTRATION

- A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain systems.

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NOT APPLICABLE

SECTION 260936 - MODULAR DIMMING CONTROLS

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. Wall-box, multiscene, modular dimming controls.
 - 2. Multipreset modular dimming controls.

1.3 DEFINITIONS

- A. BAS: Building automation system.
- B. Fade Rate: The time it takes each zone to arrive at the next scene, dependent on the degree of change in lighting level.
- C. Low Voltage: As defined in NFPA 70, the term for circuits and equipment operating at less than 50 V or for remote-control, signaling, and power-limited circuits.
- D. RFI: Radio-frequency interference.
- E. Scene: The lighting effect created by adjusting several zones of lighting to the desired intensity.
- F. SCR: Silicon-controlled rectifier.
- G. Zone: A luminaire or group of luminaires controlled simultaneously as a single entity. Also known as a "channel."

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product.
 - 1. For modular dimming controls; include elevation, dimensions, features, characteristics, ratings, and labels.
 - 2. Device plates and plate color and material.
 - 3. Ballast and lamp combinations compatible with dimmers.
 - 4. Sound data including results of operational tests of central dimming controls.

5. Operational documentation for software and firmware.
- B. Shop Drawings: Detail assemblies of standard components, custom assembled for specific application on Project. Indicate dimensions, weights, arrangement of components, and clearance and access requirements.
1. Include elevation views of front panels of control and indicating devices and control stations.
 2. Include diagrams for power, signal, and control wiring.
 3. Address Drawing: Reflected ceiling plan and floor plans, showing connected luminaires, address for each luminaire, and luminaire groups. Base plans on construction plans, using the same legend, symbols, and schedules.
 4. Point List and Data Bus Load: Summary list of all control devices, sensors, ballasts, and other loads. Include percentage of rated connected load and device addresses.
 5. Wire Termination Diagrams and Schedules: Coordinate nomenclature and presentation with Drawings and block diagram. Differentiate between manufacturer-installed and field-installed wiring.
 6. Block Diagram: Show interconnections between components specified in this Section and devices furnished with power distribution system components. Indicate data communication paths and identify networks, data buses, data gateways, concentrators, and other devices used. Describe characteristics of network and other data communication lines.
- C. Samples for Initial Selection: For master- and remote-control stations, and faceplates with factory-applied color finishes and technical features.
- D. Samples for Verification: For master- and remote-control stations, and faceplates with factory-applied color finishes and technical features.
- 1.5 INFORMATIONAL SUBMITTALS
- A. Coordination Drawings: Submit evidence that lighting controls are compatible with connected monitoring and control devices and systems specified in [Section 230923 "Direct Digital Control (DDC) System for HVAC."] <Insert Section number and title.>
1. Show interconnecting signal and control wiring, and interface devices that show compatibility of inputs and outputs.
 2. For control interfaces and adapters, list network protocols and provide statements from manufacturers that input and output devices comply with interoperability requirements of the protocol.
- B. Field quality-control reports.
- C. Sample Warranty: For special warranty.

1.6 CLOSEOUT SUBMITTALS

- A. Operation and Maintenance Data: For standalone multipreset modular dimming controls to include in emergency, operation, and maintenance manuals.
1. In addition to items specified in Section 017823 "Operation and Maintenance Data," include the following:
 - a. Software manuals.
 - b. Adjustments of scene preset controls, adjustable fade rates, and fade overrides.
 - c. Operation of adjustable zone controls.
 - d. Testing and adjusting of panic and emergency power features.

1.7 WARRANTY

- A. Special Warranty: Manufacturer agrees to repair or replace components of standalone multipreset modular dimming controls that fail in materials or workmanship within specified warranty period.
1. Failures include, but are not limited to, the following:
 - a. Damage from transient voltage surges.
 - b. <Insert type of failure>.
 2. Warranty Period: Cost to repair or replace any parts for [two] <Insert number> years from date of Substantial Completion.
 3. Extended Warranty Period: Cost of replacement parts (materials only, f.o.b. the nearest shipping point to Project site), for [eight] <Insert number> years, that failed in service due to transient voltage surges.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, [provide products by the following] [provide products by one of the following] [available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following]:
- B. Basis-of-Design Product: Subject to compliance with requirements, provide [product indicated on Drawings] <Insert manufacturer's name; product name or designation> or comparable product by one of the following:
1. Douglas Lighting Controls.
 2. Leviton Manufacturing Co., Inc.
 3. Lightolier; a Philips group brand.
 4. Lutron Electronics Co., Inc.

5. Philips Lighting Controls.

2.2 SYSTEM DESCRIPTION

A. Compatibility:

1. Dimming control components shall be compatible with [luminaires] [luminaires and ballasts] [luminaires, ballasts, and transformers].

B. Dimmers and Dimmer Modules: Comply with UL 508.

1. Audible Noise and RFI Suppression: Solid-state dimmers shall operate smoothly over their operating ranges without audible lamp or dimmer noise or RFI. Modules shall include integral or external filters to suppress audible noise and RFI.
2. Dimmer or Dimmer-Module Rating: Not less than 125 percent of connected load unless otherwise indicated.

C. Capacities: Unit shall be rated for [2400 W at 240-V ac and 2000 W at 120-V ac] <Insert value> for up to [100] <Insert number> devices or zones.

D. Surge Protection: Withstand supply power surges without impairment to performance.

1. Panels: 6000 V, 3000 A, complying with IEEE C62.41.1 and IEEE C62.41.2.
2. Other System Devices: 6000 V, 3000 A, complying with IEEE C62.41.1 and IEEE C62.41.2.

E. Off Control Position: User-selected off position of any control point shall disconnect the load from line supply.

F. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

2.3 WALL-BOX MULTISCENE DIMMING CONTROLS

A. Description: Factory-fabricated equipment providing manual dimming consisting of a wall-box-mounted master controller[and indicated number of wall-box zone stations]. Controls and dimmers shall be integrated for mounting in multigang wall box under a single wall plate. Each zone shall be adjustable to indicated number of scenes, which shall reside in the memory of zone controller.

B. Dimmers: Each zone shall be configurable to control the following loads:

1. Fluorescent lamps with [electronic] [magnetic] ballasts.
2. LED lamps.
3. Incandescent lamps.
4. Low-voltage lamps, derived with [magnetic] [electronic] transformers.
5. Non-dim, on-off switching only.

6. <Insert special lighting equipment>.
- C. Dimmers: Regulate voltages to maintain a constant light level, with no visible flicker, when the source voltage varies plus or minus 2 percent of rms voltage.
- D. Memory:
 1. Retain preset scenes and fade rates through momentary (up to 3-second) power interruptions.
 2. Retain preset scenes through power failures for at least [seven] <Insert number> days.
- E. Device Plates: Style, material, and color [shall comply with Section 262726 "Wiring Devices."] <Insert description.> Master-control cover plate shall be one piece.
- F. Master controller shall include the following:
 1. Cover-mounted switches, including master off, all bright, and selectors for each scene.
 2. Cover-mounted LED indicator lights, one associated with each scene switch, and one for the master off switch.
 3. Concealed switches and indicators for specified function.
 4. A raise/lower switch for each zone for temporary adjustments of the zone, without altering scene values stored in memory.
 5. Fade time indicated by digital display for current scene while fading.
 6. Cover-mounted infrared receiver.
- G. Infrared Transmitters: Wireless remote control for recalling [each] [four] <Insert number> of the presets. Operate up to **50 feet** within line of sight of the master controller.

2.4 MULTIPRESET MODULAR DIMMING CONTROLS

- A. Description: Factory-fabricated equipment providing manual dimming consisting of the following:
 1. Master controller.
 2. Dimmer panels[, and indicated number of zone stations].
 3. Controls and dimmers shall be integrated for mounting in a multigang wall box under a single wall plate.
 4. Each zone shall be adjustable to indicated number of scenes, which shall reside in the memory of zone controller.
- B. Dimmers: Each zone shall be configurable to control the following loads:
 1. Fluorescent lamps with [electronic] [magnetic] ballasts.
 2. LED lamps.
 3. Incandescent lamps.
 4. Low-voltage incandescent lamps, derived with [magnetic] [electronic] transformers.
 5. Non-dim, on-off switching only.
 6. Neon and cold-cathode lighting.
 7. <Insert special lighting equipment>.

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- C. Dimmers: Regulate voltages to maintain a constant light level, with no visible flicker, when the source voltage varies plus or minus 2 percent of rms voltage.
- D. Memory: Retain preset scenes and fade settings through power failures by retaining physical settings of controls.
- E. Device Plates: Style, material, and color [shall comply with Section 262726 "Wiring Devices."] <Insert description.> Master-control cover plate shall be one piece.
- F. Master controller shall include the following:
 - 1. Wall-box style, single coverplate supplied by manufacturer.
 - 2. Cover-mounted switches, including master off, all bright, and selectors for each scene.
 - 3. Cover-mounted LED indicator lights, one associated with each scene switch, and one for the master off switch.
 - 4. Concealed switches and indicators for specified function.
 - 5. A raise/lower switch for each zone for temporary adjustments of the zone, without altering scene values stored in memory.
 - 6. Fade time indicated by digital display for current scene while fading.
 - 7. Cover-mounted infrared receiver.
- G. Remote-Control Stations:
 - 1. Numbered push buttons to select scenes.
 - 2. Off switch to turn master station off.[Operating the off switch at any remote station shall automatically turn on selected housekeeping lighting.]
 - 3. On switch turns all scenes of master station to full bright.
 - 4. Control Wiring: NFPA 70, Class 2.
 - 5. Mounting: Single flush wall box with manufacturer's [standard faceplate] <Insert special material and color for faceplate>.
- H. Infrared Remote-Control Station: Same functions as for standard remote-control station except that functions are input by a hand-held infrared transmitter. Operate up to **50 feet** within line of sight of the master controller.
- I. Dimmer Panels: Modular, plug-in type, complying with UL 508.
 - 1. Integrated Short-Circuit Rating: [10 kA at 120 V][, 14 kA at 277 V].
 - 2. Dimmers:
 - a. Dimming Circuit: Two SCR dimmers, in inverse parallel configuration.
 - b. Dimming Curve: Modified "square law" as specified in IES's "Lighting Handbook"; control voltage is 0- to 10-V dc.
 - c. Dimming Range: Zero to 100 percent, full output voltage not less than 98 percent of line voltage.
 - d. Voltage Regulation: Dimmer shall maintain a constant light level, with no visible flicker, when the source voltage varies plus or minus 2 percent of rms voltage.
- J. Circuit Breakers: Complying with UL 489 and classified as switch duty.

2.5 CONDUCTORS AND CABLES

- A. Wiring to Supply Side of Remote-Control Power Sources: Not smaller than No. 12 AWG. Comply with requirements in Section 260519 "Low-Voltage Electrical Power Conductors and Cables."
- B. Class 2 Control Cable: Multiconductor cable with stranded-copper conductors not smaller than [No. 18] [No. 22] [No. 24] AWG. Comply with requirements in Section 260519 "Low-Voltage Electrical Power Conductors and Cables."

PART 3 - EXECUTION

3.1 WIRING INSTALLATION

- A. Comply with NECA 1.
- B. Wiring Method: Comply with requirements in Section 260519 "Low-Voltage Electrical Power Conductors and Cables." Minimum conduit size shall be 1/2 inch.
- C. Wiring within Enclosures: Bundle, lace, and train conductors to terminal points. Separate power-limited and nonpower-limited conductors according to conductor manufacturer's written instructions.
- D. Size conductors according to lighting control device manufacturer's written instructions unless otherwise indicated.
- E. Splices, Taps, and Terminations: Make connections only on numbered terminal strips in junction, pull, and outlet boxes; terminal cabinets; and equipment enclosures.

3.2 IDENTIFICATION

- A. Comply with requirements for identification specified in Section 260553 "Identification for Electrical Systems."
- B. Label each dimmer module with a unique designation.
- C. Label each scene control button with approved scene description.

3.3 FIELD QUALITY CONTROL

- A. Testing Agency: [Owner will engage] [Engage] a qualified testing agency to perform tests and inspections.
- B. Manufacturer's Field Service: Engage a factory-authorized service representative to test and inspect components, assemblies, and equipment installations, including connections.

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- C. Perform the following tests and inspections[with the assistance of a factory-authorized service representative]:
 - 1. Continuity tests of circuits.
 - 2. Operational Test: Set and operate controls to demonstrate their functions and capabilities in a methodical sequence that cues and reproduces actual operating functions.
 - a. Include testing of modular dimming control equipment under conditions that simulate actual operational conditions. Record control settings, operations, cues, and functional observations.
- D. Dimming control components will be considered defective if they do not pass tests and inspections.
- E. Test Labeling: After satisfactory completion of tests and inspections, apply a label to tested components indicating test results, date, and responsible agency and representative.
- F. Reports: Written reports of tests and observations. Record defective materials and workmanship and unsatisfactory test results. Record repairs and adjustments.

END OF SECTION 260936

SECTION 265119 - LED INTERIOR LIGHTING

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. Interior solid-state luminaires that use LED technology.
2. Lighting fixture supports.

B. Related Requirements:

1. Section 260923 "Lighting Control Devices" for automatic control of lighting, including time switches, photoelectric relays, occupancy sensors, and multipole lighting relays and contactors.
2. Section 260926 "Lighting Control Panelboards" for panelboards used for lighting control.
3. Section 260933 "Central Dimming Controls" or Section 260936.19 "Standalone Multipreset Modular Dimming Controls" for architectural dimming systems and for fluorescent dimming controls with dimming ballasts specified in interior lighting Sections.

1.3 DEFINITIONS

- A. CCT: Correlated color temperature.
- B. CRI: Color Rendering Index.
- C. Fixture: See "Luminaire."
- D. IP: International Protection or Ingress Protection Rating.
- E. LED: Light-emitting diode.
- F. Lumen: Measured output of lamp and luminaire, or both.
- G. Luminaire: Complete lighting unit, including lamp, reflector, and housing.

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product.
1. Arrange in order of luminaire designation.
 2. Include data on features, accessories, and finishes.
 3. Include physical description and dimensions of luminaires.
 4. Include emergency lighting units, including batteries and chargers.
 5. Include life, output (lumens, CCT, and CRI), and energy efficiency data.
 6. Photometric data and adjustment factors based on laboratory tests[, complying with IESNA Lighting Measurements Testing and Calculation Guides, of each lighting fixture type. The adjustment factors shall be for lamps and accessories identical to those indicated for the lighting fixture as applied in this Project] [IES LM-79] [and] [IES LM-80].
 - a. Manufacturers' Certified Data: Photometric data certified by manufacturer's laboratory with a current accreditation under the National Voluntary Laboratory Accreditation Program for Energy Efficient Lighting Products.
 - b. Testing Agency Certified Data: For indicated luminaires, photometric data certified by a qualified independent testing agency. Photometric data for remaining luminaires shall be certified by manufacturer.
- B. Shop Drawings: For nonstandard or custom luminaires.
1. Include plans, elevations, sections, and mounting and attachment details.
 2. Include details of luminaire assemblies. Indicate dimensions, weights, loads, required clearances, method of field assembly, components, and location and size of each field connection.
 3. Include diagrams for power, signal, and control wiring.
- C. LEED Submittals:
1. Product Data for Credit IEQ 4.2: For paints and coatings, documentation including printed statement of VOC content.
 2. Laboratory Test Reports for Credit IEQ 4.2: For paints and coatings, documentation indicating that products comply with the testing and product requirements of the California Department of Public Health's "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers."
- D. Samples: For each luminaire and for each color and texture with standard factory-applied finish.
- E. Samples for Initial Selection: For each type of luminaire with custom factory-applied finishes.
1. Include Samples of luminaires and accessories involving color and finish selection.
- F. Samples for Verification: For each type of luminaire.
1. Include Samples of luminaires and accessories to verify finish selection.
- G. Product Schedule: For luminaires and lamps.[Use same designations indicated on Drawings.]

1.5 INFORMATIONAL SUBMITTALS

- A. Coordination Drawings: Reflected ceiling plan(s) and other details, drawn to scale, on which the following items are shown and coordinated with each other, using input from installers of the items involved:
1. Lighting luminaires.
 2. Suspended ceiling components.
 3. Partitions and millwork that penetrate the ceiling or extend to within 12 inches of the plane of the luminaires.
 4. Structural members to which [equipment] [and] [or] luminaires will be attached.
 5. Initial access modules for acoustical tile, including size and locations.
 6. Items penetrating finished ceiling, including the following:
 - a. Other luminaires.
 - b. Air outlets and inlets.
 - c. Speakers.
 - d. Sprinklers.
 - e. Access panels.
 - f. Ceiling-mounted projectors.
 - g. <Insert item>.
 7. Moldings.
 8. <Insert feature>.
- B. Qualification Data: For testing laboratory providing photometric data for luminaires.
- C. Seismic Qualification Certificates: For luminaires, accessories, and components, from manufacturer.
1. Basis for Certification: Indicate whether withstand certification is based on actual test of assembled components or on calculation.
 2. Dimensioned Outline Drawings of Equipment Unit: Identify center of gravity and locate and describe mounting and anchorage provisions.
- D. Detailed description of equipment anchorage devices on which the certification is based and their installation requirements.
- E. Product Certificates: For each type of luminaire.
- F. Product Test Reports: For each luminaire, for tests performed by [manufacturer and witnessed by a qualified testing agency] [a qualified testing agency].
- G. Sample warranty.

1.6 CLOSEOUT SUBMITTALS

- A. Operation and Maintenance Data: For luminaires and lighting systems to include in operation and maintenance manuals.

1. Provide a list of all lamp types used on Project; use ANSI and manufacturers' codes.

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. Lamps: [Ten for every 100] <Insert quantity> of each type and rating installed. Furnish at least one of each type.
 2. Diffusers and Lenses: [One for every 100] <Insert quantity> of each type and rating installed. Furnish at least one of each type.
 3. Globes and Guards: [One for every 20] <Insert quantity> of each type and rating installed. Furnish at least one of each type.

1.8 QUALITY ASSURANCE

- A. Luminaire Photometric Data Testing Laboratory Qualifications: Luminaire manufacturer's laboratory that is accredited under the NVLAP for Energy Efficient Lighting Products.
- B. Luminaire Photometric Data Testing Laboratory Qualifications: Provided by an independent agency, with the experience and capability to conduct the testing indicated, that is an NRTL as defined by OSHA in 29 CFR 1910.7, accredited under the NVLAP for Energy Efficient Lighting Products, and complying with the applicable IES testing standards.
- C. Provide luminaires from a single manufacturer for each luminaire type.
- D. Each luminaire type shall be binned within a three-step MacAdam Ellipse to ensure color consistency among luminaires.
- E. Mockups: For interior lighting luminaires in room or module mockups, complete with power and control connections.
 1. Obtain Architect's approval of luminaires in mockups before starting installations.
 2. Maintain mockups during construction in an undisturbed condition as a standard for judging the completed Work.
 3. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.
 4. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.9 DELIVERY, STORAGE, AND HANDLING

- A. Protect finishes of exposed surfaces by applying a strippable, temporary protective covering before shipping.

1.10 WARRANTY

- A. Warranty: Manufacturer and Installer agree to repair or replace components of luminaires that fail in materials or workmanship within specified warranty period.
- B. Warranty Period: [Five] <Insert number> year(s) from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Seismic Performance: Luminaires shall withstand the effects of earthquake motions determined according to [ASCE/SEI 7] <Insert requirement>
- B. Seismic Performance: Luminaires and lamps shall be labeled vibration and shock resistant.
 - 1. The term "withstand" means "the luminaire will remain in place without separation of any parts when subjected to the seismic forces specified[] and the luminaire will be fully operational during and after the seismic event[.]".

2.2 LUMINAIRE REQUIREMENTS

- A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
- B. NRTL Compliance: Luminaires for hazardous locations shall be listed and labeled for indicated class and division of hazard by an NRTL.
- C. FM Global Compliance: Luminaires for hazardous locations shall be listed and labeled for indicated class and division of hazard by FM Global.
- D. Recessed Fixtures: Comply with NEMA LE 4.
- E. Bulb shape complying with ANSI C79.1.
- F. Lamp base complying with [ANSI C81.61] [or] [IEC 60061-1].
- G. CRI of [minimum] [65] [70] [80] <Insert number>. CCT of [2700 K] [3000 K] [4100 K] <Insert value>.
- H. Rated lamp life of [35,000] [50,000] <Insert number> hours.
- I. Lamps dimmable from 100 percent to 0 percent of maximum light output.
- J. Internal driver.
- K. Nominal Operating Voltage: [120 V ac] [240 V ac] [277 V ac] [12 V dc] [24 V dc].

1. Lens Thickness: At least 0.125 inch minimum unless otherwise indicated.

L. Housings:

1. [Extruded-aluminum] <Insert option> housing and heat sink.
2. [Clear] <Insert color> [anodized] [powder-coat] [painted] finish.

2.3 CYLINDER

- A. Manufacturers: Subject to compliance with requirements, [provide products by the following] [provide products by one of the following] [available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following]:
- B. Basis-of-Design Product: Subject to compliance with requirements, provide [product indicated on Drawings] <Insert manufacturer's name; product name or designation> or comparable product by one of the following:
1. Albeo Technologies, Inc.; a GE company.
 2. Amerlux.
 3. Architectural Lighting Works.
 4. Axis Lighting, Inc.
 5. Cooper Lighting.
 6. Edge Lighting.
 7. Edison Price Lighting.
 8. Eureka.
 9. Focal Point.
 10. GE Lighting Solutions.
 11. Juno Lighting Group by Schneider Electric.
 12. Lighting Science Group.
 13. Lightolier; a Philips group brand.
 14. Lithonia Lighting; Acuity Brands Lighting, Inc.
 15. MP Lighting.
 16. OSRAM SYLVANIA.
 17. Pure Lighting.
 18. Sea Gull Lighting.
 19. Selux Corporation.
 20. Specialty Lighting Industries, Inc.
 21. Tech Lighting.
 22. <Insert manufacturer's name>.
- C. Minimum [250] [575] [1000] <Insert number> lumens. Minimum allowable efficacy of [80] <Insert number> lumens per watt.
- D. With integral mounting provisions.

2.4 DOWNLIGHT

- A. Manufacturers: Subject to compliance with requirements, [provide products by the following] [provide products by one of the following] [available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following]:
- B. Basis-of-Design Product: Subject to compliance with requirements, provide [product indicated on Drawings] <Insert manufacturer's name; product name or designation> or comparable product by one of the following:
1. Amerlux.
 2. Architectural Lighting Works.
 3. Cooper Lighting.
 4. Edge Lighting.
 5. Edison Price Lighting.
 6. Eureka.
 7. Focal Point LLC.
 8. Gallium Lighting, LLC.
 9. GE Lighting Solutions.
 10. Juno Lighting Group by Schneider Electric.
 11. Lighting Science Group.
 12. Lighting Services Inc.
 13. Lightolier; a Philips group brand.
 14. Lithonia Lighting; Acuity Brands Lighting, Inc.
 15. MP Lighting.
 16. OSRAM SYLVANIA.
 17. Peerless: Acuity Brands Lighting, Inc.
 18. Pure Lighting.
 19. RAB Lighting.
 20. Sea Gull Lighting.
 21. Specialty Lighting Industries, Inc.
 22. Tech Lighting.
 23. <Insert manufacturer's name>.
- C. Minimum [1,000] <Insert number> lumens. Minimum allowable efficacy of [80] <Insert number> lumens per watt.
- D. Universal mounting bracket.
- E. Integral junction box with conduit fittings.

2.5 HIGHBAY, LINEAR

- A. Manufacturers: Subject to compliance with requirements, [provide products by the following] [provide products by one of the following] [available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following]:

- B. Basis-of-Design Product: Subject to compliance with requirements, provide [product indicated on Drawings] <Insert manufacturer's name; product name or designation> or comparable product by one of the following:
1. Axlen LED Lighting.
 2. Cooper Lighting.
 3. Digital Lumens.
 4. GE Lighting Solutions.
 5. Juno Lighting Group by Schneider Electric.
 6. Lighting Science Group.
 7. ON-Q Lighting Systems.
 8. OSRAM SYLVANIA.
 9. RAB Lighting.
 10. <Insert manufacturer's name>.
- C. Minimum [10,000] <Insert number> lumens. Minimum allowable efficacy of [80] <Insert number> lumens per watt.

2.6 HIGHBAY, NONLINEAR

- A. Manufacturers: Subject to compliance with requirements, [provide products by the following] [provide products by one of the following] [available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following]:
- B. Basis-of-Design Product: Subject to compliance with requirements, provide [product indicated on Drawings] <Insert manufacturer's name; product name or designation> or comparable product by one of the following:
1. Albeo Technologies, Inc.; a GE company.
 2. Cooper Lighting.
 3. Digital Lumens.
 4. GE Lighting Solutions.
 5. Juno Lighting Group by Schneider Electric.
 6. OSRAM SYLVANIA.
 7. RAB Lighting.
 8. <Insert manufacturer's name>.
- C. Minimum [10,000] <Insert number> lumens. Minimum allowable efficacy of [80] <Insert number> lumens per watt.
- D. Universal mounting bracket.
- E. Integral junction box with conduit fittings.

2.7 LINEAR INDUSTRIAL

- A. Manufacturers: Subject to compliance with requirements, [provide products by the following] [provide products by one of the following] [available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following]:
- B. Basis-of-Design Product: Subject to compliance with requirements, provide [product indicated on Drawings] <Insert manufacturer's name; product name or designation> or comparable product by one of the following:
 - 1. Albeo Technologies, Inc.; a GE company.
 - 2. Axlen LED Lighting.
 - 3. Cooper Lighting.
 - 4. GE Lighting Solutions.
 - 5. Lighting Science Group.
 - 6. Lithonia Lighting; Acuity Brands Lighting, Inc.
 - 7. OSRAM SYLVANIA.
 - 8. RAB Lighting.
 - 9. <Insert manufacturer's name>.
- C. Minimum [5,000] <Insert number> lumens. Minimum allowable efficacy of [80] <Insert number> lumens per watt.
- D. Housing and heat sink rated to the following:
 - 1. Class 1, Division 2 Group(s) [A] [B] [C] [and] [D].
 - 2. NEMA 4X.
 - 3. IP 54.
 - 4. IP 66.
 - 5. Marine and wet locations.
 - 6. CSA C22.2 No 137.
 - 7. <Insert standard or certification>.

2.8 LOWBAY

- A. Manufacturers: Subject to compliance with requirements, [provide products by the following] [provide products by one of the following] [available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following]:
- B. Basis-of-Design Product: Subject to compliance with requirements, provide [product indicated on Drawings] <Insert manufacturer's name; product name or designation> or comparable product by one of the following:
 - 1. Albeo Technologies, Inc.; a GE company.
 - 2. Cooper Lighting.
 - 3. GE Lighting Solutions.
 - 4. Lighting Science Group.
 - 5. Lithonia Lighting; Acuity Brands Lighting, Inc.
 - 6. OSRAM SYLVANIA.

7. <Insert manufacturer's name>.

C. Minimum [5,000] [10,000] <Insert number> lumens. Minimum allowable efficacy of 80 lumens per watt.

D. Universal mounting bracket.

2.9 PARKING GARAGE

A. Manufacturers: Subject to compliance with requirements, [provide products by the following] [provide products by one of the following] [available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following]:

B. Basis-of-Design Product: Subject to compliance with requirements, provide [product indicated on Drawings] <Insert manufacturer's name; product name or designation> or comparable product by one of the following:

1. Cooper Lighting.
2. Gallium Lighting, LLC.
3. GE Lighting Solutions.
4. ON-Q Lighting Systems.
5. OSRAM SYLVANIA.
6. RAB Lighting.
7. <Insert manufacturer's name>.

C. Minimum [2,000] <Insert number> lumens. Minimum allowable efficacy of [75] <Insert number> lumens per watt.

D. Low-profile housing and heat sink.

E. Fully gasketed and sealed.[IP 65 rated.]

F. Stainless-steel latches.

G. Integral pressure equalizer.

2.10 RECESSED LINEAR

A. Manufacturers: Subject to compliance with requirements, [provide products by the following] [provide products by one of the following] [available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following]:

B. Basis-of-Design Product: Subject to compliance with requirements, provide [product indicated on Drawings] <Insert manufacturer's name; product name or designation> or comparable product by one of the following:

1. Albeo Technologies, Inc.; a GE company.
2. Architectural Lighting Works.

3. Axis Lighting, Inc.
 4. Cooper Lighting.
 5. Finelite.
 6. Focal Point LLC.
 7. GE Lighting Solutions.
 8. Lithonia Lighting; Acuity Brands Lighting, Inc.
 9. Lumen Pulse.
 10. ON-Q Lighting Systems.
 11. OSRAM SYLVANIA.
 12. RAB Lighting.
 13. Selux Corporation.
 14. <Insert manufacturer's name>.
- C. Minimum [1,500] [2,000] [3,000] <Insert number> lumens. Minimum allowable efficacy of [85] <Insert number> lumens per watt.
- D. Integral junction box with conduit fittings.

2.11 STRIP LIGHT

- A. Manufacturers: Subject to compliance with requirements, [provide products by the following] [provide products by one of the following] [available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following]:
- B. Basis-of-Design Product: Subject to compliance with requirements, provide [product indicated on Drawings] <Insert manufacturer's name; product name or designation> or comparable product by one of the following:
1. Cooper Lighting.
 2. GE Lighting Solutions.
 3. Lighting Science Group.
 4. Lithonia Lighting; Acuity Brands Lighting, Inc.
 5. OSRAM SYLVANIA.
 6. Philips Lighting Company.
 7. Stile Lighting.
 8. <Insert manufacturer's name>.
- C. Minimum [750] <Insert number> lumens. Minimum allowable efficacy of [75] [80] <Insert number> lumens per watt.
- D. Integral junction box with conduit fittings.

2.12 SURFACE MOUNT, LINEAR

- A. Manufacturers: Subject to compliance with requirements, [provide products by the following] [provide products by one of the following] [available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following]:

- B. Basis-of-Design Product: Subject to compliance with requirements, provide [product indicated on Drawings] <Insert manufacturer's name; product name or designation> or comparable product by one of the following:
1. Albeo Technologies, Inc.; a GE company.
 2. Architectural Lighting Works.
 3. Axis Lighting, Inc.
 4. Cooper Lighting.
 5. Finelite.
 6. Focal Point LLC.
 7. GE Lighting Solutions.
 8. Lighting Science Group.
 9. Lightolier; a Philips group brand.
 10. Lithonia Lighting; Acuity Brands Lighting, Inc.
 11. Lumen Pulse.
 12. MP Lighting.
 13. OSRAM SYLVANIA.
 14. Pure Lighting.
 15. Specialty Lighting Industries, Inc.
 16. Stile Lighting.
 17. Tech Lighting.
 18. The Lighting Quotient.
 19. <Insert manufacturer's name>.
- C. Minimum [750] <Insert number> lumens. Minimum allowable efficacy of [75] [80] <Insert number> lumens per watt.
- D. Integral junction box with conduit fittings.

2.13 SURFACE MOUNT, NONLINEAR

- A. Manufacturers: Subject to compliance with requirements, [provide products by the following] [provide products by one of the following] [available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following]:
- B. Basis-of-Design Product: Subject to compliance with requirements, provide [product indicated on Drawings] <Insert manufacturer's name; product name or designation> or comparable product by one of the following:
1. Architectural Lighting Works.
 2. Cooper Lighting.
 3. Edge Lighting.
 4. Eureka.
 5. Focal Point LLC.
 6. GE Lighting Solutions.
 7. Lightolier Controls.
 8. Lithonia Lighting; Acuity Brands Lighting, Inc.
 9. Lumen Pulse.
 10. MP Lighting.

11. OSRAM SYLVANIA.
 12. Peerless: Acuity Brands Lighting, Inc.
 13. Pure Lighting.
 14. Tech Lighting.
 15. <Insert manufacturer's name>.
- C. Minimum [750] <Insert number> lumens. Minimum allowable efficacy of [75] [80] <Insert number> lumens per watt.
- D. Integral junction box with conduit fittings.
- 2.14 SUSPENDED, LINEAR
- A. Manufacturers: Subject to compliance with requirements, [provide products by the following] [provide products by one of the following] [available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following]:
- B. Basis-of-Design Product: Subject to compliance with requirements, provide [product indicated on Drawings] <Insert manufacturer's name; product name or designation> or comparable product by one of the following:
1. Architectural Lighting Works.
 2. Axis Lighting, Inc.
 3. Axlen LED Lighting.
 4. Cooper Lighting.
 5. Edge Lighting.
 6. Finelite.
 7. Focal Point LLC.
 8. Gallium Lighting, LLC.
 9. GE Lighting Solutions.
 10. Lightolier; a Philips group brand.
 11. Lithonia Lighting; Acuity Brands Lighting, Inc.
 12. Lumen Pulse.
 13. MP Lighting.
 14. ON-Q Lighting Systems.
 15. OSRAM SYLVANIA.
 16. Pure Lighting.
 17. Selux Corporation.
 18. Specialty Lighting Industries, Inc.
 19. Stile Lighting.
 20. Tech Lighting.
 21. <Insert manufacturer's name>.
- C. Minimum [1,500] [2,000] [3,000] <Insert number> lumens. Minimum allowable efficacy of [85] <Insert number> lumens per watt.

2.15 SUSPENDED, NONLINEAR

- A. Manufacturers: Subject to compliance with requirements, [provide products by the following] [provide products by one of the following] [available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following]:
- B. Basis-of-Design Product: Subject to compliance with requirements, provide [product indicated on Drawings] <Insert manufacturer's name; product name or designation> or comparable product by one of the following:
 - 1. Architectural Lighting Works.
 - 2. Cooper Lighting.
 - 3. Edge Lighting.
 - 4. Eureka.
 - 5. Focal Point LLC.
 - 6. Lithonia Lighting; Acuity Brands Lighting, Inc.
 - 7. <Insert manufacturer's name>.
- C. Minimum [1,500] [2,000] [3,000] <Insert number> lumens. Minimum allowable efficacy of [85] <Insert number> lumens per watt.
- D. Integral junction box with conduit fittings.

2.16 MATERIALS

- A. Metal Parts:
 - 1. Free of burrs and sharp corners and edges.
 - 2. Sheet metal components shall be steel unless otherwise indicated.
 - 3. Form and support to prevent warping and sagging.
- B. Doors, Frames, and Other Internal Access: Smooth operating, free of light leakage under operating conditions, and designed to permit relamping without use of tools. Designed to prevent doors, frames, lenses, diffusers, and other components from falling accidentally during relamping and when secured in operating position.
- C. Diffusers and Globes:
 - 1. [Tempered Fresnel glass] [prismatic glass] [diffuse glass] [clear glass] [prismatic acrylic] [clear, UV-stabilized acrylic]
 - 2. Acrylic Diffusers: One hundred percent virgin acrylic plastic, with high resistance to yellowing and other changes due to aging, exposure to heat, and UV radiation.
 - 3. Glass: Annealed crystal glass unless otherwise indicated.
 - 4. Lens Thickness: At least 0.125 inch minimum unless otherwise indicated.
- D. Housings:
 - 1. [Extruded-aluminum] <Insert material> housing and heat sink.
 - 2. [Clear] <Insert color> [anodized] [powder-coat] [painted] finish.

- E. Factory-Applied Labels: Comply with UL 1598. Include recommended lamps. Locate labels where they will be readily visible to service personnel, but not seen from normal viewing angles when lamps are in place.

- 1. Label shall include the following lamp characteristics:

- a. "USE ONLY" and include specific lamp type.
 - b. Lamp diameter, shape, size, wattage, and coating.
 - c. CCT and CRI for all luminaires.

2.17 METAL FINISHES

- A. Variations in finishes are unacceptable in the same piece. Variations in finishes of adjoining components are acceptable if they are within the range of approved Samples and if they can be and are assembled or installed to minimize contrast.

2.18 LUMINAIRE FIXTURE SUPPORT COMPONENTS

- A. Comply with requirements in Section 260529 "Hangers and Supports for Electrical Systems" for channel and angle iron supports and nonmetallic channel and angle supports.
- B. Single-Stem Hangers: 1/2-inch steel tubing with swivel ball fittings and ceiling canopy. Finish same as luminaire.
- C. Wires: ASTM A 641/A 641 M, Class 3, soft temper, zinc-coated steel, [12 gage] <Insert size>.
- D. Rod Hangers: 3/16-inch minimum diameter, cadmium-plated, threaded steel rod.
- E. Hook Hangers: Integrated assembly matched to luminaire, line voltage, and equipment with threaded attachment, cord, and locking-type plug.

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 the Work.
- B. Examine roughing-in for luminaire to verify actual locations of luminaire and electrical connections before fixture installation. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 TEMPORARY LIGHTING

- A. If approved by the Architect, use selected permanent luminaires for temporary lighting. When construction is sufficiently complete, clean luminaires used for temporary lighting and install new lamps.

3.3 INSTALLATION

- A. Comply with NECA 1.
- B. Install luminaires level, plumb, and square with ceilings and walls unless otherwise indicated.
- C. Install lamps in each luminaire.
- D. Supports:
 - 1. Sized and rated for luminaire weight.
 - 2. Able to maintain luminaire position after cleaning and relamping.
 - 3. Provide support for luminaire without causing deflection of ceiling or wall.
 - 4. Luminaire mounting devices shall be capable of supporting a horizontal force of 100 percent of luminaire weight and vertical force of 400 percent of luminaire weight.
- E. Flush-Mounted Luminaire Support:
 - 1. Secured to outlet box.
 - 2. Attached to ceiling structural members at four points equally spaced around circumference of luminaire.
 - 3. Trim ring flush with finished surface.
- F. Wall-Mounted Luminaire Support:
 - 1. Do not attach luminaires directly to gypsum board.
- G. Ceiling-Mounted Luminaire Support:
 - 1. Ceiling mount with [two] <Insert number> 5/32-inch- <Insert value> diameter aircraft cable supports [adjustable to] [120 inches in length] <Insert length>.
 - 2. Ceiling mount with [pendant mount] [four-point pendant mount] with [5/32-inch-] <Insert value> diameter aircraft cable supports [adjustable to] [120 inches in length] <Insert length>.
 - 3. Ceiling mount with hook mount.
- H. Suspended Luminaire Support:
 - 1. Pendants and Rods: Where longer than 48 inches, brace to limit swinging.
 - 2. Stem-Mounted, Single-Unit Luminaires: Suspend with twin-stem hangers. Support with approved outlet box and accessories that hold stem and provide damping of luminaire oscillations. Support outlet box vertically to building structure using approved devices.

3. Continuous Rows of Luminaires: Use tubing or stem for wiring at one point and [tubing or rod] [wire support] for suspension for each unit length of luminaire chassis, including one at each end.
 4. Do not use ceiling grid as support for pendant luminaires. Connect support wires or rods to building structure.
- I. Ceiling-Grid-Mounted Luminaires:
1. Secure to any required outlet box.
 2. Secure luminaire to the luminaire opening using approved fasteners in a minimum of four locations, spaced near corners of luminaire.
 3. Use approved devices and support components to connect luminaire to ceiling grid and building structure in a minimum of four locations, spaced near corners of luminaire.
- J. Comply with requirements in Section 260519 "Low-Voltage Electrical Power Conductors and Cables" for wiring connections.

3.4 IDENTIFICATION

- A. Identify system components, wiring, cabling, and terminals. Comply with requirements for identification specified in Section 260553 "Identification for Electrical Systems."

3.5 FIELD QUALITY CONTROL

- A. Perform the following tests and inspections:
1. Operational Test: After installing luminaires, switches, and accessories, and after electrical circuitry has been energized, test units to confirm proper operation.
 2. Test for Emergency Lighting: Interrupt power supply to demonstrate proper operation. Verify transfer from normal power to battery power and retransfer to normal.
- B. Luminaire will be considered defective if it does not pass operation tests and inspections.
- C. Prepare test and inspection reports.

3.6 ADJUSTING

- A. Occupancy Adjustments: When requested within [12] <Insert number> months of date of Substantial Completion, provide on-site assistance in adjusting the direction of aim of luminaires to suit occupied conditions. Make up to [two] <Insert number> visits to Project during other-than-normal hours for this purpose. Some of this work may be required during hours of darkness.
1. During adjustment visits, inspect all luminaires. Replace lamps or luminaires that are defective.
 2. Parts and supplies shall be manufacturer's authorized replacement parts and supplies.
 3. Adjust the aim of luminaires in the presence of the Architect.

END OF SECTION 265119

SECTION 260519 - LOW-VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES

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. Building wires and cables rated 2000 V and less.
 - 2. Wires and cables for PV systems rated 2000 V and less.
 - 3. Connectors, splices, and terminations rated 2000 V and less.

1.3 DEFINITIONS

- A. PV: Photovoltaic.
- B. VFC: Variable-frequency controller.

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Product Schedule: Indicate type, use, location, and termination locations.

1.5 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For testing agency.
- B. Field quality-control reports.

PART 2 - PRODUCTS

2.1 CONDUCTORS AND CABLES

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

19002
100% CONSTRUCTION DOCUMENTS

260519-1

LOW-VOLTAGE ELECTRICAL
POWER CONDUCTORS AND
CABLES

1. Alpha Wire Company.
 2. American Bare Conductor.
 3. Belden Inc.
 4. Cerro Wire LLC.
 5. Encore Wire Corporation.
 6. General Cable Technologies Corporation.
 7. Service Wire Co.
 8. Southwire Company.
 9. WESCO.
- B. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
- C. Conductor and Cable Marking: Comply with wire and cable marking according to UL's "Wire and Cable Marking and Application Guide."
- D. Comply with UL 1277, UL 1685, and NFPA 70 for Type TC-ER cable used in VFC circuits.
- E. Conductors: Aluminum and copper, complying with NEMA WC 70/ICEA S-95-658.
1. Conductor Insulation: Comply with NEMA WC 70/ICEA S-95-658 for Type THW Type THW-2 Type THHN/THWN-2 Type XHHW-2 Type UF Type USE and Type SO.

2.2 CONNECTORS AND SPLICES

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. 3M.
 2. AFC Cable Systems, Inc.
 3. Gardner Bender.
 4. Hubbell Power Systems, Inc.
 5. Ideal Industries, Inc.
 6. ILSCO.
 7. NSi Industries LLC.
 8. O-Z/Gedney; an EGS Electrical Group brand; an Emerson Industrial Automation business.
 9. Tyco Electronics Corp.
- B. Description: Factory-fabricated connectors and splices of size, ampacity rating, material, type, and class for application and service indicated; listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

PART 3 - EXECUTION

3.1 CONDUCTOR MATERIAL APPLICATIONS

- A. Feeders: Copper; standard for No. 10 AWG and smaller; stranded for No. 8 AWG and larger.
- B. Feeders: Copper for feeders smaller than No. 4 AWG; copper for feeders No. 4 AWG and larger. Conductors shall be standard for No. 10 AWG and smaller; stranded for No. 8 AWG and larger.
- C. Branch Circuits: Copper. Standard for No. 10 AWG and smaller; stranded for No. 8 AWG and larger.
- D. Branch Circuits: Copper. Standard for No. 12 AWG and smaller; stranded for No. 10 AWG and larger.
- E. VFC Output Circuits Cable: Extra-flexible stranded for all sizes.

3.2 CONDUCTOR INSULATION AND MULTICONDUCTOR CABLE APPLICATIONS AND WIRING METHODS

- A. Service Entrance: Type THHN/THWN-2, single conductors in raceway.
- B. Exposed Feeders: Type THHN/THWN-2, single conductors in raceway.
- C. Feeders Concealed in Ceilings, Walls, Partitions, and Crawlspace: Type THHN/THWN-2, single conductors in raceway.
- D. Branch Circuits Concealed in Ceilings, Walls, and Partitions: Type THHN/THWN-2, single conductors in raceway.

3.3 INSTALLATION OF CONDUCTORS AND CABLES

- A. Conceal cables in finished walls, ceilings, and floors unless otherwise indicated.
- B. Complete raceway installation between conductor and cable termination points according to Section 260533 "Raceways and Boxes for Electrical Systems" prior to pulling conductors and cables.
- C. Use manufacturer-approved pulling compound or lubricant where necessary; compound used must not deteriorate conductor or insulation. Do not exceed manufacturer's recommended maximum pulling tensions and sidewall pressure values.
- D. Use pulling means, including fish tape, cable, rope, and basket-weave wire/cable grips, that will not damage cables or raceway.
- E. Install exposed cables parallel and perpendicular to surfaces of exposed structural members, and follow surface contours where possible.

- F. Support cables according to Section 260529 "Hangers and Supports for Electrical Systems."

3.4 CONNECTIONS

- A. Tighten electrical connectors and terminals according to manufacturer's published torque-tightening values. If manufacturer's torque values are not indicated, use those specified in UL 486A-486B.
- B. Make splices, terminations, and taps that are compatible with conductor material and that possess equivalent or better mechanical strength and insulation ratings than unspliced conductors.
- C. Wiring at Outlets: Install conductor at each outlet, with at least 6 inches of slack.

3.5 IDENTIFICATION

- A. Identify and color-code conductors and cables according to Section 260553 "Identification for Electrical Systems."
- B. Identify each spare conductor at each end with identity number and location of other end of conductor, and identify as spare conductor.

3.6 SLEEVE AND SLEEVE-SEAL INSTALLATION FOR ELECTRICAL PENETRATIONS

- A. Install sleeves and sleeve seals at penetrations of exterior floor and wall assemblies. Comply with requirements in Section 260544 "Sleeves and Sleeve Seals for Electrical Raceways and Cabling."

3.7 FIRESTOPPING

- A. Apply firestopping to electrical penetrations of fire-rated floor and wall assemblies to restore original fire-resistance rating of assembly according to Section 078413 "Penetration Firestopping."

3.8 FIELD QUALITY CONTROL

- A. Testing Agency: Owner will engage a qualified testing agency to perform tests and inspections.
- B. Manufacturer's Field Service: Engage a factory-authorized service representative to test and inspect components, assemblies, and equipment installations, including connections.

- C. Perform the following tests and inspections:
1. After installing conductors and cables and before electrical circuitry has been energized, test service entrance and feeder conductors for compliance with requirements.
 2. Perform each of the following visual and electrical tests:
 - a. Inspect exposed sections of conductor and cable for physical damage and correct connection according to the single-line diagram.
 - b. Test bolted connections for high resistance using one of the following:
 - 1) A low-resistance ohmmeter.
 - 2) Calibrated torque wrench.
 - 3) Thermographic survey.
 - c. Inspect compression applied connectors for correct cable match and indentation.
 - d. Inspect for correct identification.
 - e. Inspect cable jacket and condition.
 - f. Insulation-resistance test on each conductor with respect to ground and adjacent conductors. Apply a potential of 500-V dc for 300-V rated cable and 1000-V dc for 600-V rated cable for a one-minute duration.
 - g. Continuity test on each conductor and cable.
 - h. Uniform resistance of parallel conductors.
- D. Cables will be considered defective if they do not pass tests and inspections.
- E. Prepare test and inspection reports to record the following:
1. Procedures used.
 2. Results that comply with requirements.
 3. Results that do not comply with requirements and corrective action taken to achieve compliance with requirements.

END OF SECTION 260519

HILLSBOROUGH COUNTY SHERIFF'S OFFICE -
PINEBROOKE BUILDING 4 INTERIOR RENOVATION

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