

ADDENDUM NO. 2

March 06, 2013

To the Plans and Specifications for:

Renovation for Research Space
Suites 202, 336 & 337
Science Building, Boise State University
Boise, Idaho

DPW Project # 13195

Owner: State of Idaho

Architect: Slichter Architects, Inc.
6611 Ustick Road
Boise, Idaho 83704

NOTICE TO BIDDERS:

You are hereby notified of the following changes, deletions, corrections, additions, revisions, and/or modifications to the Drawings, Specifications, and Instructions to Bidders dated February 2013, for the above mentioned project which are made a part thereof. You must acknowledge receipt of this Addendum in the space provided therefore on the Bid Form.

The items of this Addendum are as follows:

A: GENERAL

1. Provide ceiling mounted Fume Extraction Arm at each of the following:
 - a. Arms to be located in Suites 336 and 337 per plans, one at each Rotavapor & Bath System (equipment tag item E336-1C and E337-1C), one at Glove Box Workstation (equipment tag item E336-1B), and one additional at future Glove Box Workstation in Suite 337 to be located in the south-east corner.
 - b. Arm(s) to be ceiling mount white epoxy coated 10 foot reach, 6 inch diameter with 12 inch hood, Snorkvac Fume Arm by Enviroflex International Inc. model number 103.1006 with 103.1074 60" ceiling bracket option or equal.
 - c. Connect to building exhaust system to include ducting and Phoenix Controls Traccel TEV venturi valve per mechanical specifications.
2. **Architectural:**
 - a. Remove/demo and salvage to Agency, existing wood door and hollow metal frame located on the east interior wall of Suite 202. Provide metal stud infill framing with drywall and finishes to match adjacent existing construction.

3. **Electrical:**

- a. Electrical Panels
 - i. Panel 'J' is located behind the east door of Lab 202.
 - ii. Panel 'ST2B' is located in the electrical room 230 on the second floor located directly below the electrical room 340 on the third floor.

B: APPROVALS

Note: The following items/manufacturers/suppliers have been accepted as approved equals. Approval is by name only. The Contractor shall ensure the approved complies with all specification requirements, basis-of-design and is also responsible for all special field adaptations required for equipment used other than that shown in the original project design documentation. All equipment shall bear a UL label as required.

- 1. **Section 064023:**
 - a. Casework manufacturers as listed in the specifications per part 2, section 2.1.A., are basis-of-design; alternate manufacturers submitted may be accepted following meeting the qualifications of the plans and specifications, pre-approval is not required.
- 2. **Section 092216:**
 - a. SCAFCO Steel Stud Mfg. Co.
- 3. **Electrical:**
 - a. Per the Lighting Fixture Schedule, the following are approved manufacturers/suppliers.
 - i. Sensor Switch occupancy sensors
 - ii. Light fixture type UC1, Kenall #ACULED-S-SL-9L40K-120-SW-ICL3.

C: SPECIFICATIONS

- 1. **Table of Contents:**
 - a. Add specification Section 262416 - Panelboards to Division 26 – Electrical Table of Contents.
 - b. Add specification Section 283100 – Security Access to Division 28 – Digital Addressable Fire-Alarm Table of Contents.
 - c. Change Division 27 – Communications, Section 270010 – Telecommunications Infrastructure to Section 270100.
- 2. **Section 011000:**
 - a. Replace Specifications Division 01, Section 011000 – Summary, in its entirety per Attachment #1.
- 3. **Section 064023:**
 - a. Per specification Part 2.2.E, add section 5 - Upper shelf of Island Shelving.
 - i. Shelving to be type T304 stainless steel woven wire, flat top weave size 1/4" x 3"-11 gauge (0.120") architectural mesh with a 1" Type #2 90 degree formed edge around entire shelf perimeter as provided by The Western Group/Utah or equal.

4. **Section 104413:**
 - a. Per specification Part 2.2.A., change fire protection cabinet to be surface mount for fire extinguisher only, no fire blanket shelf is required.
 - b. Provide 68" x 6.25" x 4" vertical surface mount fire blanket cabinet of steel construction with baked-enamel finish, location(s) per plans, provide fire blanket per Specification Section 104416.
5. **Section 116010:**
 - a. Per Part 2.2.K. of Laboratory Hoods specifications, the low air flow monitor/alarm is not required and can be omitted from the hood options.
 - b. Change Part 2.5.A. to indicate Section 220100.
 - c. Add to Part 2.6.A.1., Model: Hamilton Safeaire, Labconco Protector XL, Mott Sigma, per manufacturer and model numbers indicated in Equipment Schedule(s) per plan sheets A2.21, A2.22 and A2.23 or approved equal.
 - d. Change Part 2.6.A.4., Accessories: Aluminum Distillation Racks for hoods located in Suites 336 and 337 only.
 - e. Change Part 3.3.B. to indicate Division 23.
6. **Section 116050:**
 - a. Per Part 2.2.B. item 1., Laboratory Equipment specifications, the water purification system shall be changed to provide Thermo Scientific Barnstead GenPure UV/UF model No. 50131217. Unit is to provide Type I water and shall be furnished with (2) sterile filter kits No. 09.1003. One water purification system shall be provided and installed in each of the three lab spaces and shall include all necessary plumbing, piping and connection to the building DI water supply as provided in plans.
7. **Section 265100:**
 - a. Add missing Specification Division 26, Section 265100 – Interior Lighting, per Attachment #2.

D: DRAWINGS

1. **Sheet A2.22 and A2.23:**
 - a. Casework base cabinets as indicated on plans as HD48, located beneath each 8' fume hood (equipment items E336-1A and E337-1A) for Suites 336 and 337 shall be changed to (2) 3' double door and (1) 2' single door base units for each fume hood supported.
 - i. (1) 2' single door unit to include (2) adjustable shelves
 - ii. (2) 3' double door units to include (2) pull-out sliding shelves with perimeter frame and Extra Heavy-Duty Full-Extension slides.
 - b. Per the Equipment Schedule, Tag Items E336-2A and E337-2A, change to provide (1 each) Flammable Storage Cabinet per plans and (1each) Securall Acid / Corrosive Storage Cabinet model #C160, connect to building exhaust per plans.
2. **Sheet A8.04:**
 - a. Per Island Shelf Casework Section Detail 1, powder coated woven wire shelving (typ. @ upper shelf) shall be changed to Stainless Steel per Addendum Section C.

3. **Sheets P1.01, P2.01 and P2.02:**

a. Suite 202:

- i. As indicated and noted on plans, demolition of existing waste lines, vent lines, all water and gas lines previously utilized by the suite are to be removed back to main branches and capped. Areas included, but not limited to demolition, include existing plumbing in the east and west walls and all floor areas of suite 202.

b. Suite 336 and 337:

- i. As indicated and noted on plans, demolition of existing waste lines, vent lines, all water and gas lines previously utilized by the suites are to be removed back to main branches and capped. Areas included, but not limited to demolition, include existing plumbing in the south walls and all floor areas of suites 336 and 337.

4. **Sheets E2.0E and E2.1:**

- a. Furnish and install GFI rated receptacles in lieu of the breakers being GFCI rated. Equipment connections shall have a GFCI rated breaker as indicated.

5. **Sheet E3.0:**

- a. Light fixture type UC1 per Lighting Fixture Schedule, shall be provided with an 120v ballast. Fixture description should read as a 22" unit.

END OF ADDENDUM NO.2

Renovation of Research Space, Labs 202, 336, & 337
Science Building (SCNC), Boise State University, DPW #13195

February 2013

SECTION 011000 - SUMMARY

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provision of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

1.2 WORK COVERED BY CONTRACT DOCUMENTS

- A. Project Identification: DPW Project #13195, Renovation of Research Spaces, Labs 202, 336, & 337 Science Building (SCNC), Boise State University.

- 1. Project Location: 2133 Campus Lane, Boise State University, Boise, Idaho 83725.

- B. Owner: State of Idaho

- 1. Owner's Project Manager: Ben Hill, Division of Public Works

- 2. Owner's Field Representative: Dave Rooke, Division of Public Works

- 3. Agency's Representative: Aaron Whitman, Boise State University

- C. Architect: Slichter Architects, Inc.

- 1. 6611 Ustick Road
Boise, Idaho 83704

- 2. Architect's Representative: Jeff Geibel

- D. The Work consists of the following:

A description of the work of this project can be summarized to include renovation of existing teaching lab space into biology and chemistry research lab spaces. The Work includes demolition of existing interior finishes, utilities and construction of new interior finishes which include sheet flooring, casework, doors and frames, painting, acoustical panels, roller shades, and equipment. Also included are new utilities such as power, data, fire alarm, hot and cold water plumbing, compressed air, vacuum, natural gas, as well as HVAC and fire sprinkler modifications.

1.3 CONTRACT

- A. Project will be constructed under a single prime contract.

1.4 ACCESS TO SITE

- A. General: Contractor shall have limited use of Project site for construction operations as indicated on Drawings by the Contract limits and as indicated by requirements of this Section.
- B. Condition of Existing Building: Maintain portions of existing building affected by construction operations in a weathertight condition throughout construction period. Repair damage caused by construction operations.

1.5 COORDINATION WITH OCCUPANTS

- A. Partial Owner Occupancy: Owner will occupy the premises during entire construction period, with the exception of areas under construction. Cooperate with Owner during construction operations to minimize conflicts and facilitate Owner usage. Perform the Work so as not to interfere with Owner's operations. Maintain existing exits unless otherwise indicated.
 - 1. Maintain access to existing walkways, corridors, and other adjacent occupied or used facilities. Do not close or obstruct walkways, corridors, or other occupied or used facilities without written permission from Owner.
 - 2. Provide not less than 72 hours' notice to Owner of activities that will affect Owner's operations.
 - 3. Adjacent rooms may be occupied for teaching during class hours; care will need to be taken to ensure noise generating activities are kept to a minimum and when necessary, are coordinated with the adjacent user to minimize effects on students.
 - 4. Work required under floor and in existing slabs will need to be coordinated with occupants below, refer to Specifications Section 1.6 Work Restrictions.

1.6 WORK RESTRICTIONS

- A. Work Restrictions, General: Comply with restrictions on construction operations.
 - 1. Comply with limitations on use of public streets and other requirements of authorities having jurisdiction.
- B. On-Site Work Hours: Limit work in the existing building to normal business working hours of 6 a.m. to 10 p.m., Monday through Friday, except as otherwise indicated.
 - 1. Weekend Hours: As coordinated and pre-arranged with Agency, 72 hours prior notice to make arrangements is required.
 - 2. Early Morning Hours: As coordinated and pre-arranged with Agency, 72 hours prior notice to make arrangements is required.
 - 3. Hours for Utility Shutdowns: Utility shutdowns must be coordinated with the Agency at a minimum of 72 hours prior to shutting utility off.

4. Hours for core drilling or other excessively noisy activity: As coordinated and pre-arranged with Agency, 72 hours prior notice to make arrangements is required. Additionally, core drilling of existing floor slabs are to be performed after normal business working hours, coordination and pre-arrange with Agency and adjacent spaces, 72 hours prior notice to make arrangements is required.
- C. Existing Utility Interruptions: Do not interrupt utilities serving facilities occupied by Owner or others unless permitted under the following conditions and then only after providing temporary utility services according to requirements indicated:
 1. Notify Architect and Owner not less than three days in advance of proposed utility interruptions.
 2. Obtain Architect's written permission before proceeding with utility interruptions.
- D. Noise, Vibration, and Odors: Coordinate operations that may result in high levels of noise and vibration, odors, or other disruption to Owner occupancy with Owner.
 1. Notify Architect, Owner, and Agency not less than two days in advance of proposed disruptive operations.
 2. Obtain Architect's written permission before proceeding with disruptive operations.
- E. Nonsmoking Campus: Smoking is not permitted on the Boise State University Campus.

1.7 SPECIFICATION AND DRAWING CONVENTIONS

- A. Specification Content: The Specifications use certain conventions for the style of language and the intended meaning of certain terms, words, and phrases when used in particular situations. These conventions are as follows:
 1. Imperative mood and streamlined language are generally used in the Specifications. The words "shall," "shall be," or "shall comply with," depending on the context, are implied where a colon (:) is used within a sentence or phrase.
 2. Specification requirements are to be performed by Contractor unless specifically stated otherwise.
- B. Division 01 General Requirements: Requirements of Sections in Division 01 apply to the Work of all Sections in the Specifications.
- C. Drawing Coordination: Requirements for materials and products identified on the Drawings are described in detail in the Specifications. One or more of the following are used on the Drawings to identify materials and products:
 1. Terminology: Materials and products are identified by the typical generic terms used in the individual Specifications Sections.
 2. Abbreviations: Materials and products are identified by abbreviations scheduled on Drawings.

3. Reference noting: Materials and products are identified by reference keynotes referencing Specification Section numbers found in this Project Manual.

1.8 SPECIFICATION FORMATS AND CONVENTIONS

- A. Specification Format: The Specifications are organized into Divisions and Sections using the 32-division format and CSI/CSC's "Master Format" numbering system.
 1. Division 1: Sections in Division 1 govern the execution of the Work of all Sections in the Specifications.
- B. Specification Content: The Specifications use certain conventions for the style of language and the intended meaning of certain terms, words, and phrases when used in particular situations. These conventions are as follows:
 1. Abbreviated Language: Language used in the Specifications and other Contract Documents is abbreviated. Words and meanings shall be interpreted as appropriate. Words implied, but not stated, shall be inferred as the sense requires. Singular words shall be interpreted as plural, and plural words shall be interpreted as singular where applicable as the context of the Contract Documents indicates.
 2. Imperative mood and streamlined language are generally used in the Specifications. Requirements expressed in the imperative mood are to be performed by Contractor. Occasionally, the indicative or subjunctive mood may be used in the Section Text for clarity to describe responsibilities that must be fulfilled indirectly by Contractor or by others when so noted.
 - a. The words "shall," "shall be," or "shall comply with," depending on the context, are implied where a colon (;) is used within a sentence or phrase.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 011000

SECTION 265100 - INTERIOR LIGHTING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This Section includes the following:
 - 1. Interior lighting fixtures, lamps, and ballasts.
 - 2. Emergency lighting units.
 - 3. Exit signs.
 - 4. Lighting fixture supports.
- B. Related Sections include the following:
 - 1. Division 26 Section "Wiring Devices" for manual wall-box dimmers for incandescent lamps.

1.3 DEFINITIONS

- A. BF: Ballast factor.
- B. CRI: Color-rendering index.
- C. CU: Coefficient of utilization.
- D. HID: High-intensity discharge.
- E. LER: Luminaire efficacy rating.
- F. Luminaire: Complete lighting fixture, including ballast housing if provided.
- G. RCR: Room cavity ratio.

1.4 SUBMITTALS

- A. Product Data: For each type of lighting fixture, arranged in order of fixture designation. Include data on features, accessories, finishes, and the following:

1. Physical description of lighting fixture including dimensions.
2. Emergency lighting units including battery and charger.
3. Ballast.
4. Energy-efficiency data.
5. Life, output, and energy-efficiency data for lamps.
6. Photometric data, in IESNA format, based on laboratory tests of each lighting fixture type, outfitted with lamps, ballasts, and accessories identical to those indicated for the lighting fixture as applied in this Project.
 - a. Photometric data shall be certified by a manufacturer's laboratory with a current accreditation under the National Voluntary Laboratory Accreditation Program (NVLAP) for Energy Efficient Lighting Products.

1.5 QUALITY ASSURANCE

- A. Luminaire Photometric Data Testing Laboratory Qualifications: Provided by manufacturers' laboratories that are accredited under the National Volunteer Laboratory Accreditation Program for Energy Efficient Lighting Products.
- B. Comply with NFPA 70.

1.6 COORDINATION

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

1.7 WARRANTY

- A. Special Warranty for Emergency Lighting Batteries: Manufacturer's standard form in which manufacturer of battery-powered emergency lighting unit agrees to repair or replace components of rechargeable batteries that fail in materials or workmanship within specified warranty period.
 1. Warranty Period for Emergency Lighting Unit Batteries: 10 years from date of Substantial Completion. Full warranty shall apply for first year, and prorated warranty for the remaining nine years.
 2. Warranty Period for Emergency Fluorescent Ballast Self-Powered Exit Sign Batteries: Seven years from date of Substantial Completion. Full warranty shall apply for first year, and prorated warranty for the remaining six years.
- B. Special Warranty for Ballasts: Manufacturer's standard form in which ballast manufacturer agrees to repair or replace ballasts that fail in materials or workmanship within specified warranty period.

1. Warranty Period for Electronic Ballasts: Five years from date of Substantial Completion.
- C. Special Warranty for T5 Fluorescent Lamps: Manufacturer's standard form, made out to Owner and signed by lamp manufacturer agreeing to replace lamps that fail in materials or workmanship, f.o.b. the nearest shipping point to Project site, within specified warranty period indicated below.
1. Warranty Period: One year(s) from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. In Interior Lighting Fixture Schedule where titles below are column or row headings that introduce lists, the following requirements apply to product selection:
1. Manufacturers: Subject to compliance with requirements, provide products by one of the manufacturers specified in the fixture schedule.

2.2 LIGHTING FIXTURES AND COMPONENTS, GENERAL REQUIREMENTS

- A. Recessed Fixtures: Comply with NEMA LE 4 for ceiling compatibility for recessed fixtures.
- B. Incandescent Fixtures: Comply with UL 1598. Where LER is specified, test according to NEMA LE 5A.
- C. Fluorescent Fixtures: Comply with UL 1598. Where LER is specified, test according to NEMA LE 5 and NEMA LE 5A as applicable.
- D. Metal Parts: Free of burrs and sharp corners and edges.
- E. 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.
- F. Reflecting surfaces shall have minimum reflectance as follows, unless otherwise indicated:
1. White Surfaces: 85 percent.
 2. Specular Surfaces: 83 percent.
 3. Diffusing Specular Surfaces: 75 percent.
 4. Laminated Silver Metallized Film: 90 percent.

G. Plastic Diffusers, Covers, and Globes:

1. Acrylic Lighting Diffusers: 100 percent virgin acrylic plastic. High resistance to yellowing and other changes due to aging, exposure to heat, and UV radiation.
 - a. Lens Thickness: At least 0.125 inch (3.175 mm) minimum unless different thickness is indicated.
 - b. UV stabilized.
2. Glass: Annealed crystal glass, unless otherwise indicated.

2.3 BALLASTS FOR LINEAR FLUORESCENT LAMPS

A. Electronic Ballasts: Comply with ANSI C82.11; instant-start type, unless otherwise indicated, and designed for type and quantity of lamps served. Ballasts shall be designed for full light output unless dimmer or bi-level control is indicated.

1. Sound Rating: A.
2. Total Harmonic Distortion Rating: Less than 10 percent.
3. Transient Voltage Protection: IEEE C62.41, Category A or better.
4. Operating Frequency: 20 kHz or higher.
5. Lamp Current Crest Factor: 1.7 or less.
6. BF: 0.85 or higher.
7. Power Factor: 0.98 or higher.
8. Parallel Lamp Circuits: Multiple lamp ballasts shall comply with ANSI C 82.11 and shall be connected to maintain full light output on surviving lamps if one or more lamps fail.

B. Ballasts for Bi-Level Controlled Lighting Fixtures: Electronic type.

1. Operating Modes: Ballast circuit and leads provide for remote control of the light output of the associated lamp between high- and low-level and off.
 - a. High-Level Operation: 100 percent of rated lamp lumens.
 - b. Low-Level Operation: 50 percent of rated lamp lumens.
2. Ballast shall provide equal current to each lamp in each operating mode.
3. Compatibility: Certified by manufacturer for use with specific bi-level control system and lamp type indicated.

2.4 BALLASTS FOR COMPACT FLUORESCENT LAMPS

A. Description: Electronic programmed rapid-start type, complying with ANSI C 82.11, designed for type and quantity of lamps indicated. Ballast shall be designed for full light output unless dimmer or bi-level control is indicated:

1. Lamp end-of-life detection and shutdown circuit.
2. Automatic lamp starting after lamp replacement.
3. Sound Rating: A.
4. Total Harmonic Distortion Rating: Less than 20 percent.
5. Transient Voltage Protection: IEEE C62.41, Category A or better.
6. Operating Frequency: 20 kHz or higher.
7. Lamp Current Crest Factor: 1.7 or less.
8. BF: 0.95 or higher, unless otherwise indicated.
9. Power Factor: 0.98 or higher.
10. Interference: Comply with 47 CFR, Chapter 1, Part 18, Subpart C, for limitations on electromagnetic and radio-frequency interference for nonconsumer equipment.
11. Ballast Case Temperature: 75 deg C, maximum.

2.5 EMERGENCY FLUORESCENT POWER UNIT

- A. Internal Type: Self-contained, modular, battery-inverter unit, factory mounted within lighting fixture body and compatible with ballast. Comply with UL 924.
1. Emergency Connection: Operate 1 fluorescent lamp(s) continuously at an output of 1100 lumens each. Connect unswitched circuit to battery-inverter unit and switched circuit to fixture ballast.
 2. Night-Light Connection: Operate one fluorescent lamp continuously.
 3. Test Push Button and Indicator Light: Visible and accessible without opening fixture or entering ceiling space.
 - a. Push Button: Push-to-test type, in unit housing, simulates loss of normal power and demonstrates unit operability.
 - b. Indicator Light: LED indicates normal power on. Normal glow indicates trickle charge; bright glow indicates charging at end of discharge cycle.
 4. Battery: Sealed, maintenance-free, nickel-cadmium type.
 5. Charger: Fully automatic, solid-state, constant-current type with sealed power transfer relay.
 6. Integral Self-Test: Factory-installed electronic device automatically initiates code-required test of unit emergency operation at required intervals. Test failure is annunciated by an integral audible alarm and flashing red LED.

2.6 EXIT SIGNS

- A. Description: Comply with UL 924; for sign colors, visibility, luminance, and lettering size, comply with authorities having jurisdiction.
- B. Internally Lighted Signs:

1. Lamps for AC Operation: Fluorescent, 2 for each fixture, 20,000 hours of rated lamp life.
2. Lamps for AC Operation: LEDs, 70,000 hours minimum rated lamp life.
3. Self-Powered Exit Signs (Battery Type): Integral automatic charger in a self-contained power pack.
 - a. Battery: Sealed, maintenance-free, nickel-cadmium type.
 - b. Charger: Fully automatic, solid-state type with sealed transfer relay.
 - c. Operation: Relay automatically energizes lamp from battery when circuit voltage drops to 80 percent of nominal voltage or below. When normal voltage is restored, relay disconnects lamps from battery, and battery is automatically recharged and floated on charger.
 - d. Test Push Button: Push-to-test type, in unit housing, simulates loss of normal power and demonstrates unit operability.
 - e. LED Indicator Light: Indicates normal power on. Normal glow indicates trickle charge; bright glow indicates charging at end of discharge cycle.
 - f. Remote Test: Switch in hand-held remote device aimed in direction of tested unit initiates coded infrared signal. Signal reception by factory-installed infrared receiver in tested unit triggers simulation of loss of its normal power supply, providing visual confirmation of either proper or failed emergency response.
 - g. Integral Self-Test: Factory-installed electronic device automatically initiates code-required test of unit emergency operation at required intervals. Test failure is annunciated by an integral audible alarm and flashing red LED.

2.7 FLUORESCENT LAMPS

- A. Low-Mercury Lamps: Comply with EPA's toxicity characteristic leaching procedure test; shall yield less than 0.2 mg of mercury per liter when tested according to NEMA LL 1.
- B. T5 rapid-start low-mercury lamps, rated 28 W maximum, nominal length of 48 inches (1220 mm), 2800 initial lumens (minimum), CRI 75 (minimum), color temperature 4100 K, and average rated life 20,000 hours, unless otherwise indicated.
- C. Compact Fluorescent Lamps: 4-Pin, low mercury, CRI 80 (minimum), color temperature 3500K, average rated life of 10,000 hours at 3 hours operation per start, unless otherwise indicated.
 1. 13 W: T4, double or triple tube, rated 900 initial lumens (minimum).
 2. 18 W: T4, double or triple tube, rated 1200 initial lumens (minimum).
 3. 26 W: T4, double or triple tube, rated 1800 initial lumens (minimum).
 4. 32 W: T4, triple tube, rated 2400 initial lumens (minimum).

5. 42 W: T4, triple tube, rated 3200 initial lumens (minimum).

2.8 LIGHTING FIXTURE SUPPORT COMPONENTS

- A. Comply with Division 26 Section "Hangers and Supports for Electrical Systems" for channel- and angle-iron supports and nonmetallic channel and angle supports.
- B. Wires: ASTM A 641/A 641M, Class 3, soft temper, zinc-coated steel, 12 gage (2.68 mm).

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Lighting fixtures: Set level, plumb, and square with ceilings and walls. Install lamps in each fixture.
- B. Support for Lighting Fixtures in or on Grid-Type Suspended Ceilings: Use grid as a support element.
 1. Install a minimum of four ceiling support system rods or wires for each fixture. Locate not more than 6 inches (150 mm) from lighting fixture corners.
 2. Support Clips: Fasten to lighting fixtures and to ceiling grid members at or near each fixture corner with clips that are UL listed for the application.
 3. Fixtures of Sizes Less Than Ceiling Grid: Install as indicated on reflected ceiling plans or center in acoustical panel, and support fixtures independently with at least two 3/4-inch (20-mm) metal channels spanning and secured to ceiling tees.
 4. Install at least one independent support rod or wire from structure to a tab on lighting fixture. Wire or rod shall have breaking strength of the weight of fixture at a safety factor of 3.
- C. Suspended Lighting Fixture Support:
 1. Pendants and Rods: Where longer than 48 inches (1200 mm), brace to limit swinging.
 2. Stem-Mounted, Single-Unit Fixtures: Suspend with twin-stem hangers.
 3. Continuous Rows: Use tubing or stem for wiring at one point and tubing or rod for suspension for each unit length of fixture chassis, including one at each end.
- D. Connect wiring according to Division 26 Section "Low-Voltage Electrical Power Conductors and Cables."

3.2 FIELD QUALITY CONTROL

- A. Test for Emergency Lighting: Interrupt power supply to demonstrate proper operation. Verify transfer from normal power to battery and retransfer to normal.

END OF SECTION 265100