SECTION 265100

INTERIOR LIGHTING

(LED - solid state)

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**NOTE TO SPECIFIER**

*Use this Specification Section for Mail Processing Facilities.*

***This is a Type 3 Specification with primarily required text; therefore, most of the text cannot be edited, but there is editable text which is noted within the Section with a “Note to Specifier.” Do not revise the required Paragraphs without an approved Deviation from USPS Headquarters, Facilities Program Management, through the USPS Project Manager.***

*For Design/Build projects, do not delete the Notes to Specifier in this Section so that they may be available to Design/Build entity when preparing the Construction Documents.*

*For the Design/Build entity, this specification is intended as a guide for the Architect/Engineer preparing the Construction Documents.*

*The MPF specifications may also be used for Design/Bid/Build projects. In either case, it is the responsibility of the design professional to edit the Specifications Sections as appropriate for the project.*

*Text shown in brackets must be modified as needed for project specific requirements.* *See the “Using the USPS Guide Specifications” document in Folder C for more information.*

*The last date that USPS revised this standard specification section occurs in two places, at the end of this section and in the Table of Contents. If the date in this section matches the date in the Table of Contents, then you are using the latest version. Do not delete or revise the “last revised” date at the end of the section during the development of the Project Manual.*

*The footer in this section should be edited to replace the text, “USPS MPF SPECIFICATION” with the project name, and the blank date in the center should be replaced with the submission date, for interim design reviews, or the issue date of the completed Project Manual.*

**Utilize this section for all new MPF construction and Mail Processing Facilities expansions.**

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1. GENERAL
   1. SUMMARY
      1. Section Includes:
         1. Interior luminaires and accessories.
         2. Emergency lighting units.
         3. Exit signs.
         4. Ballast/Light emitting diode (LED) drivers.
         5. Light Sources.
         6. Luminaire accessories.
      2. Substitutions:
         1. Section 016000 - Product Requirements: Product substitutions permitted by manufacturers listed in Paragraph 2.1A.
      3. Related Documents: The Contract Documents, as defined in Section 011000 - Summary of Work, apply to the Work of this Section. Additional requirements and information necessary to complete the Work of this Section may be found in other Documents.
      4. Related Sections:
         1. Section 260500 - Common Work Results for Electrical: Basic electrical methods.
         2. Section 260623 – Lighting Control Devices.
   2. REFERENCES
      1. As specified in Section 260500 – Common Work Results for Electrical.
      2. Illuminating Engineering Society (IES):
         1. IES LM-79 - (2008) Electrical and Photometric Measurements of Solid-State Lighting Products.
         2. IES LM-80 - (2015) Measuring Lumen Maintenance of LED Light Sources.
         3. IES TM-21 - (2011; Addendum B 2015) Projecting Long Term Lumen Maintenance of LED Light Sources.
      3. National Fire Protection Association (NFPA):
         1. NFPA 70 - National Electrical Code.
         2. NFPA 101 - Life Safety Code.
      4. National Electrical Manufacturers Association (NEMA):
         1. NEMA ANSILG C78.377 – (2017) Electric Lamps— Specifications for the Chromaticity of Solid State Lighting Products.
         2. NEMA SSL 1 – (2010) Electronic Drivers for Led Devices, Arrays, or Systems.
         3. NEMA SSL 3 - (2011) High-Power White LED Binning for General Illumination.
      5. Federal Communications Commission Parts 18.305, 18.307 (EMI RFI).
      6. American Society of Heating, Refrigerating and Air Conditioning, Inc.
         1. ANSI/ ASHRAE/ IES Standard 90.1.
      7. Underwriters Laboratories (UL)
         1. UL 1472 – (2015) UL Standard for Safety Solid-State Dimming Controls.
         2. UL 1598 – (2008; Reprint Oct 2012) Luminaires.
         3. UL 844 – (2012; Reprint Mar 2016) UL Standard for Safety Luminaires for Use in Hazardous (Classified) Locations.
         4. UL 8750 – (2015; Reprint Feb 2018) UL Standard for Safety Light Emitting Diode (LED) Equipment for Use in Lighting Products.
         5. UL 924 – (2016; Reprint Nov 2017) UL Standard for Safety Emergency Lighting and Power Equipment.
   3. SUBMITTALS
      1. As specified in Section 260500 - Common Work Results for Electrical.
         1. Product Data: Submit catalog cuts, drawings, descriptive matter and lighting performance characteristics as required to completely define the materials and construction details employed, finishes applied, dimensions, hinging, latching and relamping provisions, and electrical characteristics.
         2. Assurance/Control Submittals:
            1. Manufacturer's Instructions: Indicate application conditions and limitations of use stipulated by Product testing agency. Include instructions for storage, handling, protection, examination, preparation, and installation of Product.
      2. Section 017704 - Closeout Procedures and Training: Procedures for closeout submittals:
         1. Operation and Maintenance Data: Submit manufacturer's operation and maintenance instructions for each type of luminaire.
   4. DEFINITIONS
      1. For LED luminaire light sources, “Useful Life” is the operating hours before reaching 70 percent of the initial rated lumen output (L70) with no catastrophic failures under normal operating conditions. This is also known as 70 percent “Rated Lumen Maintenance Life” as defined in IES LM-80.
      2. For LED luminaires, “Luminaire Efficacy” (LE) is the appropriate measure of energy efficiency, measured in lumens/watt. This is gathered from LM-79 data for the luminaire, in which absolute photometry is used to measure the lumen output of the luminaire as one entity, not the source separately and then the source and housing together.
      3. Total harmonic distortion (THD) is the root mean square (RMS) of all the harmonic components divided by the total fundamental current.
   5. QUALITY ASSURANCE
      1. As specified in section 260500 – Common Work Results for Electrical.
      2. Products shall be tested, approved and labeled/listed by Underwriters Laboratories, Inc., or by a nationally recognized testing laboratory (NRTL).
      3. Electrical equipment and materials shall be new and within one year of manufacture, complying with the latest codes and standards. Re-built, refurbished and/or re-manufactured electrical equipment and materials shall not be furnished on this project.
   6. MAINTENANCE
      1. Section 017704 - Closeout Procedures and Training: Procedures for closeout submittals.
      2. Extra Products: At completion of installation, deliver to the USPS Project Manager.
         1. Two of each luminaire lens type.
         2. Each component type: Provide quantity for each unique ballast/driver, and LED array equal to 2 percent of luminaire total, but not less than two of each type.
2. PRODUCTS
   1. LUMINAIRE MANUFACTURERS
      1. Subject to compliance with project requirements, manufacturers offering Products which may be incorporated in the Work include the following:
         1. Alphabet Lighting, Tustin, CA (714) 259-9959.
         2. Beghelli, Miramar, FL (954) 442-6600.
         3. Chloride Systems, Burgaw, NC (910) 259-1000.
         4. Columbia Lighting, Greenville, SC (864) 678-1000.
         5. Cooper Lighting (Halo, Invue, Lumark, McGraw-Edison, Metalux, Portfolio, Sure-Lites), Peachtree City, GA (770)486-4800.
         6. Compass Lighting Products, Greenville, SC (866) 313-3909.
         7. Day-Brite, Tupelo, MS (662) 842-7212.
         8. Dual-Lite, Cheshire, CT (203) 699-2000.
         9. Edison-Price Lighting, Long Island City, NY (718) 685-0700.
         10. Elcast Lighting, Addison, IL (630) 543-5390.
         11. Evenlight, Trevose, PA (800) 872-0879.
         12. Gardco Lighting, San Leandro, CA (800) 227-0758.
         13. GE Lighting Systems, Charlotte, NC (803) 462-2016.
         14. Gotham Lighting, Conyers, GA (800) 315-4982.
         15. Guth Lighting, St. Louis, MO (314) 533-3200.
         16. H.E. Williams, Carthage, MO (417) 358-4065.
         17. Holophane, Newark, OH (740) 345-9631.
         18. Hubbell Lighting, Inc., (Columbia, Spaulding, Sterner) Spartanburg, SC (864) 599-6000.
         19. Indy Lighting, Fishers, IN (317) 849-1233.
         20. Intense Lighting LLC, Anaheim, CA (800) 691-5321.
         21. Kenall Manufacturing, Gurnee, IL (847) 360-8200.
         22. Killark Electric, Fenton, MO (314) 531-0460.
         23. Kirlin Lighting, Detroit, MI (313) 259-6400.
         24. Kramer Lighting, Sturtevant, WI (800) 236-6800.
         25. Kurt Versen Company, Westwood, NJ (201) 664-8200.
         26. Kurtzon Lighting, Chicago, IL (773) 277-2121.
         27. LaMar Lighting, Farming Dale, NY (631) 777-7700.
         28. LightAlarms (Thomas & Betts) Montreal, ON (888) 552-6467.
         29. Lithonia Lighting, Conyers, GA (770) 922-9000.
         30. LSI Industries, Cincinnati, OH (513) 793-3200.
         31. Lumax Industries, Altoona, PA (814) 944-2537.
         32. Omega Lighting, Tupelo, MS (800) 234-1890.
         33. Orion Energy Systems, Inc., Manitowoc, WI (800) 660-9340.
         34. Pheonix Products, Milwaukee, WI (414) 438-1200.
         35. Prescolite Lighting, Spartanburg, SC (864) 599-6000.
         36. Prudential Lighting, Los Angeles, CA (213) 746-0360.
         37. Vista Lighting, Tupelo, MS (662) 690-4105.
         38. Zumtobel Staff, Highland, NY (800) 448-4131.

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**NOTE TO SPECIFIER**

**REQUIRED: Only include the luminaires types below required for the specific project scope. Do not modify the luminaire types, only delete those types not needed for the project.**

In areas where the mounting heights do not exceed 10 feet A.F.F., integral battery units are to be added within select luminaires to provide the required emergency/lighting levels; self-contained battery luminaires are not to be used for this application. The following luminaire types do not contain the necessary part numbers for integral battery packs. Contact the manufacturer to identify part numbers for the battery backup version of the same luminaire.

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* 1. LUMINAIRE typeS
     1. Type A1: Lithonia #2BLT4-XXX-ADP-EZ1-LP840.
        1. Description: Recessed, 2 feet W x 4 feet L x 3 inch D LED type troffer with side reflectors and dropped acrylic center lens non-air handling.
        2. Lens: High performance extruded acrylic diffuser with curved linear prisms.
        3. Housing:
           1. 22 gauge steel body, flush steel door with mitered corners.
           2. Frame and housing finished with baked white enamel or powder coated finish.
        4. Ballast/Driver: LED high efficiency – 24W and 3000 Lumen, 32W at 4000 Lumen, 38W at 5000 Lumen or 48W at 6000 Lumen. Wattage based on lumen package selected.
        5. Mounting:
           1. Recessed in Inverted T suspended ceiling.
           2. Recessed in gypsum board ceiling; provide flanged frame-in kit.
        6. Lamps: 3000 Lumen, 4000 Lumen, 5000 Lumen or 6000 Lumen LED array; 4000K rated 60,000 hours at LLD = 0.8.
        7. Marking: Luminaires are to be labeled on the interior side with lumen package used.
        8. Alternate Manufacturers:
           1. Columbia #LCAT24-40-XX-G-ED1-U.
           2. Metalux #24CZ2-XXX-HE-RDP-UNV-L840-HCD-1.
           3. Substitutions permitted: As listed in Paragraph 2.1A.
     2. Type A2: Lithonia #2BLT2-XXX-ADP-EZ1-LP840.
        1. Description: Recessed, 2 feet W x 2 feet L x 3 inch D LED type troffer with side reflectors and dropped acrylic center lens, non-air handling.
        2. Lens: High performance extruded acrylic diffuser with curved linear prism.
        3. Housing:
           1. 22 gauge steel body, flush steel door with mitered corners.
           2. Frame and housing finished with baked white enamel or powder coated finish.
        4. Ballast/Driver: LED high efficiency – 16W at 2200 Lumen, 27W at 3300 Lumen or 32W at 4100 Lumen. Wattage based on lumen package selected.
        5. Mounting:
           1. Recessed in inverted T suspended ceiling.
           2. Recessed in a gypsum board ceiling. Provide frame-in kit or plaster frame.
        6. Lamps: 2200 Lumen, 3300 Lumen or 4100 Lumen LED array; 4000K rated 60,000 hours at LLD = 0.8.
        7. Marking: Luminaires are to be labeled on the interior side with lumen package used.
        8. Alternate Manufacturers:
           1. Columbia #LCAT22-40-XX-G-ED1-U.
           2. Metalux #22CZ2-XXX-HE-RDP-UNV-L840-HCD-1.
           3. Substitutions permitted: As listed in Paragraph 2.1A.
     3. Type A3: Lithonia # BLT4-XXX-ADP-EZ1-LP840.
        1. Description: Recessed, 1 foot W x 4 feet L x 3 inch D LED type troffer with side reflectors and dropped acrylic center lens, non-air handling.
        2. Lens: High performance extruded acrylic diffuser with curved linear prism.
        3. Housing:
           1. 22 gauge steel body, flush steel door with mitered corners.
           2. Frame and housing finished with baked white enamel or powder coated finish.
        4. Ballast/Driver: LED high efficiency – 12W at 1500 Lumen, 16W at 1900 Lumen, 24W at 3000 Lumen, 33W at 4100 Lumen, 40W at 5000 Lumen or 50W at 6100 Lumen. Wattage based on lumen package selected.
        5. Mounting:
           1. Recessed in inverted T suspended ceiling.
           2. Recessed in a gypsum board. Provide frame-in kit or plaster frame.
        6. Lamps: 1500 Lumen, 1900 Lumen, 3000 Lumen, 4100 Lumen, 5000 Lumen or 6100 Lumen LED array; 4000K rated 60,000 hours at LLD = 0.8.
        7. Marking: Luminaires are to be labeled on the interior side with lumen package used.
        8. Alternate Manufacturers:
           1. Columbia #LCAT14-40-XX-G-ED1-U.
           2. Metalux #14CZ2-XXXX-RDP-UNV-L840-HCD-1.
           3. Substitutions permitted: As listed in Paragraph 2.1A.
     4. Type A5: Lithonia #STL4-XXX-EZ1-LP840.
        1. Description: 10 inch W x 4 feet L x 4 inch D surface volumetric LED luminaire, non-air handling.
        2. Refractor: Impact modified, linear – faceted refractor with diffusing film.
        3. Housing:
           1. 20 gauge steel body with die-cast end caps.
           2. White baked enamel or powder coated finish.
        4. Ballast/Driver: LED high efficiency – 20W at 2000 Lumen, 27W at 3200 Lumen, 35W at 4000 Lumen or 45W at 5100 Lumen. Wattage based on lumen package selected.
        5. Mounting: Surface ceiling mounted.
        6. Lamps: 2000 Lumen, 3200 Lumen, 4000 Lumen or 5100 Lumen LED array; 4000K rated 60,000 hours at LLD = 0.9.
        7. Marking: Luminaires are to be labeled on the interior side with lumen package used.
        8. Alternate Manufacturers:
           1. Columbia #LAW4-40-XX-ED1-U.
           2. Metalux #4WSNLED-LD4-XXXL-F-UNV-L840-HCD-1.
           3. Substitutions permitted: As listed in Paragraph 2.1A.
     5. Type A6: Lithonia #WL4-XXX-EZ1-LP840.
        1. Description: 5 inch W x 4 feet L x 3 7/8 inch D surface mounted LED luminaire, non-air handling.
        2. Refractor: Impact modified, linear – faceted refractor with diffusing film.
        3. Housing:
           1. 20 gauge steel with die-cast end caps.
           2. White polyester powder coated finish.
        4. Ballast/Driver: LED high efficiency – 19W at 2200 Lumen, 28W at 3200 Lumen or 40W at 4300 Lumen. Wattage based on lumen package selected.
        5. Mounting: Surface ceiling mounted.
        6. Lamps: 2200 Lumen, 3200 Lumen or 4300 Lumen LED array; 4000K rated 60,000 hours at LLD = 0.9.
        7. Marking: Luminaires are to be labeled on the interior side with lumen package used.
        8. Alternate Manufacturers:
           1. Metalux #4SWLED-XXXX-LW-UNV-HCD-1-U.
           2. Columbia #CWM4-40-XX-SM-FR-FA-ED1-U.
           3. Substitutions permitted: As listed in Paragraph 2.1A.
     6. Type B1: Kenall # ES848-XXX40K-DCC-1-DV-2H-PP.
        1. Description: 8 inches x 4 feet long enclosed and gasketed LED luminaire. UL listed for damp location.
        2. Lens: UV-stabilized, pearlescent, polycarbonate, smooth exterior and linear prism interior, 0.125 inches thick.
        3. Housing:
           1. 20 gauge steel housing.
           2. White polyester powder coated.
        4. Ballast/Driver: LED high efficiency – 49W at 5100 Lumen, 73W at 7800 Lumen or 97W at 10,000 Lumen. Wattage based on lumen package selected.
        5. Mounting: Surface ceiling or pendant mounted.
        6. Lamps: 5100 Lumen, 7800 Lumen or 10,000 Lumen LED array; 4000K rated 80,000 hours at LLD = 0.7 (5100L & 7800L), 60,000 hours at LLD = 0.7 (10,000L).
        7. Marking: Luminaires are to be labeled on the interior side with lumen package used.
        8. Alternate Manufacturers:
           1. Fail-Safe #HVSL8-4-LD4-X-XXX-40-UNV-0-ED10-1.
           2. Kurtzon #FP-FPD-1-40-X/LEDR-840-UNV.
           3. Substitutions permitted: As listed in Paragraph 2.1A.
     7. Type B2: Kenall # ES896-XXX40K-DCC-1-DV-2H-PP.
        1. Description: 8 inches x 8 feet long enclosed and gasketed LED luminaire. UL listed for damp location.
        2. Lens: UV-stabilized, pearlescent, polycarbonate, smooth exterior and linear prismatic interior, 0.125 inches thick.
        3. Housing:
           1. 20 Gauge steel housing.
           2. White polyester powder coated.
        4. Ballast/Driver: LED high efficiency – (2) 49W at 5100 Lumen each, (2) 73W at 7800 Lumen each or (2) 97W at 10,000 Lumen each. Wattage based on lumen package selected.
        5. Mounting: Surface ceiling or pendant mounted.
        6. Lamps: (2) 5100 Lumen, (2) 7800 Lumen or (2) 10,000 Lumen LED arrays; 4000K rated 80,000 hours at LLD = 0.7 (5100L & 7800L), 60,000 hours at LLD = 0.7 (10,000L).
        7. Marking: Luminaires are to be labeled on the interior side with lumen package used.
        8. Alternate Manufacturers:
           1. Fail-Safe #HVSL8-8-LD4-X-XXX-40-UNV-0-ED10-1.
           2. Substitutions permitted: As listed in Paragraph 2.1A.

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**NOTE TO SPECIFIER**

Utilize luminaire “B3” within unattended stairways to comply with ASHRAE 90.1, Table 9.4.2-2.

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* + 1. Type B3: Lithonia #WL2-18L-EZ1-LP840-NES7/N80.
       1. Description: 5 inch W x 2 feet L x 3 7/8 inch D, surface mounted, LED luminaire. UL listed for damp location.
       2. Refractor: Impact modified, linear-faceted refractor with diffusing film.
       3. Housing:
          1. 20 ga. steel housing with die-cast end caps.
          2. White polyester powder coated finish.
       4. Ballast/Driver: 18 Watt, 1900 Lumen.
       5. Mounting: Surface wall or ceiling.
       6. Lamp: 1900 Lumen, 4000K, LED array; 60,000 Hrs. at LLD = 0.9.
       7. Luminaire shall be equipped with integral occupancy sensor to control 50% high light output.
       8. Alternate Manufacturers:
          1. Metalux #2SWLED-20SL-LW-UNV-L840-HCD-1.
          2. Columbia #CWM2-40-MW-SM-FR-FA-ED1-U-OW.
          3. Columbia #ESL2-40-MW-FA-W-ED1-U-NXOS.
          4. Orion (Apollo) #SWHU1-036L-UNV-FD10-AP-840.
          5. Substitutions permitted: As listed in Paragraph 2.1A.
    2. Type B4: Lithonia #FEML48-XXXX-IMAFL-MD-MVOLT-EZ1-40K-80CRI-STSL-SPD .
       1. Description: 7” x 4 feet long enclosed and gasketed LED luminaire. UL listed for wet location.
       2. Lens: 4.5 inches Deep high impact, injection molded, acrylic lens; linear ribbed frosted, 0.08 inches thick.
       3. Housing:
          1. One piece, 5 VA fiberglass housing with stainless steel latches.
          2. NEMA 4x, IP65 rated.
       4. Ballast/Driver:
          1. LED high efficiency – 18W at 2900 Lumen, 24W at 3800 Lumen, 38W at 5600 Lumen, 51W at 7400 Lumen or 62W at 9200 Lumen. Wattage based on lumen package selected.
          2. Integral 10 KV/5 kA surge protection device.
       5. Mounting: Surface ceiling or wall mounted.
       6. Lamps: 2900 Lumen, 3800 Lumen, 5600 Lumen, 7400 Lumen or 9200 Lumen LED array; 4000K rated 60,000 hours at LLD = 0.8.
       7. Marking: Luminaires are to be labeled on the interior side with lumen package used.
       8. Alternate Manufacturers:
          1. Metalux #4VT2-LD5-X-DR100-UNV-L840-HCD-WL-SSL.
          2. Columbia #LXEM4-40-XX-RFA-ED1-U-SSL.
          3. Substitutions permitted: As listed in Paragraph 2.1A.
    3. Type B5: Lithonia #FEML96-XXXX-IMAFL-MD-MVOLT-EZ1-40K-80CRI-STSL-SPD.
       1. Description: 7” x 8 feet long enclosed and gasketed LED luminaire. UL listed for wet location.
       2. Lens: Deep high impact, injection molded, acrylic lens; linear ribbed frosted, 0.08 inches thick.
       3. Housing:
          1. One piece, 5 VA fiberglass housing with stainless steel latches.
          2. NEMA 4x, IP65 rated.
       4. Ballast/Driver:
          1. LED high efficiency – 54W at 8500 Lumen, 76W at 11,000 Lumen, 94W at 14,000 Lumen, 104W at 17,000 Lumen or 126W at 19,000 Lumen. Wattage based on lumen package selected.
          2. Integral 10 KV/5 kA surge protection device.
       5. Mounting: Surface ceiling or wall mounted.
       6. Lamps: 8500 Lumen, 11,000 Lumen, 14,000 Lumen, 17,000 Lumen or 19,000 Lumen LED array; 4000K rated 60,000 hours at LLD = 0.8.
       7. Marking: Luminaires are to be labeled on the interior side with lumen package used.
       8. Alternate Manufacturers:
          1. Metalux #8VT2-LD4-X-DR100-UNV-L840-HCD-WL-SSL.
          2. Columbia #LXEM8-40-XX-RFA-ED1-U-SSL.
          3. Substitutions: As listed in Paragraph 2.1A.
    4. Type CL1: Lithonia #ZLIN-L48-XXXX-FST-MVOLT-40K-80CRI-WH.
       1. Description; 4 feet long, LED strip luminaire with protective lens/diffuser.
       2. Lens: Snap on frosted, diffused lens.
       3. Housing:
          1. 20 gauge cold rolled steel housing with punched knockouts for mounting.
          2. End plates shall be die-formed heavy gauge rolled steel with punched knockouts for through wiring.
          3. White baked enamel finish with a minimum 90 percent reflectance.
       4. Ballast/Driver: LED high efficiency – 25W at 3300 Lumen, 34W at 4600 Lumen or 52W at 6800 Lumen. Wattage based on lumen package selected.
       5. Mounting:
          1. Surface mounted to the underside of the ceiling. Attach luminaire to ceiling grid by means of a gripper hanger which attaches to any standard ceiling grid system.
          2. For spaces without ceiling, suspend from structure with all-thread rods to required height.
          3. Electrical Contractor to determine quantity of hangers required for either method.
       6. Lamps: 3300 Lumen, 4600 Lumen or 6800 Lumen LED arrays; 4000K rated 60,000 hours at LLD = 0.7.
       7. Marking: Luminaires are to be labeled on the interior side with lumen package used.
       8. Alternate Manufacturers:
          1. Columbia Lighting #MPS4-40XX-FW-ED1-U.
          2. Metalux #4SNLED-LD5-XX-LW-UNV-L840-HCD-1.
          3. Orion (Harris) #SFHC1-4-XX-SD-UNV-FDXX-CT-840.
          4. Substitutions permitted: As listed in Paragraph 2.1A.
    5. Type CL2: Lithonia #ZLIN-L24-XXXX-FST-MVOLT-40K-80CRI-WH.
       1. Description; 2 feet long, LED strip luminaire with protective lens/diffuser.
       2. Lens: Snap on frosted, diffused lens.
       3. Housing:
          1. 20 gauge cold rolled steel housing with punched knockouts for mounting.
          2. End plates shall be die-formed heavy gauge rolled steel with punched knockouts for through wiring.
          3. White baked enamel finish with a minimum 90 percent reflectance.
       4. Ballast/Driver: LED high efficiency – 15W at 1800 Lumen, 19W at 2400 Lumen or 31W at 3700 Lumen. Wattage based on lumen package selected.
       5. Mounting:
          1. Surface mounted to the underside of the ceiling. Attach luminaire to ceiling grid by means of a gripper hanger which attaches to any standard ceiling grid system.
          2. For spaces without ceiling, suspend from structure with all-thread rods to required height.
          3. Electrical Contractor to determine quantity of hangers required for either method.
       6. Lamps: 1800 Lumen, 2400 Lumen or 3700 Lumen LED arrays; 4000K rated 60,000 hours at LLD = 0.7.
       7. Marking: Luminaires are to be labeled on the interior side with lumen package used.
       8. Alternate Manufacturers:
          1. Columbia Lighting #MPS2-40XX-FW-ED1-U.
          2. Metalux #2SNLED-LD5-XX-LW-UNV-L840-HCD-1.
          3. Substitutions permitted: As listed in Paragraph 2.1A.
    6. Type CL3: Lithonia #TZLIN-L96-XXXX-FST-MVOLT-40K-80CRI-WH.
       1. Description; 8 feet long, LED strip luminaire with protective lens/diffuser.
       2. Lens: Snap on frosted, diffused lens.
       3. Housing:
          1. 20 gauge cold rolled steel housing with punched knockouts for mounting.
          2. End plates shall be die-formed heavy gauge rolled steel with punched knockouts for through wiring.
          3. White baked enamel finish with a minimum 90 percent reflectance.
       4. Ballast/Driver: LED high efficiency – 48W at 6800 Lumen, 68W at 9000 Lumen or 104W at 13,000 Lumen. Wattage based on lumen packages selected.
       5. Mounting:
          1. Surface mounted to the underside of the ceiling. Attach luminaire to ceiling grid by means of a gripper hanger which attaches to any standard ceiling grid system.
          2. For spaces without ceiling, suspend from structure with all-thread rods to required height.
          3. Electrical Contractor to determine quantity of hangers required for either method.
       6. Lamps: 6800 Lumen, 9000 Lumen or 13,000 Lumen LED arrays, 4000K rated 60,000 hours at LLD=0.7.
       7. Marking: Luminaires are to be labeled on the interior side with lumen package used.
       8. Alternate Manufacturers:
          1. Metalux #8TSNLED-LD5-XX-LW-UNV-L840-HCD-1.
          2. Columbia Lighting #MPS8-40XX-FW-HCD-1.
          3. Orion (Harris) #SFHC1-8-XX-SD-UNV-FDXX-CT-840.
          4. Substitutions permitted: As listed in Paragraph 2.1A.

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**NOTE TO SPECIFIER**

The lumen output and quantity of the unit mounted lamps or unit mounted lighting heads supplied with battery luminaires EM1, EM2, EM3 and EM4 shall be chosen to comply with the footcandle lighting intensities required by NFPA 101.

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* + 1. Type EM1: Lithonia #ELSQM-LEX-N.
       1. Description:Ceiling mounted semi-recessed 10.5 inch square decorative halogen emergency light unit with nickel-cadmium battery. Provide with line latching, solid-state voltage limiting charger, solid-state switching, low voltage disconnect, brownout circuit, overload, short-circuit protection test switch and power indicator light.
       2. Lens: Lexan lens.
       3. Housing: Black thermoplastic body, UL924 listed, all components meet the UL 94-0.5VA flame retardant standard.
       4. Mounting: Provide with manufacturer rough-in kit for semi-recessed installation.
       5. Voltage: [277] [120]
       6. Lamps: 2 at 8W Tungsten Halogen (included)
       7. Alternate Manufacturers:
          1. Substitutions permitted: As listed in Paragraph 2.1A.
    2. Type EM2: Lithonia #ELM4L-UVOLT-LTP-SDRT.
       1. Description:Compact contemporary design LED emergency lighting unit with adjustable heads and lithium iron phosphate battery. Provide with line latching, solid-state voltage limiting charger, solid-state switching, low voltage disconnect, brownout circuit, overload, short-circuit protection test switch and power indicator light.
       2. Battery: Sealed, maintenance free, lithium iron phosphate, 11 Watt at 9.6 volt.
       3. Housing: White thermoplastic body, UL924 listed, all components meet the UL 94-0.5VA flame retardant standard.
       4. Mounting: Wall mounted.
       5. Voltage: [277] [120]
       6. Lamps: 640 Lumens total, 2 at 3.3 Watt/9.6 Volt. (included).
       7. Alternate Manufacturers:
          1. Beghelli #XLPLED1-HO.
          2. Evenlite #TEBL3W-SD.
          3. Dual-Lite #EVHC12-I-06L.
          4. Substitutions permitted: As listed in Paragraph 2.1A.
    3. Type EM3: Exitronix #RSL6NM-42-060536-REN1-2-W-G2.
       1. Description: Industrial design LED emergency lighting unit with adjustable heads and nickel cadmium battery. Provide with line latching, solid-state voltage limiting charger, solid-state switching, low voltage disconnect, brownout circuit, overload, short-circuit protection test switch and self-test/self-diagnostics.
       2. Battery: Sealed, maintenance free, nickel cadmium, 6 volt, with 42 Watt capacity.
       3. Housing: 20-gauge steel housing finished in white epoxy, powder coat finish, with hinged faceplate for ease of maintenance. UL924 listed, all components meet the UL 94-0.5VA flame retardant standard.
       4. Mounting: Wall mounted.
       5. Voltage: [277] [120].
       6. Lamps: 2 at 5 Watt, PAR 18 LED (included).
       7. Alternate Manufacturers:
          1. Beghelli #EST6V-42-2BTMR.
          2. Dual-Lite #LM40-N-I-03L.
          3. Lightalarms #2PN1/DR130-LD10-M.
          4. Chloride #TNM50-M7F-2-IC.
          5. Substitutions permitted: As listed in Paragraph 2.1A.
    4. Type EM4 (exterior egress doors): Lithonia #AFF-OEL-DWHGXDXXXXXX-UVOLT-LTP-SDRT-FCT.
       1. Description: Wall Mounted UL wet location LED emergency lighting unit
       2. Ballast/Driver: LED high efficiency – 2.5W at 635 Lumen LED (forward throw).
       3. Housing: UL listed wet location (NEMA 4X) low profile, die-cast aluminum, sealed and gasketed. Finish by the USPS Project Manager.
       4. Battery: Lithium iron phosphate with self-diagnostics. 32 to 122 degrees F (standard), -22 to 122 degrees F (cold weather) , wet locations.
       5. Mounting: Surface wall.
       6. Voltage: [277] [120].
       7. Lamps: 2.5W at 635 Lumen LED array.
       8. Alternate Manufacturers:
          1. Isolite #ELED-EM-WH-MB.
          2. Compass #CUWZ-PC Series.
          3. Compass #CUSO Series.
          4. Sure-Lites #SELW-W-29-NC-WH-SD.
          5. Substitutions permitted: As listed in Paragraph 2.1A.

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**NOTE TO SPECIFIER**

Wall or column mounted platform task lights (dock lights) should be selected for all platforms. This cord connected luminaire is to be provided with a dedicated receptacle. At enclosed platforms, the “dock light” receptacle shall be controlled by dock door limit switch: door open - receptacle energized; door closed - receptacle de-energized. Twist-timers wired upstream of the “dock light receptacle” shall be provided at open docks.

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* + 1. Type P1: D.L. Manufacturing Versa-Light Model #450.
       1. Description: Flexible/Rotatable, shock and vibration resistant “LED” dock light with protective lamp shield.
       2. Power Supply: Solid state, fan cooled, integral transformer with integral switch and cord connection.
       3. Housing and Arm: Welded steel housing with stainless steel flexible tube.
       4. Mounting: Wall mounted.
       5. Voltage: 120 Volt with 15 Amp, 120 Volt plug and cord.
       6. Lamp: 57 Watt, 3000K, 85,000 hrs LED array.
       7. Alternate Manufacturers:
          1. Substitutions permitted: As listed in Paragraph 2.1A.
    2. Type R1: Gotham #EVO4-40/XX-WR-MD-MVOLT-EZ1.
       1. Description: Recessed 4.5 inch dia. aperture LED downlight.
       2. Reflector: Low brightness, white painted, self-flanged reflector.
       3. Ballast/Driver: 8 Watt/750 Lumen, 9 Watt/1000 Lumen or 14 Watt/1500 Lumen LED light engine with remote phosphor technology; Wattage based on lumen package selected; 5-year factory warranty.
       4. Housing:
          1. Frame to be 18 gauge galvanized steel ring.
          2. Mounting ring shall be secured to grid ceiling bar hangers (supplied with luminaire).
          3. Luminaire frame to be supported from the structure by at least two opposing corners.
       5. Junction Box:
          1. Junction box to be code approved for through wiring.
          2. Junction box to be secured to the mounting ring and accessible from two sides.
          3. Junction box to be pre-wired and accessible per code through the ceiling trim opening.
       6. Mounting:
          1. 24 inch grid ceiling bar hangers shall be supplied by manufacturer and securely fastened to grid.
          2. Provide 28 inch 'C' channel mounting bars and flange kit for drywall ceilings.
       7. Voltage: [277] [120].
       8. Lamp: 750 Lumen, 1000 Lumen or 1500 Lumen, 4000K, remote phosphor enclosed LED array; 60,000 hours at LLD = 0.7.
       9. Marking: Luminaires are to be labeled on the interior side with lumen package used.
       10. Alternate Manufacturers:
           1. Portfolio #LD4BXXD010-EU4B-1020-80-40-4LB-M-1-MW.
           2. Prescolite Lighting LTR-4RD-H-XX-40L-DM1 LTR-4RD-T-XX-40K-8-MD-WC.
           3. Intense Lighting: #SS4G4DR-LX-408-ED10V1-IC430-W-SF.
           4. Substitutions permitted: As listed in Paragraph 2.1A.
    3. Type R2**:** Gotham #EVO4WW-40/XX-WR-MVOLT-EZ1.
       1. Description: Recessed 4.5 inch dia. aperture LED wall washer type downlight.
       2. Reflector: Low brightness, white painted, self-flanged reflector.
       3. Ballast/Driver: 8 Watt/750 Lumen, 9 Watt/1000 Lumen or 15 Watt/1500 Lumen LED light engine with remote phosphor technology; Wattage based on lumen package selected; 5-year factory warranty.
       4. Housing:
          1. Frame to be 18 gauge galvanized steel ring.
          2. Mounting ring shall be secured to ceiling bar hangers (supplied with luminaire).
          3. Luminaire frame to be supported from the structure by at least two opposing corners.
       5. Junction Box:
          1. Junction box to be code approved for through wiring.
          2. Junction box to be secured to the mounting ring and accessible from two sides.
          3. Junction box to be pre-wired and accessible per code through the ceiling trim opening.
       6. Mounting:
          1. 24 inch grid ceiling bar hangers shall be supplied by manufacturer and securely fastened to grid.
          2. Provide 28 inch "C" channel mounting bars and flange kit for drywall ceiling.
       7. Voltage: [277] [120].
       8. Lamp: 750 Lumen, 1000 Lumen or 1500 Lumen, 4000K, remote phosphor enclosed LED array; 60,000 hours at LLD = 0.7.
       9. Marking: Luminaires are to be labeled on the interior side with lumen package used.
       10. Alternate Manufacturers:
           1. Portfolio #LD4BXXD010-EU4B-1020-80-40-4LBSW--1-MW.
           2. Prescolite Lighting LTR-4RD-H-XX-40L-DM1 LTR-4RW-T-XX-40K-8-LWW-WC.
           3. Intense Lighting: #SD4WH-LX-40-ED10V1-IC437-W-SF.
           4. Substitutions permitted: As listed in Paragraph 2.1A.
    4. Type R5: Gotham #EVO6-40/XXX-WR-MD-MVOLT-EZ1.
       1. Description: Recessed 6 inch dia. aperture LED downlight.
       2. Reflector: Low brightness white painted, self-flanged reflector.
       3. Ballast/Driver: 10 Watt/1000 Lumen, 15 Watt/1500 Lumen or 20 Watt/2000 Lumen LED light engine with remote phosphor technology; Wattage based on lumen package selected; 5-year factory warranty.
       4. Housing:
          1. Frame to be 18 gauge galvanized steel ring.
          2. Mounting ring shall be secured to grid ceiling bar hangers (supplied with luminaire).
          3. Luminaire frame to be supported from the structure by at least two opposing corners.
       5. Junction Box:
          1. Junction box to be code approved for through wiring.
          2. Junction box to be secured to the mounting ring and accessible from two sides.
          3. Junction box to be pre-wired and accessible per code through the ceiling trim opening.
       6. Mounting:
          1. 24 inch grid ceiling bar hangers shall be supplied by manufacturer and securely fastened to grid.
          2. Provide 28 inch 'C' channel mounting bars and flange kit for drywall ceilings.
       7. Voltage: [277] [120].
       8. Lamp: 1000 Lumen, 1500 Lumen or 2000 Lumen, 4000K, remote phosphor enclosed LED array; 60,000 hours at LLD = 0.7.
       9. Marking: Luminaires are to be labeled on the interior side with lumen package used.
       10. Alternate Manufacturers:
           1. Portfolio #LD6B-XX-D010-EU6B-1020-80-40-6LB-M-1-MW.
           2. Prescolite Lighting LTR-6RD-H-XX-40L-DM1 LTR-6RD-T-XX-40K-8-MD-WC.
           3. Intense Lighting: #SS6G4DR-XX-408-ED10V1-IC630-W-SF.
           4. Substitutions permitted: As listed in Paragraph 2.1A.

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**NOTE TO SPECIFIER**

Under cabinet lighting is required for several casework units provided within “Retail”. The luminaires are furnished by the casework supplier to be mounted and powered by the Contractor. Therefore, include under cabinet luminaires UC1 and UC2 only for existing damaged under cabinet lighting requiring replacement.

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* + 1. Type UC1: Lithonia #UCLD-24IN-30K-90-SWR-WH.
       1. Description: 2 feet long, under cabinet mounted, LED luminaire, with swivel head.
       2. Housing:
          1. Low profile extruded aluminum housing.
          2. White polyester powder coat finish with 92% overall reflectance.
       3. Lens: Clear acrylic prismatic diffuser shall snap into place without tools.
       4. Ballast/Driver:
          1. LED high efficiency – 13W at 740 Lumen.
          2. Electrical contractor shall inter-link to an adjacent under cabinet luminaire using factory connector (when applicable).
       5. Lamp: 740 Lumen LED array; 3000K, 50,000 hours at LLD=0.7.
       6. Marking: Luminaires are to be labeled on the reflector side with lamp and ballast type used.
       7. Alternate Manufacturers:
          1. HALO #HU30-SCT-24-D9-S-P.
          2. Columbia #CUC2-CS-ED120.
          3. Substitutions permitted: As listed in Paragraph 2.1A.
    2. Type UC2: Lithonia #UCLD-18IN-30K-90-SWR-WH.
       1. Description: 18 inches long, under cabinet mounted, LED luminaire, with swivel head.
       2. Housing:
          1. Low profile extruded aluminum housing.
          2. White polyester powder coat finish with 92% overall reflectance.
       3. Lens: Clear acrylic prismatic diffuser shall snap into place without tools.
       4. Ballast/Driver:
          1. LED high efficiency – 10W at 585 Lumen.
          2. Electrical contractor shall inter-link to an adjacent under cabinet luminaire using factory connector (when applicable).
       5. Lamp: 585 Lumen LED array; 3000K, 50,000 hours at LLD=0.7.
       6. Marking: Luminaires are to be labeled on the reflector side with lamp and ballast type used.
       7. Alternate Manufacturers:
          1. HALO #HU30-SCT-18-D9-S-P.
          2. Columbia #CUC1-CS-ED120.
          3. Substitutions permitted: As listed in Paragraph 2.1A.
    3. Type W1: Lithonia TZLID-L96-SMR-XXXX-FST-MVOLT-40K-80CRI-WH.
       1. Description: Cable/chain or pendant hung, 8 feet long, industrial LED, strip light luminaire, providing 10 percent uplighting with locking lamp holders and protective wireguards.
       2. Lens: Snap on frosted, diffused lens.
       3. Reflector: 8 feet long, symmetrical reflector with uplight #ZLR-L96-SYM-UPL-WH.
       4. Housing:
          1. Channel and end plates of formed steel, 20 gauge material thickness.
          2. Reflector and housing shall be white baked enamel with 90% minimum reflectance.
       5. Ballast/Driver: 60W at 8400 Lumen, 81W at 11,400 Lumen or 121W at 16,000 Lumen. Wattage based on lumen package selected.
       6. Mounting: Wire rope/chain from ceiling structure.
       7. Lamps: 8400 Lumen, 11,400 Lumen or 16,000 Lumen LED array; 4000K, 50,000 hours at LLD=0.7.
       8. Marking: Luminaires are to be labeled on the interior side with lumen package used.
       9. Alternate Manufacturers:
          1. Mercury #LW4-8-XXXX-40K-HTA-1-UNI-SRA.
          2. Lumax #CHLEDR-XXXL-4K-96-9.
          3. Substitutions permitted: As listed in Paragraph 2.1A.
    4. Type W2: Lithonia #ZLID-L48SMR-XXXX-FST-MVOLT-40K-80CRI-WH.
       1. Description:Cable/chain or pendant hung, 4 feet long single, industrial LED, strip light luminaire, providing 10 percent uplighting with locking lamp holders and protective wireguards.
       2. Lens: Snap on frosted, diffused lens.
       3. Reflector: 4 feet long, symmetrical reflector with uplight #ZLR-L48-SYM-UPL-WH.
       4. Housing:
          1. Channel and end plates of formed 20 gauge steel.
          2. Reflector and housing shall be white baked enamel with 90% minimum reflectance.
       5. Ballast/Driver: 30W at 4000 Lumen, 41W at 5500 Lumen or 59W at 7600 Lumen. Wattage based on lumen package selected.
       6. Mounting: Wire rope/chain from ceiling structure.
       7. Lamps: 4000 Lumen, 5500 Lumen or 7600 Lumen LED array; 4000K, 50,000 hours at LLD=0.7.
       8. Marking: Luminaires are to be labeled on the interior side with lumen package used.
       9. Alternate Manufacturers:
          1. Mercury #LW4-4-XXXX-40K-HTA-1-UNI-SRA.
          2. Lumax #CHLEDR-XXXL-4K-48-9.
          3. Substitutions permitted: As listed in Paragraph 2.1A.
    5. Type W3: Lithonia #TMSL-XXXX-L/LV-MVOLT-GEZ10-40K-80CRI-WH.
       1. Description: Cable/chain or pendant hung, 8 feet long, enclosed and gasketed, LED low bay luminaire. U.L. listed for damp locations.
       2. Lens: 8 feet long, enclosed and gasketed diffused acrylic.
       3. Housing:
          1. Full body housing and optical assembly of formed steel, 20 gauge material thickness.
          2. Housing shall be high gloss, white baked enamel with 90% minimum reflectance.
          3. Reflector: Internal, anodized, MIRO 5 high reflectance aluminum.
       4. Ballast/Driver: 58W at 7300 Lumen, 149W at 17,500 Lumen or 181W at 19,600 Lumen. Wattage based on lumen packages selected.
       5. Mounting: Wire rope/chain or pendant from ceiling structure.
       6. Lamps: 7300 Lumen, 17,500 Lumen or 19,600 Lumen LED array; 4000K, 60,000 hours at LLD=0.94.
       7. Marking: Luminaires are to be labeled on the interior side with lumen package used.
       8. Alternate Manufacturers:
          1. Metalux #8ILED-LD5-XX-W-FL/UPL-UNV-L840-CD.
          2. Substitutions permitted: As listed in Paragraph 2.1A.
    6. Type W4: Lithonia #MSL-XXXX-L/LV-MVOLT-GEZ10-40K-80CRI-WH.
       1. Description: Cable/chain or pendant hung, 4 feet long, enclosed and gasketed, LED low bay luminaire. U.L. listed for damp locations.
       2. Lens: 4 feet long, enclosed and gasketed diffused acrylic
       3. Housing:
          1. Full body housing and optical assembly of formed steel, 20 gauge material thickness.
          2. Housing shall be high gloss, white baked enamel with 90% minimum reflectance.
          3. Reflector: Internal, anodized, MIRO 5 high reflectance aluminum.
       4. Ballast/Driver: 29W at 3700 Lumen, 75W at 8700 Lumen or 86W at 9800 Lumen. Wattage based on lumen packages selected.
       5. Mounting: Wire rope/chain or pendant from ceiling structure.
       6. Lamps: 3700 Lumen, 8700 Lumen or 9800 Lumen LED array; 4000K, 60,000 hours at LLD=0.94.
       7. Marking: Luminaires are to be labeled on the interior side with lumen package used.
       8. Alternate Manufacturers:
          1. Metalux #4ILED-LD5-XX-W-FL/UPL-UNV-L840-CD.
          2. Substitutions permitted: As listed in Paragraph 2.1A.
    7. Type W6: Lithonia #IBG-XXXXX-SEF-PFL-WD-MVOLT-GZ10-40K-80CRI-DWH.
       1. Description: Cable/chain or pendant hung 12 inches x 2 feet (nominal) long, high bay, industrial LED luminaire with wide beam distribution, and U.L. listed for damp locations.
       2. Lens: Semi-diffused polycarbonate for glare control.
       3. Housing:
          1. Full body housing and optical assembly of formed steel, 20 gauge material thickness.
          2. Housing shall be high gloss, white baked enamel with 90% minimum reflectance.
          3. Reflectors: Injection molded acrylic.
          4. Dimensions of housing dependent on lumen package selected.
       4. Ballast/Driver: 48W at 7500 Lumen thru 178W at 30,000 Lumen. Wattage based on lumen package selected.
       5. Mounting: Wire rope/chain or pendant from ceiling structure.
       6. Lamps: 7500 Lumen thru 30,000 Lumen LED array; 4000K, 60,000 hours at LLD=0.88.
       7. Marking: Luminaires are to be labeled on the interior side with lumen package used.
       8. Alternate Manufacturers:
          1. General Electric #ABV3-0-XX-T-48-1D.
          2. Orion (Ison) #HB1F3-XX-XX-UNV-NDXX-840-LF.
          3. Metalux #LHB-XX-UNV-L840-CD.
          4. Columbia #PELX-40XXXX-FP-W-E-U.
          5. Substitutions permitted: As listed in Paragraph 2.1A.
    8. Type XF1 (hazardous location): Killark #EML-XX-30-XX-G.
       1. Description: Vapor tight LED luminaire UL listed for Class I, Div. 2, Groups C, D, hazardous locations.
       2. Lens: Heat and impact resistant fluted glass globe.
       3. Housing: Body and guard of die-cast aluminum.
       4. Ballast/Driver: LED high efficiency – 40W at 3400 Lumens or 50W at 5700 Lumen. Wattage based on lumen package selected.
       5. Mounting: Pendant, wall or ceiling mounted.
       6. Voltage: [277] [120].
       7. Lamps: 3400 Lumen or 5700 Lumen LED array; 4000K.
       8. Alternate Manufacturer:
          1. Solar Ray Lighting #HQH1-043-40-PC-U-GR (ceiling or wall mounted).
          2. Solar Ray Lighting #HTJM-XX-50-XXX-GG-XX-LG.
          3. Canlet “LED Vapor Proof”.
          4. Substitutions permitted: As listed in Paragraph 2.1A.

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**NOTE TO SPECIFIER**

The exit sign luminaires specified below include a battery. If the Facility is equipped with emergency power delete the battery and connect the luminaire to an emergency circuit as appropriate. Modify manufacturer number as necessary.

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* + 1. Type X1: Lithonia #LQM-S-W-3R-120/277-ELN-SD.
       1. Description: Ceiling, end or wall mounted, single face LED exit sign with canopy. Self-powered and with self-diagnostics.
       2. Features: Red Letters, White Stencil, White Housing (verify colors with local jurisdiction). Injection molded UL94-5V rated polycarbonate frame and canopy.
       3. Mounting: Ceiling, back or end mounted.
       4. Battery: Maintenance free sealed Nickel Cadmium with long life, full recharge time of 24 hours max.
       5. Voltage: [277] [120].
       6. Lamps: LED lamp module.
       7. Alternate Manufacturers:
          1. Sure-Lites #LPX7-X-SD.
          2. Compass #CERSD Series.
          3. Substitutions permitted: As listed in Paragraph 2.1A.
    2. Type X2: Lithonia #LQM-S-W-3R-120/277-ELN-SD.
       1. Description: Ceiling or end mount, double face LED exit sign with canopy. Self-powered and with self-diagnostics.
       2. Features: Red Letters, White Stencil, White Housing (verify colors with local jurisdiction). Injection molded UL94-5V rated polycarbonate frame and canopy. Two bottom apertures snap out to emit downlight as required.
       3. Mounting: Ceiling or end-mount.
       4. Battery: Maintenance free sealed nickel-cadmium with long life, full recharge time of 24 hours maximum.
       5. Voltage: [277] [120].
       6. Lamps: LED lamp module.
       7. Alternate Manufacturers:
          1. Sure-Lites #LPX7-X-SD.
          2. Compass #CERSD Series.
          3. Substitutions permitted: As listed in Paragraph 2.1A.
  1. LUMINAIRES
     1. Provide luminaires as indicated in luminaire schedule and details on project plans. Provide luminaires complete with light sources of quantity, type and wattage indicated. Provide all luminaires of the same type by the same manufacturer. Luminaires must be specifically designed for use with the driver or ballast and light source provided.
     2. LED Luminaires:
        1. Install ballast/drivers, LED arrays and specified accessories at the factory.
        2. Luminaires must have a minimum 5 year manufacturer's warranty.
        3. Luminaires must have a minimum L70 lumen maintenance value of 50,000 hours as calculated by IES TM-21, with data obtained per IES LM-80 requirements.
        4. Luminaire drive current value must be identical to that provided by test data for luminaire in question.
        5. Luminaires must be listed with the DesignLights Consortium 'Qualified Products List' when falling into category of "General Application" luminaires, i.e. Interior Directional, Display Case, Troffer, Linear Ambient, or Low/High Bay. Requirements are shown in the DesignLights Consortium "Technical Requirements Table" at https://data.energystar.gov/dataset/EPA-Recognized-Laboratories-For- Lighting-Products/jgwf-7qrr.
        6. Provide Department of Energy 'Lighting Facts' label for each luminaire.
     3. Luminaires for hazardous locations:
        1. In addition to requirements stated herein, provide LED luminaires for hazardous locations which conform to UL 844 or which have Factory Mutual certification for the class and division indicated.
  2. LED Drivers
     1. NEMA SSL 1, UL 8750. LED drivers must be electronic, UL Class 1, constant-current type and comply with the following requirements:
        1. Output power (watts)and luminous flux (lumens) as shown in luminaire schedule for each luminaire type to meet minimum luminaire efficacy (LE) value provided.
        2. Power Factor (PF) greater than or equal to 0.9 over the full dimming range when provided.
        3. Current draw Total Harmonic Distortion (THD) of less than 20 percent.
        4. Class A sound rating.
        5. Operable at input voltage of 120-277 volts at 60 hertz.
        6. Minimum 5 year manufacturer's warranty.
        7. RoHS compliant.
        8. Integral thermal protection that reduces or eliminates the output power if case temperature exceeds a value detrimental to the driver.
        9. UL listed for dry or damp locations typical of interior installations.
        10. LED driver shall tolerate sustained open circuit and short circuit output conditions without damage.
        11. LED driver shall comply with the requirements of the FCC rules and regulations, Title 47 CFR Part 15 Non-Consumer (Class A).
  3. LIGHT SOURCES
     1. NEMA ANSLG C78.377, NEMA SSL 3. Provide type and wattage as indicated in luminaire schedule on project plans.
     2. LED arrays shall have a correlated color temperature (CCT) of 4000K; minimum color rendering index (CRI) value of 80.
     3. High power, white light output utilizing phosphor conversion (PC) process or mixed system of colored LEDs, typically red, green and blue (RGB).
     4. Provide light source color consistency by utilizing a binning tolerance within a 4 step McAdam ellipse.
     5. Luminaire shall have door frame and lens compatible for use with LED arrays and integral airflow ventilation system.
  4. LED EMERGENCY DRIVERS
     1. Provide LED emergency driver with automatic power failure detection, test switch and LED indicator (or combination switch/indicator) located on luminaire exterior and provide self-diagnostic function integral to emergency driver. Integral nickel cadmium or lithium iron phosphate battery is required to supply a minimum of 90 minutes of emergency power at 700 Lumens (at 100 Lumens/Watt). Driver must be RoHS compliant, rated for installation in plenum-rated spaces and damp locations, and be warranted for a minimum of five years.
  5. LUMINAIRE SUPPORT HARDWARE
     1. Wire:
        1. ASTM A641/A641M; Galvanized, soft tempered steel, minimum 0.11 inches in diameter, or galvanized, braided steel, minimum 0.08 inches in diameter.
     2. Threaded Rods:
        1. Threaded steel rods, 3/16 inch diameter, zinc or cadmium coated.
     3. Straps:
        1. Galvanized steel, one inch by 3/16 inch, conforming to ASTM A653/A653M, with a light commercial zinc coating or ASTM A1008/A1008M with an electrodeposited zinc coating conforming to ASTM B633, Type RS.
  6. EQUIPMENT IDENTIFICATION
     1. Each item of equipment must have a nameplate bearing the manufacturer's name, address, model number, and serial number securely affixed in a conspicuous place; the nameplate of the distributing agent will not be acceptable.
     2. Provide labeled luminaires in accordance with UL 1598 requirements. All luminaires must be clearly marked for operation of specific light sources and ballasts or drivers. Note the following light source characteristics in the format "Use Only \_\_\_\_\_":
        1. Correlated color temperature (CCT) and color rendering index (CRI) for all luminaires.
        2. All markings related to light source type must be clear and located to be readily visible to service personnel, but unseen from normal viewing angles when light sources are in place. Ballasts or drivers must have clear markings indicating multi-level outputs and indicate proper terminals for the various outputs.
  7. FACTORY APPLIED FINISH
     1. Provide all luminaires and lighting equipment with factory-applied painting system that as a minimum, meets requirements of NEMA 250 corrosion-resistance test.
  8. RECESS- AND FLUSH-MOUNTED LUMINAIRES
     1. Provide access to lamp and ballast from bottom of luminaire. Provide trim for the exposed surface of flush-mounted luminaires as indicated on project drawings and specifications.
  9. SUSPENDED LUMINAIRES
     1. Provide hangers capable of supporting twice the combined weight of luminaires supported by hangers. Provide with swivel hangers to ensure a plumb installation. Provide cadmium-plated steel with a swivel-ball tapped for the conduit size indicated. Hangers must allow fixtures to swing within an angle of 45 degrees. Brace pendants 4 feet or longer to limit swinging. Single-unit suspended luminaires must have twin-stem hangers. Multiple-unit or continuous row luminaires must have a tubing or stem for wiring at one point and a tubing or rod suspension provided for each unit length of chassis, including one at each end. Provide rods in minimum 0.25 inch diameter.

1. EXECUTION
   1. EXAMINATION
      1. As specified in Section 260500 – Common Work Results for Electrical.
   2. INSTALLATION
      1. Electrical installations must conform to IEEE C2, NFPA 70, and to the requirements specified herein. Install luminaires to meet the requirements of ASHRAE 90.1 and ASHRAE 189.1. To encourage consistency and uniformity, install luminaires of the same manufacture and model number when residing in the same facility or building.
      2. Luminaires:
         1. Set luminaires plumb, square, and level with ceiling and walls, in alignment with adjacent luminaires and secure in accordance with manufacturers' directions and approved drawings. Installation must meet requirements of NFPA 70. Obtain approval of the exact mounting height on the job before commencing installation and, where applicable, after coordinating with the type, style, and pattern of the ceiling being installed.
         2. Recessed and semi-recessed luminaires must be independently supported from the building structure by a minimum of four wires, straps or rods per luminaire and located near each corner of the luminaire. Ceiling grid clips are not allowed as an alternative to independently supported luminaires.
         3. Round luminaires or luminaires smaller in size than the ceiling grid must be independently supported from the building structure by a minimum of two wires, straps or rods per luminaire, spaced approximately equidistant around. Do not support luminaires by acoustical tile ceiling panels.
            1. Where luminaires of sizes less than the ceiling grid are indicated to be centered in the acoustical panel, support each independently and provide at least two 3/4 inch metal channels spanning, and secured to, the ceiling tees for centering and aligning the luminaire. Provide wires, straps, or rods for luminaire support in this section.
      3. Suspended Luminaires:
         1. Provide suspended luminaires with swivel hangers so that they hang plumb and level. The stem, canopy and luminaire must be capable of 45 degree swing. Pendants, rods, or chains, 4 feet or longer excluding luminaire, must be braced to prevent swaying using three cables at 120 degree separation.
         2. Suspended luminaires in continuous rows must have internal wireway systems for end to end wiring and must be properly aligned to provide a straight and continuous row without bends, gaps, light leaks or filler pieces.
         3. Match supporting pendants with supported luminaire. Aircraft cable must be stainless steel. Canopies must be finished to match the ceiling and must be low profile unless otherwise shown.
         4. Maximum distance between suspension points must be 10 feet or as recommended by the manufacturer, whichever is less.
      4. Locate ceiling luminaires as indicated on reflected ceiling plan.
      5. Install surface mounted luminaires and exit luminaire signs plumb and adjust to align with building lines and with each other. Secure to prevent movement. Mount exit signs to outlet box mounted flush in wall or ceilings. Outlet box for ceiling mounted exit signs: Connect to rigid conduit system.
      6. Install recessed luminaires using accessories and firestopping materials to meet regulatory requirements for fire rating. In fire rated ceilings, recessed luminaires must carry 1 hour UL fire rating classification.
      7. Install earthquake clips to secure recessed grid-supported luminaires in place.
      8. Install wall mounted luminaires, emergency lighting units and exit luminaire signs at height as scheduled.
      9. Install accessories furnished with each luminaire.
      10. Bond products and metal accessories to branch circuit equipment grounding conductor.
      11. Install specified light sources in each emergency lighting unit, exit luminaire sign, and luminaire.
      12. Wire exit signs and emergency lighting units ahead of the local switch, to the normal lighting circuit located in the same room or area.
      13. Luminaire whips shall be steel or aluminum. M/C cable shall be permissible for luminaire whips/connections. Luminaire whips/connections shall be made with a minimum of #12 AWG copper conductors. Equipment grounding conductors shall be provided in all luminaire whips and/or connections.
          1. All luminaire whips shall be supported to luminaire support wire/cable with an approved fastener equal to an Erico “KX” flexible conduit hanger or other UL listed supports and fasteners.
      14. Luminaires are not to be used as a raceway unless stamped for use as raceway by manufacturer. Single luminaire in lay-in ceilings shall not be used for raceway and shall be connected to an outlet box located within six feet (6’) of fixture with flexible conduit or luminaire whips.
   3. FIELD QUALITY CONTROL
      1. Section 014000 - Quality Requirements: Field testing and inspection.
      2. Operate each luminaire after installation and connection. Inspect for proper connection and operation.
      3. Final acceptance will be based on measurement of initial lighting levels after required hours of burn in as specified in USPS Mail Processing Facility Design Criteria, not maintained lighting levels.
   4. WARRANTY
      1. Provide a written 5 year on-site replacement warranty for material, luminaire finish, and workmanship. On-site replacement includes transportation, removal, and installation of new products.
         1. Include finish warranty to include failure and substantial deterioration such as blistering, cracking, peeling, chalking, or fading.
         2. Material warranty must include:
            1. All drivers.
            2. Replacement when more than 10 percent of LED sources in any lightbar or subassembly are defective or non-starting.
      2. Warranty period must begin on date of beneficial occupancy. Provide the USPS Project Manager with signed warranty certificates prior to final payment.
   5. ADJUSTING
      1. Aim and adjust luminaires as directed by the USPS Project Manager.
      2. Position exit luminaire sign directional arrows as indicated.
   6. CLEANING
      1. Section 017300 - Execution: Cleaning installed work.
      2. Clean electrical parts to remove conductive and deleterious materials.
      3. Remove dirt and debris from enclosures.
      4. Clean photometric control surfaces as recommended by manufacturer.
      5. Clean finishes and touch up damage.

END OF SECTION

USPS MPF Specification Last Revised: 10/1/2022