

**SECTION 265000**

**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 DESCRIPTION**

- A. Provide interior and exterior lighting systems, including luminaires, hangers, supports, fittings, lamps, wiring, connections and controls, as indicated in the Contract Documents for complete and operational systems. The lighting layouts on the drawings are diagrammatic only. Refer to architectural "Reflected Ceiling Plans" for exact location of interior luminaires. Luminaires, in general, have been specified for the particular type of ceiling in which they are to be installed. Verify the ceiling construction details and provide luminaires suitable for the respective ceiling types and room finish schedule.

**1.3 QUALITY ASSURANCE**

- A. All luminaires shall be new and bear a NRTL label for the service intended. Luminaires shall be standard products of manufacturers regularly engaged in the manufacture to the specific type light luminaires specified and shall be the manufacturer's latest standard design that complies with specification requirements. Manufacturer's luminaire catalog numbers as indicated on the "Luminaire Schedule" indicate quality, type, and style, but may not cover required special design details. Provide luminaires having such special details as noted in the "Luminaire Schedule", as indicated by the specified luminaire model number and as required for proper installation. Verify the availability of all luminaires proposed to be used in the execution of the work prior to submitting same for approval. The discontinuance of production of any luminaire after such approval has been granted shall not relieve the Contractor from furnishing an approved luminaire of comparable quality and design at no additional cost. Luminaires shall be as specified in the "Luminaire Schedule". Luminaire types, appearance, characteristics, photometrics, finishes, etc., correspond to the specified manufacturer, and associated catalog number, listed in the "Luminaire Schedule". Products of other listed acceptable manufacturers shall be equivalent in every way to that of the luminaire specified. The Engineer reserves the right to disapprove any luminaire type submitted which he feels is not equal in quality, appearance or performance to the luminaire specified.
- B. Should there be any difference between drawings and schedules, secure from Architect/Engineer such information as is necessary before tendering his proposal. When finishes are not definitely specified, they shall be as selected by the Architect.
- C. Locations indicated for luminaires are approximate. Field coordinate exact locations as near as possible to the location indicated. Coordinate with the Engineer for any major location changes.

#### **1.4     SUBMITTALS**

- A.     Submit shop drawings as described in Section 260500. Luminaire shop drawings shall include photometric data for each luminaire utilizing the specified lens/louver type, lamp(s) and ballast(s). All luminaire types for the project shall be submitted in a single complete package which shall be in the form of a soft cover binder with each luminaire separated by an identified index tab. Information on each luminaire shall include:
1.     Manufacturer and Catalog Number.
  2.     Dimensioned Construction Drawing(s).
  3.     Complete Catalog "Cut" Sheet.
  4.     Photometrics (space to mounting height ratio, coefficient of utilization complete values, IES distribution hard and electronic copy, candlepower distribution by angle and luminaire efficiency).
  5.     Lens/Louver Type.
  6.     Reflector information (type, material, reflectance, etc).
  7.     Materials for all components.
  8.     Socket Type.
  9.     Lamp (rated life, initial lumen output, mean lumen output, Kelvin color, color rendering index, dimensions, wattage, socket type, mercury content).
  10.    Certification of IES LM-79 an IES LM-80 testing for LED luminaires.

#### **1.5     DELIVERY, STORAGE AND HANDLING**

- A.     Luminaires and equipment shall be delivered with NRTL and manufacturer's labels intact and legible. Broken, cracked and damaged materials and equipment shall be removed from the site immediately and be replaced with new materials and equipment. Luminaires and accessories shall be stored in protected dry locations in their original unbroken package or container. Luminaires shall be protected from dust and dampness both before and after installation. Luminaires shall be protected from paint and cleaning solvents during all phases of construction.

### **PART 2 - PRODUCTS**

#### **2.1     LUMINAIRES**

- A.     LED luminaires shall be identical in construction features, options and appearance to the luminaires specified in the Luminaire Schedule. LED luminaires include white and RGB systems respectively.
1.     LED luminaires shall be provided with all cables, controllers, power supplies, connectors, terminators and accessories required for a complete installation. LED system shall utilize pulse width modulation, non-linear scaling techniques and reverse polarity protection for high-resolution output.
  2.     RGB LED systems shall be capable of at least 8-bit control of red, green and blue module. RGB LED system shall be capable of setting each module with a unique and individual address. Each address shall be controlled independently by DMX or alternate method protocol. All RGB LED fixtures shall undergo a minimum of eight-hour burn-in testing during manufacturing.

**RW MONSTER GOLF  
MULTIPLE ACCESSORY STRUCTURES  
84 CHALET ROAD  
KIAMESHA LAKE, NEW YORK**

3. LED luminaires shall be high brightness and binned for forward voltage, luminous flux and wavelength.
4. LED luminaires shall be tested in accordance with IESNA LM-79 (luminous output, power input, luminaire efficacy (lumens/watt), color temperature and color rendering index) and IESNA LM-80 (output luminous maintenance, 10,000 hour minimum test). Luminaire output shall be a minimum of 60 lumens/watt. Rated life shall be a minimum of 50,000 hours at 50% output. Testing shall be performed by a US Department of Energy (DOE) accredited laboratory.
5. LED drivers shall be solid state Class 1 power supply/driver. The system shall have a minimum 90% power factor and a maximum of 30% THD, and heat sensing with color sensing feed-back. Adequate heat sink capability shall be provided to ensure the rated life.
6. The luminaire (to include LED lamps and LED drivers) shall have a full five (5) year minimum warranty for replacement and labor.

a. Acceptable LED Node Manufacturers:

- 1) Philips
- 2) Osram
- 3) Cree
- 4) Nichea
- 5) Lumiled

B. Lenses:

1. Shall be listed materials tested in accordance with ASTM D-635, "Rate of Burning and/or Extent and Time of Burning of Self-Supporting Plastics in a Horizontal Position" and burns less than 2/5 inches per minute.
2. The products shall have a smoke density of less than 75 when tested in accordance with ASTM D-2843, standard test method for "Density of Smoke from the Burning or Decomposition of Plastics".
3. The flame spread rating shall not exceed 0-25 and smoke developed rating shall not exceed 450 in accordance with ASTM E-84, standard test method for "Surface Burning Characteristics of Building Materials".
4. Self-ignition shall not occur below 600°F, in accordance with ASTM D-1929, standard test method for "Ignition Properties of Plastics".
5. Materials shall remain in place 15 minutes at 175°F and fall from frame at 200° below ignition temperature in accordance with ASTM D-648, "Deflection Temperature of Plastics Under Flexural Load".

C. Wiring:

1. Wiring within lighting fixture for connection to branch circuit shall be:
  - a. NEC Type AF for 120 volt, minimum No. 18 AWG.
  - b. NEC Type SF-2 for 277 volt, minimum No. 18 AWG.
2. Stranded wire within lighting fixture shall be lead dipped.

D. Luminaire Schedule:

1. Luminaire schedule is found on contract drawings.

**PART 3 - EXECUTION**

**3.1 GENERAL INSTALLATION**

- A. Provide for every luminaire shown on the plans, as scheduled on the drawings.
- B. Where a luminaire is specified or approved for certain locations, all luminaires in those locations must be of the same manufacturer and style. All luminaires shall be NRTL tested.
- C. Obtain exact location of all ceiling and wall mounted luminaires from the Architect.
- D. Luminaire fasteners or hangers shall be capable of supporting four times the luminaire weight.
- E. Luminaires shall be supported independent from ceiling system or other building services. Support luminaires at two locations, using #10 steel wire similar to that used to support the ceiling grid. Directly attach steel wire to structural member.
- F. Mount luminaires in true vertical and horizontal alignment. Offset luminaires as required to avoid obstructions. Provide all necessary hangers and supports for proper luminaire installation. Such supports shall be anchored to channels in the ceiling construction, to the structural slab or to structural members above the suspended ceiling.
- G. Provide all necessary accessories for "end-to-end" mounting where continuous rows of fluorescent luminaires are indicated.
- H. All luminaire assemblies shall be grounded.
- I. New luminaires may be provided to replace existing luminaires scheduled to remain or be reused, subject to shop drawing approval.

**3.2 SURFACE CEILING MOUNTING**

- A. Mount surface luminaires tight to surface in a manner such that mounting surface does not distort fixture.
- B. Luminaires installed in continuous rows may be fed by a single outlet if fixtures are UL approved and suitable for through wiring in luminaire raceway.
- C. Luminaire fasteners or hangers shall be capable of supporting four times luminaire weight.
- D. Luminaires shall be supported independent from ceiling system or other building services.

**3.3     RECESSED MOUNTING**

- A.     Verify ceiling type, construction, and material prior to placing an order for recessed luminaires.
- B.     Furnish fixtures with an IC rating for all recessed incandescent fixtures installed in direct contact with insulation.
- C.     Furnish and install plaster frames for plaster ceilings and flanged frames for drywall ceilings.
- D.     Furnish and install all required mounting hardware and accessories to adapt fixtures to ceiling construction.
- E.     Lay-in type luminaires shall be supported independent of the ceiling system at each end of the luminaire with galvanized support wire.
- F.     Provide and install seismic hold-down clips for all lay-in type lighting fixtures.

**3.4     PENDANT MOUNTING**

- A.     Mount pendant mounted luminaires from 1/4 in. threaded rods of required length.
- B.     Sleeve threaded rods with 1/2 in. EMT painted with color as directed by Architect/Engineer.
- C.     Luminaires installed in continuous rows may be fed by a single outlet if they are UL approved and suitable for through wiring in luminaire raceway.

**3.5     GROUNDING**

- A.     Ground all non-current carrying parts of all lighting fixtures.
- B.     All grounding shall be accomplished with NRTL tested grounding connectors suitable for this purpose.

**3.6     FINAL CLEANING**

- A.     Immediately prior to acceptance, damp clean diffusers, glassware, luminaire trim, reflectors, lamps, louvers, lens and similar objects of all luminaires. Remove all dirt, corrosion, foreign material, finger marks, and blemishes. Replace all burned out lamps and failed components.

END OF SECTION 265000