CHAPTER 20A
OUTDOOR LIGHTING REQUIREMENTS

SECTION 20A.1 PURPOSE

The purpose of this Chapter is to provide a regulatory strategy for outdoor lighting that will:

1. Permit reasonable uses of outdoor lighting for night-time safety, utility, security, productivity, enjoyment and commerce.

2. Curtail and reverse the degradation of the nighttime visual environment and the night sky.

3. Preserve the dark night sky for astronomy.

4. Minimize glare, obtrusive light, and artificial sky glow by limiting outdoor lighting that is misdirected, excessive, or unnecessary.

5. Conserve energy and resources to the greatest extent possible.

6. Help protect the natural environment from the damaging effects of night lighting from man-made sources.

SECTION 20A.2 DEFINITIONS

The following definitions shall be inserted in alphabetic order into the Section 2.02 of the Grand Haven Charter Township Zoning Ordinance.

1. **Artificial Sky Glow**: The brightening of the night sky attributable to man made sources of light.

2. **Candela**: The unit of luminous intensity of a lighting source emitted into a given direction.

3. **Canopy**: A roof-like covering over an area, in or under which a lighting fixture is mounted.

4. **Drip Line Area**: The area on the ground enclosed by vertical planes extending downward from the outer solid edge of a canopy.

5. **Facade**: The exterior wall of a building.

6. **Glare**: Light that causes visual discomfort or disability, or a loss of visual performance.
7. **Hardscape Lighting**: Lighting associated with architectural features, such as fountains, sculptures, and the like.

8. **Landscape Lighting**: Luminaires mounted in or at grade (not to exceed 3 feet overall above grade) and used solely for landscape rather than area lighting, or fully shielded luminaires mounted in trees and used solely for landscape or façade lighting.

9. **Lighting Zone**: A type of area defined on the basis of ambient lighting levels, population density, and/or other community considerations. The lighting zones are determined by the Planning Commission. A description of these four lighting zones is given in Table 1 of this ordinance.

10. **Light Trespass**: Spill light that because of quantitative, directional, or spectral content causes annoyance, discomfort, or loss in visual performance and visibility.

11. **Lumen**: The unit of luminous flux: a measure of the amount of light emitted by a lamp.

12. **Luminaire** ("light fixture"): A complete lighting unit consisting of one or more electric lamps, the lamp holder, reflector, lens, diffuser, ballast, and/or other components and accessories.

13. **Luminance**: The amount of light emitted in a given direction from a surface by the light source or by reflection from a surface. The unit is candela per square meter.

14. **Luminous Flux**: A measure of the total light output from a source, the unit being the lumen.

15. **Mounting Height**: The vertical distance between the lowest part of the luminaire and the ground surface directly below the luminaire.

16. **Nadir**: The downward direction; exactly vertical, directly below a luminaire.

17. **Obtrusive Light**: Glare and light trespass.

18. **Ornamental or Accent Lighting**: Outdoor lighting that is installed mainly or entirely for its decorative effect or to accent an object or a feature, rather than as an aid to visibility.

19. **Photometric Test Report**: A report by an independent testing laboratory or one certified by the National Institute of Standards and Technology.
(NIST) describing the candela distribution, shielding type, luminance, and other optical characteristics of a specific luminaire.

20. **Point of Service Canopy:** A canopy under which a business provides some service to a customer, such as food service, a bank transaction, or the like.

21. **Shielding:**
   
   A. Fully Shielded – A luminaire emitting no luminous flux above the horizontal plane.
   
   B. Partly Shielded – A luminaire emitting less than two percent (2%) of its luminous flux above the horizontal plane.
   
   C. Unshielded – A luminaire that may emit its flux in any direction.

22. **Spill Light:** Lighting from a lighting installation that falls outside of the boundaries of the property on which the installation is sited.

23. **Temporary Lighting:** Lighting installed with temporary wiring and operated for less than 60 days in any calendar year.

**15.20A3 SECTION 20A.3 CONFORMANCE AND APPLICATION**

1. Applicable Codes: All outdoor lighting fixtures (luminaires) shall be installed in conformance with the provisions of this Chapter, the Building Code, and the Electrical Code, as applicable and under appropriate permit and inspection.

2. Applicability: Township street lighting is not covered by this Chapter. However, it is recommended that all such lighting conform to all aspects of this Chapter.

**15.20A4 SECTION 20A.4 LIGHTING ZONES**

1. Using Table 1 as a guide, the Township shall determine and maintain Lighting Zones (LZs) within the boundaries of its jurisdiction.

2. The Lighting Zone of a parcel or project shall determine the limitations for lighting as specified in this Chapter.

3. A decrease of one or more LZ numbers or an increase of one LZ number may be granted to a specific (individual) land parcel or project upon application to and approval by the Planning Commission.
### Table 1 – Lighting Zone Ratings and Characteristics

<table>
<thead>
<tr>
<th>Zone</th>
<th>Ambient Illumination</th>
<th>Representative Locations</th>
</tr>
</thead>
<tbody>
<tr>
<td>LZ 0</td>
<td>Very Dark</td>
<td>Critical dark environments, such as especially sensitive wildlife preserves, parks, and major astronomical observatories. <em>(No LZ 0 zones are identified in the Township.)</em></td>
</tr>
<tr>
<td>LZ 1</td>
<td>Dark</td>
<td>Developed areas in County or Township parks, recreation areas, wetlands and wildlife preserves; developed areas in natural settings; and areas where residents have expressed the desire to conserve natural illumination levels. <em>(This zone includes but is not limited to the Agricultural and Rural Preserve zoning districts.)</em></td>
</tr>
<tr>
<td>LZ 2</td>
<td>Low</td>
<td>Rural areas, low- and medium density neighborhoods and districts. This zone is intended to be the default for residential areas. <em>(This zone includes the Rural Residential, Low Density Residential, R-1 Single Family, R-2 Single Family, R-3 Two Family, R-3.5 Restricted Multiple Family zoning districts, R-5 Manufactured Mobile Home, and any PUD single or two family development.)</em></td>
</tr>
<tr>
<td>LZ 3</td>
<td>Medium</td>
<td>High-density urban neighborhoods, shopping and commercial districts, industrial parks and districts. This zone is intended to be the default condition for commercial and industrial districts in urban areas. <em>(This zone includes R-4 Multiple Family, Commercial, and Industrial zoning districts, and any PUD multifamily, commercial or industrial development.)</em></td>
</tr>
</tbody>
</table>

### 15.20A5 SECTION 20A.5 EXEMPT LIGHTING

The following luminaires and lighting systems are EXEMPT from the requirements of this Chapter.

1. Internally illuminated signs. However, all such signs shall have "dark" backgrounds (opaque or colored) and "light" lettering (white or lighter colored than the background) so as to minimize glare or luminous overload.

2. Externally illuminated signs. However, all such signs shall be lit from above, with fully shielded fixtures.

3. Temporary lighting for theatrical, television, and performance areas.

4. Lighting in swimming pools and other water features governed by Article 680 of the National Electrical Code.

5. Code required exit signs.

7. Temporary holiday lighting.

8. Lighting required and regulated by the Federal Aviation Administration, U.S. Coast Guard, or other federal or state agency.

9. Interior lighting.

15.20A6 SECTION 20A.6 HIGH INTENSITY, SPECIAL PURPOSE LIGHTING

The following lighting systems are prohibited from being installed or used.

1. Aerial Lasers.

2. "Searchlight" style lights.

3. Other very intense lighting, defined as having a light source exceeding 200,000 lumens or intensity in any direction of 2,000,000 candelas or more.

15.20A7 SECTION 20A.7 LUMINAIRE LAMP WATTAGE, SHIELDING, AND INSTALLATION REQUIREMENTS

1. All outdoor lighting shall comply with the limits to lamp wattage and the shielding requirements in Table 2.

2. Only luminaires that are allowed to be unshielded in Table 2 may employ flexible or adjustable mounting systems. All other luminaires shall be permanently installed so as to maintain the shielding requirements of Table 2.

3. The Planning Commission may accept a photometric test report, demonstration or sample, or other satisfactory confirmation that the luminaire meets the requirements of the shielding classification.
4. Such shielded fixtures must be constructed and installed in such a manner that all light emitted by the fixture meets or exceeds the specification given. This includes all the light emitted by the fixture, either directly from the lamp or by a diffusing element, or indirectly by reflection or refraction from any part of the fixture. Any structural part of the fixture providing this shielding must be permanently affixed.

5. All canopy lighting must be fully shielded. However, indirect up light is permitted under an opaque canopy provided that no lamp or vertical element of a lens or diffuser is visible from beyond the canopy and such that no direct up light is emitted beyond the opaque canopy.

6. No portion of any fixtures under canopies (including the glass housing), such as over gasoline station pump islands, shall extend below the lower plane of the canopy roof, exclusive of any façade or ornamental trim which may extend below the canopy roof. They shall be recessed so the lamp does not extend below the lower plane of the canopy surface.

7. In residential lighting applications, the wattages in Table 2 may be too high (especially for energy efficient lighting sources and for building mounted lighting). It is important for homeowners and designers to assess this potential for over-lighting and adjust to lower wattages if necessary, to avoid glare and light trespass.

8. Any proposed neon lighting must be shown and found to be complementary to the overall design of the building and approved as part of the site plan approval (if applicable). Neon lights proposed to be used as an architectural detail shall be indicated on the building elevation and must be specifically found to be compatible with surrounding properties by the Planning Commission.

9. The Planning Commission may require verification that all approved lighting is installed per specifications. A registered engineer, architect, or other design professional may provide this verification to the satisfaction of the Planning Commission.
10. No lighting on any site shall cause or create obtrusive light.

Table 2 – Maximum Wattage and the Required Shielding

<table>
<thead>
<tr>
<th>Lighting Zone</th>
<th>Fully Shielded</th>
<th>Partly Shielded</th>
<th>Unshielded</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Shielding is highly encouraged however</td>
</tr>
<tr>
<td>LZ 0</td>
<td>40 watts</td>
<td>None permitted</td>
<td>None permitted.</td>
</tr>
<tr>
<td>LZ 1</td>
<td>70 watts</td>
<td>45 watts</td>
<td>None permitted.</td>
</tr>
<tr>
<td>LZ 2</td>
<td>150 watts</td>
<td>50 watts</td>
<td>• 35 watts or less for landscape lighting applications</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• 20 watts or less for non-landscape lighting applications.</td>
</tr>
<tr>
<td>LZ 3</td>
<td>320 watts</td>
<td>165 watts</td>
<td>40 watts or less</td>
</tr>
</tbody>
</table>

15.20A8 SECTION 20A.8 HEIGHT LIMITS

1. Pole Mounted Lighting: Lighting mounted onto poles or any structures intended primarily for mounting of lighting shall not exceed a mounting height of 40% of the horizontal distance of the light pole from the property line, nor a maximum height according to Table 3, whichever is lower.

Exception 1: Lighting for residential sports courts and pools shall not exceed 15 feet above court or pool deck surface.

Exception 2: Lights specifically for driveways, and then only at the intersection to the road providing access to the site, may be mounted at any distance relative to the property line, but may not exceed the mounting height listed in Table 3.

Exception 3: Mounting heights greater than 40% of the horizontal distance to the property line but no greater than permitted by Table 3 may be used provided that the luminaire is side shielded toward the property line.

Exception 4: Landscape lighting installed in a tree. (See the Definitions section.)
Table 3 — Maximum Lighting Mounting Height

<table>
<thead>
<tr>
<th>Lighting Zone</th>
<th>Max Height</th>
</tr>
</thead>
<tbody>
<tr>
<td>LZ 0</td>
<td>20 feet</td>
</tr>
<tr>
<td>LZ 1</td>
<td>20 feet</td>
</tr>
<tr>
<td>LZ 2</td>
<td>25 feet</td>
</tr>
<tr>
<td>LZ 3</td>
<td>30 feet</td>
</tr>
</tbody>
</table>

2. Lights Mounted to Buildings or Structures: Lighting mounted onto buildings or other structures shall not exceed a **mounting height** greater than 4 feet higher than the tallest part of the building or structure at the place where the lighting is installed, nor higher than 40% of the horizontal distance of the light from the property line, whichever is less.

**Exception 1:** Lighting attached to single-family residences shall not exceed the height of the eave.

**Exception 2:** Lighting for façades may be mounted at any height equal to or less than the total height of the structure being illuminated regardless of horizontal distance to property line.

15.20A9 SECTION 20A.9 TOTAL SITE POWER LIMITS

1. This Chapter applies to all outdoor lighting, whether attached to building, poles, structure, or self supporting, including but not limited to hardscape areas (which include parking lots, lighting for building entrances, sales and non-sales canopies), lighting for all outdoor sales areas, and lighting for building façades.

2. The Maximum Allowed Lighting Limit shall be determined as follows:

   A. Following the rules in Subsection 3 below, multiply the area (square footage) of each of the application types in Table 4 by the allowed lamp wattage per square foot for the appropriate **Lighting Zone**.

   B. Add up the total of all wattage for each application type (separately).

   C. The actual lighting load shall not exceed this total.

3. Rules

   A. Power is not allowed for any use types not listed, except for those items given in Section 20A.5. (Exempt Lighting) and Section 20A.6. (Special Purpose Lighting). Only one application type may
be applied to any given area.

B. **Canopy** allowances include only the area within the **drip line area** of the **canopy**.

C. Areas that are not designed to be illuminated may not be counted toward the total site limit.

15.20A10 SECTION 20A.10 RECOMMENDED LIGHTING FOR EXTERNALLY ILLUMINATED SIGNS

Externally lighted signs should be lighted from the top of the sign downward and be fully shielded.

**Exception:** Signs not taller than 10 feet above grade may be illuminated by **landscape lighting** complying with Table 2.

**Table 4 - Lamp power allowances**  (w/ft² unless otherwise noted)

<table>
<thead>
<tr>
<th>Lighting Application</th>
<th>Allowed Area</th>
<th>LZ 0</th>
<th>LZ 1</th>
<th>LZ 2</th>
<th>LZ 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Parking lots, plazas, hardscape lighting, driveways, on site private roads</td>
<td>Paved area plus 5 feet of the perimeter of adjacent unpaved land. Includes planters and landscaped areas less than 10 feet wide that are enclosed by hardscape on at least three sides.</td>
<td>0.010</td>
<td>0.020</td>
<td>0.040</td>
<td>0.080</td>
</tr>
<tr>
<td>Sidewalks, walkways, and bikeways</td>
<td>Paved area plus 5 feet of unpaved land on either side of path of travel.</td>
<td>0.020</td>
<td>0.040</td>
<td>0.080</td>
<td>0.15</td>
</tr>
<tr>
<td>Building entrances (without canopy)</td>
<td>Width of doors plus 3 feet on either side times a distance outward from the building from the surface of the doors 10 feet.</td>
<td>0.010</td>
<td>0.35</td>
<td>0.50</td>
<td>.70</td>
</tr>
<tr>
<td>Building entry, drive-up sales, and general use canopies</td>
<td><strong>Drip line area</strong> under canopy. 13 watts plus the value in the LZ columns.</td>
<td>0.00</td>
<td>0.10</td>
<td>0.20</td>
<td>0.40</td>
</tr>
<tr>
<td>Vehicle Service Station</td>
<td><strong>Drip line area</strong> under canopy; or 500 square feet per double-sided fuel dispenser unit not under canopy.</td>
<td>Not allowed</td>
<td>0.30</td>
<td>0.60</td>
<td>1.20</td>
</tr>
<tr>
<td>Building facades</td>
<td>Not allowed</td>
<td>Not allowed</td>
<td>0.18</td>
<td>0.35</td>
<td></td>
</tr>
</tbody>
</table>
## GRAND HAVEN CHARTER TOWNSHIP
### ZONING ORDINANCE

## LIGHTING

### OUTDOOR LIGHTING REQUIREMENTS

<table>
<thead>
<tr>
<th>Lighting Application</th>
<th>Allowed Area</th>
<th>LZ 0</th>
<th>LZ 1</th>
<th>LZ 2</th>
<th>LZ 3</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Outdoor Sales Lot</strong></td>
<td>Portion of uncovered outdoor sales lot used for display of vehicles or other merchandise for sale. All adjacent access drives, walkway areas, customer parking areas, vehicle service or storage areas that are not surrounded on at least three sides by sales area shall be considered hardscape.</td>
<td>Not allowed</td>
<td>Not allowed</td>
<td>0.60</td>
<td>1.10</td>
</tr>
<tr>
<td><strong>Outdoor Sales Frontage</strong></td>
<td>Valid only for sections of an outdoor sales area that are along the frontage. A corner sales lot may include both sides provided that a different principal viewing location exists for each side.</td>
<td>Not allowed</td>
<td>Not allowed</td>
<td>Not allowed</td>
<td>30 w/lf</td>
</tr>
<tr>
<td><strong>Ornamental Lighting</strong></td>
<td>Entire site</td>
<td>Not allowed</td>
<td>By special permit only</td>
<td>0.010</td>
<td>0.020</td>
</tr>
</tbody>
</table>

## 15.20A11 SECTION 20A.11 SPECIAL PERMITS

1. Upon special permit issued by the Planning Commission, lighting systems not complying with the technical requirements of this Chapter but consistent with its intent may be installed for the following applications:

   A. Sport fields and stadiums.
   B. Construction lighting.
   C. Industrial lighting for hazardous areas where the heat of the lighting fixture may cause a dangerous situation.
   D. Bridges.
   E. National and State Flag lighting with spotlights greater than 75 watts in LZ 3, and greater than 60 watts in LZ 0, LZ 1 and LZ 2
   F. Specialized Theme Park lighting.
   G. Public monuments, public buildings and Houses of Worship.
   H. Industrial areas where higher pole heights are required to avoid interference of vehicle with the pole assembly.
   I. Any other lighting application not listed in Table 4.
2. To obtain such a permit, applicants shall demonstrate that the proposed lighting installation:

A. Is not within LZ 1 or LZ 0, if such exists (except for necessary construction lighting).

B. For applications a, b, c, d above, utilizes fully shielded luminaires and, if required, side shielded and internally shielded luminaires that are installed in a fashion that maintains the shielding characteristics unless certified in writing by a registered engineer or by a lighting certified professional that such shielding is impractical. Where fully shielded fixtures cannot be utilized, acceptable luminaires shall include only those which are installed with minimum aiming angles of 25 degrees downward from the horizontal. Said aiming angle shall be measured from the axis of the luminaire's maximum beam candlepower as certified by independent testing agency.

C. Has received every reasonable effort to mitigate obtrusive light and artificial sky glow, supported by a signed statement from a registered engineer or by a lighting certified professional describing the mitigation measures.

The Planning Commission shall review each such application. A permit may be granted if, upon review, the Planning Commission believes that the proposed lighting will not create unwarranted glare, sky glow, or light trespass.

15.20A12 SECTION 20A.12 LUMINAIRE (LIGHT FIXTURE) ILLUSTRATIONS

The following luminaire illustrations shall be used as a guideline to help determine appropriate and inappropriate lighting fixtures, which offer different levels of shielding. Please note that these graphics do not represent a complete inventory of permitted and prohibited fixtures.
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