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LIGHTING OF GASOLINE STATION/CONVENIENCE STORE APRONS/CANOPIES

The lighting of gasoline station and/or convenience store aprons has become a widespread lighting problem. These facilities have carried to the extreme the notion that being more brightly illuminated than neighboring properties attracts attention and business. This is particularly true when canopies over gasoline pump islands are installed. Lighting fixtures in the canopies produce very intense light (measured at over 100 foot-candles). In addition to excessive illumination levels, the light fixtures are frequently not adequately shielded, so that glare is produced which hinders visibility for drivers and pedestrians on nearby roadways. By addressing the problems of excessive illumination levels and glare, municipalities will also achieve positive impacts in terms of skyglow and energy efficiency/cost.

Gasoline Station/Convenience Store Lighting Issues

EXCESSIVE LIGHTING LEVELS:

In most gasoline station/convenience store situations, the apron consists of two parts: the area immediately around the gasoline pumps (and under the canopy if there is one), and the more remote area around the periphery of the apron. The former area is where more detailed vision is required for tending to the vehicle, operating the pumps, etc., and this may justify a higher level of illumination than needed in the outlying areas. The outlying areas are essentially used for vehicle storage or parking, and require levels of illumination equivalent to that used in parking lots.

Research on gasoline station lighting suggests that average illumination levels in excess of 10 foot-candles serve no purpose other than attracting attention to the site². The lighting guidelines offered by IESNA³ suggest an average illuminance level of 20 foot-candles.

Another source of excessive lighting is the illumination of canopy fascias at levels well above background levels. In a sense, this is an attempt to use the fascia as a large illuminated sign or billboard.

GLARE:

Glare from canopy lighting is caused primarily when a light fixture with a wide beam or diffusing lens projects below the bottom edge of the fixture. To avoid glare, shield fixtures so that the rim of the fixture and/or the beam of light is directed away from the direct light to a cone no more than 85 degrees.

Glare coming from light fixtures serving the apron can be reduced by requiring the use of cut-off fixtures designed to direct light away from adjacent properties.

COLOR:

Most owners and operators of gasoline stations prefer white light. White light is more inviting than yellow light, and color rendering is rarely a problem. If necessary, require light sources permitted or a minimum CRI of 90.

SKYGLOW:

By reducing the lighting levels and controlling the direction of light, skyglow can be eliminated, thus reducing the contribution of the station to skyglow, even that will be reduced by controlling the lighting levels.

ENERGY EFFICIENCY/COST:

The primary impact of the suggested regulation is the reduction of overall illumination levels and the consequent reduction in energy consumption. While recessed fixtures may be more expensive, they require fewer fixtures required.

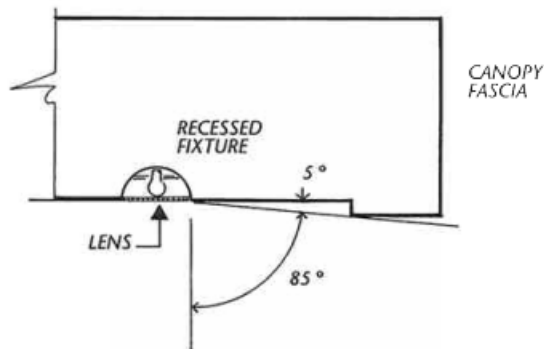
What follows is some suggested language to be incorporated into an outdoor lighting section of local zoning regulations for controlling lighting of gasoline station/convenience store aprons and canopies.

SAMPLE ZONING LANGUAGE

E. Lighting of Gasoline Station/Convenience Store Aprons and Canopies:

Lighting levels on gasoline station/ convenience store aprons and under canopies shall be adequate to facilitate the activities taking place in such locations. Lighting of such areas shall not be used to attract attention to the businesses. Signs allowed under the appropriate section of these regulations shall be used for that purpose.

- i. Areas on the apron away from the gasoline pump islands used for parking or vehicle storage shall be illuminated in accordance with the requirements for parking areas set forth elsewhere in this section. If no gasoline pumps are provided, the entire apron shall be treated as a parking area.
- ii. Areas around the pump islands and under canopies shall be illuminated so that the minimum horizontal illuminance at grade level is at least 1.0 foot-candle and no more than 5.5 foot-candles. The uniformity ratio (ratio of average to minimum



Gas pump canopy.



By using indirect lighting technology, light levels without glare. (PHOTO)

SAMPLE ZONING LANGUAGE

illuminance) shall be no greater than 5.5 foot-candles and no more than 22.0 foot-candles.

iii. Light fixtures mounted on canopies shall be recessed or flush with the bottom of the canopy by the fixture or the edge of the canopy, and shall be directed 85 degrees from vertical, as shown in the diagram.

iv. As an alternative (or supplement) to the above, lights may be used where light is beamed down from the canopy. In this case light shall be focused exclusively on the unpaved area.

v. Lights shall not be mounted on the sides (fascias) of the canopy shaft.

Presented below are some suggested regulations that might be incorporated into an outdoor lighting section of local zoning regulations if a community feels that illuminated exterior display/sales areas are current or potential problems.

SAMPLE ZONING LANGUAGE

F. Lighting of Exterior Display/Sales Areas:

Lighting levels on exterior display/sales areas shall be adequate to facilitate the activities taking place in such locations. Lighting of such areas shall not be used to attract attention to the businesses. Signs allowed under the appropriate section of these regulations shall be used for that purpose. The applicant shall designate areas to be considered display/sales areas and areas to be used as parking or passive vehicle storage areas. This designation must be approved by the Planning Commission.

- i. Areas designated as parking or passive vehicle storage areas shall be illuminated in accordance with the requirements for parking areas suggested elsewhere in this section.
- ii. Areas designated as exterior display/sales areas shall be illuminated so that the average horizontal illuminance at grade level is no more than 5.0 foot-candles. The uniformity ratio (ratio of average to minimum illuminance) shall be no greater than 4:1. The average and minimum shall be computed for only that area designated as exterior display/sales area.
- iii. Light fixtures shall meet the IESNA definition of cut-off fixtures, and shall be located, mounted, aimed, and shielded so that direct light is not cast onto adjacent streets or properties.
- iv. Fixtures shall be mounted no more than twenty-five (25) feet above grade, and mounting poles shall be located either inside the illuminated area or no more than ten (10) feet away from the outside edge of the illuminated area.

LIGHTING OF EXTERIOR SPORTS/PERFORMANCE FACILITIES

There are many types of outdoor sports/performance facilities that might be illuminated at nighttime use. The following are some general categories.

- Local recreation facilities (tennis courts, ice skating rinks) intended for use by residents and few, if any, spectators.
- Sports facilities designed not only for the participants but also significant numbers of spectators (major or minor league ball parks and high school ball fields).
- Facilities for outdoor stage presentations (amphitheaters, outdoor concert facilities, open air theaters) which include space for performers and spectators.

Each of these has its own unique lighting needs, and it is not practicable to attempt to address them all in local regulations. The IESNA *Lighting Handbook*⁴ has devoted an entire chapter to lighting outdoor sports and recreational areas, and even this reference recognizes that it is a highly specialized, technical field. Important variables include the type of facility, the number of spectators need to see not only the playing field but also the players, whether the game is played at or very near the playing surface (ice hockey) or substantially above it (basketball), the location of the playing area, and whether players typically look in few or all directions.

Lighting of these types of facilities can be highly visible. If not carefully designed, it can contribute to elevated general illumination levels in surrounding areas, create glare, and contribute to skyglow. Careful design by qualified designers can ensure adequate lighting levels, minimal external effects of glare and light trespass, and overall cost efficiency.

With this in mind, local regulations should require the submission of a lighting plan by a qualified lighting designer, which explicitly documents the need for the level of lighting provided; demonstrates that the location, selection, and aiming of all lighting fixtures focus light on the playing areas; minimizes glare and visibility from neighboring properties; minimizes contributions to skyglow; and provides an energy- and cost-efficient overall lighting system.

MUNICIPAL REGULATION AND ZONING

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