City of Portland, Maine

IN THE CITY COUNCIL

AMENDMENT TO PORTLAND CITY CODE
§§14-47, 14-182, 14-183, 14-230.1, 14-230.2 (ZONING ORDINANCE)
§§14-522, 14-526 (SITE PLAN ORDINANCE)
RE: GASOLINE SERVICE STATIONS IN THE B-2 AND B-5 ZONES

BE IT ORDAINED BY THE CITY COUNCIL OF THE CITY OF PORTLAND, MAINE IN CITY COUNCIL ASSEMBLED AS FOLLOWS:

1. That Section 14-47 of the Portland City Code is hereby amended as follows:

Sec. 14-47. Definitions.

Major gasoline service stations: A gasoline service station with more than ~~one (1)~~ two (2)pump islands or with a capacity to fuel more than eight (8) vehicles simultaneously or providing repair services including, but not limited to, tuneups, engine repair, brake work, muffler replacement, tire repair or similar activities.

Minor gasoline service stations: A gasoline service station with not more than ~~one (1)~~ two (2)pump islands~~, with a maximum of three (3) pumps~~, provided that no more than a total of eight (8) vehicles may be fueled simultaneously. Such stations shall not include car washes or vacuums. ~~with no~~ rRepair services shall be permitted, provided that there shall be no more than two (2) service bays.

2. That Section 14-182(2)m-o of the Portland City Code is hereby amended to read as follows:

Sec. 14-182. Permitted uses.

The following uses are permitted in the B-2 zone:

(2) *Business:*

m. Theaters and performance halls; ~~and~~

n. Hotels or motels of less than one hundred fifty (150) rooms; and

o. Major and minor gasoline service stations, as defined in section 14-47, provided that only a minor gasoline service station shall be permitted on a lot abutting a residential zone and that minor

gasoline service stations abutting residential zones shall only operate between the hours of 6:00 a.m. and 1:00 a.m.

3. That section 14-183(1)a of the Portland City Code is hereby amended to read as follows:

Sec. 14-183. Conditional uses.

The following uses are permitted as provided in section 14-474 (conditional uses), if they meet the following requirements:

(1) *Business:*

a. ~~Major and minor gasoline stations, as defined in section 14-47~~ Reserved;

4. That section 14-230.1 (2) is hereby amended as follows:

Sec. 14-230.1. Permitted uses.

The following uses are permitted in the B-5 urban commercial mixed use zone:

(2) *Commercial:*

o. Lumber and building material dealers;

p. Major and minor gasoline service stations, as defined in section 14-47, provided that only a minor gasoline service station shall be permitted on a lot abutting a residential zone. Major and minor gasoline service stations shall be located at least two thousand (2,000) feet from each other.

5. That section 14-230.2(1)(a) of the Portland City Code is hereby amended to read as follows:

Sec. 14-230.2. Conditional uses.

The following uses shall be permitted as conditional uses in the B-5 urban commercial mixed use zone, provided that, notwithstanding section 14-471(3), section 14-474(a), or any other provision of this Code, the planning board shall be substituted for the board of appeals as the reviewing authority, and further provided that, in addition to the provisions of section 14-474(c)(2), they shall also meet the requirements set forth below:

(1) *Commercial:*

a. ~~Automobile service stations and convenience stores~~

~~with gasoline pumps provided that they are located at least two thousand (2,000) feet from other such uses~~ Reserved.

6. That section 14-522 of the Portland City Code is hereby amended as follows:

Sec. 14-522. Definitions.

For the purposes of this article all terms and words shall have their ordinary meanings, except as defined herein.

Major development means and includes:

(5) The construction of any structure for industrial use which is more than forty-five (45) feet high; ~~or~~

(6) The addition of any additional dwelling unit to a building initially reviewed as a two-family dwelling or not previously reviewed under this article; or

(7) The construction of any new major or minor gasoline service station in the B-2 or B-5 zone, or the construction of any new major or minor gasoline service station with a structure greater than ten thousand (10,000) square feet of building area in any other permitted zone.

Minor development means and includes any of the following unless (1) the development is major development; or (2) the development is single family development subject to the provisions of section 14-524(b):

(14) The construction of any new major or minor gasoline service station with a structure of less than ten thousand (10,000) square feet of building area in any permitted zone other than the B-2 or B-5 zones.

7. That Section 14-526(a)(9) of the Portland City Code is hereby amended to read as follows and a new subsection (25) is hereby enacted, said subsection to read as follows:

Sec. 14-526. Standards.

(a) *Requirements for approval.* The planning board or planning authority shall not approve a site plan unless it meets the following criteria:

(9) The provision for exterior lighting will not be hazardous to motorists traveling on adjacent public streets; is adequate for the safety of occupants or users of the

site; and such lighting will not cause ~~significant annoyance,~~ significant glare or ~~undesirable~~ direct spill-over onto adjacent properties and complies with the applicable specifications of the City of Portland Technical and Design Standards and Guidelines;

(25) All major or minor gasoline service stations shall meet the following requirements:

a. *Signs:* Signs shall not adversely affect visibility at intersections or access drives. Such signs shall be constructed, installed and maintained so as to ensure the safety of the public. Such signs shall advertise only services or goods available on the premises.

b. *Circulation:* No ingress and egress driveways shall be located within thirty (30) feet from an intersection. No entrance or exit for vehicles shall be in such proximity to a playground, school, church, other places of public assembly, or any residential zone that the nearness poses a threat or potential danger to the safety of the public.

c. *Drive-up features:* Drive-up features, such as gasoline pumps, vacuum cleaners and menu/order boards, shall not extend nearer than twenty-five (25) feet to the street line. The site must have adequate stacking capacity for vehicles waiting to use these service features without impeding vehicular circulation or creating hazards to vehicular circulation on adjoining streets.

d. *Car washes:* Car washes shall be designed to avoid the tracking of residual waters into the street.

Bartlett Design
LIGHTING & ELECTRICAL ENGINEERING
1 FRONT STREET P.O. BOX 230 BATH, MAINE 04530
TEL (207) 443-5447 FAX (207) 443-5560

EVALUATION OF EXTERIOR LIGHTING APPLICATIONS

INFORMATION
PREPARED FOR MUNICIPAL PLANNING REVIEW

Presented to the City of Portland Planning Staff
April 9, 1996

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INTRODUCTION

The increasing desire to control light tresspass and ambient light pollution has led many communities in recent years to seek ways to better control outdoor lighting. Several factors have led to rapidly escalating levels of nighttime lighting which is now being viewed as wasteful and an evasion of neighboring property rights:

- *More Efficient, Brighter Lamp Sources*
  During the past thirty years, tremendous advances have been made in the development of new, more efficient lamps sources. Where incandescent and mercury vapor lamps represented a vast majority of lamps used in outdoor applications in the sixties, now these sources have almost entirely been replaced with sodium vapor and metal halide lamps. Current lamp technology provides a high degree of brightness at a relatively low wattage. Higher wattage lamps typically have the greatest efficacy ratings (lumen output per watt consumed) which encourages their use. Consequently, applications have often been over-lighted in the name of utilizing the most efficient lighting sources.

- *Misinterpretation of Lighting Standards*
  The Illuminating Engineering Society of North America (IESNA) publishes recommendations for illuminance levels for roadways and parking areas. These recommendations include criteria which lists overall minimum and least acceptable average illuminance levels to support pedestrian safety. Because the criteria is based on a minimum approach to achieving illuminance values, it is sometimes erroneously implied that the success of a lighting design can only be assured by "comfortably" exceeding the published values. This can often lead to excessive lighting.

- *Over Emphasis on Quantity as a Metric for Establishing Quality*
  Since the primary standard for establishing lighting recommendations for outdoor lighting (IESNA) includes tables of values for levels of illuminance, there has been a tenancy to make this the one and only measure of assessing lighting designs. The IESNA, however recognizes that the quality of light is dependant on other issues as well. Unfortunately, many of these issues, such as brightness control, uniformity, color, etc. are not as easily measured in numeric terms as is illuminance. Accordingly, the amount of light has become the single overriding means of preparing outdoor lighting designs, many times at the expense of other equalling important considerations.

- *Economic Competition*
  The difficult economic times of the late 1990's has resulted in increased competition in urban areas for a smaller retail/commercial market. The importance of advertising has grown, both in the day and at night. The role of lighting has grown accordingly as a means of supporting nighttime advertisement. As businesses compete visually, a war of escalating light levels can be the result. This is a trend which, if left uncontrolled, spreads to effect all areas either with a direct impact of light tresspass onto neighboring properties, or with an indirect impact of increased ambient sky glow.

DEFINITION OF LIGHTING TERMS

The following definitions of lighting terms are taken from the 1984 edition of the Illuminating Engineering Society of North American (IESNA) Lighting Handbook (Reference Volume).

candela, cd: the SI unit of luminous intensity. One candela is one lumen per steradian.

cut-off angle (of a luminaire): the angle, measured up from nadir, between the vertical axis and the first line of sight at which the bare source is not visible.

diffusing panel: a translucent material covering the lamps in a luminaire to reduce the luminance by distributing the flux over an extended area.

footcandle, fc: the unit of illuminance when the foot is taken as the unit of length.

footlambert, fl: a unit of luminance.

glare: the sensation produced by luminance within the visual field that is sufficiently greater than the luminance to which the eyes are adapted to cause annoyance, discomfort, or loss in visual performance and visibility.
NOTE: The magnitude of the sensation of glare depends upon such factors as the size, position and luminance of a source, the number of sources and the luminance to which the eyes are adapted.

high intensity discharge (HID) lamp: an electric discharge lamp in which the light producing arc is stabilized by wall temperature, and the arc tube has a bulb wall loading in excess of three wats per square centimeter. HID lamps include groups of lamps known as mercury, metal halide, and high pressure sodium.

high mast lighting: illumination of a large area by means of a group of luminaires which are designed to be mounted in a fixed orientation at the top of a highmast, generally 20 meters (65 feet) or higher.

high pressure sodium (HPS) lamp: high intensity discharge (HID) lamp in which light is produced by radiation from sodium vapor operating at a partial pressure of about 1.33 x 10^4 Pa (100 torr). Includes clear and diffuse-coated lamps.

illuminance: the density of the luminous flux incident on a surface.

lamp: a generic term for a man-made source of light. By extension, the term is also used to denote sources that radiate in regions of the spectrum adjacent to the visible.

lens: a glass or plastic element used in luminaires to change the direction and control the distribution of light rays.

light loss factor, LLF: a factor used in calculating illuminance after a given period of time and under given conditions. It takes into account temperature and voltage variations, dirt accumulation on luminaire and room surfaces, lamp depreciation, maintenance procedures and atmosphere conditions.

louver: a series of baffles used to shield a source from view at certain angles or to absorb unwanted light. The baffles usually are arranged in a geometric pattern.

low pressure sodium lamp: a discharge lamp in which light is produced by radiation from sodium vapor operating at a partial pressure of 0.1 to 1.5 Pa (approximately 10^{-3} to 10^{-2} torr).

lumen, lm: SI unit of luminous flux.

luminaire: a complete lighting unit consisting of a lamp or lamps together with the parts designed to distribute the light, to position and protect the lamps and to connect the lamps to the power supply.

luminance, (in a direction and at a point of a real or imaginary surface): the quotient of the luminous flux at an element of the surface surrounding the point, and propagated in directions defined by an elementary cone containing the given direction, by the product of the solid angle of the cone and the area of the orthogonal projection of the element of the surface on a plant perpendicular to the given direction.
NOTE: In common usage, the term "brightness" usually refers to the strength which results from viewing surfaces or spaces from which light comes to the eye. This sensation is determined in part by the definitely measurable luminance defined above and in part by conditions of observation such as the state of adaption of the eye.

In much of the literature the term brightness, used alone, refers to both luminance and sensation. The context usually indicates which meaning is intended. Previous usage notwithstanding, neither the term brightness nor the term photometric brightness should be use to denote the concept of luminance.

luminous flux: the time rate of flow of light.

mercury lamp: a high intensity discharge (HID) lamp in which the major portion of the light is produced by radiation from mercury operating at a partial pressure in excess of 10^5 Pa (approximately 1 atmosphere). Includes clear, phosphor-coated (mercury-fluorescent), and self-ballasted lamps.

metal halide lamp: a high intensity discharge (HID) lamp in which the major portion of the light is produced by radiation of metal halide and their products of dissociation-possibly in combination with metallic vapors such as mercury. Includes clear and phosphor coated lamps.

reflected glare: glare resulting from specular reflections of high luminances in polished or glossy surfaces in the field of view. It usually is associated with reflections from within a visual task or areas in close proximity to the region being viewed.

reflector: a device used to redirect the luminous flux from a source by the process of reflection.

refractor: a device used to redirect the luminous flux from a source, primarily by the process of refraction.

steradian, sr (unit solid angle): a solid angle subtending an area on the surface of a sphere equal to the square of the sphere radius.

veiling reflection: regular reflections superimposed upon diffuse reflections from an object that partially or total obscure the details to be seen by reducing the contrast,. This sometimes is called reflected glare.

LIGHTING DESIGN ISSUES

The following is a synopsis of design issues which relates to exterior lighting.

Safety

An important objective for exterior lighting is that of providing for safety needs. The primary function of general site lighting is to assure that people can operate at night without concern for accident or personal injury, and the development of an overall lighting solution should recognize this fact.

Vision

The only energy that we can see is a small band of the electromagnetic spectrum directly intercepted by the eye known as visible light. We see the brightness of a source or the brightness reflected from a surface, not the radiant energy (flux) in transit from a source to a surface. The quantity of light falling on a surface is known as incident light, and is measured in footcandles. The visual picture that we perceive is made up of reflected light interspersed with emanations directly from sources. It is important to understand that brightnesses and contrasts caused by sources and reflectors permit perception.

We have three modes of vision, or vision ranges, relating to the overall brightness of the visual scene; daytime, nighttime and darkness. Exterior lighting design is generally developed for nighttime, or "mesopic", vision in order to maximize safety and visibility.

Night vision is mainly dependent upon the following five visual factors:

- Luminance (brightness) level to which the eye is exposed
- Size and shape of the object to be seen
- Time available for seeing
- Contrast between the object and the background
- Contrast between portions of the object

Illuminance (Lighting Quantity)

Perhaps the most obvious criteria which is essential to achieving quality lighting design is the requirement for sufficient quantity of light for a given task. There is a wide range of naturally occurring illuminance levels which can be found in the outdoor environment. Although we tend to think of illuminance as relatively constant at any point in time, in reality there is always a significant variance of outside lighting intensities.

- Typical Night Illuminance Values

Starlight Sky (New Moon)	0.0002 Footcandles
Moonlight	0.01 - 0.02 Footcandles

- Typical Daylight Illuminance Values

Daylight (at North Window)	50 - 200 Footcandles
Daylight (in Shade)	100 - 1000 Footcandles
Direct Sunlight	5,000 - 10,000 Footcandles

- Typical Artificial Illuminance Values

Offices	50 - 100 Footcandles
Library Reading Rooms	75 - 150 Footcandles
Corridors	5 - 20 Footcandles
Residential Spaces	10 - 75 Footcandles

Luminance (Brightness)

Dimensions, shapes, textures and differences in materials are seen by contrasts in brightness. Contrast assists our perception of relative space, distance, dimension, orientation and shape. Contrast is created by the nature of incident light striking objects and of the surfaces reflecting that light. Every side of a three dimensional object lighted from a single source is illuminated with a different intensity, depending on it's orientation and distance from the source. This produces differences in reflected brightness.

Of the five visual factors which dictate night vision, contrast is the one best used in lighting design to enhance visibility. The contrast of brightness between an object in a roadway and the roadway itself is determined by the relative difference in brightness of the object to its background, the roadway. Both the object's brightness, as well as the roadway's brightness are a function of the amount of illuminance received (and of the reflective nature of each surface).

The character of surfaces such as polished metal or wet smooth pavement can be mirror-like, reflecting a nearly exact visual image of the source. Rough building materials or uneven surfaces typical of foliage, will be much less perfect reflectors. Because of this unevenness and shadowing, some areas will reflect very little light toward the viewer.

Color

Surfaces are only thought to be "colored". When white light containing "all" colors strikes a surface, some colors (wavelengths) are absorbed and others are reflected creating the perception of color. White surfaces reflect all visual wavelengths, and black surfaces, none. Surfaces cannot reflect particular wavelengths not included in the incident light striking them. When a light source which is rich in red and has little green energy (i.e.-high pressure sodium) shines on a dark green leaf, the dirty brown color of reflected light is due to the slight reddish tinge of the green. The true green will not be seen because the green wavelength is absent in the source.

When viewing objects under nearly monochromatic light, such as is produced by low pressure sodium lamps, we can detect differences only by contrasts in brightness, not color. It is, therefore, very difficult to distinguish the color of automobiles under low pressure sodium lighting because all colors are rendered in shades of greys. Thus, a more full spectrum light source, such as metal halide, may require fewer footcandles to reveal differences between objects where color is of primary importance than is required under monochromatic light.

COLOR APPEARANCE			COLOR RENDITION		
APPROX COLOR TEMP	COLOR HUE	EXAMPLE	COLOR REND. INDEX		REMARKS
25000K	Blue-White	Northwest Sky	100	☺	Full Spectrum
5710K	Blue-White	Mercury Vapor	22-52	☹	Poor Color Rendition; Turns Red/ Orange to Grey; Enhances Blue/ Green
4870K	White	Noon Sunlight	100	☺	Full Spectrum
4500K	White	Metal Halide	65-70	☺	Fair Color Rendition
4150K	White	Cool White Fluorescent	62	☹	Marginal Color Rendition
3500K	White	Color Corrected Fluoresc.	82	☺	Good Color Rendition
3000K	Yellowish	Warm White Fluorescent	52	☹	Poor Color Rendition
2900K	Yellowish	Incandescent	99	☺	Good Color Rendition
2100K	Yellowish	High Pressure Sodium	21	☹	Poor Color Rendition;Turns Green/Blue to Brown
1800K	Orange	Sunrise Sky	100	☺	Full Spectrum
1780K	Orange-Red	Low Pressure Sodium	0	☹	No color Rendition

Uniformity

Because of the time required for the eye to adapt to lower light levels, exterior lighting levels must not be too bright. Lighting levels from lamps above parking areas and roadways may produce brightnesses in the daytime accommodation range. If seen for too long, this will be detrimental to effective night vision. Many people have experienced the phenomenon that the lower the lighting levels in a rooftop restaurant, the better one can see the night view through the windows. This effect also pertains to an exterior environment when looking from one area to another that is less brightly lighted. Psychological and actual needs require that we be able to see our surroundings as much as possible at night, without being temporarily blinded by brightness ranges exceeding the adaptive capability of the eye. This temporary blindness or impairment of visual acuity, is often associated with glare, as well as with contrasting high and low levels of area luminance.

It is an interesting fact that an environment with several large bright areas is actually less safe than one which has lower brightness, but where light is more uniformly distributed, allowing the eye to comfortably adapt and thus be able to see into shadows. Problems associated with lack of lighting uniformity can be greatly compounded in downtown commercial districts where very bright storefronts occur at intermittent intervals.

Glare

Glare is produced by brightness within the field of vision that is sufficiently greater than that to which the eyes are adapted. Glare can cause annoyance, discomfort, or loss in visual performance and visibility. "Direct" (veiling) glare is caused by light sources in the field of view. "Reflected" glare is caused by reflections of high brightness from polished or glossy surfaces like building glass, metal, or wet pavement that are reflected toward the eye.

Visual Organization

Lighting can be used to provide functional help for the movement of people in an otherwise dark environment. In order to easily see the character of an environment, it should be lighted so that distinct elements in the spaces can be distinguished from each other by the contrasting intensities of their reflections, both in brightness and in color. The lighting goal is to understand what is important in the visual scene, and to deploy light accordingly, so that appropriate visual discrimination makes it easy to see.

Keeping light levels within the nighttime vision range allows maximum night visual perception, and creates safety and comfort. We must also be able to see reasonably well as soon as we go outside from a relatively bright indoor environment. The relatively low lighting levels required for nighttime vision maximize possibilities for energy conservation, minimum maintenance and initial fixture costs.

Energy

An important goal in the development of quality lighting design is to accomplish an above average standard of visibility for safety and comfort, with the lowest use of energy that is compatible with these goals. Accordingly, energy conservation is a vital factor in the selection of lighting sources and luminaires. It should be emphasized, however, that minimizing energy use, without concern for all other lighting design criteria, can be counterproductive. It is important that energy be used wisely; if the lighting system does not achieve the goals of providing safety, visibility, comfort, and make the downtown area a desirable place to be, then all the energy used will have been wasted.

Perhaps the most obvious, but least considered, means of energy conservation through lighting design is to avoid lighting elements or surfaces that do not need to be lighted. This dictates the necessity for fixtures that control light output and direct it as desired. The use of energy management controls, and scheduled maintenance programs, can reduce operating and installation costs as well.

The two most efficient lamp sources which are commonly used in exterior lighting are high pressure sodium and metal halide. The energy used by artificial light sources is rated in terms of *luminous efficacy*, or lumens emitted per watt of power consumed. A theoretical light source of maximum efficiency would produce white light entirely in the visible spectrum without any infrared or ultraviolet electromagnetic components. Such an ideal source would have a luminous efficacy of about 200 lumens/watt. Since all real lamp

sources produce some component of infrared light, and since they inevitably have power losses due to conduction and convection, the efficacy of lighting sources in use today do not come close to matching the theoretical maximum. The following information is representative for various sources which are typically used in street lighting applications.

LAMP EFFICACIES

SOURCE	WATTAGE	MEAN LUMEN OUTPUT (1)	LAMP LIFE (HOURS)	EFFICACY (LUMENS PER WATT) (2)
Low Pressure Sodium	180	3300	1800	183.3
Clear High Pressure Sodium	400	45000	24000	112.5
Clear High Pressure Sodium	250	25200	24000	100.8
Clear High Pressure Sodium	150	14400	24000	96.0
Clear Metal Halide (Vertical)	400	28800	20000	72.0
Clear Metal Halide (Vertical)	250	18000	10000	72.0
Clear Metal Halide (Vertical)	175	11600	10000	66.3
Clear Metal Halide (Vertical)	70	4200	10000	60.0
Clear Mercury Vapor	250	10800	24000	43.2
Clear Mercury Vapor	175	7340	24000	41.9
Incandescent (Long Life)	150	2380	2500	15.9

(1) Lumen ratings from published data by General Electric Company. (Low pressure sodium lumen ratings from published data by Venture Lighting).

(2) Efficacy based on mean lumen rating of lamp (ballast losses not included).

Aesthetics

Style, or physical appearance, is perhaps the characteristic element which first comes to mind when considering the issue of *aesthetics*. Addressing aesthetics usually involves some degree of artistic evaluation of a lighting system's beauty. The perceived character of lighting hardware is the principal element which is used in such an evaluation. This sense of character is established by style, use of materials, scale, and craftsmanship.

Luminaires can help to establish a sense of scale, and focus to a space, in the daytime. At night, lighting often becomes one of the most potent parts of the visual picture, exhibiting all of the visual characteristics that they do in the daytime, but more powerfully and actively. Lighting fixtures in an outdoor setting are rarely inconspicuous at night. To render them appropriately, they must be designed and located to interact positively with their setting in an integrated and dynamic way that strengthens the design goals of the setting.

Light Trespass and Light Pollution

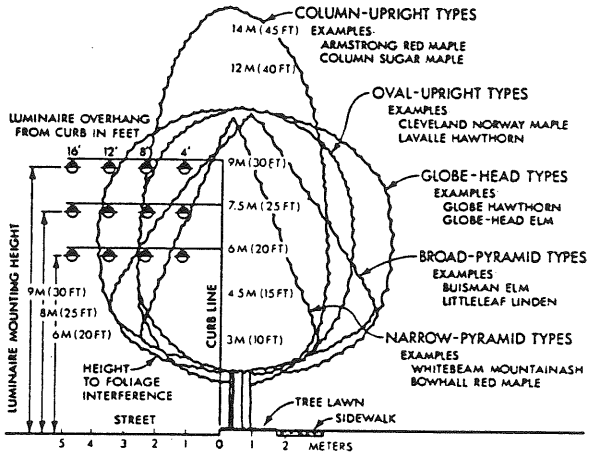
Misdirect or misapplied outdoor lighting can result in levels of astronomic light pollution and/or light trespass which will be viewed as aesthetically or environmentally unacceptable.

Sources of illuminance that are improperly shielded (such as those which do not contain shielding to cut off source brightness above 70° from vertical), or which are improperly placed, may direct objectionable levels of light to adjoining properties or skyward. Accordingly, all outdoor lighting equipment should be carefully selected and installed to avoid such conditions.

Maintenance

Any lighting system is only effective if it is maintained. Maintenance includes cleaning, relamping, and repair of lighting equipment, as well as trimming of adjacent vegetation. Accordingly, fixture location plays a significant role in determining the success of a lighting design. Pole lights which are located too close to roadways or are installed without protection are unnecessarily subjected to damage from cars and snow removal equipment. Pole lights which are located within landscaped islands may require trimming of trees so that leaves do not obscure lights and thereby reduce illuminance below acceptable levels. Lighting which is intended to serve safety and functional needs, should be located within the context of an energized landscaping plan to assure coordination of both day and night visual needs.

IES LIGHTING HANDBOOK
1987 APPLICATION VOLUME



Durability and Vandal Resistance

Lighting equipment often must be selected to be durable and resistant to inevitable hard use (and/or abuse). Ornamental detail and luminaire design should be carefully evaluated to avoid inviting vandalism. In addition, luminaire and pole materials and finishes should be selected to provide long-lasting wear without an excessive need for maintenance.

While it is impossible to make any lighting system completely vandal-proof, certain precautions can be taken to assure that damage is minimized to the greatest extent practical. Diffuser panels should be selected to be made of impact resistant materials (UV stabilized polycarbonate) in lieu of glass or acrylic plastic. Fixture finishes should be anodized where possible in lieu of painted to minimize damage (rust, scratches, etc.) and to avoid the necessity for periodic refinishing. Mounting methods of accent and decorative building entrance lighting fixtures should utilize tamper-resistant hardware to minimize potential of theft.

The following recommendations are taken from the 1987 Edition of the Illuminating Engineering Society of North America (IESNA) Lighting Handbook (Application Volume).

TABLE I

RECOMMENDED MAINTAINED ILLUMINANCE VALUES FOR ROADWAYS IN FOOTCANDLES

Road and Area Classification		*Pavement Classification* R1	R2 & R3	*Uniformity Ratio* R4	*Illuminance (Average:Minimum)*
Freeway Class A		0.6	0.9 0.8		3:1
Freeway Class B		0.4	0.6 0.5		
	Commercial	1.0	1.4 1.3		
Expressway	Intermediate	0.8	1.2 1.0		3:1
	Residential	0.6	0.9 0.8		
	Commercial	1.2	1.7 1.5		
Major	Intermediate	0.9	1.3 1.1		3:1
	Residential	0.6	0.9 0.8		
	Commercial	0.8	1.2 1.0		
Collector	Intermediate	0.6	0.9 0.8		4:1
	Residential	0.4	0.6 0.5		
	Commercial	0.6	0.9 0.8		
Local	Intermediate	0.5	0.7 0.6		6:1
	Residential	0.3	0.4 0.4		

(1) The recommended values shown are meaningful only when designed in conjunction with other elements. The most critical elements are:

(a) Lighting System Description
(b) Quality
(c) Uniformity
(d) Luminaire Mounting Height
(e) Luminaire Spacing
(f) Luminaire Selection
(g) Traffic Conflict Area

TABLE II

IES RECOMMENDED MAINTAINED LUMINANCE VALUES FOR ROADWAYS

Road and Area Classification		*Average Luminance* L_{avg} *(cd/ft²)*	*Luminance Uniformity* L_{avg} *to* L_{min}	L_{max} *to* L_{min}	*Veiling Luminance Ratio Maximum* L_v *to* L_{avg}
Freeway Class A		0.06	3.5 to 1	6 to 1	0.3 to 1
Freeway Class B		0.04	3.5 to 1	6 to 1	0.3 to 1
	Commercial	1.0	3 to 1	5 to 1	
Expressway	Intermediate	0.08	3 to 1	5 to 1	0.3 to 1
	Residential	0.06	3.5 to 1	6 to 1	
	Commercial	1.2	3 to 1	5 to 1	
Major	Intermediate	0.09	3 to 1	5 to 1	**0.3 to1**
	Residential	0.06	3.5 to 1	6 to 1	
	Commercial	0.08	3 to 1	5 to 1	
Collector	Intermediate	0.06	3.5 to 1	6 to 1	***0.4 to 1***
	Residential	0.04	4 to 1	8 to 1	
	Commercial	0.06	6 to 1	10 to 1	
Local	Intermediate	0.05	6 to 1	10 to 1	***0.4 to 1***
	Residential	0.03	6 to 1	10 to 1	

L_v = veiling luminance

TABLE III

RECOMMENDED MAINTAINED HORIZONTAL ILLUMINANCES FOR OPEN PARKING FACILITIES IN FOOTCANDLES

GENERAL PARKING AND PEDESTRIAN AREA			*VEHICLE USE AREA (ONLY)*	
Level of Activity	*Minimum on Pavement*	*Uniformity Ratio (Average:Minimum)*	*Average on Pavement*	*Uniformity Ratio (Average:Minimum)*
High	0.9	4:1	2	3:1
Medium	0.6	4:1	1	3:1
Low	0.2	4:1	0.5	3:1

TABLE IV

IES RECOMMENDED AVERAGE MAINTAINED ILLUMINANCE LEVELS FOR PEDESTRIAN WAYS (IN FOOTCANDLES)

Walkway and Bikeway Classification	*Minimum Average Horizontal Levels (1)*	*Average Vertical Levels for Special Pedestrian Security (2)*
Sidewalks (roadside) and Type A bikeways:		
Commercial areas	1.0	2.2
Intermediate areas	0.6	1.1
Residential areas	0.2	0.5
Walkways distant from roadways and Type B bikeways:		
Walkways, bikeways, and stairways	0.5	0.5
Pedestrian tunnels	4.3	5.4

(1) Crosswalks traversing roadways in the middle of long blocks at street intersections should be provided with additional illumination.
(2) For pedestrian identification at a distance. Values at 6 feet above walkway.

DEFINITIONS FOR TABLES I - IV

ROADWAY CLASSIFICATIONS

Freeway. A divided major roadway with full control of access and with no crossings at grade. This definition applies to toll as well as non-toll roads as follows:

Freeway A: Roadways with greater visual complexity and high traffic volumes. Usually this type of freeway will be found in major metropolitan areas in or near the central core and will operate through much of the early evening hours of darkness at or near design capacity.

Freeway B: All other divided roadways with full control of access where lighting is needed.

Expressway. A divided major roadway for through traffic with partial control of access and generally with interchanges at major crossroads. Expressways for noncommercial traffic within parks and park-like areas are generally known as parkways.

Major. The part of the roadway system that serves as the principal network for through traffic flow. The routes connect areas of principal traffic generation and important rural highways entering the city.

Collector. The distributor and collector roadways serving traffic between major and local roadways. These are roadways used mainly for traffic movements within residential, commercial and industrial areas.

Local. Roadways used primarily for direct access to residential, commercial, industrial, or other abutting property. They do not include roadways carrying through traffic. Long local roadways will generally be divided into short sections by collector roadway systems.

AREA CLASSIFICATIONS

Commercial. A business area of a municipality where ordinarily there are many pedestrians during night hours. This definition applies to densely developed business areas outside, as well as within, the central part of a municipality. The area contains land use which attracts a relatively heavy volume of nighttime vehicular and/or pedestrian traffic on a frequent basis.

Intermediate. Those areas of a municipality often characterized by moderately heavy nighttime pedestrian activity such as in blocks having libraries, community recreation centers, large apartment buildings, industrial buildings, or neighborhood retail stores.

Residential. A residential development, or a mixture of residential and small commercial establishments, characterized by few pedestrians at night. This definition includes areas with single family homes, town houses, and/or small apartment buildings.

Certain land uses, such as office and industrial parks, may fit into any of the above classifications. The classification selected should be consistent with the expected night pedestrian activity.

PAVEMENT CLASSIFICATIONS:

R1 - Portland Cement or asphalt road surface with a minimum of 15% artificial brightener.
R2 - Asphalt road surface a minimum of 60% gravel.
R3 - Asphalt road surface with dark aggregates and rough texture.
R4 - Asphalt road surface with very smooth texture

LAMP SOURCES

The following information is taken from Choosing Light Sources for General Lighting, CP32-1988, published by the Illumination Engineering Society of North America.

High Intensity Discharge (HID) Lamps

General. The term *high intensity discharge* describes a wide variety of light sources. The HID family of lamps are mercury, self-ballasted mercury, metal halide and high pressure sodium. Their common characteristic is the arc tube that contains an arc discharge, operating at higher pressures than fluorescent lamps which is sufficient to be the primary means of light generation. Like the fluorescent lamp, most HID sources must be operated with a current limiting device called a ballast.

These sources are normally designed with glass outer bulbs and single ended screw bases. For self-ballasted mercury lamps, a tungsten filament, mounted within the outer envelope of the lamp, provides the current limitation.

As shown in Table1, all HID lamps have certain common characteristics that include:

(1) A warm-up period, after starting, until stable light output and operating electrical values are reached.

(2) A period of time, after a short interruption of supply voltage, during which the lamps must cool before they will automatically re-start.

(3) A requirement that each type of HID lamp (except the self-ballasted mercury lamp) requires a specific ballast to properly operate the lamp

Table 1—General Characteristics of Commonly Used Light Sources*

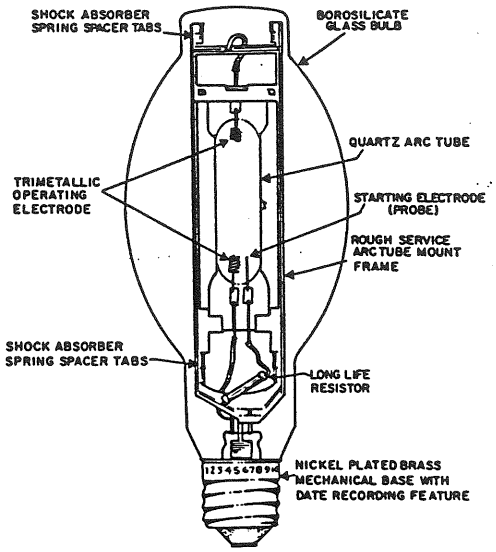
Light Source	Wattage Range	Efficacy (lm/W)	Life	Lumen Maintenance	Starting Time	Color Rendition	Ballast Required	Dimming Capability	Optical Control
High Intensity Discharge									
Mercury	40 to 1000	Low to fair	Good to very good	Very low to fair	Low	Very low to fair	Yes	Fair	Poor
Self-ballasted mercury	100 to 1500	Very low	Fair to very good	Low to fair	Fair	Low to fair	No	Very low	Poor
Metal halide	32 to 1500	Good	Low to Fair	Very low	Good	Yes	Low	Low	Good
High pressure sodium	35 to 1000	Fair to good	Fair to very good	Fair to good	Fair	Low to good	Yes	Low	Good
Miscellaneous									
Low pressure sodium	10 to 180	Fair to very good	Fair to good	Good to very good	Fair	Very low	Yes	Very low	Poor

*See manufacturers catalogs for specific data.

Mercury. The arc tube of the mercury lamp contains pure mercury that vaporizes as the lamp warms up. A small amount of argon gas aids in starting, and light output and electrical values stabilize when the mercury has completely vaporized. The arc tube of the lamp generates the characteristic blue-green visible light, and long wave ultraviolet (UV) *black light* and other UV radiation, both of which are absorbed by the outer bulb. If the inner surface of the outer bulb is coated with a phosphor, much of the UV radiation is converted to light.

Phosphors that emit wavelengths in the red-orange color regions are used to *balance* the inherent blue-green radiation of the arc tube. Thus, mercury lamps with phosphor-coated outer bulbs emit substantially improved color when compared to clear mercury lamps. The effective source size of a clear lamp is the arc tube itself while for the phosphor-coated lamp it is the size of the outer envelope.

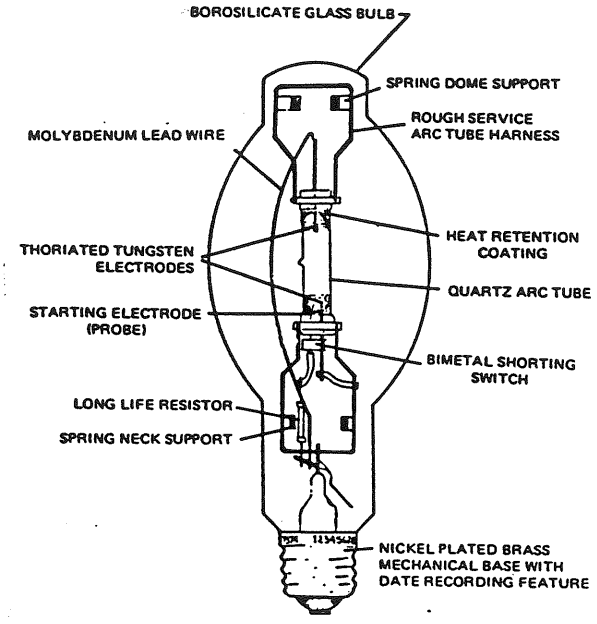
If the outer envelope of the mercury lamp should break away or be punctured the arc tube may continue to burn. All UV radiation generated by



the arc will, therefore, be emitted to the surrounding area creating a potential hazard. If the outer envelope is shattered, broken away or punctured, lamps are available that will automatically extinguish. Designated by the letter *T*, these lamps feature a safety device (such as tungsten filament) that oxidizes and burns-through in the presence of air.

Metal Halide. This lamp is similar in appearance and construction to the mercury lamp. However, in addition to mercury, small quantities of various metal halides are added in the arc tube as a means of increasing lamp lumens and improving the color of the light. Lamps with clear bulbs have an advantage over the respective mercury lamps because of their higher efficacy, improved color, and small arc tube rather than a phosphor outer envelope. Phosphor coated metal halide lamps are available for applications where a warmer color temperature and higher color rendering index (CRI) are considered more important than optical control. (See also 3.6.)

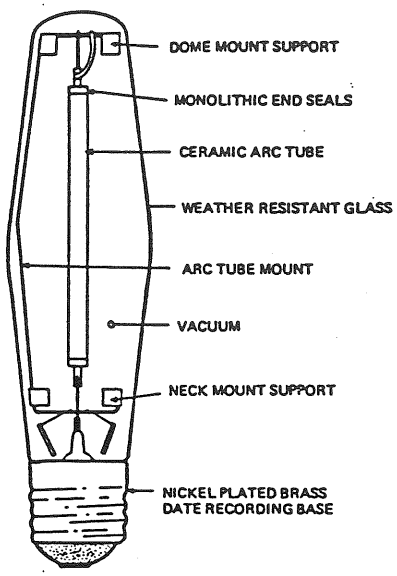
Metal halide lamps require specific metal halide ballasts for proper starting and operation. Some models are also designed to be used with certain mercury lamp ballasts for retrofit, but at a sacrifice in life and lumen maintenance. Safety-type metal halide lamps with protection against ultraviolet



emission in case of outer envelope breakage are also available.

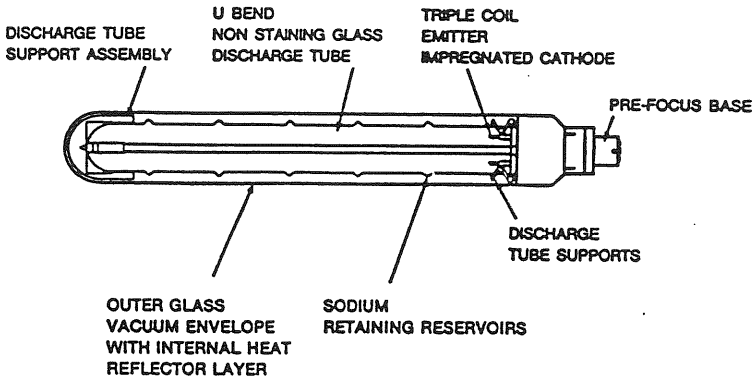
High Pressure Sodium (HPS). The HPS lamp is constructed with an alumina (aluminum oxide) arc tube containing sodium-mercury amalgam that partially vaporizes during the lamp warm-up and operation. The arc tube is encased in a hard glass envelope, which, in most cases, is clear; however, diffuse coated outer bulbs are available to reduce source brightness.

The HPS lamps require specific ballasts. An ignitor is also necessary to start the lamp. Certain types of HPS lamps are available that retrofit with certain mercury ballasts. No appreciable ultraviolet emission occurs as a result of broken outer envelopes; therefore, no safety-type lamps are necessary. The HPS lamps are characterized by their high efficacy and orange-yellow light.



Low Pressure Sodium (LPS). There are two types of LPS lamps: the linear and the hairpin or *U- tube*. The linear lamp has a double ended arc tube, similar to a fluorescent lamp, with preheat electrodes sealed into each end. The arc tube is made out of a special sodium resistant glass and is, in turn, sealed into an outer vacuum jacket with a medium bipin base at each end. The hairpin-type has the arc tube doubled back on itself with its limbs very close together in the outer envelope, and has a dc bayonet-base at one end.

The length of the lamp is directly related to the wattage rating. The light produced by the low pressure sodium arc, consisting only of radiation in the yellow region of the visible spectrum, is almost monochromatic. No mercury is present in the discharge, hence, no ultraviolet radiation emission can result in case of outer bulb breakage. The LPS lamps require specific ballasts and no retrofit lamps exist.



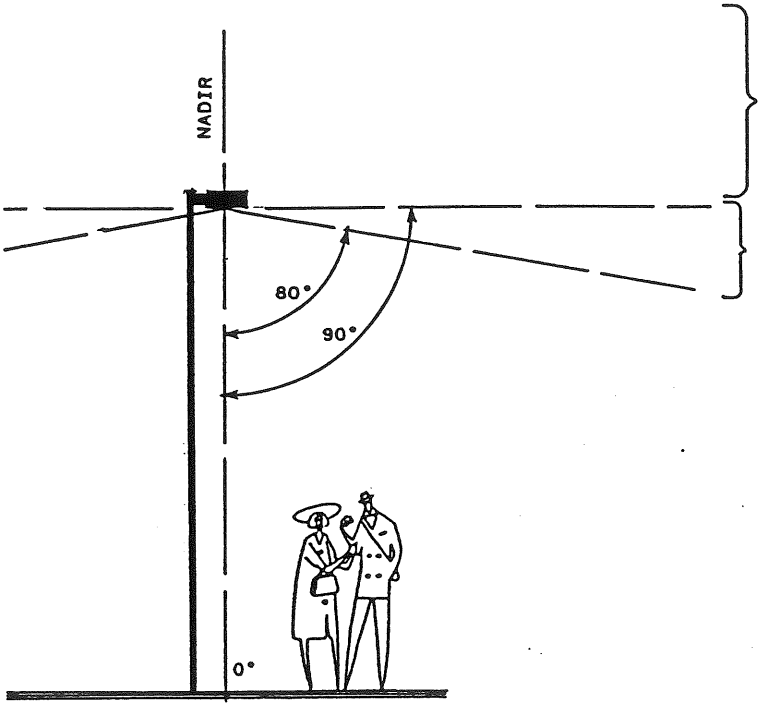
LUMINAIRES

The following luminaire classifications are defined according to Roadway Lighting, RP-8, published by The Illuminating Engineering Society of North America:

Cutoff. A luminaire light distribution is designated as cutoff when the candlepower per 1000 lamp lumens does not numerically exceed 25 (2-1/2 percent) at an angle of 90 degrees above nadir (horizontal), and 100 (10 percent) at a vertical angle 80 degrees above nadir. This applies to any lateral angle around the luminaire.

Semicutoff. A luminaire light distribution is designated as semicutoff when the candlepower per 1000 lamp lumens does not numerically exceed 50 (5 percent) at an angle of 90 degrees above nadir (horizontal), and 200 (20 percent) at a vertical angle of 80 degrees above nadir. This applies to any lateral angle around the luminaire.

Noncutoff. A luminaire light distribution is designated as noncutoff when there is no candlepower limitation in the zone above maximum candlepower.



MAXIMUM ALLOWABLE CANDLEPOWER AS A % OF TOTAL LUMENS	
2.5 %	CUTOFF CLASSIFICATION
5.0 %	SEMI-CUTOFF CLASSIFICATION
(No Limitation)	NON-CUTOFF DESIGNATION
10.0 %	CUTOFF CLASSIFICATION
20.0 %	SEMI-CUTOFF CLASSIFICATION
(No Limitation)	NON-CUTOFF DESIGNATION

EVALUATING EXTERIOR LIGHTING DESIGNS

There are four ways for a municipality to control outdoor lighting:

- *Plan Development*
  Where special considerations are generally deemed necessary for outdoor lighting, discussion within a municipal comprehensive plan is appropriate. If lower than normally accepted illuminance levels are desired, or if some special treatment is considered important, the justification for these elements should be clearly stated. The use of overlay zones or districts is a particularly effective way to document differences for special lighting requirements, based on each district's character and use

- *Land Use Ordinance*
  The inclusion of lighting performance standards and lighting design criteria in land use ordinances is usually the best way to establish a basis for control.

- *Design Review*
  Reviews by a municipal planning staff, planning or zoning board or other design review board can not only serve as a means of determining conformance to land use standards, but such reviews can also be an effect means of addressing specific issues on a given application that do not exactly fit with the published criteria. No matter how effective a written ordinance is, there will always be a need to interpret/address unique conditions.

- *Codes Enforcement*
  Often a lighting situation will be brought to the attention of a municipal codes officer, either a project is being constructed, or as an existing condition. A knowledgeable codes staff can be an effective way of disseminating good information about the importance of quality lighting and control.

For many applications, a sketch plan and a written description of the proposed lighting is sufficient to obtain an understanding of the system and its likely performance. For more complicated applications, or applications which include the need for special attention, a more comprehensive lighting design submission is necessary. Such a submission should include:

- *Lighting Plan*
  A plan should be submitted, to a scale not less than 1 inch equally 10 feet, which shows the location of all outdoor lighting equipment.

- *Documentation of Lighting Equipment*
  A written description of luminaires should be submitted, including manufacturer's name and model number, lamp type and wattage, and proposed mounting height. Inclusion of pictures of lighting fixtures is also helpful.

- *Photometric Performance of Luminaires*
  For each type of luminaire, a submission of photometric performance of candela values should be made. The submission should include a sufficient number of azimuth and altitude angles to fully describe the luminaire's performance.

- *Point-By-Point Illuminance Calculations*
  A calculation of horizontal illuminance at grade should be submitted with a point-by-point illuminance grid output. Illuminance levels should be provided at a minimum of 5 foot on center. A summary of the grid statistics should also be provided for the output area, including the overall average, the minimum, the maximum illuminance levels, as well as the ration of average to minimum illuminance uniformity.

The following issues should be considered when evaluating an outdoor lighting design submission:

- *Illuminance*
  Conformance to the illuminance criteria published in the land use ordinance should be considered in terms of average, maximum, minimum footcandle levels, and average-to-minimum uniformity. Caution should be given to accepting excessive levels.

- *Brightness*
  Even though illuminance criteria might be met, an application may still be proposing an unacceptable solution. Most often, this is due to a lack of brightness control. Lighting fixtures should be well shielded, and where practical, they should be of a cut-off classification. Exposed lamp sources with lumen outputs of over 1800 lumens should be discouraged.

- *Mount Heights*
  Excessive mounting heights can provide superior illuminance uniformity, but may be inappropriate for the district. Heights greater than 20 feet should be reserved for commercial/industrial districts to avoid a sense of inappropriate scale.

- *Light Tresspass*
  Direct light in significant quantities (.1 FC and above) should not be permitted to cross property lines. This can happen by excessive mounting heights, locating lighting equipment too close to property lines, or by improperly aiming lights.

- *Glare Control*
  Glare may result from poorly shielded lights or from improper fixture location or aiming. Luminaires should not be aimed at vehicular paths. The use of floodlights should be discouraged.

- *Color*
  Consideration should be given to the color of light sources to assure compatibility with the location.

TENTATIVE AGENDA
April 3, 1996

APRIL 9, 1996

Workshop (Council Chambers)	Maine Bank and Trust Drive-Through	RK
	Congress and Caleb Zone Chagne; RP to Contract Zone	KT/BB
	Segerstrom Zone Change; R1 to RP; 2001 Congress Street	RK
	Eastern Prom Trail	RK
Public Hearing	**Unfinished Business:**	
	Cottage Park	
	1037 Forest Avenue; Michael Scarks	KT
	New Business:	
	B-2 Setbacks	

APRIL 23, 1996

Workshop (Council Chambers)	Cumberland Ave Parking Garage	DA
	Colonial Dames Contract Zone Change; 2 Waldo Street	DA
	Jetport Access Road; Site Plan/Subdivision	RK
	Pat's Meat Market; R-5 to B-1 Rezoning; Stevens Avenue	DA
	Northeast Air Hangar Site Plan	KT
	Heldco Site Plan, 799 Riverside Street	SH
Public Hearing (7:30 p.m.)	Rite Aid; Forest and Ocean	RK
	*Congress and Caleb Zone Change; RP to B-1	KT/BB
	Industrial Zoning	SH
	Gas Station Zoning	DA

Eastern Prom (Cumberland Ave Parking & ME Bank & Trust)

MAY 14, 1996

Workshop	Micucci's Warehouse	KT
	Duplex/Subdivision; 49 Deane Street	KT
	Day Care Zoning	DA/BB
	Bed and Breakfast Zoning Policy	RK
	Cooper; Rackleff Street; Contract Rezone	KT/SH
	The Zone, 33 Allen Ave	
Public Hearing	~~*Congress and Caleb Zone Change; RP to B-1~~	~~KT/BB~~
	Colonial Dames Contract Zone Change; 2 Waldo Street	DA
	Segerstrom Zone Change; R1 to RP; 2001 Congress Street	RK
	470 Riverside St.; Bob Billings Site Plan/Subdivision	RK
	Eastern Prom Trail	RK
	Heldco Site Plan, 799 Riverside Street	SH

MAY 28, 1996

Workshop	Historic District Boundaries	DA
	Maine Medical Center Building Addition	RK
	Waynflete School Loop Road & Bus Parking	DA
Public Hearing	Pat's Meat Market; R-5 to B-1 Rezoning; Stevens Avenue	RK
	Northeast Air Hangar Site Plan	KT
	North Street Regrade	RK
	Duplex/Subdivision, 49 Dean Street	KT

JUNE 11, 1996

Workshop		
Public Hearing	Cooper Rackleff Street Contract Zone	KT/SH
	The Zone, 33 Allen Ave	SH
	Micucci's Warehouse	KT

Lighting — Larry Bartlett 4/9/96

Booklet

Defin -
illuminance —
(checking footcandles - not a good measure
- can't see footcandles (radiant energy received)
luminance ~~can't see~~ light bounced off
lumens — seeing brightness (not footcandles —
foot lamberts —
(esp equipment —)

foot lamberts —

illuminance - goes quickly away -
diminishes by distance
- glare — not same properties - won't
diminish —
footcandles almost meaningless compared
to brightness —

Intro — 4 reasons why have a problem.

1) efficiency
efficacy - light output (lumens)/watt
(before after energy efficiency - metal
halide - sodium pressure - higher
wattage - more efficient - they
are also the brightest —

2) misinterpretation of standards —
- need to consider other factors beyond foot candles
- if not enough light - accidents - save min — (beyond - more than better - not true - implied)

(if IES - gives safety levels - diminishing returns — go higher not nec. a good result - .2 is sufficient)

3) economic considerations
- to be a viable business etc. - produce daytime & night -
- competition - fierce

Term

Glare - can be a distraction factor -
- unshielded - can't concentrate -
one type of glare —
a) veiling glare - reduction of contrast
if overbake a lighting design - veiling glare - reflected light decreases contrast

- Table 1 - des - R2 & R3 - classification - Reve Class ave
- Uniformity Ratio - gives lowest to ave

The min should be no less than ⅛ of the ave.

- uniformity is imp. for control - light + dark not good in most applic - looking for uniformity - generally (rural area would want darkness)

if go less than -

gen - guidelines for a ~~standard~~ starting point - need to be thought through

- lead you to more - signif. amts of light trespass + pollution -

Light trespass - look @ property lines - (photometric - horiz. grid)

* - if a ⅒ of footcandle on a property line - have trespass. And the edge of properties should see less than ½

Light Pollution

* - light pollution - (glow in sky) too much illuminance -

(control type of lights - control amt. of light he - lighting conform w/ neighbors

candelera is ☒ meter or ☒ ft -
- ave. luminance (brightness) delivered

- Table II - look at uniformity -
looking at ave to min & max to min.

Veiling luminance ratio -
factor for reduction in contrast

☒ Table III - Parking Lots
- ave on pavement - belongs to vehicle -

2 diff criteria -
- one is min & one is ave.

* Ave min
* max to min
# of pts of light

*- ave to min (look for) (governing uniformity
max to min -
- regulate max. set upper limit
(numerically, or function of ave

1) - get grid statistics
2) - too few pts - (lighting plan 1" = 10'
- grid pts 5' on center)

3) print out pavement & roads - not landscaping — skews H's —

4) Light fixtures
- check what goes up above 90% (horizontal)

- RP. to regulate controlled shielded light fixtures —

mounting heights
- impact on H's —
- higher pole - use higher wattage more uniformity -

Poles 14 - 24' - are generally good comfort level —

Bartlett Design
LIGHTING & ELECTRICAL ENGINEERING
1 FRONT STREET P.O. BOX 230 BATH, MAINE 04530
TEL (207) 443-5447 FAX (207) 443-5560

FAX TRANSMITTAL

DATE: 6/3/96

TO: Mr. Alex Jaegerman
Planning & Urban Development
389 Congress Street
Portland, Maine 04101

NO OF PAGES: 4
(Including Transmittal)

FROM: Lawrence Bartlett

FAX: (207) 874-8716

RE: Wall pack lighting
nb

COMMENTS:

Attached you will find copies of several types of total cut-off wall lights. There are many different styles and lamp configurations from which to choose. I have attached only a few examples. If you would like more information about any of these fixtures (or any others), give me a call.

Wall Director

The Wall Director is a versatile and innovative new approach to [illegible] canopies, ceilings and architectural features from a wall mounted luminaire.

Every aspect of its form expresses the functional qualities engineered into the design. Yet, the Wall Director is vigorously non-mechanical in looks. Its flowing lines extend from the wall like a sconce, while simple geometry complements the architectural surface as functional enrichment.

Combined with performance optics, total cutoff, adjustability and invertible mounting, the Wall Director embodies the ultimate architectural wall luminaire.

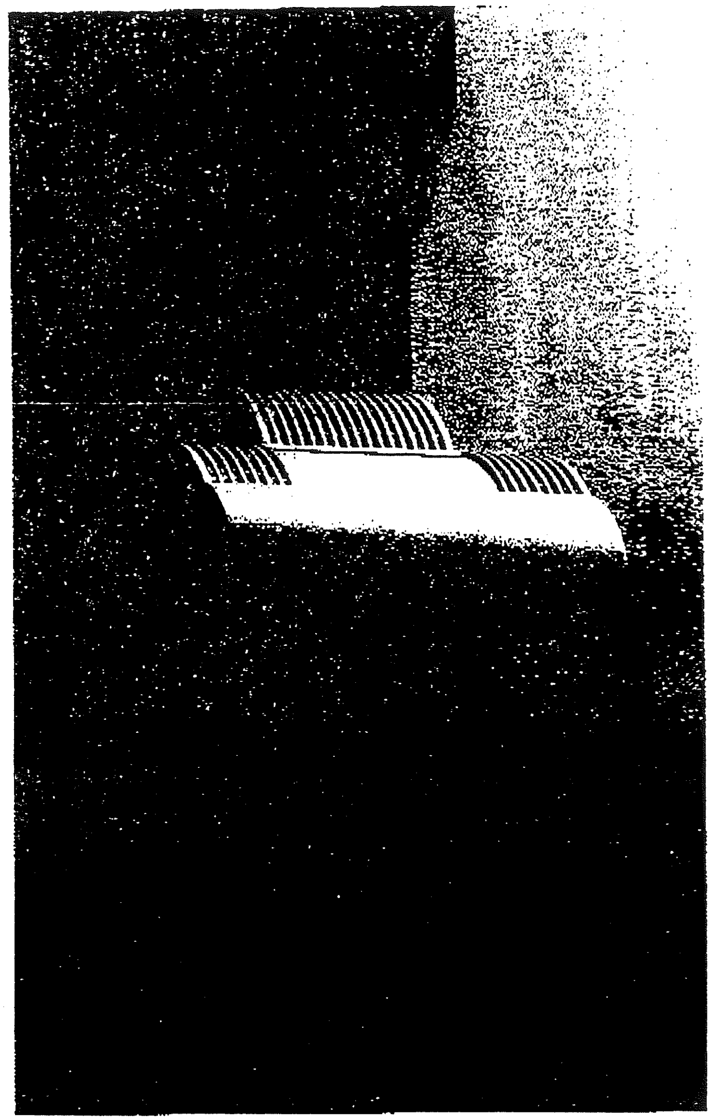
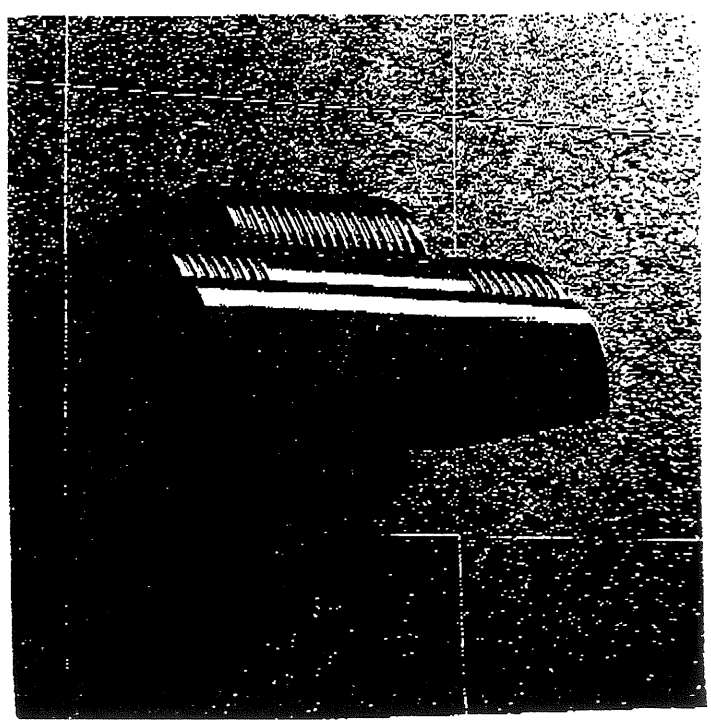


TABLE OF CONTENTS

Photometry: See the WD Series Photometric catalog in the separate Kim Photometric binder



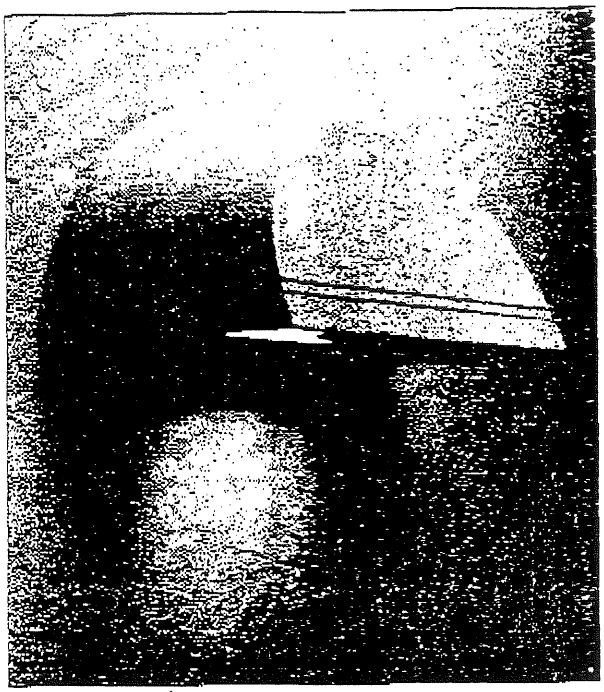
KIM LIGHTING

SITE / AREA
PARKING STRUCTURE
ROADWAY
ARCHITECTURAL FLOOD / ACCENT
LANDSCAPE

[illegible] EAST GALE [illegible]
PO BOX [illegible]
CITY OF INDUSTRY, CALIFORNIA [illegible]
U.S.A.
PHONE 818 / [illegible]
FAX 818 / [illegible]

100 LINE

PERFORMANCE SCONCES



102 Rounded Wedge Sconce

High Performance Architectural Outdoor Sconces

- **Wide luminaire spacings from sharp cutoff wall mounted luminaires.**
- **Handsome, compact forms integrate to mounting surface.**

Wide Spacings

The mcPhilben 100 Line luminaires are offered with a forward throw distribution for small parking areas or a wide throw distribution for pedestrian areas. Both optical systems feature highly specular faceted reflectors designed to efficiently direct light and provide high light levels, uniform distributions and remarkably wide luminaire spacings. These high performance optical systems may result in the ability to design with fewer fixtures providing a cleaner wall appearance, lower installation costs, and lower energy and lamp replacement costs over the life of the project.

Sharp Cutoff

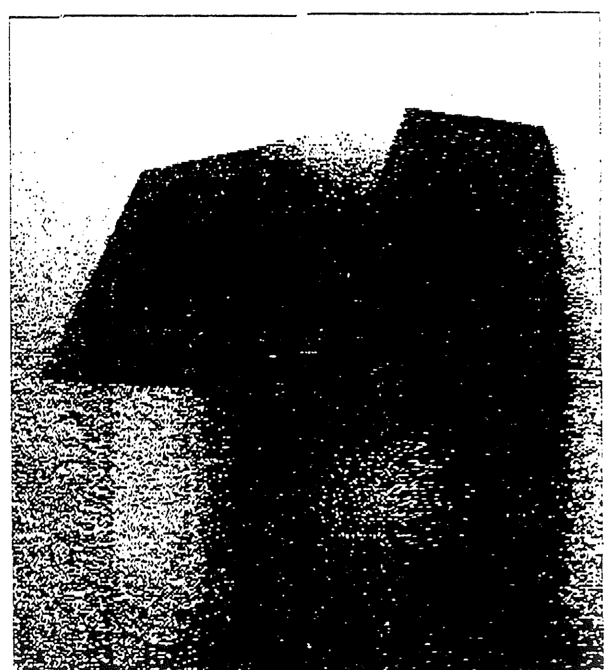
Unlike refractor wall packs, the candlepower distributions produced by the precision optical systems of the mcPhilben 100 Line meet the strict IES cutoff criteria. This assures that light above 80° is minimized resulting in exceptional control of disabling glare, curtailed light trespass beyond the property line, and elimination of direct upward sky pollution.

Handsome, Compact Designs

These outdoor sconces are available in two exquisite shapes and both were conceived with critical design sensitivity. The 101 trapezoidal luminaire mates naturally with rectilinear architectural elements and the 102 rounded wedge is appropriate for softer building details. Both units feature compact dimensions which are perfectly in scale for the recommended mounting heights of 10-14 feet.

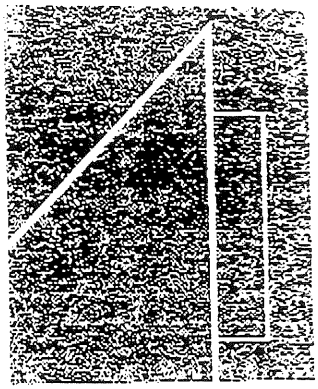
Rugged Construction

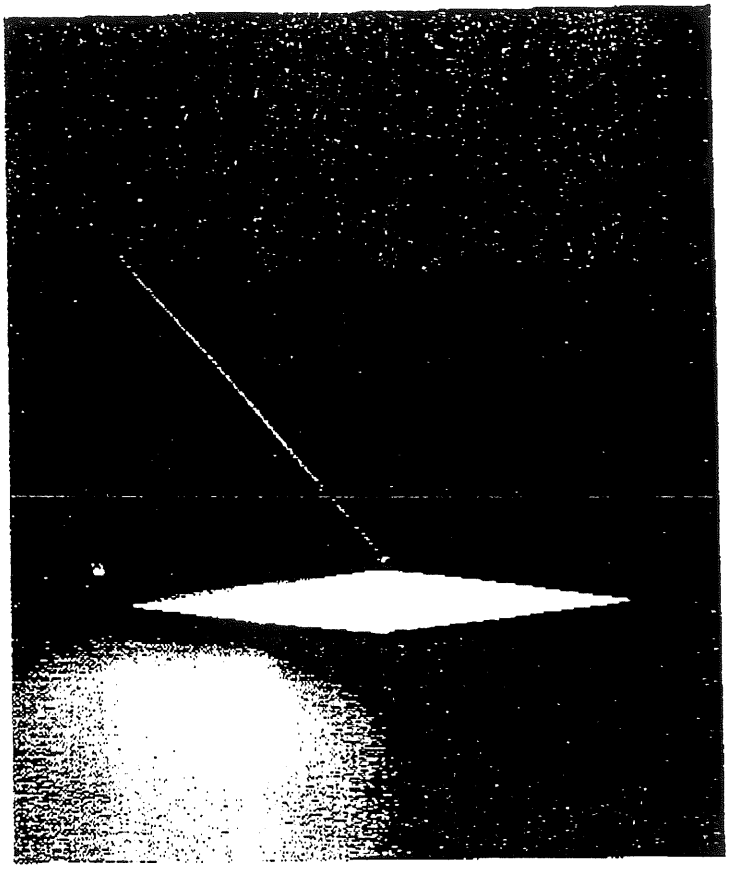
Housing, door frame and back plate are all precision die cast aluminum. Heat dissipating fins integrated into the back plate assure cool operation and extended ballast life. Each luminaire is completely prewired and factory tested before shipment. The lens is optically clear tempered glass. Completely sealed and gasketed at every point of entry and material transition to thoroughly exclude the elements and effects of time the mcPhilben 100 Line is certain to make a lasting contribution wherever it might be applied.



101 Trapezoidal Sconce

682





Wedge Downlight

The classic design of this clean wedge shape will endure as long as the solid bronze it is fabricated from. The acid washed factory finish will weather to a dark brown patina. Two larger sizes are available for H.I.D. lamping and can be found elsewhere in this section. For an uplight version – 687 – see Section C.

[illegible] BUILDING
[illegible]
[illegible]

[illegible] RESIDENCE
[illegible]

City of Portland
Memorandum

To: Mayor McDonough and Members of the City Council

From: Joseph E. Gray, Jr., Director of Planning and Urban Development

Date: September 24, 1996

Subject: October 7, 1996 Agenda Item - Substitute Zoning Text Amendments
Re: Gasoline Service Stations in the B-2 and B-5 Zones

In June, the Council held a workshop on proposed zoning and site plan ordinance text amendments which would regulate gas stations in the B2 and B5 zones. As the Council will recall, the amendments were developed by the Planning Board at the request of Councilor Kane, who sought more effective land use tools to address the impacts of gas stations in the B2 Zone, especially in those circumstances where the lot directly abuts a residential zone.

During the course of pursuing Councilor Kane's request, the Planning Board also attempted to revise the current general conditional use standards. This was considered to be a necessary part of the task, as gas stations are currently a conditional use in the B2 zone; the current standards governing conditional uses are so broad as to provide little guidance to review boards when determining whether a proposed conditional use will have measurable negative impacts.

Finally, in studying the general issue of gas stations and their physical impacts, the Planning Board felt it was appropriate to introduce some additional controls over gas stations located in strictly commercial contexts as well. While not as comprehensive as the regulations proposed for stations abutting residential zones, the Planning Board recommended the adoption of provisions which would address site lighting as well as the physical characteristics of a station's canopy. These provisions would apply in all zones where gas stations are allowed.

Attached is a copy of the amendments originally proposed by the Planning Board, together with the Planning Report which summarizes their intent.

During the workshop session, several Councilors raised concerns about the text amendments as drafted. While appreciating their intent and the concerns that prompted them, Councilors worried that the new zoning provisions might be too restrictive, putting gas stations at a disadvantage relative to their commercial neighbors. Of greatest concern to the Council, however, were the proposed revised general conditional use standards. Councilors expressed concern that the new language was still too vague and did not provide the applicable review boards with definable, measurable, defensible standards.

In response to feedback received at the workshop session, Councilor Kane instructed staff to develop substitute text which avoids some of the problems identified by Councilors, while preserving the original intent of his amendments. Enclosed as Attachment 1 is substitute text intended to replace the zoning amendments originally proposed by the Planning Board.

Briefly, the substitute text accomplishes the following:

* Removes gas stations as a conditional use in the B2 and B5 zones. By removing gas stations from the conditional use category, reliance on the problematic conditional use standards can be avoided. (Regarding the conditional use standards, Corporation Counsel and Planning Staff will be returning to the Council at a later date with a revised proposal for new standards.)

* Lists gas stations as a permitted use in the B2 and B5 zones, but subjects all gas station developments in these zones to major site plan review. Such review would be conducted by the Planning Board and would include an opportunity for public comment.

* For those B2 and B5 lots which directly abut a residential zone, only a minor gas station is allowed. Minor gas stations are defined as those featuring no more than 2 pump islands and serving no more than 8 vehicles at a time. Such stations may include repair services, but may not include car washes or vacuums.

* Revises the limitation on hours of operation. The original draft limited the hours for stations abutting residential zones to between 6am and 11pm. The new draft extends the hours for such stations to between 6am and 1am.

* Removes the specific conditional use standards which currently appear in the zoning text and relocates them to the site plan ordinance, for interpretation by the Planning Board under site plan review -- see Sec 14-526 (a) (25) . The effect of this change is to maintain the same standards, but to put the interpretation of them under the purview of the Planning Board.

* Strengthens the site plan ordinance's standard for lighting and refers applicants and the Planning authority to the City's Technical and Design Standards and Guidelines for more detailed specifications. The Technical Supplement is being amended to include a new chapter outlining specific lighting standards for parking lots, security lighting, canopy lighting for gas stations and other drive-through facilities, etc.

* Removes the canopy standards originally proposed as conditional use standards and places them in the Technical Supplement, to be interpreted by the Planning Board. Revisions to these standards will also be made to reflect Council comments from the previous workshop. Note that the canopy standards would apply not only to gas stations, but to all uses with drive-through facilities. By removing the standards to the Technical Supplement, the Planning Board has the authority to waive or amend them where circumstances warrant.

The Council will note that the enclosed draft includes a 2,000 foot dispersal requirement for stations in the B5 zone. This is not a new provision; the dispersal requirement was adopted as

part of an earlier zoning exercise and is simply lifted from the current conditional use category and relocated under the permitted use category.

Attachments:

1. Original text amendments

2. Original Planning Board Report

City of Portland, Maine

IN THE CITY COUNCIL

AMENDMENT TO PORTLAND CITY CODE
§§14-47, 14-182, 14-183, 14-230.1, 14-230.2 (ZONING ORDINANCE)
§§14-522, 14-526 (SITE PLAN ORDINANCE)
RE: GASOLINE SERVICE STATIONS IN THE B-2 AND B-5 ZONES

BE IT ORDAINED BY THE CITY COUNCIL OF THE CITY OF PORTLAND, MAINE IN CITY COUNCIL ASSEMBLED AS FOLLOWS:

1. That Section 14-47 of the Portland City Code is hereby amended as follows:

Sec. 14-47. Definitions.

Major gasoline service stations: A gasoline service station with more than ~~one (1)~~ two (2)pump islands or with a capacity to fuel more than eight (8) vehicles simultaneously or providing repair services including, but not limited to, tuneups, engine repair, brake work, muffler replacement, tire repair or similar activities.

Minor gasoline service stations: A gasoline service station with not more than ~~one (1)~~ two (2)pump islands~~, with a maximum of three (3) pumps~~, provided that no more than a total of eight (8) vehicles may be fueled simultaneously. Such stations shall not include car washes or vacuums. ~~with no r~~Repair services shall be permitted, provided that there shall be no more than two (2) service bays.

2. That Section 14-182(2)m-o of the Portland City Code is hereby amended to read as follows:

Sec. 14-182. Permitted uses.

The following uses are permitted in the B-2 zone:

(2) *Business:*

m. Theaters and performance halls; ~~and~~

n. Hotels or motels of less than one hundred fifty (150) rooms; and

o. Major and minor gasoline service stations, as defined in section 14-47, provided that only a minor gasoline service station shall be permitted on a lot abutting a residential zone and that minor

gasoline service stations abutting residential zones shall only operate between the hours of 6:00 a.m. and 1:00 a.m.

3. That section 14-183(1)a of the Portland City Code is hereby amended to read as follows:

Sec. 14-183. Conditional uses.

The following uses are permitted as provided in section 14-474 (conditional uses), if they meet the following requirements:

(1) *Business:*

a. ~~Major and minor gasoline stations, as defined in section 14-47~~ Reserved;

4. That section 14-230.1 (2) is hereby amended as follows:

Sec. 14-230.1. Permitted uses.

The following uses are permitted in the B-5 urban commercial mixed use zone:

(2) *Commercial:*

o. Lumber and building material dealers;

p. Major and minor gasoline service stations, as defined in section 14-47, provided that only a minor gasoline service station shall be permitted on a lot abutting a residential zone. Major and minor gasoline service stations shall be located at least two thousand (2,000) feet from each other.

5. That section 14-230.2(1)(a) of the Portland City Code is hereby amended to read as follows:

Sec. 14-230.2. Conditional uses.

The following uses shall be permitted as conditional uses in the B-5 urban commercial mixed use zone, provided that, notwithstanding section 14-471(3), section 14-474(a), or any other provision of this Code, the planning board shall be substituted for the board of appeals as the reviewing authority, and further provided that, in addition to the provisions of section 14-474(c)(2), they shall also meet the requirements set forth below:

(1) *Commercial:*

a. ~~Automobile service stations and convenience stores~~

~~with gasoline pumps provided that they are located at least two thousand (2,000) feet from other such uses~~ Reserved.

6. That section 14-522 of the Portland City Code is hereby amended as follows:

Sec. 14-522. Definitions.

For the purposes of this article all terms and words shall have their ordinary meanings, except as defined herein.

Major development means and includes:

(5) The construction of any structure for industrial use which is more than forty-five (45) feet high; ~~or~~

(6) The addition of any additional dwelling unit to a building initially reviewed as a two-family dwelling or not previously reviewed under this article; or

(7) The construction of any new major or minor gasoline service station in the B-2 or B-5 zone, or the construction of any new major or minor gasoline service station with a structure greater than ten thousand (10,000) square feet of building area in any other permitted zone.

Minor development means and includes any of the following unless (1) the development is major development; or (2) the development is single family development subject to the provisions of section 14-524(b):

(14) The construction of any new major or minor gasoline service station with a structure of less than ten thousand (10,000) square feet of building area in any permitted zone other than the B-2 or B-5 zones.

7. That Section 14-526(a)(9) of the Portland City Code is hereby amended to read as follows and a new subsection (25) is hereby enacted, said subsection to read as follows:

Sec. 14-526. Standards.

(a) *Requirements for approval.* The planning board or planning authority shall not approve a site plan unless it meets the following criteria:

(9) The provision for exterior lighting will not be hazardous to motorists traveling on adjacent public streets; is adequate for the safety of occupants or users of the

site; and such lighting will not cause ~~significant annoyance,~~ significant glare or ~~undesirable~~ direct spill-over onto adjacent properties and complies with the applicable specifications of the City of Portland Technical and Design Standards and Guidelines;

(25) All major or minor gasoline service stations shall meet the following requirements:

a. *Signs:* Signs shall not adversely affect visibility at intersections or access drives. Such signs shall be constructed, installed and maintained so as to ensure the safety of the public. Such signs shall advertise only services or goods available on the premises.

b. *Circulation:* No ingress and egress driveways shall be located within thirty (30) feet from an intersection. No entrance or exit for vehicles shall be in such proximity to a playground, school, church, other places of public assembly, or any residential zone that the nearness poses a threat or potential danger to the safety of the public.

c. *Drive-up features:* Drive-up features, such as gasoline pumps, vacuum cleaners and menu/order boards, shall not extend nearer than twenty-five (25) feet to the street line. The site must have adequate stacking capacity for vehicles waiting to use these service features without impeding vehicular circulation or creating hazards to vehicular circulation on adjoining streets.

d. *Car washes:* Car washes shall be designed to avoid the tracking of residual waters into the street.

Attachment 2

Note: Underlined sections indicate revisions to previous draft.

(Proposed)
SECTION VIX
SITE LIGHTING STANDARDS

1. INTENTION

These standards are intended to provide for safe and adequate site lighting for proposed developments which meets the needs of the proposed use but does not create unsafe or unpleasant conditions which adversely affect surrounding properties. The following standards attempt to prevent 1) high than necessary illuminance levels which create a sense of incompatibility with neighboring properties; 2) uncontrolled light source brightness which creates glare; and 3) improperly aimed/installed lights which cause light trespass onto neighboring properties.

2. GENERAL STANDARDS

The provision for exterior lighting shall be adequate for the safety of occupants or users of the site but shall not cause glare or direct spillover to adjacent properties or create visual distraction to motorists traveling on adjacent streets. Unless otherwise specified below, light levels shall not exceed the Illuminating Engineering Society of North America (IESNA) recommended average lighting levels for the sue, with maximum levels not exceeding three (3) times the recommended average level.

Except in limited decorative lighting applications (e.g. post-top lanterns in a park setting), fixtures shall be of a "cut off" type, where ~~the~~ lenses, refractors, reflectors or lamp sources do not extend below the surface of the fixture housing itself and no direct light shall be directed at or above the horizontal plane. Mounting heights of all fixtures shall be the minimum necessary to meet the need. The use of directional floodlights shall not be permitted. Wherever practicable, lighting installations shall include timers, dimmers and/or sensors to reduce overall energy consumption and eliminate unneeded lighting.

3. STANDARDS FOR SPECIFIC USES

A. Gasoline Service Stations

1. General Requirement for Canopy Lighting at all Gas Stations: Lighting fixtures shall be fully recessed and shall be located on the underside of the canopy with no part of the fixture extending below the surface of the underside of the canopy. There shall be no internal or external lighting of the canopy fascia, except within the permitted sign area.

2. Illuminance Levels

a. Minor Gasoline Service Stations, including those abutting residential zones. Illuminance levels shall not exceed the following:

Approaches and Drives:	1.5 FC average 3:1 average-to-minimum uniformity ratio 3.0 FC maximum
Service Areas:	3.0 FC average 3:1 average-to-minimum uniformity ratio 6.0 FC maximum
Pump Island Areas:	20 FC average 3:1 average-to-minimum uniformity ratio 40 FC maximum

b. Major Gasoline Service Stations
Illuminance levels shall not exceed the following:

Approaches and Drives:	3.0 FC average 3:1 average-to-minimum uniformity ratio 9.0 FC maximum
Service Areas:	7.0 FC average 3:1 average-to-minimum uniformity ratio 21 FC maximum
Pump Island Areas:	30 FC average 3:1 average-to-minimum uniformity ratio 90 FC maximum

B. Parking Lot Lighting

C. Aprons/Canopies

D. Lighting of Exterior Sales Area

E. Security Lighting

(Standards for these Categories to be developed at a later date)

CITY OF PORTLAND, MAINE
M E M O R A N D U M

TO: Distribution List

FROM: Natalie L. Burns, Associate Corporation Counsel

DATE: October 18, 1996

RE: **Gas Station Amendments**

Attached is a copy of the gas station zoning and site plan amendments. The City Council passed these on October 7, so they will go into effect on November 6, 1996.

Natalie L. Burns

Natalie L. Burns
Associate Corporation Counsel

NLB:lab

Distribution List:

Chairman Hagge and Members of the Planning Board
Chairman Manahan and Members of the Board of Appeals
Marge Schmuckal, Zoning Administrator
Joseph E. Gray, Jr., Director of Planning & Urban Development
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AMENDMENT TO PORTLAND CITY CODE
§§14-47, 14-182, 14-183, 14-230.1, 14-230.2 (ZONING ORDINANCE)
§§14-522, 14-526 (SITE PLAN ORDINANCE)
RE: GASOLINE SERVICE STATIONS IN THE B-2 AND B-5 ZONES

BE IT ORDAINED BY THE CITY COUNCIL OF THE CITY OF PORTLAND, MAINE IN CITY COUNCIL ASSEMBLED AS FOLLOWS:

1. That Section 14-47 of the Portland City Code is hereby amended as follows:

Sec. 14-47. Definitions.

Major gasoline service stations: A gasoline service station with more than ~~one (1)~~ two (2)pump islands or with a capacity to fuel more than eight (8) vehicles simultaneously or providing repair services including, but not limited to, tuneups, engine repair, brake work, muffler replacement, tire repair or similar activities.

Minor gasoline service stations: A gasoline service station with not more than ~~one (1)~~ two (2)pump islands~~, with a maximum of three (3) pumps~~, provided that no more than a total of eight (8) vehicles may be fueled simultaneously. Such stations shall not include car washes or vacuums. ~~with no r~~Repair services shall be permitted, provided that there shall be no more than two (2) service bays.

2. That Section 14-182(2)m-o of the Portland City Code is hereby amended to read as follows:

Sec. 14-182. Permitted uses.

The following uses are permitted in the B-2 zone:

(2) *Business:*

m. Theaters and performance halls; ~~and~~

n. Hotels or motels of less than one hundred fifty (150) rooms; and

o. Major and minor gasoline service stations, as defined in section 14-47.

3. That section 14-183(1)a of the Portland City Code is hereby

Sec. 14-522. Definitions.

For the purposes of this article all terms and words shall have their ordinary meanings, except as defined herein.

Major development means and includes:

(5) The construction of any structure for industrial use which is more than forty-five (45) feet high; ~~or~~

(6) The addition of any additional dwelling unit to a building initially reviewed as a two-family dwelling or not previously reviewed under this article; or

(7) The construction of any new major or minor gasoline service station in the B-2 or B-5 zone, or the construction of any new major or minor gasoline service station with a structure greater than ten thousand (10,000) square feet of building area in any other permitted zone.

Minor development means and includes any of the following unless (1) the development is major development; or (2) the development is single family development subject to the provisions of section 14-524(b):

(14) The construction of any new major or minor gasoline service station with a structure of less than ten thousand (10,000) square feet of building area in any permitted zone other than the B-2 or B-5 zones.

7. That Section 14-526(a)(9) of the Portland City Code is hereby amended to read as follows and a new subsection (25) is hereby enacted, said subsection to read as follows:

Sec. 14-526. Standards.

(a) *Requirements for approval.* The planning board or planning authority shall not approve a site plan unless it meets the following criteria:

(9) The provision for exterior lighting will not be hazardous to motorists traveling on adjacent public streets; is adequate for the safety of occupants or users of the site; and such lighting will not cause ~~significant annoyance,~~ significant glare or ~~undesirable~~ direct spill-over onto adjacent properties;

(25) All major or minor gasoline service stations shall meet the following requirements:

a. *Signs:* Signs shall not adversely affect visibility at intersections or access drives. Such signs shall be constructed, installed and maintained so as to ensure the safety of the public. Such signs shall advertise only services or goods available on the premises.

b. *Circulation:* No ingress and egress driveways shall be located within thirty (30) feet from an intersection. No entrance or exit for vehicles shall be in such proximity to a playground, school, church, other places of public assembly, or any residential zone that the nearness poses a threat or potential danger to the safety of the public.

c. *Drive-up features:* Drive-up features, such as gasoline pumps, vacuum cleaners and menu/order boards, shall not extend nearer than twenty-five (25) feet to the street line. The site must have adequate stacking capacity for vehicles waiting to use these service features without impeding vehicular circulation or creating hazards to vehicular circulation on adjoining streets.

d. *Car washes:* Car washes shall be designed to avoid the tracking of residual waters into the street.

City of Portland
Memorandum

To: Mayor McDonough and Members of the City Council

From: Joseph E. Gray, Jr., Director of Planning and Urban Development

Date: September 24, 1996

Subject: October 7, 1996 Agenda Item - Substitute Zoning Text Amendments
Re: Gasoline Service Stations in the B-2 and B-5 Zones

In June, the Council held a workshop on proposed zoning and site plan ordinance text amendments which would regulate gas stations in the B2 and B5 zones. As the Council will recall, the amendments were developed by the Planning Board at the request of Councilor Kane, who sought more effective land use tools to address the impacts of gas stations in the B2 Zone, especially in those circumstances where the lot directly abuts a residential zone.

During the course of pursuing Councilor Kane's request, the Planning Board also attempted to revise the current general conditional use standards. This was considered to be a necessary part of the task, as gas stations are currently a conditional use in the B2 zone; the current standards governing conditional uses are so broad as to provide little guidance to review boards when determining whether a proposed conditional use will have measurable negative impacts.

Finally, in studying the general issue of gas stations and their physical impacts, the Planning Board felt it was appropriate to introduce some additional controls over gas stations located in strictly commercial contexts as well. While not as comprehensive as the regulations proposed for stations abutting residential zones, the Planning Board recommended the adoption of provisions which would address site lighting as well as the physical characteristics of a station's canopy. These provisions would apply in all zones where gas stations are allowed.

Attached is a copy of the amendments originally proposed by the Planning Board, together with the Planning Report which summarizes their intent.

During the workshop session, several Councilors raised concerns about the text amendments as drafted. While appreciating their intent and the concerns that prompted them, Councilors worried that the new zoning provisions might be too restrictive, putting gas stations at a disadvantage relative to their commercial neighbors. Of greatest concern to the Council, however, were the proposed revised general conditional use standards. Councilors expressed concern that the new language was still too vague and did not provide the applicable review boards with definable, measurable, defensible standards.

In response to feedback received at the workshop session, Councilor Kane instructed staff to develop substitute text which avoids some of the problems identified by Councilors, while preserving the original intent of his amendments. Enclosed as Attachment 1 is substitute text intended to replace the zoning amendments originally proposed by the Planning Board.

Briefly, the substitute text accomplishes the following:

* Removes gas stations as a conditional use in the B2 and B5 zones. By removing gas stations from the conditional use category, reliance on the problematic conditional use standards can be avoided. (Regarding the conditional use standards, Corporation Counsel and Planning Staff will be returning to the Council at a later date with a revised proposal for new standards.)

* Lists gas stations as a permitted use in the B2 and B5 zones, but subjects all gas station developments in these zones to major site plan review. Such review would be conducted by the Planning Board and would include an opportunity for public comment.

* For those B2 and B5 lots which directly abut a residential zone, only a minor gas station is allowed. Minor gas stations are defined as those featuring no more than 2 pump islands and serving no more than 8 vehicles at a time. Such stations may include repair services, but may not include car washes or vacuums.

* Revises the limitation on hours of operation. The original draft limited the hours for stations abutting residential zones to between 6am and 11pm. The new draft extends the hours for such stations to between 6am and 1am.

* Removes the specific conditional use standards which currently appear in the zoning text and relocates them to the site plan ordinance, for interpretation by the Planning Board under site plan review -- see Sec 14-526 (a) (25) . The effect of this change is to maintain the same standards, but to put the interpretation of them under the purview of the Planning Board.

* Strengthens the site plan ordinance's standard for lighting and refers applicants and the Planning authority to the City's Technical and Design Standards and Guidelines for more detailed specifications. The Technical Supplement is being amended to include a new chapter outlining specific lighting standards for parking lots, security lighting, canopy lighting for gas stations and other drive-through facilities, etc.

* Removes the canopy standards originally proposed as conditional use standards and places them in the Technical Supplement, to be interpreted by the Planning Board. Revisions to these standards will also be made to reflect Council comments from the previous workshop. Note that the canopy standards would apply not only to gas stations, but to all uses with drive-through facilities. By removing the standards to the Technical Supplement, the Planning Board has the authority to waive or amend them where circumstances warrant.

The Council will note that the enclosed draft includes a 2,000 foot dispersal requirement for stations in the B5 zone. This is not a new provision; the dispersal requirement was adopted as

part of an earlier zoning exercise and is simply lifted from the current conditional use category and relocated under the permitted use category.

Attachments:

1. Original text amendments

2. Original Planning Board Report

City of Portland, Maine

IN THE CITY COUNCIL

AMENDMENT TO PORTLAND CITY CODE
§§14-47, 14-182, 14-183, 14-230.1, 14-230.2 (ZONING ORDINANCE)
§§14-522, 14-526 (SITE PLAN ORDINANCE)
RE: GASOLINE SERVICE STATIONS IN THE B-2 AND B-5 ZONES

BE IT ORDAINED BY THE CITY COUNCIL OF THE CITY OF PORTLAND, MAINE IN CITY COUNCIL ASSEMBLED AS FOLLOWS:

1. That Section 14-47 of the Portland City Code is hereby amended as follows:

Sec. 14-47. Definitions.

Major gasoline service stations: A gasoline service station with more than ~~one (1)~~ two (2)pump islands or with a capacity to fuel more than eight (8) vehicles simultaneously or providing repair services including, but not limited to, tuneups, engine repair, brake work, muffler replacement, tire repair or similar activities.

Minor gasoline service stations: A gasoline service station with not more than ~~one (1)~~ two (2)pump islands~~, with a maximum of three (3) pumps~~, provided that no more than a total of eight (8) vehicles may be fueled simultaneously. Such stations shall not include car washes or vacuums. ~~with no~~ rRepair services shall be permitted, provided that there shall be no more than two (2) service bays.

2. That Section 14-182(2)m-o of the Portland City Code is hereby amended to read as follows:

Sec. 14-182. Permitted uses.

The following uses are permitted in the B-2 zone:

(2) *Business:*

m. Theaters and performance halls; ~~and~~

n. Hotels or motels of less than one hundred fifty (150) rooms; and

o. Major and minor gasoline service stations, as defined in section 14-47, provided that only a minor gasoline service station shall be permitted on a lot abutting a residential zone and that minor

gasoline service stations abutting residential zones shall only operate between the hours of 6:00 a.m. and 1:00 a.m.

3. That section 14-183(1)a of the Portland City Code is hereby amended to read as follows:

Sec. 14-183. Conditional uses.

The following uses are permitted as provided in section 14-474 (conditional uses), if they meet the following requirements:

(1) *Business:*

a. ~~Major and minor gasoline stations, as defined in section 14-47~~ Reserved;

4. That section 14-230.1 (2) is hereby amended as follows:

Sec. 14-230.1. Permitted uses.

The following uses are permitted in the B-5 urban commercial mixed use zone:

(2) *Commercial:*

o. Lumber and building material dealers;

p. Major and minor gasoline service stations, as defined in section 14-47, provided that only a minor gasoline service station shall be permitted on a lot abutting a residential zone. Major and minor gasoline service stations shall be located at least two thousand (2,000) feet from each other.

5. That section 14-230.2(1)(a) of the Portland City Code is hereby amended to read as follows:

Sec. 14-230.2. Conditional uses.

The following uses shall be permitted as conditional uses in the B-5 urban commercial mixed use zone, provided that, notwithstanding section 14-471(3), section 14-474(a), or any other provision of this Code, the planning board shall be substituted for the board of appeals as the reviewing authority, and further provided that, in addition to the provisions of section 14-474(c)(2), they shall also meet the requirements set forth below:

(1) *Commercial:*

a. ~~Automobile service stations and convenience stores~~

~~with gasoline pumps provided that they are located at least two thousand (2,000) feet from other such uses~~ Reserved.

6. That section 14-522 of the Portland City Code is hereby amended as follows:

Sec. 14-522. Definitions.

For the purposes of this article all terms and words shall have their ordinary meanings, except as defined herein.

Major development means and includes:

(5) The construction of any structure for industrial use which is more than forty-five (45) feet high; ~~or~~

(6) The addition of any additional dwelling unit to a building initially reviewed as a two-family dwelling or not previously reviewed under this article; or

(7) The construction of any new major or minor gasoline service station in the B-2 or B-5 zone, or the construction of any new major or minor gasoline service station with a structure greater than ten thousand (10,000) square feet of building area in any other permitted zone.

Minor development means and includes any of the following unless (1) the development is major development; or (2) the development is single family development subject to the provisions of section 14-524(b):

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7. That Section 14-526(a)(9) of the Portland City Code is hereby amended to read as follows and a new subsection (25) is hereby enacted, said subsection to read as follows:

Sec. 14-526. Standards.

(a) *Requirements for approval.* The planning board or planning authority shall not approve a site plan unless it meets the following criteria:

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c. *Drive-up features:* Drive-up features, such as gasoline pumps, vacuum cleaners and menu/order boards, shall not extend nearer than twenty-five (25) feet to the street line. The site must have adequate stacking capacity for vehicles waiting to use these service features without impeding vehicular circulation or creating hazards to vehicular circulation on adjoining streets.

d. *Car washes:* Car washes shall be designed to avoid the tracking of residual waters into the street.

CITY OF PORTLAND, MAINE
M E M O R A N D U M

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FROM: Natalie L. Burns, Associate Corporation Counsel

DATE: October 18, 1996

RE: **Gas Station Amendments**

Attached is a copy of the gas station zoning and site plan amendments. The City Council passed these on October 7, so they will go into effect on November 6, 1996.

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Minor gasoline service stations: A gasoline service station with not more than ~~one (1)~~ two (2) pump islands~~, with a maximum of three (3) pumps~~, provided that no more than a total of eight (8) vehicles may be fueled simultaneously. Such stations shall not include car washes or vacuums. ~~with no r~~Repair services shall be permitted, provided that there shall be no more than two (2) service bays.

2. That Section 14-182(2)m-o of the Portland City Code is hereby amended to read as follows:

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The following uses are permitted in the B-2 zone:

(2) *Business:*

m. Theaters and performance halls; ~~and~~

n. Hotels or motels of less than one hundred fifty (150) rooms; and

o. Major and minor gasoline service stations, as defined in section 14-47.

3. That section 14-183(1)a of the Portland City Code is hereby

amended to read as follows:

Sec. 14-183. Conditional uses.

The following uses are permitted as provided in section 14-474 (conditional uses), if they meet the following requirements:

(1) *Business:*

a. ~~Major and minor gasoline stations, as defined in section 14-47~~ Reserved;

4. That section 14-230.1 (2) is hereby amended as follows:

Sec. 14-230.1. Permitted uses.

The following uses are permitted in the B-5 urban commercial mixed use zone:

(2) *Commercial:*

o. Lumber and building material dealers;

p. Major and minor gasoline service stations, as defined in section 14-47. Major and minor gasoline service stations shall be located at least two thousand (2,000) feet from each other.

5. That section 14-230.2(1)(a) of the Portland City Code is hereby amended to read as follows:

Sec. 14-230.2. Conditional uses.

The following uses shall be permitted as conditional uses in the B-5 urban commercial mixed use zone, provided that, notwithstanding section 14-471(3), section 14-474(a), or any other provision of this Code, the planning board shall be substituted for the board of appeals as the reviewing authority, and further provided that, in addition to the provisions of section 14-474(c)(2), they shall also meet the requirements set forth below:

(1) *Commercial:*

a. ~~Automobile service stations and convenience stores with gasoline pumps provided that they are located at least two thousand (2,000) feet from other such uses~~ Reserved.

6. That section 14-522 of the Portland City Code is hereby amended as follows:

Sec. 14-522. Definitions.

For the purposes of this article all terms and words shall have their ordinary meanings, except as defined herein.

Major development means and includes:

(5) The construction of any structure for industrial use which is more than forty-five (45) feet high; ~~or~~

(6) The addition of any additional dwelling unit to a building initially reviewed as a two-family dwelling or not previously reviewed under this article; or

(7) The construction of any new major or minor gasoline service station in the B-2 or B-5 zone, or the construction of any new major or minor gasoline service station with a structure greater than ten thousand (10,000) square feet of building area in any other permitted zone.

Minor development means and includes any of the following unless (1) the development is major development; or (2) the development is single family development subject to the provisions of section 14-524(b):

(14) The construction of any new major or minor gasoline service station with a structure of less than ten thousand (10,000) square feet of building area in any permitted zone other than the B-2 or B-5 zones.

7. That Section 14-526(a)(9) of the Portland City Code is hereby amended to read as follows and a new subsection (25) is hereby enacted, said subsection to read as follows:

Sec. 14-526. Standards.

(a) *Requirements for approval.* The planning board or planning authority shall not approve a site plan unless it meets the following criteria:

(9) The provision for exterior lighting will not be hazardous to motorists traveling on adjacent public streets; is adequate for the safety of occupants or users of the site; and such lighting will not cause ~~significant annoyance,~~ significant glare or ~~undesirable~~ direct spill-over onto adjacent properties;

(25) All major or minor gasoline service stations shall meet the following requirements:

a. *Signs:* Signs shall not adversely affect visibility at intersections or access drives. Such signs shall be constructed, installed and maintained so as to ensure the safety of the public. Such signs shall advertise only services or goods available on the premises.

b. *Circulation:* No ingress and egress driveways shall be located within thirty (30) feet from an intersection. No entrance or exit for vehicles shall be in such proximity to a playground, school, church, other places of public assembly, or any residential zone that the nearness poses a threat or potential danger to the safety of the public.

c. *Drive-up features:* Drive-up features, such as gasoline pumps, vacuum cleaners and menu/order boards, shall not extend nearer than twenty-five (25) feet to the street line. The site must have adequate stacking capacity for vehicles waiting to use these service features without impeding vehicular circulation or creating hazards to vehicular circulation on adjoining streets.

d. *Car washes:* Car washes shall be designed to avoid the tracking of residual waters into the street.

PLANNING BOARD REPORT #22-96

PROPOSED ZONING AND SITE PLAN AMENDMENTS TO REGULATE GAS STATIONS

~~AND~~ AND

PROPOSED REVISED CONDITIONAL USE STANDARDS

COUNCILOR THOMAS KANE, APPLICANT

~~AND~~

PROPOSED NEW CHAPTER FOR TECHNICAL SUPPLEMENT TO ADDRESS SITE LIGHTING

add: significant as modifier to glare under site plan ordinance.

note typo's in Tech Supp.

6-0

6-0

both motions

Submitted to:

Portland Planning Board
Portland, Maine

May 14, 1996

Attachment 2

Note: Underlined sections indicate revisions to previous draft.

(Proposed)
SECTION VIX
SITE LIGHTING STANDARDS

1. INTENTION

These standards are intended to provide for safe and adequate site lighting for proposed developments which meets the needs of the proposed use but does not create unsafe or unpleasant conditions which adversely affect surrounding properties. The following standards attempt to prevent 1) high than necessary illuminance levels which create a sense of incompatibility with neighboring properties; 2) uncontrolled light source brightness which creates glare; and 3) improperly aimed/installed lights which cause light trespass onto neighboring properties.

2. GENERAL STANDARDS

The provision for exterior lighting shall be adequate for the safety of occupants or users of the site but shall not cause glare or direct spillover to adjacent properties or create visual distraction to motorists traveling on adjacent streets. Unless otherwise specified below, light levels shall not exceed the Illuminating Engineering Society of North America (IESNA) recommended average lighting levels for the sue, with maximum levels not exceeding three (3) times the recommended average level. -ooh, how Freudian!

Except in limited decorative lighting applications (e.g. post-top lanterns in a park setting), fixtures shall be of a "cut off" type, where ~~the~~ lenses, refractors, reflectors or lamp sources do not extend below the surface of the fixture housing itself and no direct light shall be directed at or above the horizontal plane. Mounting heights of all fixtures shall be the minimum necessary to meet the need. The use of directional floodlights shall not be permitted. Wherever practicable, lighting installations shall include timers, dimmers and/or sensors to reduce overall energy consumption and eliminate unneeded lighting.

3. STANDARDS FOR SPECIFIC USES

A. Gasoline Service Stations

1. General Requirement for Canopy Lighting at all Gas Stations: Lighting fixtures shall be fully recessed and shall be located on the underside of the canopy with no part of the fixture extending below the surface of the underside of the canopy. There shall be no internal or external lighting of the canopy fascia, except within the permitted sign area.

I. INTRODUCTION

* B-2 gas stations where abuts res. zone
* revised conditional use standards

Councilor Kane has requested that a series of zoning and site plan ordinance text amendments be developed which would more effectively address the impacts of gas stations in the B-2 zone where the lot directly abuts a residential zone. Mr. Kane's request has also prompted a review of the general conditional use standards included in Sec. 14-474 of the Land Use Code. Planning and Corporation Counsel suggest that the conditional use standards also be revised at this time because their current lack of specificity provides little guidance to the Zoning Board of Appeals and Planning Board when determining whether a proposed conditional use (including gas stations in the B-2 zones) will have measurable negative impacts.

* amendments which would apply to all gas stations in commercial zones

In reviewing the issue of gas stations and their physical impacts, the Planning Board felt it was appropriate to extend the exercise to introduce some additional controls over gas stations in strictly commercial contexts -- in the B-2 zone where there are no residential abutters and in the B-4 and B-5 zones as well. While not as comprehensive as the regulations proposed for stations abutting residential uses, the drafted provisions would address site lighting as well as the physical characteristics of a station's canopy at stations in all of Portland's commercial zones.

* new chapter for Technical Supplement which addresses site lighting.

Enclosed as Attachment 1 is a compilation of the proposed site plan and zoning text amendments. Attachment 2 is a proposed new section to be added to the Technical Supplement which would provide detailed standards for site lighting. Attachment 3 is a report with recommendations by lighting engineer, Larry Bartlett.

Notice of the public hearing appeared in the May 6th and May 7th editions of the Portland Press Herald. Representatives of the major gas and oil distributors were also notified of the proposed amendments.

II. BACKGROUND:

In February, Councilor Kane appeared before the Planning Board to discuss his concerns about the impacts of gas stations where they abut residential neighborhoods and to request that additional review criteria be developed which would better control these impacts. In recent years, as the nature of gasoline retailing has changed, the potential for conflict with surrounding residential development has changed as well. Not only have the number of pumps increased at many stations, but stations also now commonly feature any number of accessory operations, including a convenience store, car wash, vacuums, repair garage, etc. With these added services and with increased competition, the hours of operation have increased as well. Where canopies were once reserved for only the largest operations, now they are a standard feature at most stations. Their height, their visual character, and their use as additional signage for the station often combine to dominate or overwhelm the prevailing scale and character of neighborhood. Lighting of gas stations has also intensified dramatically in recent years, as retailers seek every available means to draw customers to their station. Finally, several of the most recent gas station proposals have entailed the assembly of several contiguous lots. The very lot size of the resulting "super station" is often at dramatic odds with the existing development pattern in an area.

In assessing the existing review criteria which apply to gas stations, it became clear that there was no distinction made between B-2 stations located in a purely commercial context and those which abut a

residential zone. It also became clear that several key features of a station -- its canopy and site lighting, in particular -- were inadequately addressed, if at all, in the current standards. The current standards do not address the variety and number of functions which are typically featured in newer stations, nor the hours of operation.

The inadequacy of the current general conditional use standards (Sec 14-474 of the zoning ordinance) was also brought to light during this exercise. Gas stations, among several other uses, are a conditional use in the B-2 zone. The vague language and lack of specificity in the current standards provides little guidance to the Zoning Board of Appeals and the Planning Board when determining whether a proposed conditional use will have negative impacts. It was felt that this would be an appropriate time to revise the conditional use standards to provide more definite, measurable criteria.

Finally, the issue of controlling lighting at gas stations has raised the question of the adequacy of the site plan ordinance's current lighting standard. It was felt that a general standard in the site plan ordinance was insufficient to deal with this increasingly complex technical issue and that this would be a good opportunity to add a new chapter to the City's Technical Supplement which provides specifications for site lighting. While the enclosed draft chapter is far from complete, it provides much improved general standards and specific standards for gas station lighting. In the future, lighting specifications for other developments, such as parking lots, can be added.

III. REVIEW PROCESS

Over the course of the spring, the Board held three workshops on this topic. Staff presented slides of a wide variety of gas stations in Portland, particularly those abutting residential areas, to familiarize Board members with the issues and to begin to identify those physical and functional characteristics which can be problematic where gas stations are located adjacent to residential neighborhoods. The Board also spent a considerable amount of time discussing effective site lighting controls. Lighting consultant, Larry Bartlett, was retained to make recommendations for lighting standards for gas stations. The enclosed amendments, therefore, reflect considerable discussion and professional input.

IV. PROPOSED AMENDMENTS

A. Site Plan and Zoning Amendments Regarding Gas Stations

The enclosed amendments accomplish the following:

* In the B-2 zone, where a lot directly abuts a residential zone, only minor gas stations are allowed;

* The definition for minor gas stations has been amended to allow no more than 2 pump islands or a maximum of 8 vehicles served at one time. (Here the language was made more liberal than the current definition which allows no more than 1 pump island.) The new definition prohibits car washes or vacuums at minor stations, but allows repair services, provided there are no more than 2 services bays. (Repair services are not allowed under the current definition);

* The hours of operation for stations abutting a residential zone are limited to between 6:00am and 11:00 pm; and

* Gas station canopies (and those associated with other drive-through facilities as well) are now limited as follows:

  - the height to the underside of the canopy shall not exceed 14' 6";
  - the height of the canopy facia itself shall not exceed 3' 6";
  - the canopies shall consist of a solid, neutral color field and distinguishing banding or graphics shall be limited to the allowable sign area; and
  - canopy lighting shall conform with the applicable Technical and Design Standards for such -- a proposed new lighting section will be added to the Technical Supplement.

It should be noted that, for advertising purposes, the Board requested that the canopy standards apply to all business zones where gas stations are allowed as permitted or conditional uses, including the B-2, B-4 and B-5 zones.

B. Revised Conditional Use Standards

The current general conditional use standards in Sec. 14-474 of the zoning ordinance are to be replaced altogether with two standards which are more definite and measurable. These standards, which are recommended by Corporation Counsel, are currently used in Cape Elizabeth and Windham and have withstood court challenge. The proposed standards are as follows:

a) The proposed use will not adversely affect the value of adjacent properties; or

b) The conditional use sought will not create nor aggravate a traffic hazard or a fire hazard.

C. Revised Lighting Standards

It became clear during the course of discussion on gas station lighting that a general lighting standard in the site plan ordinance could not adequately address this increasingly complex topic nor ensure lighting solutions which were appropriate to specific circumstances. This is the case not only for gas stations but for all developments subject to site plan review. Therefore the decision was made to remove the vague language in the current site plan lighting standard and to reference the more detailed lighting specifications included in a proposed new chapter of the City of Portland's Technical and Design Standards and Guidelines. With the assistance of lighting engineer, Larry Bartlett, a draft section for the Technical Supplement was prepared which includes both general lighting standards and a more detailed section on gas station lighting. In the future, similar detailed lighting standards will be developed for parking lots, security lighting, etc.

A copy of Mr. Bartlett's report is enclosed as Attachment 3 -- see especially Section 3 of his report for his recommendations on review standards. Mr. Bartlett will also be available on Tuesday to answer questions from the Board.

Briefly, the proposed lighting standards address the numerous lighting design criteria which affect our perception of acceptable or unacceptable lighting conditions. By regulating 1) fixture type, 2) fixture placement, and 3) illuminance levels (average, maximum and average-to-minimum uniformity ratio's), a community is in a good position to effectively regulate site lighting.

The Board will note that the proposed gas station lighting standards make a distinction between minor gas stations and major gas stations. For example, canopy lighting at minor gas stations is limited to a 20-foot candle average and the maximum is set at a 2x factor, whereas major stations are allowed a 30-foot candle average and a 3x maximum.

It should be noted that Mr. Bartlett suggests that any effective lighting standard include specific authorization for the Planning Board to place conditions of approval beyond those included in the general performance standards in order to address the unique circumstances of a site. As the site plan ordinance already provides for that authority (for lighting or any other aspects of development) under Sec. 14-526(b), additional language for the Technical Supplement was not drafted.

V. MOTIONS FOR THE BOARD TO CONSIDER

On the basis of findings and information presented in Planning Report #22-96, the Board finds:

1. that the proposed zoning and site plan amendments, including revised conditional use standards, are consistent with the City of Portland's Comprehensive Plan and therefore recommends to the City Council that they be adopted.

2. that the addition of a new section to the City of Portland's Technical and Design Standards and Guidelines which addresses site lighting is consistent with the Comprehensive Plan and therefore should be adopted.

Attachments:

1. Proposed Text Amendments
2. Proposed Lighting Section for Technical Supplement
3. Report from Larry Bartlett

Attachment 1

14-183MR.004
03.08.96

AMENDMENT TO PORTLAND CITY CODE
§§14-47, 14-183, 14-229.11, 14-230.2, 14-474 (ZONING ORDINANCE)
RE: GASOLINE SERVICE STATIONS IN THE B-2, B-4 AND B-5 ZONES

BE IT ORDAINED BY THE CITY COUNCIL OF THE CITY OF PORTLAND, MAINE IN CITY COUNCIL ASSEMBLED AS FOLLOWS:

1. That Section 14-47 of the Portland City Code is hereby amended as follows:

Sec. 14-47. Definitions.

Major gasoline service stations: A gasoline service station with more than ~~one (1)~~ two (2)pump islands or with a capacity to fuel more than eight (8) vehicles simultaneously or providing repair services including, but not limited to, tuneups, engine repair, brake work, muffler replacement, tire repair or similar activities.

Minor gasoline service stations: A gasoline service station with not more than ~~one (1)~~ two (2)pump islands~~, with a maximum of three (3) pumps~~, provided that no more than a total of eight (8) vehicles may be fueled simultaneously. Such stations shall not include car washes or vacuums. ~~with no r~~Repair services shall be permitted, provided that there shall be no more than two (2) service bays.

2. That Section 14-183(1) of the Portland City Code is hereby amended to read as follows:

Sec. 14-183. Conditional uses.

The following uses are permitted as provided in section 140474 (conditional uses), if they meet the following requirements:

(1) *Business:*

a. Major and minor gasoline service stations, as defined in section 14-47;

b. Car washes;

c. Automobile dealerships; and

d. Drive-in or drive-through restaurants.

In addition to approval by the planning board or the planning authority with respect to the requirements of article V (site plan), these uses shall comply with the following conditions and standards in addition to the provisions of section 14-474:

i. *Signs:* Signs shall not adversely affect visibility at intersections or access drives. Such signs shall be constructed, installed and maintained so as to ensure the safety of the public. Such signs shall advertise only services or goods available on the premises.

ii. *Circulation:* No ingress and egress driveways shall be located within thirty (30) feet from an intersection. No entrance or exit for vehicles shall be in such proximity to a playground, school, church, other places of public assembly, or any residential zone that the nearness poses a threat or potential danger to the safety of the public.

iii. *Drive-up features:* Drive-up features, such as gasoline pumps, vacuum cleaners and menu/order boards, shall not extend nearer than twenty-five (25) feet to the street line. The site must have adequate stacking capacity for vehicles waiting to use these service features without impeding vehicular circulation or creating hazards to vehicular circulation on adjoining streets.

iv. *Car washes:* Car washes shall be designed to avoid the tracking of residual waters into the street.

v. *Major and minor gasoline service stations:* Only a minor gasoline service station shall be permitted on a lot abutting a residential zone, with the additional requirements that the hours of operation shall be limited to between 6:00 a.m. and 11:00 p.m., and no car wash shall be permitted.

vi. *Canopies:* Canopies associated with gas stations or other drive-through facilities shall meet the following requirements:

(a) The maximum height as measured to the underside of the canopy shall be fourteen feet, six inches (14'6").

(b) The maximum height of the canopy fascia shall be three feet, six inches (3'6").

(c) Canopies shall consist of a solid, neutral color field with no banding, striping or other graphics, except as permitted within the allowed sign area.

(d) Lighting shall comply with the applicable specifications contained in the City of Portland Technical and Design Standards and Guidelines.

3. That Section 14-229.11(1)h of the Portland City Code is hereby amended to read as follows:

Sec. 14-229.11. Permitted uses.

The following uses are permitted in the B-4 zone:

(1) *Business:*

h. Major and minor gasoline service stations, as defined in section 14-47. Canopies associated with major or minor gasoline service stations shall meet the following requirements:

(a) The maximum height as measured to the underside of the canopy shall be fourteen feet, six inches (14'6").

(b) The maximum height of the canopy fascia shall be three feet, six inches (3'6").

(c) Canopies shall consist of a solid, neutral color field with no banding, striping or other graphics, except as permitted within the allowed sign area.

(d) Lighting shall comply with the applicable specifications contained in the City of Portland Technical and Design Standards and Guidelines.

4. That section 14-230.2(1)(a) of the Portland City Code is hereby amended to read as follows:

Sec. 14-230.2. Conditional uses.

The following uses shall be permitted as conditional uses in the B-5 urban commercial mixed use zone, provided that, notwithstanding section 14-471(3), section 14-474(a), or any other

provision of this Code, the planning board shall be substituted for the board of appeals as the reviewing authority, and further provided that, in addition to the provisions of section 14-474(c)(2), they shall also meet the requirements set forth below:

(1) *Commercial:*

a. Automobile service stations and convenience stores with gasoline pumps provided that they are located at least two thousand (2,000) feet from other such uses. Canopies associated with such uses shall meet the following requirements:

1. The maximum height as measured to the underside of the canopy shall be fourteen feet, six inches (14'6").

2. The maximum height of the canopy fascia shall be three feet, six inches (3'6").

3. Canopies shall consist of a solid, neutral color field with no banding, striping or other graphics, except as permitted within the allowed sign area.

4. Lighting shall comply with the applicable specifications contained in the City of Portland Technical and Design Standards and Guidelines.

5. That Section 14-474(c)(2) of the Portland City Code is hereby amended to read as follows:

Sec. 14-474. Conditional uses.

Conditions for conditional uses:

(2) *Standards:* Upon a showing that a proposed use is a conditional use under this article, a conditional use permit shall be granted unless the board determines that:

a. ~~There are unique or distinctive characteristics or effects associated with the proposed conditional use;~~ The proposed use will not adversely affect the value of adjacent properties; or

b. ~~There will be an adverse impact upon the health, safety, or welfare of the public or the surrounding area; and~~ The conditional use sought will not

create nor aggravate a traffic hazard or a fire hazard.

~~c. Such impact differs substantially from the impact which would normally occur from such a use in that zone.~~

6. That Section 14-526(a)(9) of the Portland City Code is hereby amended to read as follows:

Sec. 14-526. Standards.

(a) *Requirements for approval.* The planning board or planning authority shall not approve a site plan unless it meets the following criteria:

(9) The provision for exterior lighting will not be hazardous to motorists traveling on adjacent public streets; is adequate for the safety of occupants or users of the site; and such lighting will not cause ~~significant annoyance,~~ glare or ~~undesirable~~ direct spill-over onto adjacent properties and complies with the applicable specifications of the City of Portland Technical and Design Standards and Guidelines;

significant

~~[dismantle replace]~~ 2 storage

~~October 2nd~~

minor notes:

the dispersal requirement in the B5 which was in previous draft — simply incorporated here

- What new draft does:

(1) changes definitions

minor gas stations - no more than 2 pump islands - 8 cars fueled - no car washes or vacuums - repair services allowed.

- Removes gas stations ~~from~~ conditional use — the weakness of that is avoided

~~B2 zone~~ In B2 & B5 - removes gas stations as conditional uses.

Gas stations allowed as permitted use (no longer conditional use)

However, only minor stations allowed where lot abuts residential zone.

- all Gas stations, regardless of their size, in the B2 and B5 zones are subject to major site plan review - P.B → public involvement

Site plan standards

(1) lighting standard revised — reference to Tech supp.

(2) conditional use standards now incorporated as part of site plan ordinance

2 new chapters

Technical supplementary:

① dealing specifically w/ gas stations
- canopy height, graphics, dimensions

② dealing w/ lighting, including

AMENDMENT TO PORTLAND CITY CODE
§§14-47, 14-182, 14-183, 14-230.1, 14-230.2 (ZONING ORDINANCE)
§§14-522, 14-526 (SITE PLAN ORDINANCE)
RE: GASOLINE SERVICE STATIONS IN THE B-2, B-4 AND B-5 ZONES

BE IT ORDAINED BY THE CITY COUNCIL OF THE CITY OF PORTLAND, MAINE IN CITY COUNCIL ASSEMBLED AS FOLLOWS:

1. That Section 14-47 of the Portland City Code is hereby amended as follows:

Sec. 14-47. Definitions.

Major gasoline service stations: A gasoline service station with more than ~~one (1)~~ two (2) pump islands or with a capacity to fuel more than eight (8) vehicles simultaneously or providing repair services including, but not limited to, tuneups, engine repair, brake work, muffler replacement, tire repair or similar activities.

Minor gasoline service stations: A gasoline service station with not more than ~~one (1)~~ two (2) pump islands~~, with a maximum of three (3) pumps~~, provided that no more than a total of eight (8) vehicles may be fueled simultaneously. Such stations shall not include car washes or vacuums. ~~with no~~ rRepair services shall be permitted, provided that there shall be no more than two (2) service bays.

2. That Section 14-182(2)m-o of the Portland City Code is hereby amended to read as follows:

Sec. 14-182. Permitted uses.

The following uses are permitted in the B-2 zone:

(2) *Business:*

m. Theaters and performance halls; ~~and~~

n. Hotels or motels of less than one hundred fifty (150) rooms; and

o. Major and minor gasoline service stations, as defined in section 14-47, provided that only a minor gasoline service station shall be permitted on a lot abutting a residential zone, ~~and no car~~

wash shall be permitted as part of a minor gasoline service station on a lot abutting a residential zone.

3. That section 14-183(1)a of the Portland City Code is hereby amended to read as follows:

Sec. 14-183. Conditional uses.

The following uses are permitted as provided in section 14-474 (conditional uses), if they meet the following requirements:

(1) *Business:*

a. ~~Major and minor gasoline stations, as defined in section 14-47~~ Reserved;

4. That section 14-230.1 (2) is hereby amended as follows:

Sec. 14-230.1. Permitted uses.

The following uses are permitted in the B-5 urban commercial mixed use zone:

(2) *Commercial:*

o. Lumber and building material dealers;

p. Major and minor gasoline service stations, as defined in section 14-47, provided that only a minor gasoline service station shall be permitted on a lot abutting a residential zone and that no car wash shall be permitted as part of a minor gasoline service station on a lot abutting a residential zone. Major and minor gasoline service stations shall be located at least two thousand (2,000) feet from each other.

5. That section 14-230.2(1)(a) of the Portland City Code is hereby amended to read as follows:

Sec. 14-230.2. Conditional uses.

The following uses shall be permitted as conditional uses in the B-5 urban commercial mixed use zone, provided that, notwithstanding section 14-471(3), section 14-474(a), or any other provision of this Code, the planning board shall be substituted for the board of appeals as the reviewing authority, and further provided that, in addition to the provisions of section 14-474(c)(2), they shall also meet the requirements set forth below:

(1) *Commercial:*

a. ~~Automobile service stations and convenience stores with gasoline pumps provided that they are located at least two thousand (2,000) feet from other such uses~~ Reserved.

6. That section 14-522 of the Portland City Code is hereby amended as follows:

Sec. 14-522. Definitions.

For the purposes of this article all terms and words shall have their ordinary meanings, except as defined herein.

Major development means and includes:

(5) The construction of any structure for industrial use which is more than forty-five (45) feet high; ~~or~~

(6) The addition of any additional dwelling unit to a building initially reviewed as a two-family dwelling or not previously reviewed under this article; or

(7) The construction of any new major or minor gasoline service station in the B-2 or B-5 zone, or the construction of any new major or minor gasoline service station with a structure greater than ten thousand (10,000) square feet of building area in any other permitted zone.

Minor development means and includes any of the following unless (1) the development is major development; or (2) the development is single family development subject to the provisions of section 14-524(b):

(14) The construction of any new major or minor gasoline service station with a structure of less than ten thousand (10,000) square feet of building area in any permitted zone other than the B-2 or B-5 zones.

7. That Section 14-526(a)(9) of the Portland City Code is hereby amended to read as follows and a new subsection (25) is hereby enacted, said subsection to read as follows:

Sec. 14-526. Standards.

(a) *Requirements for approval.* The planning board or planning authority shall not approve a site plan unless it meets the following criteria:

(9) The provision for exterior lighting will not be hazardous to motorists traveling on adjacent public streets; is adequate for the safety of occupants or users of the site; and such lighting will not cause ~~significant annoyance,~~ significant glare or ~~undesirable~~ direct spill-over onto adjacent properties and complies with the applicable specifications of the City of Portland Technical and Design Standards and Guidelines;

(25) All major or minor gasoline service stations shall meet the following requirements:

a. *Signs:* Signs shall not adversely affect visibility at intersections or access drives. Such signs shall be constructed, installed and maintained so as to ensure the safety of the public. Such signs shall advertise only services or goods available on the premises.

b. *Circulation:* No ingress and egress driveways shall be located within thirty (30) feet from an intersection. No entrance or exit for vehicles shall be in such proximity to a playground, school, church, other places of public assembly, or any residential zone that the nearness poses a threat or potential danger to the safety of the public.

c. *Drive-up features:* Drive-up features, such as gasoline pumps, vacuum cleaners and menu/order boards, shall not extend nearer than twenty-five (25) feet to the street line. The site must have adequate stacking capacity for vehicles waiting to use these service features without impeding vehicular circulation or creating hazards to vehicular circulation on adjoining streets.

d. *Car washes:* Car washes shall be designed to avoid the tracking of residual waters into the street.

e. Canopies: refer to Tech Subm Standards

8/1/96

if it's in tech supplement P.B. can waive!

check

also if site plan standard →

for Tech Supplement

Sec. 14-525 i.

P.B. may vary or modify

- break out conditional use standards for new

not just for gas stations - any drive-through's

- canopy, light, etc - put in site plan ordinance technical supplement?

Delete entry for back-up material

- can have altogether

Tech supplement

no car washes

only zoning

Everything as a permitted use - Mini stations only next to residential zones

mini gas stations subject to major site plan review in B2 & B5

shoot for 9/4 - 1st reading
9/16 - public hearing

have canopy language

Deb -
did you pay this
out of last year's
HP budget?

Bartlett Design
LIGHTING & ELECTRICAL ENGINEERING
1 FRONT STREET P.O. BOX 230 BATH, MAINE 04530
TEL (207) 443-5447 FAX (207) 443-5560

INVOICE FOR SERVICES

INVOICE NO: 960017-03

DATE: 7/3/96

TO: Alex Jaegerman
Planning and Urban Development Dept.
389 Congree Street
Portland, Maine 04101

PROJECT: Exterior Lighting Review - Service Station Canopies
PROJ. NO: 96-0017

Task					Amount
Planning Board Meeting					
	Engineering Hours	Hrs@	$55.00	Per Hr.	$0.00
Project Design					
	Engineering Hours	Hrs@	$55.00	Per Hr.	$0.00
Expenses					$0.00

Deb -
Paid OK
5/31/96
Deb

Debbie - this was to have been paid out of FY '95-96 HP budget - did I give you the $ for invoice?

Amount	$0.00
Amount Previously Invoiced	$778.53
Amount Due This Invoice	**$778.53**

LEB LEB

Deb-
did you pay this
out of last year's
HP budget?

Bartlett Design
LIGHTING & ELECTRICAL ENGINEERING
1 FRONT STREET P.O. BOX 230 BATH, MAINE 04530
TEL (207) 443-5447 FAX (207) 443-5560

INVOICE FOR SERVICES

INVOICE NO: 960017-03

DATE: 7/3/96

TO: Alex Jaegerman
Planning and Urban Development Dept.
389 Congree Street
Portland, Maine 04101

PROJECT: Exterior Lighting Review - Service Station Canopies
PROJ. NO: 96-0017

Task					Amount
Planning Board Meeting					
	Engineering Hours	Hrs@	$55.00	Per Hr.	$0.00
Project Design					
	Engineering Hours	Hrs@	$55.00	Per Hr.	$0.00
Expenses					$0.00

Amount	$0.00
Amount Previously Invoiced	$778.53
Amount Due This Invoice	**$778.53**

LEB LEB

Attachment 1

14-183MR.004
03.08.96

AMENDMENT TO PORTLAND CITY CODE
§§14-47, 14-183, 14-229.11, 14-230.2, 14-474 (ZONING ORDINANCE)
RE: GASOLINE SERVICE STATIONS IN THE B-2, B-4 AND B-5 ZONES

BE IT ORDAINED BY THE CITY COUNCIL OF THE CITY OF PORTLAND, MAINE IN CITY COUNCIL ASSEMBLED AS FOLLOWS:

1. That Section 14-47 of the Portland City Code is hereby amended as follows:

Sec. 14-47. Definitions.

Major gasoline service stations: A gasoline service station with more than ~~one (1)~~ two (2)pump islands or with a capacity to fuel more than eight (8) vehicles simultaneously or providing repair services including, but not limited to, tuneups, engine repair, brake work, muffler replacement, tire repair or similar activities.

Minor gasoline service stations: A gasoline service station with not more than ~~one (1)~~ two (2)pump islands~~, with a maximum of three (3) pumps~~, provided that no more than a total of eight (8) vehicles may be fueled simultaneously. Such stations shall not include car washes or vacuums. ~~with no~~ rRepair services shall be permitted, provided that there shall be no more than two (2) service bays.

2. That Section 14-183(1) of the Portland City Code is hereby amended to read as follows:

Sec. 14-183. Conditional uses.

The following uses are permitted as provided in section 140474 (conditional uses), if they meet the following requirements:

(1) *Business:*

a. Major and minor gasoline service stations, as defined in section 14-47;

b. Car washes;

c. Automobile dealerships; and

d. Drive-in or drive-through restaurants.

In addition to approval by the planning board or the planning authority with respect to the requirements of article V (site plan), these uses shall comply with the following conditions and standards in addition to the provisions of section 14-474:

i. *Signs:* Signs shall not adversely affect visibility at intersections or access drives. Such signs shall be constructed, installed and maintained so as to ensure the safety of the public. Such signs shall advertise only services or goods available on the premises.

ii. *Circulation:* No ingress and egress driveways shall be located within thirty (30) feet from an intersection. No entrance or exit for vehicles shall be in such proximity to a playground, school, church, other places of public assembly, or any residential zone that the nearness poses a threat or potential danger to the safety of the public.

iii. *Drive-up features:* Drive-up features, such as gasoline pumps, vacuum cleaners and menu/order boards, shall not extend nearer than twenty-five (25) feet to the street line. The site must have adequate stacking capacity for vehicles waiting to use these service features without impeding vehicular circulation or creating hazards to vehicular circulation on adjoining streets.

iv. *Car washes:* Car washes shall be designed to avoid the tracking of residual waters into the street.

v. *Major and minor gasoline service stations:* Only a minor gasoline service station shall be permitted on a lot abutting a residential zone, with the additional requirements that the hours of operation shall be limited to between 6:00 a.m. and 11:00 p.m., and no car wash shall be permitted.

vi. *Canopies:* Canopies associated with gas stations or other drive-through facilities shall meet the following requirements:

(a) The maximum height as measured to the underside of the canopy shall be fourteen feet, six inches (14'6").

(b) The maximum height of the canopy fascia shall be three feet, six inches (3'6").

(c) Canopies shall consist of a solid, neutral color field with no banding, striping or other graphics, except as permitted within the allowed sign area.

(d) Lighting shall comply with the applicable specifications contained in the City of Portland Technical and Design Standards and Guidelines.

3. That Section 14-229.11(1)h of the Portland City Code is hereby amended to read as follows:

Sec. 14-229.11. Permitted uses.

The following uses are permitted in the B-4 zone:

(1) *Business:*

h. Major and minor gasoline service stations, as defined in section 14-47. Canopies associated with major or minor gasoline service stations shall meet the following requirements:

(a) The maximum height as measured to the underside of the canopy shall be fourteen feet, six inches (14'6").

(b) The maximum height of the canopy fascia shall be three feet, six inches (3'6").

(c) Canopies shall consist of a solid, neutral color field with no banding, striping or other graphics, except as permitted within the allowed sign area.

(d) Lighting shall comply with the applicable specifications contained in the City of Portland Technical and Design Standards and Guidelines.

4. That section 14-230.2(1)(a) of the Portland City Code is hereby amended to read as follows:

Sec. 14-230.2. Conditional uses.

The following uses shall be permitted as conditional uses in the B-5 urban commercial mixed use zone, provided that, notwithstanding section 14-471(3), section 14-474(a), or any other

Attachment 2

Note: Underlined sections indicate revisions to previous draft.

(Proposed)
SECTION VIX
SITE LIGHTING STANDARDS

1. INTENTION

These standards are intended to provide for safe and adequate site lighting for proposed developments which meets the needs of the proposed use but does not create unsafe or unpleasant conditions which adversely affect surrounding properties. The following standards attempt to prevent 1) higher than necessary illuminance levels which create a sense of incompatibility with neighboring properties; 2) uncontrolled light source brightness which creates glare; and 3) improperly aimed/installed lights which cause light trespass onto neighboring properties.

2. GENERAL STANDARDS

The provision for exterior lighting shall be adequate for the safety of occupants or users of the site but shall not cause glare or direct spillover to adjacent properties or create visual distraction to motorists traveling on adjacent streets. Unless otherwise specified below, light levels shall not exceed the Illuminating Engineering Society of North America (IESNA) recommended average lighting levels for the use, with maximum levels not exceeding three (3) times the recommended average level.

Except in limited decorative lighting applications (e.g. post-top lanterns in a park setting), fixtures shall be of a "cut off" type, where ~~the~~ lenses, refractors, reflectors or lamp sources do not extend below the surface of the fixture housing itself and no direct light shall be directed at or above the horizontal plane. Mounting heights of all fixtures shall be the minimum necessary to meet the need. The use of directional floodlights shall not be permitted. Wherever practicable, lighting installations shall include timers, dimmers and/or sensors to reduce overall energy consumption and eliminate unneeded lighting.

3. STANDARDS FOR SPECIFIC USES

A. Gasoline Service Stations

1. General Requirement for Canopy Lighting at all Gas Stations: Lighting fixtures shall be fully recessed and shall be located on the underside of the canopy with no part of the fixture extending below the surface of the underside of the canopy. There shall be no internal or external lighting of the canopy fascia, except within the permitted sign area.

2. Illuminance Levels

a. Minor Gasoline Service Stations, including those abutting residential zones. Illuminance levels shall not exceed the following:

Approaches and Drives:	1.5 FC average 3:1 average-to-minimum uniformity ratio 3.0 FC maximum
Service Areas:	3.0 FC average 3:1 average-to-minimum uniformity ratio 6.0 FC maximum
Pump Island Areas:	20 FC average 3:1 average-to-minimum uniformity ratio 40 FC maximum

b. Major Gasoline Service Stations
Illuminance levels shall not exceed the following:

Approaches and Drives:	3.0 FC average 3:1 average-to-minimum uniformity ratio 9.0 FC maximum
Service Areas:	7.0 FC average 3:1 average-to-minimum uniformity ratio 21 FC maximum
Pump Island Areas:	30 FC average 3:1 average-to-minimum uniformity ratio 90 FC maximum

B. Parking Lot Lighting

C. Aprons/Canopies

D. Lighting of Exterior Sales Area

E. Security Lighting

(Standards for these Categories to be developed at a later date)

CITY OF PORTLAND, MAINE
MEMORANDUM

TO: Interested Parties

FROM: Alexander Jaegerman, Chief Planner AJ

DATE: May 14, 1996

SUBJECT: Proposed Amendments to Portland's Zoning and Site Plan Ordinances which would Regulate the Development of Gasoline Service Stations

On Tuesday, May 14, the Portland Planning Board will consider a series of zoning and site plan ordinance text amendments which would affect the development of gasoline service stations in Portland's B-2, B-4 and B-5 zones. The majority of the amendments address gas stations in the B-2 zone where the subject lot directly abuts a residential zone. The proposed amendments address the scale and hours of operation, the physical characteristics of the canopy and lighting at the station.

Enclosed for your information are the proposed revisions. Please note that the regulations do not affect existing stations; only future developments or redevelopments would be subject to the new regulations.

The Board will hold a public hearing on the proposed amendments at 7:00 pm in Room 209 of Portland City Hall. If you cannot attend the meeting, but would like to submit comments, please address them to the attention of Joseph E. Gray, Jr., Director of Planning and Urban Development, Portland City Hall, 389 Congress Street, Portland, Maine 04101. (Fax# 874-8716.) If you have questions about the proposed amendments, call Deborah Andrews, Senior Planner, 874-8300 ext. 8726.

Please also note that the Planning Board's action will be in the form of a recommendation to the City Council. You will be notified well in advance of the City Council's deliberations on this matter and will have an additional opportunity to comment then.

Owen Wells –

This was sent to Irving Oil's headquarters in So. Portland last week – thought you'd be interested in receiving a copy

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PLANNING BOARD REPORT #22-96

PROPOSED ZONING AND SITE PLAN AMENDMENTS TO REGULATE GAS STATIONS

AND

PROPOSED REVISED CONDITIONAL USE STANDARDS

COUNCILOR THOMAS KANE, APPLICANT

Submitted to:

Portland Planning Board
Portland, Maine

May 14, 1996

I. INTRODUCTION

Councilor Kane has requested that a series of zoning and site plan ordinance text amendments be developed which would more effectively address the impacts of gas stations in the B-2 zone where the lot directly abuts a residential zone. Mr. Kane's request has also prompted a review of the general conditional use standards included in Sec. 14-474 of the Land Use Code. Planning and Corporation Counsel suggest that the conditional use standards also be revised at this time because their current lack of specificity provides little guidance to the Zoning Board of Appeals and Planning Board when determining whether a proposed conditional use (including gas stations in the B-2 zones) will have measurable negative impacts.

In reviewing the issue of gas stations and their physical impacts, the Planning Board felt it was appropriate to extend the exercise to introduce some additional controls over gas stations in strictly commercial contexts -- in the B-2 zone where there are no residential abutters and in the B-4 and B-5 zones as well. While not as comprehensive as the regulations proposed for stations abutting residential uses, the drafted provisions would address site lighting as well as the physical characteristics of a station's canopy at stations in all of Portland's commercial zones.

Enclosed as Attachment 1 is a compilation of the proposed site plan and zoning text amendments. Attachment 2 is a proposed new section to be added to the Technical Supplement which would provide detailed standards for site lighting. Attachment 3 is a report with recommendations by lighting engineer, Larry Bartlett.

Notice of the public hearing appeared in the May 6th and May 7th editions of the Portland Press Herald. Representatives of the major gas and oil distributors were also notified of the proposed amendments.

II. BACKGROUND:

In February, Councilor Kane appeared before the Planning Board to discuss his concerns about the impacts of gas stations where they abut residential neighborhoods and to request that additional review criteria be developed which would better control these impacts. In recent years, as the nature of gasoline retailing has changed, the potential for conflict with surrounding residential development has changed as well. Not only have the number of pumps increased at many stations, but stations also now commonly feature any number of accessory operations, including a convenience store, car wash, vacuums, repair garage, etc. With these added services and with increased competition, the hours of operation have increased as well. Where canopies were once reserved for only the largest operations, now they are a standard feature at most stations. Their height, their visual character, and their use as additional signage for the station often combine to dominate or overwhelm the prevailing scale and character of neighborhood. Lighting of gas stations has also intensified dramatically in recent years, as retailers seek every available means to draw customers to their station. Finally, several of the most recent gas station proposals have entailed the assembly of several contiguous lots. The very lot size of the resulting "super station" is often at dramatic odds with the existing development pattern in an area.

In assessing the existing review criteria which apply to gas stations, it became clear that there was no distinction made between B-2 stations located in a purely commercial context and those which abut a

residential zone. It also became clear that several key features of a station -- its canopy and site lighting, in particular -- were inadequately addressed, if at all, in the current standards. The current standards do not address the variety and number of functions which are typically featured in newer stations, nor the hours of operation.

The inadequacy of the current general conditional use standards (Sec 14-474 of the zoning ordinance) was also brought to light during this exercise. Gas stations, among several other uses, are a conditional use in the B-2 zone. The vague language and lack of specificity in the current standards provides little guidance to the Zoning Board of Appeals and the Planning Board when determining whether a proposed conditional use will have negative impacts. It was felt that this would be an appropriate time to revise the conditional use standards to provide more definite, measurable criteria.

Finally, the issue of controlling lighting at gas stations has raised the question of the adequacy of the site plan ordinance's current lighting standard. It was felt that a general standard in the site plan ordinance was insufficient to deal with this increasingly complex technical issue and that this would be a good opportunity to add a new chapter to the City's Technical Supplement which provides specifications for site lighting. While the enclosed draft chapter is far from complete, it provide much improved general standards and specific standards for gas station lighting. In the future, lighting specifications for other developments, such as parking lots, can be added.

III. REVIEW PROCESS

Over the course of the spring, the Board held three workshops on this topic. Staff presented slides of a wide variety of gas stations in Portland, particularly those abutting residential areas, to familiarize Board members with the issues and to begin to identify those physical and functional characteristics which can be problematic where gas stations are located adjacent to residential neighborhoods. The Board also spent a considerable amount of time discussing effective site lighting controls. Lighting consultant, Larry Bartlett, was retained to make recommendations for lighting standards for gas stations. The enclosed amendments, therefore, reflect considerable discussion and professional input.

IV. PROPOSED AMENDMENTS

A. Site Plan and Zoning Amendments Regarding Gas Stations

The enclosed amendments accomplish the following:

* In the B-2 zone, where a lot directly abuts a residential zone, only minor gas stations are allowed;

* The definition for minor gas stations has been amended to allow no more than 2 pump islands or a maximum of 8 vehicles served at one time. (Here the language was made more liberal than the current definition which allows no more than 1 pump island.) The new definition prohibits car washes or vacuums at minor stations, but allows repair services, provided there are no more than 2 services bays. (Repair services are not allowed under the current definition);

* The hours of operation for stations abutting a residential zone are limited to between 6:00 am and 11:00 pm; and

* Gas station canopies (and those associated with other drive-through facilities as well) are now limited as follows:

  - the height to the underside of the canopy shall not exceed 14' 6";
  - the height of the canopy facia itself shall not exceed 3' 6";
  - the canopies shall consist of a solid, neutral color field and distinguishing banding or graphics shall be limited to the allowable sign area; and
  - canopy lighting shall conform with the applicable Technical and Design Standards for such -- a proposed new lighting section will be added to the Technical Supplement.

It should be noted that, for advertising purposes, the Board requested that the canopy standards apply to all business zones where gas stations are allowed as permitted or conditional uses, including the B-2, B-4 and B-5 zones.

B. Revised Conditional Use Standards

The current general conditional use standards in Sec. 14-474 of the zoning ordinance are to be replaced altogether with two standards which are more definite and measurable. These standards, which are recommended by Corporation Counsel, are currently used in Cape Elizabeth and Windham and have withstood court challenge. The proposed standards are as follows:

a) The proposed use will not adversely affect the value of adjacent properties; or

b) The conditional use sought will not create nor aggravate a traffic hazard or a fire hazard.

C. Revised Lighting Standards

It became clear during the course of discussion on gas station lighting that a general lighting standard in the site plan ordinance could not adequately address this increasingly complex topic nor ensure lighting solutions which were appropriate to specific circumstances. This is the case not only for gas stations but for all developments subject to site plan review. Therefore the decision was made to remove the vague language in the current site plan lighting standard and to reference the more detailed lighting specifications included in a proposed new chapter of the City of Portland's Technical and Design Standards and Guidelines. With the assistance of lighting engineer, Larry Bartlett, a draft section for the Technical Supplement was prepared which includes both general lighting standards and a more detailed section on gas station lighting. In the future, similar detailed lighting standards will be developed for parking lots, security lighting, etc.

A copy of Mr. Bartlett's report is enclosed as Attachment 3 -- see especially Section 3 of his report for his recommendations on review standards. Mr. Bartlett will also be available on Tuesday to answer questions from the Board.

Briefly, the proposed lighting standards address the numerous lighting design criteria which affect our perception of acceptable or unacceptable lighting conditions. By regulating 1) fixture type, 2) fixture placement, and 3) illuminance levels (average, maximum and average-to-minimum uniformity ratio's), a community is in a good position to effectively regulate site lighting.

The Board will note that the proposed gas station lighting standards make a distinction between minor gas stations and major gas stations. For example, canopy lighting at minor gas stations is limited to a 20-foot candle average and the maximum is set at a 2x factor, whereas major stations are allowed a 30-foot candle average and a 3x maximum.

It should be noted that Mr. Bartlett suggests that any effective lighting standard include specific authorization for the Planning Board to place conditions of approval beyond those included in the general performance standards in order to address the unique circumstances of a site. As the site plan ordinance already provides for that authority (for lighting or any other aspects of development) under Sec. 14-526(b), additional language for the Technical Supplement was not drafted.

V. MOTIONS FOR THE BOARD TO CONSIDER

On the basis of findings and information presented in Planning Report #22-96, the Board finds:

1. that the proposed zoning and site plan amendments, including revised conditional use standards, are consistent with the City of Portland's Comprehensive Plan and therefore recommends to the City Council that they be adopted.

2. that the addition of a new section to the City of Portland's Technical and Design Standards and Guidelines which addresses site lighting is consistent with the Comprehensive Plan and therefore should be adopted.

Attachments:

1. Proposed Text Amendments
2. Proposed Lighting Section for Technical Supplement
3. Report from Larry Bartlett

Attachment 1

14-183MR.004
03.08.96

AMENDMENT TO PORTLAND CITY CODE
§§14-47, 14-183, 14-229.11, 14-230.2, 14-474 (ZONING ORDINANCE)
RE: GASOLINE SERVICE STATIONS IN THE B-2, B-4 AND B-5 ZONES

BE IT ORDAINED BY THE CITY COUNCIL OF THE CITY OF PORTLAND, MAINE IN CITY COUNCIL ASSEMBLED AS FOLLOWS:

1. That Section 14-47 of the Portland City Code is hereby amended as follows:

Sec. 14-47. Definitions.

Major gasoline service stations: A gasoline service station with more than ~~one (1)~~ two (2)pump islands or with a capacity to fuel more than eight (8) vehicles simultaneously or providing repair services including, but not limited to, tuneups, engine repair, brake work, muffler replacement, tire repair or similar activities.

Minor gasoline service stations: A gasoline service station with not more than ~~one (1)~~ two (2)pump islands~~, with a maximum of three (3) pumps~~, provided that no more than a total of eight (8) vehicles may be fueled simultaneously. Such stations shall not include car washes or vacuums. ~~with no r~~Repair services shall be permitted, provided that there shall be no more than two (2) service bays.

2. That Section 14-183(1) of the Portland City Code is hereby amended to read as follows:

Sec. 14-183. Conditional uses.

The following uses are permitted as provided in section 140474 (conditional uses), if they meet the following requirements:

(1) *Business:*

a. Major and minor gasoline service stations, as defined in section 14-47;

b. Car washes;

c. Automobile dealerships; and

d. Drive-in or drive-through restaurants.

In addition to approval by the planning board or the planning authority with respect to the requirements of article V (site plan), these uses shall comply with the following conditions and standards in addition to the provisions of section 14-474:

i. *Signs:* Signs shall not adversely affect visibility at intersections or access drives. Such signs shall be constructed, installed and maintained so as to ensure the safety of the public. Such signs shall advertise only services or goods available on the premises.

ii. *Circulation:* No ingress and egress driveways shall be located within thirty (30) feet from an intersection. No entrance or exit for vehicles shall be in such proximity to a playground, school, church, other places of public assembly, or any residential zone that the nearness poses a threat or potential danger to the safety of the public.

iii. *Drive-up features:* Drive-up features, such as gasoline pumps, vacuum cleaners and menu/order boards, shall not extend nearer than twenty-five (25) feet to the street line. The site must have adequate stacking capacity for vehicles waiting to use these service features without impeding vehicular circulation or creating hazards to vehicular circulation on adjoining streets.

iv. *Car washes:* Car washes shall be designed to avoid the tracking of residual waters into the street.

v. *Major and minor gasoline service stations:* Only a minor gasoline service station shall be permitted on a lot abutting a residential zone, with the additional requirements that the hours of operation shall be limited to between 6:00 a.m. and 11:00 p.m., and no car wash shall be permitted.

vi. *Canopies:* Canopies associated with gas stations or other drive-through facilities shall meet the following requirements:

(a) The maximum height as measured to the underside of the canopy shall be fourteen feet, six inches (14'6").

(b) The maximum height of the canopy fascia shall be three feet, six inches (3'6").

(c) Canopies shall consist of a solid, neutral color field with no banding, striping or other graphics, except as permitted within the allowed sign area.

(d) Lighting shall comply with the applicable specifications contained in the City of Portland Technical and Design Standards and Guidelines.

3. That Section 14-229.11(1)h of the Portland City Code is hereby amended to read as follows:

Sec. 14-229.11. Permitted uses.

The following uses are permitted in the B-4 zone:

(1) *Business:*

h. Major and minor gasoline service stations, as defined in section 14-47. Canopies associated with major or minor gasoline service stations shall meet the following requirements:

(a) The maximum height as measured to the underside of the canopy shall be fourteen feet, six inches (14'6").

(b) The maximum height of the canopy fascia shall be three feet, six inches (3'6").

(c) Canopies shall consist of a solid, neutral color field with no banding, striping or other graphics, except as permitted within the allowed sign area.

(d) Lighting shall comply with the applicable specifications contained in the City of Portland Technical and Design Standards and Guidelines.

4. That section 14-230.2(1)(a) of the Portland City Code is hereby amended to read as follows:

Sec. 14-230.2. Conditional uses.

The following uses shall be permitted as conditional uses in the B-5 urban commercial mixed use zone, provided that, notwithstanding section 14-471(3), section 14-474(a), or any other

provision of this Code, the planning board shall be substituted for the board of appeals as the reviewing authority, and further provided that, in addition to the provisions of section 14-474(c)(2), they shall also meet the requirements set forth below:

(1) *Commercial:*

a. Automobile service stations and convenience stores with gasoline pumps provided that they are located at least two thousand (2,000) feet from other such uses. Canopies associated with such uses shall meet the following requirements:

1. The maximum height as measured to the underside of the canopy shall be fourteen feet, six inches (14'6").

2. The maximum height of the canopy fascia shall be three feet, six inches (3'6").

3. Canopies shall consist of a solid, neutral color field with no banding, striping or other graphics, except as permitted within the allowed sign area.

4. Lighting shall comply with the applicable specifications contained in the City of Portland Technical and Design Standards and Guidelines.

5. That Section 14-474(c)(2) of the Portland City Code is hereby amended to read as follows:

Sec. 14-474. Conditional uses.

Conditions for conditional uses:

(2) *Standards:* Upon a showing that a proposed use is a conditional use under this article, a conditional use permit shall be granted unless the board determines that:

a. ~~There are unique or distinctive characteristics or effects associated with the proposed conditional use;~~ The proposed use will not adversely affect the value of adjacent properties; or

b. ~~There will be an adverse impact upon the health, safety, or welfare of the public or the surrounding area; and~~ The conditional use sought will not

create nor aggravate a traffic hazard or a fire hazard.

~~c. Such impact differs substantially from the impact which would normally occur from such a use in that zone.~~

6. That Section 14-526(a)(9) of the Portland City Code is hereby amended to read as follows:

Sec. 14-526. Standards.

(a) *Requirements for approval.* The planning board or planning authority shall not approve a site plan unless it meets the following criteria:

(9) The provision for exterior lighting will not be hazardous to motorists traveling on adjacent public streets; is adequate for the safety of occupants or users of the site; and such lighting will not cause ~~significant annoyance,~~ glare or ~~undesirable~~ direct spill-over onto adjacent properties and complies with the applicable specifications of the City of Portland Technical and Design Standards and Guidelines;

Attachment 2

Note: Underlined sections indicate revisions to previous draft.

(Proposed)
SECTION VIX
SITE LIGHTING STANDARDS

1. INTENTION

These standards are intended to provide for safe and adequate site lighting for proposed developments which meets the needs of the proposed use but does not create unsafe or unpleasant conditions which adversely affect surrounding properties. The following standards attempt to prevent 1) high than necessary illuminance levels which create a sense of incompatibility with neighboring properties; 2) uncontrolled light source brightness which creates glare; and 3) improperly aimed/installed lights which cause light trespass onto neighboring properties.

2. GENERAL STANDARDS

The provision for exterior lighting shall be adequate for the safety of occupants or users of the site but shall not cause glare or direct spillover to adjacent properties or create visual distraction to motorists traveling on adjacent streets. Unless otherwise specified below, light levels shall not exceed the Illuminating Engineering Society of North America (IESNA) recommended average lighting levels for the sue, with maximum levels not exceeding three (3) times the recommended average level.

Except in limited decorative lighting applications (e.g. post-top lanterns in a park setting), fixtures shall be of a "cut off" type, where ~~the~~ lenses, refractors, reflectors or lamp sources do not extend below the surface of the fixture housing itself and no direct light shall be directed at or above the horizontal plane. Mounting heights of all fixtures shall be the minimum necessary to meet the need. The use of directional floodlights shall not be permitted. Wherever practicable, lighting installations shall include timers, dimmers and/or sensors to reduce overall energy consumption and eliminate unneeded lighting.

3. STANDARDS FOR SPECIFIC USES

A. Gasoline Service Stations

1. General Requirement for Canopy Lighting at all Gas Stations: Lighting fixtures shall be fully recessed and shall be located on the underside of the canopy with no part of the fixture extending below the surface of the underside of the canopy. There shall be no internal or external lighting of the canopy fascia, except within the permitted sign area.

2. Illuminance Levels

a. Minor Gasoline Service Stations, including those abutting residential zones. Illuminance levels shall not exceed the following:

Approaches and Drives:	1.5 FC average 3:1 average-to-minimum uniformity ratio 3.0 FC maximum
Service Areas:	3.0 FC average 3:1 average-to-minimum uniformity ratio 6.0 FC maximum
Pump Island Areas:	20 FC average 3:1 average-to-minimum uniformity ratio 40 FC maximum

b. Major Gasoline Service Stations
Illuminance levels shall not exceed the following:

Approaches and Drives:	3.0 FC average 3:1 average-to-minimum uniformity ratio 9.0 FC maximum
Service Areas:	7.0 FC average 3:1 average-to-minimum uniformity ratio 21 FC maximum
Pump Island Areas:	30 FC average 3:1 average-to-minimum uniformity ratio 90 FC maximum

B. Parking Lot Lighting

C. Aprons/Canopies

D. Lighting of Exterior Sales Area

E. Security Lighting

(Standards for these Categories to be developed at a later date)

Attachment 3

Bartlett Design
LIGHTING & ELECTRICAL ENGINEERING
1 FRONT STREET P.O. BOX 230 BATH, MAINE 04530
TEL (207) 443-5447 FAX (207) 443-5560

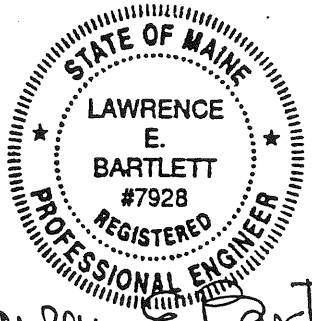
REPORT ON SERVICE STATION CANOPY LIGHTING

Submitted to the City of Portland
Department of Planning & Urban Development

April 22, 1996

Prepared By:

Lawrence E. Bartlett, PE, RA



Lawrence E. Bartlett

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There is a growing number of people in many municipalities calling for stricter controls to be established for outdoor lighting of non-residential properties. In many cases, their concern is based in the opinion that increasing amounts of sky brightness (also known as astronomic light pollution) as well as light trespass (light being directed beyond property lines) are infringements on personal and property rights. Groups such as the *International Dark-Sky Association* and the *New England Light Pollution Advisory Group* suggest that the over-lighting of outdoor sites in recent years has greatly diminished the nighttime experience, and that if left uncontrolled, exterior lighting will eventually eliminate any possibility of viewing stars in the night sky.

There has been a significant increase of outside illuminance from site lighting over the past few years. There are at least three reasons to account for this trend:

Number of Lighted Properties
Recent years have seen a increase in the number of non-residential properties which are being lighted. This is not only due to an increase of developed land, but it is also a result of an increased pressure to address safety. Many parking areas are now regulated by local law to include site lighting to assure personnel safety at night.

Improved Technology
The design of light sources has been greatly improved through advances in technology such that light can now be provided at higher levels for lesser operating costs than were previously possible.

Economic Pressures
Economic pressures of the slow economy have led to an increased level of business competition. Many businesses attract customers at night by means of being noticed above and beyond their competition. High levels of light at night are seen by some as a way of meeting this need.

Of these three contributing factors, the last is probably the most significant to consider in the evaluation of service station canopy lighting. There is however, a need for municipalities to balance this desire to use nighttime lighting as a business technique to attract customers, with the desire of residential property owners to maintain nighttime darkness.

Lighting Factors

There are several potential causes of objectionable service station lighting. In general however, two factors are root causes: improper *illuminance* levels, and/or improper *luminance* levels. Illuminance is a measure of light received at a surface. It is easily quantified by any simple light meter, in units termed footcandles. Illuminance, however, is not seen by the human eye. The eye only sees light when it is reflected off surfaces. As such, it is called luminance (often though of as "brightness"). Measuring luminance requires the use of a sophisticated type of light meter, and is recorded in units termed candela/ft^2. It is therefor necessary to consider both illuminance as well as luminance in the assessment of the overall quality of a service station canopy lighting solution.

Illuminance Standards

The Illuminating Engineering Society of North America (IESNA) has published recommendations for illuminance levels at service stations. These standards are included in the 8th edition of the *IESNA Lighting Handbook*, published in 1993. The standards include at table of recommended illuminance levels that is divided into two sections: recommendations for stations located in dark surroundings, and stations located in light surroundings:

	Recommended Illuminance In Footcandles
Dark Surroundings	
Approach	1.5
Driveway	1.5
Pump Island Area	20.0
Building Faces	10.0*
Service Areas	3.0
Landscape Highlights	2.0
Light Surroundings	
Approach	3.0
Driveway	5.0
Pump Island Area	30.0
Building Faces	30.0*
Service Areas	7.0
Landscape Highlights	5.0

* Vertical Illuminance

Recent experience has shown that many oil dealers and other owners of service stations have set targets for canopy illuminance in the range of 80 - 100 footcandles at the pavement. This is undoubtedly a reflection of a desire to produce a high nighttime profile to potential customers in vehicles on the street.

Luminance Standards

The IESNA recommendations include the statement: "*Illuminance selection, based upon visual performance, is only one lighting design criterion to be considered. There are many applications where other design criteria...are more important to successful lighting design.*"

Considering the fact that the human eye "sees" brightness (luminance), not illuminance, illuminance standards alone are not sufficient in establishing an acceptable guideline for lighting design. Unfortunately, there currently is no numeric standard relating to brightness relative to site lighting at service stations. The control of brightness however, is an equally important consideration to that of achieving proper illuminance levels, and accordingly it should not be ignored. Specifically, brightness should be considered in terms of:

- Lighting fixture brightness
- Reflected brightness of surfaces
- Overall ambient brightness of site

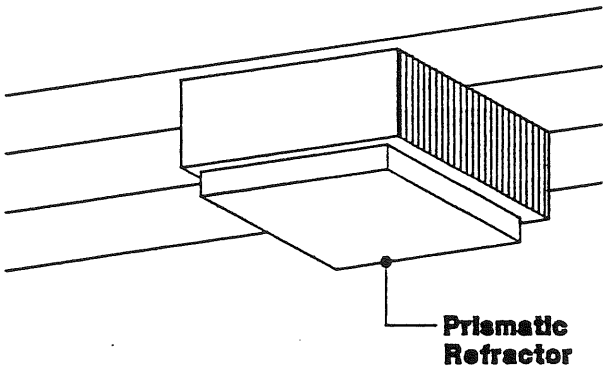
Excessive brightness seen from lighting fixtures can be a cause of distraction and/or disability glare. Both of these types of glare result from an extreme brightness which is located in the normal field of view. Distraction glare causes viewers to be momentarily distracted from their primary task, such as concentrating on driving when traveling by a service station. Disability glare reduces visibility by lowering contrast. An extremely bright light makes it difficult to see beyond the light because the contrast between the task (seeing people and objects) and the background is eliminated.

High levels of reflected brightness off surfaces can significantly contribute to astronomic light pollution. Light which strikes a vertical surface, such as a service station building wall, tends to be reflected in all directions, and accordingly, only partly serves the useful purpose of lighting parking, drive and pump areas. The remainder is usually reflected upwards toward the sky or adjacent properties.

Intense overall brightness of a service station site is often thought to be desirable by owners as an effective means of advertisement. This is not always as effective a means of calling attention to what is important as is a more carefully controlled lighting solution (for example, see description of existing conditions at the Forest Street Mobile Station in Section 2, page 5). Service stations which are lighted to extreme levels of brightness across the site or under canopies can be incompatible with the character of adjacent properties. This can be particularly true when service stations abut residential districts.

Lighting Fixtures

A majority of service station canopies include surface mounted lighting fixtures, consisting of rectangular sheet metal housings with a dropped, prismatic diffusers. The dropped refractor directs light downward toward the pump island(s), as well as upward toward the underside of the canopy ceiling. By directly lighting the canopy underside, the overall brightness of the canopy area is significantly increased. Most canopy installations include metal halide type lamps which produce a white light (some stations however utilize high pressure sodium lamps which produce an orange-yellow light).



TYPICAL CANOPY LIGHT

Both metal halide and high pressure sodium lamps are high intensity discharge lamp sources which are characterized by their relative high lumen output. The high output of these lamps causes the dropped lighting fixture refractor to be seen as points of significant brightness from great distances.

Sec. 2

Description of Existing Conditions

The City of Portland planning staff identified six existing service stations to serve as the basis for study of typical existing canopy lighting conditions. It was not the intended purpose in obtaining illuminance measurements to evaluate the appropriateness of canopy lighting at any of these six sites. Rather, this data was collected to draw general conclusions about recent past trends in service station canopy lighting design and to use this data to formulate a plan of guidance for future canopies.

- **Texaco Station**
  Brighton Ave. and St. George St.
- **Cumberland Farms**
  Brighton Ave. and Woodford St.
- **Christy's**
  Congress Ave. and Dow St.
- **Cumberland Farms**
  Pine St. and Bracket St.
- **Mobil Station**
  Forest Ave.
- **Cumberland Farms**
  Washington Ave. and Ocean Ave.

An illuminance survey was conducted at the first five sites. Permission was not granted to take illuminance readings at the Washington Ave. Cumberland Farms.

TEXACO STATION - Brighton Ave.

The canopy at this site is attached to the convenience store along one side, and is approximately 40 ft. wide by 60 ft. long. There are four pump islands below the canopy, each with a single pump station. There are a total of 12 surface mounted lights on the canopy underside surface in four rows of three fixtures. The light fixtures have dropped prismatic refractors and they utilize metal halide lamp sources.

There are three pole lights on the site for illumination of parking areas and drives. Two poles are located on Brighton Avenue and the third pole is located at the back corner on St. George Street. These pole lights also contain metal halide lamps.

The horizontal illuminance levels below the canopy do not seem to be excessive, but there is a degree of glare observed from the lighting fixture refractors. There is a Christy's Station a few blocks easterly on Brighton Avenue. The majority of properties abutting the Texaco site are residential.

CUMBERLAND FARMS - Brighton Ave.

The canopy at this site is unattached, and is approximately 32 ft. wide by 60 ft. long. There are six pump islands below the canopy, each with a single pump station. There are a total of 18 surface mounted lights on the canopy underside surface in six rows of three fixtures. The light fixtures have dropped prismatic refractors and they utilize metal halide lamp sources. Around the entire top perimeter of the canopy, there is a two-lamp fluorescent lighting cove which provides downlight for the canopy sides.

There are three pole lights on the site for illumination of parking areas and drives. Two of these poles are located on Brighton Avenue and the other is located at the corner of Woodford street. The pole lights have metal halide lamps and they contain forward-throw internal reflectors which produce a significant amount of glare.

The horizontal illuminance levels below the canopy seem to be quite high, and there is a degree of glare observed from the lighting fixture refractors. The majority of properties abutting the site are residential. There are no competing businesses in the immediate area. There is a significant amount of brightness reflected off residential buildings on abutting properties.

CHRISTY'S - Congress Ave.
The canopy at this site is unattached, and is approximately 25 ft. wide by 35 ft. long. There are two pump islands below the canopy, each with a single pump station. There are a total of 8 surface mounted lights on the canopy underside surface in two rows of four fixtures. The light fixtures have dropped prismatic refractors and they utilize high pressure sodium lamp sources.

There are two pole mounted floodlights located on Congress Avenue which are aimed back at the site for illumination of parking areas and drives. There are also two wall-pack lights mounted at approximately 10 ft. on the front face of the convenience store. These wall-pack lights have prismatic face diffusers and they contain metal halide lamps.

Due to the orange-yellow nature of the high pressure sodium lamp sources, the perception of the horizontal illuminance levels below the canopy do not seem to be as high as they actually are. There is a degree of glare observed from the canopy lighting fixture refractors, and the wall-pack lights on the building produce a significant amount of glare. The properties abutting the Christy's site are combined commercial and residential.

CUMBERLAND FARMS - Pine Street
The canopy at this site is unattached, and is approximately 25 ft. wide by 30 ft. long. There is a single pump island below the canopy, with two pump stations. There are a total of 6 surface mounted lights on the canopy underside surface in two rows of three fixtures. The light fixtures have dropped prismatic refractors and they utilize metal halide lamp sources. Around the entire top perimeter of the canopy, there is a two-lamp fluorescent lighting cove which provides downlight for the canopy sides.

There are two pole mounted floodlights which is aimed back at the site for illumination of parking areas and drives. One of these floodlights is located on the corner of the site at Bracket Street (this pole light was not operating during the survey period), and the second located on the back corner on Pine Street. The Pine Street floodlight utilizes a high pressure sodium lamp.

The horizontal illuminance levels below the canopy do not seem to be excessive, but there is a degree of glare observed from the lighting fixture refractors. The amount of reflected light off the light colored brick walls of the convenience store seems to be higher than is in keeping with the neighborhood. The majority of properties abutting the site are residential. One commercial property exists across Pine Street.

MOBIL STATION - Forest Ave.
The canopy at this site extends over the top of a convenience store, and it projects out over pump islands on either side. The canopy on the east side covers two pump islands, each with a single pump station.

The canopy on the west side is approximately 35 ft. wide by 70 ft. long and it covers four pump islands below the canopy, each with a single pump station. In both the east and west canopies, there are downlights which are fully recessed into the underside of the canopy. These recessed lights utilize metal halide lamps sources. On the east side, there are a total of 6 recessed lights, in two rows of three fixtures. On the west side, there are a total of 15 recessed lights in five rows of three fixtures. In addition to the recessed canopy downlights, there are also fluorescent lights which are built into rows above the pump islands. These lights are installed at approximately 10 ft. above the pumps, each connecting two pump islands. The fluorescent lights have blue translucent side diffuser panels and white bottom diffusers.

There are pole lights located on the back and west property lines which provide illumination of parking areas and drives. In addition, there are low level bollard lights along the Forest Ave. side of the site, and along the east side at Noyse Street. These bollards and pole lights all contain metal halide lamps.

The horizontal illuminance levels below the canopy do not seem to be excessive. The florescent lights immediately above the pump islands act as local task lights which allow the overhead canopy lights to provide a lesser level of general ambient light. The result is that higher levels of horizontal illuminance occur where they are needed at pumps, and lesser levels are provided for drives between pumps.

There is an overall balance of brightness which seems to be very acceptable. The front of the site which faces Forest Avenue is significantly less bright than the side canopy areas. This produces a stepped pattern of brightness which defies the usual scheme of presenting a bright street-scape. The result is that the station does not overwhelm Forest Avenue, and yet, it makes a very noticeable statement. The relatively low brightness of the recessed canopy lights permits the internally illuminated signage to make a dramatic visual statement by contrast of brightness.

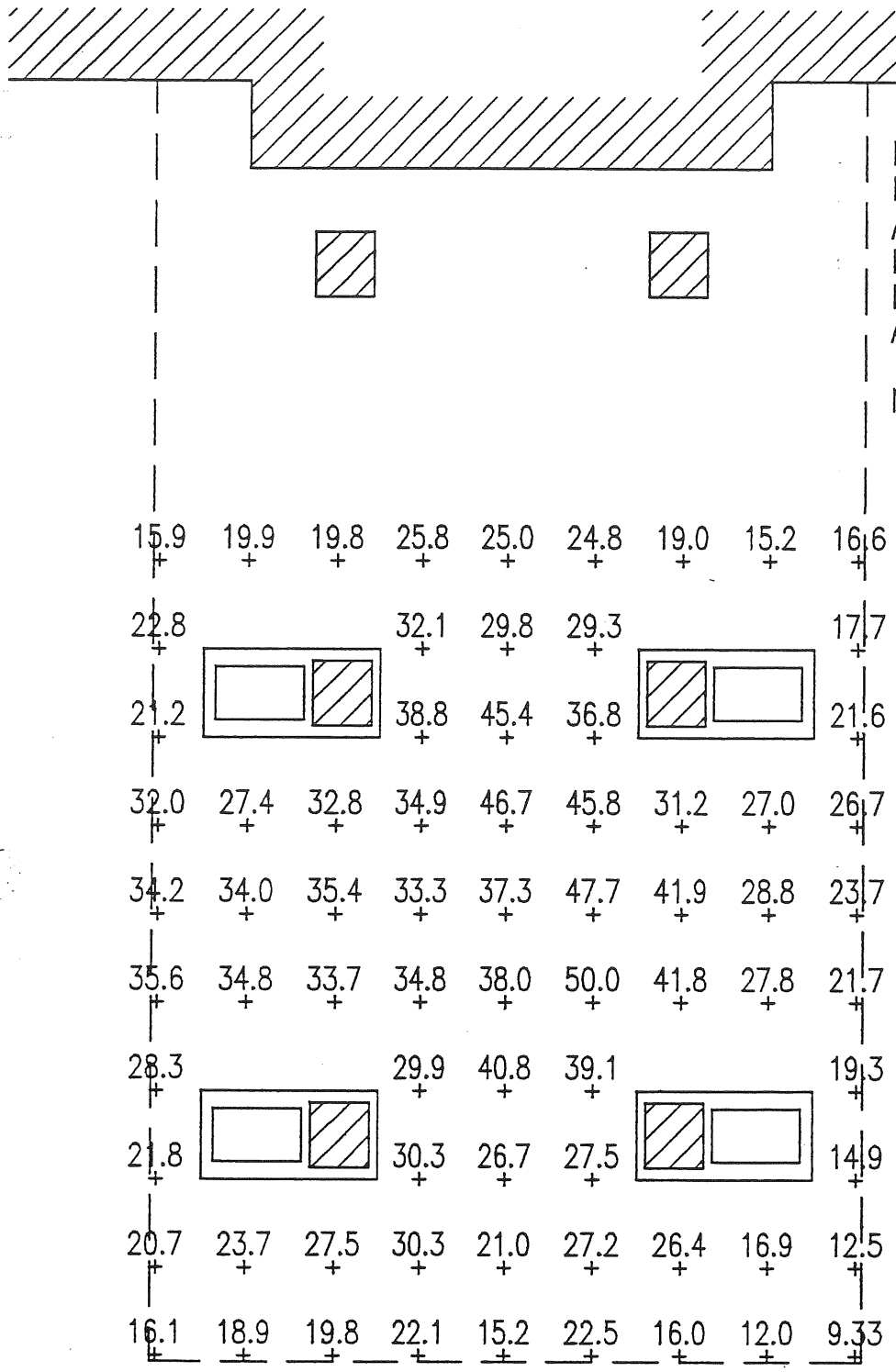
Illuminance Measurement Methodology

Measurement of illuminance levels at various service station canopies in the Portland downtown area was conducted on April 18 and 19, 1996. Measurements were made with a Minolta T-1 illuminance meter, which has a precision of .01 footcandle. The procedure for recording illuminance levels was conducted in accordance with the IESNA's published standard *LM-64 Photometric Measurements of Parking Areas*. Sky conditions during the measurement period were partly cloudy, with no moon. Measurements were recorded each evening from 8:45 pm until 11:00 pm.

Recorded Illuminance Levels

The following is a summary of horizontal illuminance levels measured at grade.

	Illuminance - Footcandles			Uniformity
	Ave.	Max.	Min.	Ave.:Min.
TEXACO STATION				
Brighton Ave.	27.7	50.0	9.33	2.97 : 1
CUMBERLAND FARMS				
Brighton Ave.	80.2	123	34.4	2.33 : 1
CHRISTY'S CITGO STATION				
Congress Ave.	70.0	136	30.1	2.32 : 1
CUMBERLAND FARMS				
Pine St.	27.3	42.5	11.8	2.31 : 1
MOBIL STATION				
Forest Ave.	34.3	85.9	6.47	5.30 : 1



HORIZONTAL ILLUMINANCE
MEASURED AT GRADE

AVERAGE:	27.7 FC
MAXIMUM:	50.0 FC
MINIMUM:	9.33 FC
AVE:MIN:	2.97:1
NO. OF POINTS:	74

TEXACO STATION
Brighton Ave .
MEASURED ILLUMINANCE
SCALE: 1"=10'- 0"

BRIGHTON AVENUE

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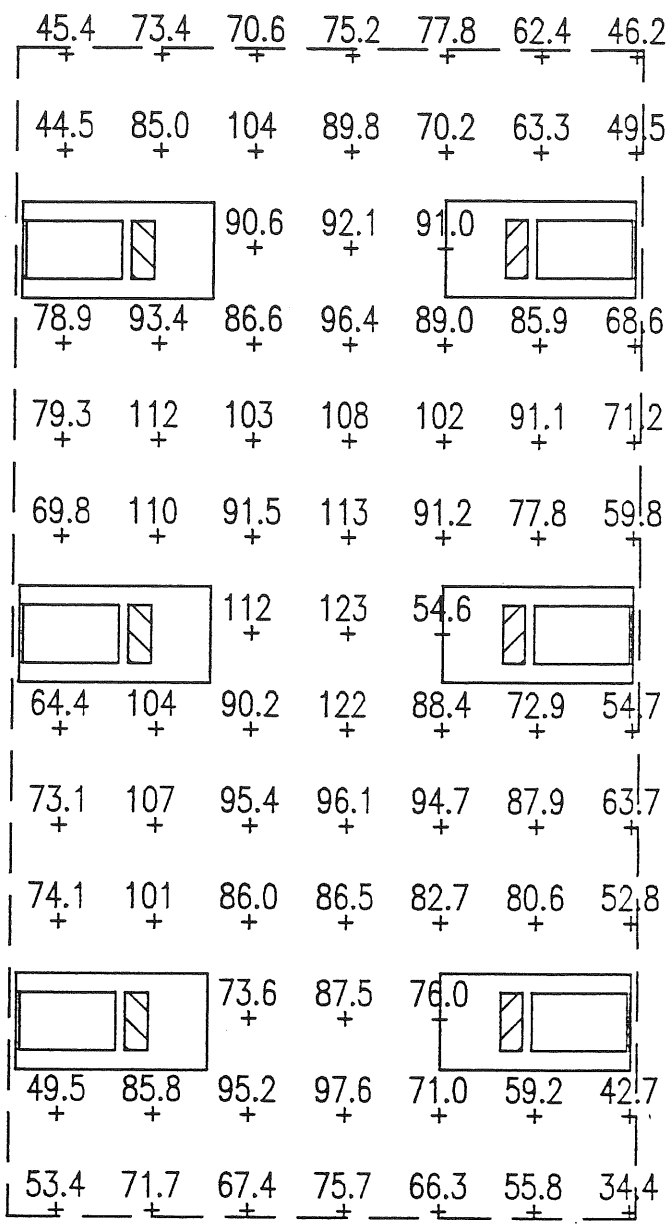

HORIZONTAL ILLUMINANCE
MEASURED AT GRADE

AVERAGE:	80.2 FC
MAXIMUM:	123 FC
MINIMUM:	34.4 FC
AVE:MIN:	2.33:1
NO. OF POINTS:	79

CUMBERLAND FARMS
Brighton Ave .
MEASURED ILLUMINANCE
SCALE: 1"=10'– 0"

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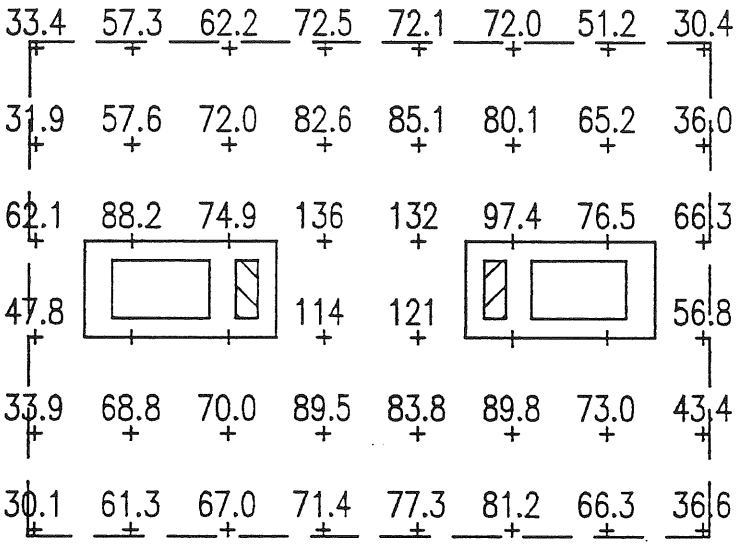
HORIZONTAL ILLUMINANCE
MEASURED AT GRADE

AVERAGE:	70.0 FC
MAXIMUM:	136 FC
MINIMUM:	30.1 FC
AVE:MIN:	2.32:1

NO. OF POINTS: 44



CHRISTY'S
Congress Ave.
MEASURED ILLUMINANCE
SCALE: 1"=10'- 0"

CONGRESS AVENUE

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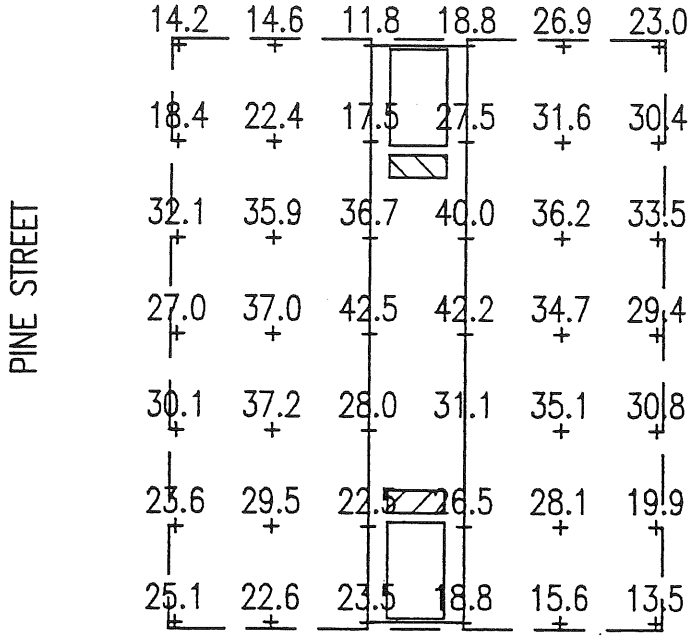
HORIZONTAL ILLUMINANCE
MEASURED AT GRADE

AVERAGE:	27.3 FC
MAXIMUM:	42.5 FC
MINIMUM:	11.8 FC
AVE:MIN:	2.31:1

NO. OF POINTS: 42



CUMBERLAND FARMS
Pine Street
MEASURED ILLUMINANCE
SCALE: 1"=10'- 0"

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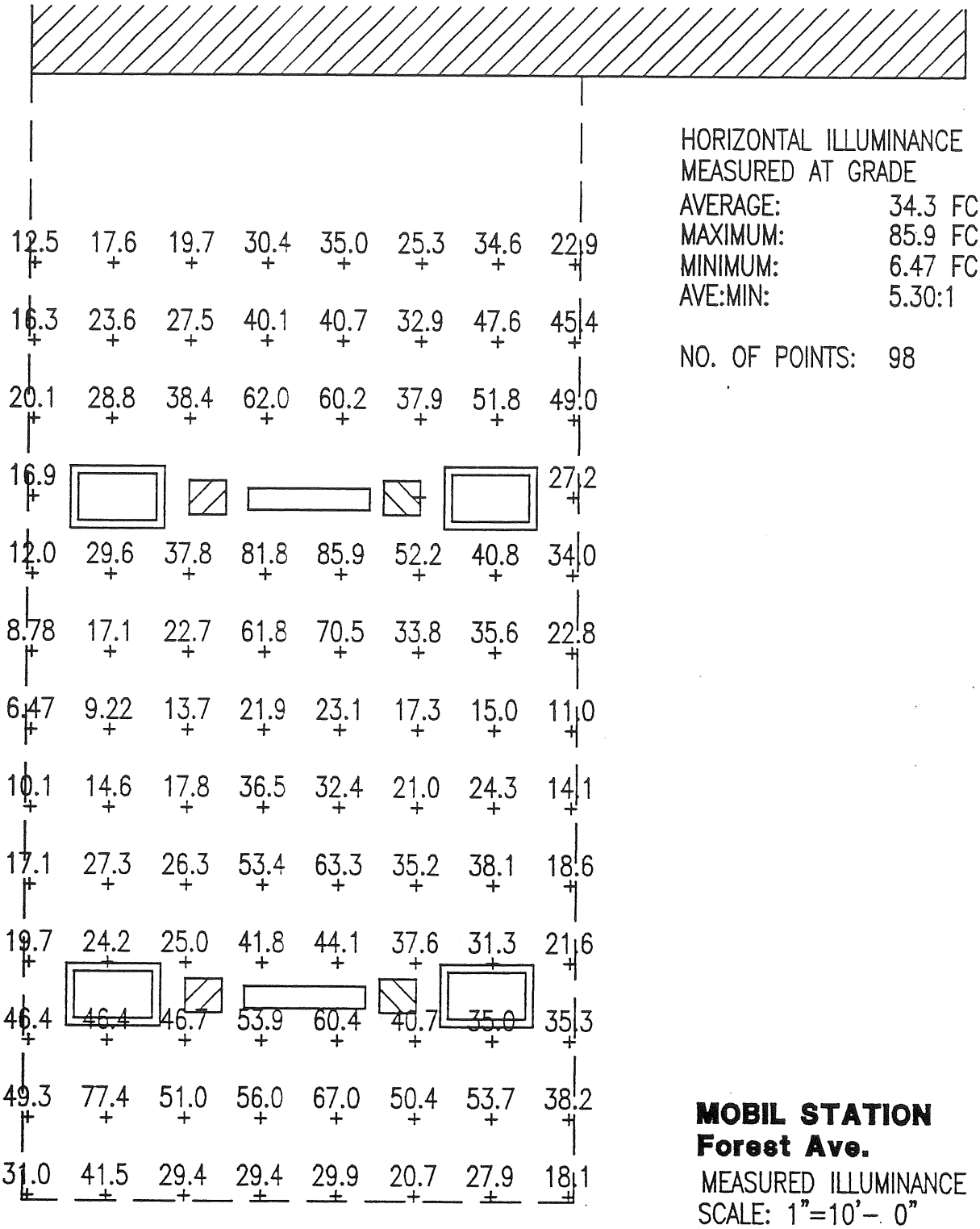

FOREST AVENUE

HORIZONTAL ILLUMINANCE
MEASURED AT GRADE

AVERAGE:	34.3 FC
MAXIMUM:	85.9 FC
MINIMUM:	6.47 FC
AVE:MIN:	5.30:1

NO. OF POINTS: 98

MOBIL STATION
Forest Ave.
MEASURED ILLUMINANCE
SCALE: 1"=10'-0"

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General Recommendations

While lighting design of service station canopies can be controlled to some extent by means of written performance standards in a land use ordinance, relying *solely* on such a method is likely to provide less than satisfactory results. Each site application is unique, and as such, each requires some degree of specific evaluation. Carefully written lighting standards can effectively serve as a starting basis for design review, but there is ultimately no substitute for evaluation and decision making by planning staff and planning boards. It is important when creating land use regulations to include the authority (and responsibility) of site review boards to address the unique character of different sites. It should be recognized that this uniqueness of site will periodically require the adoption of conditions beyond those included in general performance criteria listed in the governing ordinance.

The diversity of land use of a typical city suggest that no one lighting regulation can be adopted to meet all needs. Requirements for canopy lighting at a site in a heavily developed commercial area might not properly serve the needs for control of canopy lighting in a low density residential neighborhood. Planning for outdoor lighting is most successful when it is performed not only for specific applications (parking lots, roadways, service station canopies, etc.), but when it is also performed by district.

The best land use regulations for the control of lighting include the following:

- The intent is clearly stated;
- The language is easily understood by applicants;
- The requirements are easily enforceable.

Proposed City of Portland Service Station Canopy Lighting Standards

The following comments are made relative to the proposed Site Lighting Standards for Gasoline Service Stations, as prepared by the planning staff.

The statement of Intention included in the proposed Site Lighting Standards does a good job of expressing why such standards are deemed important.

It is appropriate that criteria to be included in site lighting standards for service station canopies include more than illuminance regulations. In paragraph 2, General Standards, the section which addresses the types of light fixtures which will be permitted is an appropriate way of controlling excessive fixture luminance. Further consideration may be made in either defining "decorative lighting applications", or in stating that the included lighting standards only apply to area lighting. It might be appropriate to state that any decorative or accent lighting must be approved as to its compatibility with the local and neighborhood character.

Permitting only "cut-off" type lighting fixtures takes a significant step in limiting unnecessary brightness. Perhaps is would be worth expanding the definition to state: "*...where lenses, refractors, reflectors or lamp sources do not extend below the surface of the fixture housing and no direct light shall be directed at or above the horizontal plane.*" Although it might seem redundant, perhaps the following should be added to make certain that there is no confusion: *"The use of directional floodlights is not permitted."*

Since not every applicant will have access to the referenced IESNA recommended illuminance levels, perhaps illuminance requirements should be included with each specific use (as is the case with the paragraphs covering gasoline service stations). The general requirement that maximum levels not exceed three times the recommended average may lead to confusion as to which of the many IESNA recommended illuminance levels are intended to apply.

Under the section which addresses Standards For Specific Uses - Gasoline Service Stations, perhaps it would be appropriate to include a more expanded list of criteria:

2. *Illuminance Levels*

a. *Minor Gasoline Service Stations, including those abutting residential zones*
Illuminance levels shall not exceed the following:

Approaches and Drives:	*1.5 FC average*
	3:1 average-to-minimum uniformity ratio
	3.0 FC maximum
Service Areas:	*3.0 FC average*
	3:1 average-to-minimum uniformity ratio
	6.0 FC maximum
Pump Island Areas:	*20 FC average*
	3:1 average-to-minimum uniformity ratio
	40 FC maximum

b. *Major Gasoline Service Stations*
Illuminance levels shall not exceed the following:

Approaches and Drives:	*3.0 FC average*
	3:1 average-to-minimum uniformity ratio
	6.0 FC maximum
Service Areas:	*7.0 FC average*
	3:1 average-to-minimum uniformity ratio
	14 FC maximum
Pump Island Areas:	*30 FC average*
	3:1 average-to-minimum uniformity ratio
	60 FC maximum

d009

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Brighton Ave.

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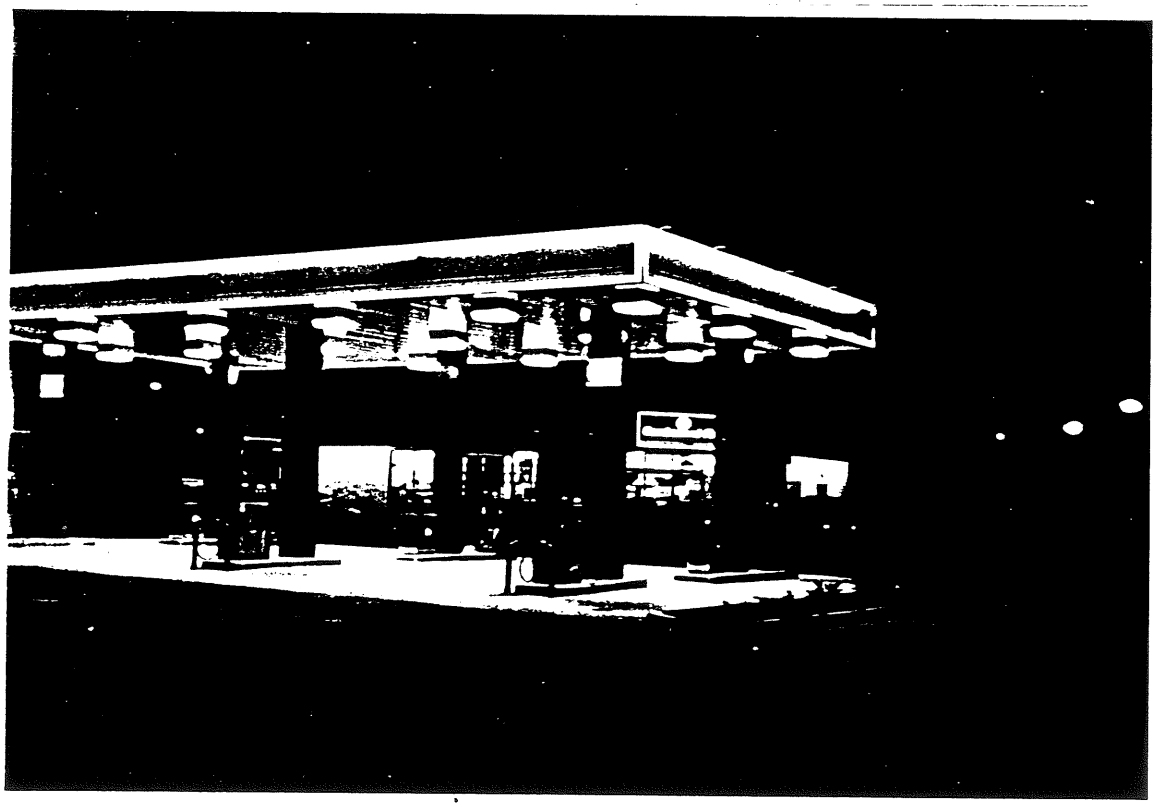
CUMBERLAND FARMS
Brighton Ave.



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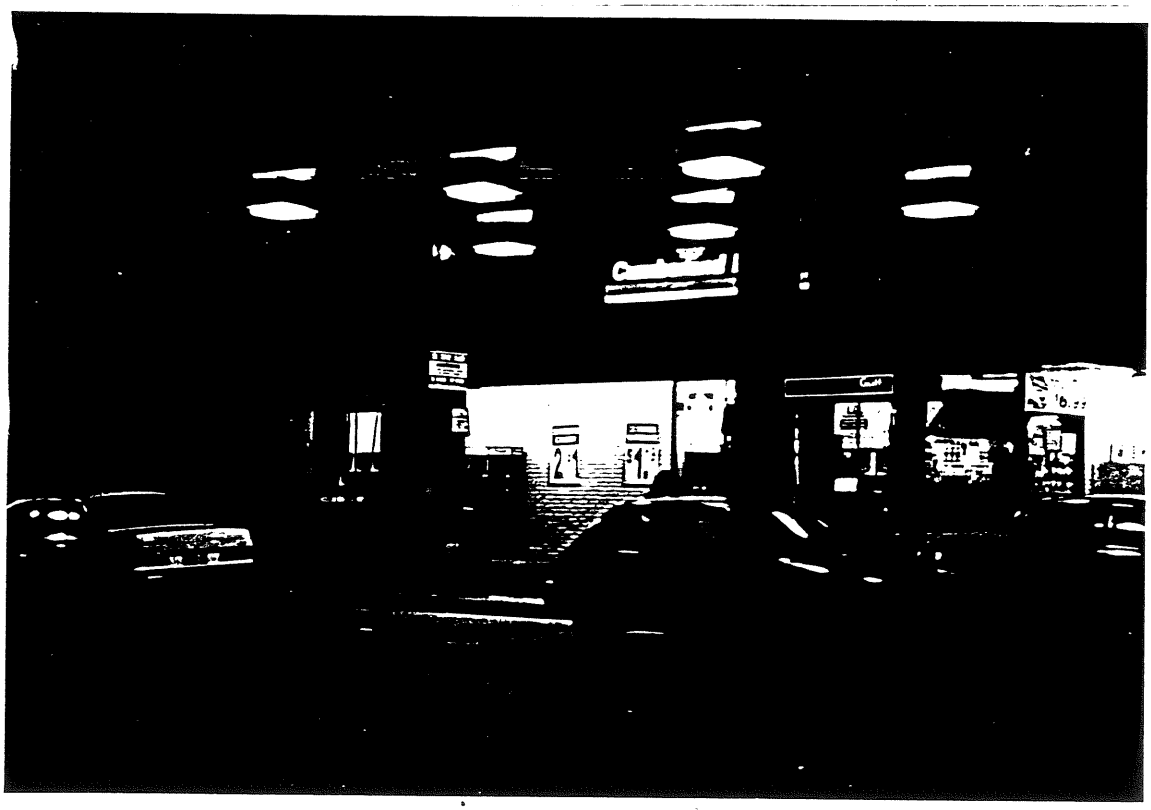
CUMBERLAND FARMS
Pine Street



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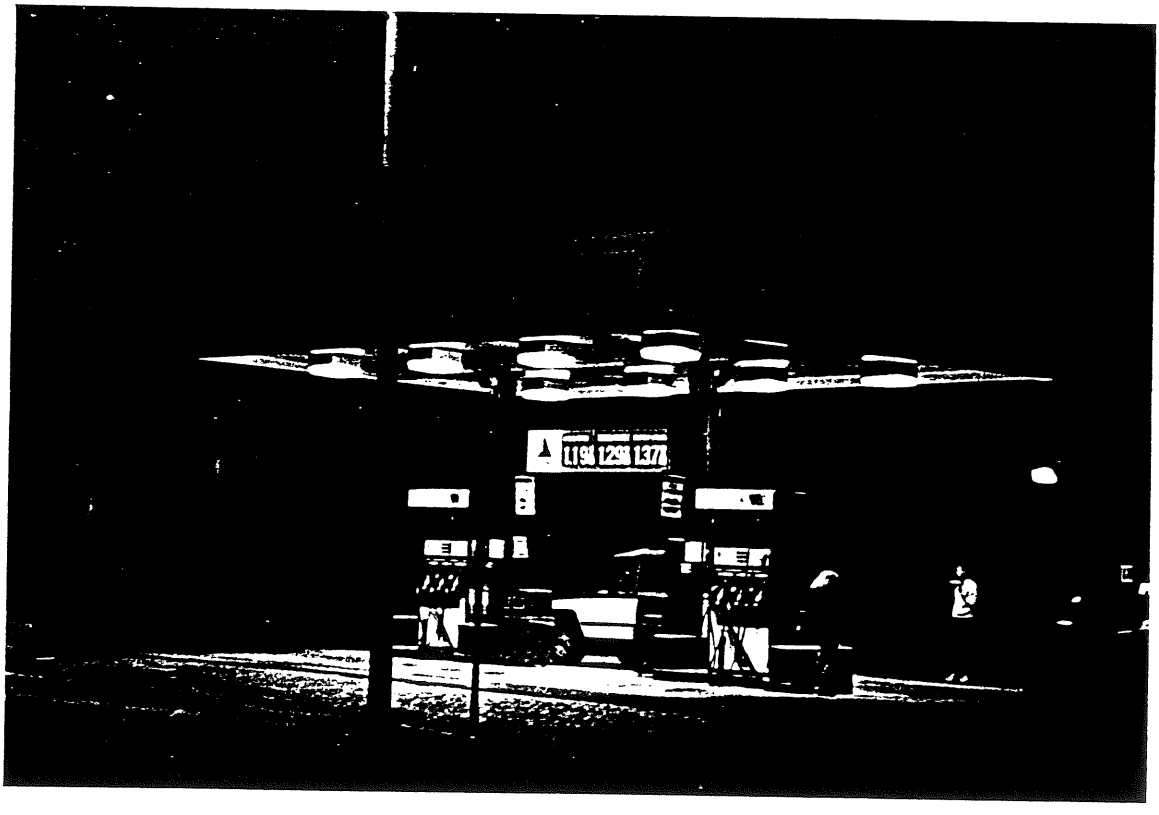
CHRISTY'S
Congress Ave.



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MOBIL STATION
Forest Ave.

CITY OF PORTLAND, MAINE
MEMORANDUM

TO: Interested Parties

FROM: Alexander Jaegerman, Chief Planner

DATE: May 14, 1996

SUBJECT: Proposed Amendments to Portland's Zoning and Site Plan Ordinances which would Regulate the Development of Gasoline Service Stations

On Tuesday, May 14, the Portland Planning Board will consider a series of zoning and site plan ordinance text amendments which would affect the development of gasoline service stations in Portland's B-2, B-4 and B-5 zones. The majority of the amendments address gas stations in the B-2 zone where the subject lot directly abuts a residential zone. The proposed amendments address the scale and hours of operation, the physical characteristics of the canopy and lighting at the station.

Enclosed for your information are the proposed revisions. Please note that the regulations do not affect existing stations; only future developments or redevelopments would be subject to the new regulations.

The Board will hold a public hearing on the proposed amendments at 7:00 pm in Room 209 of Portland City Hall. If you cannot attend the meeting, but would like to submit comments, please address them to the attention of Joseph E. Gray, Jr., Director of Planning and Urban Development, Portland City Hall, 389 Congress Street, Portland, Maine 04101. (Fax# 874-8716.) If you have questions about the proposed amendments, call Deborah Andrews, Senior Planner, 874-8300 ext. 8726.

Please also note that the Planning Board's action will be in the form of a recommendation to the City Council. You will be notified well in advance of the City Council's deliberations on this matter and will have an additional opportunity to comment then.

Tim Benoit -

This was sent to Irving Oil's headquarters in So. Portland last week - thought you'd be interested in receiving a copy

O:\PLAN\REZONE\GASSTAT\PROPAMEN.WPD

CITY OF PORTLAND, MAINE

PLANNING BOARD

PUBLIC HEARING AGENDA

Tuesday Evening, May 14, 1996, at 7:00 p.m., Public Hearing, Room 209, City Hall, 389 Congress Street, Portland, Maine.

1. **ROLL CALL AND DECLARATION OF QUORUM**

2. **COMMUNICATIONS AND REPORTS**

3. **ANNOUNCEMENT OF DECISIONS AT THE PREVIOUS MEETING ON APRIL 23, 1996.**

New Business

i. Drive-Thru Window and Automatic Teller Machine; Vicinity of Preble and Congress Streets; October Corp., Applicant.

The Portland Planning Board voted 7-0 to approve the Drive-Thru Window and Automatic Teller Machine.

ii. Contract Zone Change; Vicinity of 1343 Congress Street; John Rohner & Lisa Webber, Applicants.

The Portland Planning Board voted 7-0 to recommend contract rezoning to the City Council.

iii. Eastern Promenade Trail; City of Portland, Applicant.

The Portland Planning Board voted 7-0 to approve the trail starting at Commercial Street connecting to the Back Cove Trail.

iv. Industrial Zoning

The Portland Planning Board voted 7- 0 to table this item to the June 11, 1996 meeting.

M. W. Sewall & Co.
259 Front Street
Bath, ME ~~04530~~ 04530

~~Irving~~
Irving Oil Corporation
385 Main Street
South Portland, ME 04106

C. N Brown Co.
Main Street
Gray, ME 04039

Cumb. Farms

Maine Oil Distributors Assn.
9 Rt 1
Yarmouth, ME 04096

Downeast Energy Inc.
172 Main Street
South Portland, ME 04106

Mobil Oil Corp.
170 Lincoln St.
South Portland 04106

Cumberland Farms
730 Main St.
Westbrook, ME
04092

"carry over" standards

- hours of operation
- signage on canopy

~~pull~~

~~*~~ bring forward the lighting exercise separately - complete it.

~~*~~ bring the conditional use standards forward separately -

- Canopies ~~for gas stations~~ associated with gasoline ~~sta~~ service stations, ~~convenience~~
  ~~stores~~ & other uses with drive-through facilities.

From: Natalie Burns
To: DGA
Date: 8/9/96 1:23pm
Subject: Gas Station Revisions

1. Currently there is a dispersal requirement in the B-5 for gas stations. Will that remain?

2. Will car washes still be prohibited in the B-2 and B-5 when a gas station abuts a residential zone?

3. Will there be hours restrictions in the same situation? no

AMENDMENT TO PORTLAND CITY CODE
§§14-47, 14-182, 14-183, 14-230.1, 14-230.2 (ZONING ORDINANCE)
§§14-522, 14-526 (SITE PLAN ORDINANCE)
RE: GASOLINE SERVICE STATIONS IN THE B-2, ~~B-4~~ AND B-5 ZONES

BE IT ORDAINED BY THE CITY COUNCIL OF THE CITY OF PORTLAND, MAINE IN CITY COUNCIL ASSEMBLED AS FOLLOWS:

1. That Section 14-47 of the Portland City Code is hereby amended as follows:

Sec. 14-47. Definitions.

Major gasoline service stations: A gasoline service station with more than ~~one (1)~~ two (2)pump islands or with a capacity to fuel more than eight (8) vehicles simultaneously or providing repair services including, but not limited to, tuneups, engine repair, brake work, muffler replacement, tire repair or similar activities.

Minor gasoline service stations: A gasoline service station with not more than ~~one (1)~~ two (2)pump islands~~, with a maximum of three (3) pumps~~, provided that no more than a total of eight (8) vehicles may be fueled simultaneously. Such stations shall not include car washes or vacuums. ~~with no r~~Repair services shall be permitted, provided that there shall be no more than two (2) service bays.

2. That Section 14-182(2)m-o of the Portland City Code is hereby amended to read as follows:

Sec. 14-182. Permitted uses.

The following uses are permitted in the B-2 zone:

(2) *Business:*

m. Theaters and performance halls; ~~and~~

n. Hotels or motels of less than one hundred fifty (150) rooms; and

o. Major and minor gasoline service stations, as defined in section 14-47, provided that only a minor gasoline service station shall be permitted on a lot abutting a residential zone.

CITY OF PORTLAND
MEMORANDUM

TO: Chairman Hagge and Members of the Planning Board

FROM: Deborah Andrews, Senior Planner

DATE: March 12, 1996

SUBJECT: Proposed Zoning and Site Plan Amendments to Regulate Gas Stations Abutting Residential Zones

At the last workshop on this item, staff presented draft provisions which would regulate the physical characteristics of gas station canopies. These additional provisions were drafted in response to Planning Board observations that the presence and treatment of a gas station's canopy was a major factor in whether or not the station negatively impacted its abutting residential neighborhood. As drafted, the standards would control the canopy's height; the depth its fascia; the presence of any banding, striping or graphics (outside of the allowable sign area); and lighting.

For the second workshop staff also made some revisions to the proposed general site plan lighting standard. As amended, maximum light levels could exceed the IESNA's recommended average light levels by three (3) times, rather than the originally proposed factor of two (2) times, provided average level for the use was maintained.

During discussion of the revisions, Planning Board members expressed general support for the canopy provisions and suggested that, for advertising purposes at least, the canopy provisions apply in all business zones. However, the Board asked that more consideration be given to the issue of lighting control, both for gas stations specifically and for all projects evaluated under site plan review. Board members questioned whether the IESNA recommended light levels for gas stations were more generous than necessary and not responsive to the goal of reducing impacts on abutting residences. Regarding the general site plan lighting standard, Board members questioned whether a 3x factor for maximum light levels was excessive and suggested that perhaps the 2x factor was more appropriate for commercial uses next to residences.

In reconsidering the issue of lighting control, staff contacted Enterprise Engineering again for their opinion as to whether the IESNA's standards err on the side of safety concerns and might be too liberal for purposes of achieving compatibility with less intensive, abutting uses. Larry Bartlett of Enterprise Engineering stated that while IESNA had traditionally recommended higher light levels than necessary, recent revisions to the standards have brought them down to much more reasonable levels. In Bartlett's view, the 30-foot candle recommended average light levels would not be inappropriate for the circumstances we are trying to address (gas stations next to residences). According to Bartlett, if you regulate fixture type and fixture placement (which can ensure shielding of the light source) and stay within the IESNA standards, effective light control can be achieved. It is the combination of controls that is key. Notwithstanding Mr. Bartlett's input, the Board may opt for a 20-foot candle average light level for B-2 stations next to residential zones on the theory that if 20 foot candles is sufficient to light a station with dark surroundings, it is sufficient in a brighter context.

With respect to the question of establishing a maximum light level, Mr. Bartlett confirmed staff's earlier view that achieving a 2 x maximum would be difficult to do and, in fact, could be counterproductive, as developers might be inclined to install more lights to achieve the recommended average light levels. Mr. Bartlett suggested that if the Board was uncomfortable with a factor of 3, perhaps an adjustment to a factor of 2 1/2 would be acceptable.

In considering appropriate ceilings on light levels, it is important to keep in mind that, with the introduction of these new standards, the city will be introducing a level of control where there has been none to date. If we simply referenced IESNA standards, we would be doing a great deal to reign in undue and unnecessary site lighting and we would see over time a perceptible, positive departure from most current lighting solutions.

Since the last workshop staff also has given more thought to the best place within the Land Use Code to effectively address lighting control. As the Board will recall, the last draft attempted to address gas station lighting under Sec. 14-183's conditional use standards governing canopies and under the general site plan lighting standard. While lighting should be referenced in general terms under these sections, staff feels that the Technical and Design Standards and Guidelines is the most appropriate place to deal with specifications for lighting. This document, by design, can address the topic at a level of detail that the zoning and site plan ordinance standards can't and can be revised from time to time as our knowledge of the topic becomes more sophisticated.

Staff proposes that a new section be added to the Technical Supplement which covers site lighting. Information to be included would be the IES tables for those uses where they have been determined to be appropriate; more tailored lighting standards for other uses (including perhaps gas stations); specifications for lighting fixtures and fixture placement; etc. A draft of the proposed lighting section will be distributed on Tuesday.

Draft #3 of the zoning and site plan text amendments is enclosed as Attachment 1. You will note that the revised draft adds the canopy provisions to the B-4 and B-5 zones, the only other business zones where gas stations are allowed. We have not added this language to the industrial zones where gas stations are permitted (I2, I2b, I3 & I3b), as we recommend that this be taken up as part of the comprehensive industrial zoning revisions.

Attachment:

1. Draft #3 - Zoning and Site Plan Amendments

3. That section 14-183(1)a of the Portland City Code is hereby amended to read as follows:

Sec. 14-183. Conditional uses.

The following uses are permitted as provided in section 14-474 (conditional uses), if they meet the following requirements:

(1) *Business:*

a. ~~Major and minor gasoline stations, as defined in section 14-47~~ Reserved;

4. That section 14-230.1 (2) is hereby amended as follows:

Sec. 14-230.1. Permitted uses.

The following uses are permitted in the B-5 urban commercial mixed use zone:

(2) *Commercial:*

o. Lumber and building material dealers;

p. Major and minor gasoline service stations, as defined in section 14-47, provided that only a minor gasoline service station shall be permitted on a lot abutting a residential zone. Major and minor gasoline service stations shall be located at least two thousand (2,000) feet from each other.

5. That section 14-230.2(1)(a) of the Portland City Code is hereby amended to read as follows:

Sec. 14-230.2. Conditional uses.

The following uses shall be permitted as conditional uses in the B-5 urban commercial mixed use zone, provided that, notwithstanding section 14-471(3), section 14-474(a), or any other provision of this Code, the planning board shall be substituted for the board of appeals as the reviewing authority, and further provided that, in addition to the provisions of section 14-474(c)(2), they shall also meet the requirements set forth below:

(1) *Commercial:*

a. ~~Automobile service stations and convenience stores with gasoline pumps provided that they are located at least two thousand (2,000) feet from other such uses~~ Reserved.

6. That section 14-522 of the Portland City Code is hereby amended as follows:

Sec. 14-522. Definitions.

For the purposes of this article all terms and words shall have their ordinary meanings, except as defined herein.

Major development means and includes:

(5) The construction of any structure for industrial use which is more than forty-five (45) feet high; ~~or~~

(6) The addition of any additional dwelling unit to a building initially reviewed as a two-family dwelling or not previously reviewed under this article; or

(7) The construction of any new major or minor gasoline service station in the B-2 or B-5 zone, or the construction of any new major or minor gasoline service station with a structure greater than ten thousand (10,000) square feet of building area in any other permitted zone.

Minor development means and includes any of the following unless (1) the development is major development; or (2) the development is single family development subject to the provisions of section 14-524(b):

(14) The construction of any new major or minor gasoline service station with a structure of less than ten thousand (10,000) square feet of building area in any permitted zone other than the B-2 or B-5 zones.

7. That Section 14-526(a)(9) of the Portland City Code is hereby amended to read as follows and a new subsection (25) is hereby enacted, said subsection to read as follows:

Sec. 14-526. Standards.

(a) *Requirements for approval.* The planning board or planning authority shall not approve a site plan unless it meets the following criteria:

(9) The provision for exterior lighting will not be hazardous to motorists traveling on adjacent public streets; is adequate for the safety of occupants or users of the site; and such lighting will not cause ~~significant annoyance,~~ significant glare or ~~undesirable~~ direct spill-over onto adjacent properties and complies with the applicable specifications of the City of Portland

Technical and Design Standards and Guidelines;

(25) All major or minor gasoline service stations shall meet the following requirements:

a. *Signs:* Signs shall not adversely affect visibility at intersections or access drives. Such signs shall be constructed, installed and maintained so as to ensure the safety of the public. Such signs shall advertise only services or goods available on the premises.

b. *Circulation:* No ingress and egress driveways shall be located within thirty (30) feet from an intersection. No entrance or exit for vehicles shall be in such proximity to a playground, school, church, other places of public assembly, or any residential zone that the nearness poses a threat or potential danger to the safety of the public.

c. *Drive-up features:* Drive-up features, such as gasoline pumps, vacuum cleaners and menu/order boards, shall not extend nearer than twenty-five (25) feet to the street line. The site must have adequate stacking capacity for vehicles waiting to use these service features without impeding vehicular circulation or creating hazards to vehicular circulation on adjoining streets.

d. *Car washes:* Car washes shall be designed to avoid the tracking of residual waters into the street.

provision of this Code, the planning board shall be substituted for the board of appeals as the reviewing authority, and further provided that, in addition to the provisions of section 14-474(c)(2), they shall also meet the requirements set forth below:

(1) *Commercial:*

a. Automobile service stations and convenience stores with gasoline pumps provided that they are located at least two thousand (2,000) feet from other such uses. Canopies associated with such uses shall meet the following requirements:

1. The maximum height as measured to the underside of the canopy shall be fourteen feet, six inches (14'6").

2. The maximum height of the canopy fascia shall be three feet, six inches (3'6").

3. Canopies shall consist of a solid, ~~neutral~~ color field with no banding, striping or other graphics, except as permitted within the allowed sign area.

4. Lighting shall comply with the applicable specifications contained in the City of Portland Technical and Design Standards and Guidelines.

5. That Section 14-474(c)(2) of the Portland City Code is hereby amended to read as follows:

Sec. 14-474. Conditional uses.

Conditions for conditional uses:

(2) *Standards:* Upon a showing that a proposed use is a conditional use under this article, a conditional use permit shall be granted unless the board determines that:

a. ~~There are unique or distinctive characteristics or effects associated with the proposed conditional use;~~ The proposed use will not adversely affect the value of adjacent properties; or

b. ~~There will be an adverse impact upon the health, safety, or welfare of the public or the surrounding area; and~~ The conditional use sought will not

Attachment 3

Bartlett Design
LIGHTING & ELECTRICAL ENGINEERING
1 FRONT STREET P.O. BOX 230 BATH, MAINE 04530
TEL (207) 443-5447 FAX (207) 443-5560

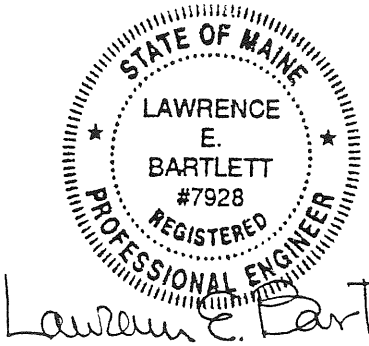
REPORT ON SERVICE STATION CANOPY LIGHTING

Submitted to the City of Portland
Department of Planning & Urban Development

April 22, 1996

Prepared By:

Lawrence E. Bartlett, PE, RA



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There is a growing number of people in many municipalities calling for stricter controls to be established for outdoor lighting of non-residential properties. In many cases, their concern is based in the opinion that increasing amounts of sky brightness (also known as astronomic light pollution) as well as light trespass (light being directed beyond property lines) are infringements on personal and property rights. Groups such as the *International Dark-Sky Association* and the *New England Light Pollution Advisory Group* suggest that the over-lighting of outdoor sites in recent years has greatly diminished the nighttime experience, and that if left uncontrolled, exterior lighting will eventually eliminate any possibility of viewing stars in the night sky.

There has been a significant increase of outside illuminance from site lighting over the past few years. There are at least three reasons to account for this trend:

Number of Lighted Properties
Recent years have seen a increase in the number of non-residential properties which are being lighted. This is not only due to an increase of developed land, but it is also a result of an increased pressure to address safety. Many parking areas are now regulated by local law to include site lighting to assure personnel safety at night.

Improved Technology
The design of light sources has been greatly improved through advances in technology such that light can now be provided at higher levels for lesser operating costs than were previously possible.

Economic Pressures
Economic pressures of the slow economy have led to an increased level of business competition. Many businesses attract customers at night by means of being noticed above and beyond their competition. High levels of light at night are seen by some as a way of meeting this need.

Of these three contributing factors, the last is probably the most significant to consider in the evaluation of service station canopy lighting. There is however, a need for municipalities to balance this desire to use nighttime lighting as a business technique to attract customers, with the desire of residential property owners to maintain nighttime darkness.

Lighting Factors

There are several potential causes of objectionable service station lighting. In general however, two factors are root causes: improper *illuminance* levels, and/or improper *luminance* levels. Illuminance is a measure of light received at a surface. It is easily quantified by any simple light meter, in units termed footcandles. Illuminance, however, is not seen by the human eye. The eye only sees light when it is reflected off surfaces. As such, it is called luminance (often though of as "brightness"). Measuring luminance requires the use of a sophisticated type of light meter, and is recorded in units termed candela/ft^2. It is therefor necessary to consider both illuminance as well as luminance in the assessment of the overall quality of a service station canopy lighting solution.

Illuminance Standards

The Illuminating Engineering Society of North America (IESNA) has published recommendations for illuminance levels at service stations. These standards are included in the 8th edition of the *IESNA Lighting Handbook*, published in 1993. The standards include at table of recommended illuminance levels that is divided into two sections: recommendations for stations located in dark surroundings, and stations located in light surroundings:

	Recommended Illuminance In Footcandles
Dark Surroundings	
Approach	1.5
Driveway	1.5
Pump Island Area	20.0
Building Faces	10.0*
Service Areas	3.0
Landscape Highlights	2.0
Light Surroundings	
Approach	3.0
Driveway	5.0
Pump Island Area	30.0
Building Faces	30.0*
Service Areas	7.0
Landscape Highlights	5.0

* Vertical Illuminance

Recent experience has shown that many oil dealers and other owners of service stations have set targets for canopy illuminance in the range of 80 - 100 footcandles at the pavement. This is undoubtedly a reflection of a desire to produce a high nighttime profile to potential customers in vehicles on the street.

Luminance Standards

The IESNA recommendations include the statement: "*Illuminance selection, based upon visual performance, is only one lighting design criterion to be considered. There are many applications where other design criteria...are more important to successful lighting design.*"

Considering the fact that the human eye "sees" brightness (luminance), not illuminance, illuminance standards alone are not sufficient in establishing an acceptable guideline for lighting design. Unfortunately, there currently is no numeric standard relating to brightness relative to site lighting at service stations. The control of brightness however, is an equally important consideration to that of achieving proper illuminance levels, and accordingly it should not be ignored. Specifically, brightness should be considered in terms of:

- Lighting fixture brightness
- Reflected brightness of surfaces
- Overall ambient brightness of site

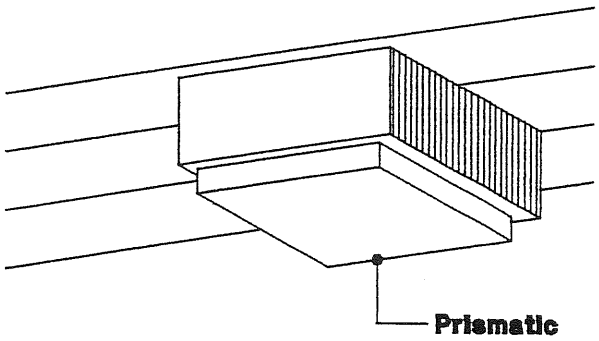
Excessive brightness seen from lighting fixtures can be a cause of distraction and/or disability glare. Both of these types of glare result from an extreme brightness which is located in the normal field of view. Distraction glare causes viewers to be momentarily distracted from their primary task, such as concentrating on driving when traveling by a service station. Disability glare reduces visibility by lowering contrast. An extremely bright light makes it difficult to see beyond the light because the contrast between the task (seeing people and objects) and the background is eliminated.

High levels of reflected brightness off surfaces can significantly contribute to astronomic light pollution. Light which strikes a vertical surface, such as a service station building wall, tends to be reflected in all directions, and accordingly, only partly serves the useful purpose of lighting parking, drive and pump areas. The remainder is usually reflected upwards toward the sky or adjacent properties.

Intense overall brightness of a service station site is often thought to be desirable by owners as an effective means of advertisement. This is not always as effective a means of calling attention to what is important as is a more carefully controlled lighting solution (for example, see description of existing conditions at the Forest Street Mobile Station in Section 2, page 5). Service stations which are lighted to extreme levels of brightness across the site or under canopies can be incompatible with the character of adjacent properties. This can be particularly true when service stations abut residential districts.

Lighting Fixtures

A majority of service station canopies include surface mounted lighting fixtures, consisting of rectangular sheet metal housings with a dropped, prismatic diffusers. The dropped refractor directs light downward toward the pump island(s), as well as upward toward the underside of the canopy ceiling. By directly lighting the canopy underside, the overall brightness of the canopy area is significantly increased. Most canopy installations include metal halide type lamps which produce a white light (some stations however utilize high pressure sodium lamps which produce an orange-yellow light).



TYPICAL CANOPY LIGHT

Both metal halide and high pressure sodium lamps are high intensity discharge lamp sources which are characterized by their relative high lumen output. The high output of these lamps causes the dropped lighting fixture refractor to be seen as points of significant brightness from great distances.

Sec. 2

Survey Results of Five Service Station Canopies

Description of Existing Conditions

The City of Portland planning staff identified six existing service stations to serve as the basis for study of typical existing canopy lighting conditions. It was not the intended purpose in obtaining illuminance measurements to evaluate the appropriateness of canopy lighting at any of these six sites. Rather, this data was collected to draw general conclusions about recent past trends in service station canopy lighting design and to use this data to formulate a plan of guidance for future canopies.

- **Texaco Station**
  Brighton Ave. and St. George St.
- **Cumberland Farms**
  Brighton Ave. and Woodford St.
- **Christy's**
  Congress Ave. and Dow St.
- **Cumberland Farms**
  Pine St. and Bracket St.
- **Mobil Station**
  Forest Ave.
- **Cumberland Farms**
  Washington Ave. and Ocean Ave.

An illuminance survey was conducted at the first five sites. Permission was not granted to take illuminance readings at the Washington Ave. Cumberland Farms.

TEXACO STATION - Brighton Ave.

The canopy at this site is attached to the convenience store along one side, and is approximately 40 ft. wide by 60 ft. long. There are four pump islands below the canopy, each with a single pump station. There are a total of 12 surface mounted lights on the canopy underside surface in four rows of three fixtures. The light fixtures have dropped prismatic refractors and they utilize metal halide lamp sources.

There are three pole lights on the site for illumination of parking areas and drives. Two poles are located on Brighton Avenue and the third pole is located at the back corner on St. George Street. These pole lights also contain metal halide lamps.

The horizontal illuminance levels below the canopy do not seem to be excessive, but there is a degree of glare observed from the lighting fixture refractors. There is a Christy's Station a few blocks easterly on Brighton Avenue. The majority of properties abutting the Texaco site are residential.

CUMBERLAND FARMS - Brighton Ave.

The canopy at this site is unattached, and is approximately 32 ft. wide by 60 ft. long. There are six pump islands below the canopy, each with a single pump station. There are a total of 18 surface mounted lights on the canopy underside surface in six rows of three fixtures. The light fixtures have dropped prismatic refractors and they utilize metal halide lamp sources. Around the entire top perimeter of the canopy, there is a two-lamp fluorescent lighting cove which provides downlight for the canopy sides.

There are three pole lights on the site for illumination of parking areas and drives. Two of these poles are located on Brighton Avenue and the other is located at the corner of Woodford street. The pole lights have metal halide lamps and they contain forward-throw internal reflectors which produce a significant amount of glare.

The horizontal illuminance levels below the canopy seem to be quite high, and there is a degree of glare observed from the lighting fixture refractors. The majority of properties abutting the site are residential. There are no competing businesses in the immediate area. There is a significant amount of brightness reflected off residential buildings on abutting properties.

CHRISTY'S - Congress Ave.
The canopy at this site is unattached, and is approximately 25 ft. wide by 35 ft. long. There are two pump islands below the canopy, each with a single pump station. There are a total of 8 surface mounted lights on the canopy underside surface in two rows of four fixtures. The light fixtures have dropped prismatic refractors and they utilize high pressure sodium lamp sources.

There are two pole mounted floodlights located on Congress Avenue which are aimed back at the site for illumination of parking areas and drives. There are also two wall-pack lights mounted at approximately 10 ft. on the front face of the convenience store. These wall-pack lights have prismatic face diffusers and they contain metal halide lamps.

Due to the orange-yellow nature of the high pressure sodium lamp sources, the perception of the horizontal illuminance levels below the canopy do not seem to be as high as they actually are. There is a degree of glare observed from the canopy lighting fixture refractors, and the wall-pack lights on the building produce a significant amount of glare. The properties abutting the Christy's site are combined commercial and residential.

CUMBERLAND FARMS - Pine Street
The canopy at this site is unattached, and is approximately 25 ft. wide by 30 ft. long. There is a single pump island below the canopy, with two pump stations. There are a total of 6 surface mounted lights on the canopy underside surface in two rows of three fixtures. The light fixtures have dropped prismatic refractors and they utilize metal halide lamp sources. Around the entire top perimeter of the canopy, there is a two-lamp fluorescent lighting cove which provides downlight for the canopy sides.

There are two pole mounted floodlights which is aimed back at the site for illumination of parking areas and drives. One of these floodlights is located on the corner of the site at Bracket Street (this pole light was not operating during the survey period), and the second located on the back corner on Pine Street. The Pine Street floodlight utilizes a high pressure sodium lamp.

The horizontal illuminance levels below the canopy do not seem to be excessive, but there is a degree of glare observed from the lighting fixture refractors. The amount of reflected light off the light colored brick walls of the convenience store seems to be higher than is in keeping with the neighborhood. The majority of properties abutting the site are residential. One commercial property exists across Pine Street.

MOBIL STATION - Forest Ave.
The canopy at this site extends over the top of a convenience store, and it projects out over pump islands on either side. The canopy on the east side covers two pump islands, each with a single pump station.

The canopy on the west side is approximately 35 ft. wide by 70 ft. long and it covers four pump islands below the canopy, each with a single pump station. In both the east and west canopies. there are downlights which are fully recessed into the underside of the canopy. These recessed lights utilize metal halide lamps sources. On the east side, there are a total of 6 recessed lights, in two rows of three fixtures. On the west side, there are a total of 15 recessed lights in five rows of three fixtures. In addition to the recessed canopy downlights, there are also fluorescent lights which are built into rows above the pump islands. These lights are installed at approximately 10 ft. above the pumps, each connecting two pump islands. The fluorescent lights have blue translucent side diffuser panels and white bottom diffusers.

There are pole lights located on the back and west property lines which provide illumination of parking areas and drives. In addition, there are low level bollard lights along the Forest Ave. side of the site, and along the east side at Noyse Street. These bollards and pole lights all contain metal halide lamps.

The horizontal illuminance levels below the canopy do not seem to be excessive. The florescent lights immediately above the pump islands act as local task lights which allow the overhead canopy lights to provide a lesser level of general ambient light. The result is that higher levels of horizontal illuminance occur where they are needed at pumps, and lesser levels are provided for drives between pumps.

There is an overall balance of brightness which seems to be very acceptable. The front of the site which faces Forest Avenue is significantly less bright than the side canopy areas. This produces a stepped pattern of brightness which defies the usual scheme of presenting a bright street-scape. The result is that the station does not overwhelm Forest Avenue, and yet, it makes a very noticeable statement. The relatively low brightness of the recessed canopy lights permits the internally illuminated signage to make a dramatic visual statement by contrast of brightness.

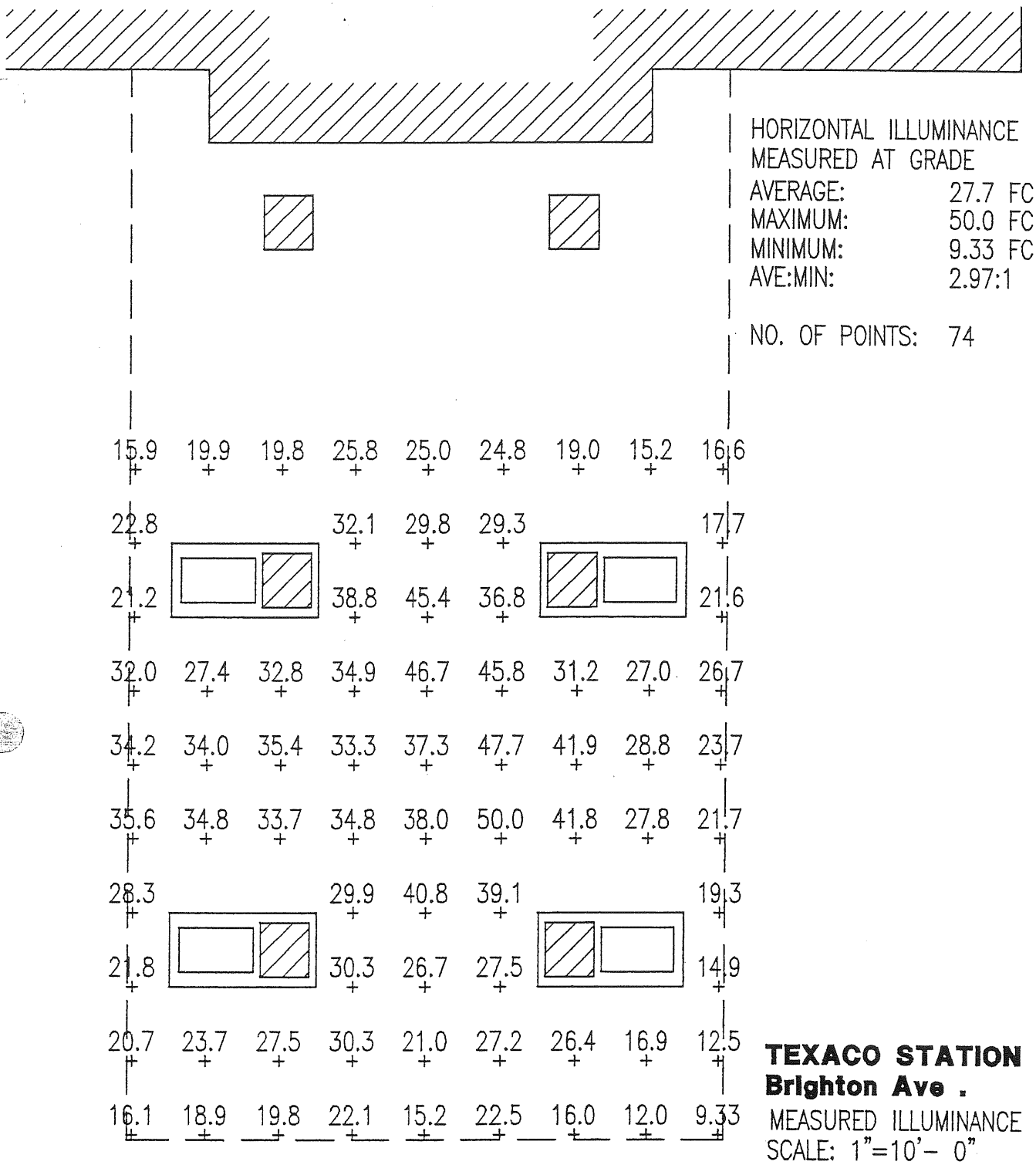
Illuminance Measurement Methodology

Measurement of illuminance levels at various service station canopies in the Portland downtown area was conducted on April 18 and 19, 1996. Measurements were made with a Minolta T-1 illuminance meter, which has a precision of .01 footcandle. The procedure for recording illuminance levels was conducted in accordance with the IESNA's published standard *LM-64 Photometric Measurements of Parking Areas.* Sky conditions during the measurement period were partly cloudy, with no moon. Measurements were recorded each evening from 8:45 pm until 11:00 pm.

Recorded Illuminance Levels

The following is a summary of horizontal illuminance levels measured at grade.

	Illuminance - Footcandles			Uniformity
	Ave.	Max.	Min.	Ave.:Min.
TEXACO STATION				
Brighton Ave.	27.7	50.0	9.33	2.97 : 1
CUMBERLAND FARMS				
Brighton Ave.	80.2	123	34.4	2.33 : 1
CHRISTY'S CITGO STATION				
Congress Ave.	70.0	136	30.1	2.32 : 1
CUMBERLAND FARMS				
Pine St.	27.3	42.5	11.8	2.31 : 1
MOBIL STATION				
Forest Ave.	34.3	85.9	6.47	5.30 : 1



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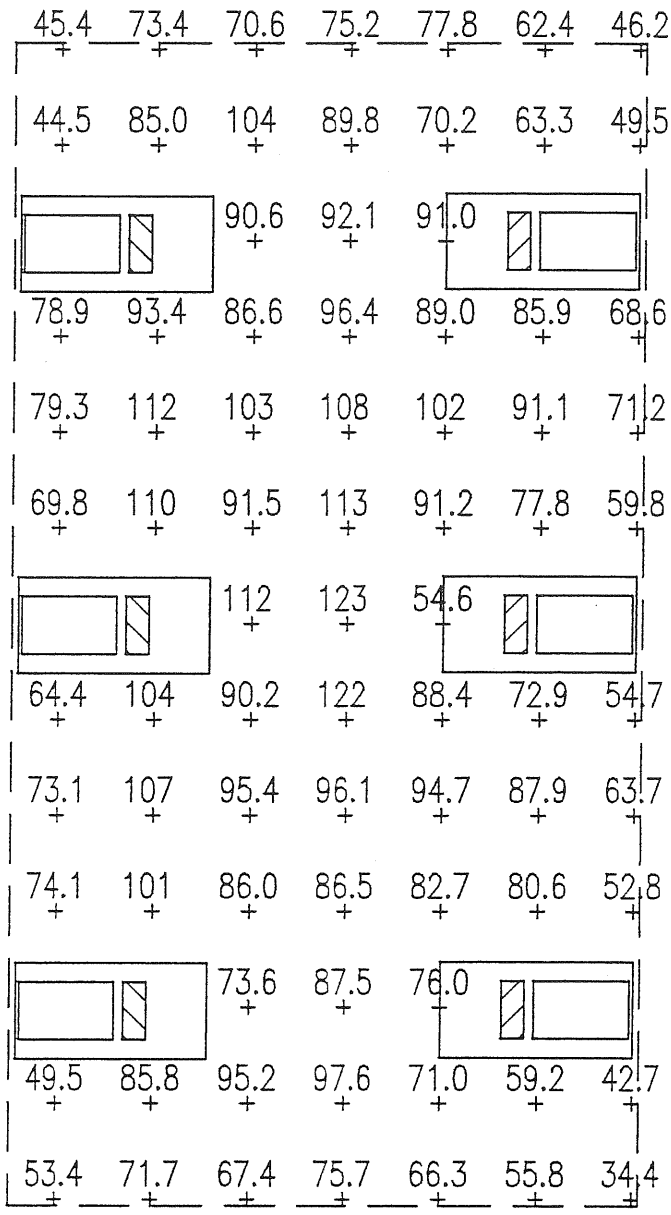
1 FRONT STREET P.O. BOX 230 BATH, MAINE 04530
TEL (207) 443-5447 FAX (207) 443-5560



HORIZONTAL ILLUMINANCE
MEASURED AT GRADE

AVERAGE:	80.2 FC
MAXIMUM:	123 FC
MINIMUM:	34.4 FC
AVE:MIN:	2.33:1
NO. OF POINTS:	79

CUMBERLAND FARMS
Brighton Ave .
MEASURED ILLUMINANCE
SCALE: 1"=10'– 0"

BRIGHTON AVENUE

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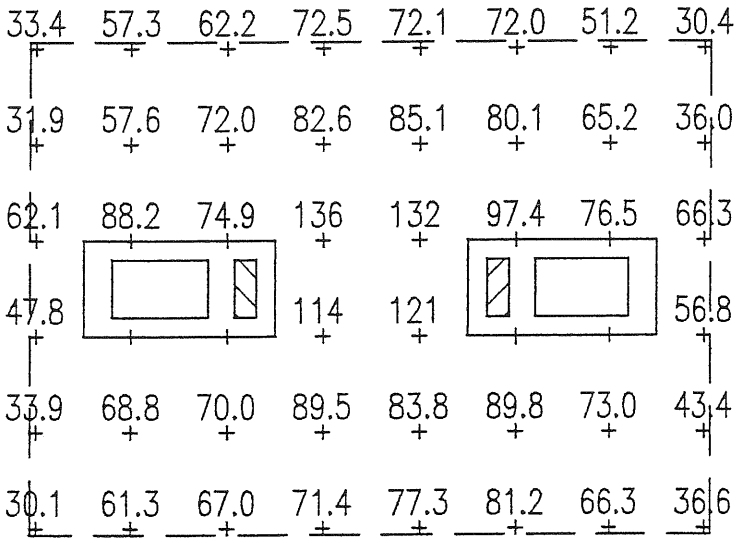
LIGHTING & ELECTRICAL ENGINEERING
1 FRONT STREET P.O. BOX 230 BATH, MAINE 04530
TEL (207) 443-5447 FAX (207) 443-5560

HORIZONTAL ILLUMINANCE
MEASURED AT GRADE

AVERAGE:	70.0 FC
MAXIMUM:	136 FC
MINIMUM:	30.1 FC
AVE:MIN:	2.32:1

NO. OF POINTS: 44



CHRISTY'S
Congress Ave.
MEASURED ILLUMINANCE
SCALE: 1"=10'- 0"

CONGRESS AVENUE

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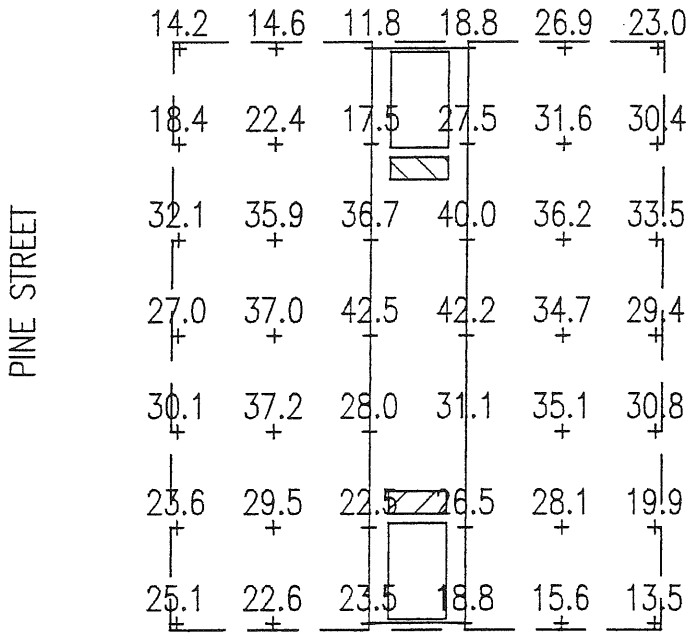
LIGHTING & ELECTRICAL ENGINEERING
1 FRONT STREET P.O. BOX 230 BATH, MAINE 04530
TEL (207) 443-5447 FAX (207) 443-5560

HORIZONTAL ILLUMINANCE
MEASURED AT GRADE

AVERAGE:	27.3 FC
MAXIMUM:	42.5 FC
MINIMUM:	11.8 FC
AVE:MIN:	2.31:1
NO. OF POINTS:	42



CUMBERLAND FARMS
Pine Street
MEASURED ILLUMINANCE
SCALE: 1"=10'- 0"

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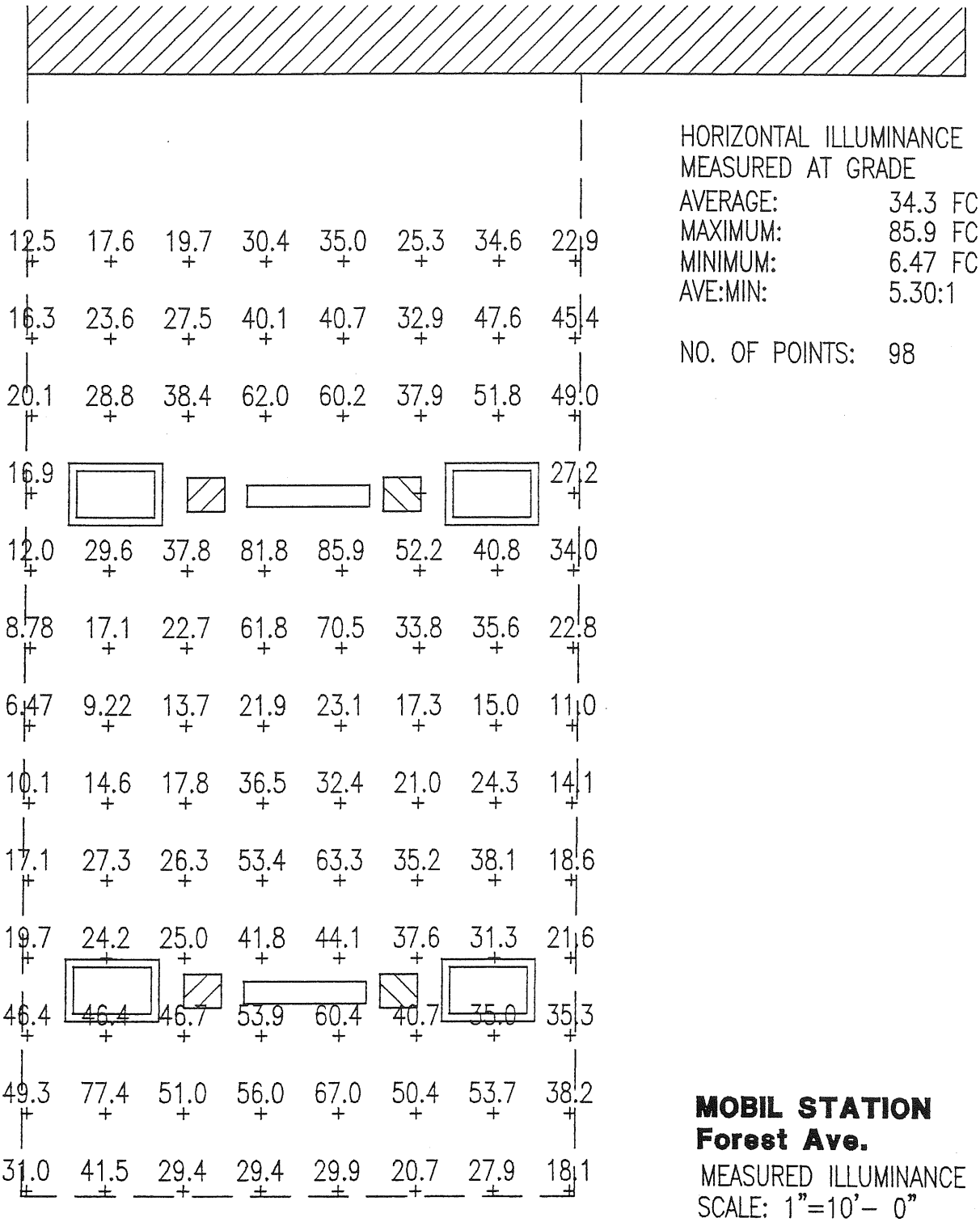
1 FRONT STREET P.O. BOX 230 BATH, MAINE 04530
TEL (207) 443-5447 FAX (207) 443-5560



FOREST AVENUE

HORIZONTAL ILLUMINANCE
MEASURED AT GRADE

AVERAGE:	34.3 FC
MAXIMUM:	85.9 FC
MINIMUM:	6.47 FC
AVE:MIN:	5.30:1

NO. OF POINTS: 98

MOBIL STATION
Forest Ave.
MEASURED ILLUMINANCE
SCALE: 1"=10'– 0"

Bartlett Design
LIGHTING & ELECTRICAL ENGINEERING
1 FRONT STREET P.O. BOX 230 BATH, MAINE 04530
TEL (207) 443-5447 FAX (207) 443-5560

General Recommendations

While lighting design of service station canopies can be controlled to some extent by means of written performance standards in a land use ordinance, relying *solely* on such a method is likely to provide less than satisfactory results. Each site application is unique, and as such, each requires some degree of specific evaluation. Carefully written lighting standards can effectively serve as a starting basis for design review, but there is ultimately no substitute for evaluation and decision making by planning staff and planning boards. It is important when creating land use regulations to include the authority (and responsibility) of site review boards to address the unique character of different sites. It should be recognized that this uniqueness of site will periodically require the adoption of conditions beyond those included in general performance criteria listed in the governing ordinance.

The diversity of land use of a typical city suggest that no one lighting regulation can be adopted to meet all needs. Requirements for canopy lighting at a site in a heavily developed commercial area might not properly serve the needs for control of canopy lighting in a low density residential neighborhood. Planning for outdoor lighting is most successful when it is performed not only for specific applications (parking lots, roadways, service station canopies, etc.), but when it is also performed by district.

The best land use regulations for the control of lighting include the following:

- The intent is clearly stated;
- The language is easily understood by applicants;
- The requirements are easily enforceable.

Proposed City of Portland Service Station Canopy Lighting Standards

The following comments are made relative to the proposed Site Lighting Standards for Gasoline Service Stations, as prepared by the planning staff.

The statement of Intention included in the proposed Site Lighting Standards does a good job of expressing why such standards are deemed important.

It is appropriate that criteria to be included in site lighting standards for service station canopies include more than illuminance regulations. In paragraph 2, General Standards, the section which addresses the types of light fixtures which will be permitted is an appropriate way of controlling excessive fixture luminance. Further consideration may be made in either defining "decorative lighting applications", or in stating that the included lighting standards only apply to area lighting. It might be appropriate to state that any decorative or accent lighting must be approved as to its compatibility with the local and neighborhood character.

Permitting only "cut-off" type lighting fixtures takes a significant step in limiting unnecessary brightness. Perhaps is would be worth expanding the definition to state: "*...where lenses, refractors, reflectors or lamp sources do not extend below the surface of the fixture housing and no direct light shall be directed at or above the horizontal plane.*" Although it might seem redundant, perhaps the following should be added to make certain that there is no confusion: *"The use of directional floodlights is not permitted."*

Since not every applicant will have access to the referenced IESNA recommended illuminance levels, perhaps illuminance requirements should be included with each specific use (as is the case with the paragraphs covering gasoline service stations). The general requirement that maximum levels not exceed three times the recommended average may lead to confusion as to which of the many IESNA recommended illuminance levels are intended to apply.

Under the section which addresses Standards For Specific Uses - Gasoline Service Stations, perhaps it would be appropriate to include a more expanded list of criteria:

2. *Illuminance Levels*

a. *Minor Gasoline Service Stations, including those abutting residential zones*
Illuminance levels shall not exceed the following:

Approaches and Drives:	*1.5 FC average*
	3:1 average-to-minimum uniformity ratio
	3.0 FC maximum
Service Areas:	*3.0 FC average*
	3:1 average-to-minimum uniformity ratio
	6.0 FC maximum
Pump Island Areas:	*20 FC average*
	3:1 average-to-minimum uniformity ratio
	40 FC maximum

b. *Major Gasoline Service Stations*
Illuminance levels shall not exceed the following:

Approaches and Drives:	*3.0 FC average*
	3:1 average-to-minimum uniformity ratio
	6.0 FC maximum
Service Areas:	*7.0 FC average*
	3:1 average-to-minimum uniformity ratio
	14 FC maximum
Pump Island Areas:	*30 FC average*
	3:1 average-to-minimum uniformity ratio
	60 FC maximum

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Bartlett Design
LIGHTING & ELECTRICAL ENGINEERING
1 FRONT STREET P.O. BOX 230 BATH, MAINE 04530
TEL (207) 443-5447 FAX (207) 443-5560

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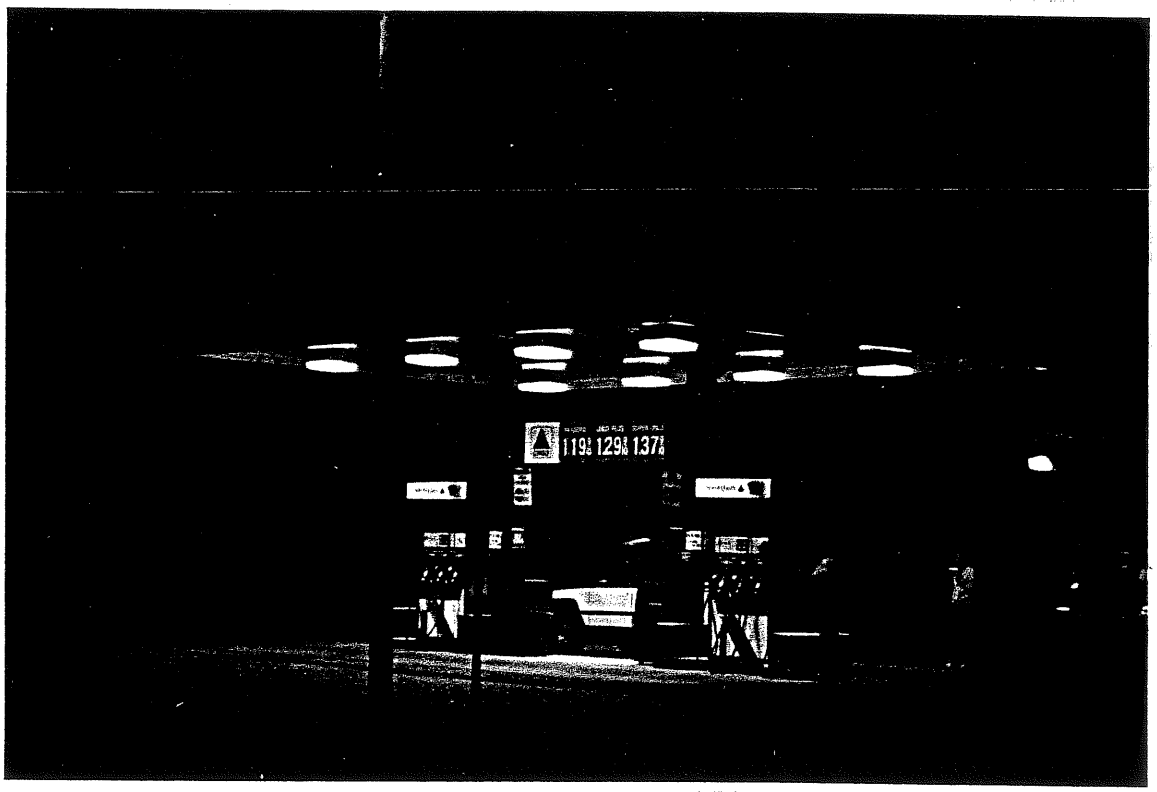
Congress Ave.



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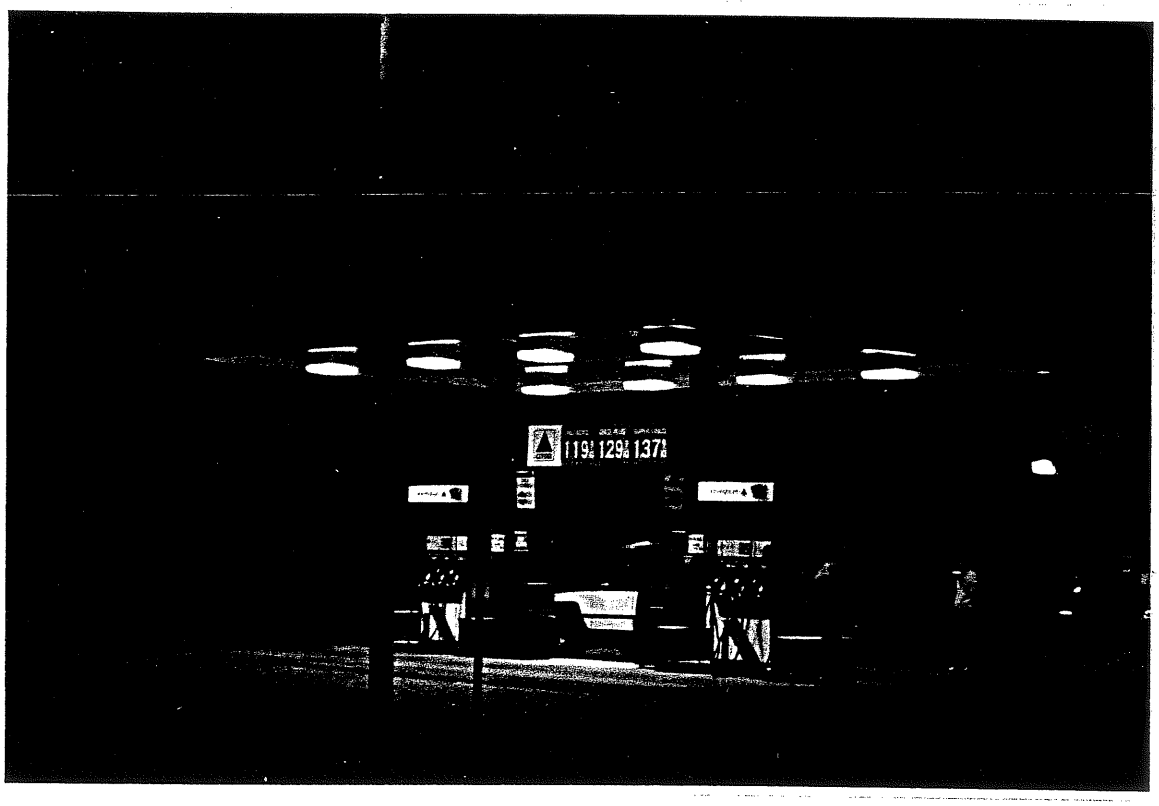

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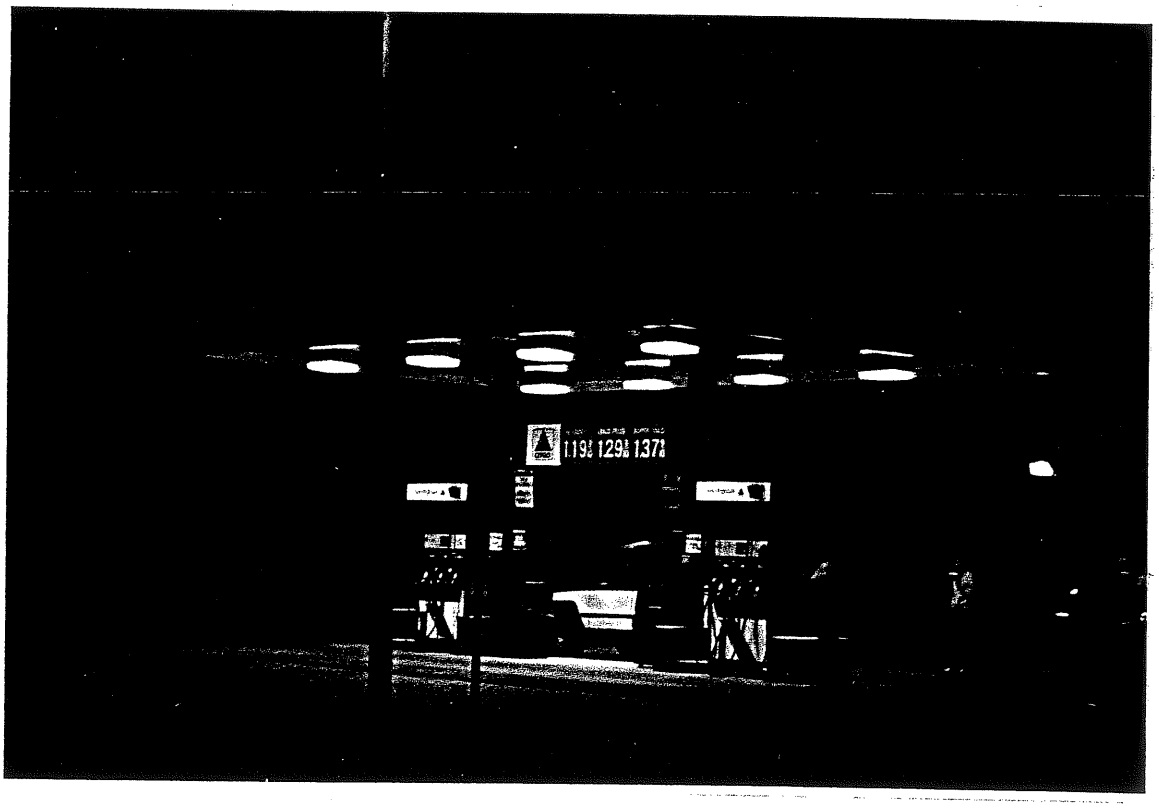


3/25/99
Draft (WN)

LIGHTING STANDARDS: POSSIBLE ADDITIONS/ALTERATIONS

SITE PLAN:
Currently, Site Plan requires that the "location and intensity of outdoor lighting system(s)" be shown (14-525(2) j.)and Site Plan Standards require that "...exterior lighting will not be hazardous to motorists traveling on adjacent streets; is adequate for the safety of occupants or users of the site; and such lighting will not cause significant glare or direct spill over onto adjacent properties and complies with...the ..Technical and Design Standards." (14-526(9))

TECHNICAL AND DESIGN STANDARDS:
The current Technical Standards for lighting refer only to street lighting and are separated into Arterial, Collector, and Local sub-categories. See Tech Standards Sec. 1 (5). Lighting is measured by a minimum foot candle (cf) designation and pole height and distances are delineated. As lighting dissipates with distance away from the source, significantly higher light density will be required in some areas to maintain the minimum cf's. No maximum or minimum to average ratios are referenced, nor do the standards mention excessive lighting, spill over, glare, or other offsite light pollution/trespass impacts.

Proposed Section VIX Site Lighting Standards recommends a set of Intentions and General Standards which address excess lighting problems and refers specifically to the Illuminating Engineering Society of North America (IESNO) for benchmark standards. These standards provide levels for illumination averages, average-to minimum uniformity ratios, and maximums as measured in Foot Candles Additionally, Section VIX supplies illuminance standards for (A) Gas Stations, separating stations into major and minor. "Standards for Categories to be developed at a later time" are (B) Parking lots, (C) Aprons and Canopies ?, (D) Lighting of Exterior Sales Area ? (E) Security Lighting ?

Note: I question C, D, and E because I do not know what is being specifically referred to. Category (E) is particularly troubling, as "security" is a requirement for any area, and could be used as an excuse to provide a greater than density of illumination for low illumination areas.

BARTLETT DESIGN : EVALUATION OF EXTERIOR LIGHTING APPLICATIONS

A report titled "EVALUATION OF EXTERIOR LIGHTING APPLICATIONS, Information Prepared for Municipal Planning Review" prepared by Bartlett Design in 1996, refers to a set of roadway, parking, and pedestrian way standards. See Bartlett tables I, II, III, and IV. The Bartlett report provides IES averages, minimums, maximums, and uniformity ratio standards for Roadways and Parking Facilities, while providing only simple averages for Pedestrian Ways and areas of "Special Pedestrian Security." The Bartlett standards are based on IES benchmarks, and have CF levels generally approximate to the simplified Portland Technical Standards for roadways. The IES standards are more complex in that they break down areas into Commercial, Intermediate, and Residential, and (for roadways) measure both Luminance and Illuminance. The Portland Standards divide regulated areas into Commercial and Residential, and measure only the more common Illuminance values (Foot Candles.)

POSSIBLE CHANGES/ADDITIONS TO THE PORTLAND STANDARDS
Currently the Portland lighting standards suffer two major deficiencies (1) excessive lighting is not adequately discouraged, and (2) Lighting levels are not specifically addressed for areas outside of roadways. Adoption of the Section VIX Site Lighting Standards will address concern (1) in a general

sense, through the Intentions and General Standards by benchmarking to IES standards. Section VIX will also address a portion of concern (2) by addressing gas stations specifically, and by providing a template for the development standards for other specific site areas. Unfortunately, the additional "standards to be developed at a later time"are too vague to be of much help for developing a more comprehensive review process for site lighting

The Bartlett report provides the standards for parking and pedestrian areas, but in a complicated form. It would be helpful to have all the standards follow a standardized format, perhaps utilizing the gas station standards from the proposed Section VIX which provides illuminance averages, average-to minimum uniformity ratios, and maximums. If accepted, the Section VIX format should, for the sake of consistency, be imposed on the Roadways Lighting Standards, which presently has no maximums or uniformity ratios

Additional areas in need of lighting standards:
Playgrounds/basketball and tennis courts. (5.0 FC by the "Cape"standards)
Retail areas
Building elevations (vertical lighting)
Industrial security
Public piers and boat landings
Industrial marine (a source of considerable existing light trespass)
Ball fields (50FC, professional; 10FC, recreational by the "Cape" standards)
Others.....

Roadways might be able to carry a simple pole height luminaire type spacing standard as a default,

We will be encouraging more of this, especially the more popular gooseneck building wall washers

Alex,

I really didn't know what you wanted for "Lighting Standards", but here is a very rough first look. Please look it over and give me an Idea of what you want for a "Product" If we want the IESNO Hand book ($389.00, Full; $60, ready reference) the Address is Illuminating Engineering Society of No. Amer 120 Wall st. 17th floor NY, NY 10005 Tell 212-248-5006 (sounds right) Email iesna@iesna.org

Site Plan

(b) *Contents.* Any final or proposed site plan for a major or minor development shall include:

(1) A standard boundary survey prepared by a registered land surveyor at a scale of not less than one (1) inch to one hundred (100) feet and shall set forth:

a. Name and address of the applicant and name of the proposed development;

b. Scale and north points;

c. Boundaries of the site;

d. Total land area of the site;

e. Topography, showing existing and proposed contours at intervals of not more than two (2) feet or, in the case of a minor site plan, at intervals determined by the public works authority to be sufficient to properly evaluate existing and proposed drainage patterns and systems;

(2) Plans and maps prepared by competent professionals, based upon the boundary survey, including the following additional information:

a. Existing soil conditions;

b. Location of watercourses, wetlands, rock outcroppings and wooded areas within the project site, and the nature, width and location of proposed easements, rights-of-way, culverts, catch basins or other means of channeling surface water within the development and over adjacent properties, and all proposed buffer strips;

c. Location, ground floor area and grade elevations of building and other structures existing and proposed, elevation drawings of exterior facades, and materials to be used;

d. Approximate location of buildings or other structures on parcels abutting the site;

e. Location of on-site solid waste receptacles, public utilities, water and sewer mains, culverts, drains, existing and proposed; showing size and direction of flows;

f. Location, dimensions and ownership of easements, public or private rights-of-way, both existing and proposed;

g. Location and dimensions of on-site pedestrian and vehicular accesses, parking areas, loading and unloading facilities, designs of ingress and egress of vehicles to and from the site onto public streets, and curb and sidewalk lines;

h. Landscape plan showing location, type, quantity and approximate size of plantings, areas of existing vegetation to be preserved, preservation measures to be employed, and details of planting and preservation specifications;

i. Location and dimensions of all fencing and screening;

j. Location and intensity of outdoor lighting system;

k. Location of fire hydrants, existing and proposed;

the parking requirement for such structures. The parking requirement shall be determined based upon a parking analysis submitted by the applicant, which shall be reviewed by the city traffic engineer, and upon the recommendation of the city traffic engineer.

(3) The bulk, location or height of proposed buildings and structures and the proposed uses thereof will not cause health or safety problems as to existing uses in the neighborhood, including without limitation health or safety problems resulting from any substantial reduction in light and air, any significant wind impact, and any significant snow loading on any neighboring structure, where setbacks from property lines are not required by article III;

(4) The bulk, location or height of proposed buildings and structure minimizes, to the extent feasible, any substantial diminution in the value or utility to neighboring structures under different ownership and not subject to a legal servitude in favor of the site being developed;

(5) The development will not overburden the sewers, sanitary and storm drains, water, solid waste disposal or similar public facilities and utilities;

(6) The on-site landscaping provides adequate buffering between the development and neighboring properties so as to adequately protect each from any detrimental features of the other;

(7) The site plan minimizes, to the extent feasible, any disturbance or destruction of significant existing vegetation;

(8) The site plan does not create any significant soil and drainage problems, whether on- or off-site, and adequately provides for control of erosion and sedimentation during construction and afterward;

(9) The provision for exterior lighting will not be hazardous to motorists traveling on adjacent public streets; is adequate for the safety of occupants or users of the site; and such lighting will not cause significant glare or direct spillover onto adjacent properties and complies with the applicable specifications of the City of Portland Technical and Design Standards and Guidelines;

(10) The development will not create fire or other safety hazards and provides adequate access to the site and to the buildings on the site for emergency vehicles;

(11) The proposed development is designed so as to be consistent with off-premises infrastructure, existing or planned by the city;

(12) Any industrial development will prevent undue adverse environmental consequences, including without limitation any substantial diminution to the value or utility of neighboring structures or significant hazard to the health or safety of persons residing in the vicinity by controlling the odor levels, sound levels, particulates, and other emissions it generates:

(13) For development within the R-P zone, where there is a consistent established architectural style or character to the existing structures in the immediate vicinity in

Tech. Standards

(b) Industrial/Commercial Road - On all new industrial roads, either a 35/40 foot wood pole or a 30 foot aluminum pole shall be used.

(c) Mainway Area - Street lighting poles and fixtures shall be approved depending on location.

(d) Minimum Lighting Design - Street lighting design shall conform to the following table:

CLASSIFICATION	COMMERCIAL		RESIDENTIAL	
Vehicular Roadways	Foot Candles	Pole Foot Spacing	Foot Candles	Pole Foot spacing *
Arterial	2.0	160' (30' pole)	1.0	130' (30' pole)
Collector	1.2	130' (30' pole)	0.6	60' (14' pole)
Local	0.9	90' (14' pole)	0.4	120' (14' pole)
		or 60' (14' pole)		

* Pole spacing distance measured from pole to pole on same side of street using staggered spacing on opposite side of street.

Street lights must be operating before occupancy of any dwellings in a subdivision

6. SURVEY CONTROL

A. Horizontal -- A minimum of two line monuments shall be tied into the Maine State Coordinate System, West Zone. This survey connection shall be required when said monuments are within 1/2 mile of a triangulation or traverse station established in conformity with the standards prescribed in Title 33, Section 805, Maine Revised Statutes Annotated.

The Department of Public Works will maintain an updated list of control stations located within the City of Portland.

B. Vertical

(a) All established elevations must be based on mean sea level datum and referenced from a specific bench mark.

(b) A minimum of one line monument shall be a bench mark monument with an established elevation.

C. Survey control determination shall be to third-order National Control Standards and Specifications, as outlined in publications prepared by the Federal Geodetic Control Committee, NOS, NOAA, by a registered land surveyor licensed to practice in the State of Maine.

(a) Survey shall be in accordance with the Maine State Board of Reg. for Land Surveyors Standards, Category 1, Condition 1.

Attachment 4

Note: Underlined sections indicate revisions to previous draft.

(Proposed)
SECTION VIX
SITE LIGHTING STANDARDS

1. INTENTION

These standards are intended to provide for safe and adequate site lighting for proposed developments which meets the needs of the proposed use but does not create unsafe or unpleasant conditions which adversely affect surrounding properties. The following standards attempt to prevent 1) high than necessary illuminance levels which create a sense of incompatibility with neighboring properties; 2) uncontrolled light source brightness which creates glare; and 3) improperly aimed/installed lights which cause light trespass onto neighboring properties.

2. GENERAL STANDARDS

The provision for exterior lighting shall be adequate for the safety of occupants or users of the site but shall not cause glare or direct spillover to adjacent properties or create visual distraction to motorists traveling on adjacent streets. Unless otherwise specified below, light levels shall not exceed the Illuminating Engineering Society of North America (IESNA) recommended average lighting levels for the sue, with maximum levels not exceeding three (3) times the recommended average level.

Except in limited decorative lighting applications (e.g. post-top lanterns in a park setting), fixtures shall be of a "cut off" type, where ~~the~~ lenses, refractors, reflectors or lamp sources do not extend below the surface of the fixture housing itself and no direct light shall be directed at or above the horizontal plane. Mounting heights of all fixtures shall be the minimum necessary to meet the need. The use of directional floodlights shall not be permitted. Wherever practicable, lighting installations shall include timers, dimmers and/or sensors to reduce overall energy consumption and eliminate unneeded lighting.

3. STANDARDS FOR SPECIFIC USES

A. Gasoline Service Stations

1. General Requirement for Canopy Lighting at all Gas Stations: Lighting fixtures shall be fully recessed and shall be located on the underside of the canopy with no part of the fixture extending below the surface of the underside of the canopy. There shall be no internal or external lighting of the canopy fascia, except within the permitted sign area.

2. Illuminance Levels

a. Minor Gasoline Service Stations, including those abutting residential zones. Illuminance levels shall not exceed the following:

Approaches and Drives:	1.5 FC average 3:1 average-to-minimum uniformity ratio 3.0 FC maximum
Service Areas:	3.0 FC average 3:1 average-to-minimum uniformity ratio 6.0 FC maximum
Pump Island Areas:	20 FC average 3:1 average-to-minimum uniformity ratio 40 FC maximum

b. Major Gasoline Service Stations
Illuminance levels shall not exceed the following:

Approaches and Drives:	3.0 FC average 3:1 average-to-minimum uniformity ratio 9.0 FC maximum
Service Areas:	7.0 FC average 3:1 average-to-minimum uniformity ratio 21 FC maximum
Pump Island Areas:	30 FC average 3:1 average-to-minimum uniformity ratio 90 FC maximum

B. Parking Lot Lighting

C. Aprons/Canopies

D. Lighting of Exterior Sales Area

E. Security Lighting

(Standards for these Categories to be developed at a later date)

Bartlett Report - Tables

The following recommendations are taken from the 1987 Edition of the Illuminating Engineering Society of North America (IESNA) Lighting Handbook (Application Volume).

TABLE I

RECOMMENDED MAINTAINED ILLUMINANCE VALUES FOR ROADWAYS IN FOOTCANDLES

Road and Area Classification		*Pavement Classification* R1	R2 & R3	*Uniformity Ratio* R4	*Illuminance (Average:Minimum)*
Freeway Class A		0.6	0.9 0.8		3:1
Freeway Class B		0.4	0.6 0.5		
	Commercial	1.0	1.4 1.3		
Expressway	Intermediate	0.8	1.2 1.0		3:1
	Residential	0.6	0.9 0.8		
	Commercial	1.2	1.7 1.5		
Major	Intermediate	0.9	1.3 1.1		3:1
	Residential	0.6	0.9 0.8		
	Commercial	0.8	1.2 1.0		
Collector	Intermediate	0.6	0.9 0.8		4:1
	Residential	0.4	0.6 0.5		
	Commercial	0.6	0.9 0.8		
Local	Intermediate	0.5	0.7 0.6		6:1
	Residential	0.3	0.4 0.4		

(1) The recommended values shown are meaningful only when designed in conjunction with other elements. The most critical elements are:

(a) Lighting System Description
(b) Quality
(c) Uniformity
(d) Luminaire Mounting Height
(e) Luminaire Spacing
(f) Luminaire Selection
(g) Traffic Conflict Area

TABLE II

IES RECOMMENDED MAINTAINED LUMINANCE VALUES FOR ROADWAYS

Road and Area Classification		*Average Luminance* L_{avg} *(cd/ft²)*	*Luminance Uniformity* L_{avg} *to* L_{min}	L_{max} *to* L_{min}	*Veiling Luminance Ratio Maximum* L_v *to* L_{avg}
Freeway Class A		0.06	3.5 to 1	6 to 1	0.3 to 1
Freeway Class B		0.04	3.5 to 1	6 to 1	0.3 to 1
Expressway	Commercial	1.0	3 to 1	5 to 1	0.3 to 1
	Intermediate	0.08	3 to 1	5 to 1	
	Residential	0.06	3.5 to 1	6 to 1	
Major	Commercial	1.2	3 to 1	5 to 1	0.3 to1
	Intermediate	0.09	3 to 1	5 to 1	
	Residential	0.06	3.5 to 1	6 to 1	
Collector	Commercial	0.08	3 to 1	5 to 1	*0.4 to 1*
	Intermediate	0.06	3.5 to 1	6 to 1	
	Residential	0.04	4 to 1	8 to 1	
Local	Commercial	0.06	6 to 1	10 to 1	*0.4 to 1*
	Intermediate	0.05	6 to 1	10 to 1	
	Residential	0.03	6 to 1	10 to 1	

L_v = veiling luminance

TABLE III

RECOMMENDED MAINTAINED HORIZONTAL ILLUMINANCES FOR OPEN PARKING FACILITIES IN FOOTCANDLES

	GENERAL PARKING AND PEDESTRIAN AREA		*VEHICLE USE AREA (ONLY)*	
Level of Activity	*Minimum on Pavement*	*Uniformity Ratio (Average:Minimum)*	*Average on Pavement*	*Uniformity Ratio (Average:Minimum)*
High	0.9	4:1	2	3:1
Medium	0.6	4:1	1	3:1
Low	0.2	4:1	0.5	3:1

TABLE IV

IES RECOMMENDED AVERAGE MAINTAINED ILLUMINANCE LEVELS FOR PEDESTRIAN WAYS (IN FOOTCANDLES)

Walkway and Bikeway Classification	*Minimum Average Horizontal Levels (1)*	*Average Vertical Levels for Special Pedestrian Security (2)*
Sidewalks (roadside) and Type A bikeways:		
Commercial areas	1.0	2.2
Intermediate areas	0.6	1.1
Residential areas	0.2	0.5
Walkways distant from roadways and Type B bikeways:		
Walkways, bikeways, and stairways	0.5	0.5
Pedestrian tunnels	4.3	5.4

(1) Crosswalks traversing roadways in the middle of long blocks at street intersections should be provided with additional illumination.
(2) For pedestrian identification at a distance. Values at 6 feet above walkway.

DEFINITIONS FOR TABLES I - IV

ROADWAY CLASSIFICATIONS

Freeway. A divided major roadway with full control of access and with no crossings at grade. This definition applies to toll as well as non-toll roads as follows:

Freeway A: Roadways with greater visual complexity and high traffic volumes. Usually this type of freeway will be found in major metropolitan areas in or near the central core and will operate through much of the early evening hours of darkness at or near design capacity.

Freeway B: All other divided roadways with full control of access where lighting is needed.

Expressway. A divided major roadway for through traffic with partial control of access and generally with interchanges at major crossroads. Expressways for noncommercial traffic within parks and park-like areas are generally known as parkways.

Major. The part of the roadway system that serves as the principal network for through traffic flow. The routes connect areas of principal traffic generation and important rural highways entering the city.

Collector. The distributor and collector roadways serving traffic between major and local roadways. These are roadways used mainly for traffic movements within residential, commercial and industrial areas.

"Cape" Standards

10/31/95

TECHNICAL BULLETIN 95-001
DEVELOPMENT OF REGIONAL IMPACT GUIDELINES FOR EXTERIOR LIGHTING DESIGN STANDARDS AND SUBMITTAL REQUIREMENTS

INTRODUCTION:
The intent of these design standards and submittal requirements is to establish a basis for review of exterior lighting design which will meet the Regional Policy Plan's Minimum Performance Standard

7.2.5.,"Unnecessarily bright lighting of a building or grounds shall not be permitted."

The primary concerns with outdoor lighting are Safety, Height, Intensity, Glare and Direction (shielding). The purpose of these guidelines is to address the above mentioned concerns.

To provide a comparison between different land uses and the recommended footcandle levels described in Section 2.8 below, the following are lighting levels in footcandles found in the IES Lighting Handbook, Reference Volume and Application Volume, Illuminating Engineering Society of North America, John E. Kaufman (ed.), New York, 1981.

USE	*LEVEL (in footcandles)*
Professional Baseball (infield)	*50.0*
Recreational Softball (infield)	*10.0*
Playgrounds	*5.0*
Roads	
Expressways	*0.6*
Dense commercial with pedestrians	*2.0*
Residential (Local)	*0.4*
Building Exteriors	
Entry (Active)	*5.0*
General grounds	*1.0*
Bikeways (along roads)	
Dense commercial	*0.9*
Residential	*0.2*
Parking Areas	*1.0*

These guidelines are to be comprehensive and generic as possible. However, there may be situations where these standards may be modified to reflect site specific issues. Applicants are encouraged to consult with the Commission's staff in the pre-application stage, if there are any questions regarding these standards.

The submittal requirements outline the information needed in advance for the review of a Development of Regional Impact. Submittal of the information described herein should insure the compliance with the Commission Minimum Performance Standard prior to equipment procurement and installation.

1. DEFINITIONS:

Equipment Factor- A factor used in the illuminance or luminance calculations that compensates for light losses due to normal production tolerances of commercially available luminaires when compared with laboratory photometric test models. It is common practice to approximate these losses using a 5% to 10% loss factor (EF=0.95-0.90).

Fixture- An electrical device which is secured to a wall, ceiling, pole, post and used to hold lamps.

Footcandles (Fc) - A unit of measuring the amount of illumination equal to one lumen per square foot on a surface.

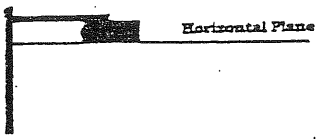
High Intensity Discharge (HID)- One of the three basic families of light fixtures. HID fixtures includes High Pressure Sodium, Low Pressure Sodium, Metal Halide and Mercury Vapor.

Horizontal Footcandles- The amount of illumination equal to one lumen per square foot on a horizontal surface.

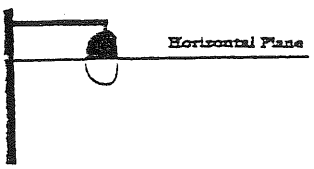
IES- Illuminating Engineering Society.

Initial Footcandle- The amount of illumination (measured by footcandles) given off by a luminaire at the point of installation.

Lighting Fixtures (Fully Shielded)- A fixture with shielding so that light rays emitted by the fixture are projected only below the horizontal plane (less than ninety (90) degrees) passing through the lowest point on the fixture from which light is emitted.



Lighting Fixtures (Partially Shielded)- A fixture with shielding so that the lower edge of the shield is at or below the centerline of the light source or lamp so as to minimize the light rays emitted above the horizontal plane.



Lighting Fixtures (Unshielded)- A fixture that does not meet the definition of fully shielded or partially shielded fixtures.

Light Loss Factors- The depreciation factors that are applied to the calculated initial footcandles to determine the maintained footcandles at a predetermined time in the operating cycle, usually just prior to relamping, and which reflect the decrease in effective light output of a lamp and luminaire during its life. The variables that should be considered when determining the light loss factors are:

1. Decrease of lamp lumen output with burning hours Lamp Lumen Depreciation (LLD);
2. Frequency and effectiveness of luminaire cleaning Luminaire Dirt Depreciation (LDD);
3. Schedule of lamp replacement;
4. Operation of light sources at other than current voltage;
5. Equipment factors (EF).

Lumen- The amount of light energy given off by a light source.

Luminaire- A complete lighting unit consisting of one or more lamps, together with the components which are designed to distribute the light, to position and protect the lamps, and to connect the lamps to the electrical power supply; also called the light fixture.

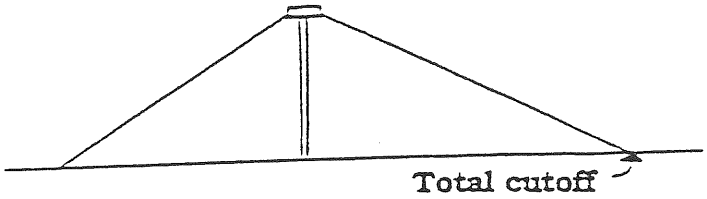
Maintained Footcandles- The amount of illumination (measured by footcandles) given off by a luminaire after being adjusted for light loss factors.

Outdoor Lighting Fixtures- Outdoor artificial illuminating devices, installed or portable, used for flood lighting, general illumination, or advertisement of commercial or industrial developments.

Reflector- A method (in combination with the refractor) of controlling the distribution of light on the surface.

Refractor- The lower portion of the luminaire, used in combination with the reflector, to control the distribution of light on the surface. The refractor is generally a molded glass element that provides prismatic control of light.

Total Cutoff- The point at which all light rays are completely shielded.



Vertical Footcandles- The amount of illumination equal to one lumen per square foot on a vertical surface.

2. GENERAL EXTERIOR LIGHTING DESIGN STANDARDS:

2.1 Exterior Lighting Design shall conform to the Commonwealth of Massachusetts State Building Code, specifically, Article 31, Energy Conservation.

2.2 The design of the exterior lighting system should conform to the recommendations set forth by the Illuminating Engineering Society of North America (IES).

2.3 The light source should be either High Pressure Sodium or Metal Halide. Other sources, such as Mercury Vapor, Incandescent and Tungsten Halogen may be considered by the Commission for low level landscaping lighting.

2.4 The luminaires should be the shoe box type or decorative in nature (with interior directional shields), consistent with the architectural theme of the development. Flood and Area lighting is unacceptable. All luminaires shall have a total cutoff of all light at less than ninety (90) degrees from vertical. The lighting fixture should only be visible from below.

2.5 Reflectors of proper (IES) distribution shall be selected for maximum efficiency. Reflectors and shielding shall provide total cutoff of all light at the property lines of the parcel to be developed.

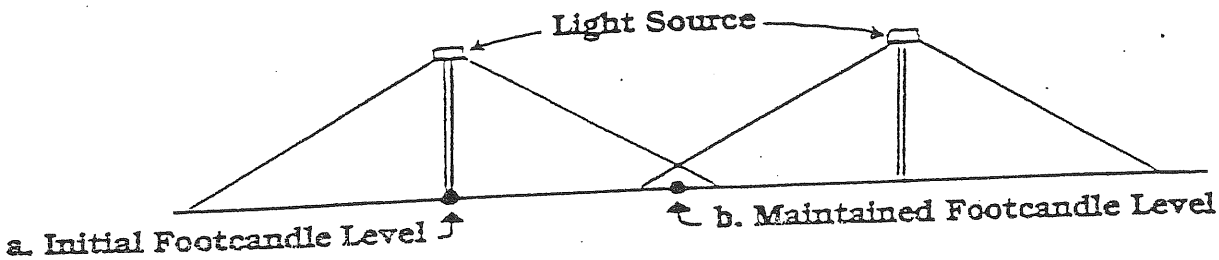
2.6 Developments, which abut residential areas and/or regional vistas or are visible from public roadways shall not utilize light poles exceeding 20'-0" in height. Developments which do not abut residential areas and/or regional vistas or are not visible from public roadways shall not utilize light poles exceeding 25'-0" in height. light poles utilized for walkway lighting shall not exceed 12'-0" in height.

2.7 Where wall pack type luminaires are utilized for exterior illumination, the fixture shall be equipped with a prismatic lens to reduce glare. Means should be provided to adjust the beam cutoff in the field. Wall pack lighting should be designed, to a maximum cutoff of seventy (70) degrees from vertical. The location of wall pack luminaires shall not exceed 20'-0" in height. Wall pack luminaires with visible lamping to normal viewing angles are not recommended.

2.8 The following footcandle levels shall be adhered to:

a. The maximum horizontal footcandle level (Initial) as measured directly below the luminaires at grade.....8.0 Fc

b. The minimum horizontal footcandle level (Maintained) measured at the point of least illumination at grade.....1.0 Fc



3.0 SUBMITTAL REQUIREMENTS:

The following information shall be submitted in two (2) sets to the Commission as part of section 2.4 (k) of a Development of Regional Impact Review application:

3.1 Site Lighting Design stamped and signed with the seal of a Massachusetts Registered Professional Electric Engineer. The electrical design drawings shall include the following information:

3.1.1. Calculations showing conformance with Massachusetts State Building Code, Article 31 Energy Conservation;

3.1.2. Electrical site plan indicating the location of each and every exterior luminaire to be installed. The fixtures shall be labeled as to the type of luminaires specified. Where wall-mounted luminaires are specified, the mounting heights of fixtures shall be indicated on the plan.

3.1.3. A lighting fixture schedule which designates the type of luminaires specified including the following information:

a) The number and type of lamps to be used in each luminaire;
b) A description of the luminaire and light pole if applicable;
c) The manufacturer's name and catalog numbers of the specified equipment;
d) Other pertinent data which may be helpful for proper evaluation.

3.2 A submittal of specified equipment shall be provided to include manufacturers specification sheets on the luminaires and poles to be used. Manufacturers specification sheets shall indicate the shape and dimensions of the luminaires and poles. ISO Footcandle diagrams shall also be included. Manufacturers specification sheets shall clearly indicate which options and accessories are to be provided. The luminaire beam cutoff data shall be stated.

3.3 A manufacturers computer-generated point to point printout, indicating the horizontal Footcandle Levels at grade, within the property to be developed and twenty-five (25) feet beyond the property lines. Computer-generated printout shall indicate the locations and type of luminaires analyzed. Pertinent data, such as building outline, building entrances & exits, loading areas, landscaping, walkways, roadways, bikeways, parking areas, curbs and property lines shall also be shown.

3.4 Two (2) additional computer-generated printouts shall be submitted: the first showing the initial footcandles levels and the second indicating maintained footcandle levels. Maintained footcandle levels shall be calculated, using IES recommended procedures. Light loss factors used to calculate maintained footcandle levels shall be indicated on the computer-generated printout.

Carrol Marriott
8.00

[redacted]
Illuminating Engineering Society of
North America
1993 Hand book
Tel: 212-248-5006
Fax: 212-248-5017
120 Wall St, 17th floor
New York, New York 10005

Email iesna@iesna.org

Soil Handbook $389.00
Reply Reference $ 60.00

(2)

lighting ideas 3/16

Model lighting standards after
our other pollution control standards
i.e. sedimentation control

Standards for specific use continued

Roadways	as for Portland	as for Cape
	CFIS	
	Portland Jetty	Bartlett	Cape
Expressways		0.6

(1)

Lighting Standards:

Conservation of Site lighting Standards

Site plan Standards state.
14-525(B)2(j) Show: # location and intensity of outdoor lighting system

12-526(9) Standards: .... exterior lighting will not be hazardous to motorists traveling on adjacent streets, is adequate for the safety of occupants or users of the site ~~and complies w/ the applicable specifications~~ will not cause glare

~~See Photometrics~~

Standards for specific use:

	Intensity (FC)
B. Parking Lot lighting:	1.0
C. Apron/Canopies (?)	
D. Lighting of Exterior Sales Area	5.0
(Front Cape Standards "Bldg Exterior, Entry" several grounds	1.0
E. Security lighting?, Parking	1.0
F. Bike Ways – same as Streets?	

Entry

Lighting – Sub-D.

d. Locations, widths and purposes of other rights-of-way or easements to be recorded;
e. All appropriate street curve information, including point of curvature, point of tangency, tangent distance, radii and interior angle, in standard engineering format;
f. Location of those utilities existing on or adjacent to the tract to be subdivided, including size and elevation of buried or underground utilities (may be shown on separate plan);
g. Tract boundary lines and property lines of lots, with accurate dimensions and either bearings or deflection angles. All lots shall be numbered;
h. Names of adjacent property owners with parcels over twenty-five thousand (25,000) square feet or names of adjacent subdivision;
i. Designation of flood hazard areas, as defined by the National Flood Insurance Program and shown on the city flood hazard boundary map, as well as any other areas in the subdivision subject to inundation by storm water or storm sewer overflow;
j. Existing historic sites and structures which either appear on the National Register or are nominated to the National Register by the state historic preservation officer;
k. Proposed private and public utility system including water, gas, telephone, fire hydrants, and any other services which shall supply the area (may be shown on separate plan);
l. Sanitary sewer and storm drain plans and profiles showing size, kind and slope of pipe, proposed manhole rim and invert elevations and catch basin locations and drains (may be shown on separate plan);
m. Lighting plan showing the location, design, height and spacing from each other of the support poles, in accordance with standards and specifications established by the public works authority (may be shown on separate plan);
n. Tree plan showing groups of existing, sizeable trees which the subdivider intends to preserve (may be shown on separate plan);
o. A detailed plan of the entire subdivision and the immediate vicinity showing all existing and proposed drainage both on and off-site including drainage swales, ditches, etc., with directional flow arrows and approximate slope grades, and showing proposed finished "spot elevations" around the perimeter of the subdivision. Proposed drainage shall be shown as it may affect or restrict development on individual lots and with reference to improvements for which a performance guarantee is required under this article. Where deemed feasible by the public works authority, proposed finished contours at intervals of two (2) feet shall be provided on the drainage plan upon request (may be shown on separate plat):
p. Location and designation of any zoning district boundaries affecting the subdivision:;
q. All future phases and sections of the subdivision proposed by the subdivider (may be shown on separate plat);

STREET LIGHT TERMS

IES Standards

Standards established by the Illuminating Engineers Society, and adopted by the City of Champaign in the Street Light Master Plan. The standard level of illumination for local residential streets is a minimum averaged maintained illumination of 0.3 fc at a maximum uniformity ratio of 6:1. This standard is measured on the street pavement, and not on the sidewalk or front yards where no

Icandescent

The most common type of household lamp and the type in the existing short pole street light system. Incandescent bulbs produce a white light with a color rendition index of 99.

Local Street

Provide access to homes, shops, churches, schools, and businesses. Generally, local streets have traffic volumes ranging from 100 to 2,000 vehicles per day.

Luminaire Assembly

On short pole street lights, part of the street light that sits on top of the pole which holds the light bulb, socket, ballast if HID, refractor, and surrounded by the street light globe. On tall poles, the assembly mounted to the end of the horizontal mast arm, often called a cobra head.

Short Poles

Street light poles which are 10 to 12 feet tall. The existing street light poles in Area 4A are short poles.

Tall Poles

Street light poles which are taller than 20 feet. The street light poles in the Clark Park neighborhood are 22'-6" tall. The street light poles on Harvard or Maple Streets near Spaulding Park are 35' tall.

Uniformity Ratio

The ratio of the average level of illumination to the minimum street illumination. Sunlight or moonlight has a uniformity ratio of 1:1 which is perfectly uniform, and is desirable. The uniformity ratio is measured on the street pavement and not on sidewalks or front yards. See IES Standards.

BACK

COUNCIL BILLS

STREET LIGHT TERMS

INTRODUCTION	FACTS	Q&A	COST ESTIMATES	●	COUNCIL BILLS
PROJECT SCHEDULE	STAFF	WHO DO I CALL?	STREET LIGHT SURVEY	NEWSLETTER UPDATES	NEWS!
HOME					

Arterial Street

The high traffic volume streets which cross several neighborhoods. *Examples*: Springfield

Collector Street

The medium traffic volume streets which connect neighborhoods to arterial streets. *Examples*: McKinley Avenue, State Street, and Randolph Street. Generally, collector streets have traffic volumes ranging from 1000 to 10,000 vehicles per day.

Existing Street Light System

Short pole (10' tall) street lights, with a 63-watt incandescent bulb installed in a porcelain socket, no refractor and with an opalsecent polyethylene globe. The globe is not sealed at the base. The electrical system is wired in series. The existing streetlights were constructed in the Fall of 1928.

Foot Candle

A unit of illuminance of a surface that is everywhere one foot from a uniform point source of light of one candle and equal to one lumen per square foot. Here are a few examples of typical lighting levels:

Sunlight at noon	over 10,000 fc
Office	50 fc
Service station driveway	5 to 10 fc
Street lighting	0.30 to 1.2 fc
Light from a full moon	0.03 fc

HID

An acronym which stands for high intensity discharge. There are 2 types of HID luminaires for street lighting: High Pressure Sodium (HPS) which produces a yellow light with a color rendition index of 22 or Metal Halide which produces a bluish-white light with a color rendition index of 67.

MORE TERMS

SUNDOWNER™ 19

Sundowner offers light sculpturing and indirect lighting with controls that dramatizes walls, ceilings and surfaces with unparalleled uniformity... both indoor and outdoor.

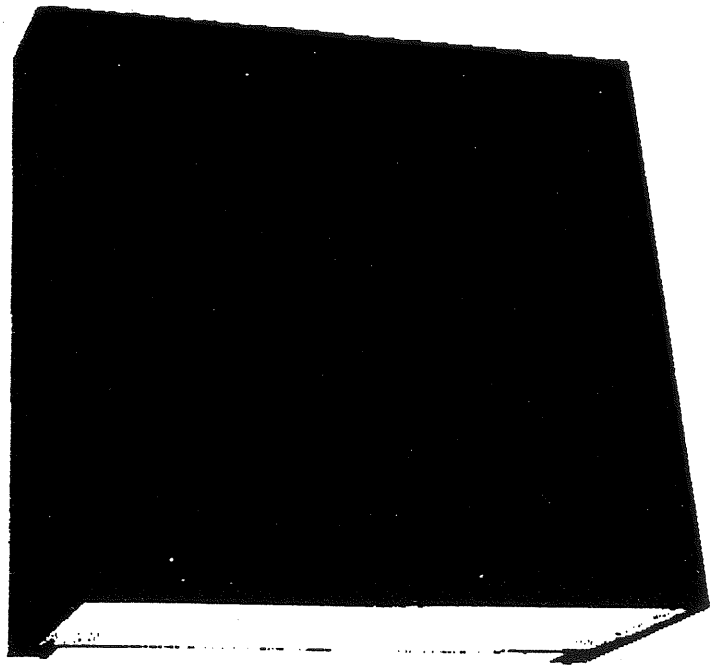
Available in wattages from 150-400 watt, Sundowner's vertical lamp position and optical system develops a sharp 85-degree light cutoff and uniform light distribution that is unique for uplight applications.

Ideal for lighting exterior walls, soffits and overhangs, tunnels, walkways, garages, stepwells and canopies. Indoor applications include shopping malls, auditoriums and convention centers. Double-up Sundowner units to create an uplight/downlight combination that is architecturally arresting.

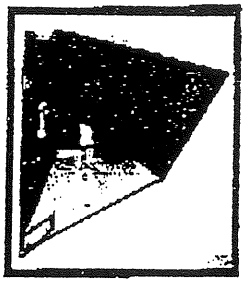
The corrosion resistant canopy is sealed to the mounting plate, and the tempered diffused glass lens is silicone sealed in fixture canopy to prevent water and minimize insect infiltration. Units are Listed for Damp Locations for uplighting.

Sundowner – Another unique lighting tool for conquering demanding lighting requirements from Guth.

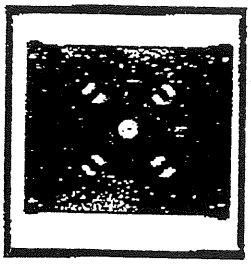
Uplight/Downlight with Minimal Light Trespass



Canopy hinges for lamp or electrical maintenance and easily removes from backplate.



One-man hanging of SND 19 with adjustable mounting and leveling plate for conventional junction box.



Fixture canopy seals to backplate with quality silicone gasketing.

Diffusing glass lens is silicone sealed in canopy to resist moisture and insect infiltration.

Specifications/Features

GENERAL

- Sharp cutoff, wall mounted HID luminaire suitable for low glare applications and light trespass code compliance.
- Utilizes Metal Halide and High Pressure Sodium HID lamps up to 400W for best design options available.
- Wet location applications.
- Uplight mounting available. (Damp Location)

CONSTRUCTION

- Corrosion resistant .06" low copper content aluminum canopy and .09" back plate finished in baked bronze polyester powder coat.
- Easy one man installation with quick leveling, gasketed 18 ga 304 stainless steel mounting bracket; has extra holes for additional wall anchors; fixture simply attaches to 4 threaded studs on mounting plate.
- Canopy hinged and easily removable from back plate; enhances ease of installation.
- Prop rod included to hold fixture open and free hands for lamp replacement and maintenance.
- Specular aluminum reflectors produce front cutoff at 85 degrees and S/MH 2.75:1.
- Canopy sealed to back plate with extruded, high temperature, silicone gasket.
- Corrosion resistant stainless steel external hardware.
- 5/32" tempered diffused glass lens silicone sealed to prevent entrance of water, and minimize insect infiltration.
- Canopy secured by two captive stainless steel screws; optional tamper resistant screws.

LISTINGS

- Listed 1572 Wet location for downlight and damp location for uplight versions.

ELECTRICAL

- Standard ballasts are 120V, HPF, maximum 400W mogul base HID lamp in vertical position.
- Ballast mounted to backplate with stake-in screws for positive grounding and secure mounting.
- Ground wire attached to backplate for positive grounding and quick installation.
- Optional button type photocell mounts in top of housing.
- All fixtures are IBEW, Union made to ensure quality.

GUTH LIGHTING

Larry Bartlett ①
9/20/99

IES- standards changed -
- Parking
- Exterior Environments

Lighting - identify priorities in order to develop standards

Illuminance = footcandles - able to measure "how much" light delivering to task"

Luminance - measure of brightness -
difficult to measure & determine // glare
→ foot Lamberts - measurement - $3,000 - $10,000 for the tool to measure -
- looking @ brightness of light @ a distance

- factor it into a contrast calculation -
- brightness of light v brightness of background - comparison tells whether it is a problem

lumens → delivered by lamp - measurement of light delivered - efficient vs inefficient

Past standards - based on low, med high activity
Parking lot — minimum + uniformity
- focus on safety / don't go address glare

average
1 to 1.5 — should be the norm — if more than that - overbaked — if less than 1 - why —

~~[illegible]~~ -

poles 18' —

— most lots can be done between 14 + 20

shows — may be higher
30' — height

— district — layers vs performance standards —

— could limit lamp types - not common.

— scale - 20' - 10' should be spacing — if you allow more — can shift grid —
- clear w/ standards
- fixture types - cut-off / house side shield / how to deliver
- 0.1 Bd - 1(?)
  - authority add additional req w/ site specific

↔ spillover - 0.1 — at property line

cut-off – definition in booklet
where the angle – 80-90 – 70-90

- Spots
- Blue accent

performance standard – base criteria
by application – by section a
zone a district

historic district – separate standards

require w/ ability to waive – design

metal halide – more glare – psychologically
– high pressure sodium – orange – reads cozy

From: Alex Jaegerman
To: Larry Bartlett Internet, Planners
Date: Wed, Sep 29, 1999 10:00 AM
Subject: Lighting Standards.

Some summary notes form our meeting with Larry Bartlett:

Minimum light levels for safety purposes would be .2 fc generally, and .5fc in "enhanced security" areas.

A new ratio, not to exceed 20 to 1 maximum to minimum fc ratio in the area targeted for lighting (e.g. within paved areas).

This might be a lighting plan with minimum values of .2 (acceptable) and maximum values of 4 (acceptable). Gorham has a maximum allowed value of 6fc. This could be our extreme upper limit.

Request photometric plans with 2 plots, **for areas to be lighted** wtih summary ratios of Maximum, Average, Minimum, Max to Min Ratio, Avg to Min Ratio. Photometric grid on 20 scale minimum plan, point spacing no greater than 10 feet.

Average of 1fc is good, and average should not exceed 1.5.

Second plot should cover to lot lines, and to 0 fc. Maximum spillover to sensitive neighbor is .1fc. House side shields may be required to improve compatibility with neighbors.

Canopy lighting is a special case, 30 fc maximum acceptable in Portland, recessed lamps only. (see tech standards previously developed)

Avoid 400 watt lamps except in industrial areas. Fixture height should range from 14 to 20 feet (Freeport maximum is 18'). 30 feet maximum pole height may be acceptable for industrial sites and larger shopping centers.

All lamps should be full cutoff (no light above 90 degrees) except special decorative fixtures or in historic districts, which should still be designed to minimize light above 90 degrees, using lenses, reflectors and refractors. Downtown lights are 90% or so below 90 degrees by design of refractor. Post office Park globe lights are decorative/historic/special case.

Wall packs should be full cutoff, no light source visible below opaque housing.

Sports lighting, building accent lighting, etc. require individual assessment. (Seek professional advice.)

Standard may vary by district for all of the above.

Section XIV

SITE LIGHTING STANDARDS

1. INTENTION

These standards are intended to provide for safe and adequate site lighting for proposed developments which meets the needs of the proposed use but does not create unsafe or unpleasant conditions which adversely affect surrounding properties. The following standards attempt to prevent 1) higher than necessary illluminance levels which create a sense of incompatibility with neighboring properties; 2) uncontrolled light source brightness which creates glare; and 3) improperly aimed/installed lights which cause light trespass onto neighboring properties.

2. GENERAL STANDARDS

The provision for exterior lighting shall be adequate for the safety of occupants or users of the site but shall not cause glare or direct spillover to adjacent properties or create visual distraction to motorists traveling on adjacent streets. Unless otherwise specified below, light levels shall not exceed the Illuminating Engineering Society of North America (IESNA) recommended average lighting levels for the use, with maximum levels not exceeding three (3) times the recommended average level.

Except in limited decorative lighting applications, fixtures shall be of a "cut off" type, where the lens does not extend below the surface of the fixture housing itself and no direct light shall be directed above the horizontal plane. Mounting heights of all fixtures shall be the minimum necessary to meet the need. Wherever practicable, lighting installations shall include timers, dimmers and/or sensors to reduce overall energy consumption and eliminate unneeded lighting.

3. STANDARDS FOR SPECIFIC USES

A. Gasoline Service Stations

1. General Requirement for Canopy Lighting at all Gas Stations: Lighting fixtures shall be fully recessed and shall be located on the underside of the canopy with no part of the fixture extending below the surface of the underside of the canopy. There shall be no internal or external lighting of the canopy fascia, except within the permitted sign area.

Lighting Standard

The provision for exterior lighting will be designed to provide sufficient illuminance for a proposed site while not causing any tresspass or spillover or glare onto adjacent properties.

Business Zones (not adjacent to residential zones or uses)

Pole heights no greater than 20 feet.
Full cut-off/shielded fixture.
Wattage no greater than 200.

Business Zones (adjacent to residential zones or uses) **and Residential Zones**

Pole heights no greater than 15 feet.
Full cut-off/shielded fixture.
Wattage no greater than 100.

Cut-off fixture is defined as fixtures *where lenses, refractors or lamp sources do not extend below the surface of the fixture housing and no direct light shall be directed at or above the horizontal plane.*

Attachment 3

Bartlett Design
LIGHTING & ELECTRICAL ENGINEERING
1 FRONT STREET P.O. BOX 230 BATH, MAINE 04530
TEL (207) 443-5447 FAX (207) 443-5560

REPORT ON SERVICE STATION CANOPY LIGHTING
Submitted to the City of Portland
Department of Planning & Urban Development

April 22, 1996

Prepared By:

Lawrence E. Bartlett, PE, RA

Lawrence E. Bartlett

TABLE OF CONTENTS

There is a growing number of people in many municipalities calling for stricter controls to be established for outdoor lighting of non-residential properties. In many cases, their concern is based in the opinion that increasing amounts of sky brightness (also known as astronomic light pollution) as well as light trespass (light being directed beyond property lines) are infringements on personal and property rights. Groups such as the *International Dark-Sky Association* and the *New England Light Pollution Advisory Group* suggest that the over-lighting of outdoor sites in recent years has greatly diminished the nighttime experience, and that if left uncontrolled, exterior lighting will eventually eliminate any possibility of viewing stars in the night sky.

There has been a significant increase of outside illuminance from site lighting over the past few years. There are at least three reasons to account for this trend:

Number of Lighted Properties
Recent years have seen a increase in the number of non-residential properties which are being lighted. This is not only due to an increase of developed land, but it is also a result of an increased pressure to address safety. Many parking areas are now regulated by local law to include site lighting to assure personnel safety at night.

Improved Technology
The design of light sources has been greatly improved through advances in technology such that light can now be provided at higher levels for lesser operating costs than were previously possible.

Economic Pressures
Economic pressures of the slow economy have led to an increased level of business competition. Many businesses attract customers at night by means of being noticed above and beyond their competition. High levels of light at night are seen by some as a way of meeting this need.

Of these three contributing factors, the last is probably the most significant to consider in the evaluation of service station canopy lighting. There is however, a need for municipalities to balance this desire to use nighttime lighting as a business technique to attract customers, with the desire of residential property owners to maintain nighttime darkness.

Sec. 1

Lighting Factors

There are several potential causes of objectionable service station lighting. In general however, two factors are root causes: improper *illuminance* levels, and/or improper *luminance* levels. Illuminance is a measure of light received at a surface. It is easily quantified by any simple light meter, in units termed footcandles. Illuminance, however, is not seen by the human eye. The eye only sees light when it is reflected off surfaces. As such, it is called luminance (often though of as "brightness"). Measuring luminance requires the use of a sophisticated type of light meter, and is recorded in units termed candela/ft^2. It is therefor necessary to consider both illuminance as well as luminance in the assessment of the overall quality of a service station canopy lighting solution.

Illuminance Standards

The Illuminating Engineering Society of North America (IESNA) has published recommendations for illuminance levels at service stations. These standards are included in the 8th edition of the *IESNA Lighting Handbook*, published in 1993. The standards include at table of recommended illuminance levels that is divided into two sections: recommendations for stations located in dark surroundings, and stations located in light surroundings:

	Recommended Illuminance In Footcandles
Dark Surroundings	
Approach	1.5
Driveway	1.5
Pump Island Area	20.0
Building Faces	10.0*
Service Areas	3.0
Landscape Highlights	2.0
Light Surroundings	
Approach	3.0
Driveway	5.0
Pump Island Area	30.0
Building Faces	30.0*
Service Areas	7.0
Landscape Highlights	5.0

* Vertical Illuminance

Recent experience has shown that many oil dealers and other owners of service stations have set targets for canopy illuminance in the range of 80 - 100 footcandles at the pavement. This is undoubtedly a reflection of a desire to produce a high nighttime profile to potential customers in vehicles on the street.

Luminance Standards

The IESNA recommendations include the statement: "*Illuminance selection, based upon visual performance, is only one lighting design criterion to be considered. There are many applications where other design criteria...are more important to successful lighting design.*"

Considering the fact that the human eye "sees" brightness (luminance), not illuminance, illuminance standards alone are not sufficient in establishing an acceptable guideline for lighting design. Unfortunately, there currently is no numeric standard relating to brightness relative to site lighting at service stations. The control of brightness however, is an equally important consideration to that of achieving proper illuminance levels, and accordingly it should not be ignored. Specifically, brightness should be considered in terms of:

- Lighting fixture brightness
- Reflected brightness of surfaces
- Overall ambient brightness of site

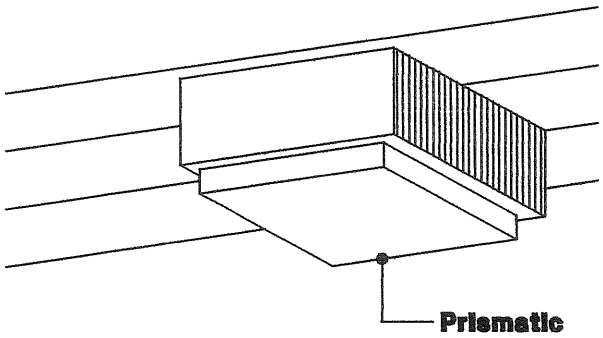
Excessive brightness seen from lighting fixtures can be a cause of distraction and/or disability glare. Both of these types of glare result from an extreme brightness which is located in the normal field of view. Distraction glare causes viewers to be momentarily distracted from their primary task, such as concentrating on driving when traveling by a service station. Disability glare reduces visibility by lowering contrast. An extremely bright light makes it difficult to see beyond the light because the contrast between the task (seeing people and objects) and the background is eliminated.

High levels of reflected brightness off surfaces can significantly contribute to astronomic light pollution. Light which strikes a vertical surface, such as a service station building wall, tends to be reflected in all directions, and accordingly, only partly serves the useful purpose of lighting parking, drive and pump areas. The remainder is usually reflected upwards toward the sky or adjacent properties.

Intense overall brightness of a service station site is often thought to be desirable by owners as an effective means of advertisement. This is not always as effective a means of calling attention to what is important as is a more carefully controlled lighting solution (for example, see description of existing conditions at the Forest Street Mobile Station in Section 2, page 5). Service stations which are lighted to extreme levels of brightness across the site or under canopies can be incompatible with the character of adjacent properties. This can be particularly true when service stations abut residential districts.

Lighting Fixtures

A majority of service station canopies include surface mounted lighting fixtures, consisting of rectangular sheet metal housings with a dropped, prismatic diffusers. The dropped refractor directs light downward toward the pump island(s), as well as upward toward the underside of the canopy ceiling. By directly lighting the canopy underside, the overall brightness of the canopy area is significantly increased. Most canopy installations include metal halide type lamps which produce a white light (some stations however utilize high pressure sodium lamps which produce an orange-yellow light).



TYPICAL CANOPY LIGHT

Both metal halide and high pressure sodium lamps are high intensity discharge lamp sources which are characterized by their relative high lumen output. The high output of these lamps causes the dropped lighting fixture refractor to be seen as points of significant brightness from great distances.

Sec. 2

Survey Results of Five Service Station Canopies

Description of Existing Conditions

The City of Portland planning staff identified six existing service stations to serve as the basis for study of typical existing canopy lighting conditions. It was not the intended purpose in obtaining illuminance measurements to evaluate the appropriateness of canopy lighting at any of these six sites. Rather, this data was collected to draw general conclusions about recent past trends in service station canopy lighting design and to use this data to formulate a plan of guidance for future canopies.

- **Texaco Station**
  Brighton Ave. and St. George St.
- **Cumberland Farms**
  Brighton Ave. and Woodford St.
- **Christy's**
  Congress Ave. and Dow St.
- **Cumberland Farms**
  Pine St. and Bracket St.
- **Mobil Station**
  Forest Ave.
- **Cumberland Farms**
  Washington Ave. and Ocean Ave.

An illuminance survey was conducted at the first five sites. Permission was not granted to take illuminance readings at the Washington Ave. Cumberland Farms.

TEXACO STATION - Brighton Ave.

The canopy at this site is attached to the convenience store along one side, and is approximately 40 ft. wide by 60 ft. long. There are four pump islands below the canopy, each with a single pump station. There are a total of 12 surface mounted lights on the canopy underside surface in four rows of three fixtures. The light fixtures have dropped prismatic refractors and they utilize metal halide lamp sources.

There are three pole lights on the site for illumination of parking areas and drives. Two poles are located on Brighton Avenue and the third pole is located at the back corner on St. George Street. These pole lights also contain metal halide lamps.

The horizontal illuminance levels below the canopy do not seem to be excessive, but there is a degree of glare observed from the lighting fixture refractors. There is a Christy's Station a few blocks easterly on Brighton Avenue. The majority of properties abutting the Texaco site are residential.

CUMBERLAND FARMS - Brighton Ave.

The canopy at this site is unattached, and is approximately 32 ft. wide by 60 ft. long. There are six pump islands below the canopy, each with a single pump station. There are a total of 18 surface mounted lights on the canopy underside surface in six rows of three fixtures. The light fixtures have dropped prismatic refractors and they utilize metal halide lamp sources. Around the entire top perimeter of the canopy, there is a two-lamp fluorescent lighting cove which provides downlight for the canopy sides.

There are three pole lights on the site for illumination of parking areas and drives. Two of these poles are located on Brighton Avenue and the other is located at the corner of Woodford street. The pole lights have metal halide lamps and they contain forward-throw internal reflectors which produce a significant amount of glare.

The horizontal illuminance levels below the canopy seem to be quite high, and there is a degree of glare observed from the lighting fixture refractors. The majority of properties abutting the site are residential. There are no competing businesses in the immediate area. There is a significant amount of brightness reflected off residential buildings on abutting properties.

CHRISTY'S - Congress Ave.
The canopy at this site is unattached, and is approximately 25 ft. wide by 35 ft. long. There are two pump islands below the canopy, each with a single pump station. There are a total of 8 surface mounted lights on the canopy underside surface in two rows of four fixtures. The light fixtures have dropped prismatic refractors and they utilize high pressure sodium lamp sources.

There are two pole mounted floodlights located on Congress Avenue which are aimed back at the site for illumination of parking areas and drives. There are also two wall-pack lights mounted at approximately 10 ft. on the front face of the convenience store. These wall-pack lights have prismatic face diffusers and they contain metal halide lamps.

Due to the orange-yellow nature of the high pressure sodium lamp sources, the perception of the horizontal illuminance levels below the canopy do not seem to be as high as they actually are. There is a degree of glare observed from the canopy lighting fixture refractors, and the wall-pack lights on the building produce a significant amount of glare. The properties abutting the Christy's site are combined commercial and residential.

CUMBERLAND FARMS - Pine Street
The canopy at this site is unattached, and is approximately 25 ft. wide by 30 ft. long. There is a single pump island below the canopy, with two pump stations. There are a total of 6 surface mounted lights on the canopy underside surface in two rows of three fixtures. The light fixtures have dropped prismatic refractors and they utilize metal halide lamp sources. Around the entire top perimeter of the canopy, there is a two-lamp fluorescent lighting cove which provides downlight for the canopy sides.

There are two pole mounted floodlights which is aimed back at the site for illumination of parking areas and drives. One of these floodlights is located on the corner of the site at Bracket Street (this pole light was not operating during the survey period), and the second located on the back corner on Pine Street. The Pine Street floodlight utilizes a high pressure sodium lamp.

The horizontal illuminance levels below the canopy do not seem to be excessive, but there is a degree of glare observed from the lighting fixture refractors. The amount of reflected light off the light colored brick walls of the convenience store seems to be higher than is in keeping with the neighborhood. The majority of properties abutting the site are residential. One commercial property exists across Pine Street.

MOBIL STATION - Forest Ave.
The canopy at this site extends over the top of a convenience store, and it projects out over pump islands on either side. The canopy on the east side covers two pump islands, each with a single pump station.

The canopy on the west side is approximately 35 ft. wide by 70 ft. long and it covers four pump islands below the canopy, each with a single pump station. In both the east and west canopies, there are downlights which are fully recessed into the underside of the canopy. These recessed lights utilize metal halide lamps sources. On the east side, there are a total of 6 recessed lights, in two rows of three fixtures. On the west side, there are a total of 15 recessed lights in five rows of three fixtures. In addition to the recessed canopy downlights, there are also fluorescent lights which are built into rows above the pump islands. These lights are installed at approximately 10 ft. above the pumps, each connecting two pump islands. The fluorescent lights have blue translucent side diffuser panels and white bottom diffusers.

There are pole lights located on the back and west property lines which provide illumination of parking areas and drives. In addition, there are low level bollard lights along the Forest Ave. side of the site, and along the east side at Noyse Street. These bollards and pole lights all contain metal halide lamps.

The horizontal illuminance levels below the canopy do not seem to be excessive. The florescent lights immediately above the pump islands act as local task lights which allow the overhead canopy lights to provide a lesser level of general ambient light. The result is that higher levels of horizontal illuminance occur where they are needed at pumps, and lesser levels are provided for drives between pumps.

There is an overall balance of brightness which seems to be very acceptable. The front of the site which faces Forest Avenue is significantly less bright than the side canopy areas. This produces a stepped pattern of brightness which defies the usual scheme of presenting a bright street-scape. The result is that the station does not overwhelm Forest Avenue, and yet, it makes a very noticeable statement. The relatively low brightness of the recessed canopy lights permits the internally illuminated signage to make a dramatic visual statement by contrast of brightness.

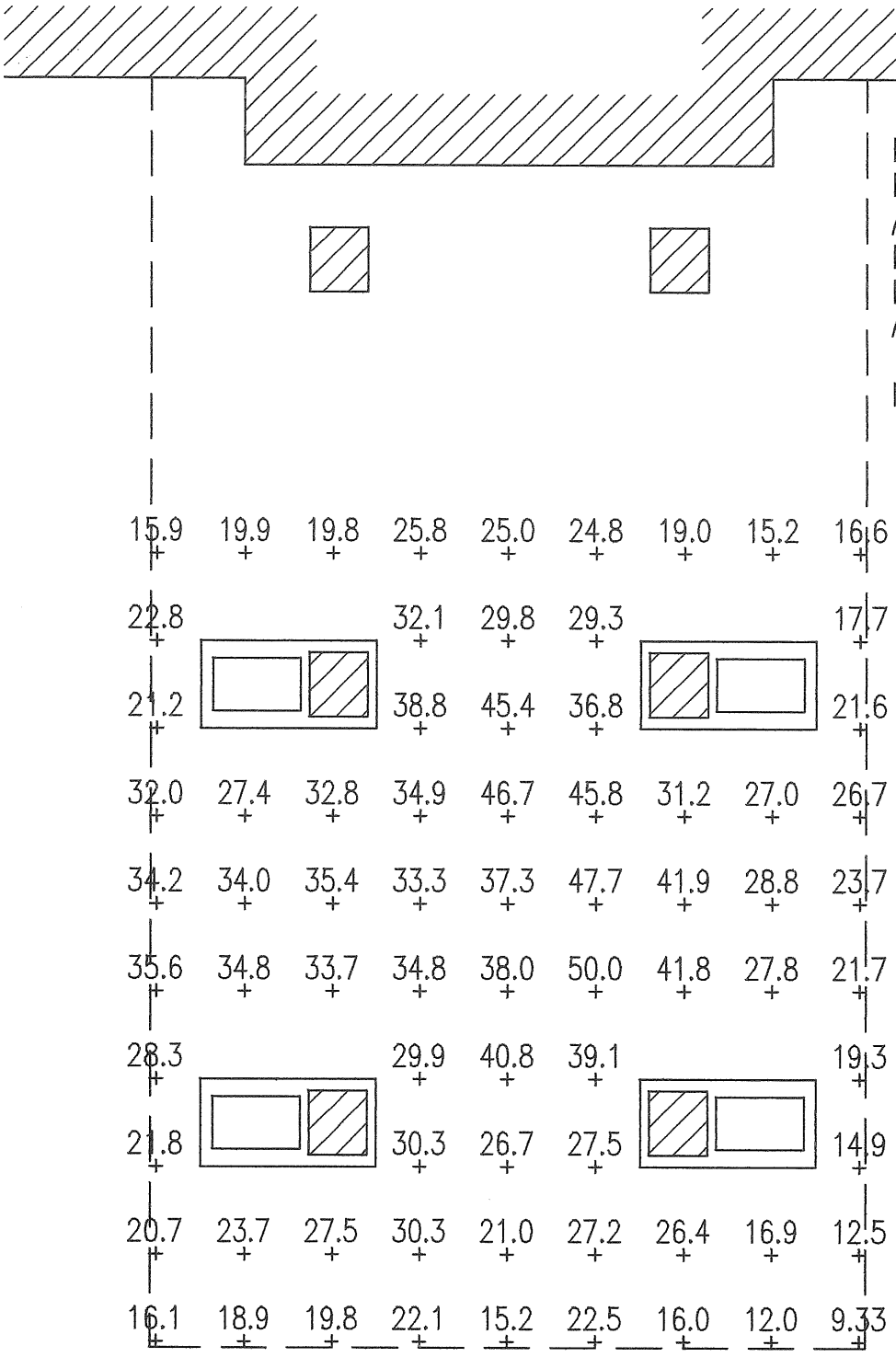
Illuminance Measurement Methodology

Measurement of illuminance levels at various service station canopies in the Portland downtown area was conducted on April 18 and 19, 1996. Measurements were made with a Minolta T-1 illuminance meter, which has a precision of .01 footcandle. The procedure for recording illuminance levels was conducted in accordance with the IESNA's published standard *LM-64 Photometric Measurements of Parking Areas.* Sky conditions during the measurement period were partly cloudy, with no moon. Measurements were recorded each evening from 8:45 pm until 11:00 pm.

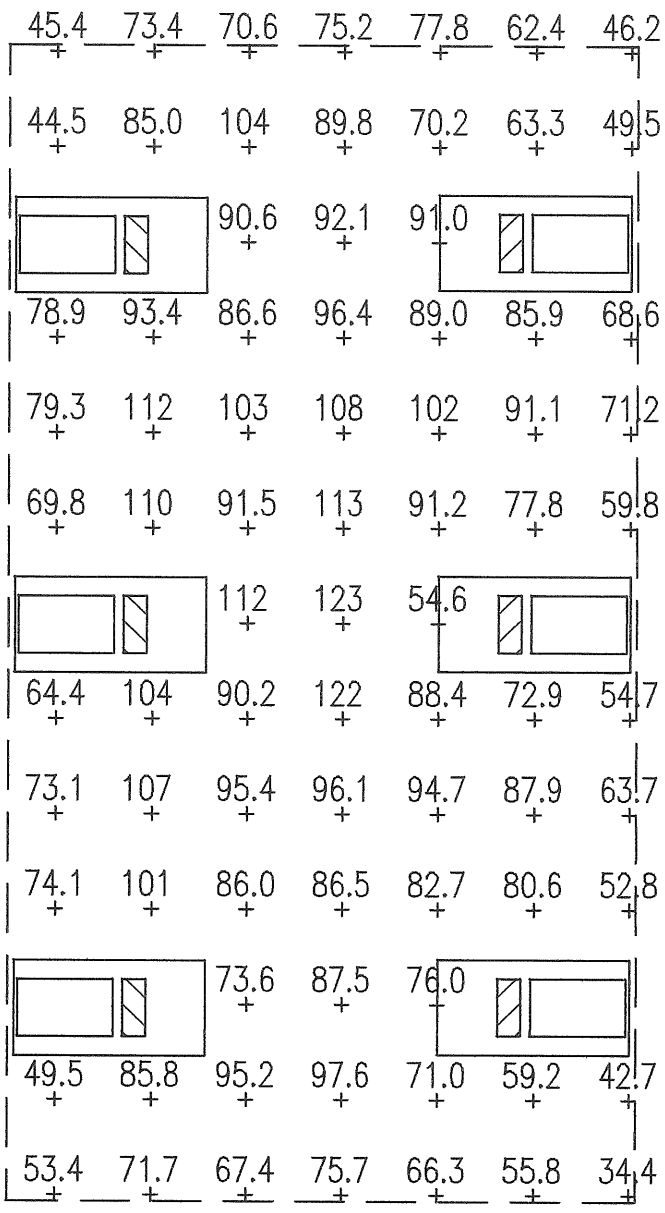
Recorded Illuminance Levels

The following is a summary of horizontal illuminance levels measured at grade.

	Illuminance - Footcandles			Uniformity
	Ave.	Max.	Min.	Ave.:Min.
TEXACO STATION				
Brighton Ave.	27.7	50.0	9.33	2.97 : 1
CUMBERLAND FARMS				
Brighton Ave.	80.2	123	34.4	2.33 : 1
CHRISTY'S CITGO STATION				
Congress Ave.	70.0	136	30.1	2.32 : 1
CUMBERLAND FARMS				
Pine St.	27.3	42.5	11.8	2.31 : 1
MOBIL STATION				
Forest Ave.	34.3	85.9	6.47	5.30 : 1



Bartlett Design
LIGHTING & ELECTRICAL ENGINEERING
1 FRONT STREET P.O. BOX 230 BATH, MAINE 04530
TEL (207) 443-5447 FAX (207) 443-5560



HORIZONTAL ILLUMINANCE
MEASURED AT GRADE

AVERAGE:	80.2 FC
MAXIMUM:	123 FC
MINIMUM:	34.4 FC
AVE:MIN:	2.33:1
NO. OF POINTS:	79

CUMBERLAND FARMS
Brighton Ave .
MEASURED ILLUMINANCE
SCALE: 1"=10'- 0"

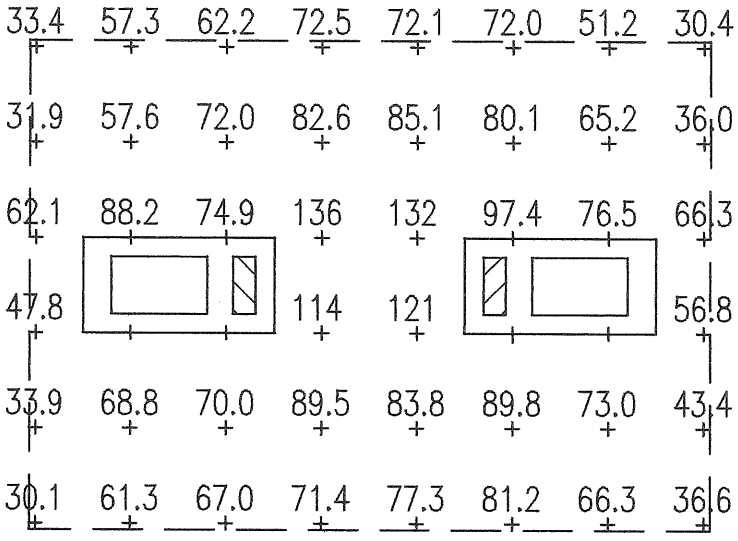
BRIGHTON AVENUE

Bartlett Design
LIGHTING & ELECTRICAL ENGINEERING
1 FRONT STREET P.O. BOX 230 BATH, MAINE 04530
TEL (207) 443-5447 FAX (207) 443-5560

HORIZONTAL ILLUMINANCE
MEASURED AT GRADE

AVERAGE:	70.0 FC
MAXIMUM:	136 FC
MINIMUM:	30.1 FC
AVE:MIN:	2.32:1

NO. OF POINTS: 44



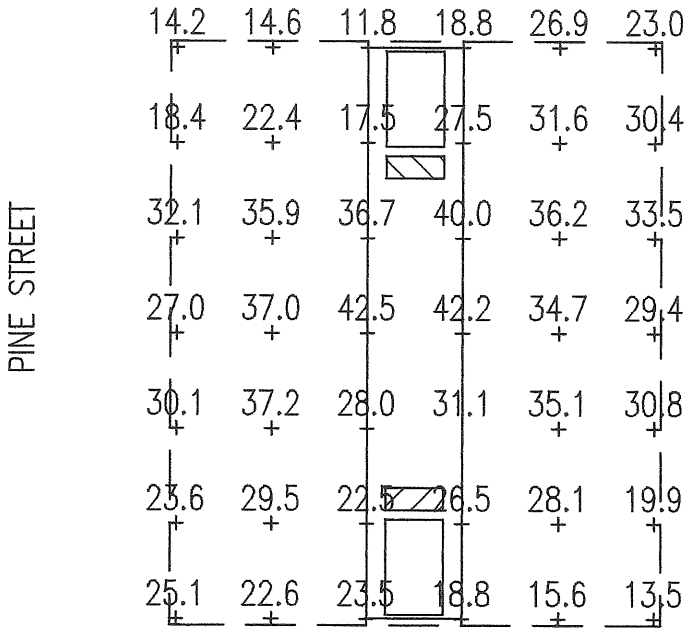
CHRISTY'S
Congress Ave.
MEASURED ILLUMINANCE
SCALE: 1"=10'- 0"

CONGRESS AVENUE

Bartlett Design
LIGHTING & ELECTRICAL ENGINEERING
1 FRONT STREET P.O. BOX 230 BATH, MAINE 04530
TEL (207) 443-5447 FAX (207) 443-5560

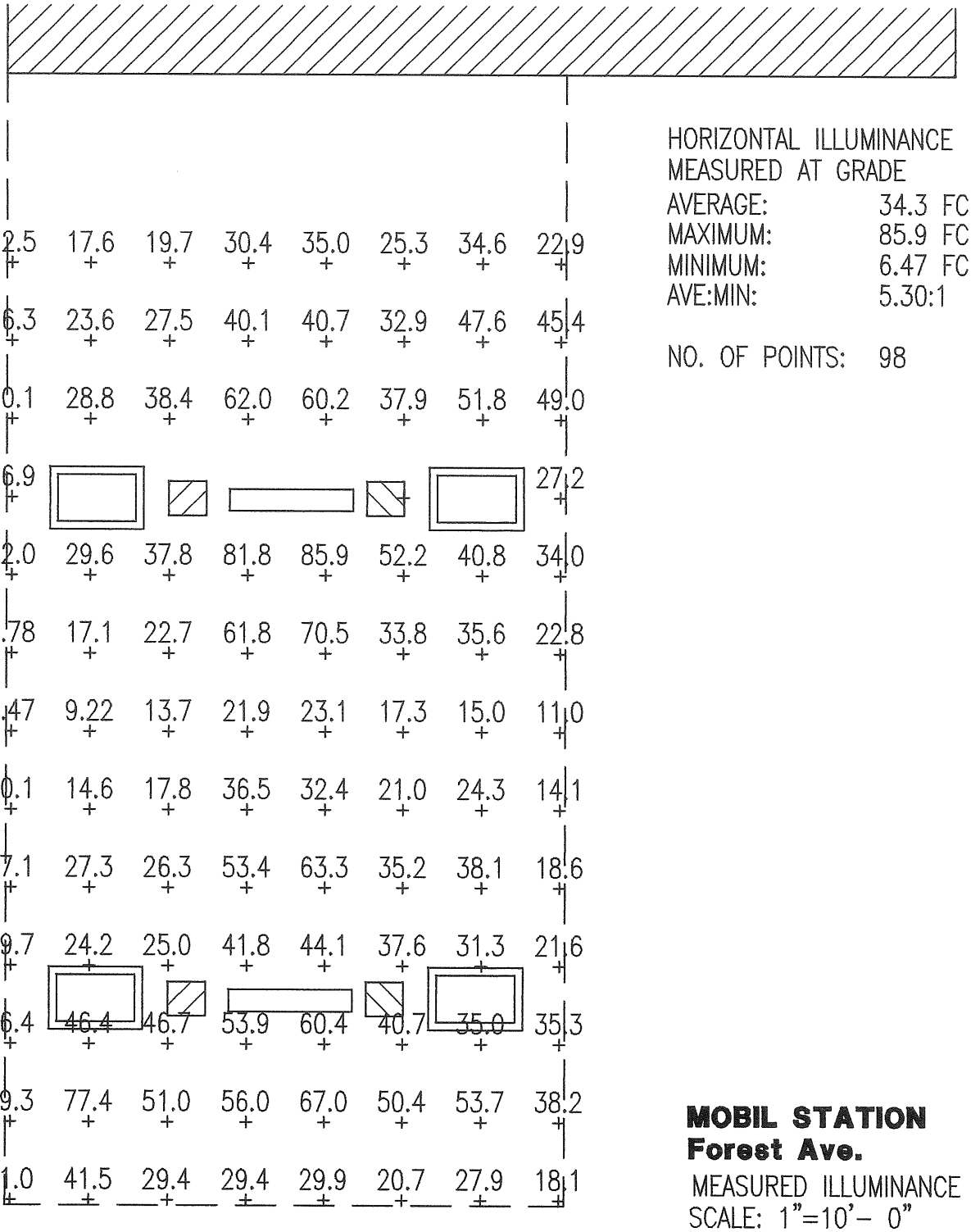
HORIZONTAL ILLUMINANCE
MEASURED AT GRADE

AVERAGE:	27.3 FC
MAXIMUM:	42.5 FC
MINIMUM:	11.8 FC
AVE:MIN:	2.31:1
NO. OF POINTS:	42



CUMBERLAND FARMS
Pine Street
MEASURED ILLUMINANCE
SCALE: 1"=10'– 0"

Bartlett Design
LIGHTING & ELECTRICAL ENGINEERING
1 FRONT STREET P.O. BOX 230 BATH, MAINE 04530
TEL (207) 443-5447 FAX (207) 443-5560



FOREST AVENUE

HORIZONTAL ILLUMINANCE
MEASURED AT GRADE

AVERAGE:	34.3 FC
MAXIMUM:	85.9 FC
MINIMUM:	6.47 FC
AVE:MIN:	5.30:1
NO. OF POINTS:	98

MOBIL STATION
Forest Ave.
MEASURED ILLUMINANCE
SCALE: 1"=10'- 0"

Bartlett Design
LIGHTING & ELECTRICAL ENGINEERING
1 FRONT STREET P.O. BOX 230 BATH, MAINE 04530
TEL (207) 443-5447 FAX (207) 443-5560

General Recommendations

While lighting design of service station canopies can be controlled to some extent by means of written performance standards in a land use ordinance, relying *solely* on such a method is likely to provide less than satisfactory results. Each site application is unique, and as such, each requires some degree of specific evaluation. Carefully written lighting standards can effectively serve as a starting basis for design review, but there is ultimately no substitute for evaluation and decision making by planning staff and planning boards. It is important when creating land use regulations to include the authority (and responsibility) of site review boards to address the unique character of different sites. It should be recognized that this uniqueness of site will periodically require the adoption of conditions beyond those included in general performance criteria listed in the governing ordinance.

The diversity of land use of a typical city suggest that no one lighting regulation can be adopted to meet all needs. Requirements for canopy lighting at a site in a heavily developed commercial area might not properly serve the needs for control of canopy lighting in a low density residential neighborhood. Planning for outdoor lighting is most successful when it is performed not only for specific applications (parking lots, roadways, service station canopies, etc.), but when it is also performed by district.

The best land use regulations for the control of lighting include the following:

- The intent is clearly stated;
- The language is easily understood by applicants;
- The requirements are easily enforceable.

Proposed City of Portland Service Station Canopy Lighting Standards

The following comments are made relative to the proposed Site Lighting Standards for Gasoline Service Stations, as prepared by the planning staff.

The statement of Intention included in the proposed Site Lighting Standards does a good job of expressing why such standards are deemed important.

It is appropriate that criteria to be included in site lighting standards for service station canopies include more than illuminance regulations. In paragraph 2, General Standards, the section which addresses the types of light fixtures which will be permitted is an appropriate way of controlling excessive fixture luminance. Further consideration may be made in either defining "decorative lighting applications", or in stating that the included lighting standards only apply to area lighting. It might be appropriate to state that any decorative or accent lighting must be approved as to its compatibility with the local and neighborhood character.

Permitting only "cut-off" type lighting fixtures takes a significant step in limiting unnecessary brightness. Perhaps is would be worth expanding the definition to state: "*...where lenses, refractors, reflectors or lamp sources do not extend below the surface of the fixture housing and no direct light shall be directed at or above the horizontal plane."* Although it might seem redundant, perhaps the following should be added to make certain that there is no confusion: *"The use of directional floodlights is not permitted."*

Since not every applicant will have access to the referenced IESNA recommended illuminance levels, perhaps illuminance requirements should be included with each specific use (as is the case with the paragraphs covering gasoline service stations). The general requirement that maximum levels not exceed three times the recommended average may lead to confusion as to which of the many IESNA recommended illuminance levels are intended to apply.

Under the section which addresses Standards For Specific Uses - Gasoline Service Stations, perhaps it would be appropriate to include a more expanded list of criteria:

2. *Illuminance Levels*

a. *Minor Gasoline Service Stations, including those abutting residential zones*
Illuminance levels shall not exceed the following:

Approaches and Drives:	*1.5 FC average*
	3:1 average-to-minimum uniformity ratio
	3.0 FC maximum
Service Areas:	*3.0 FC average*
	3:1 average-to-minimum uniformity ratio
	6.0 FC maximum
Pump Island Areas:	*20 FC average*
	3:1 average-to-minimum uniformity ratio
	40 FC maximum

b. *Major Gasoline Service Stations*
Illuminance levels shall not exceed the following:

Approaches and Drives:	*3.0 FC average*
	3:1 average-to-minimum uniformity ratio
	6.0 FC maximum
Service Areas:	*7.0 FC average*
	3:1 average-to-minimum uniformity ratio
	14 FC maximum
Pump Island Areas:	*30 FC average*
	3:1 average-to-minimum uniformity ratio
	60 FC maximum

d009

PLANNING BOARD REPORT #22-96

PROPOSED ZONING AND SITE PLAN AMENDMENTS TO REGULATE GAS STATIONS

AND

PROPOSED REVISED CONDITIONAL USE STANDARDS

COUNCILOR THOMAS KANE, APPLICANT

Submitted to:

Portland Planning Board
Portland, Maine

May 14, 1996

I. INTRODUCTION

Councilor Kane has requested that a series of zoning and site plan ordinance text amendments be developed which would more effectively address the impacts of gas stations in the B-2 zone where the lot directly abuts a residential zone. Mr. Kane's request has also prompted a review of the general conditional use standards included in Sec. 14-474 of the Land Use Code. Planning and Corporation Counsel suggest that the conditional use standards also be revised at this time because their current lack of specificity provides little guidance to the Zoning Board of Appeals and Planning Board when determining whether a proposed conditional use (including gas stations in the B-2 zones) will have measurable negative impacts.

In reviewing the issue of gas stations and their physical impacts, the Planning Board felt it was appropriate to extend the exercise to introduce some additional controls over gas stations in strictly commercial contexts -- in the B-2 zone where there are no residential abutters and in the B-4 and B-5 zones as well. While not as comprehensive as the regulations proposed for stations abutting residential uses, the drafted provisions would address site lighting as well as the physical characteristics of a station's canopy at stations in all of Portland's commercial zones.

Enclosed as Attachment 1 is a compilation of the proposed site plan and zoning text amendments. Attachment 2 is a proposed new section to be added to the Technical Supplement which would provide detailed standards for site lighting. Attachment 3 is a report with recommendations by lighting engineer, Larry Bartlett.

Notice of the public hearing appeared in the May 6th and May 7th editions of the Portland Press Herald. Representatives of the major gas and oil distributors were also notified of the proposed amendments.

II. BACKGROUND:

In February, Councilor Kane appeared before the Planning Board to discuss his concerns about the impacts of gas stations where they abut residential neighborhoods and to request that additional review criteria be developed which would better control these impacts. In recent years, as the nature of gasoline retailing has changed, the potential for conflict with surrounding residential development has changed as well. Not only have the number of pumps increased at many stations, but stations also now commonly feature any number of accessory operations, including a convenience store, car wash, vacuums, repair garage, etc. With these added services and with increased competition, the hours of operation have increased as well. Where canopies were once reserved for only the largest operations, now they are a standard feature at most stations. Their height, their visual character, and their use as additional signage for the station often combine to dominate or overwhelm the prevailing scale and character of neighborhood. Lighting of gas stations has also intensified dramatically in recent years, as retailers seek every available means to draw customers to their station. Finally, several of the most recent gas station proposals have entailed the assembly of several contiguous lots. The very lot size of the resulting "super station" is often at dramatic odds with the existing development pattern in an area.

In assessing the existing review criteria which apply to gas stations, it became clear that there was no distinction made between B-2 stations located in a purely commercial context and those which abut a

residential zone. It also became clear that several key features of a station -- its canopy and site lighting, in particular -- were inadequately addressed, if at all, in the current standards. The current standards do not address the variety and number of functions which are typically featured in newer stations, nor the hours of operation.

The inadequacy of the current general conditional use standards (Sec 14-474 of the zoning ordinance) was also brought to light during this exercise. Gas stations, among several other uses, are a conditional use in the B-2 zone. The vague language and lack of specificity in the current standards provides little guidance to the Zoning Board of Appeals and the Planning Board when determining whether a proposed conditional use will have negative impacts. It was felt that this would be an appropriate time to revise the conditional use standards to provide more definite, measurable criteria.

Finally, the issue of controlling lighting at gas stations has raised the question of the adequacy of the site plan ordinance's current lighting standard. It was felt that a general standard in the site plan ordinance was insufficient to deal with this increasingly complex technical issue and that this would be a good opportunity to add a new chapter to the City's Technical Supplement which provides specifications for site lighting. While the enclosed draft chapter is far from complete, it provide much improved general standards and specific standards for gas station lighting. In the future, lighting specifications for other developments, such as parking lots, can be added.

III. REVIEW PROCESS

Over the course of the spring, the Board held three workshops on this topic. Staff presented slides of a wide variety of gas stations in Portland, particularly those abutting residential areas, to familiarize Board members with the issues and to begin to identify those physical and functional characteristics which can be problematic where gas stations are located adjacent to residential neighborhoods. The Board also spent a considerable amount of time discussing effective site lighting controls. Lighting consultant, Larry Bartlett, was retained to make recommendations for lighting standards for gas stations. The enclosed amendments, therefore, reflect considerable discussion and professional input.

IV. PROPOSED AMENDMENTS

A. Site Plan and Zoning Amendments Regarding Gas Stations

The enclosed amendments accomplish the following:

* In the B-2 zone, where a lot directly abuts a residential zone, only minor gas stations are allowed;

* The definition for minor gas stations has been amended to allow no more than 2 pump islands or a maximum of 8 vehicles served at one time. (Here the language was made more liberal than the current definition which allows no more than 1 pump island.) The new definition prohibits car washes or vacuums at minor stations, but allows repair services, provided there are no more than 2 services bays. (Repair services are not allowed under the current definition);

* The hours of operation for stations abutting a residential zone are limited to between 6:00am and 11:00 pm; and

* Gas station canopies (and those associated with other drive-through facilities as well) are now limited as follows:

  - the height to the underside of the canopy shall not exceed 14' 6";
  - the height of the canopy facia itself shall not exceed 3' 6";
  - the canopies shall consist of a solid, neutral color field and distinguishing banding or graphics shall be limited to the allowable sign area; and
  - canopy lighting shall conform with the applicable Technical and Design Standards for such -- a proposed new lighting section will be added to the Technical Supplement.

It should be noted that, for advertising purposes, the Board requested that the canopy standards apply to all business zones where gas stations are allowed as permitted or conditional uses, including the B-2, B-4 and B-5 zones.

B. Revised Conditional Use Standards

The current general conditional use standards in Sec. 14-474 of the zoning ordinance are to be replaced altogether with two standards which are more definite and measurable. These standards, which are recommended by Corporation Counsel, are currently used in Cape Elizabeth and Windham and have withstood court challenge. The proposed standards are as follows:

a) The proposed use will not adversely affect the value of adjacent properties; or

b) The conditional use sought will not create nor aggravate a traffic hazard or a fire hazard.

C. Revised Lighting Standards

It became clear during the course of discussion on gas station lighting that a general lighting standard in the site plan ordinance could not adequately address this increasingly complex topic nor ensure lighting solutions which were appropriate to specific circumstances. This is the case not only for gas stations but for all developments subject to site plan review. Therefore the decision was made to remove the vague language in the current site plan lighting standard and to reference the more detailed lighting specifications included in a proposed new chapter of the City of Portland's Technical and Design Standards and Guidelines. With the assistance of lighting engineer, Larry Bartlett, a draft section for the Technical Supplement was prepared which includes both general lighting standards and a more detailed section on gas station lighting. In the future, similar detailed lighting standards will be developed for parking lots, security lighting, etc.

A copy of Mr. Bartlett's report is enclosed as Attachment 3 -- see especially Section 3 of his report for his recommendations on review standards. Mr. Bartlett will also be available on Tuesday to answer questions from the Board.

Briefly, the proposed lighting standards address the numerous lighting design criteria which affect our perception of acceptable or unacceptable lighting conditions. By regulating 1) fixture type, 2) fixture placement, and 3) illuminance levels (average, maximum and average-to-minimum uniformity ratio's), a community is in a good position to effectively regulate site lighting.

The Board will note that the proposed gas station lighting standards make a distinction between minor gas stations and major gas stations. For example, canopy lighting at minor gas stations is limited to a 20-foot candle average and the maximum is set at a 2x factor, whereas major stations are allowed a 30-foot candle average and a 3x maximum.

It should be noted that Mr. Bartlett suggests that any effective lighting standard include specific authorization for the Planning Board to place conditions of approval beyond those included in the general performance standards in order to address the unique circumstances of a site. As the site plan ordinance already provides for that authority (for lighting or any other aspects of development) under Sec. 14-526(b), additional language for the Technical Supplement was not drafted.

V. MOTIONS FOR THE BOARD TO CONSIDER

On the basis of findings and information presented in Planning Report #22-96, the Board finds:

1. that the proposed zoning and site plan amendments, including revised conditional use standards, are consistent with the City of Portland's Comprehensive Plan and therefore recommends to the City Council that they be adopted.

2. that the addition of a new section to the City of Portland's Technical and Design Standards and Guidelines which addresses site lighting is consistent with the Comprehensive Plan and therefore should be adopted.

Attachments:

1. Proposed Text Amendments
2. Proposed Lighting Section for Technical Supplement
3. Report from Larry Bartlett

AMENDMENT TO PORTLAND CITY CODE
§§14-47, 14-182, 14-183, 14-230.1, 14-230.2 (ZONING ORDINANCE)
§§14-522, 14-526 (SITE PLAN ORDINANCE)
RE: GASOLINE SERVICE STATIONS IN THE B-2, ~~B-4~~ AND B-5 ZONES

BE IT ORDAINED BY THE CITY COUNCIL OF THE CITY OF PORTLAND, MAINE IN CITY COUNCIL ASSEMBLED AS FOLLOWS:

1. That Section 14-47 of the Portland City Code is hereby amended as follows:

Sec. 14-47. Definitions.

Major gasoline service stations: A gasoline service station with more than ~~one (1)~~ two (2)pump islands or with a capacity to fuel more than eight (8) vehicles simultaneously or providing repair services including, but not limited to, tuneups, engine repair, brake work, muffler replacement, tire repair or similar activities.

Minor gasoline service stations: A gasoline service station with not more than ~~one (1)~~ two (2)pump islands~~, with a maximum of three (3) pumps~~, provided that no more than a total of eight (8) vehicles may be fueled simultaneously. Such stations shall not include car washes or vacuums. ~~with no~~ rRepair services shall be permitted, provided that there shall be no more than two (2) service bays.

2. That Section 14-182(2)m-o of the Portland City Code is hereby amended to read as follows:

Sec. 14-182. Permitted uses.

The following uses are permitted in the B-2 zone:

(2) *Business:*

m. Theaters and performance halls; ~~and~~

n. Hotels or motels of less than one hundred fifty (150) rooms; and

o. Major and minor gasoline service stations, as defined in section 14-47, provided that only a minor gasoline service station shall be permitted on a lot abutting a residential zone.

3. That section 14-183(1)a of the Portland City Code is hereby amended to read as follows:

Sec. 14-183. Conditional uses.

The following uses are permitted as provided in section 14-474 (conditional uses), if they meet the following requirements:

(1) *Business:*

a. ~~Major and minor gasoline stations, as defined in section 14-47~~ Reserved;

4. That section 14-230.1 (2) is hereby amended as follows:

Sec. 14-230.1. Permitted uses.

The following uses are permitted in the B-5 urban commercial mixed use zone:

(2) *Commercial:*

o. Lumber and building material dealers;

p. Major and minor gasoline service stations, as defined in section 14-47, provided that only a minor gasoline service station shall be permitted on a lot abutting a residential zone. Major and minor gasoline service stations shall be located at least two thousand (2,000) feet from each other.

5. That section 14-230.2(1)(a) of the Portland City Code is hereby amended to read as follows:

Sec. 14-230.2. Conditional uses.

The following uses shall be permitted as conditional uses in the B-5 urban commercial mixed use zone, provided that, notwithstanding section 14-471(3), section 14-474(a), or any other provision of this Code, the planning board shall be substituted for the board of appeals as the reviewing authority, and further provided that, in addition to the provisions of section 14-474(c)(2), they shall also meet the requirements set forth below:

(1) *Commercial:*

a. ~~Automobile service stations and convenience stores with gasoline pumps provided that they are located at least two thousand (2,000) feet from other such uses~~ Reserved.

6. That section 14-522 of the Portland City Code is hereby amended as follows:

Sec. 14-522. Definitions.

For the purposes of this article all terms and words shall have their ordinary meanings, except as defined herein.

Major development means and includes:

(5) The construction of any structure for industrial use which is more than forty-five (45) feet high; ~~or~~

(6) The addition of any additional dwelling unit to a building initially reviewed as a two-family dwelling or not previously reviewed under this article; or

(7) The construction of any new major or minor gasoline service station in the B-2 or B-5 zone, or the construction of any new major or minor gasoline service station with a structure greater than ten thousand (10,000) square feet of building area in any other permitted zone.

Minor development means and includes any of the following unless (1) the development is major development; or (2) the development is single family development subject to the provisions of section 14-524(b):

(14) The construction of any new major or minor gasoline service station with a structure of less than ten thousand (10,000) square feet of building area in any permitted zone other than the B-2 or B-5 zones.

7. That Section 14-526(a)(9) of the Portland City Code is hereby amended to read as follows and a new subsection (25) is hereby enacted, said subsection to read as follows:

Sec. 14-526. Standards.

(a) *Requirements for approval.* The planning board or planning authority shall not approve a site plan unless it meets the following criteria:

(9) The provision for exterior lighting will not be hazardous to motorists traveling on adjacent public streets; is adequate for the safety of occupants or users of the site; and such lighting will not cause ~~significant annoyance,~~ significant glare or ~~undesirable~~ direct spill-over onto adjacent properties and complies with the applicable specifications of the City of Portland

Technical and Design Standards and Guidelines;

(25) All major or minor gasoline service stations shall meet the following requirements:

a. *Signs:* Signs shall not adversely affect visibility at intersections or access drives. Such signs shall be constructed, installed and maintained so as to ensure the safety of the public. Such signs shall advertise only services or goods available on the premises.

b. *Circulation:* No ingress and egress driveways shall be located within thirty (30) feet from an intersection. No entrance or exit for vehicles shall be in such proximity to a playground, school, church, other places of public assembly, or any residential zone that the nearness poses a threat or potential danger to the safety of the public.

c. *Drive-up features:* Drive-up features, such as gasoline pumps, vacuum cleaners and menu/order boards, shall not extend nearer than twenty-five (25) feet to the street line. The site must have adequate stacking capacity for vehicles waiting to use these service features without impeding vehicular circulation or creating hazards to vehicular circulation on adjoining streets.

d. *Car washes:* Car washes shall be designed to avoid the tracking of residual waters into the street.

City of Portland
Memorandum

To: Mayor McDonough and Members of the City Council

From: Joseph E. Gray, Jr., Director of Planning and Urban Development

Date: September 24, 1996

Subject: October 7, 1996 Agenda Item - Substitute Zoning Text Amendments
Re: Gasoline Service Stations in the B-2 and B-5 Zones

In June, the Council held a workshop on proposed zoning and site plan ordinance text amendments which would regulate gas stations in the B2 and B5 zones. As the Council will recall, the amendments were developed by the Planning Board at the request of Councilor Kane, who sought more effective land use tools to address the impacts of gas stations in the B2 Zone, especially in those circumstances where the lot directly abuts a residential zone.

During the course of pursuing Councilor Kane's request, the Planning Board also attempted to revise the current general conditional use standards. This was considered to be a necessary part of the task, as gas stations are currently a conditional use in the B2 zone; the current standards governing conditional uses are so broad as to provide little guidance to review boards when determining whether a proposed conditional use will have measurable negative impacts.

Finally, in studying the general issue of gas stations and their physical impacts, the Planning Board felt it was appropriate to introduce some additional controls over gas stations located in strictly commercial contexts as well. While not as comprehensive as the regulations proposed for stations abutting residential zones, the Planning Board recommended the adoption of provisions which would address site lighting as well as the physical characteristics of a station's canopy. These provisions would apply in all zones where gas stations are allowed.

Attached is a copy of the amendments originally proposed by the Planning Board, together with the Planning Report which summarizes their intent.

During the workshop session, several Councilors raised concerns about the text amendments as drafted. While appreciating their intent and the concerns that prompted them, Councilors worried that the new zoning provisions might be too restrictive, putting gas stations at a disadvantage relative to their commercial neighbors. Of greatest concern to the Council, however, were the proposed revised general conditional use standards. Councilors expressed concern that the new language was still too vague and did not provide the applicable review boards with definable, measurable, defensible standards.

In response to feedback received at the workshop session, Councilor Kane instructed staff to develop substitute text which avoids some of the problems identified by Councilors, while preserving the original intent of his amendments. Enclosed as Attachment 1 is substitute text intended to replace the zoning amendments originally proposed by the Planning Board.

Briefly, the substitute text accomplishes the following:

* Removes gas stations as a conditional use in the B2 and B5 zones. By removing gas stations from the conditional use category, reliance on the problematic conditional use standards can be avoided. (Regarding the conditional use standards, Corporation Counsel and Planning Staff will be returning to the Council at a later date with a revised proposal for new standards.)

* Lists gas stations as a permitted use in the B2 and B5 zones, but subjects all gas station developments in these zones to major site plan review. Such review would be conducted by the Planning Board and would include an opportunity for public comment.

* For those B2 and B5 lots which directly abut a residential zone, only a minor gas station is allowed. Minor gas stations are defined as those featuring no more than 2 pump islands and serving no more than 8 vehicles at a time. Such stations may include repair services, but may not include car washes or vacuums.

* Revises the limitation on hours of operation. The original draft limited the hours for stations abutting residential zones to between 6am and 11pm. The new draft extends the hours for such stations to between 6am and 1am.

* Removes the specific conditional use standards which currently appear in the zoning text and relocates them to the site plan ordinance, for interpretation by the Planning Board under site plan review -- see Sec 14-526 (a) (25) . The effect of this change is to maintain the same standards, but to put the interpretation of them under the purview of the Planning Board.

* Strengthens the site plan ordinance's standard for lighting and refers applicants and the Planning authority to the City's Technical and Design Standards and Guidelines for more detailed specifications. The Technical Supplement is being amended to include a new chapter outlining specific lighting standards for parking lots, security lighting, canopy lighting for gas stations and other drive-through facilities, etc.

* Removes the canopy standards originally proposed as conditional use standards and places them in the Technical Supplement, to be interpreted by the Planning Board. Revisions to these standards will also be made to reflect Council comments from the previous workshop. Note that the canopy standards would apply not only to gas stations, but to all uses with drive-through facilities. By removing the standards to the Technical Supplement, the Planning Board has the authority to waive or amend them where circumstances warrant.

The Council will note that the enclosed draft includes a 2,000 foot dispersal requirement for stations in the B5 zone. This is not a new provision; the dispersal requirement was adopted as

part of an earlier zoning exercise and is simply lifted from the current conditional use category and relocated under the permitted use category.

Attachments:

1. Original text amendments

2. Original Planning Board Report