Appendix C

District at South Bay Lighting Study

ESA

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DISTRICT AT SOUTH BAY LIGHTING STUDY

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Table of Contents

List of Tables

List of Figures

This Lighting Study by Francis Krahe & Associate Inc. analyzes the illuminated signs and the architectural building and site lighting within the District at South Bay (Project), which is located just southwest of the I-405 Freeway between Main Street and Avalon Boulevard in Carson, California (Property). The Project is bounded by a proposed 300-unit multifamily residential project across Del Amo Boulevard to the north, the Torrance Lateral Flood Control Channel and residential uses to the south and west, industrial and residential uses to the west and the I-405 Freeway to the east. In a larger context, the Project is surrounded by various uses. East of the I-405 Freeway, land uses include neighborhood and regional retail shopping, most notably the South Bay Pavilion. There is a proposed 300-unit multifamily residential project across Del Amo Boulevard to the north. To the north and east of the Project and the I-405 Freeway is the Victoria golf course, with single-family residential uses located further to the east. To the west of the Project extending away from the site on Torrance and Del Amo Boulevards are commercial and light industrial uses. Further north on Main Street are several light industrial uses. The "Project" as such term is used in this report consists of the project that would be permitted by amendment to the existing Boulevards at South Bay Specific Plan Amendment (hereinafter referred to as SPA, to be renamed the District at South Bay Specific Plan) comprised of a potential mix of approximately 1.6 million square feet of regional commercial and general commercial and entertainment uses, 350 hotel rooms located in two hotels and up to 1,250 residential units on a 157 acre former landfill site (Property).

This Study reviews the parameters that affect Light Trespass or Glare (each as defined below) at adjacent properties in the vicinity of the Property, reviews the applicable lighting metrics and regulations pertaining to artificial lighting, examines the existing lighting conditions within and surrounding the Project, and evaluates the proposed Project's illuminated signs and architectural building and site lighting to identify potential environmental impacts on surrounding properties.

The methods of analysis utilized for this Study are based upon the recommended practices established by the Illuminating Engineering Society of North America (IESNA) for the practice of illumination engineering design and application, and the actual measurements of light sources and illuminated surfaces. The IESNA 10th Edition Handbook is the current reference published by IESNA, which supersedes the 9th Edition IESNA Handbook and various Recommended Practice (RP) References published by IESNA prior to 2011.

1. Project Description

This Study analyzes the Project's potential environmental impacts relating to lighting for two lighting scope components:

1. The Project's illuminated signs (Sign Lighting) as authorized by the SPA pursuant to City of Carson Municipal Code, District at South Bay Specific Plan, Sections 6.6 Signage and 6.7 Lighting, included as Appendix A of this Study) and as described by the Sign Concept Documents included as Appendix B of this Study.

2. The Project's architectural building and site lighting (Building Lighting) as authorized by the SPA pursuant to City of Carson Municipal Code, District at South Bay Specific Plan, Section 6.7 Lighting, included as Appendix A of this Study) and as described by the Lighting Design Documents included as Appendix C of this Study. The Building Lighting includes all exterior and interior lighting that may produce a new potentially significant source of light or glare at adjacent properties.

The SPA covers an area which includes several project development sites and is divided into subareas. The Project comprises three Planning Areas. Planning Area 1 would be developed with a mixed-use residential or commercial component; Planning Area 2 would contain regional commercial uses, including outlets, and may contain a small portion of associated restaurant uses; and Planning Area 3 would include general retail uses, consisting of major retail stores and smaller neighborhood stores, restaurants, supermarket and entertainment uses along with surface parking lots and two hotels. The northern hotel is proposed to include 200 rooms while the southern hotel would consist of 150 rooms.

At this time, there is no specific guidance available on the scope or extent of signs or building lighting in Planning Area 1 and Planning Area 3, therefore the analysis within this Study is limited to the Project Sign Lighting and Project Building Lighting within Planning Area 2 of the SPA only (referred to below as the Project

Signs and Project Building Lighting). As set forth in the SPA, any Sign Lighting or Building Lighting within Planning Area 1 and 3 and any modifications to lighting within Planning Areas 2 that exceed the Sign Lighting and or Building Lighting project design features/parameters] set forth in this analysis below will require a separate analysis prepared in connection with an application for such Sign Lighting and or Building Lighting.

The Project's Sign Lighting for Planning Area 2 is described in Appendix B, and complies with the requirements of the proposed amended SPA, which regulates sign types, location, size and operating characteristics of all signage proposed within the Property. Sign types may include, but are not limited to: wall signs, window signs, monument signs, canopy signs, hanging signs, electronic message digital displays, full motion electronic message digital display signs, full motion electronic message digital display projecting signs, supergraphic signs, offsite signs and building identification signs

The proposed SPA has established the following parameters with respect to Sign Lighting:

- Illuminated signs will not exceed 500 candelas/m^2 luminance at night from 45 minutes after sunset until 45 minutes prior to sunrise, and 10,000 candelas/m^2 during day time hours from 45 minutes after sunrise until 45 minutes prior to sunset. Sign luminance shall transition smoothly from daytime luminance to night time luminance and vice versa.
- Illuminated signs that have the potential to exceed 500 candelas/m^2 will include an electronic control mechanism to reduce sign luminance to 500 candelas/m^2 at any time when ambient sunlight is less than 100 footcandles.
- Externally illuminated signs will incorporate design elements to limit the direct view of the light source surface at all exterior light fixtures to ensure that the light source cannot be seen from adjacent residential-zoned properties.

While the details of the Sign Lighting within Planning Area 1 and 3 are not known today, the analysis accurately evaluates the potential for Sign Lighting with the Project to create a new source of light trespass and or glare at adjacent residential properties. The sign types, dimensions, and maximum luminance are defined by the SPA. The Project Sign locations within Planning Area 2 are identified in detail within the Sign Concept Plan (included herein as Appendix B), and are evaluated with all signs operating simultaneously at maximum luminance of 1000 cd/m^2, all white. The Project Signs will not operate in this manner in practice. However, this analysis represents a conservative evaluation of the Project Signs potential for offsite visibility, glare, and light trespass. Furthermore, this analysis also evaluates signs in Planning Area 2 located in close proximity to the sensitive uses, which provide a conservative analysis. Therefore, the results of this analysis may be applied to the future conditions within Planning Area 1 and 3. All Signs which exceed the luminance limits defined by the SPA require separate analysis.

The Project's Building Lighting includes light for safety and use of the property, including exterior and interior lighting. The Building Lighting conceptual design for Planning Area 2 is included in this Report as Appendix C. These conceptual designs are analyzed within this Report to demonstrate that the Project's lighting complies with the applicable provisions of the 2016 California Energy Code - California Code of Regulations, Title 24, Part 6 and Part 11 (CEC), which limit light trespass and energy use for lighting. Applicable regulatory requirements for lighting include:

- Light trespass at the Project property line or centerline of adjacent public right of way limited to a maximum of 0.74 footcandles (0.8 lux) as per CEC Lighting Zone 3[1], and IESNA Table 26.4 and Table 26.5.
- Comply with CEC Section 140.7 -REQUIREMENTS FOR OUTDOOR LIGHTING, including maximum energy use for exterior lighting.

[1] *As described below, all urban areas within California are designated Lighting Zone 3 as default under the CEC*

- All exterior light fixtures will comply with the requirements of 2016 CEC California Green Building Standards Code Section 5.106.8, including the backlight, uplight and glare requirements which limit brightness of luminaires and prevents light spill and light pollution.

Although the Project Building lighting elements within Planning Area 1 and 3 are not know today, all buildings within California must comply with the CEC requirements listed above. Therefore, the analysis presented for Planning Areas 2 is consistent with the analysis of any future lighting proposed for Planning Area 1 and 3, and the conclusions stated within this Study apply for all Building and Site Lighting within the Project.

2. Summary

Exterior lighting impact issues are focused around two key subjects: Light Trespass and Glare. These two technical terms are defined by the Illuminating Engineering Society of North America (IESNA) as follows:

- *Light Trespass*[2] is the light that falls on a property but originates on an adjacent property. Light Trespass is measured in terms of illuminance (foot-candles or metric units lux), and can be measured at any point and at in any direction. Where Light Trespass is evaluated the illuminance is measured perpendicular to the source of light, toward the source of light, at the property line, or the location where light is causing an issue, such as a residential window or balcony.

- *Glare*[3] occurs when either the luminance is too high or the range of brightness in a visual field is too large. A bright light source, such as a flood light or street light, viewed against a dark sky may be uncomfortable to look at, and may create a temporary sensation of blindness, which is referred to as disability glare. Glare is evaluated by measuring the luminance (footlamberts or metric units candelas/m^2) at the source of light, such as a digital display, in comparison to the surrounding adjacent luminance. The term which describes the extent of Glare at an observer position for a view is referred to as contrast, and is determined by the variation of luminance within the field of view. "High," "Medium," and "Low" contrast are terms used to describe contrast ratios. The ratio of peak measured luminance to the average within a field of view: contrast ratios greater than 30:1, between 10:1 and 30:1, and below 10:1, respectively. Contrast ratios above 30:1 are generally uncomfortable for the human eye to perceive. Any source luminance that is more than 50 times the adjacent background will be viewed as prominent, and may be viewed as distracting.

Light Trespass is evaluated at night. Glare may occur either during the day or night.

The Project will not create an adverse lighting effect at surrounding residential use properties with respect to Light Trespass and Glare with the following requirements and limits defined within the Project SPA and with the mitigation measures noted below:

All Project Sign Lighting will be limited as follows:

- Sign Lighting luminance will not exceed 500 candelas/m^2 luminance at night from 45 minutes after sunset until 45 minutes prior to sunrise, and 10,000 candelas/m^2 during day time hours from 45 minutes after sunrise until 45 minutes prior to sunset. Sign luminance shall transition smoothly from daytime luminance to night time luminance and vice versa.

- Sign Lighting where sign luminance has the potential to exceed 500 candelas/m^2 will include an electronic control mechanism to reduce sign luminance to 500 candelas/m^2 at any time when ambient sunlight is less than 100 fc.

- Sign Lighting with external illumination will seek to incorporate design elements to limit the direct view of the light source surface at all exterior light fixtures to ensure that the light source cannot be seen from adjacent residential-zoned properties.

Mitigation measures which will reduce any high contrast, glare condition from the Project Signs to a medium contrast, non-glare condition may include the following:

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[2] *IESNA Handbook, 10th Edition, 19.3: Light Pollution and Trespass, page 19.7*

[3] *IESNA Handbook, 10th Edition, 4.10: Glare, page 4.25*

- **Mitigation Measure B-2:** The distribution, placement, and orientation of signs along the I-405 Freeway shall be in substantial compliance with the signage concepts and in compliance with the sign standards in the SPA.

- **Mitigation Measure B-3:** If any portion of the illuminated surface of the sign is visible from a residential use within 1,000 feet of said sign at night, then the proposed modified Project sign luminance shall be reduced to less than 300 cd/m^2 at night.

- **Mitigation Measure B-5:** If any portion of the illuminated surface of the sign is visible from a residential use within 1000 ft. of said sign, sign area and/or sign luminance shall be limited so that the light trespass illuminance is less than 0.74 fc at residential property line.

All Project Building Lighting will be limited as follows:

- Building Lighting fixtures will be located and aimed to limit light trespass illuminance to less than 0.74 fc at adjacent residential property lines.

- Building Lighting must comply with the requirements of 2016 CEC California Green Building Standards Code Section 5.106.8, including the backlight, uplight and glare requirements which limit brightness of luminaires and prevents light spill and light pollution.

3. Glossary of Lighting Terminology

Discussions of lighting issues include precise definitions, descriptions or terminology of the specific lighting technical parameters. The following glossary summarizes explanations of the technical lighting terms utilized in this Report and the related practice standards to facilitate discussion of these issues. The following technical terms are used in this Report.

Brightness: The magnitude of sensation that results from viewing surfaces from which light comes to the eye. This sensation is determined partly by the measurable luminance of the source and partly by the conditions of observation (Context), such as the state of adaptation of the eye. For example, very bright lamps at night appear dim during the day, because the eye adapts to the higher brightness of daylight.

BUG Rating: A luminaire classification system established in *IES TM-15-11*, BUG Ratings Addendum that provides for uniform assessment of the directional characteristics of illumination for exterior area lighting. BUG is an acronym composed of Backlight, Uplight, and Glare. BUG ratings are based on a zonal lumen calculations for secondary solid angles defined in *IES TM-15-11*.

Candela: Measure of light energy from a source at a specific standard angle and distance. Candela (cd) is a convenient measure to evaluate output of light from a lamp or light fixture in terms of both the intensity of light and the direction of travel of the light energy away from the source.

Contrast: Calculated evaluation of high, medium and low contrast of visible light sources or surfaces within the Property by a ratio of luminance. Contrast is the ratio of one surface luminance to a second surface luminance or to the field of view. Contrast exceeding 30 to 1 are usually deemed uncomfortable; 10 to 1 are clearly visible; and less than 3 to 1 appear to be equal.

Fully Shielded: A lighting fixture constructed in such a manner that all light emitted by the fixture, either directly from the lamp or a diffusing element, or indirectly by reflection or refraction from any part of the Luminaire, is projected below the horizontal as determined by photometric test or certified by the manufacturer. Any structural part of the light fixture providing this shielding must be permanently affixed. In other words, no light shines above the horizontal from any part of the fixture.

Glare:

Glare is visual discomfort experienced from high luminance or high range of luminance. For exterior environments at night, glare occurs when the range of luminance in a visual field is too large. The light energy incident at a point is measured by a scale of footcandles or lux, and is described in the technical term Illuminance. This incident light is not visible to the eye until it is reflected from a surface, such as pavement, wall, dust in the atmosphere or the surface of a light bulb. The visible brightness of a surface is measured in footlamberts (or metric equivalent candelas per square meter) and is described by the term Luminance.

The human eye processes brightness variations across a very broad spectrum of intensities. The range of brightness generated by direct noon sun versus a moonlight evening is over 5000 to 1. Human eyes are capable of accommodating to this range of intensities given adequate time to adjust. However, the eye cannot process brightness ratios of more than 30 to 1 within a view without discomfort. See IESNA 10th Edition Handbook, Section 4.10.1, Discomfort Glare and Section 10.9.2 Calculating Glare.

For the purpose of this analysis, brightness of light sources may be described subjectively by the following criteria:

High Contrast Conditions: View of light fixture emitting surface, such as a lens, reflector, or lamp, where brightness contrast ratio exceeds 30 to 1 (source Luminance to background Luminance ratio in footlamberts).

Medium Contrast Conditions: Brightly lighted surfaces where contrast ratio exceeds 10 to 1, but is less than 30 to 1 (lighted surface Luminance to background Luminance ratio in footlamberts).

Low Contrast Conditions: Illuminated surfaces where contrast ratio exceeds 3 to 1, but less than 10 to 1 (source Luminance to background Luminance ratio in footlamberts).

Illuminance:

Illuminance is the means of evaluating the density of Luminous Flux. Illuminance indicates the amount of Luminous Flux from a light source falling on a given area. Illuminance is measured in footcandles (fc) which is the lumens per square foot, or Lux (lumens per square meter). Illuminance need not necessarily be related to a real surface since it may be measured at any point within a space. Illuminance is determined from the Luminous intensity of the light source. Illuminance of a point source decreases with the square of the distance from the light source (see Inverse Square Law definition).

Horizontal Illuminance:

Illuminance incident upon a horizontal plane. The orientation of the illuminance meter or calculation point will be 180° from Nadir.

Vertical Illuminance:

Illuminance incident upon a vertical plane. The orientation of the illuminance meter or calculation point will be 90° from Nadir.

Inverse Square Law:

In physics, an inverse-square law is any physical law stating that a specified physical quantity or intensity is inversely proportional to the square of the distance from the source of that physical quantity. The fundamental cause for this relationship can be understood as geometric dilution corresponding to point-source radiation into three-dimensional space (see Figure 1). The divergence of a vector field which is the resultant of radial inverse-square law fields with respect to one or more sources is everywhere proportional to the strength of the local sources, and hence zero outside sources. Newton's law of universal gravitation follows an inverse-square law, as do the effects of electric, magnetic, light, sound, and radiation phenomena. Thus, Illuminance decreases with the square of the distance from the light source.

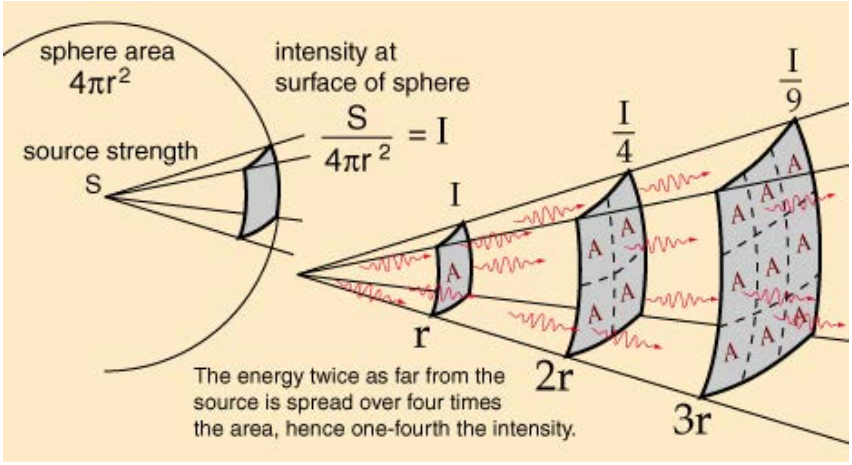

Figure 1: Inverse square law diagram (hyperphysics.phy-ast.gsu.edu)

Output Direction:

Luminaires for general lighting are classified in accordance with the percentages of total luminaire output emitted above and below horizontal. The light distribution curves may take many forms within the limits of upward and downward distribution, depending upon the type of light and the design of the luminaire.

Lighting Array:

An installation of multiple light sources or lamps where the distance between each lamp or light source within the Lighting Array is less than 5 feet on center in any direction from any other source.

Light Source:

Device which emits light energy from an electric power source.

Light Trespass:

Electric light from subject property incident onto adjacent properties, measured in footcandles or lux, usually analyzed by measurement at or near the adjacent property line.

Lighting Zone (LZ):

Defined by IESNA and summarized in Table 26.4 in the Handbook and adopted by CALGreen.

Lighting Zone LZ2:

Outdoor areas of human activity where the vision of human residents and users is adapted to moderate light levels. Lighting is not uniform or consistent. Lighting is generally desired for safety, security and/or convenience.

Lighting Zone LZ3:

Outdoor areas of human activity where the vision of human residents and users is adapted to moderately high light levels. Lighting is generally desired for safety, security and/or convenience.

Lighting Zone LZ4: Outdoor areas of human activity where the vision of human residents and users is adapted to high light levels. Lighting is generally desired for safety, security and/or convenience.

Luminaire: A complete lighting unit consisting of a lamp or lamps and ballast(s) (when applicable) together with the parts designed to distribute the light, to position and protect the lamps, and to connect the lamps to the power supply. Also referred to as a Light Fixture.

Luminance: Luminance is a measure of emissive or reflected light from a specific surface in a specific direction over a standard area. Luminance is measured in footlamberts (fL) (Candela per square foot) or cd/m^2 (Candela per square meter). $1fL = 3.43\ cd/m^2$.

Whereas Illuminance indicates the amount of Luminous Flux falling on a given surface, Luminance describes the brightness of an illuminated or luminous surface. Luminance is defined as the ratio of luminous intensity of a surface (Candela) to the projected area of this surface (m^2 or ft^2).

Luminous Flux: Mean value of total Candelas produced by a light source. Luminous Flux describes the total amount of light emitted by a light source. The unit for measuring Luminous Flux is Lumen (lm).

This radiation could basically be measured or expressed in watts. This does not, however, describe the optical effect of a light source adequately, since the varying spectral sensitivity of the eye is not taken into account. To include the spectral sensitivity of the eye the Luminous Flux is measured in lumen. Radiant Flux or 1 W emitted at the peak of the spectral sensitivity (in the photopic range at 555 nanometers produces a Luminous Flux of 683 lumen). The unit of lumen does not define direction.

Skyglow: Skyglow is the description of luminous atmospheric background and results from both natural and human made conditions. Natural causes of skyglow include sunlight reflected from the surface of the earth and moon, sunlight illuminating the upper atmosphere, and visible illumination from other interplanetary sources. Human made causes of skyglow include electric light that is emitted directly upward into the sky (Uplight), or reflected off of the ground. Such light illuminates the aerosol particles within the atmosphere and

4. Review of Lighting Regulations & Reference Standards

Exterior lighting is regulated throughout California by the local municipal code and the state energy and building codes. Pertinent lighting sections are summarized and discussed for the City of Carson, California Municipal Code, the State of California Green Building Code, and the California Energy Code (CalGreen). Reference standards include model lighting ordinances provided by the Illuminating Engineering Society of North America (IESNA) and the International Dark Sky Organization, ASHRAE 90-75, and the U.S. Green Building Council. Various aspects of these reference standards are included in local regulations to improve the outcomes of any approved project and avoid future disputes or legal challenges to proposed lighting plans. The lighting standards summarized below balance the requirements of property owners for sufficient brightness and flexibility for the use of their property, with minimizing the off-site negative effects of Light Trespass and Glare.

4.1 City of Carson, California Municipal Code

Light Trespass illuminance limits are generally guided by the local Municipal Code or State of California building or energy codes. The City of Carson, California Municipal Code does not include specific limits to light trespass illuminance. The City of Carson adopts the California Building Code and the California Energy Code.

4.2 California Code of Regulations, Title 24

Title 24 of the California Code of Regulations (CCR), also known as the California Building Standards Code, consists of regulations to control building standards throughout the State. The following components of Title 24 include standards related to lighting:

California Building Code (Title 24, Part 1) and California Electrical Code (Title 24, Part 3)

The California Building Code (Title 24, Part 1) and the California Electrical Code (Title 24, Part 3) stipulate minimum light intensities for safety and security at pedestrian pathways, circulation ways, and paths of egress. All exterior lighting will comply with the requirements of the California Building Code and California Electrical Code.

California Energy Code (Title 24, Part 6)

The California Energy Code (CEC) stipulates allowances for lighting power and provides lighting control requirements for various lighting systems (see Appendix D herein), with the aim of reducing energy consumption through efficient and effective use of lighting equipment.

California Green Building Standards Code (Title 24, Part 11)

The California Green Building Standards Code, which is Part 11 of Title 24, is commonly referred to as the CALGreen Code. Paragraph 5.1106.8, Light pollution reduction, requires that all non-residential outdoor lighting must comply with the following:

- The minimum requirements in the CEC for Lighting Zones 1–4 as defined in Chapter 10 of the California Administrative Code as noted above; and
- Backlight, Uplight and Glare (BUG) ratings as defined in the Illuminating Engineering Society of North America's Technical Memorandum on Luminaire Classification Systems for Outdoor Luminaires identified as IESNA TM-15-07 Addendum A; and
- Allowable BUG ratings not exceeding those shown in Table A5.106.8 in Section 5.106.8[4] of the CALGreen Code (excerpt included in the Appendix E of this Study); or
- Comply with a local ordinance lawfully enacted pursuant to Section 101.7, whichever is more stringent.

4.3 Lighting Zone Designation LZ3

The City of Carson, California is an existing suburban residential zone with extensive nighttime use nearby including retail, restaurants, and schools. Current best practices for lighting standards recognize the unique issues related to night time use adjacent to residences. The California Energy Code (CEC) includes designations for Lighting Zones (LZ) 1 through 4, included below in Appendix D, which correspond to the Light Trespass recommendations within the IESNA 10th Edition Handbook, Table 26.4, included herein Appendix F.

All urban areas within California are designated Lighting Zone 3 as default under the CEC, which limits the Light Trespass to 8 lux (0.74 fc). Per the CEC, California Building Energy Efficiency Standards, Section 10-114, page 40, 41. (Appendix D herein), the designations for outdoor lighting zones in urban areas are as follows:

"The default for urban areas, as defined by the U.S. Census Bureau, is Lighting Zone 3."

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[4] *Table 5.106.8, Footnote 2 defines the location of the Property Line for the purpose of evaluating compliance with the BUG ratings and provides that: "For property lines that abut public walkways, bikeways, plazas and parking lots, the property line may be considered to be 5 feet beyond the actual property line for purpose of determining compliance with this section. For property lines that abut public roadways and public transit corridors, the property line may be considered to be the centerline of the public roadway or public transit corridor for the purpose of determining compliance with this section." See Appendix E.*

The CEC standard is well defined and supported by the IESNA and ASHRAE, and other independent lighting organizations such as the International Dark Sky Organization and U.S. Green Building Council.

4.4 California Vehicle Code, Division 11. Rules of the Road

Chapter 2, Article 3 of the California Vehicle Code stipulates limits to the location of light sources that may cause glare and impair the vision of drivers.

ARTICLE 3. Offenses Relating to Traffic Devices [21450 - 21468] (Article 3 enacted by Stats. 1959, Ch. 3.), Section 21466.5. No person shall place or maintain or display, upon or in view of any highway, any light of any color of such brilliance as to impair the vision of drivers upon the highway. A light source shall be considered vision impairing when its brilliance exceeds the values listed below.

The brightness reading of an objectionable light source shall be measured with a 1-1/2 degree photoelectric brightness meter placed at the driver's point of view. The maximum measured brightness of the light source within 10 degrees from the driver's normal field of view shall not be more than 1,000 times the minimum measured brightness in the driver's field of view, except that when the minimum measured brightness in the field of view is 10 footlamberts or less, the measured brightness of the light source in footlambert shall not exceed 500 plus 100 times the angle, in degrees, between the driver's field of view and the light source.

4.5 IESNA Recommended Practices

The Illuminating Engineering Society of North America (IESNA) recommends illumination standards for a wide range of building and development types. These recommendations are widely recognized and accepted as best practices and are therefore a consistent predictor of the type and direction of illumination for any given building type. For all areas not stipulated by the regulatory building code, municipal code or specifically defined requirements, the IESNA standards are used as the basis for establishing the amount and direction of light for the Project.

The IESNA 10th Edition Lighting Handbook defines Outdoor Lighting Zones relative to a range of human activity versus natural habitat. Table 26.4, Nighttime Outdoor Lighting Zone Definitions, included in Appendix E of this Study, establishes the Zone designation for a range of existing lighting conditions, from low or no existing lighting to high light levels in urban areas. Table 26.4 is referenced by the CEC as noted above in relation to allowable energy use for outdoor lighting. In addition, the IESNA 10th Edition Lighting Handbook defines Recommended Light Trespass Limits in Table 26.5, included in the Appendix F hereto, relative to the Outdoor Lighting Zones. The Recommended Light Trespass Illuminance Limits describe the maximum Light Trespass values in Lux at the location where trespass is under review. As noted above, the CEC stipulates that all urban areas in California are designated as Lighting Zone 3. IESNA Table 26.5, lists a Pre-curfew 8 Lux (0.74 footcandles) maximum at the location where trespass is under review for Zone 3.

5. Significance Threshold

Appendix G of the California Environmental Quality Act (CEQA) Guidelines (14 California Code of Regulations, Sections 15000–15387) provides a set of sample questions to evaluate impacts with regard to aesthetics, including light and glare. The question that pertains to light and glare is as follows:

Would the project:

- Create a new source of substantial light and glare which would adversely affect day or nighttime views in the area?

In the context of this question from Appendix G of the CEQA Guidelines, the determination of significance takes into account the following factors:

- The change in ambient nighttime levels as a result of project sources; and
- The extent to which project lighting would spill off the Property and affect adjacent residential zoned properties.

The Project would create a significant impact with regard to artificial light or glare if:

- The Project exceeds 0.74 foot-candles at the property line of a residential zoned property and therefore adversely changes the ambient light level at residential properties.
- The Project creates new high contrast conditions visible from a field of view from a residentially zoned property.

In addition, based on the California Vehicle Code requirements identified above, the Project would create a significant impact with regard to artificial light or glare effects on drivers of motor vehicles if:

- The maximum measured brightness of the light source within 10 degrees from the driver's normal field of view shall not be more than 1,000 times the minimum measured brightness in the driver's field of view, except that when the minimum measured brightness in the field of view is 10 footlamberts or less, the measured brightness of the light source in footlambert shall not exceed 500 plus 100 times the angle, in degrees, between the driver's field of view and the light source.[5]

6. Methodology

6.1 Existing Conditions Procedures

Existing conditions lighting observations were conducted following recommended practice procedures defined by the IESNA in RP-33-00 Lighting for Outdoor Environments, TM-10-00 Addressing Obtrusive Light (Urban Sky Glow and Light Trespass) in Conjunction with Roadway Lighting, and TM-11-00 Light Trespass: Research, Results and Recommendations. Field illuminance and luminance measurements were conducted to accurately document all existing incident and visible light at each Monitoring Site location. Incident light can be understood as a vector of luminous flux moving through space. As the vector (light) is incident upon a surface, the intensity of the resulting illuminance will vary depending upon the relative orientation of the vector to the surface. The greatest illuminance will result when the surface and vector are perpendicular. The least illuminance will result when the surface and vector are parallel. In the field conditions, where there are multiple sources of light originating from varied positions, illuminance measurements are recorded horizontally with the photosensor facing up at 3 feet above grade, and vertically with the photosensor facing the Project as per as per IESNA standards. These measurements document the total horizontal illuminance received at a Monitoring Site as well as the direction and intensity of light converging on the Monitoring Site from the direction of the Property. Since most of the Monitoring Sites are located at a long distance away from the Property, greater than 100 feet as noted in Section 7 below, the vertical illuminance represents a plane perpendicular to the light sources. Under these conditions, there is little difference between the vertical and perpendicular plane, and the vertical plane analysis that is conducted in this Study would be equal to or greater than the measured luminance from a precisely perpendicular plane analysis. Therefore, this study utilizes a vertical and horizontal illuminance analysis. The existing Illuminance is measured with a Minolta Illuminance meter.

Figure 2: Minolta LS-100 meter

[5] *The driver's field of view from the center of the roadway plus 10 degrees."*

The existing luminance is measured from a Monitoring Site to light sources and surfaces within the field of view toward the Property from that Monitoring Site. This existing conditions luminance data is measured with a Minolta LS-100 Luminance meter with procedures consistent with best practices for field measurement of luminance as per IESNA standards. The LS-100 meter utilized by Francis Krahe & Associates, Inc. reports luminance data in either candelas per square meter or footlamberts (fL). All existing luminance data measured and reported in this Study are recorded as cd/m^2.

6.2 Project Signs Analysis

The analysis of the Project Signs includes evaluation of the illuminance Light Trespass from the Property at the Property line adjacent to residential properties, and an evaluation of Glare from the Project Signs visible at residential properties or at Freeway locations.

This Study presents a conservative analysis with respect to light trespass and glare, where all signs are evaluated with a maximum luminance of 1,000 cd/m^2 at night (twice the allowed maximum luminance within the SPA at 500 cd/m^2), and 10,000 cd/m^2 during the day, all white light. The actual sign luminance will be defined by the light sources and materials utilized by the Applicant to comply with the requirements of the SPA. Many of the Project Signs will generate far lower luminance than the lighting that has been modeled, thus, making this a conservative analysis. This Study utilizes the Project Sign Concept locations identified in Appendix B, which identify locations in PA2 and signs within the right of way of Streets A and B, and adjacent to the Freeway.

While the details of the Sign Lighting within Planning Area 1 and 3 are not known today, the analysis accurately evaluates the potential for the Project Sign Lighting to create a new source of light trespass and or glare at adjacent residential properties. The sign types, dimensions, and maximum luminance are defined by the SPA. The Project Sign locations within Planning Area 2 are identified in detail within the Sign Concept Plan (included herein as Appendix B), and are evaluated with all signs operating simultaneously at maximum luminance of 1,000 cd/m^2, all white. The Project Signs will not operate in this manner in practice. However, this analysis represents a conservative evaluation of the Project Signs potential for offsite visibility, glare, and light trespass. This analysis evaluates signs in Planning Area 2 which are located in close proximity to the sensitive uses, which are also conservative locations. Therefore, the results of this analysis may be applied to the future conditions within Planning Area 1 and 3. All Signs which exceed the luminance limits defined by the SPA require separate analysis.

a. Project Signs Light Trespass Analysis

Sign light trespass illuminance is calculated at the Project property line through the illumination modeling software program AGI32. This software utilizes the 3-dimensional architectural computer model, including building dimensions and exterior materials, in conjunction with the Project Sign concept plan and specifications to generate an accurate prediction of future illuminance and luminance. The illuminated sign lighting is evaluated with respect to horizontal and vertical illuminance at the locations where lighting is under review.[6]

For the analysis of light trespass at the nearest residential properties, the illuminance is calculated at the review location within a 90 feet tall vertical plane at 10 feet on center. The calculation plane simulates the illumination values (fc) captured by light meters. Figure 3 illustrates the locations where the lighting is under review and where the horizontal and vertical illuminance is calculated to evaluate light trespass.

The vertical calculation planes analyze the lighting at the Property line, which will be greater than the illuminance at any location more distant from the Property. Incident light (fc) from a source degrades in proportion to the inverse square of the distance from the source to the location where lighting is under review. The illuminance E_v (fc) incident at any given distance D (ft) from an illuminated surface S (ft^2) with uniform surface luminance of L (cd/m^2) is calculated by the following formula:

$$E_v = \frac{L \times S}{10.76 \times D^2}$$

[6] *See Note 2, above.*

Figure 3: Illuminance calculation vertical planes

This formula illustrates the reduction in illuminance at any location as the distance increases from a light source. More distant residential properties will receive less light from the Project due to the increased distance. Therefore, the Project Sign Lighting will produce a less significant light trespass impact on residential properties more distant from the Project property line.

b. Project Signs Glare Analysis

Sign luminance is evaluated with respect to potential glare at sensitive night use properties and for drivers on adjacent roadways. Project sign luminance is evaluated with respect to the resulting contrast ratio, which equals the maximum sign luminance divided by the measured average existing luminance within the field of view from the Monitoring Sites identified in the field survey of existing conditions. Contrast ratios greater than 30:1 are considered potential glare conditions.

Luminance is independent of distance for large area sources, such as illuminated signs, where the viewing locations are relatively close to the sign and the sign fills a large portion of the field of view. At viewing locations less than 19 times the height or width of the illuminated surface, the sampled area viewed or measured by a luminance meter increases with distance, cancelling the inverse square losses. The standard meter for luminance measurement utilizes a 3 degree lens, thus the 3 degree view translates to approximately 19.1 times the height or width dimension. At viewing locations beyond 19 times the height or width the illuminated surface becomes a point source, and the inverse square relationship will again predict the measured luminance or perceived brightness. The Project includes signs with a range of sizes. The Conceptual Sign Plan includes signs dimensions up to 20 feet high or 200 feet wide, and a range of viewing distances from 65 feet to over 2000 feet. The luminance of the largest signs within the Project are analyzed with a constant luminance of 1,000 cd/m^2 for all viewing distances up to 1,000 feet.

The potential roadway glare impacts are analyzed with respect to the Project sign luminance compliance with the California Vehicle Code requirements for both night and day conditions at the Freeway Site locations identified in Figure 5. According to California Vehicle Code Section 21466.5, the Project would have a significant impact with regard to artificial light or glare if:

- The maximum measured brightness of a light source within 10 degrees from a driver's normal line of sight exceed 1,000 times the minimum measured brightness in the driver's field of view, except when the minimum values are less than 10 footlamberts (fL).
- At minimum luminance less than 10 footlamberts (fL) the source brightness shall not exceed 500 fL plus 100 times the angle, in degrees, between the driver's line of sight and the light source.

The roadway glare analysis includes evaluation of the view angle at each freeway receptor Site location from the driver's line of sight to the Project illuminated signs to determine the visibility of the Project illuminated signs, and evaluates the luminance of the Project illuminated signs at that location.

6.3 Project Building Lighting Analysis

The analysis of the Project Building Lighting includes evaluation of the illuminance light trespass from the Project at the Project property line adjacent to residential properties, and an evaluation of glare from the Project light fixtures visible at residential properties.

This technical analysis incorporates the performance criteria stipulated in the SPA, including the limits to light pole heights and exterior illuminance. In order to present a conservative analysis with respect to light trespass and glare, this Study assumes that all Project Building Lighting will continuously emit the maximum value allowed within the SPA (see Appendix A). The actual Project Building Lighting will be defined by the specific light sources and materials utilized by the Applicant to comply with the requirements of the SPA. Many of the Project Building Lighting fixtures will generate far lower illuminance than the lighting that has been modeled, thus, making this a conservative analysis.

While the specific lighting elements within Planning Area 1 are not know today, all projects within California must comply with the requirements of the provisions of the 2016 California Energy Code - California Code of Regulations, Title 24, Part 6 and Part 11 (CEC), listed above. Therefore, the analysis presented for Planning Areas 2 and 3 is consistent with the analysis of any future lighting proposed for Planning Area 1, and the conclusions stated within this Study apply for all Building and Site Lighting within the Project.

a. Project Building Lighting Trespass Analysis

Project Building Lighting illuminance is calculated at the Project property line through the illumination modeling software program AGI32 by Lighting Analyst Inc. This software utilizes the 3-dimensional architectural computer model, including building dimensions and exterior materials, in conjunction with the Project lighting concept plan and specifications to generate an accurate prediction of future illuminance and luminance. The Project Building Lighting is evaluated with respect to horizontal and vertical illuminance at the locations where lighting is under review.

For the analysis of light trespass, the illuminance is calculated at the review location within a 90 feet tall vertical plane at 10 feet on center. The calculation plane simulates the illumination values (fc) captured by light meters. Figure 3 illustrates the locations where the lighting is under review and where the horizontal and vertical illuminance is calculated to evaluate light trespass.

Incident light (fc) from a source degrades in proportion to the inverse square of the distance from the source to the location where lighting is under review. The illuminance E_v (fc) incident at any given distance D (ft) from an illuminated surface S (ft^2) with uniform surface luminance of L (cd/m^2) is calculated by the following formula:

$$E_v = \frac{L \times S}{10.76 \times D^2}$$

This formula illustrates the reduction in illuminance at any location as the distance increases from a light source. More distant residential properties will receive less light from the Project due to the increased distance.

Therefore, the Project Building Lighting will produce a less significant light trespass impact on residential properties more distant from the Project property line.

6.4 Project Building Lighting Glare Analysis

The analysis of the Project includes an evaluation of glare from the Project Building Lighting visible at sensitive sites. Glare is analyzed by comparison of the source luminance to the luminance of surrounding surfaces and other light sources visible at the sensitive sites. The light source luminance is determined from the specified lighting product luminance at a particular viewing angle. The surrounding luminance is determined from the measured existing luminance determined in Section 7 below.

7. Project Existing Conditions

The District at South Bay Project (Project) is located just southwest of the I-405 Freeway between Main Street and Avalon Boulevard in Carson, California (Property). The Project is bounded by a proposed 300 unit multifamily residential project across Del Amo Boulevard to the north, the Torrance Lateral Flood Control Channel and residential uses to the south and west, industrial and residential uses to the west and the I-405 Freeway to the east. In a larger context, the Property is surrounded by various uses. East of the I-405 Freeway, land uses include neighborhood and regional retail shopping, most notably the South Bay Pavilion. There is a

Figure 4: Project and surrounding use properties

proposed 300 unit multifamily residential project across Del Amo Boulevard to the north. To the north and east of the Project and the I-405 Freeway is the Victoria golf course, with single-family residential uses located further to the east. To the west of the Project extending away from the site on Torrance and Del Amo Boulevards are commercial and light industrial uses. Further north on Main Street are several light industrial uses. The "Project" as such term is used in this report consists of the project that would be permitted by amendment to the existing Boulevards at South Bay Specific Plan (to be renamed the District at South Bay Specific Plan) comprised of a potential mix of approximately 1.6 million square feet of regional commercial and general commercial and entertainment uses, 350 hotel rooms located in two hotels and up to 1,250 residential units on a 157 acre former landfill site (Property).

The SPA covers an area which includes several project development sites and is divided into subareas. The Property comprises three Planning Areas. Planning Area 1 would be developed with a mixed-use residential or commercial component; Planning Area 2 would contain regional commercial uses, including outlets, and may contain a small portion of associated restaurant uses; and Planning Area 3 would include general retail uses, consisting of major retail stores and smaller neighborhood stores, restaurants, supermarket and entertainment uses along with surface parking lots and two hotels.[7] The northern hotel is proposed to include 200 rooms while the southern hotel would consist of 150 rooms. At this time, there is no specific guidance available on the scope or extent of signs in PA1, therefore the Sign Lighting analysis within this Study is limited to the Project Sign Lighting within Planning Areas 2 and 3 of the SPA only (referred to below as the Project Signs). As set forth in the SPA, any Sign Lighting within Planning Area 1 and any modifications to Sign Lighting within Planning Areas 2 and 3 that exceed the Sign Lighting project design features/parameters] set forth in this analysis below will require a separate analysis prepared in connection with an application for such Sign Lighting.

The existing lighting conditions within and surrounding the Project include the exterior building lights at the Property, temporary construction lights utilized for security and safety, commercial illuminated signs along the Freeway I-405 , street lights along the Freeway, illuminated parking lots east of the Freeway, and building and landscape lighting at adjacent residences.

The distance to adjacent residential properties varies considerably. The residential properties within close proximity to the north are located at the north edge of the Del Amo Boulevard right of way, approximately 87 feet from the north Project property line. The residential properties to the west are set back from the Property by a drainage channel and berm, approximately 105 feet away from the west Property boundary. Residential properties to the south are set back from the Property by the drainage channel and berm with distances from 125 feet to 130 feet away from the Project south property line. The east Property boundary abuts the south bound lanes of the Freeway and does not include any residential use properties. The properties to the east of the Freeway are commercial, and located east of the river approximately 700 feet from the Project Property line.

7.1 Existing Conditions Monitoring Sites

Monitoring sites are utilized to describe and evaluate the existing lighting conditions at and surrounding the Property to determine the maximum potential impacts that may result from light or glare onto adjacent sensitive sites surrounding the Property. All Monitoring Site locations are within close proximity of the Project and have views of the Property. Monitoring Sites may also be considered existing residential use properties, or may be located adjacent to existing residential properties.

The following criteria are used to select potential Monitoring Site locations:

Project Light Visibility – Monitoring sites are analyzed that provide direct view of the areas of greatest light intensity from the Project.

Proximity – Monitoring sites at the least distance to the Project are analyzed. These locations are selected because light intensity decreases exponentially with distance. Locations at a greater distance will experience less light intensity than nearby locations.

Figure 5 shows the Project's location, the Monitoring Site locations, the Freeway Site locations, and the properties surrounding the Property. The Property is shaded green. Monitoring Site locations were selected for observation and field lighting measurements to evaluate the views to the Property from adjacent residential properties and to determine the extent and intensity of existing light sources within and surrounding the Property. The Monitoring Sites are within the public right of way, adjacent to residences. These locations are representative of the view to the Property from the vicinity of the residences surrounding the Property to the north, south and west. Figure 5 illustrates the following Monitoring Site locations:

Monitoring Site M1: Monitoring Site M1 is located on the north side of Del Amo Boulevard, opposite to the intersection of "B" Street, to evaluate the Project north elevation and north facing

[7] *Residential units are also permitted in portions of Planning Area 2 with issuance of an Administrative Permit by the City, however, the total cap of 1,250 units remains in place for the Property.*

signs. The distance to the Property is approximately 87 ft., and the distance to the Project north exterior façade is approximately 645 ft.

Monitoring Site M2: Monitoring Site M2 is located adjacent unit #45 within the Imperial Avalon Mobile Home Estates, south of the Property south property line, near the Street "A" bridge over the Drainage Channel, at the south side of the private street, to evaluate the Project south elevation and south facing signs. The distance to the Property is approximately 130 ft., and the distance to the Project south exterior façade is approximately 615 ft.

Monitoring Site M3: Monitoring Site M3 is located adjacent to 451 Javelin Street, near the Grace Avenue cul-de-sac at the south side of the Drainage Channel, to evaluate the Project south elevation and south facing signs. The distance to the Property is approximately 132 ft., and the distance to the Project south exterior façade is approximately 280 ft.

Monitoring Site M4: Monitoring Site M4 is located adjacent to 333 East Javelin Street, near the intersection with Delores Street at the south side of the East Javelin Street right of way, to evaluate the Project south elevation and south facing signs. The distance to the Property is approximately 127 ft., and the distance to the Project south exterior façade is approximately 385 ft.

Monitoring Site M5: Monitoring Site M5 is located adjacent to 267 East Dominguez Street, near the intersection with the Drainage Channel and the East Dominguez Street right of way, to evaluate the Project west elevation and west facing signs. The distance to the Property is approximately 105 ft., and the distance to the Project south exterior façade is approximately 315 ft.

Figure 5: Monitoring Site Locations

The Freeway Sites were selected to evaluate views to the Property where Freeway directional signs are within the drivers line of sight. Figure 5 illustrates the following Freeway Site locations:

Freeway Site FS1: Freeway Site FS1 is located in the south bound lanes of the I-405 Freeway near the north Project property immediately south of the Del Amo Boulevard overcrossing.

The distance to the Property is approximately 135 ft., and the distance to the Project east exterior façade is approximately 271 ft.

Freeway Site FS2: Freeway Site FS2 is located in the south bound lanes of the I-405 Freeway near the midpoint of the north Project property line. The distance to the Property is approximately 80 ft., and the distance to the Project east exterior façade is approximately 125 ft.

Freeway Site FN1: Freeway Site FN1 is located in the north bound lanes of the I-405 Freeway, south of the Project property line and south of the Avalon Boulevard overcrossing. The distance to the Property is approximately 1100 ft., and the distance to the Project east exterior façade is approximately 1670 ft.

Freeway Site FN2: Freeway Site FN2 is located in the north bound lanes of the I-405 Freeway north of the Avalon Boulevard overcrossing and north of the Project south property line. The distance to the Property is approximately 785 ft., and the distance to the Project east exterior façade is approximately 1360 ft.

7.2 Criteria

The impact of the Project is evaluated in comparison to the existing conditions with respect to the thresholds established in Section 5. Table 1 summarizes the factors used to assess the existing conditions at each Monitoring Site:

Table 1: Existing Conditions Lighting Criteria

Criteria	Metric	Procedure
Light Trespass - Illuminance	Measured illuminance (footcandle) documented at each Monitoring Site	Horizontal and vertical illuminance measurements at each Monitoring Site with Minolta illuminance meter.[8]
Glare – Contrast Ratio	Observed existing conditions	Observed and recorded conditions with respect to the view to the Property from the Monitoring Site in terms of project coverage and context, light sources, lighted surfaces, and illuminated signs.

7.3 Monitoring Site Survey Data

The observations and measurement of existing lighting conditions within and surrounding the Property are summarized below in relation to the evaluation factors established in Section 5, Significance Threshold:

Illuminance: The Illuminance listed in Table 2, below, summarize the measured Illuminance at the Monitoring Sites. The measured illuminance is consistent with a suburban lighting condition, with relatively high illuminance at the street and sidewalk within the public right of way and nearby commercial properties, and lower illuminance within the residential properties, but sufficient light for safety and security. The existing Property includes very

[8] *Horizontal Illuminance measurements are recorded with the light meter held horizontally and the sensor at 180 degrees to the nadir at 3 feet above grade. Vertical illuminance measurements are recorded with the light meter in the vertical position and the sensor located 90 degrees from nadir at 3 feet above grade. For the Project, the vertical illuminance data is presented to identify the sum of all existing illuminance at the Monitoring Sites from the direction of the Property. The existing lights at the Property and at the surrounding streets vary in height from grade mounted flood lights to medium height light poles at approximately 25 feet above grade. This range of variation in height produces an angle of incidence to the light meter of less than 10 degrees for Monitoring Sites at 125 feet from the Property and less than 5 degrees at distances above 300 feet. Because of these conditions, the vertical illuminance measurements are used in this Study to summarize values for incident illuminance at the Monitoring Sites and is a more conservative measurement than perpendicular illuminance data.*

few lights which are limited to the remediation facilities. Adjacent commercial properties to the east of the I-405 Freeway and along Avalon Boulevard contribute to a relatively bright night environment.

Table 2: Summary of Illuminance Measurements at Monitoring Sites

Monitoring Site	Illuminance (fc)		Description
	Horizontal	Vertical	
M1	0.068	0.011	Very Low
M2	1.050	1.100	Moderate
M3	0.981	1.156	Moderate
M4	1.287	0.978	Moderate
M5	1.167	0.878	Moderate

The highest existing horizontal illuminance level was recorded at Monitoring Site at M4 with 1.287 fc, while the lowest horizontal illuminance was recorded at Monitoring Site M1 at 0.068 fc. The highest existing vertical illuminance level was recorded at Monitoring Site M3 at 1.156 fc, while the lowest vertical illuminance was recorded at Monitoring Site M1 at 0.011 fc.

Contrast/Glare: The visual evaluation of High, Medium and Low Contrast describes the perception of how bright a visible object appears to the surrounding objects within any given field of view and context. High Contrast indicates a potential glare condition for residential properties nearby. Table 3 summarizes the measured maximum luminance at each Monitoring Site along with calculated average luminance and contrast rations to describe the existing conditions. The calculated values include the contrast ratio for the maximum luminance in comparison to the surrounding illuminated surfaces within the field of view to the Property from the Monitoring Sites.

Table 3: Measured Existing Luminance, (cd/m^2)

Monitoring Site	Luminance (cd/m^2)			Contrast Ratio (Max / Average) x : 1	Contrast Ratio (Max / Background) x : 1
	Maximum	Average	Background Average		
M1	1575.00	167.64	11.27	9.4	140
M2	1858.00	217.47	12.40	8.5	150
M3	2195.00	229.21	10.79	9.6	203
M4	2975.00	315.62	20.13	9.4	148
M5	3047.00	315.60	12.11	9.7	252

The measured luminance recorded at the Monitoring Sites within the view to the Property includes prominent, high brightness light sources and illuminated surfaces, such as street lights, illuminated signs, and flood lighted buildings, as well as lower brightness surfaces such as sidewalks, parking lots, and un-illuminated walls or landscape areas. The range of recorded luminance is summarized in Table 3.

The existing Property is dark with a few illuminated areas where night work is underway. The measured luminance within the view to surrounding properties and streets has a very wide range. The lowest measured

luminance occurs at the un-illuminated sections of Del Amo where the average background luminance is 11.27 cd/m^2. The adjacent maximum luminance is 1575 cd/m^2, which results in very high contrast ratio of 140 to 1. The highest contrast conditions occur at M5, where the existing street lights are 252 to1 in comparison to the average background luminance. The background luminance is very low, which results in very high contrast where street lights or illuminated signs are visible against this dark background.

a. Monitoring Site M1: Del Amo Boulevard @ Stamps Drive:

M1 is immediately opposite from the intersection of Del Amo Boulevard and "B" Street, on the north side of the Del Amo Boulevard right of way. The distance to the Property is approximately 87 ft., and the distance to the Project north exterior façade is approximately 645 ft.

Figure 6: M1 Day View to Property August 17, 2017 10:10 AM

Figure 7: M1 Day View from the Property August 17, 2017 10:10 AM

At night the area surrounding M1 is dark, with no direct illumination within the Property and on the adjacent Del Amo Boulevard. There are no existing street lights along Del Amo Boulevard from the I-405 Freeway overcrossing to the intersection of Main Street and Del Amo Boulevard to the south. Commercial properties to the east and south east of the Property are visible in the distance at night. Skyglow brightness from the exterior parking areas to the east of the Property is visible.

Figure 8: M1 Night View to the Property August 29, 2017 10:15 pm

b. Monitoring Site M2: #45 Avalon Mobile Home Estates:

Monitoring Site M2 is located adjacent to unit #45 within the Imperial Avalon Mobile Home Estates, south of the Property south property line, near the Street "A" bridge over the Drainage Channel, at the south side of the private street, to evaluate the Project south elevation and south facing signs. The distance to the Property is approximately 130 ft., and the distance to the Project south exterior façade is approximately 615 ft. The Property

Figure 9: M2 Day View to Property August 17 2017 9:30 AM

is visible from the private street and from within the residences. The Drainage Channel to the south of the Property is adjacent to the back yard of the residence.

The residence at #45 Avalon Mobile Home Estates includes existing low level, street and pathway lighting adjacent to the residence. The residence includes front porch lights and limited outdoor lighting. There is no visible existing lighting within the Property. Freeway lights and exterior lighting for the commercial properties to the east of the Property are visible in the distance and create skyglow brightness.

c. Monitoring Site M3: 451 Javelin Road:

Monitoring Site M3 is located adjacent to 451 Javelin Street, near the Grace Avenue cul-de-sac at the south side of the Drainage Channel, to evaluate the Project south elevation and south facing signs. The distance to the Property is approximately 132 ft., and the distance to the Project south exterior façade is approximately 280 ft.

There is no visible existing lighting within the Property. Freeway lights and exterior lighting for the commercial properties to the east of the Property are visible in the distance and create skyglow brightness. Street lights are the dominant light source near M3. The residences include front porch lighting and limited outdoor lighting.

Figure 10: M3 Day View to Property August 17, 2017 9:40 AM

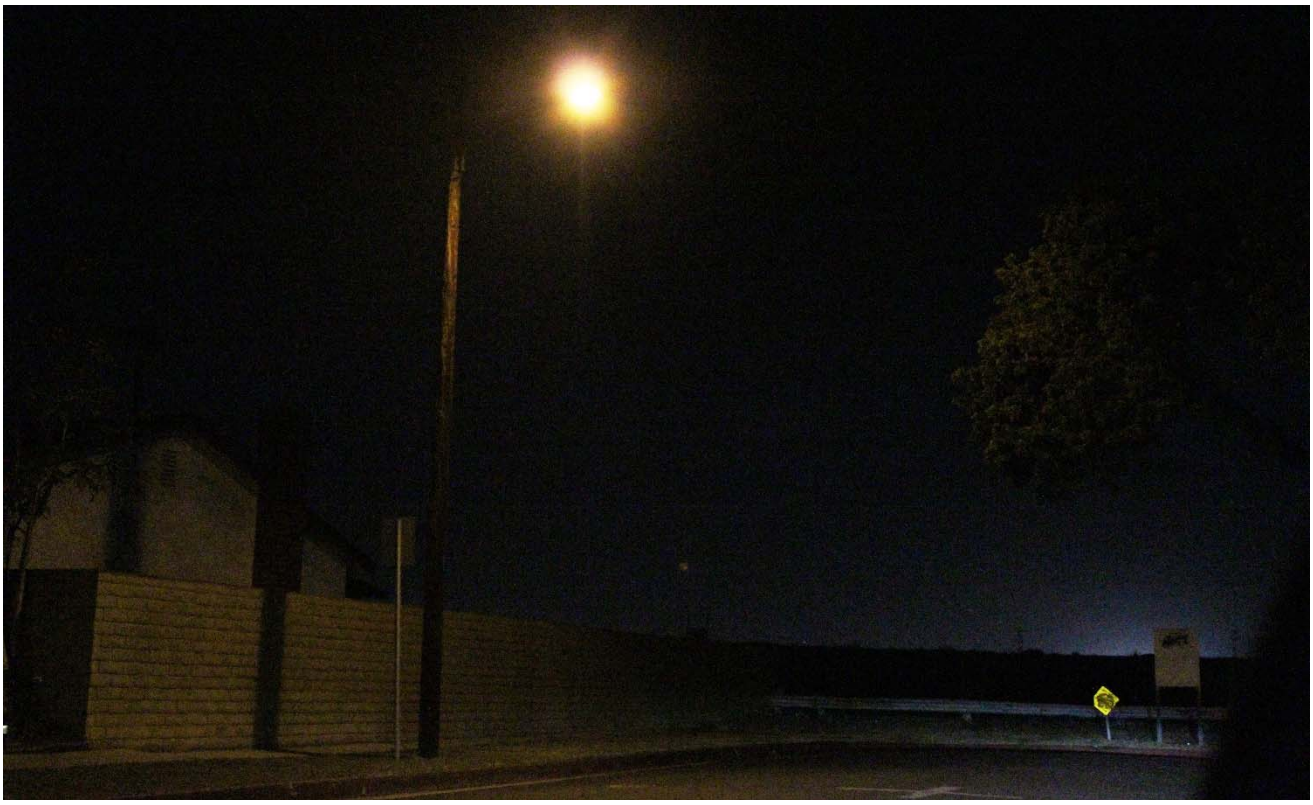


Figure 11: M3 Night View to Property August 29, 2017 9:05 PM

d. Monitoring Site M4:

Monitoring Site M4 is located adjacent to 333 East Javelin Street, near the intersection with Delores Street at the south side of the East Javelin Street right of way, to evaluate the Property south elevation and south facing signs. The distance to the Property is approximately 127 ft., and the distance to the Property south exterior façade is approximately 385 ft.

Figure 12: M4 Day View to Property August 17, 2017 9:50 AM

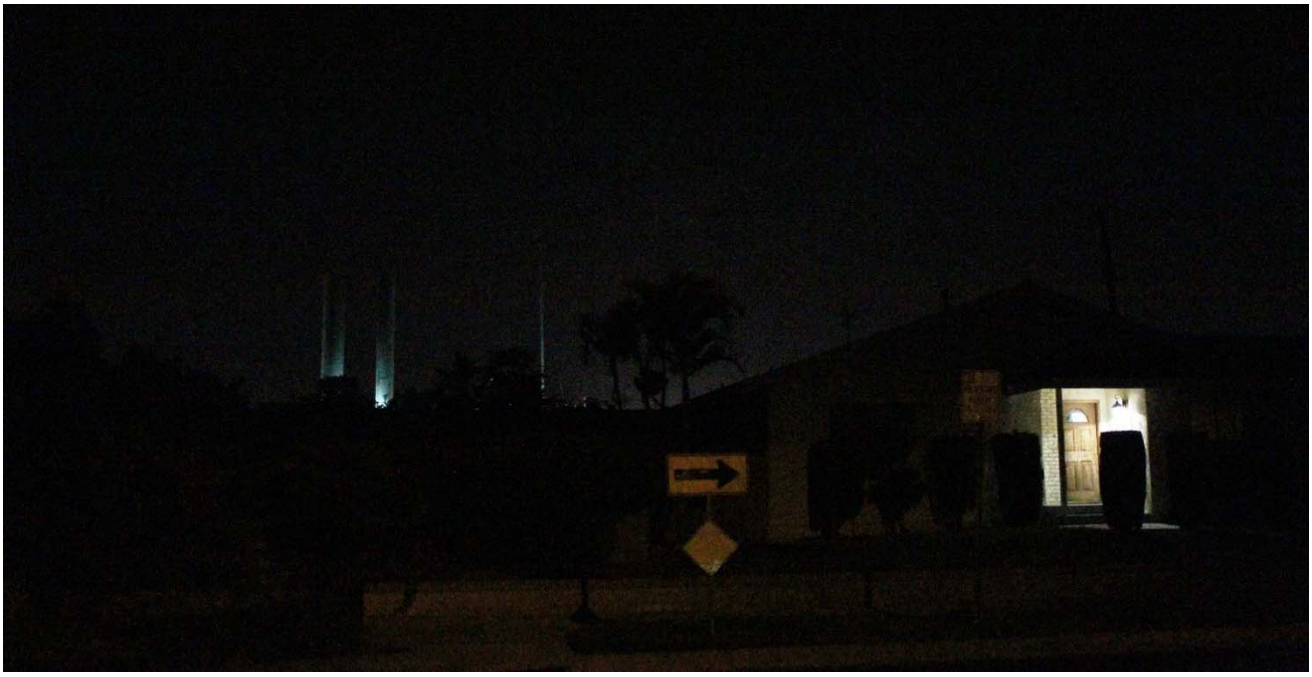


Figure 13: M4 Night View to Property August 29, 2017 9:20 PM

High pressure sodium street lights are the dominant light source near M4. The residences include front porch lighting and limited outdoor lighting.

Exterior floodlights and security lights are visible within the Property. Freeway lights and exterior lighting for the commercial properties to the east of the Property are visible in the distance and create skyglow brightness.

e. Monitoring Site M5:

Monitoring Site M5 is located adjacent to 267 East Dominguez Street, near the intersection with the Drainage Channel and the East Dominguez Street right of way, to evaluate the Project west elevation and west facing signs. The distance to the Property is approximately 105 ft., and the distance to the Property south exterior façade is approximately 315 ft.

Figure 14: M5 Day View to Property August 17, 2017 10:00 AM

Figure 15: M5 Night View to Property August 29, 2017 9:40 PM

High pressure sodium street lights are the dominant light source near M4. The residences include front porch and limited outdoor lighting.

Exterior floodlights, security lights, and interior work lights are visible within the Property. Freeway lights and exterior lighting for the commercial properties to the east of the Property are visible in the distance and create skyglow brightness.

f. Freeway Site FS1:

Freeway Site FS1 is located within the south bound lanes of the I-405 Freeway near the north Project property line below the Del Amo Boulevard overcrossing. The distance to the Property is approximately 135 ft., and the distance to the Project east exterior façade is approximately 270 ft. Distance to the Freeway Directional Sign is approximately 620 ft. The sign is illuminated at night and the measured luminance is 3.9 cd/m^2.

Figure 16: FS1 Day View to Property and Freeway Directional Sign, Google Earth

Figure 17: FS1 Night View to Property and Freeway Directional Sign, August 29, 2017 9:00 PM

g. Freeway Site FS2:

Freeway Site FS2 is located within the south bound lanes of the I-405 Freeway near the midpoint of the north Project property line. The distance to the Property is approximately 80 ft., and the distance to the Project east exterior façade is approximately 125 ft. Distance to the Freeway Directional Sign is approximately 1,000 ft. The sign is illuminated at night and the measured luminance is 3.7 cd/m^2.

Figure 18: FS2 Day View to Property and Freeway Directional Sign, Google Earth

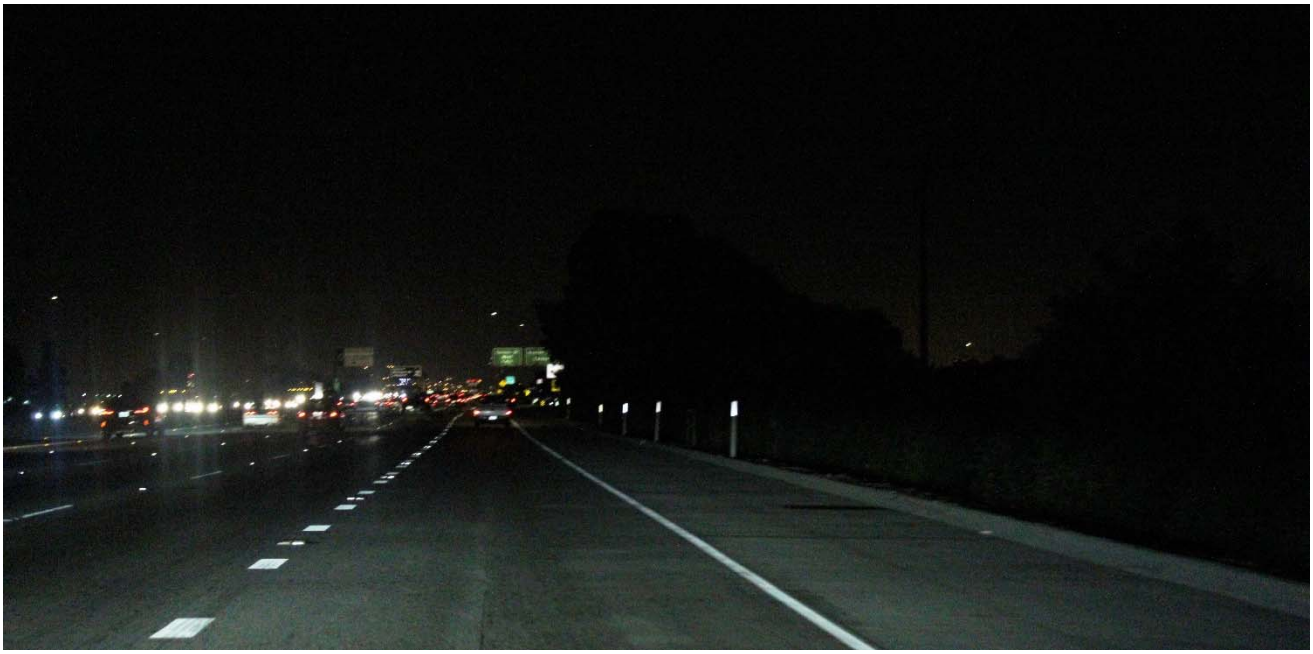


Figure 19: FS2 Night View to Property and Freeway Directional Sign August 29, 2017 9:00 PM

h. Freeway Site FN1:

Freeway Site FN1 is located in the north bound lanes of the I-405 Freeway, south of the Project property line near the Avalon Boulevard overcrossing. The distance to the Property is approximately 1100 ft., and the distance to the Project east exterior façade is approximately 1670 ft. Distance to the Freeway Directional Sign is approximately 690 ft. The sign is not illuminated at night.

Figure 20: FN1 Day View to the Property and Freeway Directional Signs, Google Earth

i. Freeway Site FN2:

Freeway Site FN2 is located in the north bound lanes of the I-405 Freeway north of the Avalon Boulevard overcrossing and north of the Project south property line. The distance to the Property is approximately 785 ft., and the distance to the Project east exterior façade is approximately 1360 ft. Distance to the Freeway Directional Sign is approximately 320 ft. The sign is not illuminated at night.

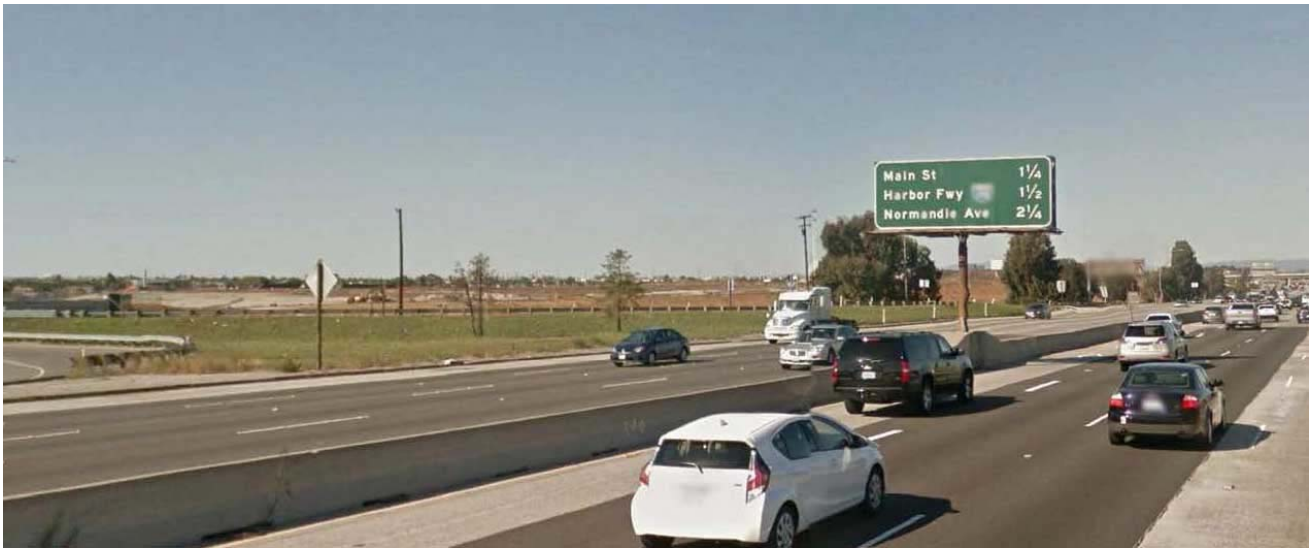


Figure 21: FN2 Day View to the Property and Freeway Directional Sign, Google Earth

8. The Project Analysis

The Project includes sign and building lighting improvements as described in Appendix B and C. The Project will add new lighted signs, lighting for buildings and landscape lighting to allow the proposed commercial, hotel and residential use of the Property.

Future proposed Project may cause Light Trespass or Glare with respect to the following variables:

- The light source (LED or other technology) projects light toward an adjacent property, and is close enough (immediately adjacent to or less than 500 feet away) to create substantial illuminance at a residential property line.
- The light source surface area is large enough to create substantial illuminance at an adjacent residential property line.
- The light source surface is bright enough to create Glare, or high contrast conditions, when the light fixture surface luminance is compared to the surrounding surface luminance.

The following criteria are used to evaluate the Light Trespass and Glare impacts of the Project:

- Light Trespass illuminance must be less than the LZ3 value of 0.74 fc at adjacent residential zoned property lines.
- Light fixture luminance visible from residential properties must be less than 300 candelas/m^2 to reduce Glare to below high contrast conditions.

8.1 Project Sign Light Trespass Illuminance Analysis

The Project Sign Light Trespass analysis evaluates the illuminance (fc) at the property line with respect to light leaving the Property toward adjacent properties from the Project Signs at the four vertical plane locations identified in Figure 3 (VP-1 through VP-4). The Project Signs include building mounted and freestanding signs as defined in the SPA and as illustrated in the Project Concept Sign Plan in Appendix B. As summarized in Table 4, the Project Sign illuminance light trespass at the Project property line is less than 0.74 fc at VP1 and VP4, where residential properties area adjacent to the Project. Vertical Plane VP2 is above the threshold. However, VP2 is adjacent to the Freeway, which is not a residential use. Vertical Plane VP3 is above the threshold. However, VP3 is adjacent to the Avalon Boulevard off ramp, which is not a residential use property. Complete calculated data is presented in Appendix I.

Table 4: Sign Illuminance (fc) – Calculated at vertical planes where lighting is under review

Vertical Plane	Description	Illuminance			Analysis
		Vertical fc			
		Max	Min	Average	
VP1	North of the Property at the centerline of Del Amo Boulevard	0.70	0.00	0.25	Below Threshold
VP2	Northeast Project Property Line I-405 Freeway	99.00	0.00	2.49	Above Threshold
VP3	East Project Property Line Avalon Blvd Ramp	6.10	0.20	0.90	Above Threshold
VP4	South Project Property Line	0.40	0.00	0.13	Below Threshold

8.2 Project Sign Glare Analysis

Glare from Sign lighting occurs when the light source is visible against a dark background, such as a dark sky. The maximum source brightness is determined by the rated source luminance. For this Study, the maximum night time luminance is analyzed at 1000 cd/m^2. The maximum luminance permitted by the SPA is 500 cd/m^2, therefore, this Study presents a conservative analysis. The existing average luminance is summarized in Table 3 in Section 7 above. Table 5 summarizes the contrast ratio for the maximum night sign luminance versus the average existing measured luminance. The results of this comparison indicate the Project signs would create a source of high contrast and glare at luminance of 1,000 cd/m^2 when viewed from the Monitoring Sites, M1 through M5.

Table 5: Contrast Ratio comparison of existing measured luminance to Project Signs @ 1,000 cd/m^2

Monitoring Site	Existing Measured Luminance (cd/m^2)			Project Luminance			Contrast Ratio Analysis
	Max	Average	Background Average	Max (cd/m^2)	Contrast Ratio		
					Max to Average	Max to Background	
M1	1575.00	167.64	11.27	1,000	6.0	88.7	High
M2	1858.00	217.47	12.40	1,000	4.6	80.6	High
M3	2195.00	229.21	10.79	1,000	4.4	92.7	High
M4	2975.00	315.62	20.13	1,000	3.2	49.7	High
M5	3047.00	315.60	12.11	1,000	3.2	82.6	High

Table 6 summarizes the contrast ratio for the maximum night sign luminance at 300 cd/m^2 versus the average existing measured luminance. The results of this comparison indicate the Project Signs would create a source of medium contrast and glare at luminance of 300 cd/m^2 when viewed from the Monitoring Site, M1 through M5.

Table 6: Contrast Ratio, comparison of existing measured luminance to Project Signs @ 300 cd/m^2

Monitoring Site	Existing Measured Luminance (cd/m^2)			Project Luminance (cd/m^2)			Contrast Ratio Analysis
	Max	Average	Background Average	Max (cd/m^2)	Contrast Ratio		
					Max: Average	Max: Background	
M1	1575.00	167.64	11.27	300	1.8	26.6	Medium
M2	1858.00	217.47	12.40	300	1.4	24.2	Medium
M3	2195.00	229.21	10.79	300	1.3	27.8	Medium
M4	2975.00	315.62	20.13	300	1.0	14.9	Medium
M5	3047.00	315.60	12.11	300	1.0	24.8	Medium

8.3 Sign Luminance Mitigation Measures

Mitigation measures which will reduce any high contrast, glare condition from the Project Signs to a medium contrast, non-glare condition may include the following:

- Mitigation Measure B-2: The distribution, placement, and orientation of signs along the I-405 Freeway shall be in substantial compliance with the signage concepts and in compliance with the sign standards in the SPA.
- Mitigation Measure B-3: If any portion of the illuminated surface of the sign is visible from a residential use within 1,000 feet of said sign at night, then the proposed modified Project Sign luminance shall be reduced to less than 300 cd/m^2 at night.
- Mitigation Measure B-5: If any portion of the illuminated surface of the sign is visible from a residential use within 1,000 feet of said sign, sign area and/or sign luminance shall be limited so that the light trespass illuminance is less than 0.74 fc at residential property line.

8.4 Project Sign Glare Analysis for Roadways

The lighting impact to driver's visibility from the Project Signs is evaluated by way of the methodology defined above at the locations where lighting is under review. As summarized below, the results of this evaluation demonstrate the light impacts resulting from the Project Signs at the locations where light is under review are below the significance threshold for excessive luminance, or glare, during night, twilight (sunrise/sunset), and day. The Project meets the California Vehicle Code standard for roadways approaching the Project from all directions.

The glare analysis of the Project Signs during night assumes the simultaneous use of all Project illuminated signs on full white at the maximum luminance allowed by the SPA, and compares the resulting luminance to the most stringent requirements of the California Vehicle Code to determine if the Project Signs introduce a source of distracting glare to drivers. The most stringent condition identified within the California Vehicle Code Section 21466.5, states: "except that when the minimum measured brightness in the field of view is 10 footlamberts or

less, the measured brightness of the light source in footlamberts (fL) shall not exceed 500 plus 100 times the angle, in roadway degrees, between the driver's field of view and the light source." Thus, a conservative evaluation, occurs where the Project Signs are visible within the centerline of the driver's field of view, the angle noted above within the field of view is 0, the surrounding surface luminance is less than 10 fL, and therefore the maximum allowable luminance is 500 fL. Therefore, the most conservative condition at night evaluates Project Signs against a threshold for luminance of a maximum 500 fL.

A measured brightness within the driver's field of view of less than 10 fL may occur at night. As per the SPA the maximum luminance of Project illuminated signs is 500 candelas/m^2. Calculating the equivalent Project sign luminance by converting to english units from metric units: 500 candelas/m^2 equals 159 fL. The Project signs will not exceed 159 fL, which is 68% less than the 500 fL maximum, the most conservative limit stipulated by the California Vehicle Code for conditions where the minimum brightness in the driver's field of view is less than 10 fL.

For signs located beyond the driver's 10 degree field of view the maximum luminance is permitted to increase under the California Vehicle Code. For example, signs located 15 degrees from the centerline of the driver's field of view would be limited to a maximum of 1,000 fL (500 fL plus 100 times the angle (5 degrees) = 1,000 fL). All Project illuminated signs will operate at maximum of 159 fL at night, or less than approximately 16% of the maximum allowed by the California Vehicle code for those locations at 15 degrees from the center of the driver's field of view. Therefore, at night the Project illuminated signs will not exceed the 500 fL threshold and will not introduce a new source of glare as defined by the California Vehicle Code Section 21466.5.

The Project illuminated signs are also evaluated during twilight (the transition period from day to night, from 45 minutes before sunset to 20 minutes before sunset, and from 20 minutes after sunrise to 45 minutes thereafter). Sunlight increases gradually from the minimum brightness at sunrise to maximum brightness at mid-day, and then decreases gradually to the minimum brightness at sunset. Therefore, the minimum ambient luminance occurs at sunset or sunrise. However, in order to analyze the, most conservative, low level sunlight conditions, this Study adjusts the time frame for the minimum ambient luminance condition of 10 fL to 20 minutes prior to sunset and 20 minutes after sunrise, extending the duration of night. At 20 minutes prior to sunset the ambient sunlight will be greater than the minimum values at sunset, and at 20 minutes after sunrise the luminance will be greater than the minimum at sunrise. At 20 minutes prior to sunset, the minimum luminance values within the driver's field of view will be above the minimum night time values (10fL) due to the light from the setting or rising sun. However, to maintain a conservative analysis, this evaluation assumes the minimum luminance within the driver's field of view will be less than 10 fL from 20 minutes prior to sunset until 20 minutes after sunrise. Therefore, the maximum luminance threshold during this time will remain at 500 fL as noted above in the evaluation of the night threshold. At 45 minutes prior to sunset the Project Signs are specified to begin transition from the maximum daytime luminance of 10,000 cd/m^2 to the maximum nighttime luminance of 500 candelas/m^2. This transition must be completed no later than 20 minutes prior to sunset as per the SPA. Similarly, the Project Signs are specified to transition from the night maximum luminance of 500 cd/m^2 to the day maximum luminance of 10,000 cd/m^2, beginning no earlier than 20 minutes after sunrise. Therefore, the Project Signs will not exceed 500 cd/m^2 for the period beginning 20 minutes prior to sunset until 20 minutes after sunrise. The SPA requires that the Project illuminated signs remain limited to the 500 cd/m^2 (159 fL) maximum luminance value, from 20 minutes before sunset to 20 minutes after sunrise. Therefore, at 20 minutes before and including sunset and at sunrise and 20 minutes after, the Project illuminated signs will not exceed the threshold of 500 fL, and will therefore not introduce a new source of glare.

The evaluation of the Project illuminated signs during the day (20 minutes after sunrise until 20 minutes before sunset) compares the daytime, ambient brightness to the maximum sign brightness stipulated by the California Vehicle Code during full sun conditions and overcast sky conditions. The California Vehicle Code, Section 21466.5 above permits the Project signs to "generate light intensity levels greater than 1,000 times the minimum measured brightness in the driver's field of view, except when the minimum values are less than 10 (fL)."

During the day (20 minutes after sunrise until 20 minutes before sunset) sunlight with clear sky conditions or light overcast conditions provides sufficient illuminance to generate surface brightness greater than 10 fL and up to 1200 fL on the least reflective surfaces, such as roadway pavement. Utilizing the value of 10fL as the minimum within the driver's field of view, the maximum allowable brightness would be 1,000 times 10 fL, or 10,000 fL. The SPA requires that the Project illuminated signs not exceed 10,000 cd/m^2 (3,180 fL) during the daytime hours of operation, and Project signs will therefore operate at less than 32% of the maximum luminance stipulated by

the California Vehicle Code. Therefore, the Project illuminated signs will not create a new source of glare during day time hours of operation with clear sky or light overcast conditions.

Severe storms, heavy cloud cover, or other atmospheric conditions may occur during the day, which may cause the minimum brightness within the driver's field of view to be less than 10 fL The SPA requires that the Project illuminated signs include an electronic control system to reduce the sign luminance from 10,000 cd/m^2 (3180 fL) to 500 candelas/m^2 (159 fL) maximum when the ambient sun light falls to illuminance values similar to night, less than 100 fc. During the day, when storms, cloud cover, or other low ambient sunlight conditions occur and when the ambient sunlight is less than 100 fc, the Project illuminated signs will transition from the daytime 10,000 cd/m^2 (3180 fL) to 500 candelas/m^2 (159 fL) maximum, and thereby ensure that the sign brightness remains less than the maximum brightness stipulated by the California Vehicle Code. Therefore, the Project illuminated signs will not create a new source of glare during day time periods with storm or severe overcast weather conditions.

The Project illuminated signs are designed to not exceed 500 candelas/m^2 (159 fL) luminance at night or during overcast sky conditions, and will not exceed 10,000 cd/m^2 (3180 fL) during the day. These values are less than the California Vehicle Code standard, including 32% of the maximum allowable luminance identified as the threshold for glare during the day, therefore the Project illuminated signs will not create a new source of glare.

8.5 Project Building Light Trespass Illuminance Analysis

The Light Trespass analysis evaluates the illuminance (fc) at the property line with respect to light leaving the Property toward adjacent properties. The Project Lighting includes building lighting adjacent to the property line and site lighting at roadways and within the surface parking lots near the Project property line.

The light trespass from the Project Building Lighting is evaluated by way of the calculated illuminance (fc) according to the methodology defined above at the locations where lighting is under review. As summarized in Table 7, the results of this calculation demonstrate the light trespass impacts resulting from the proposed Project Lighting at the position where light is under review are below the significance threshold of 0.74 foot-candles.

Table 7: Building Lighting Illuminance (fc) – Calculated at vertical planes where lighting is under review

Vertical Plane	Description	Illuminance Vertical fc			Analysis
		Max	Min	Average	
VP1	North of the Property at the centerline of W Del Amo Boulevard	0.50	0.00	0.22	Below threshold
VP2	Northeast Property Line I-405 Freeway	0.60	0.10	0.20	Below threshold
VP3	East Property Line Avalon Blvd Ramp	0.60	0.10	0.22	Below threshold
VP4	South Property Line	0.70	0.00	0.19	Below threshold

Illuminance light trespass is calculated through the illumination calculation software program AGI. This software utilizes the 3-dimensional architectural computer model of the Project, including site and building dimensions, exterior materials, in conjunction with the Project Lighting specifications as defined in Appendix E to generate an accurate prediction of future illuminance at a specific location. Project light trespass is evaluated with respect to horizontal and vertical illuminance calculated at the review locations within a series of vertical planes, with calculated illuminance data generated at 10 feet on center. The calculated data points are offset from the perimeter of the vertical plane by 5 feet, so that the lowest data points are 5 feet above grade, and then 10 feet on center thereafter. Complete calculated data is presented in Appendix J.

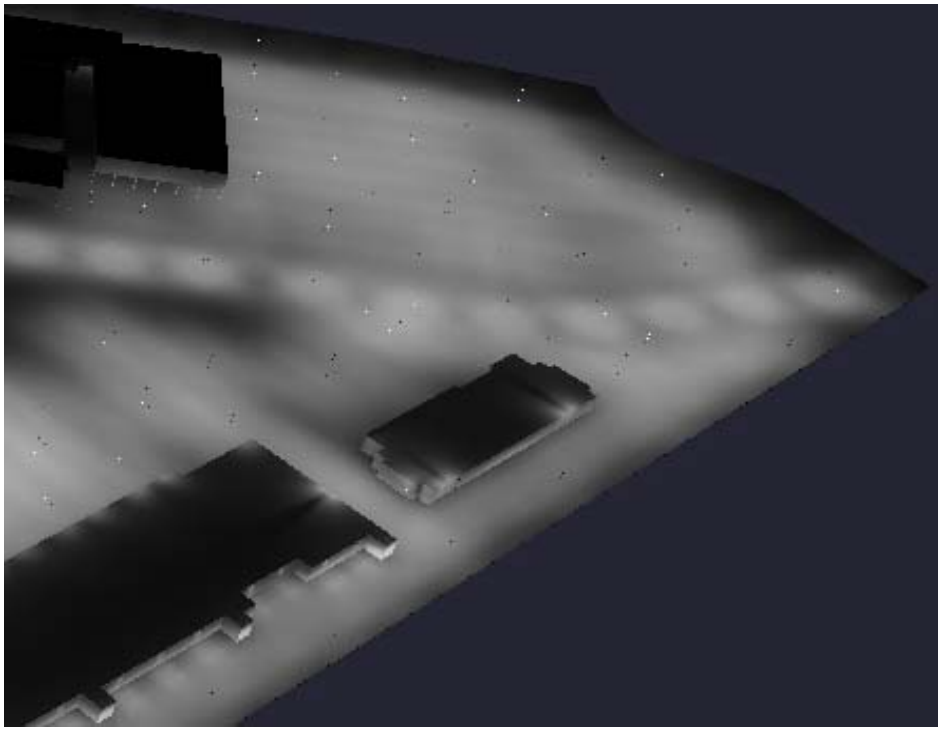


Figure 22: Building Lighting Illuminance Calculation Rendered View

8.6 Project Building Lighting Glare Analysis

Glare from retail and entertainment lighting occurs when the light source is visible against a dark background sky. The maximum source brightness is determined by the rated source luminance which is measured for each light fixture at 10 degree increments perpendicular and parallel to the source aiming direction. The maximum source brightness corresponds with the productive light generation zone of the lighting product, which is designed to deliver maximum light to the task surface and minimize stray light, which is unproductive and may be visible beyond the Property.

The SPA limits light fixture pole heights to 40 feet maximum. The Project Lighting must also comply with the requirements of CALGreen Table 5.106.8 for LZ3:

- Light Fixtures located more than 2 mounting heights from the property line (80 feet for this Project): G3 to minimize glare.
- Light Fixtures located 1 to 2 mounting heights from the property line (40 to 80 feet for this Project): G1 and B4 to minimize glare.
- Light Fixtures located 0.5 to 1 mounting heights from the property line (20 to 40 feet for this Project): G1 and B3 to minimize glare.
- Light Fixtures located less than 0.5 mounting heights from the property line (less than 20 feet for this Project): G0 and B1 to minimize glare.

The Project lighting plan indicates all light fixtures are set back more than 20 feet from the Project property line, therefore the most conservative condition for light fixture glare is G1 and B3. G1 limits Forward Very High angle or Backward Very High Angle light output to 150 lumens. B3 limits Forward Very High angle or Backward Very High Angle light output to 0 lumens. Therefore, the most conservative configuration of 150 lumens within the Forward to Backward Very Hight angle of 10 degrees results in 2.9 candelas within a 10-degree region, and approximately 11.6 cd/m^2 with a source surface of 0.25 m^2. The luminance is 1.2 times the lowest average

background luminance measured at the Monitoring Sites listed in Table 3 above, and well below the 30 to 1 maximum contrast ratio for a new source of glare. Therefore, the Project Lighting will not create a new source of glare at adjacent residential use properties.

9. Conclusions

The SPA provides adequate illumination for the Project while minimizing light trespass and glare to neighboring residential properties through the following steps:

- Sign Lighting luminance is limited to 500 cd/m^2 and includes Mitigation Measures to limit visible Sign Lighting at sensitive residential properties.
- Employs state of the art, shielded, and focused lighting technology compliant with CALGreen.
- Directs light down to the Property with maximum 40 ft. tall light poles
- Moves the light poles away from adjacent residential properties.
- Light trespass illuminance is less than 0.74 fc
- Mitigation measures which will reduce any high contrast, glare condition from the Project Signs to a medium contrast, non-glare condition may include the following:
    - Mitigation Measure B-2: The distribution, placement, and orientation of signs along the I-405 Freeway shall be in substantial compliance with the signage concepts and in compliance with the sign standards in the SPA.
    - Mitigation Measure B-3: If any portion of the illuminated surface of the sign is visible from a residential use within 1,000 feet of said sign at night, then the proposed modified Project sign luminance shall be reduced to less than 300 cd/m^2 at night.
    - Mitigation Measure B-5: If any portion of the illuminated surface of the sign is visible from a residential use within 1000 ft. of said sign, sign area and/or sign luminance shall be limited so that the light trespass illuminance is less than 0.74 fc at residential property line.

The analysis summarized within this Study confirms the Light Trespass and Glare from the Project Sign Lighting and Building Lighting will not create a new source of light trespass and glare at adjacent residential properties.

While the details of the Sign Lighting within Planning Area 1 and 3 are not known today, this analysis accurately evaluates the potential for Project Sign Lighting to create a new source of light trespass and or glare at adjacent residential properties. The sign types, dimensions, and maximum luminance are defined by the SPA. The Project Sign locations within Planning Area 2 are identified in detail within the Sign Concept Plan (included herein as Appendix B), and are evaluated with all signs operating simultaneously at maximum luminance of 1,000 cd/m^2, all white.

The Project Signs will not operate in this manner in practice, and the SPA limits maximum night time luminance to 500 cd/m^2. As such, this analysis represents a conservative evaluation of the proposed Project's Signs potential for off-site light trespass, and glare. Therefore, the results of this analysis may be applied to the future conditions within PA 1 and PA 3.

The conclusions of the analysis indicate Project Signs must include mitigation measures to reduce visibility from the adjacent sensitive uses or reduce luminance to below a 30:1 contrast ratio. All Signs which exceed the luminance limits defined by the SPA require separate analysis.

Although the Project Building lighting elements within Planning Area 1 and 3 are not know today, all projects within California must comply with the requirements of the provisions of the 2016 California Energy Code - California Code of Regulations, Title 24, Part 6 and Part 11 (CEC), listed above. Therefore, the analysis presented for Planning Areas 2 is consistent with the analysis of any future lighting proposed for Planning Area 1 and 3, and the conclusions stated within this Study apply for all Building and Site Lighting within the Project.

APPENDIX A: Project Specific Plan Amendment, Sections 6.6 Signage and 6.7 Lighting

6.6 Signage

Because of their high visibility, signs are prominent elements of the physical environment of Specific Plan Area. Signs announce the presence of The District at South Bay, welcome visitors and residents, and help users navigate the Project Site. The sign development standards set forth below are intended to maximize the identification of The District at South Bay as a distinct location in a manner that complements the overall image of the City of Carson. All signs proposed for the Project Site will be governed by a comprehensive sign program for each proposed development that will provide internal consistency in design style and direction for placement and size of signs, including a standardized way-finding program. The comprehensive sign program shall also include provisions that ensure that lighting from signs shall not significantly intrude upon or impact adjacent residential uses. The comprehensive sign program may be submitted and approved as part of any Site Plan and Design Review application pursuant to Section 8.1.8 or if submitted under separate cover, shall be reviewed and approved pursuant to the applicable procedures and findings for Site Plan and Design Review set forth in Section 8.1.8 of this Specific Plan.

General sign standards are provided in Table 6.6, while a conceptual map of sign locations is shown in Figure 6.6a. Final sign designs, including designs for any digital signage, may vary and will be provided as part of a comprehensive sign program that shall be reviewed and approved by the Planning Manager.

Table 6.6
Sign Standards

SIGN TYPE[1]	MAXIMUM NUMBER	MAXIMUM SIGN DIMENSIONS		NOTES	MAX. NIGHTTIME LUMINANCE[2]	
		Height	Width		Digital	Static
Freeway Icon Pylon:[3,4] Double Faced LED Digital Display	1 – PA2 Developer	88 feet	65 feet	The supporting pylon width will be 10 to 25 feet. The 20 foot high and 60 foot long LED digital display board with Changeable Message Display, Color Changing Illumination and Electronic Message Display will be attached to sign panels or a sign frame that will be a maximum of 25 feet high and 62 feet wide. The top of the reader board will be located no higher than 88 feet above measured I-405 Freeway elevation. Height is measured from the elevation of I-405 Freeway immediately adjacent to the sign location. Off-site advertising may be permitted on this sign, subject to City approval and the obtaining of appropriate permits.	500 cd/m²	-
Freeway Icon Pylon:[3,4] Digital Display allowed	1 – City of Carson	70 feet	48 feet	The base width will be 10 feet to 25 feet. If the base is greater than 15 feet, the sign will taper up to 15 feet at top. The sign face will be 14 feet by 48 feet LED digital or static billboard display attached to the pylon. Height is measured from the elevation of the I-405 Freeway immediately adjacent to the sign location. This sign would allow off-site advertising if appropriate permits are obtained.	500 cd/m²	500 cd/m²

Table 6.6
Sign Standards

SIGN TYPE	MAXIMUM NUMBER	MAXIMUM SIGN DIMENSIONS		NOTES	MAX. NIGHTTIME LUMINANCE[2]	
		Height	Width		Digital	Static
Freeway Icon Pylon[3,4]	2 – PA3 Developer	70 feet	25 feet	The base width will be 10-25 feet. If the base is greater than 15 feet, the sign will taper up to 15 feet at top. Up to 6 tenant signs on 2 sides. Tenant signs may be 6 feet by 20 feet each. PA 3 Center ID may be placed on pylon. Height is measured from the elevation of I-405 Freeway immediately adjacent to the sign location.	-	500 cd/m^2
Vertical Project Name ID	6- PA2 Developer	38 feet	15 feet	Sign consists of three components: 7 foot by 15 foot base, 4 foot by 5 foot by 38 foot high project tower, 2 foot by 8 foot by 18 foot high tenant sign panel with up to 6 tenant signs of that size on each side. Height is measured from the finished pad. Signage could alternatively, at developer's discretion, meet standards for Vertical Project Name ID established for PA3.	-	500 cd/m^2
Vertical Project Name ID	4 – PA3 Developer	38 feet	15 feet	**While the overall height is 38 feet with tower element, the sign consists of 14 foot high by 8 foot wide base element with tenant signage up to 6 feet high by 8 feet wide. Height is measured from the finished pad.** Signage could alternatively, at developer's discretion, meet standards for Vertical Project Name ID established for PA2.	-	500 cd/m^2
Main Street Entry Monument with Tower Element	1 – PA2 Developer 1- PA3 Developer	38 feet	15 feet	While the overall height is 38 feet with tower element, the sign consists of 14 foot high by 8-foot-wide base element with tenant signage up to 6 feet high by 8 feet wide. Height is measured from the finished pad.	-	500 cd/m^2
Parking Garage Signage and Commercial – Elevated Podium Wall Signage	Multiple – PA2 Developer	30 feet	300 feet	The multiple letter and graphic signs for tenant names, and static billboard display shall be allowed on parking garage and commercial elevated - podium wall area facing Freeway, Street A, and site parking fields with 60 percent maximum wall coverage.	-	500 cd/m^2
Wall Mounted Project ID Exterior[5]	2 – PA2 Developer 2 – PA2 Developer	12 feet 8 feet	330 feet 230 feet	Individual illuminated sign letters located on building wall.	-	500 cd/m^2
Plaza Project ID Exterior (Entry SW and NW corners)	2 – PA2 Developer	10 feet	12 or 24 feet	Individual illuminated sign letters. 2 to 4 letters each location at grade level exterior plaza.	-	500 cd/m^2
Wall Billboard Exterior	4 – PA2 Developer	20 feet	60 feet	Static billboards with external front illumination. Billboards allowed to extend above top of building wall. Billboards allowed to convert to digital LED display board in the future.	500 cd/m^2	500 cd/m^2
Wall Billboard Exterior	2 – PA2 Developer	14 feet	48 feet	Static billboards with external front illumination. Billboards allowed to extend above top of building wall.	-	500 cd/m^2

Table 6.6
Sign Standards

SIGN TYPE	MAXIMUM NUMBER	MAXIMUM SIGN DIMENSIONS		NOTES	MAX. NIGHTTIME LUMINANCE[2]	
		Height	Width		Digital	Static
Roof Billboard Interior	8 – PA2 Developer	10 feet	34 feet	Static billboards with external front illumination. Billboards located on roof above top of building wall.	-	500 cd/m^2
Wall Billboard Interior	1 – PA2 Developer	14 feet	48 feet	Static billboard with external front illumination. Billboard allowed to convert to digital LED display board in the future	500 cd/m^2	500 cd/m^2
Integrated Identity Architectural Wall Graphic[6]	6 – PA2 Developer	(2) 27 feet (1) 24 feet (1) 24 feet (1) 24 feet (1)24 feet	330 feet 265 feet 235 feet 220 feet 105 feet	Painted Project ID Name integrated into architectural wall vertical fin design	-	-

1 All free-standing signs may be double-sided

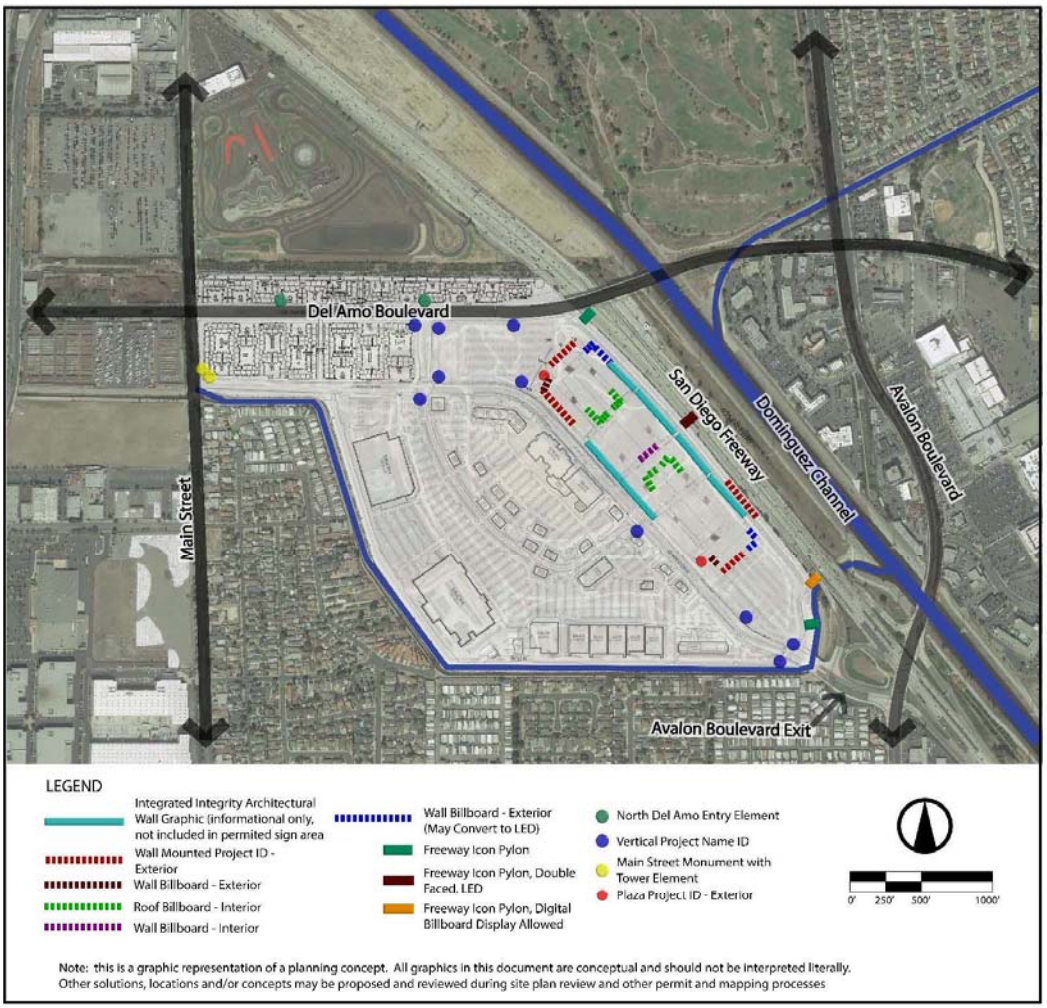
2 If any portion of the illuminated surface of the sign is visible from a residential use within 1,000 feet of said sign at night, then the proposed modified Project sign luminance shall be reduced to less than 300 cd/m2 at night.

3 Signage adjacent to the freeway will comply with applicable Caltrans standards and requirements.

4 A view analysis shall be conducted prior to finalizing the locations of freestanding freeway oriented signs to ensure that the visibility of any sign is not compromised by the placement of freestanding freeway signs

5 Wall mounted project ID exterior signs may project above top of building wall.

6 Integrated Identity Graphics/Murals are not considered signage; they are considered as architectural features, which are excluded from permitted signage area.



Source: RE|Solutions LLC, 2017

Figure 6.6a Conceptual Sign Locations

6.7 Lighting

The District at South Bay lighting standards establish a design framework to guide all future lighting improvements and meet specific lighting standards for each particular application and type of use anticipated within the proposed development options. These standards define the scale, brightness, direction, and shielding for all lighting installations within the Project Site and are intended to restrict light intensity, minimize off- site impacts, proscribe light control methods, and limit light pole heights. Design of lighting is focused on providing comfortable spaces for people to walk and ensuring the safety of residents, visitors, shoppers and employees. A Lighting Guideline Palette, consisting of various lighting styles, is included in Appendix B.

The lighting standards and the resulting lighting improvements establish the basis for evaluation of the proposed lighting impact of this development on the surrounding community. The information presented within the lighting standards establish criteria based upon standard practices established by the Illuminating Engineering Society of North America (IESNA) for measurement and design of light sources, illuminated surfaces, and lighting systems.

Generally, all light sources will be shielded to prevent direct view of high brightness light sources from adjacent properties. The lighting standards provide for specific control of the direction of light so as to limit glare and any off-site view of glare. This control limits the light distribution angle so that light is primarily directed down to the ground or up to a vertical surface. Special Event Lighting, Entertainment Lighting, and Construction Lighting are exempt from these angular criteria if the light is focused to restrict any direct illumination of adjacent residential properties.

To provide for safe illumination for vehicles and pedestrians within Project Site, pole- mounted lights will be required for roads and sidewalks. To prevent direct view of these pole-mounted light sources off-site and to reduce the overall brightness of the Specific Plan area, the standards establish maximum heights for street and pedestrian lighting fixtures, maximum horizontal illuminance (foot-candles) at the ground plane, and average to minimum uniformity ratios for light at the ground plane. The lighting standards define special lighting criteria for parking areas to prevent direct view of lighting fixtures. The recommended criteria are summarized below as a table of measurable numerical criteria based on the various options for at-grade commercial, Commercial-Elevated Podium commercial, residential, and mixed-use development within the Project Site.

Lighting conditions and narrative prototypical solutions are presented for the following: Perimeter Roadways, Interior Roadways, Retail Exterior, Office Exterior, Residential Exterior, At-Grade Parking, Parking Structures, Parking under Raised Podium, Pedestrian Sidewalks and Walkways, and Landscape Illumination. Design performance standards are established for each of the above-mentioned project components by the following issues and their listed measurable criteria:

Light Level Requirements: Task Illuminance (foot candles)
Light Control Methods: Glare/Light Distribution (luminaire photometrics)
Visibility: Pole Height Limits (section diagram)
Design Style or Character: Luminaire and pole characteristics, pattern of light, and color of light

6.7.1 Light Level Requirements

The commercial and social use of The District at South Bay is dependent upon activities at night, which will require illumination for vehicular and pedestrian access, advertising, and on-site tasks or functions. Each of these activities has a defined light level requirement (illuminance, measured in foot-candles) as well as unique color, brightness, pattern, and architectural features. Low-pressure and high-pressure sodium lamps will not be considered for design purposes within these standards. To provide for more aesthetically pleasing environmental conditions, the use of low-pressure and high-pressure sodium lamps is not recommended due to their low correlated color temperature (CCT), particularly less than 2,100K.

Table 6.7-1 summarized light intensity levels (illuminance, foot-candles) recommended by the IESNA for safe operation of vehicles and pedestrian security. Future lighting improvements should meet or exceed these minimum standards to provide adequate light for the Project Site for public access. These standards are the recommended average maintained horizontal illuminance values for each specified use within the Project Site. As used below, "entrances" refers to entrance areas where lighting is required for entrance identification and "egress lighting" applies to areas where lighting is required for safe path of travel.

Table 6.7
Light Intensity Minimum Requirements

SPECIFIC USE/AREA	LOCATION OF FOOT-CANDLES	FOOT-CANDLES AVERAGE	UNIFORM RATIO (MIN TO MAX fc)
PERIMETER AND INTERIOR ROADWAYS			
On-Site Circulation Roads	Pavement	1.0	5:1
Entrance Roads	Pavement	2.0	5:1
RETAIL EXTERIOR			
Entrances	Doorway	5.0	-
Facade Floodlighting	Building	3.0 to 15	-
Elevated Podium Building Façade Lighting	Building	3.0 to 15	-
Elevated Podium Building Concourse	Building	3.0 to 15	-
Elevated Podium Building Canyons[15]	Building	3.0 to 15	
OFFICE EXTERIOR			
Entrances	Doorway	3.0	-
Façade Lighting	Building	3.0	-
RESIDENTIAL ROADWAYS			
Roadway	Pavement	0.6	5:1
ON-GRADE PARKING			
Parking	Parking Surface	1.0	15:1
PARKING STRUCTURES/PARKING UNDER RAISED PODIUMS			
Parking	Parking Surface	5.0	10:1
SIDEWALKS			
Residential	Pavement	0.6	-
Commercial	Pavement	1.0	-
LANDSCAPE			
Tree Up-Lighting	Foliage	1.0	

[15] Includes color changing illumination.

A. Perimeter Roadways: The lighting for perimeter roadways shall provide adequate illumination for safe and efficient vehicular travel. Roadway lighting fixtures shall either be equipped with glare shields or be of a full cutoff type reflector system. On-site circulation roads will conform to an "Intermediate" classification characterized by medium-sized residential and business developments with frequent moderately heavy nighttime pedestrian activity. The entrance roads will be designed to conform to a "Commercial" classification characterized by dense business developments with heavy nighttime vehicular and pedestrian traffic.

B. Interior Roadways: The lighting for interior roadways shall provide adequate illumination for safe and efficient vehicular travel. Roadway lighting fixtures shall either be equipped with glare shields or be of a full cutoff type reflector system. Lighting of roadways categorized as Scenic Byways shall be of a minimal level, with fixtures being shielded to prevent glare. Circulation roads within the mixed-use/residential sites will be designed to conform to an "Intermediate" classification defined by medium-sized residential and business developments with frequent moderately heavy nighttime pedestrian activity. Entrance roads to the Project Site will be designed to conform to a "Commercial" classification defined by dense business developments with heavy nighttime vehicular and pedestrian traffic.

C. Retail Exterior: The lighting for the exterior of retail buildings and spaces shall be safe and attractive to customers. This can be achieved mainly with entrance accent lighting and façade floodlighting. "Entrances" and "Façade Lighting," as listed in Table 6.7-1, refer to entrances of dense retail developments with heavy nighttime vehicular and pedestrian traffic. Commercial-Elevated Podium uses should be illuminated with static white light from extended armatures at base of façades.

D. Office Exterior: The lighting for the exterior of office buildings and spaces shall be to a level that provides security and egress. If the office use is part of a mixed-use building, then the retail criteria can override the values shown in Table 6.7-1. "Entrances," as shown in Table 6.7-1, refer to entrances that are unoccupied at nighttime, requiring lighting for entrance identification. Egress lighting shall be provided at a level that provides security and safe egress.

E. Residential Exterior: The lighting for the exterior of residential buildings and spaces shall be to a level that provides security and safe egress. If part of a mixed-use building, then the retail criteria can override the lower values.

F. At-Grade Parking: The lighting for at-grade parking lots shall be to a level that provides safe movement of vehicles and pedestrians, and the security and safety of customers and employees, as approved by the Sheriff 's Department. Lighting fixtures for parking lots shall either be equipped with spill control and/or with full cutoff capability at light poles at property perimeter with no cut-off at parking field interior poles. Lighting fixture standard height shall not be in excess of what is necessary to meet with recommended minimum illuminance levels identified in Table 6.7-1.

G. Parking Structures/Parking Under Raised Podiums: The lighting for parking structures and parking under raised podiums shall be provided at a level that enhances pedestrian safety and visibility. These recommended values should apply to those parking structures used by apartment building and/or commercial developments.

H. Pedestrian Sidewalks and Walkways: The lighting for pedestrian sidewalks and bikeways shall be to a level that increases pathway visibility and safety of pedestrians. For the purposes of these standards and guidelines, "Intermediate" refers to medium-sized residential and business developments with frequent moderately heavy nighttime pedestrian activity, and "Commercial" refers to dense business developments with heavy nighttime vehicular and pedestrian traffic. Pedestrian scale lighting should be provided along interior streets, as deemed appropriate by the Planning Manager.

I. Landscape Illumination: In vertical landscape, i.e., palm and decorative trees with foliage, up-lighting illumination is encouraged.

6.7.2 Light Control Methods

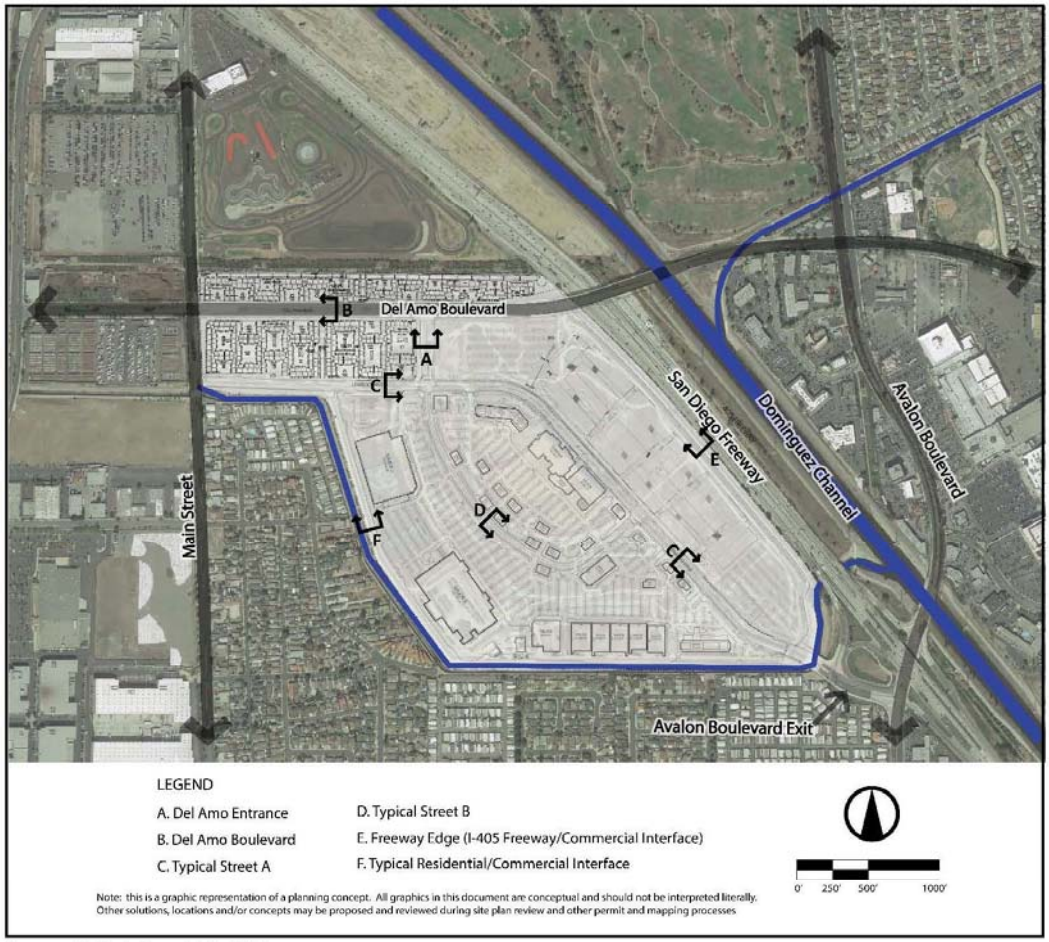
A. Glare/Light Distribution: Offensive or unattractive lighting results from excessive contrast, or glare. Glare conditions usually result from highly visible lamps (light bulbs) within landscape, streetlights, parking, security, or entertainment lighting. Proper design and selection of light fixtures, mounting heights, and placement will control the visibility and perceived brightness of light sources from outside or within the Project Site, and therefore limit the perception of glare. The lighting standards establish criteria to control the light output, mounting height, and placement of fixtures to reduce glare.

B. All Parking and Roadway light poles from 12 ft. high to 40 ft. high shall be in accordance with Section 5.106.8 of the CALGreen Code which limits light fixture brightness adjacent to the property line of the Project Site.

Pole Height Limits: Light pole height limits are established to prevent light trespass from the Project Site onto adjacent properties. These height restrictions will not eliminate complete visibility of the pole itself. Height restrictions in combination with the shielding and glare control restrictions will decrease visibility of the high brightness lamps within the pole fixtures and will prevent stray light from extending over the property line of the Project Site. Lighting shall be constructed, shielded and directed so that adjacent residences are not impacted by light or glare coming from the Project Site.

6.7.3 Site Lighting Exhibits

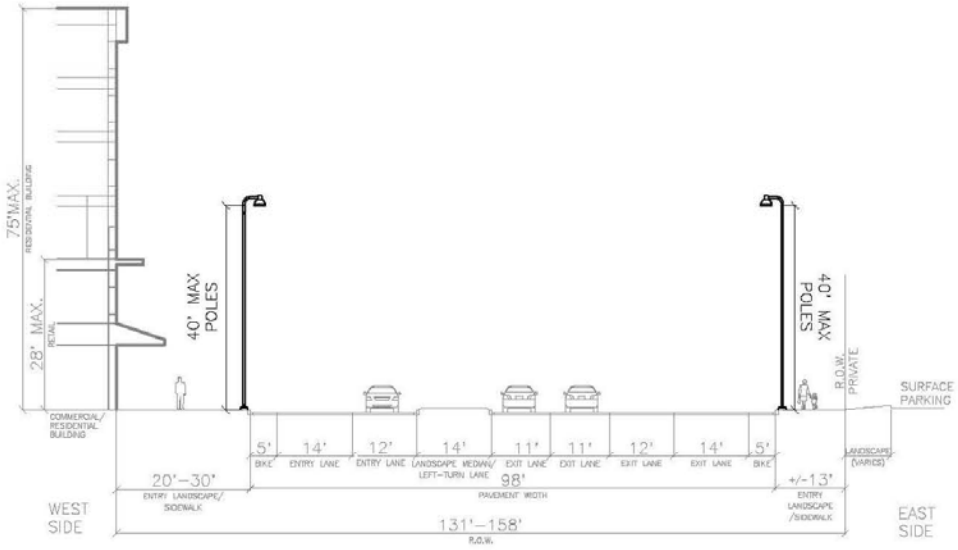
Lighting design exhibits as shown on Figures 6.7a through 6.7h demonstrate conceptual lighting design for each area with intended pole locations and heights, and luminaire head orientations. Location of streetlights is subject to the approval of the City Engineer and the Planning Manager, and may be placed in either the parkway or the medians.



Source: RE|Solutions LLC, 2017

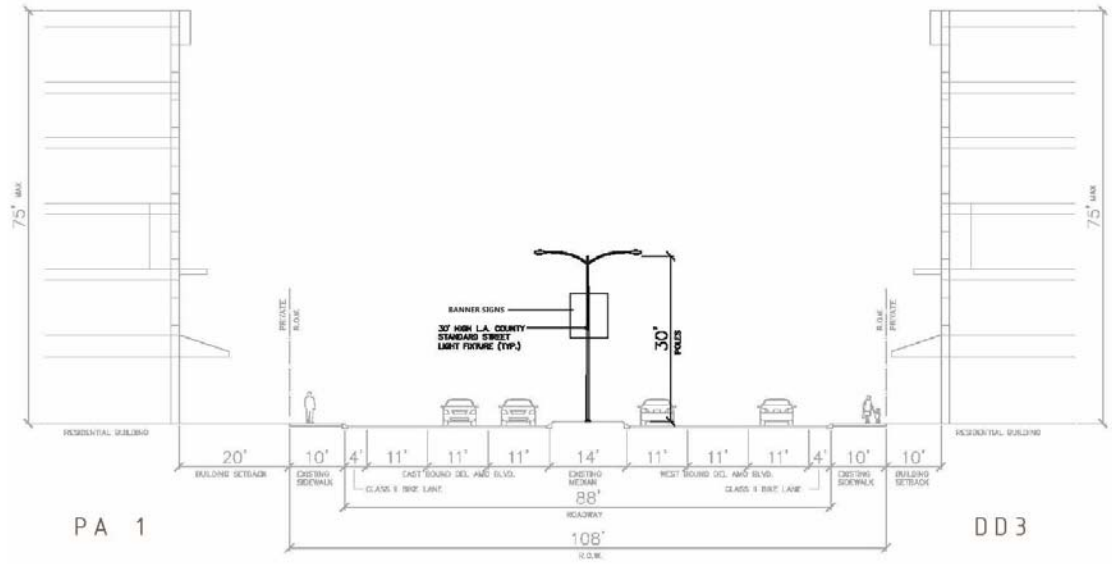
Figure 6.7a Conceptual Site Lighting Exhibit Key Map

Figure 6.7b Section A - Del Amo Entrance



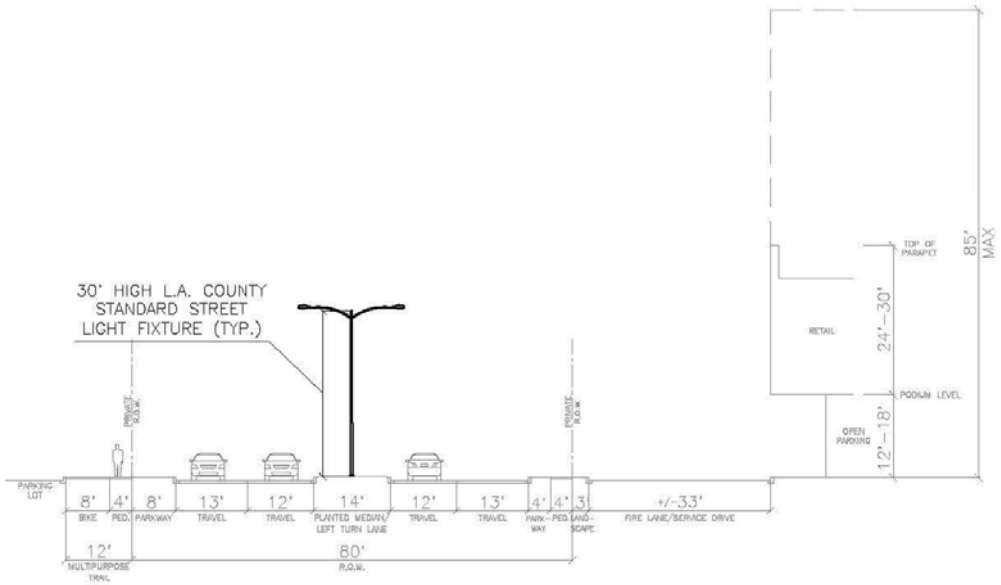
Source: RE|Solutions LLC, 2017

Figure 6.7c Section B - Del Amo Boulevard



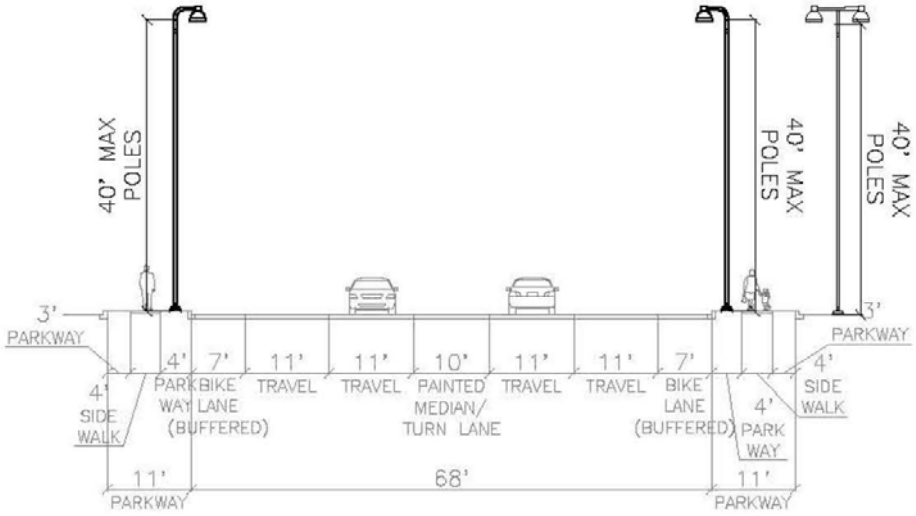
Source: The Planning Center, 2010.

Figure 6.7d Section C - Typical Street A



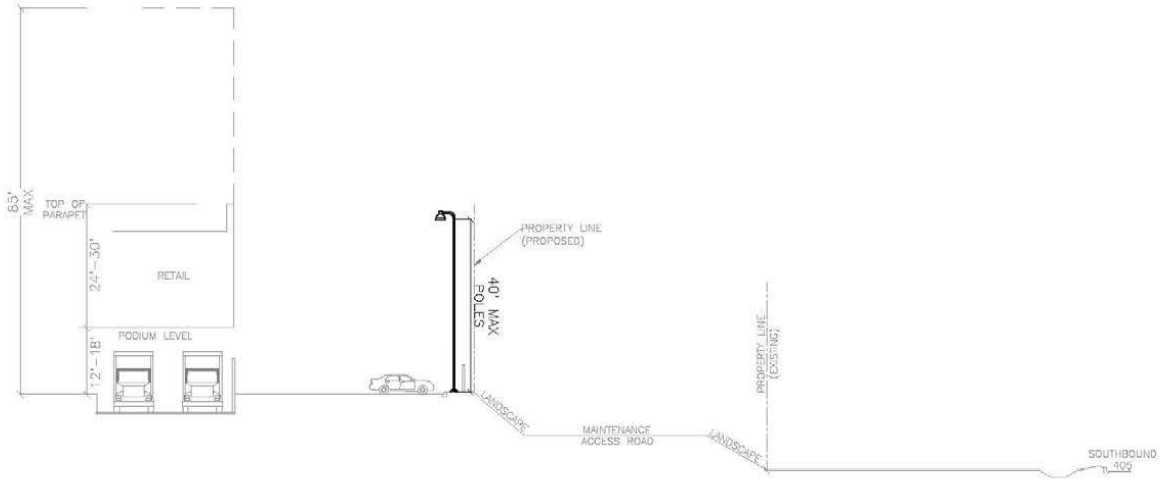
Source: RE|Solutions LLC, 2017

Figure 6.7e Section D – Typical Street B



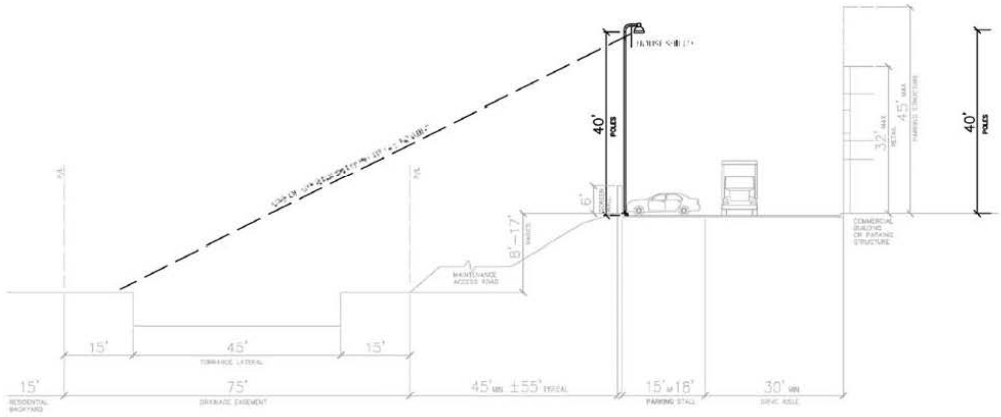
Source: RE|Solutions LLC, 2017

Figure 6.7f Section E - Freeway Edge (I-405/Project Interface)



Source: RE|Solutions LLC, 2017

Figure 6.7g Section - F Channel-Adjacent Slope (Residential/Project Interface)



Source: The Planning Center, 2010

APPENDIX B
LIGHTING PALETTE

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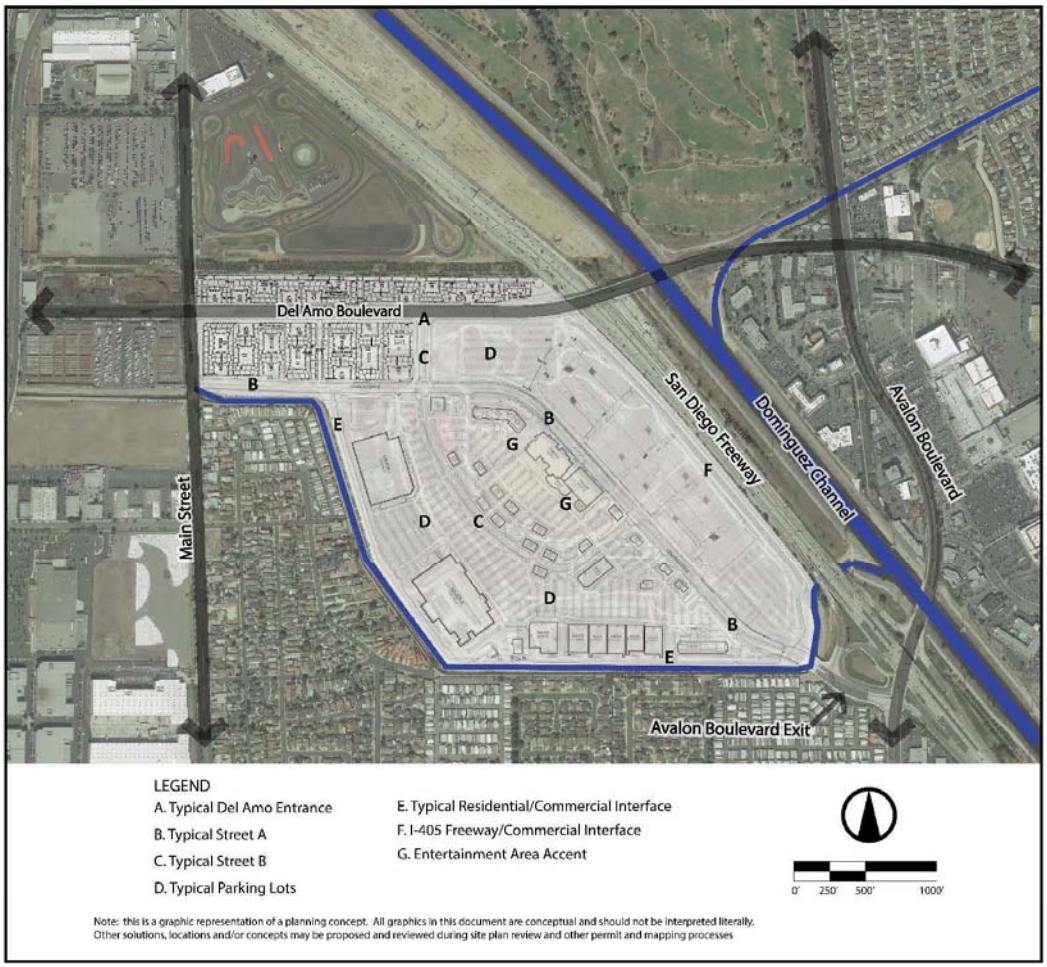
THE DISTRICT AT SOUTH BAY LIGHTING PALETTE

The proposed palette of lighting fixtures, presented below, demonstrates examples of systems that would be in compliance with the design guidelines and to provide examples of the architectural scale and quality of these materials. These fixtures selections should meet the performance criteria of the guidelines while providing an attractive complement to the building and landscape. For each building-type and roadway component within the proposed development, examples of fixture types that would be applicable are illustrated below. These fixtures represent examples of lighting products that will satisfy the guidelines criteria and legal requirements for task illuminance, light trespass, and glare.



The following example is applicable to:

Section A - Typical Del Amo Entry
Section E - Typical Residential/Project Interface

The following example is applicable to:

Section B – Typical Street A
Section C – Typical Street B
Section D - Typical Parking Lots
Section F – 405 Freeway Edge/Commercial Interface

The following example is applicable to:

Section G - Entertainment Driveway Accent

APPENDIX B: Sign Concept Plan PA2

FASHION OUTLETS
LOS ANGELES

COMPREHENSIVE SIGNAGE PLAN | CITY OF CARSON, CA

MACERICH®

401 Wilshire Boulevard, Suite 700
Santa Monica, CA 90401
(310) 394-6000

ISSUE DATE: 15 SEPTEMBER, 2017

Prepared by:
sosDesign Inc
1960 Walnut Street, Suite 102 // Boulder, Colorado 80302
720-564-0505

TABLE OF CONTENTS | COMPREHENSIVE SIGN PLAN

TABLE OF CONTENTS

PROJECT IDENTITY - SITE & BUILDING SIGNAGE

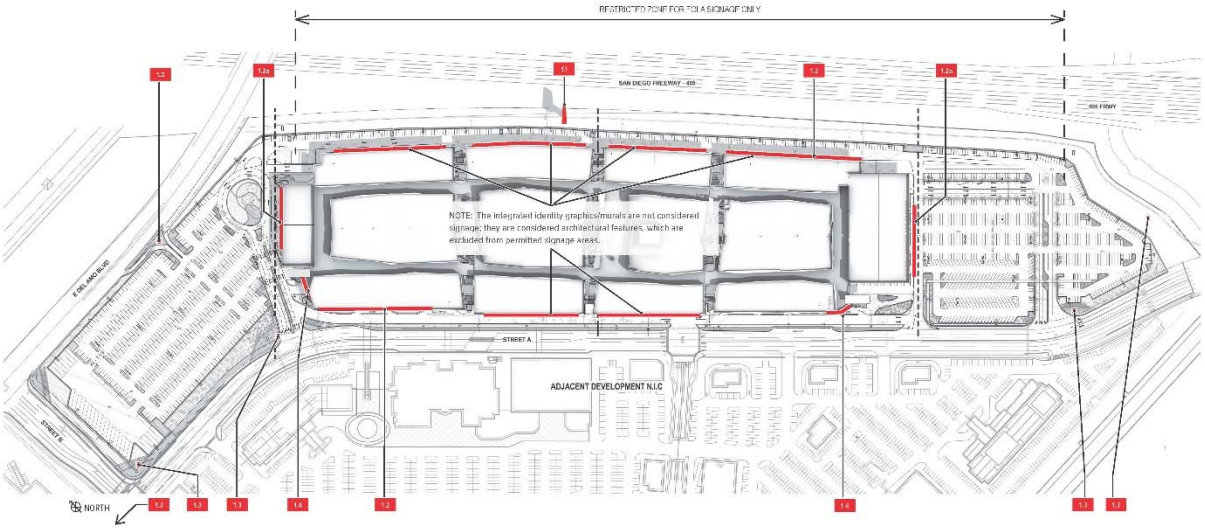
Sign Type 1.1 - HWY Pylon

Sign Type 1.2 - Wall Mounted ID East/West

Sign Type 1.2a - Wall Mounted ID North/South

Sign Type 1.3 - Corner Project ID: Vertical Totem

Sign Type 1.4 - Entry Plaza Project ID: "Fashion Outlets LA"



PROJECT AD PANELS

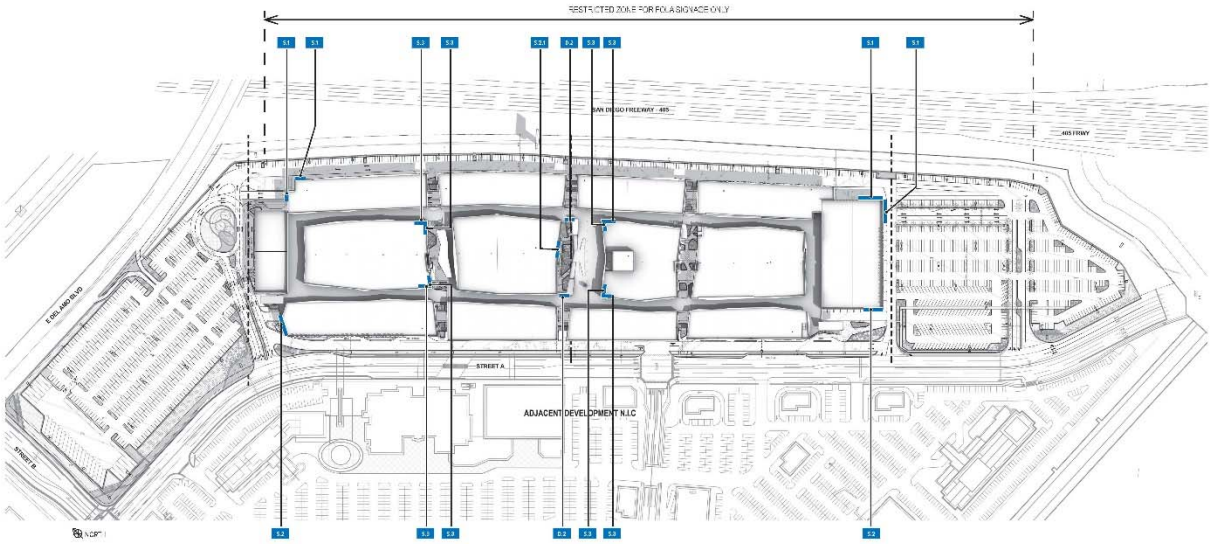
Sign Type S.1 - Static AD (20x60) (Future conversion to LED digital)

Sign Type S.2 - Static AD (14x48)

Sign Type S.2.1 - Static AD (14x48) (Future conversion to LED digital)

Sign Type S.3 - Static AD (10x34)

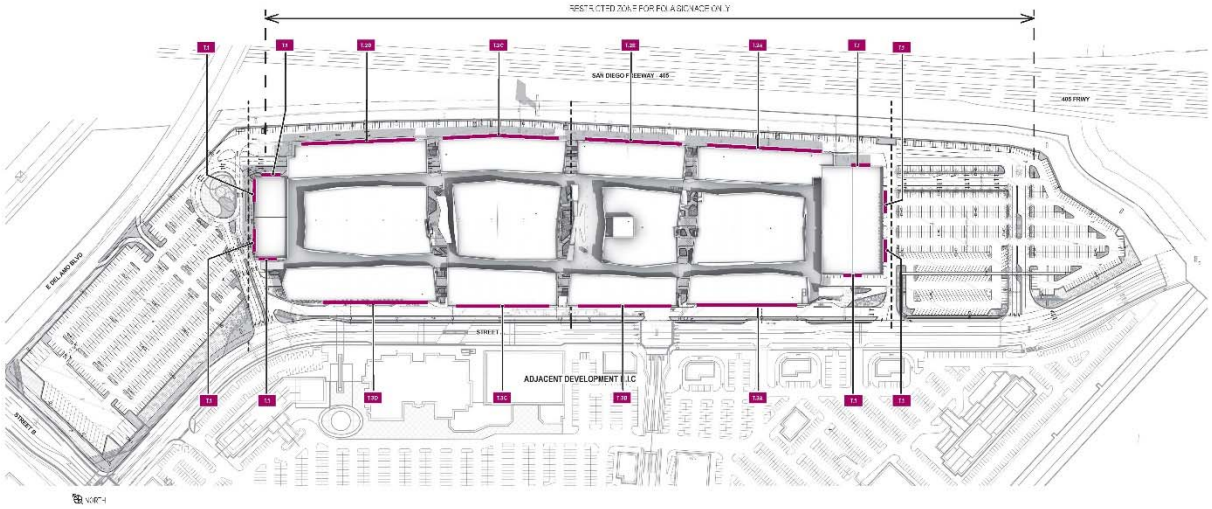
Sign Type D.2 - Digital Bulkhead AD (8x12)



BUILDING MOUNTED-EXTERIOR FACING TENANT SIGNS

Sign Type T.1 - PRIMARY ANCHOR SIGN
Sign Type T.2A EAST FRONTAGE TENANT SIGNS BLOCK A
Sign Type T.2B EAST FRONTAGE TENANT SIGNS BLOCK B
Sign Type T.2C - EAST FRONTAGE TENANT SIGNS-BLOCK C
Sign Type T.2D - EAST FRONTAGE TENANT SIGNS-BLOCK D

Sign Type T.3A - WEST FRONTAGE TENANT SIGNS-BLOCK A
Sign Type T.3B WEST FRONTAGE TENANT SIGNS BLOCK B
Sign Type T.3C WEST FRONTAGE TENANT SIGNS BLOCK C
Sign Type T.3D - WEST FRONTAGE TENANT SIGNS-BLOCK D



PROJECT IDENTITY - SITE & BUILDING SIGNAGE

Sign Type 1.1 - HWY Pylon
Sign Type 1.2 Wall Mounted ID East/West
Sign Type 1.2a - Wall Mounted ID-North/South
Sign Type 1.3 - Corner Project ID: Vertical Totem
Sign Type 1.4 - Entry Plaza Project ID "Fashion Outlets LA"

PROJECT AD PANELS

Sign Type S.1 - Static AD (20x60)
Sign Type S.2 Static AD (14x48)
Sign Type S.3 - Static AD (10x34)
Sign Type D.2 - Digital Bulkhead AD (8x12)

BUILDING MOUNTED-EXTERIOR FACING TENANT SIGNS

Sign Type T.1 - PRIMARY ANCHOR SIGN
Sign Type T.2A EAST FRONTAGE TENANT SIGNS BLOCK A
Sign Type T.2B - EAST FRONTAGE TENANT SIGNS-BLOCK B
Sign Type T.2C - EAST FRONTAGE TENANT SIGNS-BLOCK C
Sign Type T.2D EAST FRONTAGE TENANT SIGNS BLOCK D

NOTE: The integrated identity graphics/murals are not considered signage, they are considered architectural features, which are excluded from permitted signage areas.

PROJECT IDENTITY - SITE & BUILDING SIGNAGE

Sign Type 1.1 - HWY Pylon

Sign Type 1.2 - Wall Mounted ID-East/West

Sign Type 1.2a - Wall Mounted ID North/South

Sign Type 1.3 - Corner Project ID: Vertical Totem

Sign Type 1.4 - Entry Plaza Project ID "Fashion Outlets LA"

PROJECT AD PANELS

Sign Type 5.1 - Static AD (20x60)

Sign Type 5.2 - Static AD (14x48)

Sign Type 5.3 - Static AD (10x34)

Sign Type D.2 - Digital Bulkhead AD (8x12)

BUILDING MOUNTED-EXTERIOR FACING TENANT SIGNS

Sign Type T.1 - PRIMARY ANCHOR SIGN

Sign Type T.3A - WEST FRONTAGE TENANT SIGNS-BLOCK A

Sign Type T.3B - WEST FRONTAGE TENANT SIGNS BLOCK B

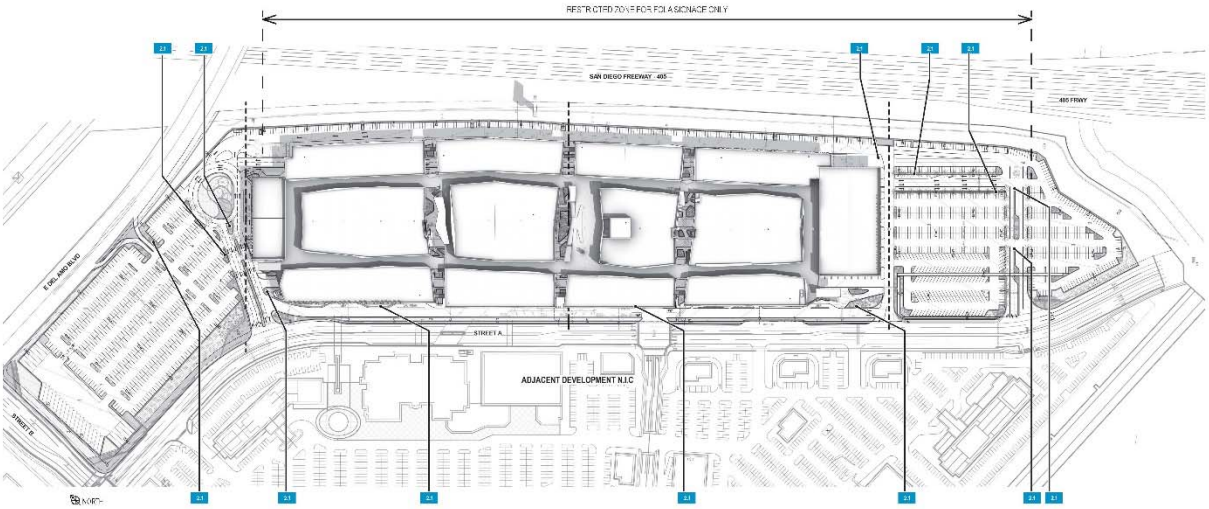
Sign Type T.3C - WEST FRONTAGE TENANT SIGNS-BLOCK C

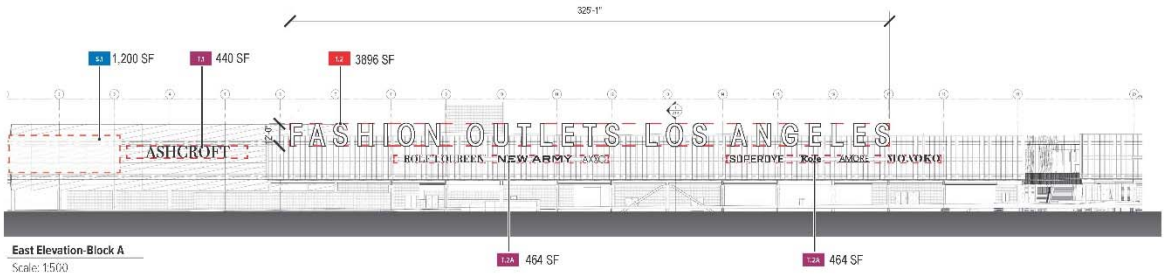
Sign Type T.3D - WEST FRONTAGE TENANT SIGNS-BLOCK D

NOTE: The integrated identity graphics/murals are not considered signage; they are considered architectural features, which are excluded from permitted signage areas.

SITE VEHICULAR DIRECTIONAL SIGNS

Sign Type 2.1 - SHOWN FOR REFERENCE ONLY - FINAL POSITIONS TBD





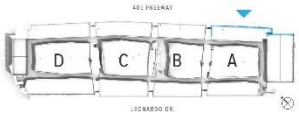
East Elevation-Block A
Scale: 1:500

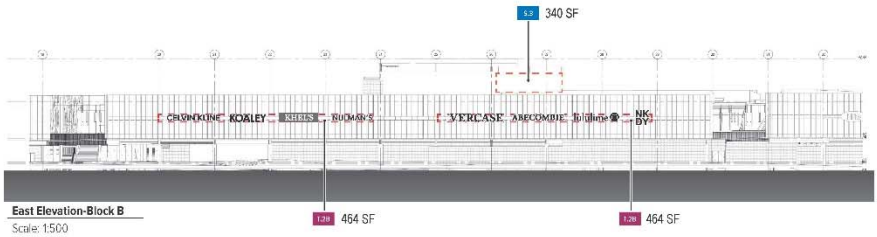
405 FREEWAY FACING: AREA TABULATIONS

OVERALL PROPERTY LENGTH: 2,544 FT - OVERALL LENGTH: WALL +/- 540 FT

All signage shown is for allowable area and not a representation of the final signage by tenant

SIGN TYPE	DESCRIPTION	QTY	AREA	SUB TOTAL	SPECIFIC PLAN ALLOWABLE AREA
T.2	WALL MOUNTED BUILDING ID SIGN	1	3,896	3,896	3,960
T.1	PRIMARY ANCHOR SIGN	1	440	440	7,776
T.2A	EAST FRONTAGE TENANT SIGNS	2	464	928	INCLUDED ABOVE
S.1	STATIC AD (20X60)	1	1,200	1,200	1,200
			SUB TOTAL:	6,464	12,936





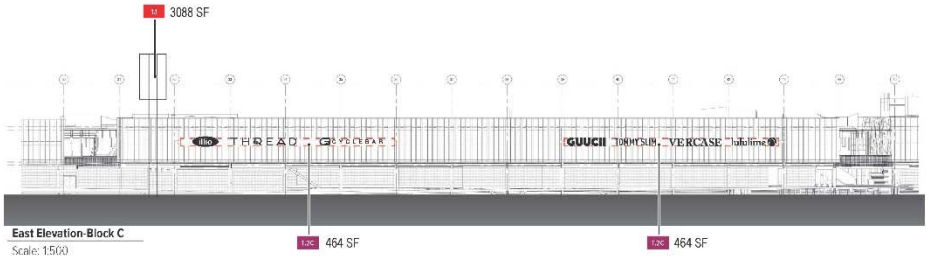
East Elevation-Block B
Scale: 1:500

405 FREEWAY FACING: AREA TABULATIONS

OVERALL PROPERTY LENGTH: 2,544 FT - WALL LENGTH: +/- 330 FT

All signage shown is for allowable area and not a representation of the final signage by tenant

SIGN TYPE	DESCRIPTION	QTY	AREA	SUB TOTAL	SPECIFIC PLAN ALLOWABLE AREA
S.3	STATIC AD (10X34)	2	340	680	680
T.2B	EAST FRONTAGE TENANT SIGNS	2	464	928	4,752
			SUB TOTAL:	1608	5,432



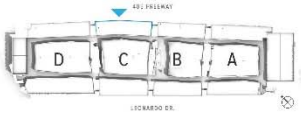
East Elevation-Block C
Scale: 1:500

405 FREEWAY FACING: AREA TABULATIONS

OVERALL PROPERTY LENGTH: 2,544 FT - WALL LENGTH: +/- 390 FT

All signage shown is for allowable area and not a representation of the final signage by tenant

SIGN TYPE	DESCRIPTION	QTY	AREA	SUB-TOTAL	SPECIFIC PLAN ALLOWABLE AREA
T.2C	EAST FRONTAGE TENANT SIGNS	2	464	928	5,616
1.1	405 FREEWAY PYLON-20 X 60 DIGITAL DISPLAYS	DOUBLE SIDED	1544	3088	3,188
			SUB TOTAL:	**4016**	**8,804**



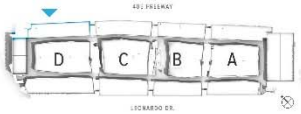
East Elevation-Block D
Scale: 1:500

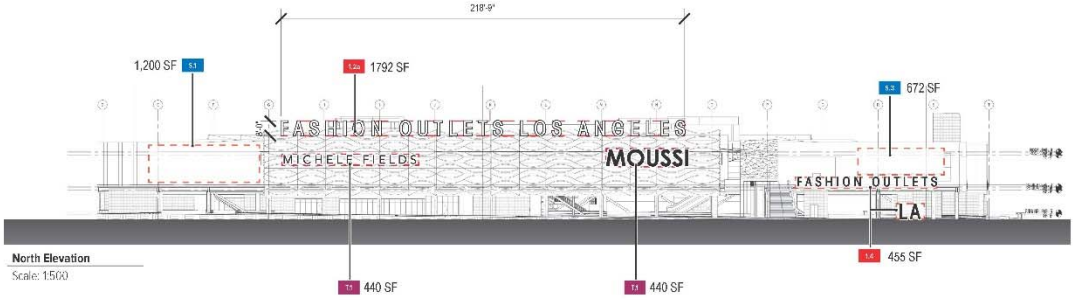
405 FREEWAY FACING: AREA TABULATIONS

OVERALL PROPERTY LENGTH: 2,544 FT - WALL LENGTH: +/- 510 FT

All signage shown is for allowable area and not a representation of the final signage by tenant

SIGN TYPE	DESCRIPTION	QTY	AREA	SUB-TOTAL	SPECIFIC PLAN ALLOWABLE AREA
S.3	STATIC AD (10X34)	2	340	680	680
T.2D	EAST FRONTAGE TENANT SIGNS	2	464	928	7,344
T.1	PRIMARY ANCHOR SIGN	1	440	440	INCLUDED ABOVE
S.1	STATIC AD (20X60)	1	1,200	1,200	1,200
			SUB TOTAL:	**3,248**	**9,224**





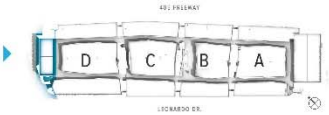
North Elevation
Scale: 1:500

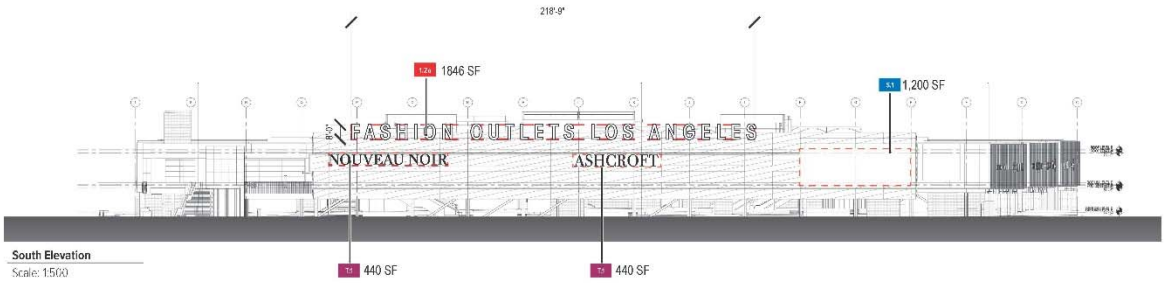
NORTH FACING: AREA TABULATIONS

OVERALL PROPERTY LENGTH: 880 FT - WALL LENGTH: +/- 490 FT

All signage shown is for allowable area and not a representation of the final signage by tenant

SIGN TYPE	DESCRIPTION	QTY	AREA	SUB-TOTAL	SPECIFIC PLAN ALLOWABLE AREA
1.2a	WALL MOUNTED BUILDING ID SIGN	1	1,792	1,792	1,840
1.4	ENTRY PLAZA PROJECT ID "FASHION OUTLETS LA"	1	455	455	455
T.1	PRIMARY ANCHOR SIGN	2	440	880	7,056
S.3	STATIC AD (14X48)	1	672	672	672
S.1	STATIC AD (20X60)	1	1,200	1,200	1,200
			SUB TOTAL:	**4,999**	**11,223**





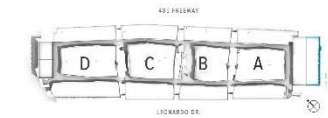
South Elevation
Scale: 1:500

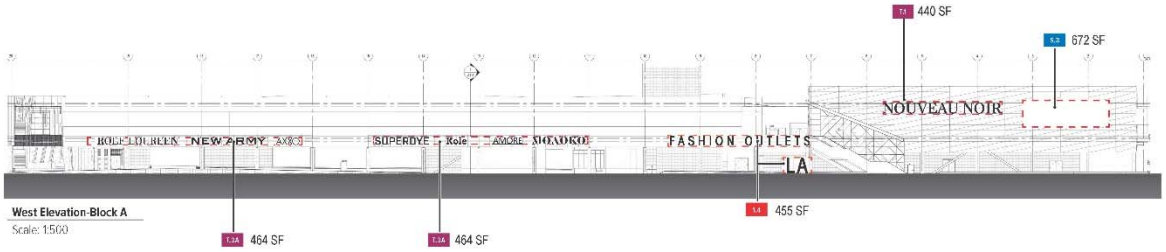
SOUTH FACING: AREA TABULATIONS

OVERALL PROPERTY LENGTH: 536 FT - OVERALL BUILDING LENGTH: 450 FT

All signage shown is for allowable area and not a representation of the final signage by tenant

SIGN TYPE	DESCRIPTION	QTY	AREA	SUB-TOTAL	SPECIFIC PLAN ALLOWABLE AREA
1.2a	WALL MOUNTED BUILDING ID SIGN	1	1,792	1,792	1,840
T.1	PRIMARY ANCHOR SIGN	2	440	880	6,480
S.1	STATIC AD (20X60)	1	1200	1,200	1,200
			SUB TOTAL:	**3,872**	**9,520**





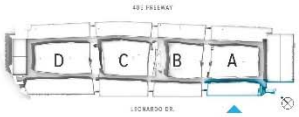
West Elevation-Block A
Scale: 1:500

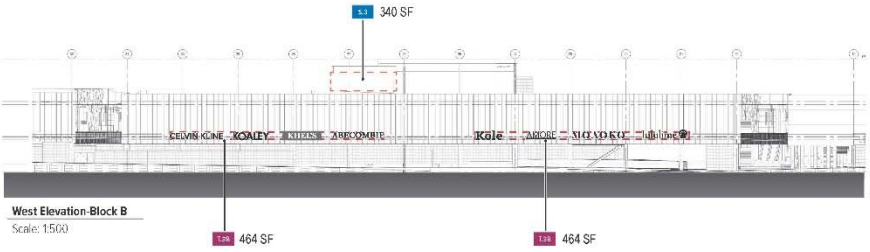
LEONARDO FACING: AREA TABULATIONS

OVERALL PROPERTY LENGTH: 2985 FT - WALL LENGTH: +/- 570FT

All signage shown is for allowable area and not a representation of the final signage by tenant

SIGN TYPE	DESCRIPTION	QTY	AREA	SUB-TOTAL	SPECIFIC PLAN ALLOWABLE AREA
1.4	ENTRY PLAZA PROJECT ID "FASHION OUTLETS LA"	1	455	455	455
T.1	PRIMARY ANCHOR SIGN	1	440	440	8,208
T.3A	WEST FACING TENANT SIGNAGE	2	464	928	INCLUDED ABOVE
S.3	STATIC AD (14X48)	1	672	672	672
			SUB TOTAL:	2,495	9,335





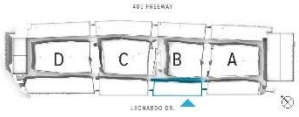
West Elevation-Block B
Scale: 1:500

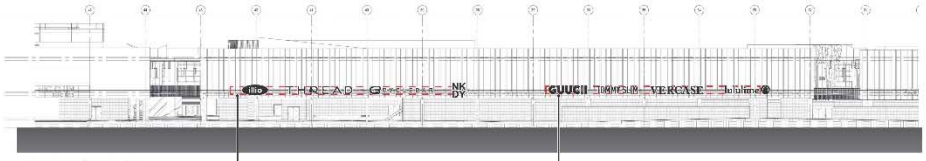
LEONARDO FACING: AREA TABULATIONS

OVERALL PROPERTY LENGTH: 2985 FT - WALL LENGTH: +/- 330 FT

All signage shown is for allowable area and not a representation of the final signage by tenant

SIGN TYPE	DESCRIPTION	QTY	AREA	SUB-TOTAL	SPECIFIC PLAN ALLOWABLE AREA
T.3A	WEST FACING TENANT SIGNAGE	2	464	928	4,752
S.3	STATIC AD (10X34)	2	340	680	680
			SUB TOTAL:	1,608	5,432





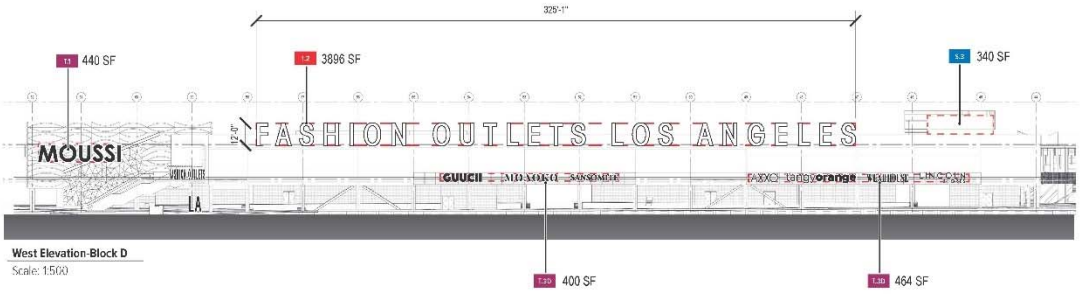
West Elevation-Block C
Scale: 1:500

LEONARDO FACING: AREA TABULATIONS

OVERALL PROPERTY LENGTH: 2985 FT - WALL LENGTH: +/- 330 FT

All signage shown is for allowable area and not a representation of the final signage by tenant

SIGN TYPE	DESCRIPTION	QTY	AREA	SUB TOTAL	SPECIFIC PLAN ALLOWABLE AREA
T.3A	WEST FACING TENANT SIGNAGE	2	464	928	4,752
			SUB TOTAL:	**928**	4,752



West Elevation-Block D
Scale: 1:500

LEONARDO FACING: AREA TABULATIONS

OVERALL PROPERTY LENGTH: 2985 FT - WALL LENGTH: +/- 540 FT

All signage shown is for allowable area and not a representation of the final signage by tenant

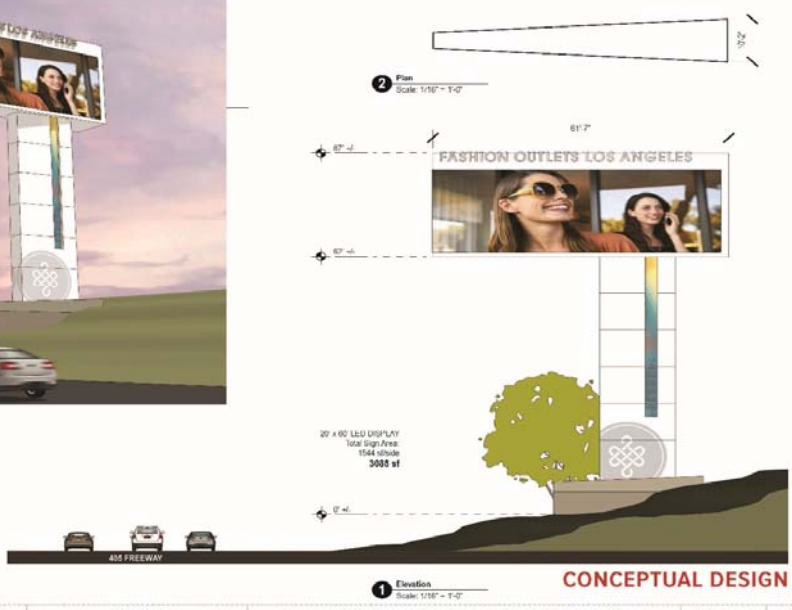
SIGN TYPE	DESCRIPTION	QTY	AREA	SUB TOTAL	SPECIFIC PLAN ALLOWABLE AREA
T.2	WALL MOUNTED BUILDING ID SIGN	1	3,896	3,896	3,960
T.1	PRIMARY ANCHOR SIGN	1	440	440	7,776
T.3D	WEST FACING TENANT SIGNAGE	2	464	928	INCLUDED ABOVE
S.3	STATIC AD (10X34)	2	340	680	680
			SUB TOTAL:	**5,944**	**12,416**

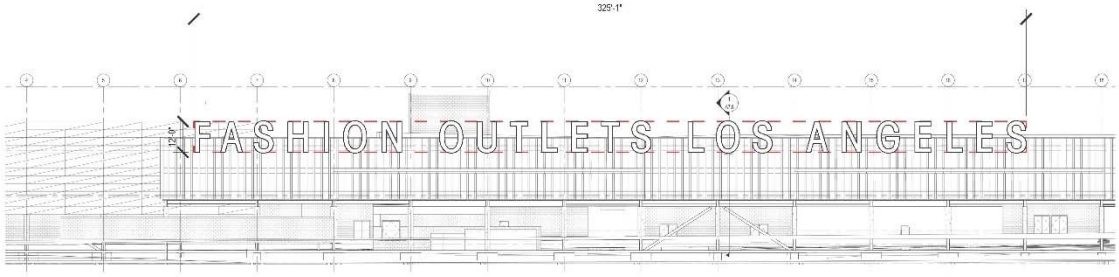
CUMULATIVE SIGN TYPE AREA TABULATION

SIGNS NOT SHOWN IN ELEVATION SHEETS:

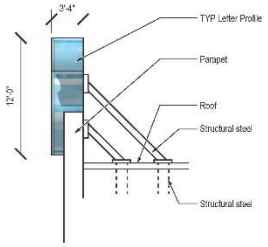
SIGN TYPE	DESCRIPTION	QTY	AREA	SUB TOTAL	SPECIFIC PLAN ALLOWABLE AREA
1.3	FREE STANDING PYLON SIGN WITH TENANT NAMES	6	206	1,236	1,236
			SUB TOTAL:	**1,236**	**1,236**

SHEET	AREA DESCRIPTION	SIGNAGE AREA	SPECIFIC PLAN ALLOWABLE AREA
2.1	405 FACING EAST-BLOCK A	6,464	12,936
2.2	405 FACING EAST-BLOCK B	1,608	5,432
2.3	405 FACING EAST-BLOCK C	4,016	8,804
2.4	405 FACING EAST-BLOCK D	3,248	9,224
2.5	NORTH FACING DEL AMO	4,999	11,223
2.6	SOUTH FACING 405 OFF RAMP	3,872	9,520
2.7	LEONARDO FACING WEST-BLOCK A	2,495	9,335
2.8	LEONARDO FACING WEST-BLOCK B	1,608	5,432
2.9	LEONARDO FACING WEST-BLOCK C	928	4,752
2.10	LEONARDO FACING WEST-BLOCK D	5,944	12,416
	SUB TOTAL:	**35,182**	**89,074**
	PROPOSED TOTAL (SUBTOTAL ABOVE + 1,236)	**36,418**	**90,310**
	(ORDINANCE NO. 11-1469, APRIL 5, 2011) APPROVED SIGN AREA	**21,004**	
	PROPOSED EXCESS SIGN AREA	**15,414**	**90,310**



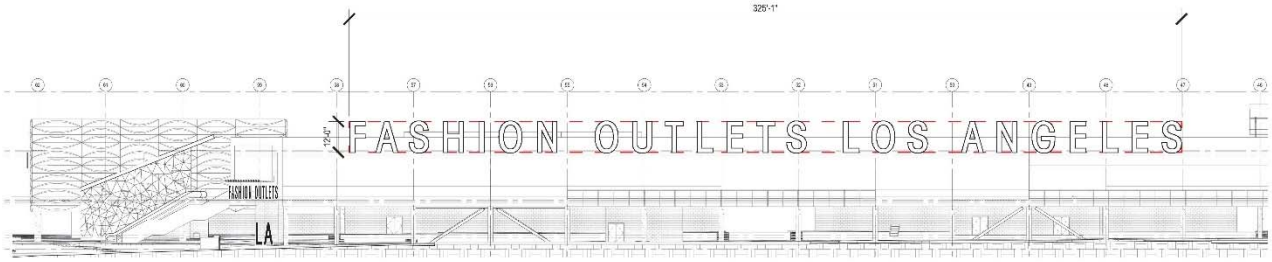


3 East Elevation-Block A
Scale: 1" = 30'

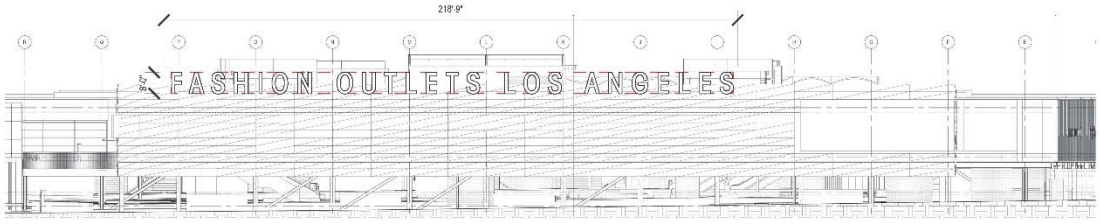


2 End View
Scale: 1/8" = 1'-0"

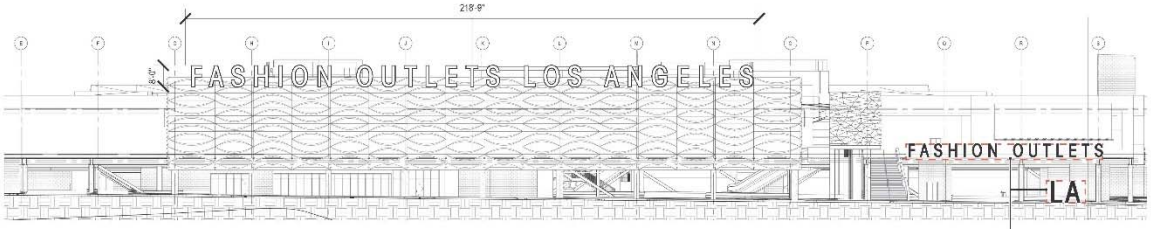
1 Perespective
Scale: NTS



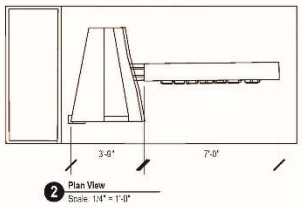
3 West Elevation-Block D
Scale: 1" = 30'



2 South Elevation
Scale: 1" = 30'

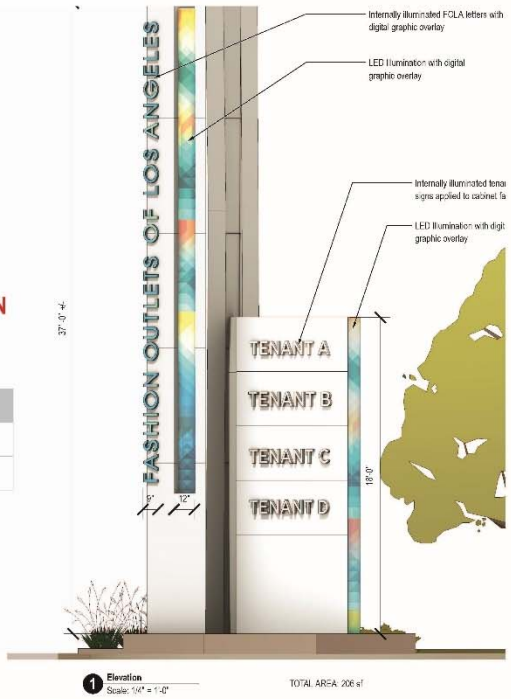


1 North Elevation
Scale: 1" = 30'



2 Plan View
Scale: 1/4" = 1'-0"

CONCEPTUAL DESIGN



1 Elevation
Scale: 1/4" = 1'-0"

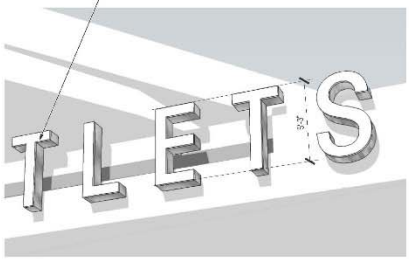
TOTAL AREA: 206 sf

SIGN TYPE AREA TABULATION

SIGN TYPE	DESCRIPTION	QTY	AREA	SUB-TOTAL	SPECIFIC PLAN ALLOWABLE AREA
1.3	FREE STANDING PYLON SIGN WITH TENANT NAMES	6	206	618	1,236
			SUB TOTAL:	**618**	**1,236**

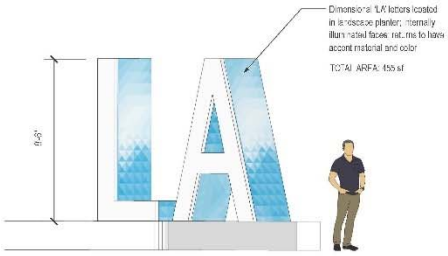
Integrated identity graphics/murals are not considered signage; they are considered architectural features, which are excluded from permitted signage areas.

1 Concept View: South Entry Sign
NTS



Dimensional project name letters mounted to face of building; internally illuminated faces. "FASHION" letters mounted west elevation. "OUTLETS" letters mounted to corner south west elevation surface

2 Building Mounted Letters: Detail View
NTS



Dimensional "LA" letters located in landscape planter; internally illuminated faces; returns to have accent material and color

TOTAL AREA: 455 sf

3 Freestanding Mounted Letters: Detail View
NTS

SIGN TYPE AREA TABULATION

SIGN TYPE	DESCRIPTION	QTY	AREA	SUB TOTAL	SPECIFIC PLAN ALLOWABLE AREA
1.4	BUILDING MOUNTED AND FREE STANDING LETTERS	2 SETS	455	910	910
			SUB TOTAL:	**910**	**910**

CONCEPTUAL DESIGN

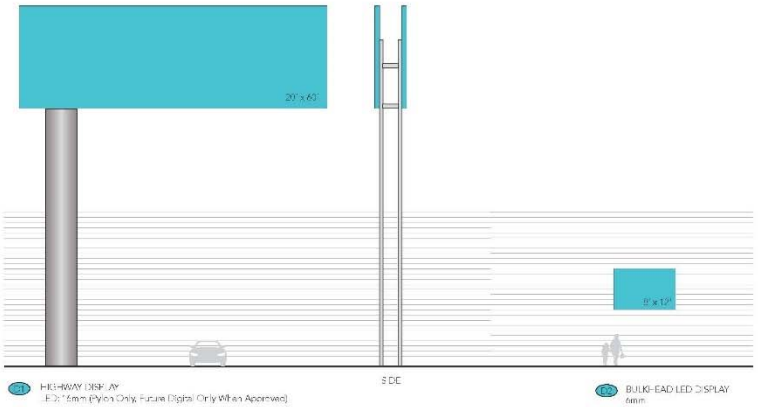
NOTE:

REFER TO MACERICH STANDARD 2-SIDED EXTERIOR VERTICAL

S DE

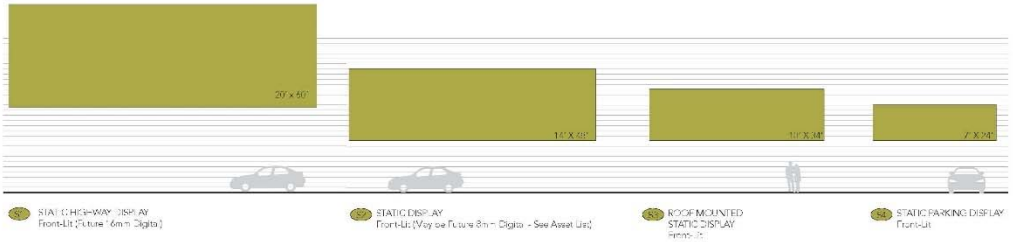
DOUBLE-SIDED INTERACTIVE KIOSK
(2) 65" LCD

MED A HYDRANT



HIGHWAY DISPLAY
LED 16mm (Pylon Only, Future Digital Only When Approved)

BULKHEAD LED DISPLAY
6mm



STATIC HIGHWAY DISPLAY
Front-Lit (Future 16mm Digital)

STATIC DISPLAY
Front-Lit (May be Future 8mm Digital - See Asset List)

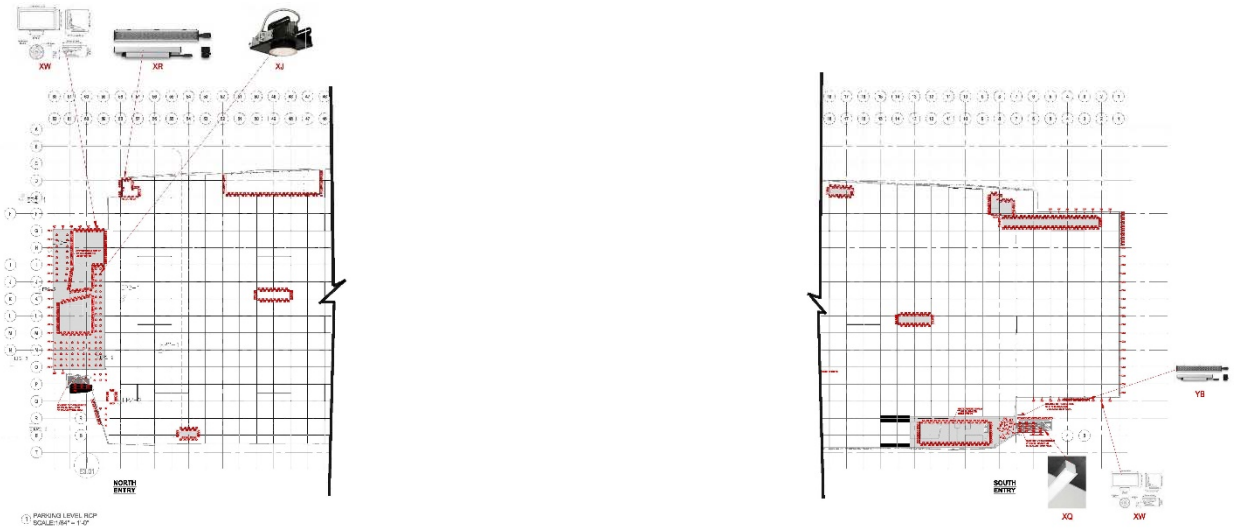
ROOF MOUNTED STATIC DISPLAY
Front-Lit

STATIC PARKING DISPLAY
Front-Lit

APPENDIX C: Building Lighting Concept Plan PA2

FASHION OUTLETS LOS ANGELES

DEVELOPMENT PERMIT APPLICATION
CONCEPT EXTERIOR LIGHTING DESIGN

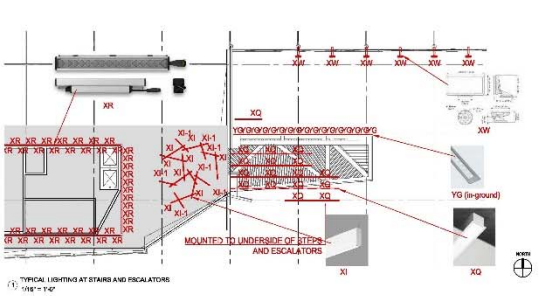


DLR Group | ABRAMSON_TEIGER ARCHITECTS

RCP - Parking Level

MACERICH

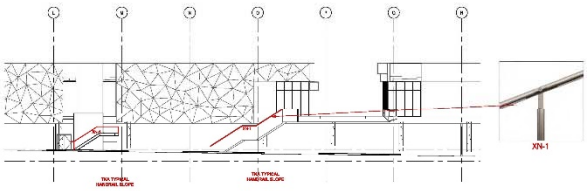
LT2.3.1
FASHION OUTLETS OF LOS ANGELES
CARSON, CA
ENTITLEMENT DOCUMENTS



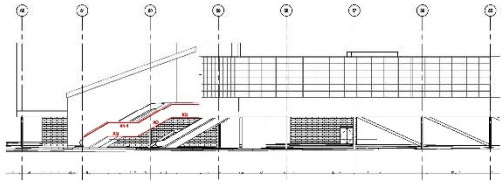
TYPICAL LIGHTING AT STAIRS AND ESCALATORS

EXAMPLE OF UNDERSTAIR LIGHTING

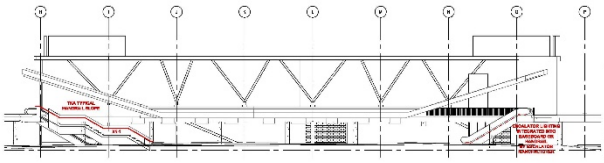
EXAMPLE OF WALL/GRAZING EFFECT FOR TYPE YG



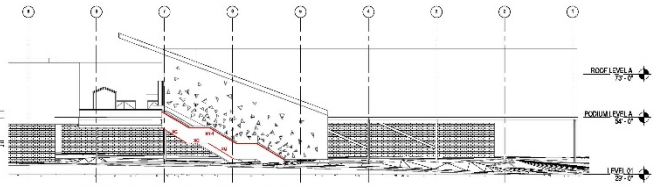
TYPICAL ELEVATION OF HANDRAIL LIGHTING AT FEATURE AND FORESS STAIRS IN SLOT CANYON



TYPICAL ELEVATION OF HANDRAIL LIGHTING AT STAIRS AT NORTH ENTRY



TYPICAL ELEVATION OF HANDRAIL LIGHTING AT STAIRS AND ESCALATOR IN RUNWAY CANYON



TYPICAL ELEVATION OF HANDRAIL LIGHTING AT STAIRS AT SOUTH ENTRY

DLR Group | ABRAMSON_TEIGER ARCHITECTS

Specialty Lighting at Escalators & Stairs

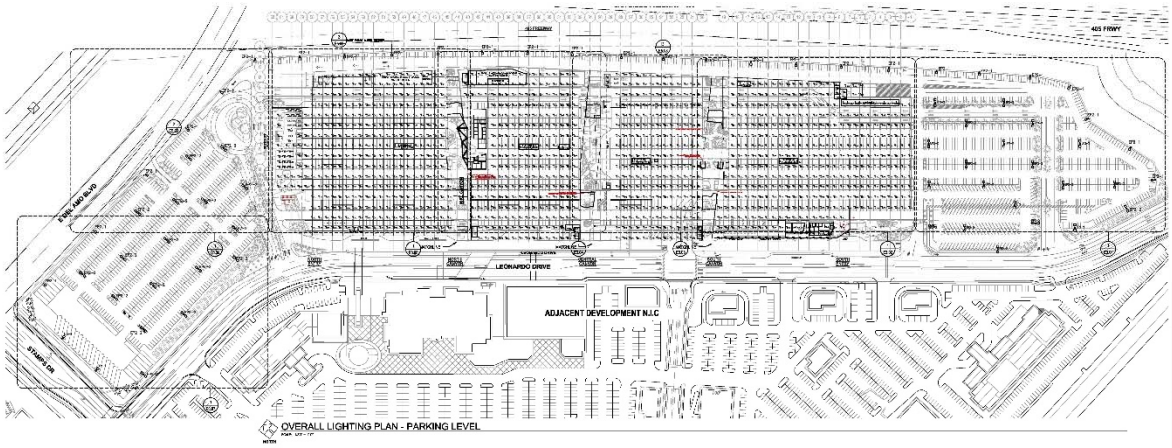
MACERICH

LT7.5

FASHION OUTLETS OF LOS ANGELES
CARSON, CA
ENTITLEMENT DOCUMENTS

T Kondos Associates
International Lighting Consultants

333 W. 39th St.
New York, NY 10018
212.736.5510

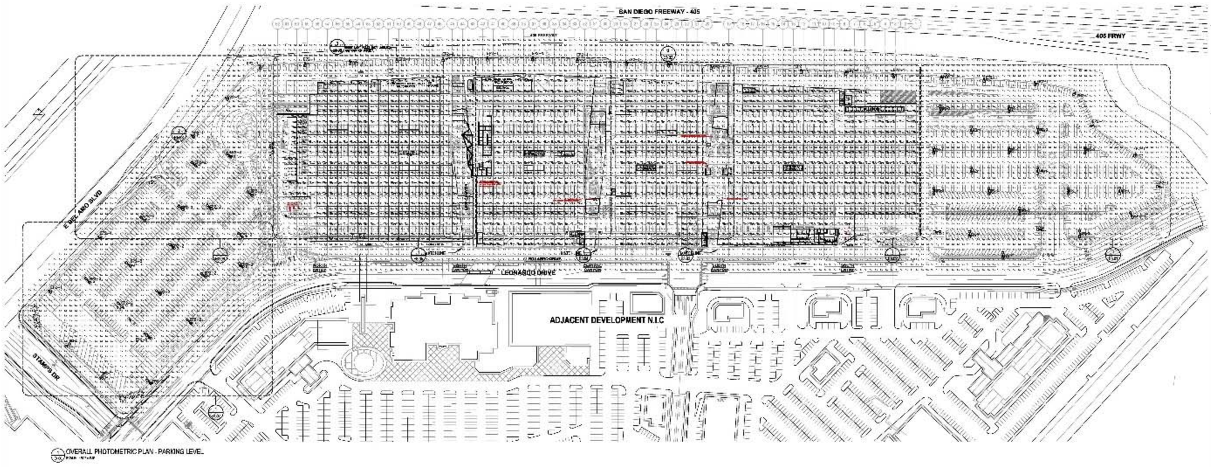


PARKING LEVEL OVERALL LIGHTING PLAN
FASHION OUTLETS L.A.
CARSON, CA

E3.00

NOT FOR CONSTRUCTION

DLR Group



OVERALL PHOTOMETRIC PLAN - PARKING LEVEL

PARKING LEVEL OVERALL PHOTOMETRIC PLAN
FASHION OUTLETS L.A.
CARSON, CA

E4.00

NOT FOR CONSTRUCTION

Luminaire Schedule

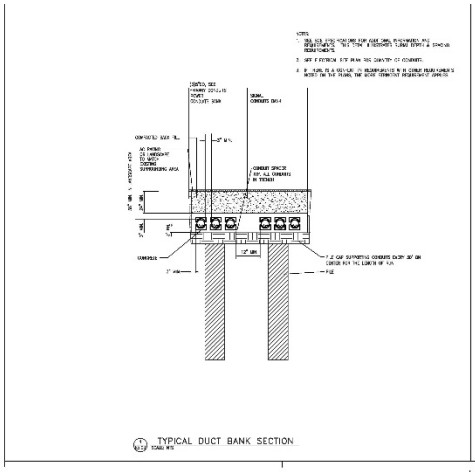
Qty	Symbol	Label	Tag	Description	Tot. Lumens	LLF
63		EB1	McGraw-Edison	TV-C2-LED-E1-WQ	4598	0.900
122		EB2	Metalux	8TSNLED-LD4-60SL-LN-UNV-L8-ESM8360-L835-CD1-U	6089	0.900
868		EP1	Metalux	4VTG-LD4-8-PRSC-UNV-L840-CDC-WL-SSS-U	8758	0.900
27		EP2-1	McGraw-Edison	GLEON-AF-04-LED-480-AFL-1200	27023	0.900
66		EP2-2	McGraw-Edison	GLEON-AF-04-LED-480-AFL-1200	27023	0.900

Calculation Summary

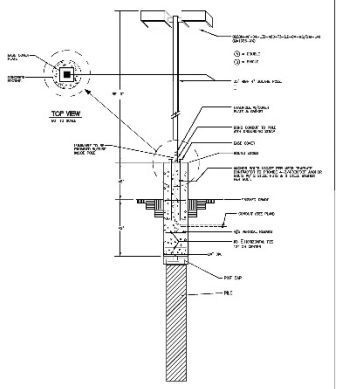
Label	Units	Avg	Max	Min	Avg/Min	Max/Min
Arrival Reception & Lounge_Workplane	Fc	18.73	29.4	9.1	2.06	3.23
Drivers Lounge_Workplane	Fc	18.64	23.3	14.6	1.28	1.60
Fire Control Room_Workplane	Fc	30.60	30.6	30.6	1.00	1.00
Mall Offices_Workplane	Fc	18.85	31.8	7.8	2.42	4.08
Mall Offices Workplane 1	Fc	18.47	29.6	7.6	2.43	3.89
Mall Security Workplane	Fc	24.88	31.6	18.1	1.37	1.75
Mall Storage_Workplane	Fc	23.15	26.8	19.6	1.18	1.37
Room 1_Workplane	Fc	24.90	25.7	22.8	1.09	1.13
Site Site	Fc	5.79	21.5	0.0	N.A.	N.A.
Substation 2 Electric Room_Workplane	Fc	21.40	24.5	18.3	1.17	1.34
Substation 2 Room 1_Workplane	Fc	26.88	28.1	25.9	1.04	1.08
Substation 2 Room 2 Workplane	Fc	26.10	27.4	24.8	1.05	1.10
Substation 2 Room 3_Workplane	Fc	24.00	25.0	23.5	1.02	1.06
Substation 2 Room 4_Workplane	Fc	23.63	25.5	21.8	1.08	1.17
Substation 2 Utility Room_Workplane	Fc	22.45	23.4	21.5	1.04	1.09
Substation 3 Electric Room_Workplane	Fc	21.52	25.5	17.0	1.27	1.50
Substation 3 Room 1_Workplane	Fc	26.08	28.7	24.0	1.09	1.20
Substation 3 Room 2_Workplane	Fc	16.61	17.6	15.6	1.06	1.13
Substation 3 Room 3_Workplane	Fc	23.88	25.5	22.5	1.06	1.13
Substation 3 Utility Room_Workplane	Fc	24.50	27.4	22.4	1.11	1.22
Substation 4 Electric Room_Workplane	Fc	21.41	25.7	16.9	1.27	1.52
Substation 4 Room 1 Workplane	Fc	20.70	23.7	17.4	1.19	1.36
Substation 4 Room 2_Workplane	Fc	21.17	24.0	17.7	1.22	1.35
Substation 4 Room 3_Workplane	Fc	25.70	25.7	25.7	1.00	1.00
Substation 4 Room 4_Workplane	Fc	16.20	18.4	14.4	1.13	1.28
Substation 4 Room 5 Workplane	Fc	22.70	26.4	16.7	1.36	1.58
Substation 4 Room 6_Workplane	Fc	32.43	33.5	31.8	1.02	1.05
Substation 4 Utility Room_Workplane	Fc	21.40	23.3	19.5	1.10	1.12
North Parking Lot	Fc	3.36	6.0	1.1	3.05	5.45
Parking Area East	Fc	3.69	9.8	1.5	2.46	6.53
South Parking Lot	Fc	3.60	6.4	1.2	3.00	5.33
Substation 1 Parking Area	Fc	2.98	5.6	1.1	2.71	5.09
Substation 2 Parking Area	Fc	15.51	31.8	4.0	3.88	7.95
Substation 3 Parking Area	Fc	15.04	28.7	4.3	3.50	6.67
Substation 4 Parking Area	Fc	15.52	33.5	4.2	3.70	7.98

OVERALL PHOTOMETRIC STATISTICS - PARKING LEVEL

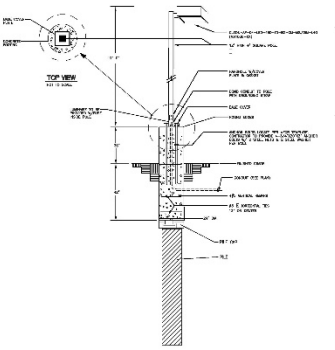
DLR Group



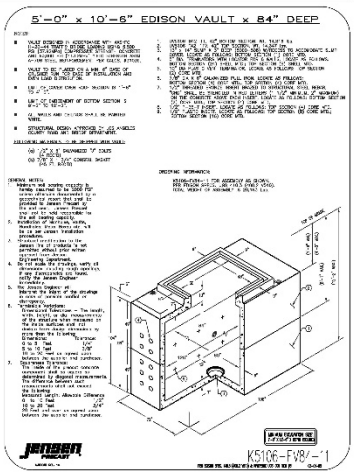
TYPICAL DUCT BANK SECTION

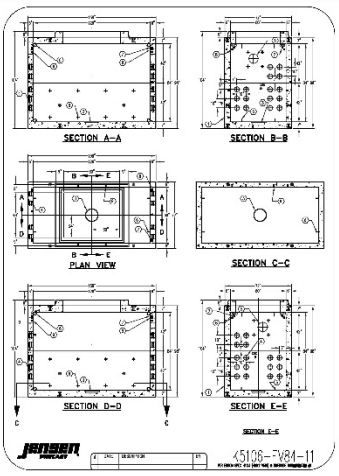


TYPICAL PARKING LIGHT FIXTURE AND POLE BASE DETAIL



TYPICAL PARKING LIGHT FIXTURE AND POLE BASE DETAIL





ELECTRICAL DETAILS
FASHION OUTLETS L.A.
CARSON, CA

E5.03

NOT FOR CONSTRUCTION

DLR Group

COOPER Lighting

Photometric Toolbox

IES ROAD REPORT
PHOTOMETRIC FILENAME : GLEON-AF-04-LED-E1-T3.IES

DESCRIPTIVE INFORMATION (From Photometric File)

IESNA:LM-63-2002
[TEST]P191452
[MORE]TEST IS SCALED FROM IESNA LM-79-08 TEST DATA (P24140)
[TESTLAB]Innovations Center P2
[ISSUEDATE]7/5/2016
[MANUFAC] EATON - McGRAW-EDISON (FORMER COOPER LIGHTING)
[LUMCAT]GLEON-AF-04-LED-E1-T3
[LUMINAIRE]GALLEON AREA AND ROADWAY LUMINAIRE
[MORE](4) 70 CRI, 4000K, 1050mA LIGHTSQUARES WITH 16 LEDS EACH AND TYPE III OPTICS
[DRIVER]ELECTRONIC DRIVER
[_SEARCH_SOURCETYPE] LED
[_SEARCH_CRI] 70
[_SEARCH_COLORTEMP] 4000K
[_SEARCH_APPLICATION] Outdoor, Architectural, Area, Automotive, Commercial, Educational, Facade, Government, Healthcare
[MORE] Retail, Roadway, Sidewalk, Site, Street, Substation, Security, Corrosion Resistant, Vandal Resistant, Wet Location
[_SEARCH_MOUNTING] Arm, Pole
[_ABSOLUTE]DATA SHOWN IS ABSOLUTE FOR THE SAMPLE PROVIDED
[MORE]ABSOLUTE PHOTOMETRY IS BASED ON CALIBRATION FACTORS
[MORE]CREATED USING LAB LUMEN STANDARDS IN GONIOPHOTOMETER
[MORE]WITH TEST DISTANCE OF 28.75 FEET
[_ABSOLUTELUMENS]24017

CHARACTERISTICS

IES Classification	Type III
Longitudinal Classification	Short
Lumens Per Lamp	N.A. (absolute)
Total Lamp Lumens	N.A. (absolute)
Luminaire Lumens	24017
Downward Total Efficiency	N.A. (absolute)
Total Luminaire Efficiency	N.A. (absolute)
Luminaire Efficacy Rating (LER)	107
Total Luminaire Watts	225
Ballast Factor	1.00
Upward Waste Light Ratio	0.00
Maximum Candela	17598.8
Maximum Candela Angle	55H 67.5V
Maximum Candela (<90 Degrees Vertical)	17598.8
Maximum Candela Angle (<90 Degrees Vertical)	55H 67.5V
Maximum Candela At 90 Degrees Vertical	0 (0.0% Luminaire Lumens)
Maximum Candela from 80 to <90 Degrees Vertical	2083.4 (8.7% Luminaire Lumens)
Cutoff Classification (deprecated)	N.A. (absolute)

IES ROAD REPORT
PHOTOMETRIC FILENAME : GLEON-AF-04-LED-E1-T3.IES

LUMINAIRE CLASSIFICATION SYSTEM (LCS)

	Lumens	% Lamp	% Luminaire
FL - Front-Low (0-30)	1287.4	N.A.	5.4
FM - Front-Medium (30-60)	9022.6	N.A.	37.6
FH - Front-High (60-80)	8302.8	N.A.	34.6
FVH - Front-Very High (80-90)	216.1	N.A.	0.9
BL - Back-Low (0-30)	1083.4	N.A.	4.5
BM - Back-Medium (30-60)	2477.8	N.A.	10.3
BH - Back-High (60-80)	1443.9	N.A.	6.0
BVH - Back-Very High (80-90)	183.1	N.A.	0.8
UL - Uplight-Low (90-100)	0.0	N.A.	0.0
UH - Uplight-High (100-180)	0.0	N.A.	0.0
Total	24017.1	N.A.	100.0
BUG Rating	B3-U0-G4		

APPENDIX D: CalGreen 2016 Building Energy Efficiency Standards, pages 40,41

10-114 – DETERMINATION OF OUTDOOR LIGHTING ZONES AND ADMINISTRATIVE RULES FOR USE

This section establishes rules for implementing outdoor lighting zones to show compliance with Section 140.7 of Title 24, California Code of Regulations, Part 6.

(a) **Lighting Zones**. Exterior lighting allowances in California vary by Lighting Zones (LZ).

(b) **Lighting Zone Characteristics**. TABLE 10-114-A specifies the relative ambient illumination level and the statewide default location for each lighting zone.

(c) **Amending the Lighting Zone Designation**. A local jurisdiction may officially adopt changes to the lighting zone designation of an area by following a public process that allows for formal public notification, review, and comment about the proposed change. The local jurisdiction may determine areas where Lighting Zone 4 is applicable and may increase or decrease the lighting zones for areas that are in State Default Lighting Zones 1, 2 and 3, as specified in TABLE 10-114-A.

(d) **Commission Notification, Amended Outdoor Lighting Zone Designation**. Local jurisdictions who adopt changes to the State Default Lighting Zones shall notify the Commission by providing the following materials to the Executive Director:

1. A detailed specification of the boundaries of the adopted Lighting Zones, consisting of the county name, the city name if any, the zip code(s) of the re designated areas, and a description of the physical boundaries within each zip code;
2. A description of the public process that was conducted in adopting the Lighting Zone changes; and
3. An explanation of how the adopted Lighting Zone changes are consistent with the specifications of Section 10-114.

(e) The Commission shall have the authority to not allow Lighting Zone changes which the Commission finds to be inconsistent with the specifications of Section 10-114.

TABLE 10-114-A LIGHTING ZONE CHARACTERISTICS AND RULES FOR AMENDMENTS BY LOCAL JURISDICTIONS

Zone	Ambient Illumination	State wide Default Location	Moving Up to Higher Zones	Moving Down to Lower Zones
LZ0	Very Low	Undeveloped areas of government designated parks, recreation areas, and wildlife preserves.	Undeveloped areas of government designated parks, recreation areas, and wildlife preserves can be designated as LZ1 or LZ2 if they are contained within such a zone.	Not applicable
LZ1	Low	Developed portion of government designated parks, recreation areas, and wildlife preserves. Those that are wholly contained within a higher lighting zone may be considered by the local government as part of that lighting zone.	Developed portion of a government designated park, recreation area, or wildlife preserve, can be designated as LZ2 or LZ3 if they are contained within such a zone.	Not applicable.
LZ2	Moderate	Rural areas, as defined by the 2010 U.S. Census.	Special districts within a default LZ2 zone may be designated as LZ3 or LZ4 by a local jurisdiction. Examples include special commercial districts or areas with special security considerations located within a rural area.	Special districts and government designated parks within a default LZ2 zone maybe designated as LZ1 by the local jurisdiction for lower illumination standards, without any size limits.
LZ3	Moderately High	Urban areas, as defined by the 2010 U.S. Census.	Special districts within a default LZ3 may be designated as a LZ4 by local jurisdiction for high intensity nighttime use, such as entertainment or commercial districts or areas with special security considerations requiring very high light levels.	Special districts and government designated parks within a default LZ3 zone may be designated as LZ1 or LZ2 by the local jurisdiction, without any size limits.
LZ4	High	None.	Not applicable.	Not applicable.

APPENDIX E: Table A5.106.8 in Section 5.106.8 of the CALGreen Code

2. See Vehicle Code Section 22511 for EV charging spaces signage in off-street parking facilities and for use of EV charging spaces.
3. The Governor's Office of Planning and Research published a Zero-Emission Vehicle Community Readiness Guidebook which provides helpful information for local governments, residents and businesses. www.opr.ca.gov/docs/ZEV_Guidebook.pdf.

5.106.8 Light pollution reduction. [N] Outdoor lighting systems shall be designed and installed to comply with the following:

1. The minimum requirements in the *California Energy Code* for Lighting Zones 1-4 as defined in Chapter 10 of the *California Administrative Code*; and
2. Backlight, Uplight and Glare (BUG) ratings as defined in IES TM-15-11; and
3. Allowable BUG ratings not exceeding those shown in Table 5.106.8, or

Comply with a local ordinance lawfully enacted pursuant to Section 101.7, whichever is more stringent.

Exceptions: [N]

1. Luminaires that qualify as exceptions in Section 140.7 of the *California Energy Code.*
2. Emergency lighting.
3. Building facade meeting the requirements in Table 140.7-B of the *California Energy Code*, Part 6.
4. Custom lighting features as allowed by the local enforcing agency, as permitted by Section 101.8 Alternate materials, designs and methods of construction.

Note: [N] See also *California Building Code*, Chapter 12, Section 1205.6 for college campus lighting requirements for parking facilities and walkways.

5.106.10 Grading and paving. Construction plans shall indicate how site grading or a drainage system will manage all surface water flows to keep water from entering buildings. Examples of methods to manage surface water include, but are not limited to, the following:

1. Swales.
2. Water collection and disposal systems.
3. French drains.
4. Water retention gardens.
5. Other water measures which keep surface water away from buildings and aid in groundwater recharge.

Exception: Additions and alterations not altering the drainage path.

TABLE 5.106.8 [N]
MAXIMUM ALLOWABLE BACKLIGHT, UPLIGHT AND GLARE (BUG) RATINGS[1,2]

ALLOWABLE RATING	LIGHTING ZONE 1	LIGHTING ZONE 2	LIGHTING ZONE 3	LIGHTING ZONE 4
Maximum Allowable Backlight Rating[3]				
Luminaire greater than 2 mounting heights (MH) from property line	No Limit	No Limit	No Limit	No Limit
Luminaire back hemisphere is 1 – 2 MH from property line	B2	B3	B4	B4
Luminaire back hemisphere is 0.5 – 1 MH from property line	B1	B2	B3	B3
Luminaire back hemisphere is less than 0.5 MH from property line	B0	B0	B1	B2
Maximum Allowable Uplight Rating				
For area lighting[4]	U0	U0	U0	U0
For all other outdoor lighting, including decorative luminaires	U1	U2	U3	U4
Maximum Allowable Glare Rating[5]				
Luminaire greater than 2 MH from property line	G1	G2	G3	G4
Luminaire front hemisphere is 1 – 2 MH from property line	G0	G1	G1	G2
Luminaire front hemisphere is 0.5 – 1 MH from property line	G0	G0	G1	G1
Luminaire back hemisphere is less than 0.5 MH from property line	G0	G0	G0	G1

1. IESNA Lighting Zones 0 and 5 are not applicable; refer to Lighting Zones as defined in the *California Energy Code* and Chapter 10 of the *California Administrative Code*.
2. For property lines that abut public walkways, bikeways, plazas and parking lots, the property line may be considered to be 5 feet beyond the actual property line for purpose of determining compliance with this section. For property lines that abut public roadways and public transit corridors, the property line may be considered to be the centerline of the public roadway or public transit corridor for the purpose of determining compliance with this section.
3. If the nearest property line is less than or equal to two mounting heights from the back hemisphere of the luminaire distribution, the applicable reduced Backlight rating shall be met.
4. General lighting luminaires in areas such as outdoor parking, sales or storage lots shall meet these reduced ratings. Decorative luminaires located in these areas shall meet *U*-value limits for "all other outdoor lighting."
5. If the nearest property line is less than or equal to two mounting heights from the front hemisphere of the luminaire distribution, the applicable reduced Glare rating shall be met.

APPENDIX F: IESNA 10th Edition Lighting Handbook, Table 26.4, Nighttime Outdoor Lighting Zone Definitions

Table 26.4 | Nighttime Outdoor Lighting Zone Definitions

Zone	Outdoor Lighting Situation	Definition
LZ4	High Ambient Lighting	Areas of human activity where the vision of human residents and users is adapted to high light levels. Lighting is generally considered necessary for safety, security and/or convenience and it is mostly uniform and/or continuous. After curfew, lighting may be extinguished or reduced in some areas as activity levels decline.
LZ3	Moderately High Ambient Lighting	Areas of human activity where the vision of human residents and users is adapted to moderately high light levels. Lighting is generally desired for safety, security and/or convenience and it is often uniform and/or continuous. After curfew, lighting may be extinguished or reduced in most areas as activity levels decline.
LZ2	Moderate Ambient Lighting	Areas of human activity where the vision of human residents and users is adapted to moderate light levels. Lighting may typically be used for safety and convenience but it is not necessarily uniform or continuous. After curfew, lighting may be extinguished or reduced as activity levels decline.
LZ1	Low Ambient Lighting	Areas where lighting might adversely affect flora and fauna or disturb the character of the area. The vision of human residents and users is adapted to low light levels. Lighting may be used for safety and convenience but it is not necessarily uniform or continuous. After curfew, most lighting should be extinguished or reduced as activity levels decline.
LZ0	No Ambient Lighting	Areas where the natural environment will be seriously and adversely affected by lighting. Impacts include disturbing the biological cycles of flora and fauna and/or detracting from human enjoyment and appreciation of the natural environment. Human activity is subordinate in importance to nature. The vision of human residents and users is adapted to the darkness, and they expect to see little or no lighting. When not needed, lighting should be extinguished.

APPENDIX G: IESNA 10th Edition Lighting Handbook, Table 26.5, Recommended Light Trespass Illuminance Limits

Table 26.5 | Recommended Light Trespass Illuminance Limits

Lighting Zone	Limit in lux[a]	
	Pre-curfew	Post-curfew
LZ4	15	6
LZ3	8	3
LZ2	3	1
LZ1	1	0
LZ0	0.1	0

a. Maximum initial illuminance on a plane perpendicular to the line of sight to the luminaire(s). Plane located at observer position where light trespass is under review. [7]

APPENDIX H: IES TM15-11, Addendum A

Addendum A for IES TM-15-11: Backlight, Uplight, and Glare (BUG) Ratings

This Addendum replaces Addendum A in IESNA TM-15-07.
The following Backlight, Uplight, and Glare ratings may be used to evaluate luminaire optical performance related to light trespass, sky glow, and high angle brightness control. These ratings are based on a zonal lumen calculations for secondary solid angles defined in TM-15-11. The zonal lumen thresholds listed in the following three tables are based on data from photometric testing procedures approved by the Illuminating Engineering Society for outdoor luminaries (LM-31 or LM-35).

Table A-1: Backlight Ratings (maximum zonal lumens)

		Backlight Rating					
	Secondary Solid Angle	B0	B1	B2	B3	B4	B5
Backlight / Trespass	BH	110	500	1000	2500	5000	>5000
	BM	220	1000	2500	5000	8500	>8500
	BL	110	500	1000	2500	5000	>5000

Table A-2: Uplight Ratings (maximum zonal lumens)

		Uplight Rating					
	Secondary Solid Angle	U0	U1	U2	U3	U4	U5
Uplight / Skyglow	UH	0	10	50	500	1000	>1000
	UL	0	10	50	500	1000	>1000

Table A-3: Glare Ratings (maximum zonal lumens)

Glare Rating for
Asymmetrical Luminaire Types (Type I, Type II, Type III, Type IV)

	Secondary Solid Angle	G0	G1	G2	G3	G4	G5
Glare / Offensive Light	FVH	10	100	225	500	750	>750
	BVH	10	100	225	500	750	>750
	FH	660	1800	5000	7500	12000	>12000
	BH	110	500	1000	2500	5000	>5000

Glare Rating for
Quadrilateral Symmetrical Luminaire Types (Type V, Type V Square)

	Secondary Solid Angle	G0	G1	G2	G3	G4	G5
Glare / Offensive Light	FVH	10	100	225	500	750	>750
	BVH	10	100	225	500	750	>750
	FH	660	1800	5000	7500	12000	>12000
	BH	660	1800	5000	7500	12000	>12000

APPENDIX I: Sign Lighting Illuminance Calculation (fc)

Sign Lighting illuminance data presented below is derived from the lighting illuminance calculations prepared as per the methods described in Section 6.2 above. Illuminance data is presented in the following tables with location coordinates defined relative to the elevation and horizontal distance from lower left, viewing from the Property to the vertical plane where light trespass is under review. Grid data is displayed at five feet on center, vertical and horizontal.

Vertical Plane 1

VERTICAL (ft) \ HORIZONTAL (ft)	0	10	20	30	40	50	60	70	80	90	100
85	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
75	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
65	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1
55	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1
45	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1
35	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.0	0.1
25	0.2	0.3	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1
15	0.2	0.3	0.3	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1
5	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1

Vertical Plane 1

VERTICAL (ft) \ HORIZONTAL (ft)	110	120	130	140	150	160	170	180	190	200
85	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
75	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
65	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
55	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
45	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.0	0.1
35	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0
25	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
15	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5	0.1	0.1	0.1	0.1	0.0	0.0	0.1	0.1	0.0	0.0

Vertical Plane 1

VERTICAL (ft) \ HORIZONTAL (ft)	210	220	230	240	250	260	270	280	290	300
85	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
75	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
65	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
55	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
45	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
35	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1
25	0.0	0.0	0.0	0.1	0.0	0.1	0.1	0.1	0.1	0.1
15	0.0	0.0	0.0	0.1	0.0	0.0	0.1	0.1	0.1	0.1
5	0.0	0.0	0.0	0.1	0.0	0.1	0.1	0.1	0.1	0.1

Vertical Plane 1
HORIZONTAL (ft)

VERTICAL (ft)	310	320	330	340	350	360	370	380	390	400
85	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2
75	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2
65	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2
55	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
45	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
35	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
25	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
15	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
5	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1

Vertical Plane 1
HORIZONTAL (ft)

VERTICAL (ft)	410	420	430	440	450	460	470	480	490	500
85	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3
75	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3
65	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3
55	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.3
45	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.3
35	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2
25	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2
15	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2
5	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2

Vertical Plane 1
HORIZONTAL (ft)

VERTICAL (ft)	510	520	530	540	550	560	570	580	590	600
85	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
75	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.3	0.3	0.3
65	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.3	0.3	0.3
55	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.4	0.3	0.3
45	0.3	0.3	0.3	0.4	0.5	0.5	0.5	0.4	0.3	0.3
35	0.3	0.3	0.4	0.5	0.5	0.4	0.5	0.4	0.3	0.3
25	0.3	0.3	0.4	0.5	0.6	0.5	0.6	0.4	0.3	0.3
15	0.3	0.3	0.4	0.5	0.5	0.5	0.5	0.4	0.3	0.3
5	0.3	0.3	0.3	0.4	0.4	0.4	0.5	0.4	0.3	0.3

Vertical Plane 1
HORIZONTAL
(ft)

VERTICAL (ft)	610	620	630	640	650	660	670	680	690	700
85	0.3	0.3	0.4	0.3	0.4	0.4	0.4	0.4	0.4	0.4
75	0.3	0.3	0.4	0.3	0.4	0.4	0.4	0.4	0.4	0.4
65	0.3	0.3	0.4	0.3	0.3	0.4	0.4	0.4	0.4	0.4
55	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.4
45	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
35	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
25	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
15	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
5	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3

Vertical Plane 1
HORIZONTAL
(ft)

VERTICAL (ft)	710	720	730	740	750	760	770	780	790	800
85	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.5	0.5	0.5
75	0.4	0.4	0.4	0.4	0.4	0.5	0.5	0.5	0.5	0.5
65	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
55	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
45	0.4	0.3	0.4	0.3	0.4	0.3	0.3	0.3	0.3	0.3
35	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
25	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
15	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
5	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3

Vertical Plane 1
HORIZONTAL
(ft)

VERTICAL (ft)	810	820	830	840	850	860	870	880	890	900
85	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
75	0.5	0.5	0.4	0.4	0.5	0.5	0.5	0.5	0.5	0.5
65	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.5	0.5	0.5
55	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
45	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.4
35	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.4
25	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.4	0.4
15	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.4
5	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.3	0.4	0.4

Vertical Plane 1

VERTICAL (ft) \ HORIZONTAL (ft)	910	920	930	940	950	960	970	980	990	1000
85	0.5	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.7	0.7
75	0.5	0.5	0.5	0.6	0.6	0.6	0.6	0.7	0.7	0.7
65	0.5	0.5	0.5	0.5	0.5	0.5	0.6	0.6	0.6	0.7
55	0.4	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.6	0.6
45	0.4	0.4	0.4	0.4	0.4	0.5	0.5	0.5	0.5	0.6
35	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.5	0.6
25	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.5	0.5
15	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.5
5	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.5

Vertical Plane 2

VERTICAL (ft) \ HORIZONTAL (ft)	0	10	20	30	40	50	60	70	80	90	100
85	0.5	0.6	0.6	0.7	0.8	1.0	1.1	1.2	1.2	1.1	0.7
75	0.5	0.6	0.7	0.8	0.9	1.1	1.3	1.4	1.6	1.4	0.9
65	0.5	0.6	0.7	0.8	0.9	1.1	1.3	1.6	1.7	1.6	1.0
55	0.5	0.5	0.6	0.7	0.9	1.1	1.3	1.6	1.8	1.7	1.0
45	0.4	0.5	0.6	0.7	0.8	1.0	1.2	1.4	1.6	1.5	0.9
35	0.4	0.5	0.6	0.6	0.8	0.9	1.1	1.2	1.3	1.1	0.7
25	0.4	0.5	0.5	0.6	0.7	0.8	0.9	1.0	1.0	0.8	0.5
15	0.4	0.4	0.5	0.5	0.6	0.7	0.7	0.8	0.7	0.6	0.3
5	0.4	0.4	0.4	0.5	0.5	0.5	0.6	0.6	0.5	0.4	0.2

Vertical Plane 2

VERTICAL (ft) \ HORIZONTAL (ft)	110	120	130	140	150	160	170	180	190	200
85	0.2	0.4	0.9	1.2	1.2	1.1	1.0	0.9	0.8	0.7
75	0.2	0.5	1.2	1.5	1.5	1.4	1.2	1.0	0.9	0.7
65	0.2	0.5	1.4	1.8	1.7	1.5	1.3	1.1	0.9	0.8
55	0.2	0.5	1.5	1.8	1.7	1.5	1.3	1.0	0.9	0.8
45	0.1	0.4	1.2	1.6	1.5	1.3	1.1	0.9	0.7	0.6
35	0.1	0.3	1.0	1.2	1.3	1.1	0.9	0.8	0.6	0.5
25	0.1	0.2	0.7	0.9	1.0	0.9	0.8	0.7	0.6	0.5
15	0.1	0.2	0.5	0.7	0.7	0.7	0.6	0.6	0.5	0.4
5	0.1	0.1	0.3	0.5	0.5	0.6	0.5	0.5	0.4	0.4

Vertical Plane 2

HORIZONTAL (ft) / VERTICAL (ft)	210	220	230	240	250	260	270	280	290	300
85	0.6	0.6	0.5	0.5	0.5	0.5	0.4	0.4	0.4	0.4
75	0.7	0.6	0.5	0.5	0.5	0.5	0.5	0.4	0.4	0.4
65	0.7	0.6	0.5	0.5	0.5	0.5	0.4	0.4	0.4	0.4
55	0.6	0.6	0.5	0.5	0.5	0.4	0.4	0.4	0.4	0.4
45	0.5	0.4	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.2
35	0.4	0.3	0.3	0.2	0.2	0.2	0.1	0.1	0.1	0.1
25	0.4	0.3	0.3	0.2	0.2	0.2	0.1	0.1	0.1	0.1
15	0.3	0.3	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1
5	0.3	0.3	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1

Vertical Plane 2

HORIZONTAL (ft) / VERTICAL (ft)	310	320	330	340	350	360	370	380	390	400
85	0.4	0.4	0.4	0.4	0.4	0.5	0.5	0.5	0.5	0.5
75	0.4	0.4	0.4	0.4	0.4	0.5	0.4	0.5	0.5	0.4
65	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.5	0.5
55	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
45	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
35	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0
25	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0
15	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0
5	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.0	0.0

Vertical Plane 2

HORIZONTAL (ft) / VERTICAL (ft)	410	420	430	440	450	460	470	480	490	500
85	0.5	0.5	0.5	0.5	0.6	0.6	0.6	0.6	0.7	0.7
75	0.5	0.5	0.5	0.5	0.5	0.6	0.6	0.7	0.6	0.7
65	0.5	0.5	0.5	0.5	0.6	0.6	0.6	0.6	0.6	0.7
55	0.5	0.5	0.5	0.5	0.6	0.6	0.6	0.6	0.6	0.6
45	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3
35	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
25	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
15	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5	0.1	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1

Vertical Plane 2
HORIZONTAL (ft)

VERTICAL (ft)	510	520	530	540	550	560	570	580	590	600
85	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
75	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
65	0.7	0.6	0.6	0.6	0.7	0.6	0.7	0.6	0.7	0.7
55	0.7	0.6	0.6	0.6	0.6	0.7	0.7	0.7	0.7	0.7
45	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
35	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1
25	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1
15	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
5	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1

Vertical Plane 2
HORIZONTAL (ft)

VERTICAL (ft)	610	620	630	640	650	660	670	680	690	700
85	0.7	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8
75	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8
65	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
55	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.8	0.7	0.7
45	0.5	0.5	0.5	0.5	0.5	0.6	0.5	0.5	0.5	0.5
35	0.1	0.1	0.2	0.3	0.4	0.4	0.4	0.3	0.2	0.1
25	0.1	0.1	0.2	0.2	0.3	0.3	0.2	0.2	0.1	0.1
15	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.1	0.1	0.1
5	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.1	0.1	0.1

Vertical Plane 2

HORIZONTAL (ft) / VERTICAL (ft)	710	720	730	740	750	760	770	780	790	800
85	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.9
75	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.9
65	0.7	0.7	0.7	0.7	0.7	0.7	0.8	0.8	0.8	0.8
55	0.8	0.7	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.9
45	0.5	0.5	0.5	0.5	0.5	0.5	0.6	0.6	0.6	0.6
35	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3
25	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3
15	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3
5	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3

Vertical Plane 2
HORIZONTAL
(ft)

VERTICAL (ft)	810	820	830	840	850	860	870	880	890	900
85	0.7	0.8	0.8	0.8	0.8	0.9	0.9	1.0	1.1	1.2
75	0.7	0.7	0.8	0.8	0.8	0.9	0.9	1.0	1.1	1.2
65	0.7	0.7	0.7	0.8	0.8	0.8	0.9	1.0	1.1	1.1
55	0.7	0.8	0.8	0.8	0.8	0.9	1.0	1.0	1.1	1.2
45	0.5	0.5	0.5	0.5	0.6	0.6	0.7	0.7	0.8	0.9
35	0.2	0.2	0.3	0.3	0.3	0.4	0.4	0.5	0.6	0.7
25	0.2	0.2	0.3	0.3	0.3	0.4	0.4	0.5	0.6	0.7
15	0.2	0.2	0.3	0.3	0.3	0.4	0.4	0.5	0.6	0.6
5	0.2	0.2	0.3	0.3	0.3	0.4	0.4	0.5	0.5	0.6

Vertical Plane 2
HORIZONTAL
(ft)

VERTICAL (ft)	910	920	930	940	950	960	970	980	990	1000
85	1.3	1.5	1.7	2.0	2.3	2.9	3.6	4.7	6.4	9.0
75	1.3	1.5	1.7	2.0	2.4	3.0	3.8	5.0	6.9	9.8
65	1.3	1.5	1.7	2.0	2.4	3.0	3.7	4.9	6.8	9.7
55	1.3	1.5	1.7	2.0	2.4	2.9	3.6	4.7	6.3	8.6
45	1.1	1.2	1.5	1.7	2.1	2.6	3.2	4.1	5.4	7.0
35	0.8	1.0	1.1	1.4	1.7	2.1	2.6	3.2	4.2	5.2
25	0.8	0.9	1.1	1.3	1.5	1.9	2.3	2.8	3.4	4.1
15	0.7	0.9	1.0	1.2	1.4	1.7	2.0	2.4	2.8	3.2
5	0.7	0.8	1.0	1.1	1.3	1.5	1.8	2.1	2.4	2.6

Vertical Plane 2
HORIZONTAL
(ft)

VERTICAL (ft)	1010	1020	1030	1040	1050	1060	1070	1080	1090	1100
85	13.3	20.1	30.7	44.0	0.4	50.7	36.7	24.0	15.7	10.5
75	14.9	24.0	41.7	83.2	0.2	99.0	51.1	29.2	18.0	11.6
65	14.4	22.6	36.4	62.6	0.2	74.0	44.3	27.3	17.4	11.4
55	12.3	17.3	22.7	19.7	1.1	22.1	26.6	20.5	14.5	10.2
45	9.4	11.9	12.9	8.0	0.9	8.9	14.8	13.9	11.0	8.2
35	6.6	7.7	7.6	4.4	0.5	4.7	8.6	8.9	7.6	6.0
25	4.9	5.3	4.9	2.8	0.5	3.0	5.5	6.0	5.5	4.6
15	3.5	3.7	3.1	1.7	0.4	1.8	3.4	4.0	4.0	3.6
5	2.7	2.6	2.1	1.1	0.3	1.1	2.3	2.8	3.0	2.8

Vertical Plane 2
HORIZONTAL (ft)

VERTICAL (ft)	1110	1120	1130	1140	1150	1160	1170	1180	1190	1200
85	7.4	5.4	4.2	3.4	2.8	2.4	2.1	1.8	1.6	1.5
75	8.0	5.7	4.3	3.4	2.8	2.4	2.0	1.8	1.6	1.4
65	7.8	5.6	4.2	3.3	2.7	2.2	1.9	1.7	1.5	1.3
55	7.2	5.4	4.1	3.2	2.7	2.2	1.9	1.7	1.5	1.3
45	6.2	4.7	3.7	3.0	2.5	2.1	1.8	1.6	1.4	1.3
35	4.7	3.7	2.9	2.3	1.8	1.5	1.2	1.0	0.9	0.8
25	3.8	3.1	2.5	2.1	1.7	1.4	1.2	1.0	0.9	0.8
15	3.1	2.6	2.2	1.8	1.6	1.3	1.1	1.0	0.8	0.7
5	2.6	2.2	2.0	1.7	1.4	1.2	1.1	0.9	0.8	0.7

Vertical Plane 2
HORIZONTAL (ft)

VERTICAL (ft)	1210	1220	1230	1240	1250	1260	1270	1280	1290	1300
85	1.4	1.3	1.2	1.1	1.0	1.0	0.9	0.9	0.8	0.8
75	1.3	1.2	1.1	1.1	1.0	0.9	0.9	0.8	0.8	0.8
65	1.2	1.1	1.0	1.0	0.9	0.8	0.8	0.8	0.7	0.7
55	1.2	1.1	1.0	1.0	0.9	0.8	0.8	0.7	0.7	0.7
45	1.2	1.1	1.0	0.9	0.8	0.8	0.7	0.7	0.7	0.6
35	0.7	0.6	0.5	0.5	0.4	0.4	0.4	0.3	0.3	0.3
25	0.7	0.6	0.5	0.5	0.5	0.4	0.4	0.4	0.4	0.4
15	0.7	0.6	0.5	0.5	0.4	0.4	0.4	0.4	0.4	0.4
5	0.6	0.6	0.5	0.5	0.4	0.4	0.4	0.4	0.4	0.3

Vertical Plane 2
HORIZONTAL (ft)

VERTICAL (ft)	1310	1320	1330	1340	1350	1360	1370	1380	1390	1400
85	0.8	0.8	0.7	0.7	0.7	0.7	0.8	0.8	0.8	0.8
75	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.8	0.8	0.8
65	0.7	0.7	0.7	0.7	0.6	0.6	0.7	0.7	0.7	0.8
55	0.6	0.6	0.6	0.6	0.6	0.6	0.7	0.7	0.7	0.8
45	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.7	0.7	0.8
35	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.5	0.6	0.7
25	0.3	0.4	0.4	0.4	0.4	0.4	0.5	0.5	0.6	0.7
15	0.3	0.4	0.4	0.4	0.4	0.4	0.5	0.5	0.6	0.7
5	0.3	0.4	0.4	0.4	0.4	0.4	0.5	0.5	0.6	0.7

Vertical Plane 2
HORIZONTAL
(ft)

VERTICAL (ft)	1410	1420	1430	1440	1450	1460	1470	1480	1490	1500
85	0.9	0.9	1.0	1.0	1.1	1.2	1.3	1.4	1.4	1.5
75	0.9	0.9	1.0	1.0	1.1	1.2	1.3	1.4	1.5	1.6
65	0.8	0.9	1.0	1.1	1.1	1.2	1.3	1.4	1.5	1.6
55	0.9	1.0	1.0	1.1	1.2	1.3	1.4	1.5	1.6	1.7
45	0.9	1.0	1.1	1.2	1.3	1.4	1.4	1.5	1.5	1.6
35	0.8	0.9	1.1	1.2	1.3	1.3	1.4	1.4	1.5	1.6
25	0.9	1.0	1.2	1.3	1.4	1.5	1.5	1.5	1.6	1.6
15	0.9	1.1	1.3	1.4	1.6	1.6	1.5	1.5	1.6	1.6
5	0.9	1.1	1.3	1.4	1.5	1.5	1.5	1.4	1.5	1.5

Vertical Plane 2
HORIZONTAL
(ft)

VERTICAL (ft)	1510	1520	1530	1540	1550	1560	1570	1580	1590	1600
85	1.6	1.7	1.8	1.8	1.9	1.9	2.0	2.0	2.1	2.1
75	1.6	1.7	1.8	1.9	2.0	2.0	2.1	2.1	2.1	2.2
65	1.7	1.7	1.8	1.9	2.0	2.0	2.1	2.2	2.2	2.2
55	1.7	1.8	1.9	1.9	2.0	2.0	2.1	2.2	2.3	2.3
45	1.7	1.8	1.9	1.9	2.0	2.0	2.1	2.1	2.2	2.2
35	1.7	1.7	1.8	1.9	1.9	2.0	2.1	2.1	2.2	2.2
25	1.7	1.7	1.8	1.9	2.0	2.0	2.1	2.1	2.2	2.2
15	1.6	1.7	1.8	1.8	1.9	1.9	2.0	2.1	2.1	2.1
5	1.6	1.6	1.7	1.7	1.8	1.8	1.9	1.9	1.9	2.0

Vertical Plane 2
HORIZONTAL
(ft)

VERTICAL (ft)	1610	1620	1630	1640	1650	1660	1670	1680	1690	1700
85	2.1	2.1	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2
75	2.2	2.2	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3
65	2.3	2.3	2.3	2.4	2.3	2.3	2.4	2.4	2.4	2.4
55	2.3	2.3	2.4	2.3	2.3	2.4	2.4	2.4	2.4	2.4
45	2.2	2.2	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3
35	2.2	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3
25	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3
15	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2
5	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.0

Vertical Plane 2
HORIZONTAL
(ft)

VERTICAL (ft)	1710	1720	1730	1740	1750	1760	1770	1780	1790	1800
85	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.3	2.4
75	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.4	2.4	2.5
65	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.5	2.5
55	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.5
45	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.4	2.3	2.4
35	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.4	2.4	2.5
25	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.4	2.4	2.4
15	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.3	2.3
5	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.2

Vertical Plane 2
HORIZONTAL
(ft)

VERTICAL (ft)	1810	1820	1830	1840	1850	1860	1870	1880	1890	1900
85	2.4	2.5	2.6	2.8	3.0	3.2	3.6	3.9	4.3	4.7
75	2.5	2.6	2.7	2.9	3.2	3.4	3.8	4.2	4.7	5.2
65	2.6	2.7	2.8	3.0	3.3	3.6	4.0	4.4	4.9	5.5
55	2.6	2.7	2.9	3.1	3.4	3.7	4.1	4.5	5.2	5.7
45	2.5	2.6	2.8	3.0	3.3	3.6	4.0	4.5	5.2	5.7
35	2.5	2.6	2.8	3.0	3.3	3.6	4.0	4.5	5.2	5.8
25	2.6	2.7	2.8	3.0	3.3	3.6	4.0	4.5	5.1	5.7
15	2.4	2.5	2.7	2.9	3.1	3.5	3.8	4.3	4.8	5.4
5	2.3	2.4	2.5	2.7	2.9	3.3	3.6	4.0	4.5	5.1

Vertical Plane 2
HORIZONTAL
(ft)

VERTICAL (ft)	1910	1920	1930	1940	1950	1960	1970	1980	1990	2000
85	5.1	5.5	5.9	6.2	6.3	6.3	6.2	6.1	6.1	6.0
75	5.6	6.1	6.4	6.7	6.9	6.9	6.8	6.7	6.6	6.5
65	6.0	6.5	6.9	7.2	7.4	7.4	7.3	7.2	7.1	6.9
55	6.3	6.8	7.3	7.7	7.8	7.8	7.7	7.5	7.4	7.2
45	6.3	6.9	7.4	7.8	7.9	7.9	7.7	7.6	7.4	7.2
35	6.4	7.0	7.5	7.8	8.0	8.0	7.7	7.6	7.5	7.2
25	6.3	6.8	7.3	7.7	7.9	7.9	7.7	7.6	7.4	7.2
15	6.0	6.6	7.0	7.3	7.5	7.5	7.4	7.2	7.1	7.0
5	5.5	6.1	6.5	6.8	7.0	7.0	6.9	6.8	6.7	6.5

Vertical Plane 2
HORIZONTAL

VERTICAL (ft) \ (ft)	2010	2020	2030	2040	2050	2060	2070	2080	2090	2100
85	5.8	5.6	5.3	5.1	4.8	4.5	4.2	3.9	3.6	3.4
75	6.2	6.0	5.7	5.4	5.1	4.7	4.4	4.1	3.8	3.5
65	6.6	6.3	6.0	5.6	5.3	4.9	4.5	4.2	3.9	3.6
55	6.9	6.6	6.2	5.8	5.4	5.0	4.6	4.3	4.0	3.7
45	6.9	6.6	6.2	5.8	5.4	5.0	4.6	4.2	3.9	3.6
35	6.9	6.6	6.2	5.8	5.4	5.0	4.6	4.2	3.9	3.6
25	6.9	6.6	6.2	5.8	5.4	5.1	4.6	4.3	4.0	3.6
15	6.7	6.4	6.0	5.6	5.3	4.9	4.5	4.2	3.9	3.6
5	6.3	6.0	5.7	5.4	5.1	4.7	4.4	4.1	3.7	3.5

Vertical Plane 2
HORIZONTAL

VERTICAL (ft) \ (ft)	2110	2120	2130	2140	2150	2160	2170	2180	2190	2200
85	3.1	2.9	2.7	2.5	2.3	2.2	2.0	1.9	1.8	1.7
75	3.2	3.0	2.8	2.6	2.4	2.2	2.1	1.9	1.8	1.7
65	3.3	3.1	2.8	2.6	2.4	2.2	2.1	1.9	1.8	1.7
55	3.4	3.1	2.8	2.6	2.4	2.3	2.1	2.0	1.8	1.7
45	3.3	3.0	2.8	2.6	2.4	2.2	2.0	1.9	1.8	1.7
35	3.3	3.0	2.8	2.5	2.4	2.2	2.0	1.9	1.8	1.7
25	3.3	3.1	2.9	2.6	2.4	2.2	2.1	1.9	1.8	1.7
15	3.3	3.0	2.8	2.6	2.4	2.2	2.0	1.9	1.8	1.7
5	3.2	2.9	2.7	2.5	2.3	2.2	2.0	1.9	1.7	1.6

Vertical Plane 2
HORIZONTAL

VERTICAL (ft) \ (ft)	2210	2220	2230	2240	2250	2260	2270	2280	2290	2300
85	1.6	1.5	1.5	1.4	1.5	1.5	1.5	1.7	1.9	2.2
75	1.6	1.6	1.5	1.5	1.5	1.5	1.6	1.8	2.2	2.7
65	1.6	1.6	1.5	1.5	1.5	1.6	1.7	2.0	2.4	3.2
55	1.6	1.6	1.5	1.5	1.5	1.6	1.7	2.0	2.5	3.3
45	1.6	1.5	1.5	1.4	1.5	1.5	1.6	1.9	2.3	3.0
35	1.6	1.5	1.4	1.4	1.4	1.4	1.5	1.7	2.0	2.5
25	1.6	1.5	1.5	1.4	1.4	1.5	1.5	1.6	1.8	2.0
15	1.6	1.5	1.4	1.4	1.4	1.4	1.4	1.4	1.5	1.6
5	1.5	1.5	1.4	1.4	1.3	1.3	1.3	1.3	1.3	1.3

Vertical Plane 2

VERTICAL (ft) \ HORIZONTAL (ft)	2310	2320	2330	2340	2350	2360	2370	2380	2390	2400
85	2.3	2.2	1.2	0.7	1.6	2.2	2.1	1.8	1.5	1.2
75	3.3	3.5	1.8	0.7	2.9	3.7	3.0	2.3	1.6	1.1
65	4.3	5.2	2.8	0.7	4.7	5.1	3.5	2.3	1.6	1.1
55	4.7	5.8	3.2	0.7	5.4	5.8	3.8	2.5	1.6	1.1
45	4.0	4.7	2.5	0.7	4.2	4.7	3.3	2.2	1.5	1.1
35	2.9	3.0	1.6	0.7	2.3	3.0	2.4	1.8	1.3	1.0
25	2.1	1.9	1.1	0.7	1.4	1.8	1.6	1.3	1.0	0.8
15	1.6	1.4	0.9	0.7	0.9	1.2	1.0	0.9	0.8	0.7
5	1.3	1.1	0.8	0.7	0.7	0.8	0.7	0.7	0.6	0.6

Vertical Plane 2

VERTICAL (ft) \ HORIZONTAL (ft)	2410	2420	2430	2440	2450	2460	2470	2480	2490	2500	2510	2520
85	1.0	0.8	0.8	0.7	0.6	0.6	0.5	0.5	0.5	0.5	0.5	0.5
75	0.8	0.7	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.4	0.4
65	0.8	0.7	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.4	0.4	0.4
55	0.8	0.7	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.4	0.4	0.4
45	0.8	0.7	0.6	0.5	0.5	0.5	0.5	0.5	0.4	0.4	0.4	0.4
35	0.8	0.6	0.5	0.5	0.5	0.5	0.5	0.4	0.4	0.4	0.4	0.4
25	0.7	0.6	0.5	0.5	0.5	0.5	0.5	0.5	0.4	0.4	0.4	0.4
15	0.6	0.5	0.5	0.4	0.4	0.5	0.5	0.4	0.4	0.4	0.4	0.4
5	0.5	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4

Vertical Plane 3

VERTICAL (ft) \ HORIZONTAL (ft)	0	10	20	30	40	50	60	70	80	90	100
85	1.0	1.0	1.0	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9
75	1.0	1.0	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9
65	1.0	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9
55	1.0	0.9	0.9	0.8	0.8	0.9	0.9	0.8	0.8	0.9	0.9
45	0.9	0.9	0.9	0.9	0.9	0.8	0.8	0.8	0.8	0.8	0.8
35	0.9	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8
25	1.0	0.9	0.9	0.9	0.9	0.8	0.8	0.8	0.7	0.8	0.9
15	1.0	0.9	0.8	0.8	0.8	0.9	0.9	0.8	0.8	0.8	0.8
5	0.9	0.9	0.9	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8

Vertical Plane 3
HORIZONTAL (ft)

VERTICAL (ft)	110	120	130	140	150	160	170	180	190	200
85	0.9	0.9	1.0	1.1	1.2	1.2	1.3	1.2	1.0	0.7
75	0.9	1.0	1.0	1.1	1.2	1.3	1.4	1.4	1.2	0.8
65	0.9	1.0	1.1	1.2	1.3	1.4	1.5	1.6	1.4	0.9
55	0.9	1.0	1.1	1.2	1.3	1.4	1.5	1.6	1.4	0.9
45	0.9	0.9	1.0	1.1	1.2	1.4	1.5	1.4	1.3	0.8
35	0.9	0.9	1.0	1.1	1.2	1.3	1.3	1.3	1.1	0.7
25	0.9	0.9	1.0	1.0	1.1	1.2	1.2	1.1	1.0	0.7
15	0.8	0.9	0.9	1.0	1.0	1.0	1.0	1.0	0.9	0.6
5	0.8	0.8	0.9	0.9	0.9	0.9	0.9	0.9	0.7	0.5

Vertical Plane 3
HORIZONTAL (ft)

VERTICAL (ft)	210	220	230	240	250	260	270	280	290	300
85	0.5	0.7	1.0	1.3	1.3	1.3	1.1	1.0	0.9	0.8
75	0.4	0.7	1.2	1.5	1.5	1.5	1.3	1.1	0.9	0.8
65	0.4	0.8	1.3	1.6	1.6	1.3	1.1	0.9	0.8	0.8
55	0.4	0.8	1.4	1.7	1.7	1.3	1.1	0.9	0.8	0.8
45	0.4	0.7	1.3	1.6	1.6	1.3	1.1	0.9	0.8	0.8
35	0.4	0.6	1.1	1.3	1.4	1.1	1.0	0.8	0.8	0.8
25	0.4	0.6	0.9	1.1	1.2	0.9	0.9	0.8	0.7	0.8
15	0.4	0.6	0.8	0.9	0.9	0.8	0.7	0.7	0.6	0.7
5	0.4	0.5	0.6	0.8	0.8	0.6	0.6	0.6	0.6	0.7

Vertical Plane 3
HORIZONTAL (ft)

VERTICAL (ft)	310	320	330	340	350	360	370	380	390	400
85	0.7	0.6	0.6	0.5	0.5	0.4	0.4	0.4	0.4	0.3
75	0.8	0.7	0.6	0.6	0.5	0.5	0.4	0.4	0.3	0.3
65	0.8	0.7	0.6	0.6	0.6	0.5	0.4	0.4	0.3	0.3
55	0.8	0.8	0.7	0.8	0.8	0.7	0.5	0.4	0.4	0.3
45	0.8	0.8	0.8	1.1	1.6	1.4	0.6	0.4	0.3	0.3
35	0.8	0.8	1.0	1.7	4.2	3.8	0.9	0.3	0.4	0.3
25	0.8	0.8	1.2	2.4	6.1	5.2	1.1	0.4	0.3	0.2
15	0.7	0.9	1.2	2.5	5.8	4.4	0.9	0.3	0.3	0.2
5	0.7	0.8	1.1	1.8	3.1	2.2	0.5	0.3	0.3	0.2

Vertical Plane 3
HORIZONTAL (ft)

VERTICAL (ft)	410	420	430	440
85	0.3	0.3	0.3	0.3
75	0.3	0.3	0.3	0.3
65	0.3	0.3	0.3	0.3
55	0.3	0.3	0.3	0.3
45	0.3	0.3	0.2	0.2
35	0.3	0.2	0.2	0.2
25	0.2	0.2	0.2	0.2
15	0.2	0.2	0.2	0.2
5	0.2	0.2	0.2	0.2

Vertical Plane 4
HORIZONTAL (ft)

VERTICAL (ft)	0	10	20	30	40	50	60	70	80	90	100
85	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.3	0.4
75	0.3	0.3	0.3	0.3	0.4	0.3	0.3	0.4	0.3	0.3	0.3
65	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.4
55	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
45	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
35	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
25	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
15	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
5	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3

Vertical Plane 4
HORIZONTAL (ft)

VERTICAL (ft)	110	120	130	140	150	160	170	180	190	200
85	0.3	0.4	0.3	0.4	0.4	0.3	0.4	0.4	0.3	0.4
75	0.3	0.4	0.3	0.4	0.4	0.3	0.3	0.3	0.3	0.3
65	0.3	0.4	0.3	0.4	0.4	0.4	0.4	0.3	0.3	0.4
55	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
45	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
35	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
25	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
15	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
5	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3

Vertical Plane 4
HORIZONTAL (ft)

VERTICAL (ft)	210	220	230	240	250	260	270	280	290	300
85	0.4	0.3	0.3	0.4	0.4	0.4	0.3	0.4	0.3	0.3
75	0.4	0.3	0.3	0.4	0.4	0.3	0.3	0.4	0.3	0.4
65	0.4	0.4	0.3	0.4	0.4	0.4	0.4	0.4	0.3	0.4
55	0.4	0.3	0.3	0.4	0.3	0.3	0.3	0.3	0.3	0.3
45	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
35	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
25	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
15	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
5	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3

Vertical Plane 4
HORIZONTAL (ft)

VERTICAL (ft)	310	320	330	340	350	360	370	380	390	400
85	0.3	0.3	0.4	0.3	0.3	0.3	0.3	0.4	0.3	0.3
75	0.3	0.4	0.4	0.3	0.4	0.3	0.3	0.4	0.4	0.3
65	0.3	0.4	0.3	0.3	0.4	0.3	0.3	0.4	0.3	0.4
55	0.3	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.4
45	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
35	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
25	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
15	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
5	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3

Vertical Plane 4
HORIZONTAL (ft)

VERTICAL (ft)	410	420	430	440	450	460	470	480	490	500
85	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
75	0.3	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
65	0.3	0.4	0.3	0.3	0.3	0.4	0.3	0.3	0.3	0.3
55	0.3	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
45	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
35	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
25	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.2
15	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.2
5	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.1

Vertical Plane 4
HORIZONTAL (ft)

VERTICAL (ft)	510	520	530	540	550	560	570	580	590	600
85	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
75	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
65	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
55	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
45	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
35	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
25	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
15	0.2	0.2	0.2	0.2	0.2	0.1	0.0	0.0	0.0	0.0
5	0.2	0.2	0.2	0.2	0.1	0.1	0.0	0.0	0.0	0.0

Vertical Plane 4
HORIZONTAL (ft)

VERTICAL (ft)	610	620	630	640	650	660	670	680	690	700
85	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
75	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
65	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
55	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
45	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
35	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.2
25	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
15	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Vertical Plane 4
HORIZONTAL (ft)

VERTICAL (ft)	710	720	730	740	750	760	770	780	790	800
85	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
75	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
65	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.2
55	0.2	0.2	0.3	0.2	0.2	0.3	0.2	0.2	0.2	0.2
45	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.3	0.2
35	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
25	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
15	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Vertical Plane 4
HORIZONTAL (ft)

VERTICAL (ft)	810	820	830	840	850	860	870	880	890	900
85	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
75	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
65	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
55	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
45	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
35	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
25	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1
15	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Vertical Plane 4
HORIZONTAL (ft)

VERTICAL (ft)	910	920	930	940	950	960	970	980	990	1000
85	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
75	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
65	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
55	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
45	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
35	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1
25	0.1	0.2	0.2	0.1	0.1	0.1	0.2	0.2	0.1	0.1
15	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1
5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Vertical Plane 4
HORIZONTAL (ft)

VERTICAL (ft)	1010	1020	1030	1040	1050	1060	1070	1080	1090	1100
85	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1
75	0.2	0.2	0.2	0.2	0.1	0.1	0.2	0.2	0.2	0.1
65	0.2	0.2	0.2	0.2	0.1	0.2	0.2	0.1	0.2	0.1
55	0.2	0.2	0.2	0.2	0.1	0.1	0.2	0.1	0.1	0.1
45	0.2	0.2	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1
35	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
25	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
15	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Vertical Plane 4
HORIZONTAL (ft)

VERTICAL (ft)	1110	1120	1130	1140	1150	1160	1170	1180	1190	1200
85	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
75	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
65	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
55	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
45	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
35	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
25	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
15	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Vertical Plane 4
HORIZONTAL (ft)

VERTICAL (ft)	1210	1220	1230	1240	1250	1260	1270	1280	1290	1300
85	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
75	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
65	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
55	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
45	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
35	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
25	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
15	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Vertical Plane 4
HORIZONTAL (ft)

VERTICAL (ft)	1310	1320	1330	1340	1350	1360	1370	1380	1390	1400
85	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
75	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
65	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
55	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
45	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
35	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
25	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
15	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Vertical Plane 4
HORIZONTAL (ft)

VERTICAL (ft)	1410	1420	1430	1440	1450	1460	1470	1480	1490	1500
85	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
75	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
65	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
55	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
45	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
35	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
25	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
15	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Vertical Plane 4
HORIZONTAL (ft)

VERTICAL (ft)	1510	1520	1530	1540	1550	1560	1570	1580	1590	1600
85	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
75	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
65	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
55	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
45	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
35	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
25	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.1
15	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Vertical Plane 4
HORIZONTAL (ft)

VERTICAL (ft)	1610	1620	1630	1640	1650	1660	1670	1680	1690	1700
85	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
75	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
65	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
55	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
45	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
35	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
25	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
15	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Vertical Plane 4
HORIZONTAL (ft)

VERTICAL (ft)	1710	1720	1730	1740	1750	1760	1770	1780	1790	1800
85	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
75	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
65	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
55	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
45	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.0
35	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
25	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1
15	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Vertical Plane 4
HORIZONTAL (ft)

VERTICAL (ft)	1810	1820	1830	1840	1850	1860	1870	1880	1890	1900
85	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
75	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
65	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
55	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
45	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
35	0.1	0.1	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0
25	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
15	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Vertical Plane 4
HORIZONTAL (ft)

VERTICAL (ft)	1910	1920	1930	1940	1950	1960	1970	1980	1990	2000
85	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
75	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
65	0.1	0.1	0.1	0.0	0.0	0.1	0.1	0.0	0.0	0.0
55	0.1	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0
45	0.1	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.1	0.0
35	0.0	0.0	0.1	0.0	0.0	0.1	0.0	0.0	0.0	0.0
25	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
15	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Vertical Plane 4
HORIZONTAL (ft)

VERTICAL (ft)	2010	2020	2030	2040	2050	2060	2070	2080	2090	2100
85	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0
75	0.1	0.1	0.1	0.0	0.1	0.1	0.0	0.0	0.0	0.0
65	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
55	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
45	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
35	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
25	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
15	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Vertical Plane 4
HORIZONTAL (ft)

VERTICAL (ft)	2110	2120	2130	2140	2150	2160	2170	2180	2190	2200
85	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
75	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
65	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
55	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
45	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
35	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
25	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
15	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Vertical Plane 4
HORIZONTAL (ft)

VERTICAL (ft)	2210	2220	2230	2240	2250	2260	2270	2280	2290	2300
85	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
75	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
65	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
55	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
45	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
35	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
25	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
15	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Vertical Plane 4
HORIZONTAL (ft)

VERTICAL (ft)	2310	2320	2330	2340	2350	2360	2370	2380	2390	2400
85	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
75	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
65	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
55	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
45	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
35	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
25	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
15	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Vertical Plane 4
HORIZONTAL (ft)

VERTICAL (ft)	2410	2420	2430	2440	2450	2460
85	0.0	0.0	0.0	0.0	0.0	0.0
75	0.0	0.0	0.0	0.0	0.0	0.0
65	0.0	0.0	0.0	0.0	0.0	0.0
55	0.0	0.0	0.0	0.0	0.0	0.0
45	0.0	0.0	0.0	0.0	0.0	0.0
35	0.0	0.0	0.0	0.0	0.0	0.0
25	0.0	0.0	0.0	0.0	0.0	0.0
15	0.0	0.0	0.0	0.0	0.0	0.0
5	0.0	0.0	0.0	0.0	0.0	0.0

APPENDIX J: Building Lighting Illuminance Calculation (fc)

Building Lighting illuminance data presented below is derived from the lighting illuminance calculations prepared as per the methods described in Section 6.3 above. Illuminance data is presented in the following tables with location coordinates defined relative to the elevation and horizontal distance from lower left, viewing from the Property to the vertical plane where light trespass is under review. Grid data is displayed at five feet on center, vertical and horizontal.

Vertical Plane 1

VERTICAL (ft) \ HORIZONTAL (ft)	0	10	20	30	40	50	60	70	80	90	100
85	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
75	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
65	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
55	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
45	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2
35	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2
25	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.3
15	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.3	0.3
5	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.3	0.3	0.3

Vertical Plane 1

VERTICAL (ft) \ HORIZONTAL (ft)	110	120	130	140	150	160	170	180	190	200
85	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
75	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
65	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
55	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
45	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
35	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.2
25	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.2
15	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
5	0.3	0.3	0.3	0.4	0.3	0.3	0.3	0.3	0.3	0.3

Vertical Plane 1

VERTICAL (ft) \ HORIZONTAL (ft)	210	220	230	240	250	260	270	280	290	300
85	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2
75	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2
65	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2
55	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
45	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
35	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3
25	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3
15	0.3	0.3	0.3	0.2	0.3	0.3	0.3	0.3	0.3	0.3
5	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.4

Vertical Plane 1
HORIZONTAL (ft)

VERTICAL (ft)	310	320	330	340	350	360	370	380	390	400
85	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
75	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
65	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
55	0.2	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
45	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.2
35	0.3	0.3	0.3	0.3	0.4	0.4	0.3	0.3	0.3	0.3
25	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
15	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
5	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4

Vertical Plane 1
HORIZONTAL (ft)

VERTICAL (ft)	410	420	430	440	450	460	470	480	490	500
85	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
75	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
65	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
55	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
45	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3
35	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
25	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.4
15	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.4
5	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.5

Vertical Plane 1
HORIZONTAL (ft)

VERTICAL (ft)	510	520	530	540	550	560	570	580	590	600
85	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
75	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
65	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
55	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
45	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
35	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
25	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
15	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5

Vertical Plane 1
HORIZONTAL (ft)

VERTICAL (ft)	610	620	630	640	650	660	670	680	690	700
85	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
75	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
65	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
55	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
45	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
35	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
25	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.4
15	0.4	0.4	0.4	0.3	0.3	0.4	0.4	0.4	0.4	0.4
5	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4

Vertical Plane 1
HORIZONTAL (ft)

VERTICAL (ft)	710	720	730	740	750	760	770	780	790	800
85	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1
75	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1
65	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1
55	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1
45	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
35	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.2
25	0.4	0.4	0.4	0.4	0.4	0.3	0.3	0.3	0.3	0.2
15	0.4	0.4	0.4	0.4	0.4	0.3	0.3	0.3	0.3	0.3
5	0.4	0.4	0.4	0.4	0.4	0.4	0.3	0.3	0.3	0.3

Vertical Plane 1
HORIZONTAL (ft)

VERTICAL (ft)	810	820	830	840	850	860	870	880	890	900
85	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
75	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
65	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
55	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
45	0.2	0.2	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2
35	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
25	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3
15	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3
5	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3

Vertical Plane 1

VERTICAL (ft) \ HORIZONTAL (ft)	910	920	930	940	950	960	970	980	990	1000	1010	1020	1030
85	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
75	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
65	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
55	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
45	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
35	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1
25	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1
15	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1
5	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1

Vertical Plane 2

VERTICAL (ft) \ HORIZONTAL (ft)	0	10	20	30	40	50	60	70	80	90	100
85	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
75	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
65	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
55	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
45	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2
35	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2
25	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.3
15	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.3	0.3
5	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3

Vertical Plane 2

VERTICAL (ft) \ HORIZONTAL (ft)	110	120	130	140	150	160	170	180	190	200
85	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
75	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
65	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
55	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
45	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
35	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.2
25	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.2
15	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.2
5	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.2

Vertical Plane 2
HORIZONTAL (ft)

VERTICAL (ft)	210	220	230	240	250	260	270	280	290	300
85	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
75	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
65	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
55	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
45	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
35	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.2
25	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.2
15	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.2
5	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2

Vertical Plane 2
HORIZONTAL (ft)

VERTICAL (ft)	310	320	330	340	350	360	370	380	390	400
85	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
75	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
65	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
55	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
45	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
35	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3
25	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3
15	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3
5	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3

Vertical Plane 2
HORIZONTAL (ft)

VERTICAL (ft)	410	420	430	440	450	460	470	480	490	500
85	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
75	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
65	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
55	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
45	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
35	0.3	0.3	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3
25	0.3	0.3	0.3	0.2	0.2	0.2	0.3	0.3	0.3	0.3
15	0.3	0.3	0.3	0.2	0.2	0.2	0.3	0.3	0.3	0.3
5	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3

Vertical Plane 2
HORIZONTAL (ft)

VERTICAL (ft)	510	520	530	540	550	560	570	580	590	600
85	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
75	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
65	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
55	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
45	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
35	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2
25	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.2
15	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.2
5	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2

Vertical Plane 2
HORIZONTAL (ft)

VERTICAL (ft)	610	620	630	640	650	660	670	680	690	700
85	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
75	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
65	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
55	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
45	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
35	0.2	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2
25	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.2
15	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.2
5	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2

Vertical Plane 2
HORIZONTAL (ft)

VERTICAL (ft)	710	720	730	740	750	760	770	780	790	800
85	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
75	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
65	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
55	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
45	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
35	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
25	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.2	0.2
15	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
5	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2

Vertical Plane 2
HORIZONTAL

VERTICAL (ft) \ HORIZONTAL (ft)	810	820	830	840	850	860	870	880	890	900
85	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
75	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
65	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
55	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
45	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
35	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
25	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3
15	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3
5	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2

Vertical Plane 2
HORIZONTAL

VERTICAL (ft) \ HORIZONTAL (ft)	910	920	930	940	950	960	970	980	990	1000
85	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
75	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
65	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
55	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
45	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
35	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3
25	0.3	0.3	0.3	0.2	0.2	0.2	0.3	0.3	0.3	0.3
15	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3
5	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3

Vertical Plane 2
HORIZONTAL

VERTICAL (ft) \ HORIZONTAL (ft)	1010	1020	1030	1040	1050	1060	1070	1080	1090	1100
85	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
75	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
65	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
55	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
45	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
35	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2
25	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.2
15	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.2
5	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2

Vertical Plane 2
HORIZONTAL

VERTICAL (ft) \ HORIZONTAL (ft)	1110	1120	1130	1140	1150	1160	1170	1180	1190	1200
85	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
75	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
65	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
55	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
45	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1
35	0.2	0.2	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.2
25	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.2
15	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.2
5	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2

Vertical Plane 2
HORIZONTAL

VERTICAL (ft) \ HORIZONTAL (ft)	1210	1220	1230	1240	1250	1260	1270	1280	1290	1300
85	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
75	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
65	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
55	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
45	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
35	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
25	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
15	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
5	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1

Vertical Plane 2
HORIZONTAL

VERTICAL (ft) \ HORIZONTAL (ft)	1310	1320	1330	1340	1350	1360	1370	1380	1390	1400
85	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
75	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
65	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
55	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
45	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2
35	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2
25	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.3	0.3	0.3
15	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.3
5	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2

Vertical Plane 2
HORIZONTAL

VERTICAL (ft) \ (ft)	1410	1420	1430	1440	1450	1460	1470	1480	1490	1500
85	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
75	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
65	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
55	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
45	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
35	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3
25	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3
15	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3
5	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2

Vertical Plane 2
HORIZONTAL

VERTICAL (ft) \ (ft)	1510	1520	1530	1540	1550	1560	1570	1580	1590	1600
85	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
75	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
65	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
55	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
45	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
35	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.2
25	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.2
15	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.2
5	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2

Vertical Plane 2
HORIZONTAL

VERTICAL (ft) \ (ft)	1610	1620	1630	1640	1650	1660	1670	1680	1690	1700
85	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
75	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
65	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
55	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
45	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
35	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.2
25	0.3	0.3	0.3	0.3	0.4	0.4	0.3	0.3	0.3	0.3
15	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
5	0.2	0.3	0.3	0.3	0.3	0.2	0.3	0.3	0.2	0.2

Vertical Plane 2
HORIZONTAL (ft)

VERTICAL (ft)	1710	1720	1730	1740	1750	1760	1770	1780	1790	1800
85	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
75	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
65	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
55	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
45	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
35	0.2	0.2	0.2	0.3	0.3	0.3	0.4	0.4	0.3	0.3
25	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.4
15	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
5	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3

Vertical Plane 2
HORIZONTAL (ft)

VERTICAL (ft)	1810	1820	1830	1840	1850	1860	1870	1880	1890	1900
85	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
75	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
65	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
55	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
45	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3
35	0.3	0.3	0.3	0.2	0.2	0.3	0.3	0.3	0.3	0.4
25	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.4
15	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.4
5	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3

Vertical Plane 2
HORIZONTAL (ft)

VERTICAL (ft)	1910	1920	1930	1940	1950	1960	1970	1980	1990	2000
85	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2
75	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2
65	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2
55	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2
45	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.3	0.3
35	0.4	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.4
25	0.4	0.4	0.4	0.4	0.4	0.3	0.3	0.4	0.4	0.4
15	0.4	0.4	0.4	0.4	0.4	0.3	0.3	0.4	0.4	0.4
5	0.3	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4

Vertical Plane 2
HORIZONTAL

VERTICAL (ft) \ HORIZONTAL (ft)	2010	2020	2030	2040	2050	2060	2070	2080	2090	2100
85	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
75	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
65	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
55	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
45	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
35	0.4	0.5	0.5	0.5	0.5	0.5	0.4	0.4	0.4	0.4
25	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.4	0.4	0.4
15	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.4	0.4
5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5

Vertical Plane 2
HORIZONTAL

VERTICAL (ft) \ HORIZONTAL (ft)	2110	2120	2130	2140	2150	2160	2170	2180	2190	2200
85	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
75	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
65	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
55	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
45	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.3
35	0.4	0.4	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
25	0.4	0.5	0.5	0.5	0.6	0.6	0.6	0.6	0.5	0.5
15	0.4	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
5	0.5	0.5	0.5	0.5	0.5	0.5	0.6	0.6	0.6	0.6

Vertical Plane 2
HORIZONTAL

VERTICAL (ft) \ HORIZONTAL (ft)	2210	2220	2230	2240	2250	2260	2270	2280	2290	2300
85	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
75	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
65	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
55	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
45	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.4
35	0.4	0.4	0.4	0.4	0.5	0.5	0.5	0.5	0.5	0.5
25	0.5	0.5	0.5	0.5	0.5	0.5	0.6	0.6	0.6	0.6
15	0.5	0.5	0.5	0.5	0.5	0.5	0.6	0.6	0.6	0.6
5	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6

Vertical Plane 2

HORIZONTAL (ft) / VERTICAL (ft)	2310	2320	2330	2340	2350	2360	2370	2380	2390	2400
85	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
75	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
65	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
55	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
45	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
35	0.5	0.5	0.4	0.4	0.4	0.3	0.3	0.4	0.4	0.4
25	0.5	0.5	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.4
15	0.5	0.5	0.5	0.5	0.4	0.4	0.4	0.4	0.4	0.4
5	0.6	0.6	0.6	0.5	0.5	0.5	0.5	0.5	0.5	0.5

Vertical Plane 2

HORIZONTAL (ft) / VERTICAL (ft)	2410	2420	2430	2440	2450	2460	2470	2480	2490	2500	2510	2520
85	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1
75	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1
65	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1
55	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
45	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1
35	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.2
25	0.4	0.4	0.4	0.4	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.2
15	0.4	0.4	0.4	0.4	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.2
5	0.5	0.4	0.4	0.4	0.4	0.3	0.3	0.3	0.2	0.2	0.2	0.2

Vertical Plane 3

HORIZONTAL (ft) / VERTICAL (ft)	0	10	20	30	40	50	60	70	80	90	100
85	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2
75	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
65	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
55	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
45	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2
35	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
25	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
15	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3
5	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3

Vertical Plane 3
HORIZONTAL

VERTICAL (ft) \ HORIZONTAL (ft)	110	120	130	140	150	160	170	180	190	200
85	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
75	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
65	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2
55	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
45	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
35	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
25	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
15	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.4	0.4
5	0.4	0.4	0.4	0.5	0.5	0.6	0.6	0.6	0.6	0.6

Vertical Plane 3
HORIZONTAL

VERTICAL (ft) \ HORIZONTAL (ft)	210	220	230	240	250	260	270	280	290	300
85	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
75	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
65	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
55	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2
45	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
35	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
25	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
15	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
5	0.5	0.5	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.4

Vertical Plane 3
HORIZONTAL

VERTICAL (ft) \ HORIZONTAL (ft)	310	320	330	340	350	360	370	380	390	400
85	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
75	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
65	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
55	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1
45	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
35	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
25	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.2
15	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.2
5	0.5	0.5	0.5	0.5	0.5	0.5	0.4	0.4	0.3	0.3

Vertical Plane 3

VERTICAL (ft) \ HORIZONTAL (ft)	410	420	430	440
85	0.2	0.2	0.2	0.2
75	0.2	0.2	0.2	0.2
65	0.2	0.2	0.2	0.2
55	0.1	0.1	0.2	0.1
45	0.2	0.2	0.2	0.2
35	0.2	0.2	0.2	0.2
25	0.2	0.2	0.2	0.2
15	0.2	0.2	0.2	0.2
5	0.3	0.3	0.3	0.5

Vertical Plane 4

VERTICAL (ft) \ HORIZONTAL (ft)	0	10	20	30	40	50	60	70	80	90	100
85	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2
75	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2
65	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2
55	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2
45	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
35	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2
25	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2
15	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
5	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.2

Vertical Plane 4

VERTICAL (ft) \ HORIZONTAL (ft)	110	120	130	140	150	160	170	180	190	200
85	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
75	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
65	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
55	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
45	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
35	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3
25	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.4
15	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.4	0.4
5	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.4	0.4	0.5

Vertical Plane 4
HORIZONTAL (ft)

VERTICAL (ft)	210	220	230	240	250	260	270	280	290	300
85	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
75	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
65	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
55	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
45	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
35	0.3	0.4	0.4	0.4	0.4	0.4	0.3	0.3	0.3	0.3
25	0.4	0.5	0.5	0.5	0.5	0.4	0.4	0.4	0.3	0.4
15	0.4	0.5	0.5	0.5	0.5	0.4	0.4	0.4	0.4	0.4
5	0.5	0.5	0.5	0.5	0.5	0.4	0.4	0.4	0.4	0.4

Vertical Plane 4
HORIZONTAL (ft)

VERTICAL (ft)	310	320	330	340	350	360	370	380	390	400
85	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
75	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
65	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
55	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
45	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
35	0.3	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.3	0.3
25	0.4	0.4	0.5	0.5	0.5	0.5	0.5	0.5	0.4	0.4
15	0.4	0.4	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.4
5	0.4	0.4	0.4	0.5	0.5	0.5	0.5	0.6	0.6	0.5

Vertical Plane 4
HORIZONTAL (ft)

VERTICAL (ft)	410	420	430	440	450	460	470	480	490	500
85	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
75	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
65	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
55	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
45	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
35	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
25	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.5	0.5	0.4
15	0.4	0.4	0.4	0.4	0.4	0.5	0.5	0.5	0.5	0.5
5	0.5	0.5	0.5	0.4	0.4	0.5	0.5	0.5	0.5	0.5

Vertical Plane 4
HORIZONTAL (ft)

VERTICAL (ft)	510	520	530	540	550	560	570	580	590	600
85	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
75	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
65	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
55	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1
45	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1
35	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2
25	0.4	0.4	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.2
15	0.4	0.4	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.2
5	0.5	0.5	0.4	0.4	0.3	0.3	0.3	0.2	0.2	0.2

Vertical Plane 4
HORIZONTAL (ft)

VERTICAL (ft)	610	620	630	640	650	660	670	680	690	700
85	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1
75	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1
65	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
55	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
45	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
35	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3
25	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.4
15	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3
5	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3

Vertical Plane 4
HORIZONTAL (ft)

VERTICAL (ft)	710	720	730	740	750	760	770	780	790	800
85	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
75	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
65	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
55	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
45	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
35	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.2
25	0.4	0.4	0.4	0.4	0.4	0.3	0.3	0.3	0.2	0.2
15	0.4	0.4	0.4	0.4	0.4	0.3	0.3	0.3	0.2	0.2
5	0.3	0.4	0.4	0.4	0.3	0.3	0.3	0.2	0.2	0.2

Vertical Plane 4
HORIZONTAL (ft)

VERTICAL (ft)	810	820	830	840	850	860	870	880	890	900
85	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
75	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
65	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
55	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2
45	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2
35	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3
25	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3
15	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3
5	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3

Vertical Plane 4
HORIZONTAL (ft)

VERTICAL (ft)	910	920	930	940	950	960	970	980	990	1000
85	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
75	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
65	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
55	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
45	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
35	0.3	0.3	0.4	0.4	0.4	0.4	0.4	0.3	0.3	0.3
25	0.4	0.4	0.5	0.5	0.5	0.5	0.5	0.4	0.4	0.4
15	0.4	0.4	0.5	0.5	0.5	0.5	0.5	0.5	0.4	0.4
5	0.4	0.5	0.5	0.6	0.6	0.6	0.6	0.5	0.5	0.4

Vertical Plane 4
HORIZONTAL (ft)

VERTICAL (ft)	1010	1020	1030	1040	1050	1060	1070	1080	1090	1100
85	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
75	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
65	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
55	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
45	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
35	0.3	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.3	0.3
25	0.4	0.4	0.5	0.5	0.6	0.6	0.6	0.5	0.4	0.4
15	0.4	0.4	0.5	0.5	0.5	0.5	0.5	0.5	0.4	0.4
5	0.4	0.4	0.4	0.5	0.5	0.5	0.5	0.4	0.4	0.4

Vertical Plane 4
HORIZONTAL (ft)

VERTICAL (ft)	1110	1120	1130	1140	1150	1160	1170	1180	1190	1200
85	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1
75	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.2	0.1	0.1
65	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
55	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
45	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
35	0.3	0.3	0.3	0.4	0.4	0.5	0.5	0.5	0.4	0.4
25	0.3	0.3	0.4	0.5	0.6	0.7	0.7	0.7	0.6	0.5
15	0.3	0.3	0.4	0.4	0.5	0.6	0.6	0.6	0.5	0.4
5	0.3	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4

Vertical Plane 4
HORIZONTAL (ft)

VERTICAL (ft)	1210	1220	1230	1240	1250	1260	1270	1280	1290	1300
85	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
75	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
65	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
55	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
45	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
35	0.3	0.2	0.2	0.3	0.3	0.4	0.4	0.4	0.4	0.4
25	0.4	0.3	0.3	0.3	0.4	0.5	0.5	0.6	0.6	0.5
15	0.3	0.3	0.3	0.3	0.4	0.4	0.5	0.5	0.5	0.5
5	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.4

Vertical Plane 4
HORIZONTAL (ft)

VERTICAL (ft)	1310	1320	1330	1340	1350	1360	1370	1380	1390	1400
85	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
75	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
65	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
55	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
45	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
35	0.4	0.3	0.3	0.2	0.2	0.3	0.4	0.5	0.5	0.5
25	0.5	0.4	0.3	0.3	0.3	0.4	0.5	0.6	0.7	0.7
15	0.4	0.4	0.3	0.3	0.3	0.4	0.5	0.5	0.6	0.6
5	0.4	0.4	0.3	0.3	0.3	0.4	0.4	0.4	0.5	0.5

Vertical Plane 4
HORIZONTAL (ft)

VERTICAL (ft)	1410	1420	1430	1440	1450	1460	1470	1480	1490	1500
85	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
75	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
65	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
55	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
45	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
35	0.5	0.4	0.3	0.3	0.2	0.2	0.2	0.3	0.3	0.4
25	0.6	0.5	0.4	0.3	0.3	0.3	0.3	0.4	0.5	0.5
15	0.6	0.5	0.4	0.3	0.3	0.3	0.3	0.4	0.4	0.5
5	0.5	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.4	0.4

Vertical Plane 4
HORIZONTAL (ft)

VERTICAL (ft)	1510	1520	1530	1540	1550	1560	1570	1580	1590	1600
85	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2
75	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
65	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
55	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
45	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
35	0.4	0.4	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.3
25	0.6	0.6	0.6	0.5	0.4	0.4	0.3	0.4	0.4	0.5
15	0.5	0.5	0.5	0.5	0.4	0.4	0.3	0.4	0.4	0.4
5	0.4	0.4	0.4	0.4	0.4	0.4	0.3	0.4	0.4	0.4

Vertical Plane 4
HORIZONTAL (ft)

VERTICAL (ft)	1610	1620	1630	1640	1650	1660	1670	1680	1690	1700
85	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
75	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
65	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
55	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
45	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
35	0.4	0.4	0.4	0.4	0.3	0.3	0.3	0.2	0.3	0.3
25	0.5	0.5	0.5	0.5	0.4	0.4	0.3	0.3	0.3	0.4
15	0.5	0.5	0.5	0.5	0.4	0.4	0.3	0.3	0.3	0.4
5	0.4	0.4	0.4	0.5	0.4	0.4	0.4	0.4	0.4	0.4

Vertical Plane 4
HORIZONTAL (ft)

VERTICAL (ft)	1710	1720	1730	1740	1750	1760	1770	1780	1790	1800
85	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
75	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1
65	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1
55	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1
45	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1
35	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.2
25	0.4	0.4	0.5	0.5	0.5	0.4	0.4	0.3	0.3	0.3
15	0.4	0.4	0.5	0.5	0.4	0.4	0.4	0.3	0.3	0.3
5	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.3	0.3	0.3

Vertical Plane 4
HORIZONTAL (ft)

VERTICAL (ft)	1810	1820	1830	1840	1850	1860	1870	1880	1890	1900
85	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
75	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
65	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
55	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
45	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
35	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.1	0.1
25	0.3	0.4	0.4	0.4	0.4	0.4	0.3	0.3	0.2	0.1
15	0.3	0.4	0.4	0.4	0.4	0.3	0.3	0.3	0.2	0.1
5	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.1

Vertical Plane 4
HORIZONTAL (ft)

VERTICAL (ft)	1910	1920	1930	1940	1950	1960	1970	1980	1990	2000
85	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0
75	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
65	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
55	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
45	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
35	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0
25	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0
15	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0
5	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Vertical Plane 4
HORIZONTAL
(ft)

VERTICAL (ft)	2010	2020	2030	2040	2050	2060	2070	2080	2090	2100
85	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
75	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
65	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
55	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
45	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
35	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
25	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
15	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Vertical Plane 4
HORIZONTAL
(ft)

VERTICAL (ft)	2110	2120	2130	2140	2150	2160	2170	2180	2190	2200
85	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
75	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
65	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
55	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
45	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
35	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
25	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
15	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Vertical Plane 4
HORIZONTAL
(ft)

VERTICAL (ft)	2210	2220	2230	2240	2250	2260	2270	2280	2290	2300
85	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
75	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
65	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
55	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
45	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
35	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
25	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
15	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Vertical Plane 4
HORIZONTAL (ft)

VERTICAL (ft)	2310	2320	2330	2340	2350	2360	2370	2380	2390	2400
85	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
75	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
65	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
55	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
45	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
35	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
25	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
15	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Vertical Plane 4
HORIZONTAL (ft)

VERTICAL (ft)	2410	2420	2430	2440	2450	2460
85	0.0	0.0	0.0	0.0	0.0	0.0
75	0.0	0.0	0.0	0.0	0.0	0.0
65	0.0	0.0	0.0	0.0	0.0	0.0
55	0.0	0.0	0.0	0.0	0.0	0.0
45	0.0	0.0	0.0	0.0	0.0	0.0
35	0.0	0.0	0.0	0.0	0.0	0.0
25	0.0	0.0	0.0	0.0	0.0	0.0
15	0.0	0.0	0.0	0.0	0.0	0.0
5	0.0	0.0	0.0	0.0	0.0	0.0