APPENDIX B

Lighting Study

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LIGHTING STUDY

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This Lighting Study by Francis Krahe & Associate Inc. analyzes the new lighting associated with the proposed Carol Kimmelman Sports and Academic Campus project ("Project") improvements at 340 Martin Luther King Jr. Street in Carson, California, including new lighting for buildings, signage, outdoor soccer, tennis, car parking and site access roads. The Project site is located on approximately 87 acres of the existing approximately 171-acre Victoria Golf Course property and is bounded by Martin Luther King Jr. Street to the north, South Avalon Boulevard to the east, and the balance of the Victoria Golf Course site to the south and west. There are existing residential use properties to the east of the Project site east property line along South Avalon Boulevard which face Dunbrooke Avenue, and to the north of Victoria Park, north of the Project north property line. There is also an active, private Goodyear Blimp Airfield further to the west of the Project site at South Main Street.

Figure 1: Project Site and Surrounding Properties

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

This Study reviews the proposed Project (as described herein as Appendix A) with respect to Light Trespass and Glare at adjacent light sensitive use properties near the Project site. Adjacent Residential properties are identified as the most light sensitive use sites due to their close proximity to the Project and possible direct view of the Project Lighting and Signs Lighting. Light intensity diminishes rapidly in relation to distance (see Inverse Square Law page 8). Therefore, more distant sensitive site locations will receive much lower Light Trespass illuminance and or luminance, and will therefore be less affected by the Project. There is no Light Trespass or Glare threshold for commercial use properties, which are not considered light or glare-sensitive receptors.

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*[1] 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 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 may intrude, such as a residential window or balcony.

- *Glare*[2] 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 street light, viewed against a dark sky may be uncomfortable to look at. 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, which is determined by the variation of luminance within the field of view, or the ratio of peak luminance to the average luminance. "High," "Medium," and "Low" contrast are terms used to describe contrast ratios: 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. For driver's visibility, the range of acceptable glare is higher, due to the use of head lights for traffic visibility and the range of variations in background luminance. For driver's visibility the glare threshold is defined by the California Vehicle code as a maximum luminance value relative to the drivers' field of vision.

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

Lighting within the Project is described by the Lighting Concept Design Documents included as Appendix A of this Study and by the Signs Lighting Concept Design Documents included as Appendix B of this Study. The Project Lighting and Signs Lighting includes all exterior and interior lighting that may produce a new potentially significant source of light or glare at adjacent properties.

The Project Lighting includes light for safety and use of the property, including exterior and interior lighting, sports lighting for soccer fields and tennis courts. The Project Lighting conceptual design is included in this Study as Appendix A. These conceptual designs are analyzed within this Study, including evaluation of the Project's Lighting under the 2016 Los Angeles County Building Code and 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 including:

- Light trespass maximum of 0.74 fc (0.8 lux) as per CEC Lighting Zone 3, and IESNA Table 26.4 and Table 26.5, maximum energy use for outdoor lighting (CEC Section 140.), and green building standards that limit brightness and light spill (Section 5.106.8).

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

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

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

This Study demonstrates the Light Trespass from the Project Lighting at the adjacent light sensitive use properties would be below the 0.74 footcandles (fc) standard as defined by the CEC Lighting Zone 3 and the Illuminating Engineering Society of North America (IESNA) (included herein as Appendix C).

Furthermore, the Project Lighting is evaluated with respect to Glare visible at adjacent light sensitive use properties or roadways.

This Study analyzes the Glare from the Project Lighting at light sensitive use properties at night by calculating the contrast ratio, which compares the maximum luminance to the existing average luminance measured at the monitoring sites. The luminance is estimated to be less than 100 cd/m^2 and the calculated contrast ratios are less than 30:1 as visible from a field of view from light sensitive uses, which indicates the Project would not create a new glare condition at adjacent light sensitive use properties. The Glare at roadways is evaluated with respect to the standards identified by the California Motor Vehicle Code, which defines maximum luminance within driver's field of view for both day and night. This Study confirms the Project Lighting would not exceed the maximum luminance defined by the California Motor Vehicle Code during the day, at night, and during periods of low sun intensity.

This Study analyzes the Project potential impacts relating to the Project Signs Lighting scope components, as described in Appendix B of this Study. This Study includes the following illumination levels for Signs Lighting for purposes of this analysis:

- Light Trespass illuminance will not exceed 0.74 fc at the adjacent sensitive use properties
- Project Digital Sign DS-1 will not exceed 300 cd/m^2 (all white) at nighttime, from sunset until after sunrise, and will not exceed 7000 cd/m^2 (all white) during daytime, from 30 minutes after sunrise until 30 minutes before sunset.
- Project Building Identification Signs and Entry Monument Signs will not exceed 100 cd/m^2 (all white) from sunset until after sunrise.
- Project Digital Signs will transition smoothly from daytime to nighttime luminance and vice versa over a twenty minute time period.

This Study demonstrates the Light Trespass from the Sign Lighting at the adjacent sensitive use properties is below the 0.74 footcandles (fc) threshold as defined by the California Energy Code. There is no Light Trespass threshold for commercial use properties, which are not considered light or glare-sensitive receptors.

Furthermore, the Sign Lighting is evaluated with respect to Glare visible at adjacent residential properties or roadways. To present a conservative analysis, this Study evaluates the Signs Lighting with a maximum luminance of 7000 cd/m^2 during the day and 300 cd/m^2 at night with all signs operating at all white.

This Study analyzes the Glare from the Sign Lighting at sensitive use properties at night by calculating the contrast ratio, which compares the maximum Project Sign luminance to the existing average luminance measured at the residential properties. At 7000 cd/m^2 during the day and 300 cd/m^2 at night the calculated contrast ratio does not exceed 30:1 and therefore this analysis indicates the Sign Lighting will not create a new Glare condition at adjacent sensitive use properties.

The Glare at roadways is evaluated with respect to the standards identified by the California Motor Vehicle Code, which defines maximum sign luminance within drivers field of view for both day and night. This Study confirms the Sign Lighting will not exceed the maximum luminance defined by the California Motor Vehicle Code during the day, at night, and during periods of low sun intensity.

Therefore, the results of this Study indicate the Project Signs Lighting will not create a new source of Light Trespass or Glare.

Therefore, the results of this Study indicate the Project Lighting and Project Signs Lighting will not create a significant new source of Light Trespass or Glare and lighting impacts would be less than significant for this Project.

2. Project Description

The Project consists of a new sports and academic campus, including a Learning Center, Tennis Center and Soccer Center, and other recreational amenities. The Project site consists of approximately 87 acres of the existing 171-acre Victoria Golf Course property at 340 Martin Luther King Jr. Street in the City of Carson, California. The Project site property is bounded by Martin Luther King Jr. Street to the north, South Avalon Boulevard to the east, and the balance of the Victoria Golf Course to the south and to the west. There are existing residential use properties to the east of the Project site east property line along S Avalon Boulevard which face Dunbrooke Avenue, and to the north of Victoria Park, north of the Project north property line. There is also an active, private Goodyear Blimp airfield further to the west of the Project site at South Main Street.

The Project includes light sources to provide illumination for nighttime use of the property, including building code required lighting for safety and security, as well as lighting for occupants use and enjoyment of the sports facilities including lighting for approximately half of the ten proposed outdoor soccer/athletic fields, lighting for all proposed tennis courts, lighting for on site roads and parking, and illuminated signage.

This analysis represents a conservative evaluation of the Project potential for offsite Light Trespass Illuminance and Glare.

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 Study and the related practice standards to facilitate discussion of these issues. The following technical terms are used in this Study.

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.

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

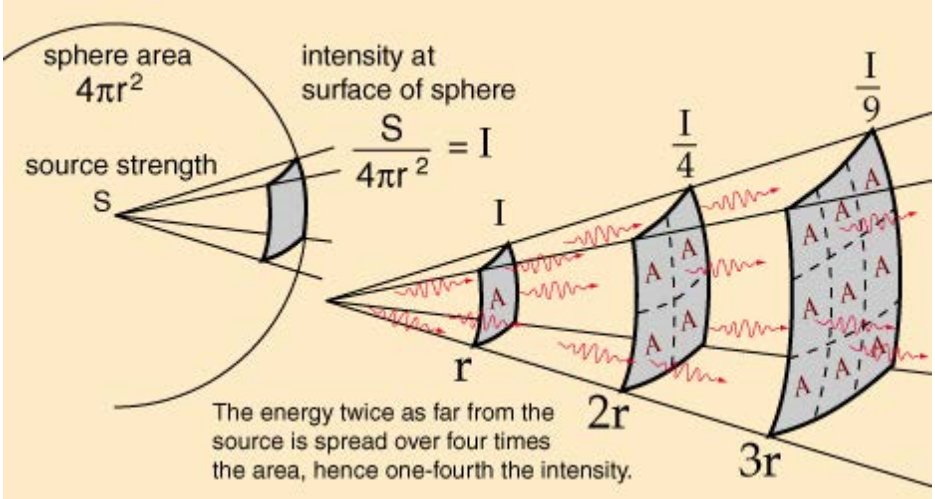

Figure 2: Inverse square law diagram (hyperphysics.phy-ast.gsu.edu)

into three-dimensional space (see Figure 2). 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.

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.
Monitoring Sites:	Monitoring Sites are locations selected for observation and field lighting measurements to evaluate the views to the Project from adjacent sensitive use properties and to determine the extent and intensity of existing light sources within and surrounding the Project. The Monitoring Sites are within the public right of way, and may be adjacent to sensitive use sites. These locations are representative of the view to the Project from the vicinity of the sensitive sites surrounding the Project to the north, south, east and west. Figure 5 below illustrates the Monitoring Site locations.
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.

4. Review of Lighting Regulations & Reference Standards

Exterior lighting is regulated throughout California by the state energy and building codes and local municipal codes. Pertinent lighting sections are summarized and discussed for the County of Los Angeles, California Building 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. The lighting standards summarized below balance the requirements of property owners and the public for sufficient

brightness and flexibility for the use and safety of property, with minimizing the off-site negative effects of Light Trespass and Glare.

4.1 County of Los Angeles Building Code (Title 26)

The County of Los Angeles Building Code (LABC) regulates lighting with respect to building lighting, transportation, and street lighting. The County also enforces the building code requirements of the Los Angeles County Electrical Code 2017 (Title 27), the California Building Code, the California Green Building Standards Code (CALGreen), and the California Electrical Code. The LABC does not define maximum light trespass illuminance for all properties within the County.

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 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 C 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 non-residential outdoor lighting comply with the minimum requirements in the CEC for Lighting Zones 1–4 as defined in Chapter 10 of the California Administrative Code as noted above or an applicable local ordinance if more stringent.

4.3 Lighting Zone Designation LZ3

The Project site and surrounding properties are urban, mixed use, commercial and residential zones with extensive nighttime use, including the existing use on the Project site of a night illuminated golf driving range and practice facility and related parking. The California Energy Code (CEC) includes designations for Lighting Zones (LZ) 1 through 4, included below in Appendix C, which correspond to the Light Trespass recommendations within the IESNA 10th Edition Handbook, Table 26.4, included herein Appendix D and E.

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 footcandles). Per the CEC, California Building Energy Efficiency Standards, Section 10-114, page 40, 41, 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. Local AHJs (Authorities Having Jurisdiction) may designate areas to Lighting Zone 4 for high intensity nighttime use, such as entertainment or commercial districts or areas with special security considerations requiring very high light levels."

The existing conditions within and surrounding the Project site and along South Avalon Boulevard and I-405 Freeway are consistent with the definition of Lighting Zone 3 noted above. In addition, the IESNA defines Lighting Zone 3 as:

"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 or continuous."

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. 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. Table 26.4, Nighttime Outdoor Lighting Zone Definitions, included in Appendix D 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 E 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.

The existing conditions surrounding the Project site are best described 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 in this Study 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 Project site and affect adjacent residential zoned properties.

Specifically, this Study evaluated that the Project would create a significant impact with regard to artificial light or glare if:

- The Project Light Trespass illuminance exceeds 0.74 foot-candles at the property line of a residential zoned property.
- The Project creates Glare with new high contrast conditions, with contrast ratio greater than 30:1, visible from a field of view from a residentially zoned property.

In addition, based on the California Vehicle Code section discussed 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 were 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.[3]

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, TM10-00 Addressing Obtrusive Light (Urban Sky Glow and Light Trespass) in Conjunction with Roadway Lighting, and TM11-00 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, vertical illuminance measurements are recorded at 3 feet above grade, with the photosensor facing the Project as per IESNA standards. These measurements document the total vertical 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 Project site. The majority of the Monitoring Sites are located at a long distance away from the Project site, greater than 100 feet as noted in Section 7 below. 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 illuminance analysis. The existing Illuminance is measured with a Minolta Illuminance meter.

Figure 3: Minolta LS-100 meter

The existing luminance is measured from each Monitoring Site to light sources and surfaces within the field of view toward the Project site from that Monitoring Site. This existing condition luminance data is measured with a Minolta

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

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 Analysis

The analysis of the Project includes evaluation of the illuminance Light Trespass from the Project at adjacent residential properties, and an evaluation of Glare from the Project visible at residential properties or at adjacent roadways.

This Study presents a conservative analysis with respect to Light Trespass and Glare. The Project is evaluated with a configuration of the maximum permissible lights that are within the limits of the California Building Code. This Study evaluates the Project Lighting Concept identified in Appendix A and the Project Signs Lighting Concept as identified in Appendix B.

a. Project Light Trespass Analysis

Light Trespass illuminance is calculated at the location where lighting is under review through the illumination modeling software program AGI32. This software utilizes the 3-dimensional architectural computer model, including the lighting fixtures types and locations, and Project lit signs and locations, to generate an accurate prediction of future illuminance. Light Trespass illuminance is evaluated with respect to vertical illuminance at the locations where lighting is under review.[4]

Figure 4: Project Site and Vertical Calculation Planes locations

To evaluate Light Trespass at the nearest light sensitive use properties, the illuminance from the Project is calculated at the review location within a vertical plane at the sensitive use property line, extending from grade to a maximum

[4] *See Note 1, above.*

viewing elevation above grade (to the east and north of the Project Site at 60 feet above grade and to the south of the Project Site at 100 feet above grade). The calculation plane simulates the illumination (fc) captured by light meters. The calculated illuminance data is presented at 10 feet on center. Figure 4 below illustrates the locations where the lighting is under review and where the vertical illuminance is calculated to evaluate Light Trespass (e.g., VPE1 represents the length of the eastern boundary of Avalon Boulevard).

The vertical calculation planes analyze the lighting at the nearest residential use property line adjacent to the Project property line, which will be greater than the illuminance at any location more distant from the Project. 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 to the location where lighting is under review. More distant sensitive use properties will receive less light from the Project due to the increased distance. Therefore, lighting from the Project will produce a less significant Light Trespass illuminance impact on sensitive use properties more distant from the Project property line. Similarly, light sources further within the Project site will produce less significant Light Trespass impact on sensitive use properties than light sources at the Project property line.

b. Project Glare Analysis

Glare from the Project is evaluated at light sensitive use properties and for drivers on adjacent streets. Project luminance is evaluated by the contrast ratio, which equals the maximum Project luminance divided by the measured average existing luminance within the field of view at the Monitoring Sites identified in the field survey of existing conditions (see Section 7 below). Contrast ratios greater than 30:1 are considered potential glare conditions.

The potential roadway glare impacts are analyzed with respect to the Project luminance as compared to the California Vehicle Code requirements for both night and day conditions at the adjacent roadways identified in Figure 5 below.

The roadway glare analysis includes evaluation of the view angle from the driver's line of sight to the Project to determine the visibility of the lighting within the Project site, and evaluates the luminance of the Project from adjacent roadways near the Project site.

7. Project Existing Conditions

The Project site is bounded by Martin Luther King Jr. Street to the north (formerly 192nd Street), South Avalon Boulevard to the east, and the balance of the Victoria Golf Course site to the south and west. There are existing residential use properties to the east of the Project site east property line along S Avalon Boulevard which face Dunbrooke Avenue, and to the north of Victoria Park, north of the Project north property line. There is also an active, private Goodyear Blimp airfield to the west of the Project site at South Main Street.

The existing lighting conditions within and surrounding the Project include street lights, exterior parking lot light, exterior lighting utilized for security and safety, athletic lights, commercial illuminated signs within adjacent buildings, and landscape lighting at adjacent residences.

The distance to adjacent residential properties varies considerably. Several residential properties are approximately 150 feet from the Project east property line.

The existing active Goodyear Blimp airfield to the west of the Project site is not considered a sensitive use site, since it is not a residential use, and is not adversely affected by increased night illumination from the Project.

7.1 Existing Conditions Monitoring Sites

Monitoring sites are utilized to describe and evaluate the existing lighting conditions at and surrounding the Project site to determine the maximum potential impacts that may result from Light Trespass or Glare onto adjacent sensitive sites surrounding the Project site. All Monitoring Site locations are within close proximity of the Project and have views of the Project Site. Monitoring Sites may be located adjacent to existing residential properties.

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

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

Proximity – Monitoring sites at the least distance to the Project were analyzed. These locations were 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 and the properties surrounding the Project. The Project is shaded blue. Residential properties are shaded red. Monitoring Site locations were selected for observation and field lighting measurements to evaluate the views to the Project from adjacent residential properties and to determine the extent and intensity of existing light sources within and surrounding the Project. The Monitoring Sites are within the public right of way, adjacent to residences or at the Project property line. These locations are representative of the view to the Project from the vicinity of the residences surrounding the Project to the north, east, and southeast.

Figure 5: Project Site and Monitoring Site locations

Figure 5 illustrates the following Monitoring Site locations:

Monitoring Site ME1: Monitoring Site ME1 is located along S Avalon Blvd behind the residential property located at 19925 Dunbrooke Ave, north of E Turmont St, to evaluate the view to the

Project east and south property line. The distance to the Project property line is approximately 150 feet.

Monitoring Site ME2: Monitoring Site ME2 is located on SE corner of Dunbrooke Ave and E Elsmere Dr at the residential property of 19602 Dunbrooke Ave, to evaluate the Project east property line. The distance to the Project property line is approximately 300 feet.

Monitoring Site ME3: Monitoring Site ME3 is located along S Avalon Blvd behind the residential property located at 19327 Dunbrooke Ave, north of E Elsmere Dr, to evaluate the east property line. The distance to the Project property line is approximately 150 feet.

Monitoring Site MN1: Monitoring Site MN1 is located at the existing north parking lot, to evaluate the Project north property line. The distance to the Project property line is approximately 50 feet.

Monitoring Site MS1: Monitoring Site MS1 is located on the south-side of the Dominguez Channel between S Main St and E Del Amo Blvd to evaluate the Project southwest property line. The distance to the Project property line is approximately 1,000 feet.

7.2 Criteria

As established in Section 1.3, the following factors were 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.
Glare – Contrast Ratio	Observed existing conditions. Measured luminance at each Monitoring Site	Observed and recorded conditions with respect to the view to the Property from the Monitoring Site in terms of Project visibility within the field of view from the Monitoring, including measurement of visible and prominent 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 an urban lighting condition, with relatively higher 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 lighting for the existing parking lot, buildings and driving range. Commercial properties and roadways to the south, east, and west contribute to a relatively bright night environment.

Measured illuminance greater than 3.0 fc is evaluated as high illuminance, from 1.0 fc to 3.0 fc is evaluated as medium illuminance, and from 1.0 fc or less as low illuminance.

The highest existing horizontal illuminance level was recorded at Monitoring Site at ME3 with 0.27 fc, while the lowest horizontal illuminance was recorded at Monitoring Site MS1 at 0.04 fc. The highest existing vertical

illuminance level was recorded at Monitoring Site ME1 at 0.93 fc, while the lowest vertical illuminance was recorded at Monitoring Site MS1 at 0.03 fc.

Table 2. Measured Illuminance (fc) at Monitoring Sites

Monitoring Site	Illuminance (fc)		Description	Evaluation
	Horizontal	Vertical		
ME1	0.21	0.93	Measured at 19925 Dunbrooke Ave, south of E Elsmere Dr	Low horizontal and vertical illuminance
ME2	0.11	0.18	Measured at 19602 Dunbrooke Ave, SE corner of Dunbrooke Ave and E Elsmere Dr	Low horizontal and vertical illuminance
ME3	0.27	0.71	Measured at 19327 Dunbrooke Ave, north of E Elsmere Dr	Low horizontal and vertical illuminance
MN1	0.11	0.66	Measured at Project site boundary on MLK Jr St	Low horizontal and vertical illuminance
MS1	0.04	0.03	Measured at south of the Dominguez Channel Trail between S Main St and E Del Amo Blvd	Low horizontal and vertical illuminance

Contrast/Glare: The evaluation of High, Medium and Low Contrast describes the perception of how bright a visible object appears in comparison to the surrounding objects within any given field of view. The "luminance ratio" is the ratio of the highest Measured Luminance as compared to the Luminance within the field of view visible at an observer position. This ratio is referred to as "contrast", and is determined by the variation of luminance. "High," "Medium," and "Low" contrast are terms used to describe effect of the contrast ratios (the ratio of peak measured luminance to the average within a field of view) of greater than 30:1, between 10:1 and 30:1, and below 10:1, respectively. Luminance contrast ratios above 30:1 are generally uncomfortable for the human eye to perceive. High Contrast indicates a potential Glare condition.

Table 3: Measured Luminance, (cd/m^2) at Monitoring Sites

Monitoring Site	Luminance (cd/m^2)		Contrast Ratio (Max / Average)	Description	Evaluation
	Average	Maximum			
ME1	28.3	583.0	20.6	Measured at 19925 Dunbrooke Ave, south of E Elsmere Dr	Medium average luminance, medium contrast
ME2	4.2	82.0	19.6	Measured at 19602 Dunbrooke Ave, SE corner of Dunbrooke Ave and E Elsmere Dr	Low average luminance, medium contrast
ME3	4.2	80.4	19.2	Measured at 19327 Dunbrooke Ave, north of E Elsmere Dr	Low average luminance, medium contrast
MN1	331.9	6765	20.4	Measured at Project site boundary at MLK Jr St	High average luminance, medium contrast
MS1	10.6	99.0	9.3	Measured at south of the Dominguez Channel Trail between S Main St and E Del Amo Blvd	Medium average luminance, low contrast

The existing Project site is a golf course with light poles at portions of the golf course and at parking and roadways. The site is well illuminated in portions of the golf course with many bright light sources and illuminated surfaces visible from the Monitoring Sites. The measured luminance recorded at the Monitoring Sites within the view to the Project includes prominent, high brightness light sources and illuminated surfaces, such as street lights, golf course light poles, and flood lighted buildings, as well as lower brightness surfaces such as sidewalks and un-illuminated walls or landscape areas. The range of recorded luminance is summarized in Table 3.

The observations at each Monitoring Site are identified in Section 7.3a through 7.3e below, including qualitative descriptions of the existing conditions. The qualitative summary includes notations regarding the brightness of visible light sources and surrounding illuminated surfaces within the field of view to the Project from the Monitoring Sites and the visibility of the Project within the field of view.

The highest measured average luminance was recorded at Monitoring Site at MN1 at 331.9 cd/m^2, while the lowest measured average luminance was recorded at Monitoring Site ME2 at 4.2 cd/m^2. The highest measured maximum luminance was recorded at Monitoring Site MN1 at 6765 cd/m^2, while the lowest measured maximum luminance was recorded at Monitoring Site ME3 at 80.4 cd/m^2. The calculated contrast ratio for Monitoring Sites ME1, ME2, ME3 and MN1 is medium contrast, less than 30:1. The calculated contrast ratio for Monitoring Sites MS1 is low contrast, less than 10:1.

a. Monitoring Site ME1:

Monitoring Site ME1 is located along South Avalon Blvd behind the residential property located at 19925 Dunbrooke Ave, north of East Turmont Street, to evaluate the Project east and south property line. The distance to the Project property line is approximately 150 feet. Street lighting along S Avalon Boulevard is visible in the foreground. Sports lighting poles are visible in the distance and contribute to the general illumination and brightness.

Figure 6: ME1 June 27, 2018, 2:30 PM

Figure 7: ME1 June 26, 2018, 9:30 PM

b. Monitoring Site ME2:

Monitoring Site ME2 is located on the south east corner of the Dunbrooke Avenue and E Elsmere Drive intersection at the residential property 19602 Dunbrooke Ave, to evaluate the Project east property line. The distance to the Project property line is approximately 300 feet. Street lighting along S Avalon Boulevard is visible in the foreground. Skyglow from commercial properties to the west is visible in the distance.

Figure 8: ME2 June 27, 2018, 2:30 PM

Figure 9: ME2 June 26, 2018 9:30 AM

c. Monitoring Site ME3:

Monitoring Site ME3 is located along the S Avalon Blvd east right of way behind the residential property located at 19327 Dunbrooke Ave, north of East Elsmere Dr, to evaluate the Project east property line. The distance to the Project property line is approximately 150 feet. Exterior lighting for the golf course practice facility is visible in the distance and the commercial properties to the west of the Project create skyglow brightness.

Figure 10: ME3 June 27, 2018, 2:30 PMFigure 11: ME3 June 26, 2018, 9:30 PM

d. Monitoring Site MS1:

Monitoring Site MS1 is located on the south-side of the Dominguez Channel between South Main Street and East

Del Amo Boulevard to evaluate the Project west property line. The distance to the Project property line is approximately 1,000 feet. Tall sports lighting poles within the Project Site are highly visible in the foreground and contribute to the general high illumination of the area.

Figure 12: June 27, 2018, 2:30 PM

Figure 13: MS1 June 26, 2018, 9:30 PM

e. Monitoring Site MN1:

Monitoring Site MN1 is located at the existing north parking lot on MLK Jr St, to evaluate the Project north property line. The distance to the Project property line is approximately 50 feet. The Project Site is illuminated immediately south of MN1 with tall sports light poles, visible within the Project site.

Figure 14: MN1 June 27, 2018, 2:30 PM

Figure 15: MN1 June 26, 2018, 9:30 PM

8. The Project Analysis

The Project would introduce new Lighting as described in Section 2 and depicted in Appendix A.

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

- Light Trespass illuminance greater than 0.74 fc at adjacent residential zoned property lines.
- Light source luminance visible from the light sensitive use properties creates high contrast conditions, greater than 30 to 1 contrast ratios as viewed from the monitoring sites above.

8.1 Light Trespass Illuminance Analysis – Project Lighting

The Light Trespass analysis evaluates the illuminance (fc) at the nearest residential property line adjacent to the Project Site with respect to light leaving the Project toward adjacent light sensitive properties from the Project Lighting. The Project Lighting include the light sources as defined in and as illustrated in the Project Lighting Concept Plan in Appendix A.

Table 4: Light Trespass Illuminance (fc) – Project Lighting, calculated at vertical planes

Vertical Plane	Description	Illuminance (fc)			Analysis
		Vertical			
		Max	Min	Avg	
VP-E1	East Residential Property Line	0.70	0.10	0.46	Below threshold, not a significant impact
VP-N1	North Residential Property Line	0.30	0.10	0.22	Below threshold, not a significant impact
VP-S1	South Residential Property Line	0.10	0.00	0.07	Below threshold, not a significant impact

As summarized in Table 4, the Project Light Trespass illuminance at the Vertical Planes varies from a minimum of 0 fc to a maximum of 0.70 fc. Complete calculated data is presented in Appendix G.

The Project Light Trespass illuminance calculation data is presented below in rendered views within Figure 16. The calculated data is presented as a grid on the Vertical Plane surface from the Project site toward the light sensitive use properties and is summarized in Appendix G.

The maximum Project Light Trespass illuminance at vertical plane VPE1 is 0.70 fc, which is less than the 0.74 fc maximum illuminance threshold. Vertical Plane VPE1 is adjacent to the property line of the rear of the residential properties to the east of the Project site. The Light Trespass illuminance is less than 0.74 fc therefore the Project Lighting will not create a new source of Light Trespass at VPE1.

The maximum Project Light Trespass illuminance at vertical plane VPN1 is 0.30 fc, which is less than the 0.74 fc maximum illuminance threshold. Vertical Plane VPN1 is adjacent to the property line of the rear of the residential properties to the north of the Project site. The Light Trespass illuminance is less than 0.74 fc therefore the Project Lighting will not create a new source of Light Trespass at VPN1.

The maximum Project Light Trespass illuminance at vertical plane VPS1 is 0.10 fc, which is less than the 0.74 fc maximum illuminance threshold. Vertical Plane VPS1 is adjacent to the property line of the rear of the residential properties to the south of the Project site. The Light Trespass illuminance is less than 0.74 fc therefore the Project Lighting will not create a new source of Light Trespass at VPS1.

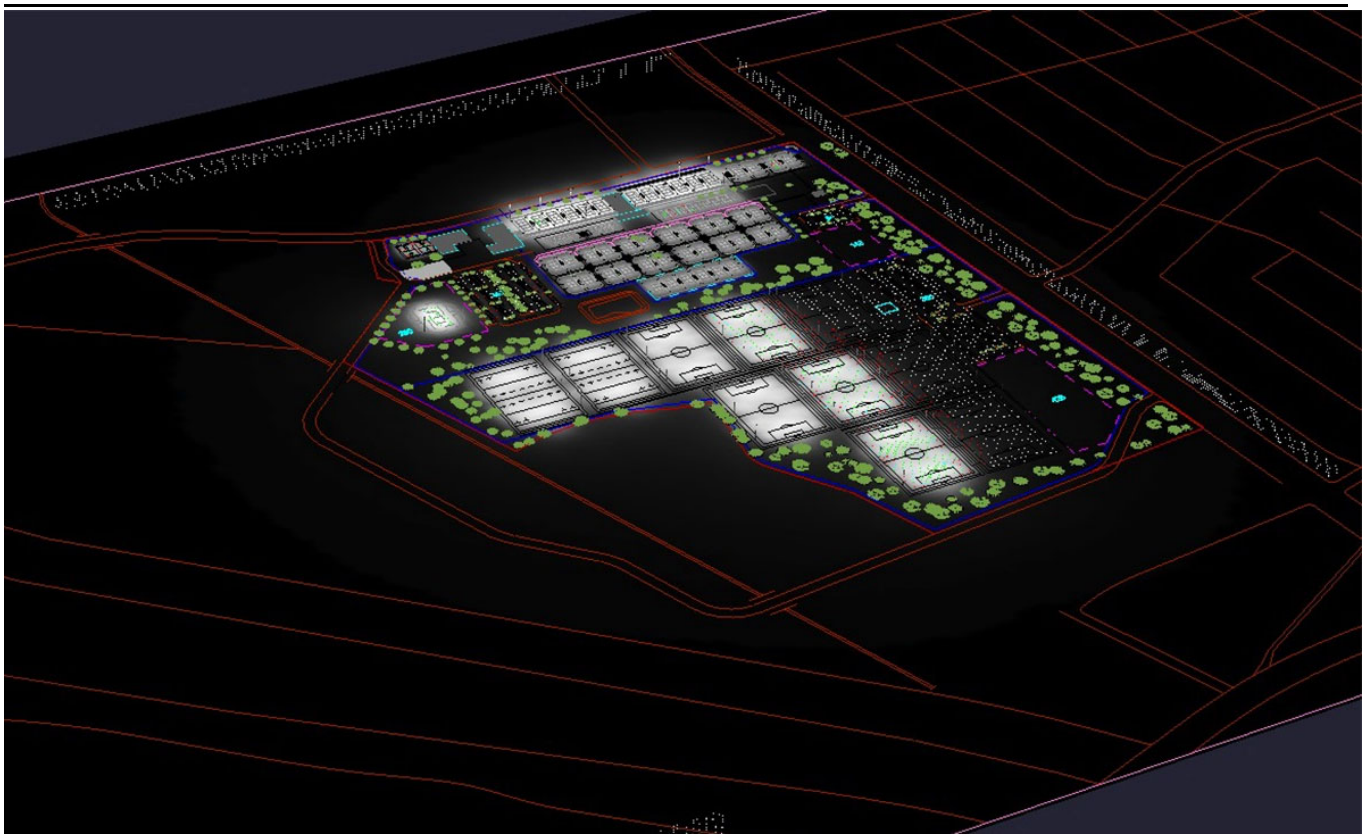

Figure 16: Project Light Trespass Illuminance data (fc) rendered

The calculated Light Trespass confirms the maximum illuminance at the light sensitive properties is less than 0.74 fc and therefore the Project will not create a significant new source of Light Trespass illuminance.

8.2 Glare Analysis – Project Lighting

Glare from the Project Lighting occurs when light sources within the Project site are visible against a dark background, such as a dark sky, or when a high brightness source is aimed at a low angle within the field of view. The maximum source brightness is determined by the rated source luminance for lighting fixtures. The measured existing luminance is summarized in Table 3 in Section 7 above. Table 5 summarizes the contrast ratio calculated for the maximum night Project luminance (based on the Concepts presented in Appendix A, and compliance with applicable code lighting standards) versus the average existing measured luminance. The contrast ratio is calculated in comparison to the total measured existing luminance (Max to Average in Table 5). The results of this comparison of the Project luminance to the existing measured luminance indicates the Contrast Ratios are less than 30 to 1. Therefore, the Project would not create a source of high contrast and or Glare greater than 30 to 1 contrast ratios when viewed from the Monitoring Sites, M1 through M4.

The Project Lighting Concept Design (Appendix A) defines a lighting design program for the Project that limits the Glare at adjacent properties by shielding the light sources and restricting the Project Lighting to the Project Site. The Project Lighting would comply with the applicable requirements of CalGreen, which limits view of bright light sources such as parking or field light poles. The California Green Building Standards Code (Title 24, Part 11), defines light trespass standards for buildings and exterior site lighting. This code defines the amount of energy and light trespass allowed based upon the intensity of nighttime use. All urban areas in California are defined as LZ3 by default. Table 5.106.8 of the CEC stipulates backlight, uplight, and glare requirements for all exterior lighting to reduce the brightness visible from adjacent properties. Within Table 5.106.8, for Zone 3, the maximum allowable glare rating is G2, which allows up to 375 zonal lumens for either BVH or FVH zones. The 375 lumen maximum is comparable to an approximately 30 cd/m^2 surface luminance for a light source area approaching 1 m^2. The Project

Lighting is evaluated with a maximum luminance of 100 cd/m^2 to present a conservative analysis of Glare. The actual Project Luminance will be determined by the specific lighting products installed and the distance from the light fixtures to the sensitive use properties, which are anticipated to be less than the maximum luminance analyzed.

The Project Lighting which may be visible from the surrounding properties is evaluated in comparison to the Average Measured Luminance identified in Section 6 above and as summarized in Table 5 (based on the Project Lighting Concept Design and compliance with applicable code lighting standards). The Contrast Ratio is calculated by dividing the Project Lighting Maximum Luminance by the Average Measured Luminance. Contrast Ratios less than 30:1 are considered medium contrast, and will not introduce a new source of glare. Contrast Ratios less than 10:1 are considered low contrast, and will not introduce a new source of glare.

Table 5: Contrast Ratio: comparison of existing measured to Project Lighting

Monitoring Site	Existing Measured Luminance (cd/m^2)		Project Lighting Luminance		Evaluation
	Average	Maximum	Max (cd/m^2)	Contrast Ratio (max to average)	
ME1	28.3	583	100	4	Low Contrast Ratio, No Glare Impact
ME2	4.2	82	100	24	Medium Contrast Ratio, No Glare Impact
ME3	4.2	80	100	24	Medium Contrast Ratio, No Glare Impact
MN1	331.9	6765	100	0.3	Low Contrast Ratio, No Glare Impact
MS1	10.6	99	100	9	Low Contrast Ratio, No Glare Impact

The calculated contrast ratio for Monitoring sites ME2 and ME3 are less than 30:1, and therefore are medium contrast. At Monitoring Sites ME2 and ME3 Project Lighting will not create a new source of Glare.

The calculated contrast ratio for Monitoring sites ME1, MN1 and MS1 are less than 10:1, and therefore are low contrast. At Monitoring Sites ME1, MN1 and MS1 Project Lighting will not create a new source of Glare.

8.3 Glare Analysis for Roadways – Project Lighting

The potential lighting impact to driver's visibility from the Project Lighting is evaluated by way of the methodology defined above. As summarized below, the results of this evaluation demonstrate the light impacts resulting from the Project Lighting at the locations where light is under review are below the significance threshold for excessive luminance, or Glare. The Project Lighting would be consistent with the California Vehicle Code standard for motorists on roadways approaching the Project from all directions.

The Glare analysis of the Project Lighting assumes the simultaneous use of all Project Lighting at the maximum luminance calculated from the lighting product data, and compares the resulting luminance to the California Vehicle Code standards to determine if the Project Lighting will introduce a source of distracting Glare to drivers. The most stringent standard 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 Lights 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 Lighting 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. The Project Lighting is evaluated with a maximum luminance of 100 cd/m^2 as viewed from a light sensitive use (based on the Project Lighting Concept Design and compliance with applicable code lighting standards). Calculating the equivalent Project Lighting luminance by converting to English units from metric units: 100 cd/m^2 equals 29.2 fL. The Project Lighting will not exceed 29.2 fL, which is 94% 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 Project Lighting located beyond the driver's 10 degree field of view the maximum luminance is permitted to increase under the California Vehicle Code. For example, light sources 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). As calculated above, Project Lighting would operate at maximum of 29.2 fL at night, or less than approximately 6% 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 Lighting will not exceed the 1000 fL threshold and will not introduce a new source of Glare as defined by the California Vehicle Code Section 21466.5.

These values are less than the California Vehicle Code standard, including 6% of the maximum allowable luminance identified as the threshold for Glare, therefore the Project Lighting will not create a new source of Glare.

8.4 Light Trespass Illuminance Analysis – Signs Lighting

The Signs Light Trespass analysis evaluates the illuminance (fc) at the Vertical Planes identified in Figure 4 above with respect to light leaving the Project toward adjacent light sensitive properties from the Project Signs Lighting. The Project Signs Lighting includes the light sources as defined in and as illustrated in the Project Signs Concept Plan in Appendix B.

As summarized in Table 6, the Project Signs Light Trespass illuminance at the Vertical Planes varies from a minimum of 0 fc to a maximum of 0.3 fc. Complete calculated data is presented in Appendix H.

The Project Signs Light Trespass illuminance calculation data is presented below in rendered views within Figure 17. The calculated data is presented as a grid on the Vertical Plane surface from the Project site toward the light sensitive use properties and is summarized in Appendix H.

The maximum Project Signs Light Trespass illuminance at vertical plane VPE1 is 0.3 fc, which is less than the 0.74 fc maximum illuminance threshold. Vertical Plane VPE1 is adjacent to the property line of the rear of the residential properties to the east of the Project site. The Light Trespass illuminance is less than 0.74 fc therefore the Project Sign Lighting will not create a new source of Light Trespass at VPE1.

Table 6: Light Trespass Illuminance (fc) – Project Signs, calculated at vertical planes

Vertical Calculation Planes	Description	Illuminance (fc)			Analysis
		Max	Min	Average	
VPE1	East Residential Property Line	0.3	0	0.03	Below Threshold of 0.74 fc
VPN1	North Residential Property Line	0	0	0	Below Threshold of 0.74 fc
VPS1	South Residential Property Line	0	0	0	Below Threshold of 0.74 fc

The maximum Project Signs Light Trespass illuminance at vertical plane VPS1 is 0 fc, which is less than the 0.74 fc maximum illuminance threshold. Vertical Plane VPS1 is adjacent to the property line of the rear of the residential

properties to the south of the Project site. The Light Trespass illuminance is less than 0.74 fc therefore the Project Signs Lighting will not create a new source of Light Trespass at VPS1.

The maximum Project Signs Light Trespass illuminance at vertical plane VPN1 is 0 fc, which is less than the 0.74 fc maximum illuminance threshold. Vertical Plane VPN1 is adjacent to the property line of the rear of the residential properties to the north of the Project site. The Light Trespass illuminance is less than 0.74 fc therefore the Project Signs Lighting will not create a new source of Light Trespass at VPN1.

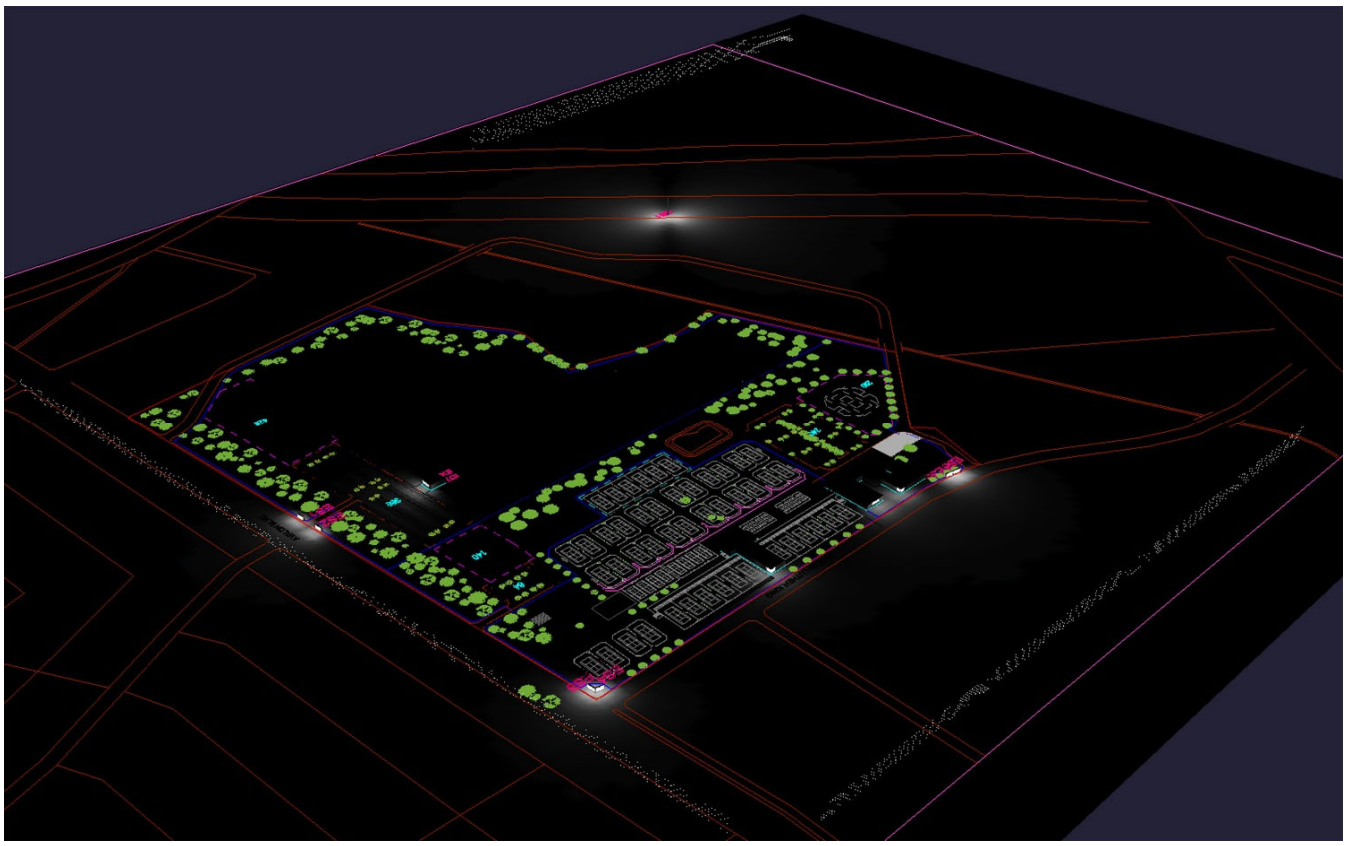

Figure 17: Light Trespass Illuminance data (fc) Signs Lighting, rendered view from northeast

The calculated Project Signs Light Trespass confirms the maximum illuminance at the light sensitive properties is less than 0.74 fc and therefore the Project Signs will not create a significant new source of Light Trespass illuminance.

8.5 Glare Analysis – Signs Lighting

Glare from Project Signs Lighting occurs when the lit signs within the Project site are visible against a dark background, such as a dark sky, or when a high brightness light source is aimed at a low angle within the field of view. The maximum source brightness is determined by the rated source luminance for each sign type as defined in Appendix B. Digital Sign DS-1 is evaluated with a maximum luminance of 300 cd/m^2. Building Identification Signs ID1 through ID8 and Entry Monument Signs ES 1 through ES6 are evaluated with a maximum luminance of 100 cd/m^2. The measured existing luminance is summarized in Table 3 in Section 7 above. Table 7 summarizes the contrast ratio calculated for the maximum night Project Sign luminance (based on the Project Signs Concept in Appendix B and compliance with applicable code lighting standards) versus the average existing measured luminance. The contrast ratio is calculated in comparison to the total measured existing luminance (Max to Average in Table 7). The results of this comparison of the Project luminance to the existing measured luminance indicates the Contrast Ratios are less than 30 to 1. Therefore, the Project Signs Lighting would not create a source of high

contrast and or Glare or greater than 30 to 1 contrast ratios when viewed from the Monitoring Sites, M1 through M4.

The Project Signs Lighting Concept Design (Appendix B) defines a lighting program for the Project that limits the Glare at adjacent properties by limiting the light source luminance. The Project Signs Lighting is evaluated in comparison to the existing Baseline Average luminance identified in Section 7 above and as summarized in Table 7 below.

Table 7: Contrast Ratio: comparison of existing measured to Project Signs Lighting[5]

Monitoring Site	Existing Measured Luminance (cd/m²)		Project Lighting Luminance		Evaluation
	Average	Maximum	Max (cd/m²)	Contrast Ratio (max to average)	
ME1	28.3	583	100	4	Low Contrast Ratio, No Glare Impact
ME2	4.2	82	100	24	Medium Contrast Ratio, No Glare Impact
ME3	4.2	80	100	24	Medium Contrast Ratio, No Glare Impact
MN1	332	6765	100	0.3	Low Contrast Ratio, No Glare Impact
MS1	10.6	99	300	28.3	Medium Contrast Ratio, No Glare Impact

The Project Signs Lighting which may be visible from the surrounding properties is evaluated in comparison to the Average Measured Luminance identified in Section 7 above and as summarized in Table 7 (based on the Project Signs Lighting Concept Design and compliance with applicable code lighting standards). The Contrast Ratio is calculated by dividing the Project Lighting Maximum Luminance by the Average Measured Luminance. Contrast Ratios less than 30:1 are considered medium contrast, and will not introduce a new source of glare. Contrast Ratios less than 10:1 are considered low contrast, and will not introduce a new source of glare.

The calculated contrast ratio for Monitoring sites ME2, ME3, and MS1 are less than 30:1, and therefore are medium contrast. At Monitoring Sites ME2, ME3, and MS1 Project Lighting will not create a new source of Glare.

The calculated contrast ratio for Monitoring sites ME1, and MN1 are less than 10:1, and therefore are low contrast. At Monitoring Sites ME1 and MN1 Project Lighting will not create a new source of Glare.

8.6 Glare Analysis for Roadways - Signs Lighting

The lighting impact to driver's visibility from the Project Signs Lighting is evaluated by way of the methodology defined above. As summarized below, the results of this evaluation demonstrate the light impacts resulting from the Project Signs Lighting at the locations where light is under review are below the significance threshold for excessive luminance, or Glare. The Signs Lighting would be consistent with the California Vehicle Code standard for roadways approaching the Project from all directions.

The glare analysis of the Project Signs Lighting at night (20 minutes after sunset until 20 minutes before sunrise) assumes the simultaneous use of all Project Signs Lighting at the maximum luminance as defined in Appendix B and compares the resulting luminance to the California Vehicle Code standards to determine if the Project Signs Lighting will introduce a source of distracting Glare to drivers. The Project Signs Lighting includes Digital Signs which operate at night with maximum luminance of 300 cd/m² , and Project Identification Signs and Project Entrance Signs which operate with a maximum luminance of 100 cd/m². Therefore, the Project Digital Signs are evaluated

[5] *Based on the Project Lighting Concept Design and compliance with applicable code lighting standards*

to present the most conservative analysis of Glare for Signs Lighting at night. The Project Identification Signs and Project Entrance Signs have lower luminance which results in lower Glare.

The most stringent standard 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 Lights 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 Lighting 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. The Project Lighting is evaluated with a maximum luminance of 300 cd/m^2 at the Digital Sign DS-1 along the north edge of the drainage channel to the south of the Project Site, north of the 405 Freeway (see figure 4 above). Calculating the equivalent Project Lighting luminance by converting to English units from metric units: 300 cd/m^2 equals 87.6 fL. The Project Lighting will not exceed 87.6 fL, which is 83% 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 Project Signs Lighting located beyond the driver's 10 degree field of view the maximum luminance is permitted to increase under the California Vehicle Code. For example, light sources 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 Lighting will operate at maximum of 87.6 fL at night, or less than approximately 9% 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 Lighting will not exceed the 1000 fL threshold and will not introduce a new source of Glare as defined by the California Vehicle Code Section 21466.5.

The Sign Lighting is also evaluated during twilight (the transition period from day to night, from 20 minutes before sunset to 20 minutes after sunset, and from 20 minutes before sunrise to 20 minutes after sunrise). 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 analysis 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. The maximum light source luminance of 500 fL converting to metric units equals 1579 cd/m^2.

The Project Signs Lighting is designed to limit maximum luminance to less than 300 cd/m^2 (87.6 fL) maximum luminance, from 20 minutes before sunset to 20 minutes after sunrise. Therefore, the Sign Lighting will not exceed 300 cd/m^2 for the period beginning 20 minutes prior to sunset until 20 minutes after sunrise. Therefore, at 20 minutes before and including sunset and at sunrise and 20 minutes after, the Sign Lighting will not exceed the threshold of 500 fL, and will therefore not introduce a new source of glare.

Sign Lighting is designed to not exceed 300 candelas/m^2 (87.6 fL) luminance at night. These values are less than the California Vehicle Code standard, including 17% of the maximum allowable luminance identified as the threshold for glare during the day, therefore Sign Lighting will not create 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 Project Digital Signs will operate with a

maximum luminance of 7000 cd/m^2. The Project Identification Signs and Project Entrance Signs will not operate during the day. Therefore, the Project Digital Signs are evaluated to present the most conservative analysis of Glare for Signs Lighting during the day.The Project Digital Signs will operate during the day (20 minutes after sunrise until 20 minutes before sunset) at a maximum luminance of 7000 cd.m2. The evaluation of the Project Digital Signs during the day 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 Applicant proposes that the Project illuminated signs not exceed 7,000 cd/m^2 (2,043 fL) during the daytime hours of operation, and Project signs would therefore operate at less than 20% of the maximum luminance stipulated by the California Vehicle Code. Therefore, the Project illuminated signs would 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 Project Digital Signs include an electronic control system to reduce the sign luminance from 7,000 cd/m^2 (2043 fL) to 300 cd/m^2 (87.6 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 would transition from the daytime 7,000 cd/m^2 (2043 fL) to 300 cd/m^2 (87.6 fL) maximum, and thereby ensure that the sign brightness remains less than 20% of the maximum brightness stipulated by the California Vehicle Code. Therefore, the Project Signs Lighting would not create a new source of glare during day time periods with storm or severe overcast weather conditions.

Project Signs Lighting will not exceed 300 candelas/m^2 (87.6 fL) luminance at night, and will not exceed 7000 cd/m^2 luminance during the days Project Signs Lighting luminance is less than the California Vehicle Code maximum allowable luminance identified as the threshold for Glare. Therefore the Project Signs Lighting will not create a new source of Glare.

9. Conclusions

The Project proposes to install new outdoor lighting and lit signs while minimizing Light Trespass and Glare to neighboring sensitive use properties through design features that comply with the applicable code standards

This analysis evaluates the potential for Project Lighting and Sign Lighting to create a new source of Light Trespass and or Glare at adjacent sensitive use properties. The Project Lighting locations, types, dimensions, and maximum luminance are as described by the Concept Plan in Appendix A and are evaluated with all Project Lighting operating simultaneously at maximum luminance. The Project Signs Lighting locations, types, dimensions and maximum luminance were evaluated as described in the Signs Lighting Concept Plan in Appendix B and are evaluated with all Signs Lighting operating simultaneously at maximum luminance. As such, this analysis represents a conservative evaluation of the proposed Project and the potential for off-site Light Trespass, and Glare. This analysis concludes the Project will not create a new source of Light Trespass and or Glare.

APPENDIX A: Site Lighting Concept Plan

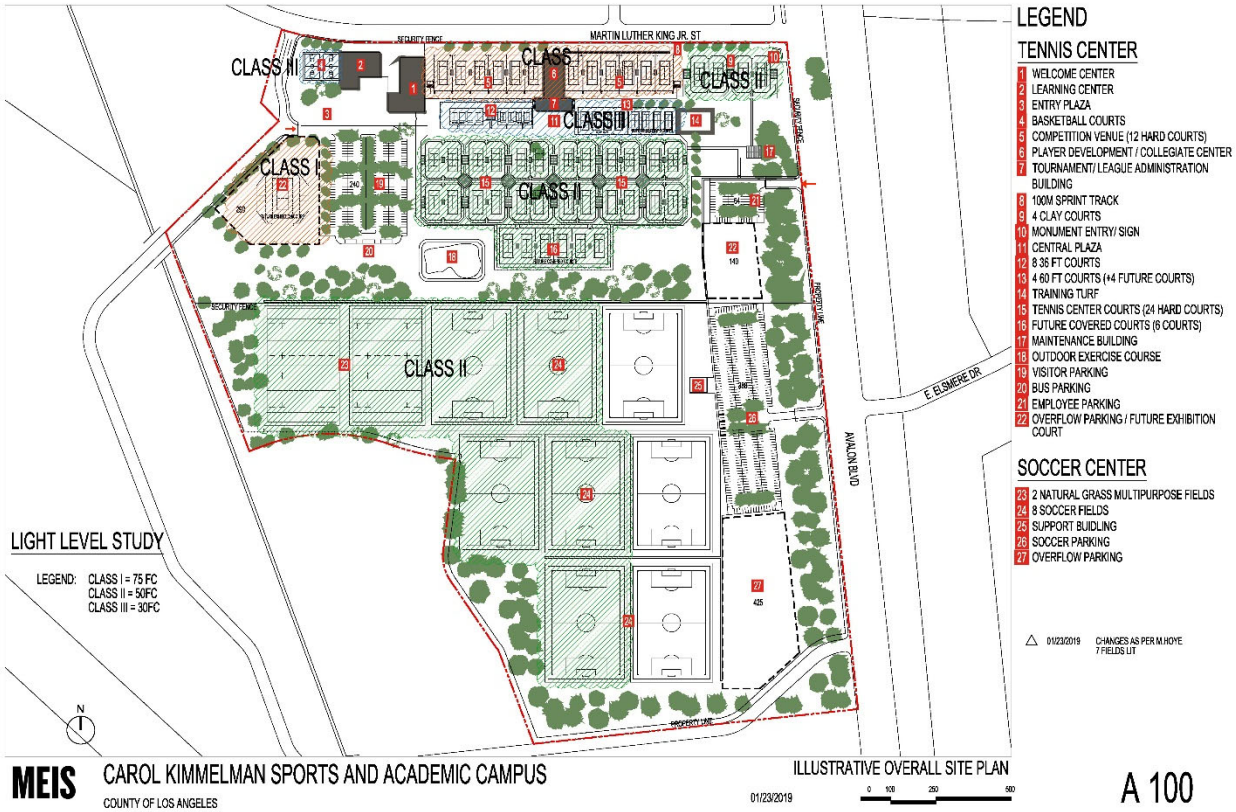

Figure 18: Project Site Plan

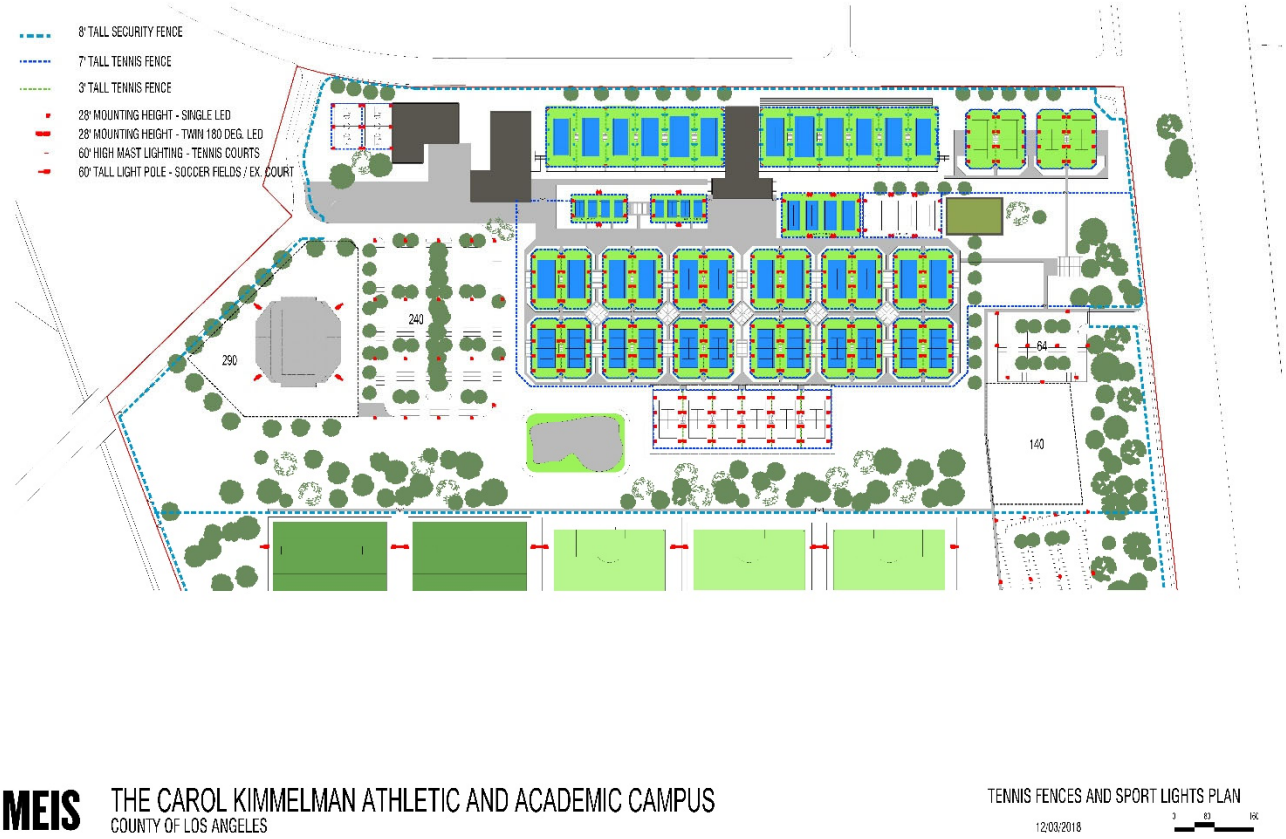

Figure 19: Project Lighting Plan - North

Figure 20: Project Lighting Plan - South

APPENDIX B: Project Signs Lighting Concept Plan

Figure 21: Project Signs Location Plan

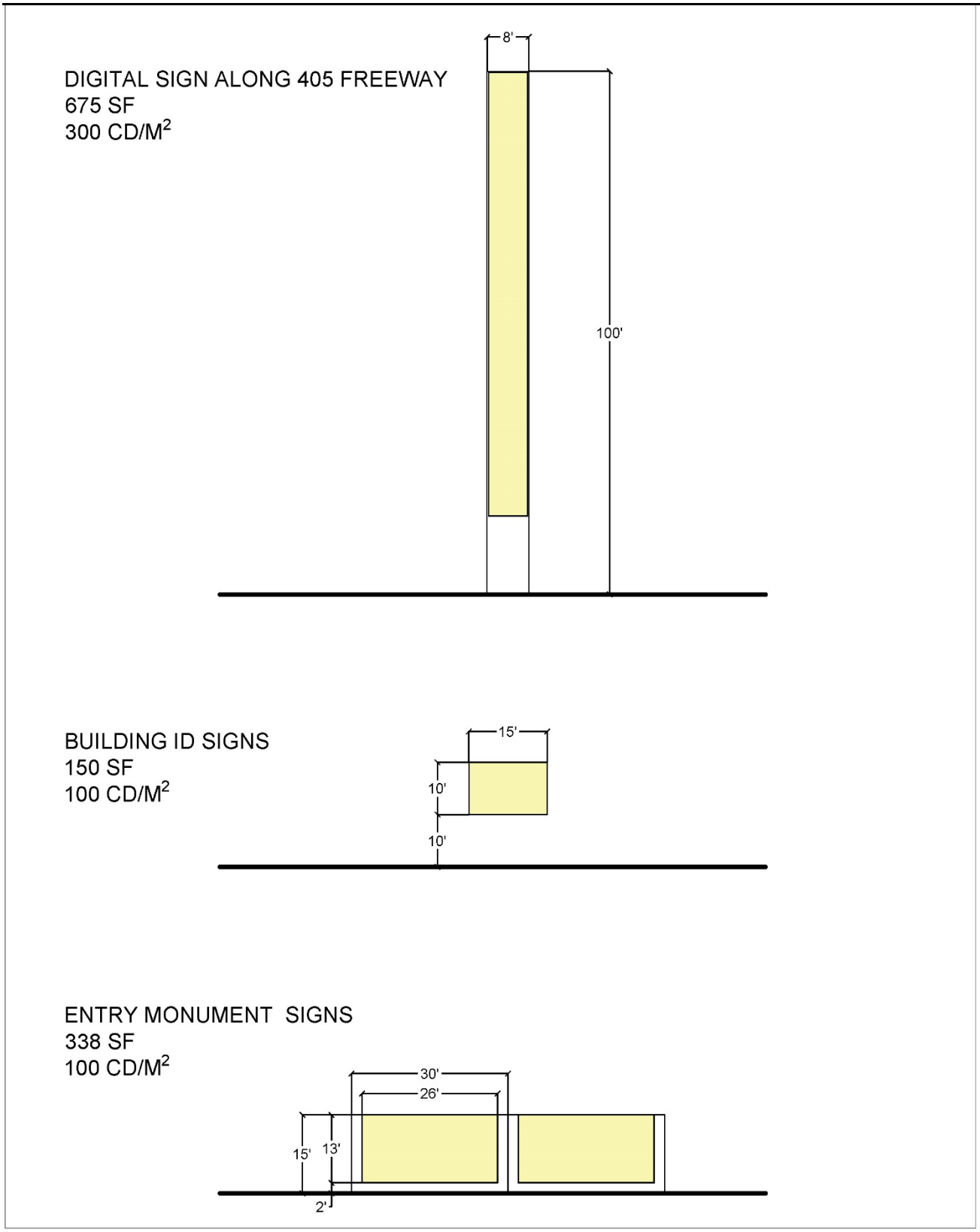

Figure 22: Project Signs Dimensions

APPENDIX C: 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 D: 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 E: 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 F: Project Lighting Illuminance Light Trespass Calculation (fc)

Project 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 illuminance is under review. Grid data is displayed at ten feet on center, vertical and horizontal.

Vertical Plane VPE1

HORIZONTAL (ft)	0	10	20	30	40	50	60	70	80	90	100
55	0.2	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	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	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
5	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2

HORIZONTAL (ft)	110	120	130	140	150	160	170	180	190	200	210
55	0.2	0.2	0.2	0.2	0.3	0.2	0.3	0.3	0.3	0.3	0.3
45	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3
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	0.2	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	0.2

HORIZONTAL (ft)	220	230	240	250	260	270	280	290	300	310	320
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	0.2	0.2	0.3	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3
15	0.2	0.2	0.2	0.2	0.2	0.3	0.3	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	0.2

HORIZONTAL (ft)	330	340	350	360	370	380	390	400	410	420	430
55	0.3	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	0.4	0.4	0.4	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	0.4
25	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.4
15	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
5	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3

HORIZONTAL (ft)	440	450	460	470	480	490	500	510	520	530	540
55	0.5	0.5	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	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5

35	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.5	0.5	0.5
25	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
15	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.4
5	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.3

HORIZONTAL (ft)	**550**	**560**	**570**	**580**	**590**	**600**	**610**	**620**	**630**	**640**	**650**
55	0.6	0.6	0.6	0.6	0.7	0.6	0.7	0.7	0.7	0.7	0.7
45	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
35	0.5	0.5	0.5	0.5	0.5	0.6	0.6	0.6	0.6	0.6	0.6
25	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
15	0.4	0.4	0.4	0.4	0.4	0.5	0.4	0.4	0.5	0.5	0.5
5	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4

HORIZONTAL (ft)	**660**	**670**	**680**	**690**	**700**	**710**	**720**	**730**	**740**	**750**	**760**
55	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
45	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.6	0.6	0.6	0.6
35	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
25	0.5	0.5	0.6	0.6	0.6	0.6	0.6	0.5	0.5	0.5	0.5
15	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
5	0.4	0.4	0.4	0.4	0.5	0.4	0.4	0.4	0.4	0.4	0.4

HORIZONTAL (ft)	**770**	**780**	**790**	**800**	**810**	**820**	**830**	**840**	**850**	**860**	**870**
55	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.6	0.6	0.7
45	0.7	0.6	0.7	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
35	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
25	0.6	0.6	0.6	0.6	0.5	0.6	0.5	0.5	0.5	0.5	0.5
15	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
5	0.4	0.4	0.4	0.4	0.4	0.5	0.5	0.4	0.4	0.4	0.5

HORIZONTAL (ft)	**880**	**890**	**900**	**910**	**920**	**930**	**940**	**950**	**960**	**970**	**980**
55	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
45	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
35	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.5	0.6	0.6	0.5
25	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
15	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
5	0.5	0.4	0.5	0.5	0.4	0.5	0.5	0.4	0.5	0.5	0.4

HORIZONTAL (ft)	**990**	**1000**	**1010**	**1020**	**1030**	**1040**	**1050**	**1060**	**1070**	**1080**	**1090**
55	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
45	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6

35	0.5	0.6	0.6	0.6	0.6	0.6	0.6	0.5	0.6	0.6	0.6
25	0.5	0.5	0.5	0.5	0.6	0.5	0.5	0.5	0.6	0.5	0.6
15	0.5	0.5	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	0.5	0.5	0.5	0.5	0.5

HORIZONTAL (ft)	**1100**	**1110**	**1120**	**1130**	**1140**	**1150**	**1160**	**1170**	**1180**	**1190**	**1200**
55	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
45	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
35	0.6	0.6	0.5	0.5	0.6	0.6	0.6	0.6	0.6	0.6	0.6
25	0.6	0.5	0.5	0.5	0.6	0.6	0.6	0.6	0.6	0.5	0.6
15	0.5	0.5	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	0.5	0.5	0.5	0.5	0.5

HORIZONTAL (ft)	**1210**	**1220**	**1230**	**1240**	**1250**	**1260**	**1270**	**1280**	**1290**	**1300**	**1310**
55	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
45	0.6	0.5	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
35	0.6	0.5	0.6	0.6	0.6	0.5	0.6	0.6	0.6	0.6	0.5
25	0.6	0.5	0.6	0.6	0.6	0.5	0.6	0.6	0.6	0.6	0.5
15	0.6	0.5	0.6	0.6	0.6	0.5	0.6	0.6	0.6	0.5	0.5
5	0.6	0.5	0.5	0.5	0.5	0.5	0.6	0.6	0.5	0.5	0.5

HORIZONTAL (ft)	**1320**	**1330**	**1340**	**1350**	**1360**	**1370**	**1380**	**1390**	**1400**	**1410**	**1420**
55	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
45	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
35	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
25	0.6	0.6	0.6	0.6	0.5	0.6	0.6	0.6	0.6	0.6	0.6
15	0.6	0.6	0.6	0.6	0.5	0.6	0.6	0.6	0.6	0.6	0.6
5	0.5	0.6	0.6	0.6	0.5	0.5	0.6	0.6	0.6	0.6	0.6

HORIZONTAL (ft)	**1430**	**1440**	**1450**	**1460**	**1470**	**1480**	**1490**	**1500**	**1510**	**1520**	**1530**
55	0.5	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.5	0.5	0.5
45	0.5	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.5	0.5	0.6
35	0.5	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.5	0.5	0.6
25	0.5	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.5	0.5	0.5
15	0.5	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.5	0.5	0.5
5	0.5	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.5	0.5	0.5

HORIZONTAL (ft)	**1540**	**1550**	**1560**	**1570**	**1580**	**1590**	**1600**	**1610**	**1620**	**1630**	**1640**
55	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
45	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6

35	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
25	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
15	0.6	0.6	0.6	0.6	0.6	0.6	0.6	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	0.6

HORIZONTAL (ft)	**1650**	**1660**	**1670**	**1680**	**1690**	**1700**	**1710**	**1720**	**1730**	**1740**	**1750**
55	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
45	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
35	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
25	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
15	0.6	0.6	0.6	0.6	0.6	0.6	0.6	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	0.6

HORIZONTAL (ft)	**1760**	**1770**	**1780**	**1790**	**1800**	**1810**	**1820**	**1830**	**1840**	**1850**	**1860**
55	0.6	0.6	0.6	0.6	0.5	0.6	0.6	0.6	0.6	0.6	0.6
45	0.6	0.6	0.6	0.5	0.5	0.6	0.6	0.6	0.6	0.6	0.6
35	0.6	0.6	0.6	0.6	0.5	0.6	0.6	0.6	0.6	0.6	0.6
25	0.6	0.6	0.6	0.6	0.5	0.6	0.6	0.6	0.6	0.6	0.6
15	0.6	0.6	0.6	0.6	0.5	0.6	0.6	0.6	0.7	0.6	0.6
5	0.6	0.6	0.6	0.6	0.5	0.6	0.6	0.7	0.7	0.6	0.6

HORIZONTAL (ft)	**1870**	**1880**	**1890**	**1900**	**1910**	**1920**	**1930**	**1940**	**1950**	**1960**	**1970**
55	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.5	0.6	0.6	0.6
45	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
35	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
25	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
15	0.6	0.6	0.6	0.6	0.6	0.6	0.6	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	0.6

HORIZONTAL (ft)	**1980**	**1990**	**2000**	**2010**	**2020**	**2030**	**2040**	**2050**	**2060**	**2070**	**2080**
55	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.5	0.5
45	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
35	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
25	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
15	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
5	0.7	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6

HORIZONTAL (ft)	**2090**	**2100**	**2110**	**2120**	**2130**	**2140**	**2150**	**2160**	**2170**	**2180**	**2190**
55	0.6	0.5	0.5	0.6	0.6	0.6	0.6	0.6	0.5	0.5	0.5
45	0.6	0.6	0.5	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.5

35	0.6	0.6	0.5	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
25	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
15	0.6	0.6	0.6	0.6	0.6	0.6	0.6	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	0.6

HORIZONTAL (ft)	**2200**	**2210**	**2220**	**2230**	**2240**	**2250**	**2260**	**2270**	**2280**	**2290**	**2300**
55	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
45	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
35	0.6	0.5	0.5	0.5	0.5	0.5	0.5	0.6	0.6	0.5	0.5
25	0.6	0.6	0.5	0.5	0.5	0.5	0.5	0.6	0.6	0.5	0.5
15	0.6	0.6	0.5	0.5	0.6	0.5	0.6	0.6	0.6	0.5	0.5
5	0.6	0.6	0.5	0.6	0.6	0.5	0.6	0.6	0.6	0.5	0.6

HORIZONTAL (ft)	**2310**	**2320**	**2330**	**2340**	**2350**	**2360**	**2370**	**2380**	**2390**	**2400**	**2410**
55	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
45	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
35	0.5	0.5	0.5	0.5	0.5	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	0.5	0.5	0.5	0.5	0.5
15	0.5	0.5	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	0.5	0.5	0.5	0.5	0.5

HORIZONTAL (ft)	**2420**	**2430**	**2440**	**2450**	**2460**	**2470**	**2480**	**2490**	**2500**	**2510**	**2520**
55	0.5	0.5	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
45	0.5	0.5	0.5	0.5	0.5	0.5	0.4	0.4	0.4	0.4	0.4
35	0.5	0.5	0.5	0.5	0.5	0.5	0.4	0.4	0.4	0.4	0.5
25	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.4	0.4	0.5
15	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.4	0.4	0.5
5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.4	0.5

HORIZONTAL (ft)	**2530**	**2540**	**2550**	**2560**	**2570**	**2580**	**2590**	**2600**	**2610**	**2620**	**2630**
55	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
45	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
35	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
25	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
15	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
5	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4

HORIZONTAL (ft)	**2640**	**2650**	**2660**	**2670**	**2680**	**2690**	**2700**	**2710**	**2720**	**2730**	**2740**
55	0.4	0.3	0.4	0.4	0.4	0.4	0.3	0.4	0.4	0.4	0.4
45	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4

35	0.4	0.4	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	0.4
15	0.4	0.4	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	0.4

HORIZONTAL (ft)	**2750**	**2760**	**2770**	**2780**	**2790**	**2800**	**2810**	**2820**	**2830**	**2840**	**2850**
55	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
45	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
35	0.4	0.4	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3
25	0.4	0.4	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3
15	0.4	0.4	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3
5	0.4	0.4	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3

HORIZONTAL (ft)	**2860**	**2870**	**2880**	**2890**	**2900**	**2910**	**2920**	**2930**	**2940**	**2950**	**2960**
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

HORIZONTAL (ft)	**2970**	**2980**	**2990**	**3000**	**3010**	**3020**	**3030**	**3040**	**3050**	**3060**	**3070**
55	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.3	0.2	0.2
45	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.3	0.3	0.2	0.2
35	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.3	0.3	0.2	0.2
25	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.3	0.3	0.2	0.2
15	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.3	0.3	0.2	0.2
5	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.3	0.3	0.2	0.2

HORIZONTAL (ft)	**3080**	**3090**	**3100**	**3110**	**3120**	**3130**	**3140**	**3150**	**3160**	**3170**	**3180**
55	0.2	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	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	0.2	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	0.2

HORIZONTAL (ft)	**3190**	**3200**	**3210**	**3220**	**3230**
55	0.2	0.2	0.2	0.2	0.2
45	0.2	0.2	0.2	0.2	0.2

35	0.2	0.2	0.2	0.2	0.2
25	0.2	0.2	0.2	0.2	0.2
15	0.2	0.2	0.2	0.2	0.2
5	0.2	0.2	0.2	0.2	0.2

Vertical Plane VPN1

HORIZONTAL (ft)	**0**	**10**	**20**	**30**	**40**	**50**	**60**	**70**	**80**	**90**	**100**
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	0.1	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	0.1
25	0.1	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	0.1
5	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1

HORIZONTAL (ft)	**110**	**120**	**130**	**140**	**150**	**160**	**170**	**180**	**190**	**200**	**210**
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	0.1	0.1	0.1
35	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.1
25	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.1	0.1	0.1
15	0.1	0.1	0.1	0.1	0.1	0.2	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	0.1

HORIZONTAL (ft)	**220**	**230**	**240**	**250**	**260**	**270**	**280**	**290**	**300**	**310**	**320**
55	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.2	0.2
45	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
35	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.2	0.2
25	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.2	0.2
15	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.2
5	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.2	0.2

HORIZONTAL (ft)	**330**	**340**	**350**	**360**	**370**	**380**	**390**	**400**	**410**	**420**	**430**
55	0.2	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	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	0.2	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	0.2

HORIZONTAL (ft)	**440**	**450**	**460**	**470**	**480**	**490**	**500**	**510**	**520**	**530**	**540**
55	0.2	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	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	0.2	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	0.2

HORIZONTAL (ft)	**550**	**560**	**570**	**580**	**590**	**600**	**610**	**620**	**630**	**640**	**650**
55	0.2	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	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	0.2	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	0.2

HORIZONTAL (ft)	**660**	**670**	**680**	**690**	**700**	**710**	**720**	**730**	**740**	**750**	**760**
55	0.2	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	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	0.2	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	0.2

HORIZONTAL (ft)	**770**	**780**	**790**	**800**	**810**	**820**	**830**	**840**	**850**	**860**	**870**
55	0.2	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	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	0.2	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	0.2

HORIZONTAL (ft)	**880**	**890**	**900**	**910**	**920**	**930**	**940**	**950**	**960**	**970**	**980**
55	0.2	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	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	0.2	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	0.2

HORIZONTAL (ft)	**990**	**1000**	**1010**	**1020**	**1030**	**1040**	**1050**	**1060**	**1070**	**1080**	**1090**
55	0.2	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	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	0.2	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	0.2

HORIZONTAL (ft)	**1100**	**1110**	**1120**	**1130**	**1140**	**1150**	**1160**	**1170**	**1180**	**1190**	**1200**
55	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	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	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	0.2	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	0.2

HORIZONTAL (ft)	**1210**	**1220**	**1230**	**1240**	**1250**	**1260**	**1270**	**1280**	**1290**	**1300**	**1310**
55	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3
45	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	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	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	0.2	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	0.2

HORIZONTAL (ft)	**1320**	**1330**	**1340**	**1350**	**1360**	**1370**	**1380**	**1390**	**1400**	**1410**	**1420**
55	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.3	0.3	0.3	0.3
45	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.3	0.2	0.3	0.3
35	0.2	0.2	0.2	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	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	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2

HORIZONTAL (ft)	**1430**	**1440**	**1450**	**1460**	**1470**	**1480**	**1490**	**1500**	**1510**	**1520**	**1530**
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	0.2	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	0.3	0.3	0.3	0.3
15	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
5	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2

HORIZONTAL (ft)	**1540**	**1550**	**1560**	**1570**	**1580**	**1590**	**1600**	**1610**	**1620**	**1630**	**1640**
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	0.2	0.3	0.3	0.3	0.3	0.3	0.3	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	0.2	0.3	0.2
5	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2

HORIZONTAL (ft)	**1650**	**1660**	**1670**	**1680**	**1690**	**1700**	**1710**	**1720**	**1730**	**1740**	**1750**
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	0.2	0.3	0.3	0.3	0.2	0.3	0.3	0.3	0.3	0.3	0.3
15	0.2	0.2	0.2	0.2	0.2	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	0.2

HORIZONTAL (ft)	**1760**	**1770**	**1780**	**1790**	**1800**	**1810**	**1820**	**1830**	**1840**	**1850**	**1860**
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	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
15	0.2	0.2	0.2	0.2	0.3	0.3	0.3	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	0.2

HORIZONTAL (ft)	**1870**	**1880**	**1890**	**1900**	**1910**	**1920**	**1930**	**1940**	**1950**	**1960**	**1970**
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	0.2	0.2
5	0.2	0.2	0.3	0.2	0.3	0.2	0.2	0.2	0.2	0.2	0.2

HORIZONTAL (ft)	**1980**	**1990**	**2000**	**2010**	**2020**	**2030**	**2040**	**2050**	**2060**	**2070**	**2080**
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	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.2	0.3	0.2	0.3
5	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2

HORIZONTAL (ft)	**2090**	**2100**	**2110**	**2120**	**2130**	**2140**	**2150**	**2160**	**2170**	**2180**	**2190**
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	0.2	0.2	0.3	0.3	0.2	0.2	0.2	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	0.2

HORIZONTAL (ft)	**2200**	**2210**	**2220**	**2230**	**2240**	**2250**	**2260**	**2270**	**2280**	**2290**	**2300**
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	0.2
15	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
5	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2

HORIZONTAL (ft)	**2310**	**2320**	**2330**	**2340**	**2350**	**2360**	**2370**	**2380**	**2390**	**2400**	**2410**
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	0.2	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	0.3	0.2	0.3
25	0.3	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	0.2	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	0.2

HORIZONTAL (ft)	**2420**	**2430**	**2440**	**2450**	**2460**	**2470**
55	0.3	0.3	0.3	0.3	0.3	0.3
45	0.2	0.3	0.3	0.2	0.2	0.3
35	0.2	0.3	0.3	0.2	0.2	0.2
25	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
5	0.2	0.2	0.2	0.2	0.2	0.2

Vertical Plane VPS1

HORIZONTAL (ft)	**0**	**10**	**20**	**30**	**40**	**50**	**60**	**70**	**80**	**90**	**100**
95	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
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	0.1	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	0.1
25	0.1	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	0.1
5	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1

HORIZONTAL (ft)	110	120	130	140	150	160	170	180	190	200	210
95	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
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	0.1	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	0.1
25	0.1	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	0.1
5	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.1	0.1	0.1

HORIZONTAL (ft)	220	230	240	250	260	270	280	290	300	310	320
95	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
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	0.1	0.1	0.2
35	0.1	0.1	0.1	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.2
25	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.2
15	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.2
5	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.2	0.2

HORIZONTAL (ft)	330	340	350	360	370	380	390	400	410	420	430
95	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
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	0.1	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	0.1
25	0.1	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	0.1
5	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1

HORIZONTAL (ft)	440	450	460	470	480	490	500	510	520	530	540
95	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
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	0.1	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	0.1
25	0.1	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	0.1
5	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1

HORIZONTAL (ft)	**550**	**560**	**570**	**580**	**590**	**600**	**610**	**620**	**630**	**640**	**650**
95	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
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	0.1	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	0.1
25	0.1	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	0.1
5	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1

HORIZONTAL (ft)	**660**	**670**	**680**	**690**	**700**	**710**	**720**	**730**	**740**	**750**	**760**
95	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
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	0.1	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	0.1
25	0.1	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	0.1
5	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1

HORIZONTAL (ft)	**770**	**780**	**790**	**800**	**810**	**820**	**830**	**840**	**850**	**860**	**870**
95	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
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	0.1	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	0.1
25	0.1	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	0.1
5	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1

HORIZONTAL (ft)	**880**	**890**	**900**	**910**	**920**	**930**	**940**	**950**	**960**	**970**	**980**

95	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
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	0.1	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	0.1
25	0.1	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	0.1
5	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1

HORIZONTAL (ft)	**990**	**1000**	**1010**	**1020**	**1030**	**1040**	**1050**	**1060**	**1070**	**1080**	**1090**
95	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
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	0.1	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	0.1
25	0.1	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	0.1
5	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1

HORIZONTAL (ft)	**1100**	**1110**	**1120**	**1130**	**1140**	**1150**	**1160**	**1170**	**1180**	**1190**	**1200**
95	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
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	0.1	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	0.1
25	0.1	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	0.1
5	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1

HORIZONTAL (ft)	**1210**	**1220**	**1230**	**1240**	**1250**	**1260**	**1270**	**1280**	**1290**	**1300**	**1310**
95	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
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	0.1	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	0.1
25	0.1	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	0.1
5	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1

HORIZONTAL (ft)	**1320**	**1330**	**1340**	**1350**	**1360**	**1370**	**1380**	**1390**	**1400**	**1410**	**1420**
95	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
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	0.1	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	0.1
25	0.1	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	0.1
5	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1

HORIZONTAL (ft)	**1430**	**1440**	**1450**	**1460**	**1470**	**1480**	**1490**	**1500**	**1510**	**1520**	**1530**
95	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
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	0.1
45	0.1	0.1	0.1	0.1	0.1	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	0.1
25	0.1	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	0.1
5	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1

HORIZONTAL (ft)	**1540**	**1550**	**1560**	**1570**	**1580**	**1590**	**1600**	**1610**	**1620**	**1630**	**1640**
95	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0
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
55	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0	0
45	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0	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	0.1
25	0.1	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	0.1
5	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1

HORIZONTAL (ft)	**1650**	**1660**	**1670**	**1680**	**1690**	**1700**	**1710**	**1720**	**1730**	**1740**	**1750**
95	0.1	0.1	0.1	0.1	0	0.0	0.0	0.0	0.0	0.0	0.0
85	0.1	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0

75	0.1	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0
65	0	0	0.1	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
45	0.1	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0
35	0.1	0	0	0	0.1	0.0	0.0	0.0	0.0	0.0	0.0
25	0.1	0.1	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0
15	0.1	0.1	0.1	0	0	0.0	0.0	0.0	0.0	0.0	0.0
5	0.1	0.1	0.1	0.1	0	0.0	0.0	0.0	0.0	0.0	0.0

HORIZONTAL (ft)	**1760**	**1770**	**1780**	**1790**	**1800**	**1810**	**1820**	**1830**	**1840**	**1850**	**1860**
95	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
85	0.0	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	0.0
65	0.0	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	0.0
45	0.0	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	0.0
25	0.0	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	0.0
5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

HORIZONTAL (ft)	**1870**	**1880**	**1890**	**1900**	**1910**	**1920**	**1930**	**1940**	**1950**	**1960**	**1970**
95	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
85	0.0	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	0.0
65	0.0	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	0.0
45	0.0	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	0.0
25	0.0	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	0.0
5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

HORIZONTAL (ft)	**1980**	**1990**	**2000**	**2010**	**2020**	**2030**	**2040**	**2050**	**2060**	**2070**	**2080**
95	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
85	0.0	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	0.0
65	0.0	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	0.0
45	0.0	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	0.0
25	0.0	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	0.0
5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

HORIZONTAL (ft)	2090	2100	2110	2120	2130	2140	2150	2160	2170	2180	2190
95	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
85	0.0	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	0.0
65	0.0	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	0.0
45	0.0	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	0.0
25	0.0	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	0.0
5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

HORIZONTAL (ft)	2200	2210	2220	2230	2240	2250	2260	2270	2280	2290	2300
95	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
85	0.0	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	0.0
65	0.0	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	0.0
45	0.0	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	0.0
25	0.0	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	0.0
5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

APPENDIX G: Project Signs Lighting Illuminance Light Trespass Calculation (fc)

Project Signs 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 illuminance is under review. Grid data is displayed at ten feet on center, vertical and horizontal.

Vertical Plane VPE1

HORIZONTAL (ft)	0	10	20	30	40	50	60	70	80	90	100
55	0.0	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	0.0
35	0.0	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	0.0
15	0.0	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	0.0

HORIZONTAL (ft)	110	120	130	140	150	160	170	180	190	200	210
55	0.0	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	0.0

35	0.0	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	0.0
15	0.0	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	0.0

HORIZONTAL (ft)	**220**	**230**	**240**	**250**	**260**	**270**	**280**	**290**	**300**	**310**	**320**
55	0.0	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	0.0
35	0.0	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	0.0
15	0.0	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	0.0

HORIZONTAL (ft)	**330**	**340**	**350**	**360**	**370**	**380**	**390**	**400**	**410**	**420**	**430**
55	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1
45	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1
35	0.0	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	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1
15	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1
5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1

HORIZONTAL (ft)	**440**	**450**	**460**	**470**	**480**	**490**	**500**	**510**	**520**	**530**	**540**
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	0.1	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	0.2
25	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2
15	0.1	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	0.1

HORIZONTAL (ft)	**550**	**560**	**570**	**580**	**590**	**600**	**610**	**620**	**630**	**640**	**650**
55	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
45	0.2	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	0.1	0.1
25	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1
15	0.2	0.2	0.2	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	0.1	0.1	0.1	0.1	0.1	0.1	0.1

HORIZONTAL (ft)	**660**	**670**	**680**	**690**	**700**	**710**	**720**	**730**	**740**	**750**	**760**
55	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0
45	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0

35	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0
25	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0
15	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0
5	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0

HORIZONTAL (ft)	**770**	**780**	**790**	**800**	**810**	**820**	**830**	**840**	**850**	**860**	**870**
55	0.0	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	0.0
35	0.0	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	0.0
15	0.0	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	0.0

HORIZONTAL (ft)	**880**	**890**	**900**	**910**	**920**	**930**	**940**	**950**	**960**	**970**	**980**
55	0.0	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	0.0
35	0.0	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	0.0
15	0.0	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	0.0

HORIZONTAL (ft)	**990**	**1000**	**1010**	**1020**	**1030**	**1040**	**1050**	**1060**	**1070**	**1080**	**1090**
55	0.0	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	0.0
35	0.0	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	0.0
15	0.0	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	0.0

HORIZONTAL (ft)	**1100**	**1110**	**1120**	**1130**	**1140**	**1150**	**1160**	**1170**	**1180**	**1190**	**1200**
55	0.0	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	0.0
35	0.0	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	0.0
15	0.0	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	0.0

HORIZONTAL (ft)	**1210**	**1220**	**1230**	**1240**	**1250**	**1260**	**1270**	**1280**	**1290**	**1300**	**1310**
55	0.0	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	0.0

35	0.0	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	0.0
15	0.0	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	0.0

HORIZONTAL (ft)	**1320**	**1330**	**1340**	**1350**	**1360**	**1370**	**1380**	**1390**	**1400**	**1410**	**1420**
55	0.0	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	0.0
35	0.0	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	0.0
15	0.0	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	0.0

HORIZONTAL (ft)	**1430**	**1440**	**1450**	**1460**	**1470**	**1480**	**1490**	**1500**	**1510**	**1520**	**1530**
55	0.0	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	0.0
35	0.0	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	0.0
15	0.0	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	0.0

HORIZONTAL (ft)	**1540**	**1550**	**1560**	**1570**	**1580**	**1590**	**1600**	**1610**	**1620**	**1630**	**1640**
55	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1
45	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1
35	0.0	0.0	0.0	0.0	0.0	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	0.1	0.1	0.1	0.1	0.1
15	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1
5	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1

HORIZONTAL (ft)	**1650**	**1660**	**1670**	**1680**	**1690**	**1700**	**1710**	**1720**	**1730**	**1740**	**1750**
55	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2
45	0.1	0.1	0.1	0.1	0.2	0.2	0.2	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	0.2
25	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2
15	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2
5	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2

HORIZONTAL (ft)	**1760**	**1770**	**1780**	**1790**	**1800**	**1810**	**1820**	**1830**	**1840**	**1850**	**1860**
55	0.2	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	0.2

35	0.2	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	0.2
15	0.2	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	0.2

HORIZONTAL (ft)	**1870**	**1880**	**1890**	**1900**	**1910**	**1920**	**1930**	**1940**	**1950**	**1960**	**1970**
55	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
45	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	0.1	0.1	0.1	0.1	0.1	0.1	0.1
25	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1
15	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
5	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1

HORIZONTAL (ft)	**1980**	**1990**	**2000**	**2010**	**2020**	**2030**	**2040**	**2050**	**2060**	**2070**	**2080**
55	0.1	0.1	0.0	0.0	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	0.0
35	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
25	0.1	0.1	0.0	0.0	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	0.0
5	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

HORIZONTAL	**2090**	**2100**	**2110**	**2120**	**2130**	**2140**	**2150**	**2160**	**2170**	**2180**	**2190**
55	0.0	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	0.0
35	0.0	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	0.0
15	0.0	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	0.0

HORIZONTAL (ft)	**2200**	**2210**	**2220**	**2230**	**2240**	**2250**	**2260**	**2270**	**2280**	**2290**	**2300**
55	0.0	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	0.0
35	0.0	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	0.0
15	0.0	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	0.0

HORIZONTAL (ft)	**2310**	**2320**	**2330**	**2340**	**2350**	**2360**	**2370**	**2380**	**2390**	**2400**	**2410**
55	0.0	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	0.0
35	0.0	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	0.0
15	0.0	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	0.0

HORIZONTAL (ft)	**2420**	**2430**	**2440**	**2450**	**2460**	**2470**	**2480**	**2490**	**2500**	**2510**	**2520**
55	0.0	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	0.0
35	0.0	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	0.0
15	0.0	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	0.0

HORIZONTAL (ft)	**2530**	**2540**	**2550**	**2560**	**2570**	**2580**	**2590**	**2600**	**2610**	**2620**	**2630**
55	0.0	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	0.0
35	0.0	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	0.0
15	0.0	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	0.0

HORIZONTAL (ft)	**2640**	**2650**	**2660**	**2670**	**2680**	**2690**	**2700**	**2710**	**2720**	**2730**	**2740**
55	0.0	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	0.0
35	0.0	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	0.0
15	0.0	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	0.0

HORIZONTAL (ft)	**2750**	**2760**	**2770**	**2780**	**2790**	**2800**	**2810**	**2820**	**2830**	**2840**	**2850**
55	0.0	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	0.0
35	0.0	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	0.0
15	0.0	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	0.0

HORIZONTAL (ft)	**2860**	**2870**	**2880**	**2890**	**2900**	**2910**	**2920**	**2930**	**2940**	**2950**	**2960**
55	0.0	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	0.0
35	0.0	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	0.0
15	0.0	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	0.0

HORIZONTAL (ft)	**2970**	**2980**	**2990**	**3000**	**3010**	**3020**	**3030**	**3040**	**3050**	**3060**	**3070**
55	0.0	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	0.0
35	0.0	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	0.0
15	0.0	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	0.0

HORIZONTAL (ft)	**3080**	**3090**	**3100**	**3110**	**3120**	**3130**	**3140**	**3150**	**3160**	**3170**	**3180**
55	0.0	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	0.0
35	0.0	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	0.0
15	0.0	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	0.0

HORIZONTAL (ft)	**3190**	**3200**	**3210**	**3220**	**3230**
55	0.0	0.0	0.0	0.0	0.0
45	0.0	0.0	0.0	0.0	0.0
35	0.0	0.0	0.0	0.0	0.0
25	0.0	0.0	0.0	0.0	0.0
15	0.0	0.0	0.0	0.0	0.0
5	0.0	0.0	0.0	0.0	0.0

Vertical Plane VPN1

HORIZONTAL (ft)	**0**	**10**	**20**	**30**	**40**	**50**	**60**	**70**	**80**	**90**	**100**
55	0.0	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	0.0
35	0.0	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	0.0
15	0.0	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	0.0

HORIZONTAL (ft)	**110**	**120**	**130**	**140**	**150**	**160**	**170**	**180**	**190**	**200**	**210**
55	0.0	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	0.0
35	0.0	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	0.0

15	0.0	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	0.0

HORIZONTAL (ft)	**220**	**230**	**240**	**250**	**260**	**270**	**280**	**290**	**300**	**310**	**320**
55	0.0	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	0.0
35	0.0	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	0.0
15	0.0	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	0.0

HORIZONTAL (ft)	**330**	**340**	**350**	**360**	**370**	**380**	**390**	**400**	**410**	**420**	**430**
55	0.0	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	0.0
35	0.0	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	0.0
15	0.0	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	0.0

HORIZONTAL (ft)	**440**	**450**	**460**	**470**	**480**	**490**	**500**	**510**	**520**	**530**	**540**
55	0.0	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	0.0
35	0.0	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	0.0
15	0.0	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	0.0

HORIZONTAL (ft)	**550**	**560**	**570**	**580**	**590**	**600**	**610**	**620**	**630**	**640**	**650**
55	0.0	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	0.0
35	0.0	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	0.0
15	0.0	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	0.0

HORIZONTAL (ft)	**660**	**670**	**680**	**690**	**700**	**710**	**720**	**730**	**740**	**750**	**760**
55	0.0	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	0.0
35	0.0	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	0.0

15	0.0	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	0.0

HORIZONTAL (ft)	**770**	**780**	**790**	**800**	**810**	**820**	**830**	**840**	**850**	**860**	**870**
55	0.0	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	0.0
35	0.0	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	0.0
15	0.0	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	0.0

HORIZONTAL (ft)	**880**	**890**	**900**	**910**	**920**	**930**	**940**	**950**	**960**	**970**	**980**
55	0.0	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	0.0
35	0.0	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	0.0
15	0.0	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	0.0

HORIZONTAL (ft)	**990**	**1000**	**1010**	**1020**	**1030**	**1040**	**1050**	**1060**	**1070**	**1080**	**1090**
55	0.0	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	0.0
35	0.0	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	0.0
15	0.0	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	0.0

HORIZONTAL (ft)	**1100**	**1110**	**1120**	**1130**	**1140**	**1150**	**1160**	**1170**	**1180**	**1190**	**1200**
55	0.0	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	0.0
35	0.0	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	0.0
15	0.0	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	0.0

HORIZONTAL (ft)	**1210**	**1220**	**1230**	**1240**	**1250**	**1260**	**1270**	**1280**	**1290**	**1300**	**1310**
55	0.0	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	0.0
35	0.0	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	0.0

15	0.0	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	0.0

HORIZONTAL (ft)	**1320**	**1330**	**1340**	**1350**	**1360**	**1370**	**1380**	**1390**	**1400**	**1410**	**1420**
55	0.0	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	0.0
35	0.0	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	0.0
15	0.0	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	0.0

HORIZONTAL (ft)	**1430**	**1440**	**1450**	**1460**	**1470**	**1480**	**1490**	**1500**	**1510**	**1520**	**1530**
55	0.0	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	0.0
35	0.0	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	0.0
15	0.0	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	0.0

HORIZONTAL (ft)	**1540**	**1550**	**1560**	**1570**	**1580**	**1590**	**1600**	**1610**	**1620**	**1630**	**1640**
55	0.0	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	0.0
35	0.0	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	0.0
15	0.0	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	0.0

HORIZONTAL (ft)	**1650**	**1660**	**1670**	**1680**	**1690**	**1700**	**1710**	**1720**	**1730**	**1740**	**1750**
55	0.0	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	0.0
35	0.0	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	0.0
15	0.0	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	0.0

HORIZONTAL (ft)	**1760**	**1770**	**1780**	**1790**	**1800**	**1810**	**1820**	**1830**	**1840**	**1850**	**1860**
55	0.0	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	0.0
35	0.0	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	0.0

15	0.0	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	0.0

HORIZONTAL (ft)	**1870**	**1880**	**1890**	**1900**	**1910**	**1920**	**1930**	**1940**	**1950**	**1960**	**1970**
55	0.0	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	0.0
35	0.0	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	0.0
15	0.0	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	0.0

HORIZONTAL (ft)	**1980**	**1990**	**2000**	**2010**	**2020**	**2030**	**2040**	**2050**	**2060**	**2070**	**2080**
55	0.0	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	0.0
35	0.0	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	0.0
15	0.0	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	0.0

HORIZONTAL (ft)	**2090**	**2100**	**2110**	**2120**	**2130**	**2140**	**2150**	**2160**	**2170**	**2180**	**2190**
55	0.0	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	0.0
35	0.0	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	0.0
15	0.0	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	0.0

HORIZONTAL (ft)	**2200**	**2210**	**2220**	**2230**	**2240**	**2250**	**2260**	**2270**	**2280**	**2290**	**2300**
55	0.0	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	0.0
35	0.0	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	0.0
15	0.0	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	0.0

HORIZONTAL (ft)	**2310**	**2320**	**2330**	**2340**	**2350**	**2360**	**2370**	**2380**	**2390**	**2400**	**2410**
55	0.0	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	0.0
35	0.0	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	0.0

15	0.0	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	0.0

HORIZONTAL (ft)	**2420**	**2430**	**2440**	**2450**	**2460**	**2470**
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

Vertical Plane VPS1

HORIZONTAL (ft)	**0**	**10**	**20**	**30**	**40**	**50**	**60**	**70**	**80**	**90**	**100**
95	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
85	0.0	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	0.0
65	0.0	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	0.0
45	0.0	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	0.0
25	0.0	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	0.0
5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

HORIZONTAL (ft)	**110**	**120**	**130**	**140**	**150**	**160**	**170**	**180**	**190**	**200**	**210**
95	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
85	0.0	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	0.0
65	0.0	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	0.0
45	0.0	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	0.0
25	0.0	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	0.0
5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

HORIZONTAL (ft)	**220**	**230**	**240**	**250**	**260**	**270**	**280**	**290**	**300**	**310**	**320**
95	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
85	0.0	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	0.0
65	0.0	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	0.0
45	0.0	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	0.0
25	0.0	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	0.0
5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

HORIZONTAL (ft)	**330**	**340**	**350**	**360**	**370**	**380**	**390**	**400**	**410**	**420**	**430**
95	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
85	0.0	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	0.0
65	0.0	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	0.0
45	0.0	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	0.0
25	0.0	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	0.0
5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

HORIZONTAL (ft)	**440**	**450**	**460**	**470**	**480**	**490**	**500**	**510**	**520**	**530**	**540**
95	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
85	0.0	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	0.0
65	0.0	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	0.0
45	0.0	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	0.0
25	0.0	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	0.0
5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

HORIZONTAL (ft)	**550**	**560**	**570**	**580**	**590**	**600**	**610**	**620**	**630**	**640**	**650**
95	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
85	0.0	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	0.0
65	0.0	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	0.0
45	0.0	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	0.0
25	0.0	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	0.0
5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

HORIZONTAL (ft)	**660**	**670**	**680**	**690**	**700**	**710**	**720**	**730**	**740**	**750**	**760**

95	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
85	0.0	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	0.0
65	0.0	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	0.0
45	0.0	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	0.0
25	0.0	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	0.0
5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

HORIZONTAL (ft)	**770**	**780**	**790**	**800**	**810**	**820**	**830**	**840**	**850**	**860**	**870**
95	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
85	0.0	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	0.0
65	0.0	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	0.0
45	0.0	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	0.0
25	0.0	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	0.0
5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

HORIZONTAL (ft)	**880**	**890**	**900**	**910**	**920**	**930**	**940**	**950**	**960**	**970**	**980**
95	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
85	0.0	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	0.0
65	0.0	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	0.0
45	0.0	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	0.0
25	0.0	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	0.0
5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

HORIZONTAL (ft)	**990**	**1000**	**1010**	**1020**	**1030**	**1040**	**1050**	**1060**	**1070**	**1080**	**1090**
95	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
85	0.0	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	0.0
65	0.0	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	0.0
45	0.0	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	0.0
25	0.0	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	0.0
5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

HORIZONTAL (ft)	**1100**	**1110**	**1120**	**1130**	**1140**	**1150**	**1160**	**1170**	**1180**	**1190**	**1200**
95	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
85	0.0	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	0.0
65	0.0	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	0.0
45	0.0	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	0.0
25	0.0	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	0.0
5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

HORIZONTAL (ft)	**1210**	**1220**	**1230**	**1240**	**1250**	**1260**	**1270**	**1280**	**1290**	**1300**	**1310**
95	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
85	0.0	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	0.0
65	0.0	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	0.0
45	0.0	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	0.0
25	0.0	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	0.0
5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

HORIZONTAL (ft)	**1320**	**1330**	**1340**	**1350**	**1360**	**1370**	**1380**	**1390**	**1400**	**1410**	**1420**
95	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
85	0.0	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	0.0
65	0.0	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	0.0
45	0.0	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	0.0
25	0.0	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	0.0
5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

HORIZONTAL (ft)	**1430**	**1440**	**1450**	**1460**	**1470**	**1480**	**1490**	**1500**	**1510**	**1520**	**1530**
95	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
85	0.0	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	0.0
65	0.0	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	0.0
45	0.0	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	0.0
25	0.0	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	0.0
5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

HORIZONTAL (ft)	**1540**	**1550**	**1560**	**1570**	**1580**	**1590**	**1600**	**1610**	**1620**	**1630**	**1640**
95	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
85	0.0	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	0.0
65	0.0	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	0.0
45	0.0	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	0.0
25	0.0	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	0.0
5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

HORIZONTAL (ft)	**1650**	**1660**	**1670**	**1680**	**1690**	**1700**	**1710**	**1720**	**1730**	**1740**	**1750**
95	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
85	0.0	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	0.0
65	0.0	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	0.0
45	0.0	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	0.0
25	0.0	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	0.0
5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

HORIZONTAL (ft)	**1760**	**1770**	**1780**	**1790**	**1800**	**1810**	**1820**	**1830**	**1840**	**1850**	**1860**
95	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
85	0.0	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	0.0
65	0.0	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	0.0
45	0.0	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	0.0
25	0.0	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	0.0
5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

HORIZONTAL (ft)	1870	1880	1890	1900	1910	1920	1930	1940	1950	1960	1970
95	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
85	0.0	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	0.0
65	0.0	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	0.0
45	0.0	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	0.0
25	0.0	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	0.0
5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

HORIZONTAL (ft)	1980	1990	2000	2010	2020	2030	2040	2050	2060	2070	2080
95	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
85	0.0	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	0.0
65	0.0	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	0.0
45	0.0	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	0.0
25	0.0	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	0.0
5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

HORIZONTAL (ft)	2090	2100	2110	2120	2130	2140	2150	2160	2170	2180	2190
95	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
85	0.0	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	0.0
65	0.0	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	0.0
45	0.0	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	0.0
25	0.0	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	0.0
5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

HORIZONTAL (ft)	2200	2210	2220	2230	2240	2250	2260	2270	2280	2290	2300
95	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
85	0.0	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	0.0
65	0.0	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	0.0
45	0.0	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	0.0
25	0.0	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	0.0
5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0