BOPC Received
3-18-2021

Appendix AES
Aesthetics, Shadow and Wind Supporting Information

AES.1 Technical Lighting Study

The Oakland Athletics
Howard Terminal Ballpark
DRAFT Environmental Impact Report
Technical Lighting Analysis

HLB Lighting Design
new york | san francisco | los angeles | boston | miami | denver | austin
HLBlighting.com

Table of Contents

1 Introduction 6

1.1 Project Description 6

1.1.1 Existing Site 6

2 Thresholds of Significance 7

2.1 Prevailing Standards and Codes 7

2.1.1 California Code of Regulations Title 24 Article 1 7

2.1.2 California Code of Regulations Title 24 Part 6 7

2.1.3 California Code of Regulations Title 24 Part 11 8

2.1.4 California Building Code 8

2.1.5 California Vehicle Code 8

2.1.6 The City of Oakland California Environmental Quality Act (CEQA) Thresholds of Significance Guidelines (2013) 8

2.1.7 City of Oakland Outdoor Lighting Standards 8

2.1.8 City of Oakland Bird Safety Measures 9

2.1.9 Port of Oakland Exterior Lighting Policy 9

2.1.10 Illuminating Engineering Society RP-33-14 9

2.1.11 International Commission on Illumination (CIE) Guide on the Limitation of the Effects of Obtrusive Light from Outdoor Lighting Installations, 2nd Edition (CIE 150:2017) 9

2.2 Determination of Thresholds of Significance 9

2.2.1 CIE 150:2017 Environmental Lighting Zone Determination 10

2.2.2 Sensitive Receptor Sites: Spill Light 10

2.2.3 Sensitive Receptor Sites: Glare 11

3 Proposed Project Description 12

3.1 Baseline Project 13

3.2 Maritime Reservation Area (MRA) Project 13

3.3 “Phase 1” Scenario 13

3.4 “Full Buildout” Scenario 14

3.5 Reduced Ballpark Height Option 15

3.6 Rotated Ballpark Option 16

3.7 Gondola Variant 17

3.8 Project Design 18

3.8.1 Lighting Masterplan Information 18
3.8.2 Identified Digital Signage Locations 21
3.8.3 Field Lighting 22
3.8.4 House Lighting 23
3.9 Design Features to Limit Impact 23
4 Methodology 24
4.1 Receptor Site Identification 24
4.2 Equipment 25
4.3 Analysis Method 26
4.3.1 Existing Lighting Conditions 26
4.3.2 Receptor Site Measurements 26
4.4 Software for Glare Analysis of Existing Conditions 27
4.5 Modeling of Proposed Project 27
4.5.1 Geometry 27
4.5.2 Software 27
4.5.3 Lighting 28
4.5.4 Identified Digital Signage 29
4.5.5 Sports Lighting 29
4.5.6 House Lighting 30
4.5.7 Cloud Cover 30
4.5.8 Modeled Lighting Conditions 32
5 Existing Conditions Assessment Lighting Conditions 33
5.1 Status of Existing Lighting Equipment 33
5.2 On-Site Measurements 33
5.2.1 Horizontal Illuminance 35
5.2.2 Light Trespass from Site 35
5.2.3 Light Trespass onto Site 35
5.3 Receptor Site Identification 35
5.3.1 Lighting Conditions at Receptor Sites 35
5.4 Sky Glow 62
6 Summary of Results 64

6.1 Overview of Results 64
6.1.1 Spill Light Impact Summary 64
6.1.2 Glare Impact Summary 66
6.1.3 Baseline Ballpark 72
6.1.4 Reduced Ballpark Height Design Option 72
6.1.5 Rotated Ballpark Design Option 72
6.1.6 Gondola Variant 73
6.2 Specific Areas of Concern 73
6.2.1 Impact on Turning Basin (Receptor Site 2, 2B and 2C) 73
6.2.2 Additional Measurement Sites 79
6.2.3 Impact on Aviation 83
6.3 Recommended Additional Optional Measures 84
6.4 Recommended Digital Signage Requirements 84
6.4.1 Brightness Limitation 84
6.4.2 Dimming and Controls 84
6.4.3 Glare Control 84
6.4.4 Field Verification 84
7 Glossary 85
8 Assessment of Baseline Project 88
8.1 Baseline Project with Baseline ballpark height condition including gondola variant 88
8.1.1 “Phase 1” Scenario 88
8.1.2 “Full Buildout” Scenario 121
8.2 Project Design Option – Reduced Ballpark Height 154
8.2.1 “Phase 1” Scenario 154
8.2.2 “Full Buildout” Scenario 163
8.3 Project Design Option – Rotated Ballpark 172
8.3.1 “Phase 1” Scenario 172
8.3.2 “Full Buildout” Scenario 181
8.4 Impact of Cloud Cover 190
9 Assessment of “Maritime Reservation Area” Project 193
9.1 Baseline project, Baseline ballpark height, Condition Including Gondola Variant 193

9.1.1 “Phase 1” Scenario 193
9.1.2 “Full Buildout” Scenario 226
9.2 Project Design Option – Reduced Ballpark Height 259
9.2.1 “Phase 1” Scenario 259
9.2.2 “Full Buildout” Scenario 268
9.3 Project Design Option – Rotated Ballpark 277
9.3.1 “Phase 1” Scenario 277
9.3.2 “Full Buildout” Scenario 286
9.4 Impact of Cloud Cover 295
10 APPENDIX A – SPORTS LIGHTING PHOTOMETRIC REPORT 298
11 APPENDIX B – HOUSE LIGHTING PHOTOMETRIC REPORT 340
12 APPENDIX C – EXISTING LIGHTING PHOTOMETRIC REPORT 354
13 APPENDIX D – RECEPTOR SITE BIRGHTNESS MEASUREMENTS VS CALCULATED BRIGHTNESSES – BASELINE PROJECT 361
14 APPENDIX E – RECEPTOR SITE BIRGHTNESS MEASUREMENTS VS CALCULATED BRIGHTNESSES – MRA PROJECT 447

1 Introduction

1.1 Project Description

The Oakland Athletics organization has proposed the construction of a new ballpark and associated amenities, including multiple towers with retail and other mixed-used occupancies, along the Oakland waterfront. The current facility for the Major League Baseball team, the Coliseum, is nearing the end of its useful life and needs to be replaced. The Athletics have proposed a new waterfront ballpark district at Howard Terminal.

1.1.1 Existing Site

The site proposed for the new ballpark and amenities is the Howard Terminal site, which lies along the waterfront of the Oakland Estuary, as shown in Figure 1. The terminal site is the easternmost terminal site within the Port of Oakland and historically served as an active terminal, though it now functions primarily for ancillary maritime uses. As such, the existing infrastructure of lighting has not been maintained to the typically high light levels required at an active port site.

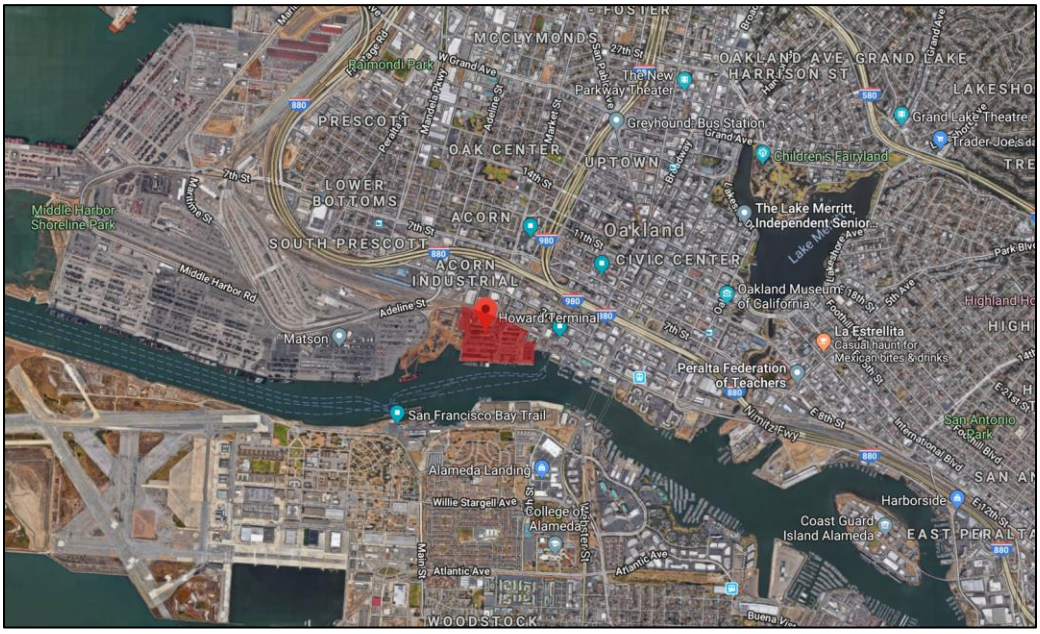


Figure 1: Howard terminal site context

The Howard Terminal site is immediately adjacent to Jack London Square, a center for retail and other hospitality amenities in the area, which also has easy access to Amtrak and a ferry terminal. On the west side of the terminal site is Schnitzer Steel. To the north of the project site, the developments mostly consistent of low-rise non-residential buildings including warehouses, retail, and storage facilities.

The terminal site is also directly adjacent to the turning basin within the estuary. The turning basin is used to turn ships as they either approach the active terminals or prepare for departure. Ships are turned within the basin with the assistance of tugs and under the direction of a member of the San Francisco Bar Pilots. The turning maneuver requires diligent observation of adjacencies to shoreline, objects in the water, and marine conditions including currents, as well as communication with the tugs assisting with the turning effort.

2 Thresholds of Significance

2.1 Prevailing Standards and Codes

The lighting design for the development must meet the standards set forth by the State of California, the City of Oakland, and the Port of Oakland. The California Code of Regulations Title 24, also known as the Building Energy Efficiency Standards, sets legal compliance requirements for residential and non-residential construction, and is updated on a three-year code cycle. The current version of the standard is dated 2016 and is in force until January 1, 2020, at which time the applicability of the code will not change, though technical updates to Part 6 described below is expected.

2.1.1 California Code of Regulations Title 24 Article 1

Title 24 Article 1 includes the framework to establish Lighting Zones for use by the State and by other Authorities Having Jurisdiction (AHJ). The lighting zone determination of a property is a functional way of categorizing the expected appropriate brightness of a property based on the expected ambient brightness. The majority of properties in California fall into Lighting Zone 2 (LZ2) or Lighting Zone 3 (LZ3). Based on the 2010 US Census data, the Howard Terminal site is assigned to LZ3.

Zone	Ambient Illumination	State wide Default Location	Moving Up to Higher Zones	Moving Down to Lower Zones
LZ1	Dark	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.	A government designated park, recreation area, wildlife preserve, or portions thereof, can be designated as LZ2 or LZ3 if they are contained within such a zone.	Not applicable.
LZ2	Low	Rural areas, as defined by the 2000 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	Medium	Urban areas, as defined by the 2000 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.

Figure 2: Lighting Zone Descriptions and Applicability per Title 24 2016 Article 1

2.1.2 California Code of Regulations Title 24 Part 6

Part 6 of Title 24 is known as the Efficiency Standards, and includes mandatory requirements for indoor and outdoor lighting and lighting controls. Specific to outdoor lighting, the standard provides prescriptive maximum limitations on lighting power density (LPD), measured in watts per square foot, for various use types as a function of lighting zone. The standard also includes prescriptive lighting controls requirements for outdoor applications, including but not limited to the use of occupancy-based

controls in parking lots and the use of time-based dimming controls. Additionally, Part 6 includes “BUG” rating limitations for all outdoor luminaires with lamps greater than 150W, excluding a variety of specific applications such as façade lighting.

2.1.3 California Code of Regulations Title 24 Part 11

Part 11 of Title 24 is known as CalGreen and is a mandatory state-wide green building regulation. Nonresidential mandatory measures include additional requirements to reduce light pollution, trespass, and glare from outdoor lighting sources. Specifically, it includes additional “BUG” rating limitations for all outdoor luminaires independent of wattage, excluding the same variety of specific applications exempt for Part 6.

2.1.4 California Building Code

The California Building Code (CBC) is the standard building code applicable statewide, and is based on the International Building Code (IBC) with state-specific modifications. The current version in force is the 2016 CBC, which is based on the 2015 IBC.

2.1.5 California Vehicle Code

The California Vehicle Code (CVC) includes statutes related to the vehicles, such as operation and registration, the California Department of Motor Vehicles and the California Highway Patrol. Specific to lighting, the CVC in Section 21466.5 places luminance limitations on lighting as it relates to a driver’s field of view. Given the geometry of the proposed design, it is anticipated that the scoreboard will be in the field of view from drivers on the ramp from southbound Interstate 980 to eastbound Interstate 880. Based on the modeled geometry, the closest to direct line of site from a driver’s position to the scoreboard is measured as 4.5°. Based on the established criteria within the CVC, this would place a maximum allowable brightness of the scoreboard side facing away from the ballpark at 3,500 cd/m^2 (or nits).

2.1.6 The City of Oakland California Environmental Quality Act (CEQA) Thresholds of Significance Guidelines (2013)

The Oakland CEQA guidelines provide information to establish the criteria for the significant impact of a project on the environment. Lighting is included within the “Aesthetics, Shadow and Wind” section; specifically, the guidelines state that “The project would have a significant impact on the environment if it would… create a new source of substantial light or glare which would substantially and adversely affect day or nighttime views in the area.”

2.1.7 City of Oakland Outdoor Lighting Standards

The City of Oakland Outdoor Lighting Standards is applicable to private development projects on public right of ways. As such, the requirements in the standard are assumed to apply to all new roadways constructed within the project boundaries. Requirements include general glare, light trespass, and light pollution mitigation measures such as using full-cutoff luminaires wherever available and avoiding bare light sources (bulbs). In addition, the standard provides specific lighting equipment guides relevant to street and pedestrian light pole heights.

2.1.8 City of Oakland Bird Safety Measures

The City of Oakland Bird Safety Measures policy requires a reduction of light pollution, which can be achieved in multiple ways including:

- Extinguishing architectural lighting during bird migration season.
- Using time-based or occupancy-based controls between 11 pm and sunrise.
- Avoiding beams of light during spring and fall migration.

2.1.9 Port of Oakland Exterior Lighting Policy

The Port of Oakland Exterior Lighting Policy provides specific requirements associated with all exterior lighting at the Port and is applicable to all Port tenants. The requirements within that document are assumed to be applicable to the proposed project site.

2.1.10 Illuminating Engineering Society RP-33-14

IES RP-33-14 "Lighting for Exterior Environments" provides exterior-specific lighting recommendations including illuminance levels for specific applications. In addition, this recommended practice document provides recommended maximum vertical illuminance values at the property line which are intended to align with the limitation of light trespass. Figure 3 provides the table of light trespass limitation recommendations from this document.

Lighting Zone 0	Lighting Zone 1	Lighting Zone 2	Lighting Zone 3	Lighting Zone 4
0.05 FC or 0.5 LUX	0.1 FC or 1.0 LUX	0.3 FC or 3.0 LUX	0.8 FC or 8.0 LUX	1.5 FC or 15.0 LUX

Figure 3: IES RP-33-14 recommended maximum vertical illuminance at the property line

2.1.11 International Commission on Illumination (CIE) Guide on the Limitation of the Effects of Obtrusive Light from Outdoor Lighting Installations, 2nd Edition (CIE 150:2017)

CIE 150:2017 is the primary document from the standards-setting international body that provides various guidance on limiting obtrusive light. The recommendations included in this guiding document are intended to be applied broadly to new construction and existing installations, and include metrics that can be the basis for evaluating light trespass (spill light), glare, contribution to light pollution, and mitigation options for nuisance installations.

2.2 Determination of Thresholds of Significance

Due to the lack of standards, codes, or ordinances within Oakland, Alameda County and the bay area in general regarding obtrusive light definitions, the international standards established in CIE 150:2017 are used to determine significant thresholds for light spill and glare for this analysis.

2.2.1 CIE 150:2017 Environmental Lighting Zone Determination

Based on the description included in Table 1 of the CIE 150:2017 document, shown in Figure 4, the project site falls into the E4 zone which is the baseline for commercial areas.

Zone	Lighting Environment	Examples
E0	Intrinsically dark	UNESCO Starlight Reserves, IDA Dark Sky Parks, Major optical observatories
E1	Dark	Relatively uninhabited rural areas
E2	Low district brightness	Sparsely inhabited rural areas
E3	Medium district brightness	Well inhabited rural and urban settlements
E4	High district brightness	Town and city centres and other commercial areas
NOTE Regardless of the level of urban development, the recommendations for Environmental Zone 1 or 0, should be followed for all locations within 100 km of a major optical astronomy observatory. Regardless of the level of urban development, the recommendations for Environmental Zone 2 (or better) should be followed for locations within 30 km of an operating urban optical astronomy observatory, and for locations between 100 km and 300 km from a major optical astronomy observatory.		

Figure 4: CIE 150:2017 Environmental Lighting Zones Determination

2.2.2 Sensitive Receptor Sites: Spill Light

Based on the CIE guide, for environmental zone E4, pre-curfew light is considered obtrusive when it generates in excess of 25 lux vertical on a property, and in excess of 5 lux on a property post-curfew. Spill light results for the proposed project can be found in Section 6.1.1 below.

Light Technical Parameter	Application Conditions	Environmental Zones				
		E0	E1	E2	E3	E4
Illuminance in vertical plane (E_v)	Pre-curfew	n/a	2 lx	5 lx	10 lx	25 lx
	Post-curfew	n/a	< 0,1 lx*	1 lx	2 lx	5 lx
* If the installation is for public (road) lighting then this value may be up to 1 lx.						

Figure 5: CIE 150:2017 Maximum Values of Vertical Illuminance

2.2.3 Sensitive Receptor Sites: Glare

Based on the CIE guide, for environmental zone E4, building façade luminance for both pre- and post-curfew are considered obtrusive when they are in excess of 25 cd/m^2. Sign luminance is considered obtrusive when it is in excess of 1,000 cd/m^2. Glare results for the proposed project can be found in Section 6.1.2 below. Results of the specific glare analysis focused on the specific areas of concern, including the Turning Basin, can be found in Section 6.2 below.

Light Technical Parameter	Application Conditions	Environmental Zones				
		E0	E1	E2	E3	E4
Building Facade Luminance (L_b)	Taken as the product of the design average illuminance and reflectance divided by π.	< 0,1 cd/m^2	< 0,1 cd/m^2	5 cd/m^2	10 cd/m^2	25 cd/m^2
Sign Luminance (L_s)	Taken as the product of the design average illuminance and reflectance divided by π, or for self-luminous signs, its average luminance.	< 0,1 cd/m^2	50 cd/m^2	400 cd/m^2	800 cd/m^2	1 000 cd/m^2
NOTE The values apply to both pre- and post-curfew, except that in Zones 0 and 1 the values shall be zero post-curfew. The values for signs do not apply to signs for traffic control purposes.						

Figure 6: CIE 150:2017 Maximum Permitted Values of Average Surface Luminance

While no standards currently exist in the US pertaining to limiting the glare of sports lighting as viewed from neighboring locations, the European Committee for Standardization, in their publication CEN EN 12193:2007 “Light and lighting – Sports lighting”, provides guidance for limiting the maximum intensity of sports light fixtures, measured in candela (cd), in the direction of sensitive sites to limit obtrusive light, as shown in Figure 7. The standard states “To safeguard and enhance the night time environment it is necessary to control obtrusive light, which can present physiological and ecological problems to surroundings and people.” “Obtrusive light” is defined in the standard as “spill light which because of quantitative, directional or spectral attributes in a given context give rise to annoyance, discomfort, distraction or reduction in the ability to see essential information.”

Environmental zone	Light on properties		Luminaire intensity		Upward light
	E_v lx		I cd		ULR
	Pre-curfew[a]	Post-curfew	Pre-curfew	Post-curfew	%
E1	2	0	2 500	0	0
E2	5	1	7 500	500	5
E3	10	2	10 000	1 000	15
E4	25	5	25 000	2 500	25
[a] In case no curfew regulations are available, the higher values shall not be exceeded and the lower values should be taken as preferable limits.					

Figure 7: EN 12193:2007 Maximum Obtrusive Light Permitted for Exterior Lighting Applications

3 Proposed Project Description

The proposed project is centered around a ballpark with a capacity of 35,000. The ballpark is intended to have rooftop park that is accessible to the public approximately 280 days per year on non-game days, and to ticketed patrons during games to enhance the variety of gameday experiences available to fans. The rooftop park returns to meet ground level behind centerfield, in the direction of Jack London Square, to promote engagement with the public along the primary anticipated sequence of arrival.

Figure 8: Proposed development rendering

The design of the lighting specific to the field of play is intended to meet MLB and broadcast requirements for televising games. The baseline approach includes providing the majority of field lighting by avoiding large light poles to the extent possible and instead using sports lighting fixtures luminaires integrated into the roof edge. This condition allows the sports lighting luminaires to be spread out along the extent of the interior edge of the roof, which will help reduce perceived brightness by avoiding large clustering of lights as much as is feasible. The baseline proposed geometry is such that the sports lighting luminaires would be below the top edge of the roof, allowing the luminaires to sit below the roofline and minimizing direct view of the luminaires from outside of the ballpark.

To provide full coverage, two pole-mounted lighting clusters will still be required to illuminate the outfield. These clusters will be minimized in size and number of luminaires to the extent feasible.

The digital scoreboard is anticipated to be pole-mounted behind centerfield, in line with the anticipated typical approach to the project from Jack London Square. The scoreboard is anticipated to be double-sided to engage patrons as they approach the project, and it is anticipated to be of the resolution

necessary to allow for video display feed both day and night. In addition to the scoreboard, two digital LED “ribbon” boards are anticipated to wrap the front fascia of both the mezzanine and balcony levels. Other digital signage will be introduced at a later date.

3.1 Baseline Project

The term “Baseline Project” used throughout this analysis refers to the use of the full existing Howard Terminal Site.

3.2 Maritime Reservation Area (MRA) Project

The term “MRA Project” used throughout this analysis refers to the potential condition where the southwest corner of the Howard Terminal Site is used instead to expand the adjacent turning basin as part of a separate project that may be implemented in the future, reducing the area of development.

3.3 “Phase 1” Scenario

The “Phase 1” scenario is intended to capture the extent of development targeted for a 2025 completion, identified as Phase 1. This includes the ballpark itself with its immediate amenities, and the development of a select number of immediately-adjacent buildings programmed as mixed-use. The balance of the site is anticipated to serve as interim surface parking with temporary lighting.

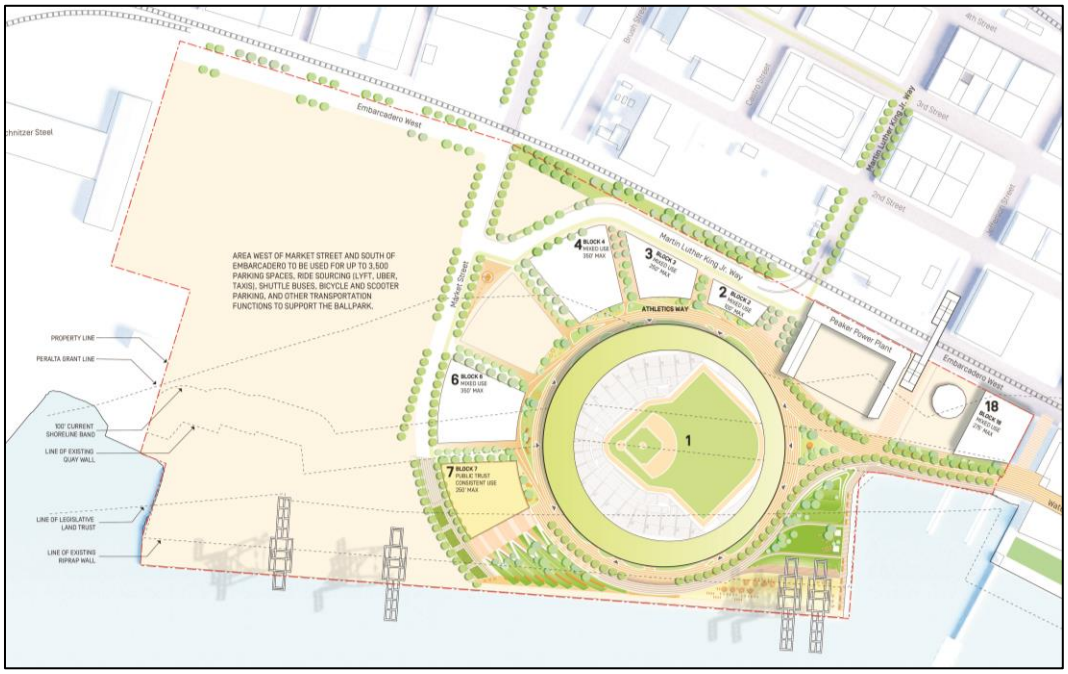


Figure 9: “Phase 1” scenario site plan for Baseline Project

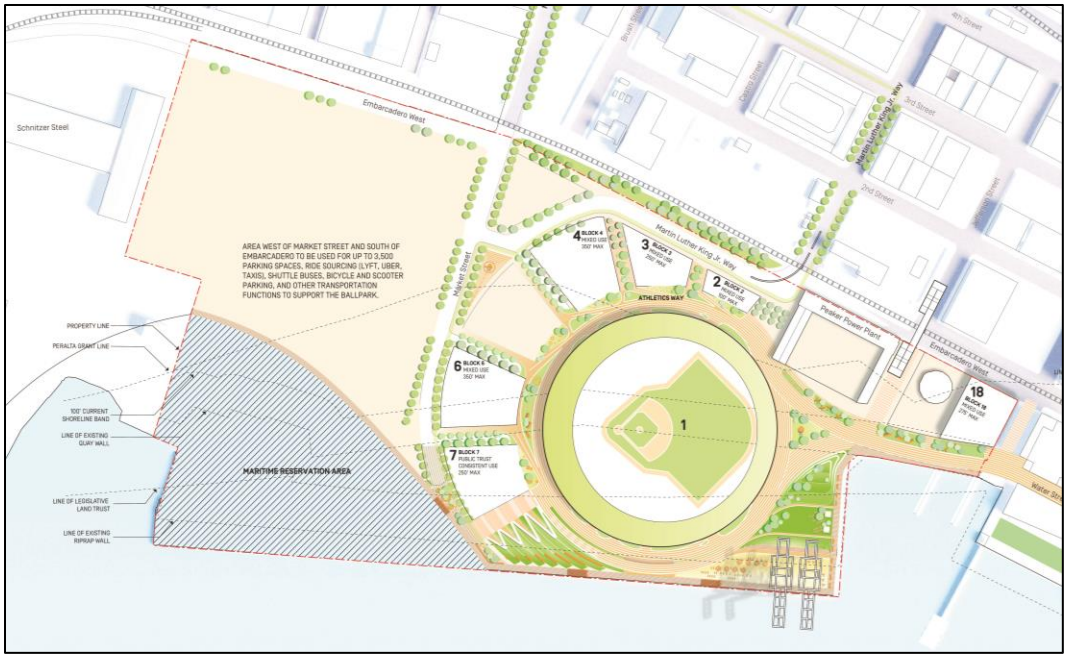


Figure 10: "Phase 1" scenario site plan for MRA Project

3.4 "Full Buildout" Scenario

The "Full Buildout" is intended to capture the extent of the full site development. This includes the development of buildings on the balance of the property, construction of additional roadways, and activation of additional park and green space. Surface parking is anticipated to be eliminated in this scenario.

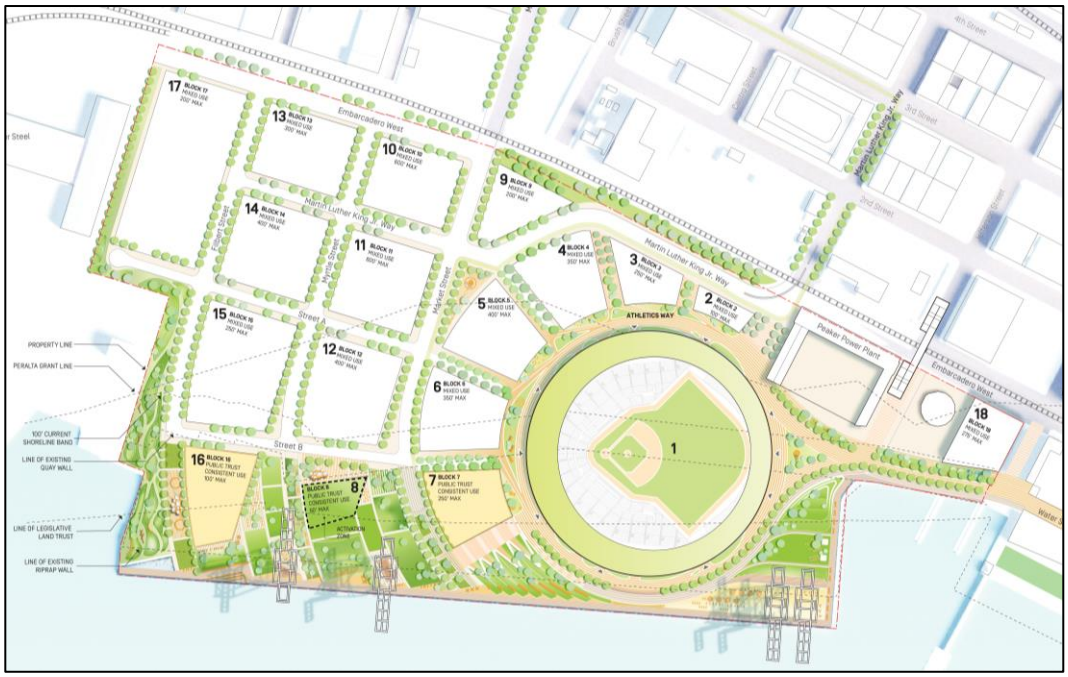


Figure 11: "Full Buildout" site plan for Baseline Project

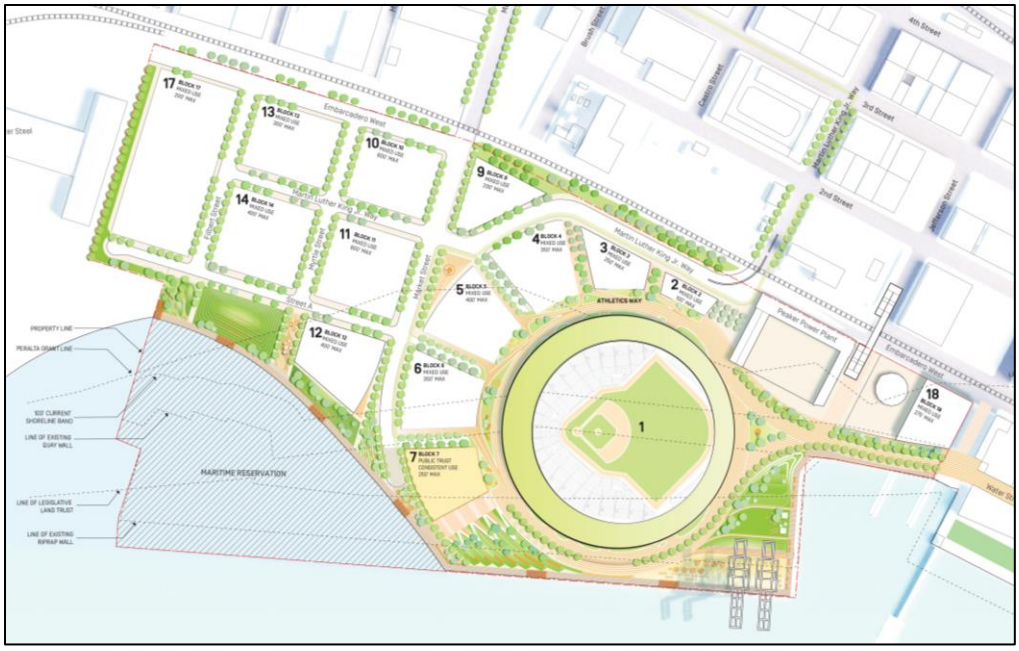


Figure 12: “Full Buildout” site plan for MRA Project

3.5 Reduced Ballpark Height Option

A reduction in the height of the ballpark is a design option considered in this assessment. The ballpark height option includes reducing the height of the ballpark itself, which would make the integrated roofline “halo” sports lighting unachievable due to aiming angle restrictions within the MLB standards. In this scenario, it is anticipated that four additional pole-mounted lighting clusters will be provided and will be located outside of the ballpark behind the first and third base lines. The anticipated two outfield poles included in the base condition are also anticipated to remain in this option. The analysis included herein evaluates the potential impact of this project option.

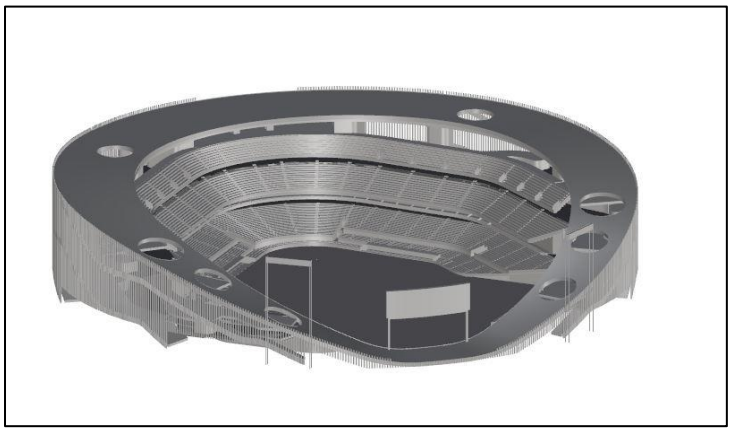


Figure 13: Ballpark height baseline geometry model

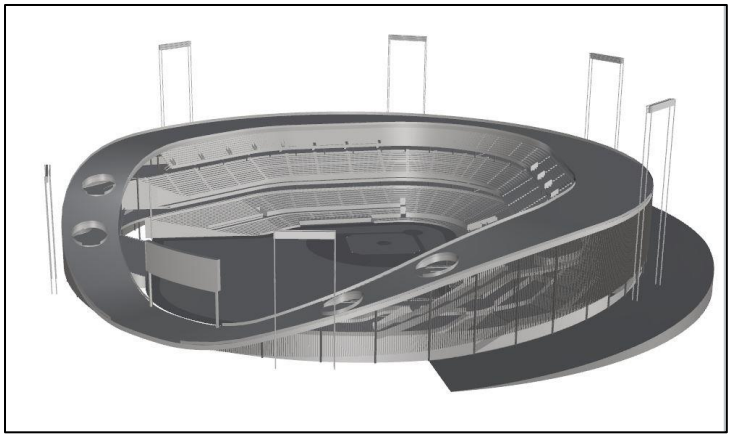


Figure 14: Reduced ballpark height option model

3.6 Rotated Ballpark Option

A rotation of the ballpark structure is a design option considered in this assessment. The rotated ballpark option assumes the reduced height of the ballpark itself as noted in section 3.5 above, however the ballpark is rotated so that the opening is shifted from centerfield to rightfield. The orientation of the field of play remains the same as in the Reduced Ballpark Height option. The height and location of the pole-mounted light clusters is slightly adjusted to accommodate the updated geometry. The analysis of this rotated geometry includes the “Phase 1” and “Full Buildout” scenarios for both the Baseline Project and the MRA Project.

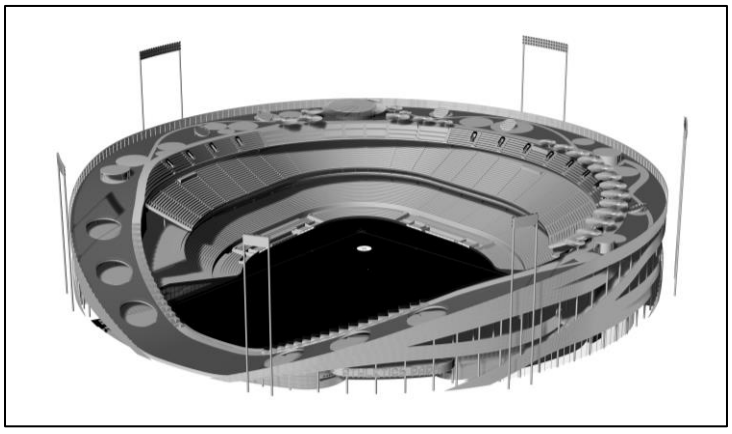


Figure 15: Rotated Ballpark Option

3.7 Gondola Variant

An additional key variant considered for the project is a gondola intended to increase ease of access to the site. The proposed gondola would effectively run along Washington St. One station would be located adjacent to the Oakland Convention Center, providing easy access to a heavily-trafficked BART line. The second station would be located immediately adjacent to Jack London Square, allowing patrons easy access to the full development including the ballpark and other amenities. The span of the gondola would be supported by a tower immediately south of Interstate 880. The analysis included herein evaluated the potential impact of this project variant.

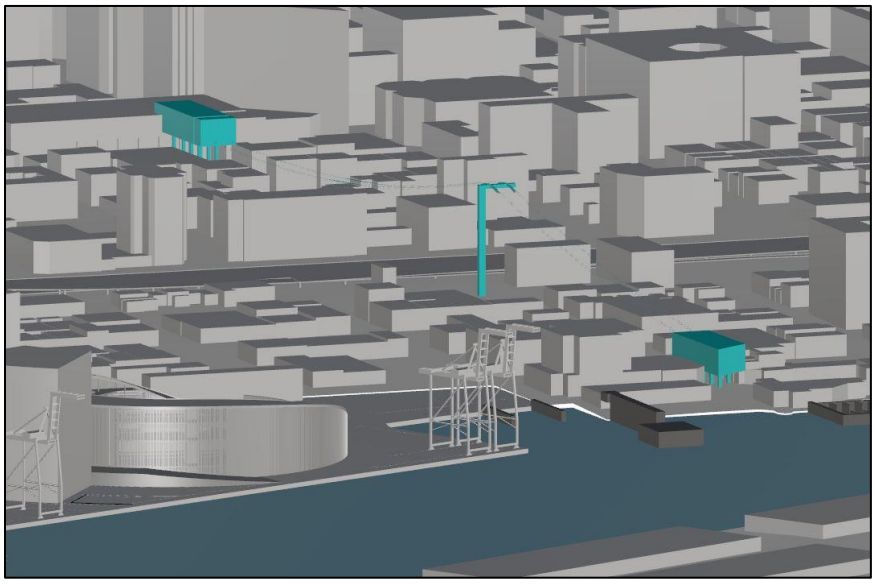


Figure 16: Gondola variant model (gondola stations and central support tower shown in teal)

3.8 Project Design

The design of the development, including the ballpark and adjacent development, is in early conceptual design phase. The proposed lighting included in this analysis includes lighting of the playing field and seating within the ballpark, architectural lighting of buildings, and lighting of horizontal planes including rooftops and ground surfaces, in addition to the anticipated digital signage locations defined in paragraph 0 below. All existing lighting within the project development boundary is anticipated to be removed.

3.8.1 Lighting Masterplan Information

Given the early stage of design, the specifics of the lighting including luminaire selection and layouts have not been developed. The assumed input to the analysis included herein is based on the Lighting Masterplan developed for the project, which includes illuminance targets for the ranges of intended use. Illuminance targets are based on lighting design recommendations included in the Illuminating Engineering Society 10th Ed. Lighting Handbook and appropriate Recommended Practices for specific uses (such as parking) from the Illuminating Engineering Society.

All lighting for the project is anticipated to use LED sources. LED sources provide higher efficiency and longer anticipated life than legacy lighting technology. Additionally, LED sources are typically more able to deliver light in a controlled way, which assists with minimizing glare and wasted spill light.

The project is also anticipated, per the masterplan, to use integrated lighting controls to allow lights across the development to be tuned to specific uses and dimmed during periods of low activity.

Anticipated light levels for architectural lighting, including for parking lots, parks, plazas, facades, streets, sidewalks, intersections, and alleyways, were established to comply with IES standards.

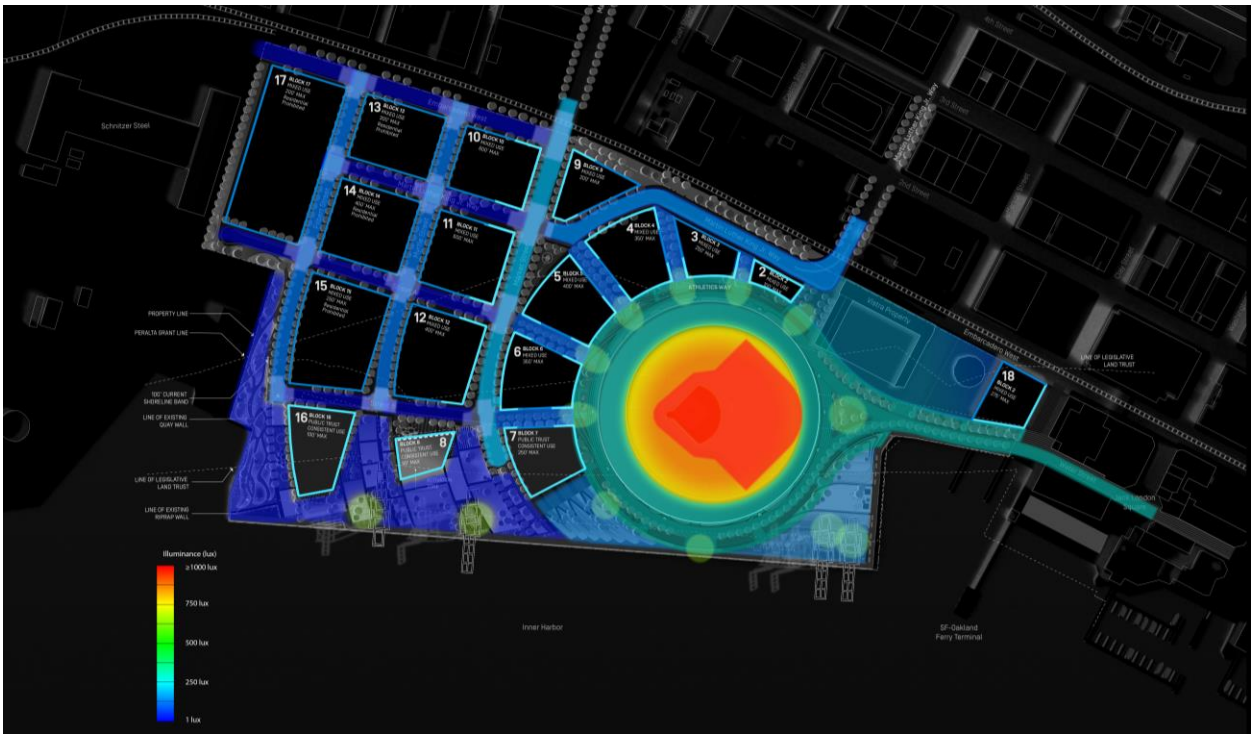


Figure 17: Lighting masterplan site plan showing horizontal illuminance targets for Baseline Project

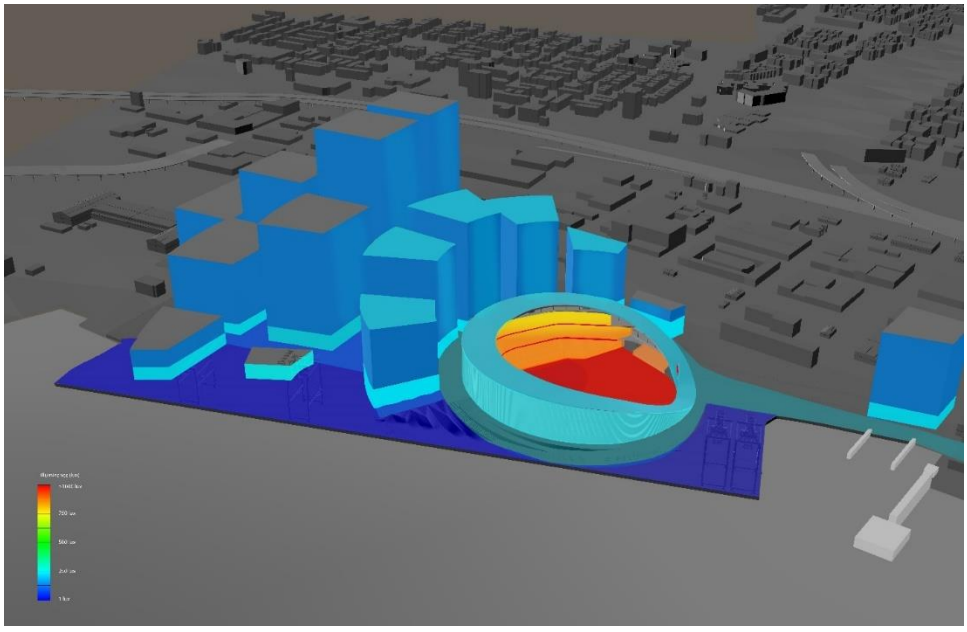


Figure 18: Lighting masterplan isometric showing vertical and horizontal illuminance targets for Baseline Project

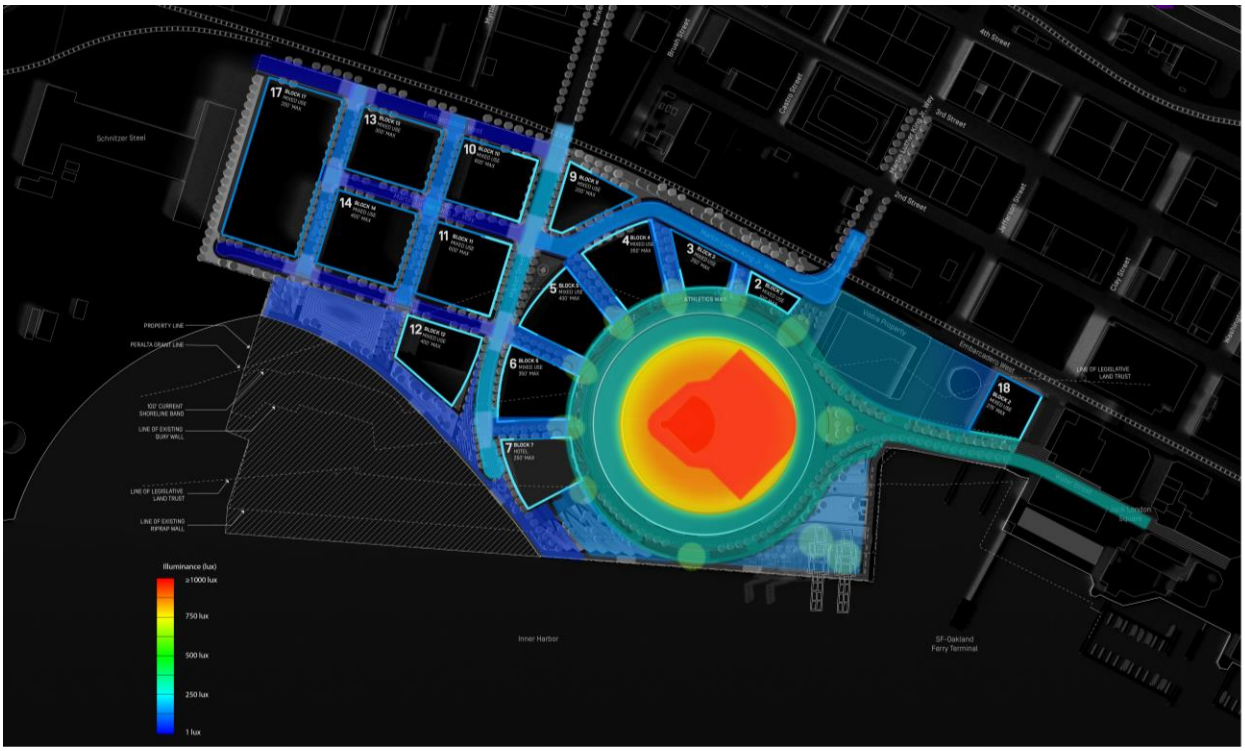


Figure 19: Lighting masterplan site plan showing horizontal illuminance targets for MRA Project

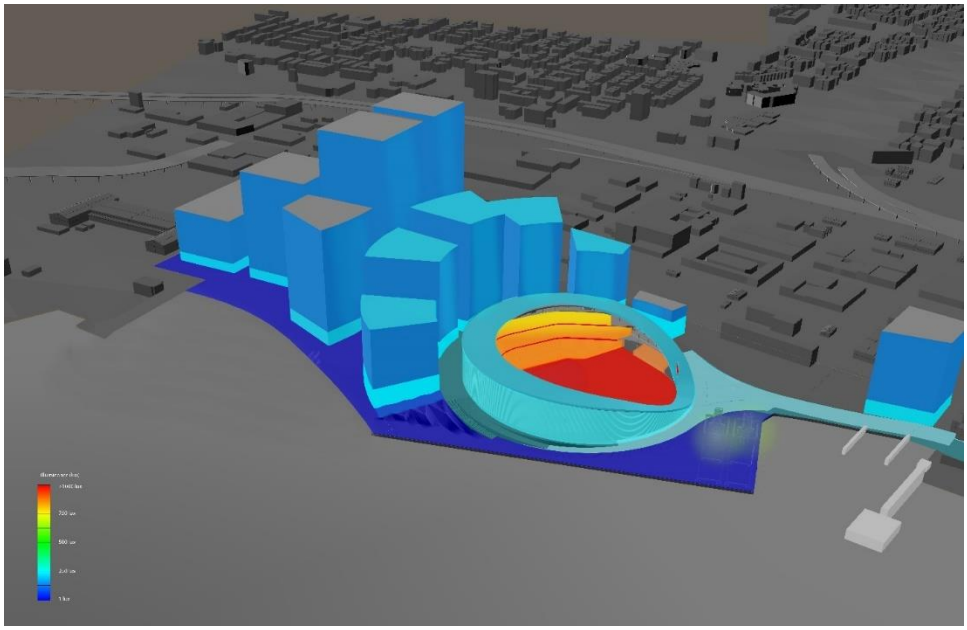


Figure 20: Lighting masterplan isometric showing vertical and horizontal illuminance targets for MRA Project

3.8.2 Identified Digital Signage Locations

As described above, the identified digital signage locations for the baseline ballpark currently include the double-sided scoreboard and the ribbon boards. Digital signage locations for the Rotated Ballpark option include single-sided digital scoreboards inside the ballpark and a single-sided display on the exterior of the ballpark facing Jack London Square. Additional digital signage locations have not been identified and are therefore not included in this analysis. All digital signage proposed during the advancement of the design will be required to comply with the mitigation measures included below.

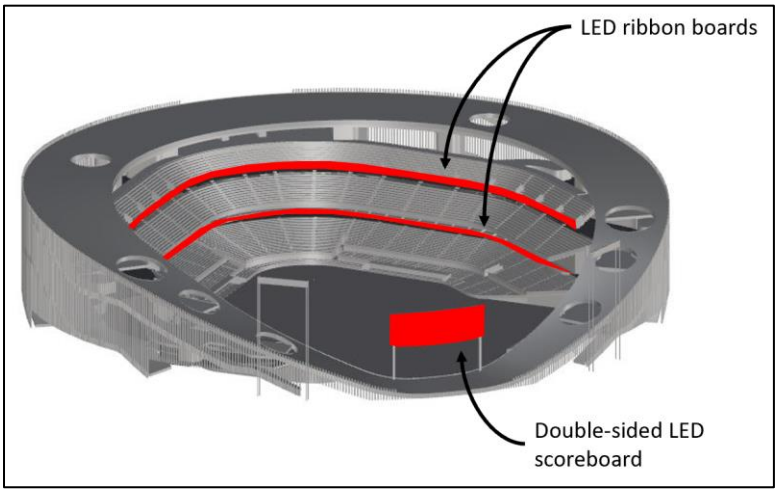


Figure 21: Isometric view showing modeled digital signage for baseline and reduced height ballpark

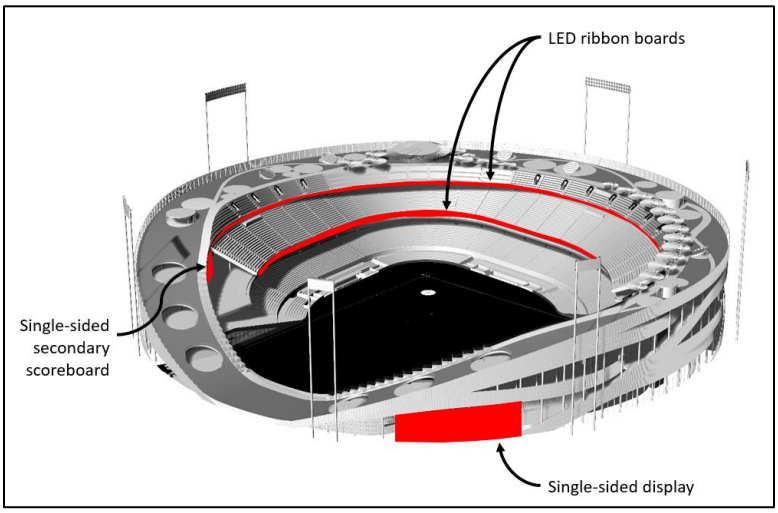


Figure 22: Isometric view showing modeled digital signage for rotated ballpark

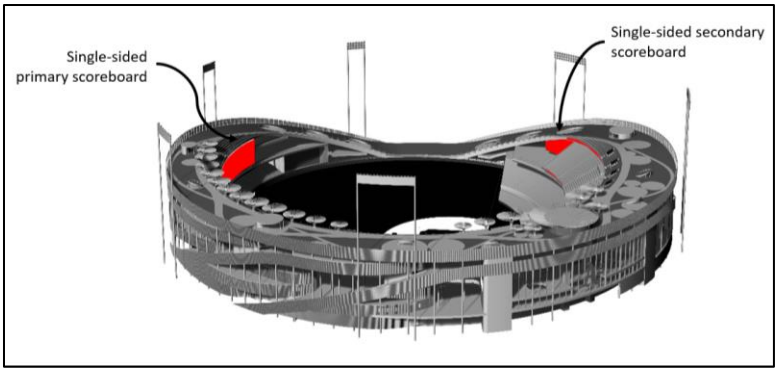


Figure 23: Isometric view showing modeled digital signage for rotated ballpark

3.8.3 Field Lighting

The lighting specific to the field-of-play and seating areas is also in very early design stages by Henderson Engineers to meet MLB standards. Preliminary approximate quantities of luminaires and approximate locations have been provided by Henderson and have been integrated into this analysis.

Infield and midfield lighting is anticipated to require 395 – 410 luminaires, and outfield lighting is anticipated to require 170 – 180 luminaires. For this analysis, the worst-case scenario of 410 infield/midfield luminaires and 180 outfield luminaires was assumed. The LED luminaire proposed for these locations has the following characteristics:

- Approximately 1400W
- Approximately 147,000 initial lumens
- CIE correlated color temperature of 5700K
- Minimum color rendering index of 75
- Visor/shield to minimize light spill, anticipated to be 2 – 4”

Per MLB design standards, targeted light levels at the ground plane are:

- Infield: 250 fc (approximately 2,690 lux), 1.1:1 maximum to minimum uniformity ratio
- Midfield: 225 fc (approximately 2,421 lux), 1.2:1 maximum to minimum uniformity ratio
- Outfield: 200 fc (approximately 2,153 lux), 1.3:1 maximum to minimum uniformity ratio

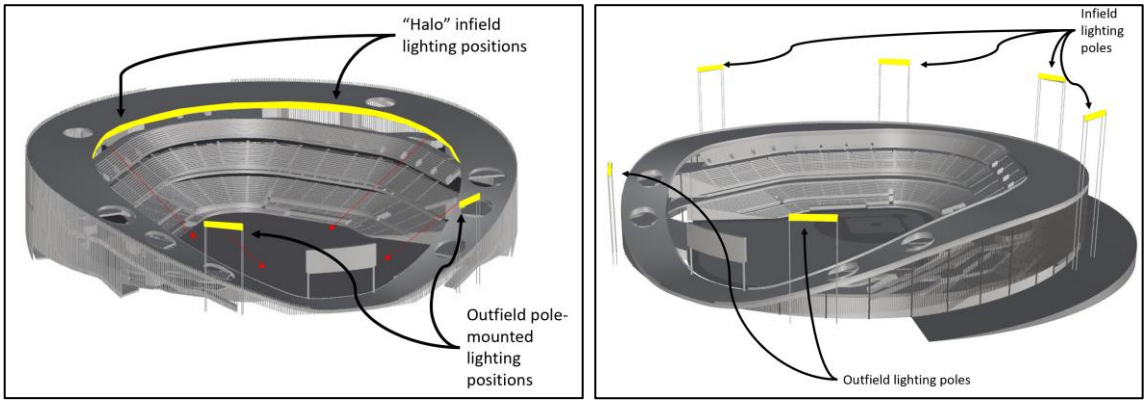


Figure 24: Field lighting location for baseline ballpark (left) and reduced height ballpark (right)

Locations for the sports lighting fixtures will likely be refined as the design of the ballpark progresses, potentially resulting in nominal refinements in locations and mounting heights. All refinements will be made within the constraints of MLB's strict placement and aiming requirements, and will not measurably change spill light or glare analysis results for the inner harbor turning basin.

3.8.4 House Lighting

Lighting of the stands, or "house", is also in very early design stages by Henderson Engineers. House lighting is currently intended to be provided by approximately 20 – 30 luminaires, to be mounted to the inside face of the curved canopy/roof or underside of the seating bowl treads. For this analysis, the modeling efforts assumed 30 luminaires. The LED luminaire proposed for this location has the following characteristics:

- Approximately 600W
- Approximately 54,000 initial lumens at a CIE correlated color temperature of 5700K
- Minimum color rendering index of 80
- Fully-shielded (no uplight)

Targeted light levels are 10 – 15 fc (107 – 161 lux) at the seating average per Henderson.

3.9 Design Features to Limit Impact

It is anticipated, per the masterplan, that the lighting design will consider reducing wasted light, which can contribute to light trespass and light pollution, during the selection and layout of lighting equipment. Light will generally be directed downward to reduce wasted uplight which can contribute to skyglow. Luminaires used for all area lighting including any surface parking will be full-cutoff, which blocks direct light from leaving the luminaire above the horizontal, reducing wasted light. Lighting will generally be integrated into architectural and landscape features throughout park and plaza areas to minimize energy use while helping to define a human scale.

4 Methodology

4.1 Receptor Site Identification

Sensitive receptor sites were identified by ESA in their 1 February 2019 memo, included as an appendix to that report. The memo identified six key receptor sites, as shown below in Figure 25.

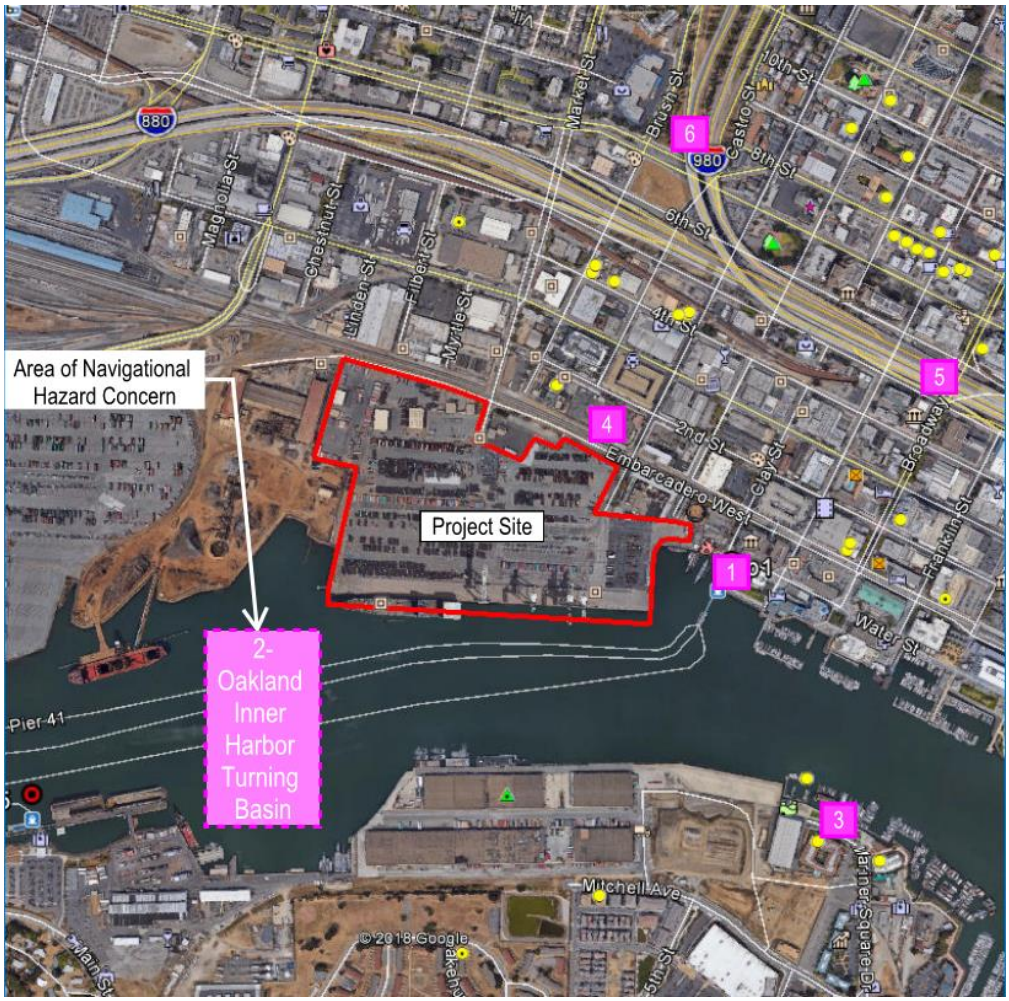


Figure 25: Receptor sites identified by ESA in their 1 February 2019 memo indicating receptor site locations and numbers in pink. Note that the project boundary (in red) is incorrect; refer to the project boundary shown in the plan diagrams in Section 3 above.

Two receptor sites, Site 5 and Site 6, were identified to be located on the highway. Since full measurements were not feasible at those locations due to safety concerns, alternate sites were identified and confirmed with ESA. Additionally, subcategories of receptor sites were added to allow the assessment to include the potential impacts of the Gondola variant, including its two stations and central support tower. Figure 26 indicates the final receptor site locations and orientations used for this analysis.

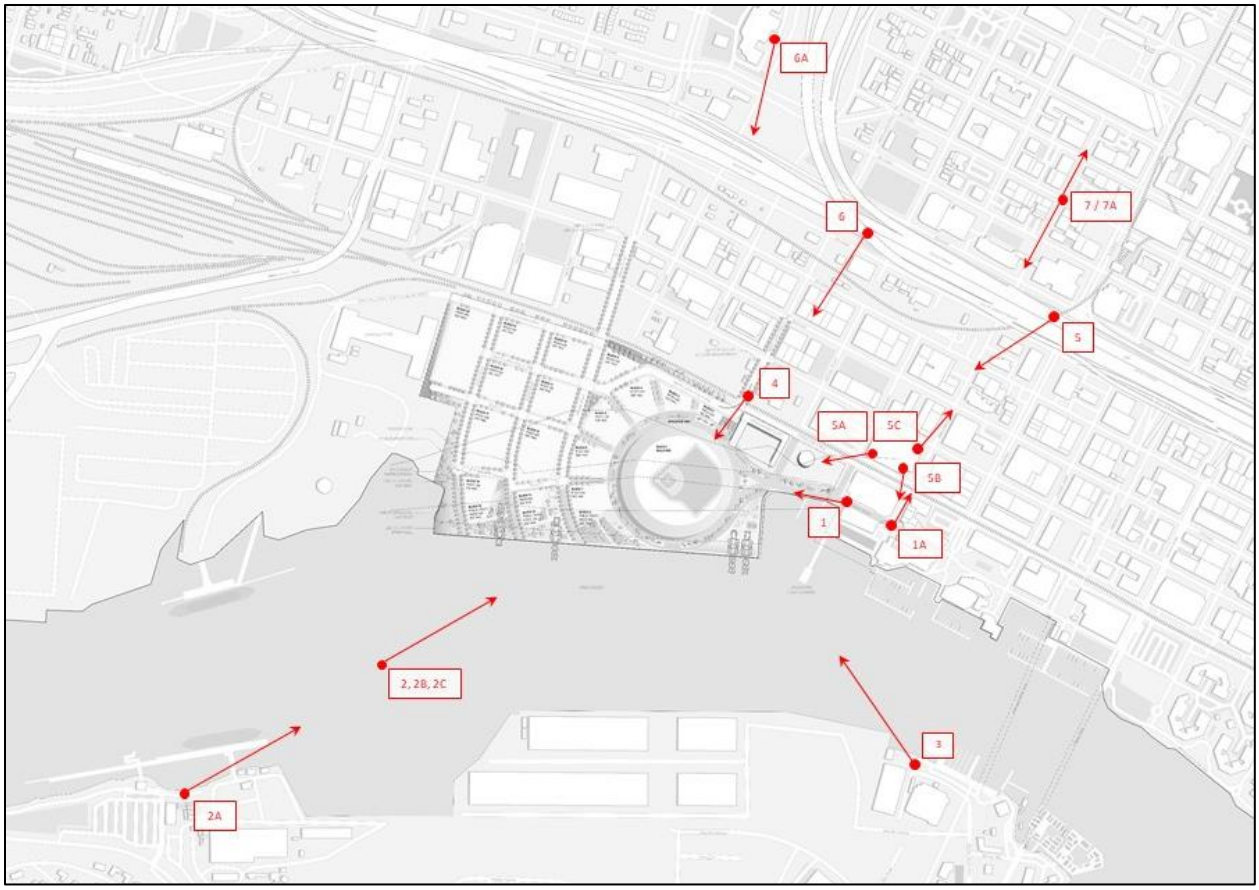


Figure 26: Expanded receptor site location map showing the locations of the receptor sites and their orientations

4.2 Equipment

All luminance and illuminance measurements were taken using a Sekonic L-758 light meter, as shown in Figure 27.

Figure 27: Light meter used for luminance and illuminance measurements

All photographs were taken using a Canon EOS Rebel T6i with an 18-55mm IS SM lens kit, as shown in Figure 28. A tripod was used to allow photographs to be taken at approximately 5'-6" above grade. The camera has a 24.2 megapixel CMOS sensor and fully manual modes, including manual focus.

Figure 28: Camera used for all photography

4.3 Analysis Method

4.3.1 Existing Lighting Conditions

Preliminary analysis included the measurement of existing lighting conditions at the project site. Horizontal illuminance measurements were taken throughout the site and along the property line. Vertical illuminance measurements were taken at the property line facing inward, perpendicular to the property line, to assess light trespass from the project site. Additionally, vertical illuminance measurements were taken at the property line facing outward, perpendicular to the property line, to assess light trespass onto the property.

4.3.2 Receptor Site Measurements

For all receptor site locations with the exception of Receptor Site 2, the sites were first visited during the day to establish a reference daytime photograph and to identify safe locations for subsequent night measurements. Receptor sites were then visited to perform spill light and glare measurements concurrently after dark.

4.3.2.1 Spill Light

To measure spill light, spot vertical illuminance measurements were taken with the illuminance meter at approximately 5’-6” above grade. A series of five measurements were taken and recorded at each receptor site to accommodate varying conditions caused by traffic, people, and other variabilities. Illuminance readings were taken vertically, with the sensor oriented toward the ballpark, gondola station, or gondola tower, depending on the receptor site location and purpose.

4.3.2.2 Glare

Glare measurements were not recorded at the receptor site locations located on the highways (Receptor Site 5 – 880 Westbound and Receptor Site 6 – 980 Ramp to Eastbound 880).

To measure glare, both the luminance meter and photography equipment were used. The camera was mounted on the tripod so the lens was approximately 5’-6” above grade. Following typical HDRI procedure, a series of bracketed photographs were taken at optimal exposure, underexposure, and overexposure. Remote triggering via Wi-Fi was used to reduce camera movement for long exposures.

Additionally, reference measurements were recorded. Using a portable tablet PC, a reference picture was taken to closely match the view of the camera. Between three and seven (average 5.4) reference measurements were taken for each view. Reference values were then used to calibrate final images.

4.4 Software for Glare Analysis of Existing Conditions

The bracketed exposure photographs taken were then used to assess the existing glare experience at each receptor site. For each receptor site, the series of bracketed exposure JPEG files were combined using Photosphere, with a downloaded sensor response curve that is specific to the type of camera body and sensor used which allows for the software to extract the per-pixel luminance values based on JPEG pixel values. Specific spot calibration was checked against the field measurements recorded on site and adjusted if required to match field measurements. The result of this process was a calibrated, full-color High Dynamic Range (HDR) image in *.hdr file format.

The *.hdr files were then viewed through the “wxfalsecolor.exe” plug-in for Diva with Radiance, which allows the per-pixel luminance values to be mapped using falsecolor with a logarithmic scale (second order or higher, depending on the luminance range within the HDR image). The falsecolor images, in JPEG format, were then saved and used to assess existing glare sources in the normal field of view.

4.5 Modeling of Proposed Project

To evaluate the potential impact from the proposed project, a series of lighting models were created to allow direct comparison of existing conditions to proposed lighting conditions.

4.5.1 Geometry

For all evaluation, the fundamental modeled geometry was provided by BIG. This model included the existing developments surrounding the project and fully encompassing the identified receptor sites. The model also included the ballpark itself, adjacent associated development, the gondola variant, and the location of proposed sports lighting. In addition, a model was provided that included the project design option of the lower ballpark height and its associated sports/field lighting positions.

All geometries provided were based on “massing models”, which are models that include the fundamental critical geometry, such as overall height, but exclude detailed geometry, typical with the conceptual design phase in which the project current sits. All models were provided in Rhino file formats.

4.5.2 Software

All lighting calculations were performed using AGI32 software. AGI is a radiosity-based software that allows for the modeling of complex surface interactions while minimizing processor requirements. AGI32 has been validated according to the CIE 171:2006 validation process requirements.

In order to import the model from Rhino to AGI32, all geometries were first exported to Autodesk Autocad 2018 and manipulated within to remove duplicate or null surfaces, and to union congruent three-dimensional geometries. Autocad models were then saved down to a 2007 version to allow for import into AGI32.

All non-vertical surfaces were assigned a 10% light reflectance value and all vertical surfaces were assigned a 50% light reflectance value. Ground planes on roof gardens, including the ballpark roof, were

assigned a 40% light reflectance value. All lighting was modeled assuming initial conditions, and do not account for any depreciation due to dirt, age, weather exposure, or other factors.

AGI renderings showing false-color luminance values were exported from each receptor site to provide a direct before-and-after comparison of the anticipated impact of the project. The mesh levels required for accurate calculations associated with surface or entity size, for some portions of the model, required such tight meshing that the mesh boundaries in the exported renderings somewhat obscure the displayed false-color representation of the anticipated luminances.

4.5.3 Lighting

Since the project is in early conceptual design, the specifics of the lighting design such as luminaire selection and placement have not been developed. As such, the lighting information available via the lighting masterplan was at a coarse level of detail, indicating illuminance targets for all major activities anticipated within the project.

To allow the impact of that lighting to be modeled, the various surfaces within the project were assigned luminances within AGI32, effectively allowing them to "glow" via reflected light. This method allows for the effect of the light to be modeled without having to model the luminaires themselves. Based on the lighting masterplan and the proposed geometry, Table 1 provides the pre-curfew modeled surface luminances and Table 2 provides the post-curfew modeled surface luminances. The luminances were derived using the assumed light reflectance values listed previously, assuming a Lambertian distribution.

	Illuminance, [lux]	**Reflectance**	**Luminance, [cd/m^2]**
Retail Storefronts*	300	50%	47.7
Mixed-Use Facades	35	50%	5.6
Roof Gardens	60	40%	7.6
Intersections	18	10%	0.6
Streets - Primary	20	10%	0.6
Streets - Secondary	20	10%	0.6
Plazas/Parks	6	10%	0.2
Athletics Way	6	10%	0.2
Ballpark Façade	100	50%	15.9
Gondola Loading Platforms	200	10%	6.4
Surface Parking	10	10%	0.3

Table 1: Initial luminances pre-curfew (applies to game and non-game nights)

*Retail storefront luminance pre-curfew is intended to capture the impact of interior lighting emanating from within

	Illuminance, [lux]	Reflectance	Luminance, [cd/m^2]
Retail Storefronts*	35	50%	5.6
Mixed-Use Facades	35	50%	5.6
Roof Gardens	0	40%	0.0
Intersections	18	10%	0.6
Streets - Primary	20	10%	0.6
Streets - Secondary	20	10%	0.6
Plazas/Parks	6	10%	0.2
Athletics Way	6	10%	0.2
Ballpark Façade	15	50%	2.4
Gondola Loading Platforms	200	10%	6.4
Surface Parking	10	10%	0.3

Table 2: Initial luminances post-curfew

*Retail storefront luminance post-curfew is intended to capture exterior architectural lighting only

4.5.4 Identified Digital Signage

Though the full extent of digital signage for the project was not yet determined at this early stage in design, two known and/or probable locations were included in the modeling effort.

Primarily, the main outfield scoreboard was included in the assessment. This pole-mounted scoreboard is anticipated to be fully digital video and to be double-sided. Since the scoreboard will be in direct view from some highway driving positions, it must comply with the California Vehicle Code, addressed in section 2.1.5 above, and therefore was analyzed assuming a diffuse nighttime luminance of 3,500 cd/m^2.

Additionally, two locations of ribbon board were also included in the assessment. The ribbon boards are also anticipated to be fully digital video displays to allow for customized displays and dynamic fan engagement. It is assumed that the ribbon boards would not be brighter than the scoreboard to balance brightnesses within the ballpark, and therefore the ribbon boards were assumed also to have a diffuse nighttime luminance of 3,500 cd/m^2.

4.5.5 Sports Lighting

Sports lighting information, described in section 3.8.3 above, was provided by Henderson. The information provided included an approximation of the number of sports light luminaires provided for the field of play lighting to meet a target of 20% above MLB criteria.

IES files were obtained for sports lighting equipment from a sports lighting manufacturer that closely matches the assumed luminaires. A light loss factor of 80% (20% loss) was assumed for each luminaire. These luminaires and the house light luminaires are the only actual light sources modeled within the assessment; all other modeling included the effect of the light, not the lights themselves.

Luminaires were located per the description from Henderson and aimed at 40° above nadir, which is the maximum allowable aiming angle per MLB standards, and horizontally aimed perpendicular to the light standards or structure to which they are mounted. This high aiming angle provides the worst-case scenario for glare from a distance, since the luminaires are aimed as close to horizontal as permitted and therefore most likely to capture the impact of potential glare from a distance.

The photometric report for the luminaires used for this assessment are included in APPENDIX A – SPORTS LIGHTING PHOTOMETRIC REPORT.

4.5.6 House Lighting

House lighting information, as described in section 3.8.4 above, was provided by Henderson. The information provided included an approximate number of the house luminaires to meet a target illuminance of 100 – 150 lux average.

IES files were obtained for a typical full-cutoff area light that closely matches the assumed luminaires. Lumen output of the IES file was adjusted to match the assumed luminaires. No additional light loss factor was applied, which assumes worst-case condition. These luminaires and the sports lighting luminaires are the only actual light sources modeled with in the assessment; all other modeling included the effect of the light, not the lights themselves.

Luminaires were located per the description from Henderson, and aimed straight down. The luminaires are full-cutoff and were modeled without a tilt applied.

The photometric report for the luminaires used for this assessment are included in APPENDIX B – HOUSE LIGHTING PHOTOMETRIC REPORT.

4.5.7 Cloud Cover

The San Francisco Bay area in general experiences a significant amount of cloud cover, often at low elevations. Cloud cover is known to increase light spill by reflecting upward-directed light back down. The lower the cloud ceiling is, the more significant the impact of the cloud cover on light spill can generally be assumed. Based on TMY3 weather data from the National Renewable Energy Laboratory (NREL) for the Oakland International Airport, the cloud ceiling conditions nearby are surprisingly high for most of the year, with more than 63% of typical annual hours with a cloud ceiling above 10,000ft. Lower cloud ceilings (4,000 ft and under) account for approximately 29.2% of the annual hours.

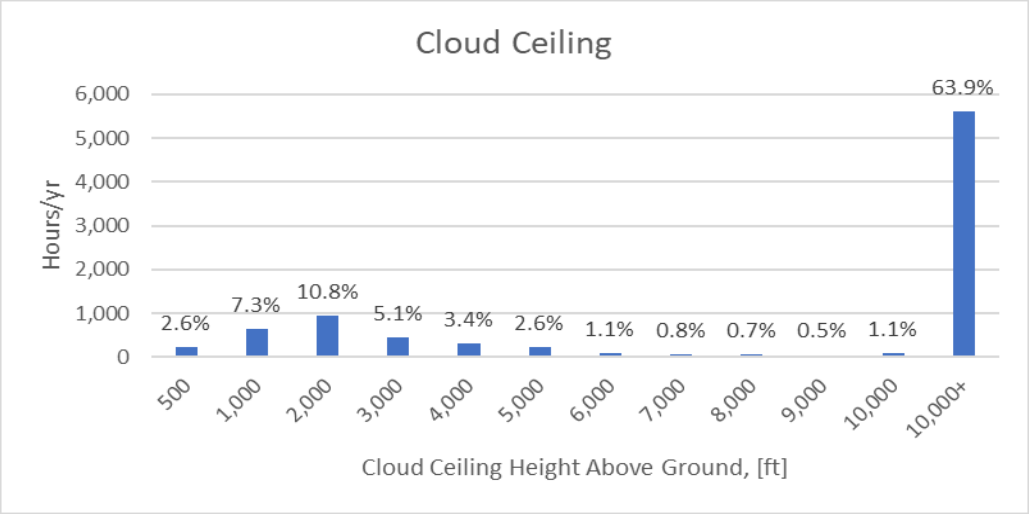


Figure 29: Hours per year of typical cloud ceiling height based on TMY3 data for Oakland International Airport

Figure 30 shows the annual typical cloud cover measured at Oakland Metropolitan Airport, the closest weather station reporting this data. As is shown, the sky dome is most typically 30 – 60% covered (shown in teal), with the least amount of cloud coverage typically experienced mid-day in the fall and the most amount of cloud coverage typically experienced in the morning hours in the summer and fall, and in the midday hours in the winter.

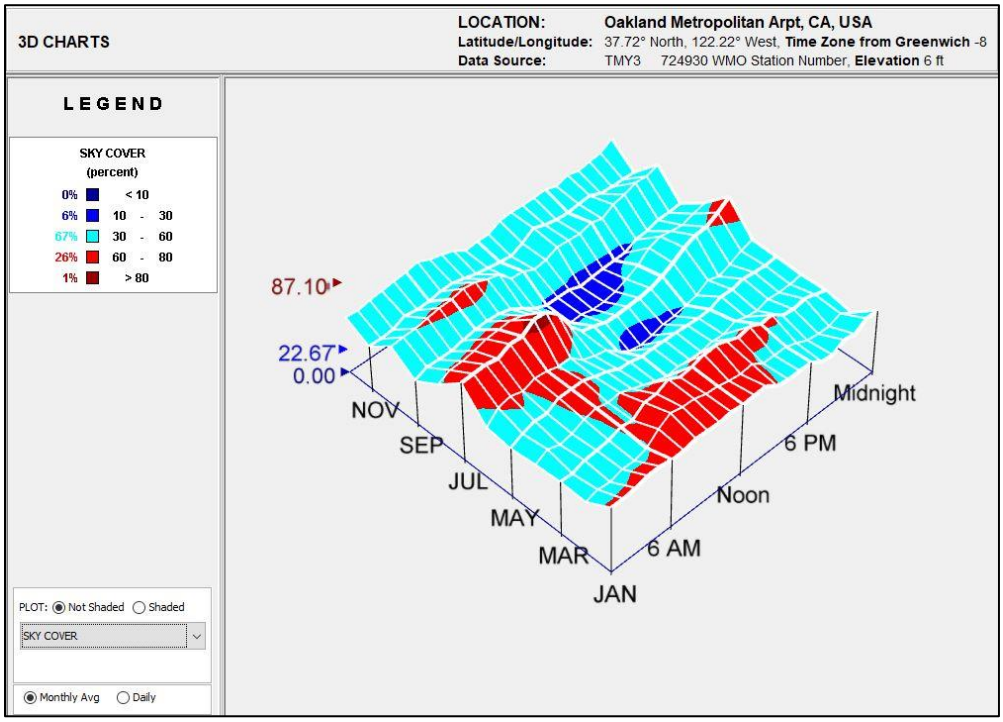


Figure 30: Cloud cover data from Climate Consultant using Oakland International Airport *.epw data

Since the cloud cover in this area is significant, the assessment included a parametric study of the impact of cloud cover on the calculated spill light. In order to model the impact of cloud cover, a floating horizontal plane was placed at various heights above the model and the resultant impact on the spill light calculations were recorded. The cloud ceiling plane was modeled as low as 500 ft and as high as 10,000 ft above grade to model the range of potentially likely conditions. The cloud ceiling reflectance was assigned as diffuse 65% light reflectance, since most sources indicate cloud reflectance values can range between 10% and 90%.

4.5.8 Modeled Lighting Conditions

Three lighting conditions were modeled:

- Game Nights: Assumed to be dusk to curfew during game nights (approximately 40 per year)
    - Architectural surfaces illuminated to full brightness per Table 1.
    - Sports and house lighting “on”
    - Scoreboard and ribbon board displays “on”
- Non-Game Nights, Pre-Curfew: Assumed to be dusk to curfew during non-game and non-event nights (approximately 315 nights per year)
    - Architectural surfaces illuminated to full brightness per Table 1.
    - Sports and house lighting “off”
    - Scoreboard and ribbon board displays “off”
- Post curfew: Assumed to be curfew to dusk all nights of the year
    - Architectural surfaces illuminated to reduced brightness per Table 2.
    - Sports and house lighting “off”
    - Scoreboard and ribbon board displays “off”

All three of the lighting conditions described above were modeled for both the “Phase 1” scenario meant to quantify the impact of the initial development and the “Full Buildout” scenario meant to quantify the cumulative impact of the full development buildout, for both the “Baseline Project” and “MRA Project”.

Additionally, the design option assessing the potential for the reduced ballpark height was modeled based on only the Game Night lighting condition, for both the “Phase 1” scenario and the “Full Buildout” scenario, and for both the “Baseline Project” and “MRA Project”.

In total, 148 simulations were created to complete the assessment.

5 Existing Conditions Assessment Lighting Conditions

The first step of the assessment was to examine the existing lighting conditions. A site visit was made to the Howard Terminal site on Tuesday, February 5th, 2019 beginning at 7pm. The sky conditions were clear. Due to security, access to select portions of the site was limited.

5.1 Status of Existing Lighting Equipment

The existing site is primarily lighted by high-mast poles, each with twelve high-pressure sodium cutoff area lights. Additionally, shorter pole-mounted flood lights are placed at select locations around the perimeter of the site lighting inward. During the site visit, it was observed that approximately 10% of the total luminaires on the site were working. Additionally, many of the high-pressure sodium lamps were cycling, indicating they are nearing failure and likely producing up to 30% less light each than when they were installed and maintained. As such, the baseline established by the existing lighting conditions is lower in terms of both spill light and glare compared to a fully operational port condition.

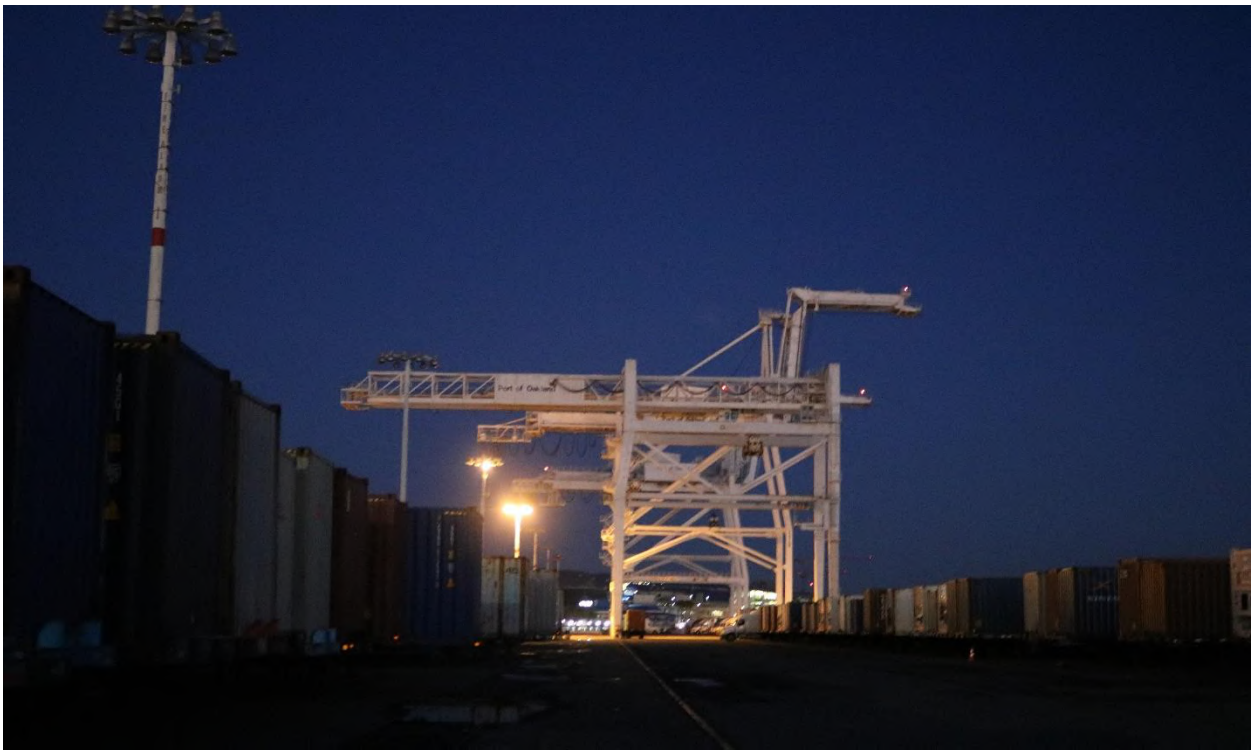


Figure 31: Photograph of existing site lighting from 5 February 2019 site visit.

5.2 On-Site Measurements

Measurements of the existing lighting were taken throughout the site and are summarized in Figure 32 and Table 3. Horizontal illuminance measurements were taken near the ground plane in the center of the site, targeting areas where the surrounding high-mast pole lights were functioning to the greatest extent observed, to record the existing on-site light levels.

At the perimeter of the site, where accessible, horizontal illuminance measurements were taken at the ground plane. Additionally, two vertical illuminance readings were recorded at approximately 5’-6” AFG at the perimeter of the site at selected locations. One of the two vertical illuminance readings was taken

facing toward the property, perpendicular to the property line, to assess the amount of light spilling from the property onto adjacent properties and/or into the water. Additionally, vertical illuminance readings were taken facing outward from the property, perpendicular to the property line, to assess the amount of light spilling onto the property which helps to evaluate how the existing site is light-polluted by adjacent sources.

Figure 32: Existing site lighting measurement locations recorded 5 February 2019

		Vertical Illuminance, [lux]	
Markpoint	**Horizontal Illuminance, [lux]**	**Facing In**	**Facing Out**
A	0.0	Not measured	1.1
B	0.0	Not measured	0.0
C	0.0	1.3	Not measured
D	0.0	1.9	0.0
E	11.8	24.7	0.0
F	Not measured	Not measured	0.0
G (Vertical Facing West)	1.5	Not measured	3.2
G (Vertical Facing South)	1.5	Not measured	1.3
H	2.0	Not measured	3.8
J	2.2	Not measured	3.8
K	2.5	4.1	Not measured
M	4.6	Not measured	6.1
N	5.0	7.5	1.5
P	17.2	Not measured	Not measured
Q	24.7	Not measured	Not measured
R	3.8	5.4	1.2

Table 3: Existing site lighting measurement values recorded 5 February 2019

5.2.1 Horizontal Illuminance

As shown in Table 3, the existing lighting on the site was found to provide approximately 17.2 lux between poles and approximately 24.7 lux directly under poles when approximately four out of twelve luminaires per mast were working.

Additionally, horizontal illuminance readings at the property line varied from zero lux up to 4.9 lux, indicating spill light at the property line that is contributed to by both the on-site lighting and the lighting of adjacent properties. In general, horizontal illuminance readings along the waterfront were extremely low, likely due in part to the fact that many of the luminaires immediately adjacent to the waterfront area were off combined with the obstruction posed by the stored shipping containers and trucks

5.2.2 Light Trespass from Site

Vertical illuminance readings at the property line facing into the site were taken to assess the impact of the lighting on the project site onto adjacent properties and the water. As shown in Figure 32, vertical illuminance recordings were taken ranging from 1.3 lux up to 24.7 lux, indicating that the current lighting is contributing to light pollution onto adjacent properties. Per the recommendations included in IES RP-33-14, shown in Figure 3, vertical illuminances on the property line in Lighting Zone 3 should not exceed 8.0 lux.

5.2.3 Light Trespass onto Site

Vertical illuminance readings at the property line were also taken facing away from the site to assess how light-polluted the site is from adjacent light sources. As shown in Figure 32, vertical illuminance recordings were taken ranging from 0 lux on the southeast corner of the property, to 3.8 lux on the west side of the property. While these values are high, they do comply with the recommendations in IES RP-33-14, shown in Figure 3, for Lighting Zone 3 and indicate that the site is not highly light-polluted by adjacent properties.

5.3 Receptor Site Identification

As described in section 4.1 above, the receptor sites were identified by ESA and expanded to include alternate locations were measurements were not feasible due to unsafe or inaccessible locations, and are shown in Figure 26 above.

All identified receptor sites were visited during the day on either Wednesday, February 5th or Thursday, February 6th, 2019 to obtain daytime photographs.

5.3.1 Lighting Conditions at Receptor Sites

Lighting conditions were measured on the evening of Wednesday, February 6th, 2019 at all receptor sites excluding Receptor Site 2 beginning at 7:30 pm. Weather conditions were partly cloudy.

At each receptor site, spill light measurements, glare measurements, and calibrated photography measurements were recorded concurrently. For the two receptor sites located on elevated freeways, the spill light measurements were taken from the back seat of a car travelling along the freeway with the window rolled down.

5.3.1.1 Receptor Site 1 – Water Street facing Ballpark

Table 4 provides the results of the spill light measurements for Receptor Site 1, Figure 33 provides the daytime photo of the view from Receptor Site 1 to the proposed ballpark location, Figure 34 provides the nighttime calibrated high dynamic range image of the view from Receptor Site 1 to the proposed ballpark location, and Figure 35 provides the falsecolor high dynamic range image of the view from Receptor Site 1 to the proposed ballpark showing the measured luminance values. Note the luminance scale for each HDR image is unique and displayed on the left side of the image in units of cd/m^2.

Receptor Site 1 is located very close to the proposed development and the primary field of view is the existing terminal site. The calibrated images and falsecolor images show that the primary sources of brightness in the field of view are the high mast pole lights located on the project site and the high mast pole lights located on properties to the west of the Terminal site. From this view, high luminance contrast is experienced.

	Vertical Illuminance, [lux]		
	Average	**Max**	**Min**
Receptor Site 1 - Water Street (Facing Ballpark)	6.0	6.5	5.7

Table 4: Receptor Site 1 Existing Spill Light

Figure 33: Receptor Site 1 Daytime Photo

Figure 34: Receptor Site 1 Nighttime Calibrated HDR Image

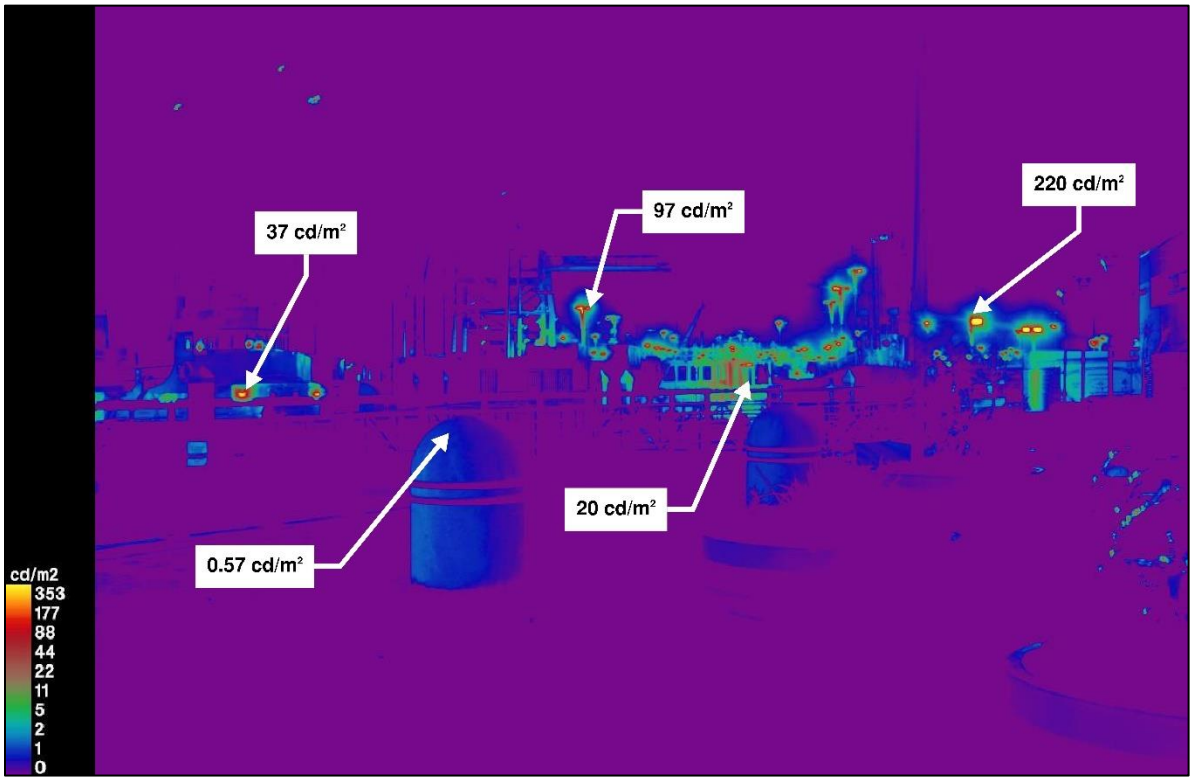


Figure 35: Receptor Site 1 Falsecolor Image

5.3.1.2 Receptor Site 1A – Water Street at Washington (Facing Gondola)

Table 5 provides the results of the spill light measurements for Receptor Site 1A, Figure 36 provides the daytime photo of the view from Receptor Site 1A to the proposed gondola station location, Figure 37 provides the nighttime calibrated high dynamic range image of the view from Receptor Site 1A to the proposed gondola station location, and Figure 38 provides the falsecolor high dynamic range image of the view from Receptor Site 1A to the proposed gondola station location showing the measured luminance values. Note the luminance scale for each HDR image is unique and displayed on the left side of the image in units of cd/m^2.

Receptor Site 1A is located very close to the proposed gondola station included as a project variant and the primary field of view is the Washington Street corridor. The calibrated images and falsecolor images show that the primary sources of brightness in the field of view are the pedestrian pole lights located along Washington Street and other architectural light sources mounted to adjacent buildings. From this view, moderate luminance contrast is experienced.

	Vertical Illuminance, [lux]		
	Average	**Max**	**Min**
Receptor Site 1A - Water Street at Washington (Facing Gondola)	7.3	7.5	7.1

Table 5: Receptor Site 1A Existing Spill Light

Figure 36: Receptor Site 1A Daytime Photo

Figure 37: Receptor Site 1A Nighttime Calibrated HDR Image

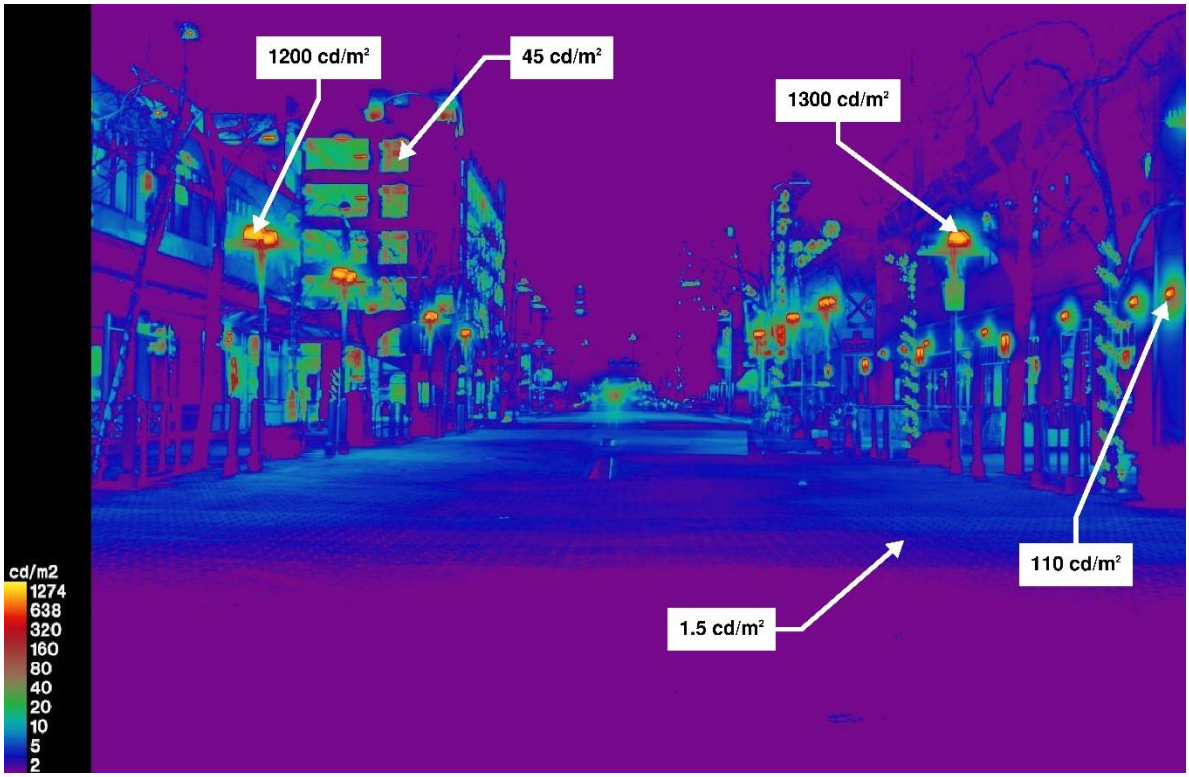


Figure 38: Receptor Site 1A Falsecolor Image

5.3.1.3 Receptor Sites 2, 2B and 2C – Inner Harbor Turning Basin

On September 30, 2019, a visit to the Inner Harbor Turning Basin was conducted. Weather conditions were partly cloudy. Measurements were taken at eye height aboard a ship with a deck height of 47m (154 ft), giving a measurement height of approximately 159 ft above the water line. The site visit occurred pre-dawn, and as such no daytime photos were taken. These measurements are used to approximate the experience at Receptor Site 2, which is located 190' above the water level. No measurements were taken to approximate Receptor Sites 2B or 2C as these sites were inaccessible.

Table 6 provides the results of the spill light measurements for Receptor Site 2, Figure 39 provides the nighttime calibrated high dynamic range image of the view from Receptor Site 2 to the proposed project location, and Figure 40 provides the falsecolor high dynamic range image of the view from Receptor Site 2 to the proposed project location showing the measured luminance values. Note the luminance scale for each HDR image is unique and displayed on the left side of the image in units of cd/m^2.

The calibrated images and falsecolor images show that the primary source of brightness in the field of view is the high-mast lighting and the reflected light from the light-colored paving surfaces. As noted in the discussion of the existing lighting conditions at Howard Terminal in Section 5.1 above, many of the existing light fixtures were not "on", particularly in the southwest corner of the terminal site.

	Vertical Illuminance, [lux]		
	Average	**Max**	**Min**
Receptor Site 2 - Inner Harbor Turning Basin @ 190'	1.2	1.2	1.1

Table 6: Receptor Site 2 Existing Spill Light

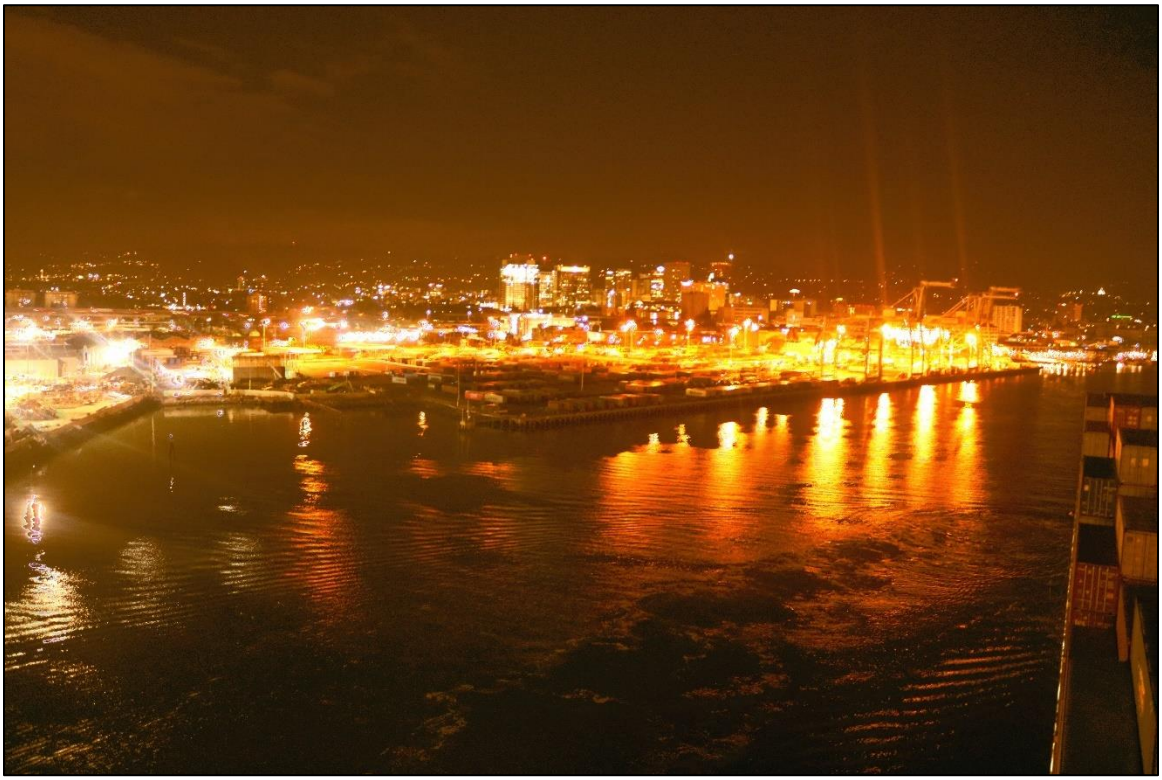


Figure 39: Receptor Site 2 Nighttime Calibrated HDR Image

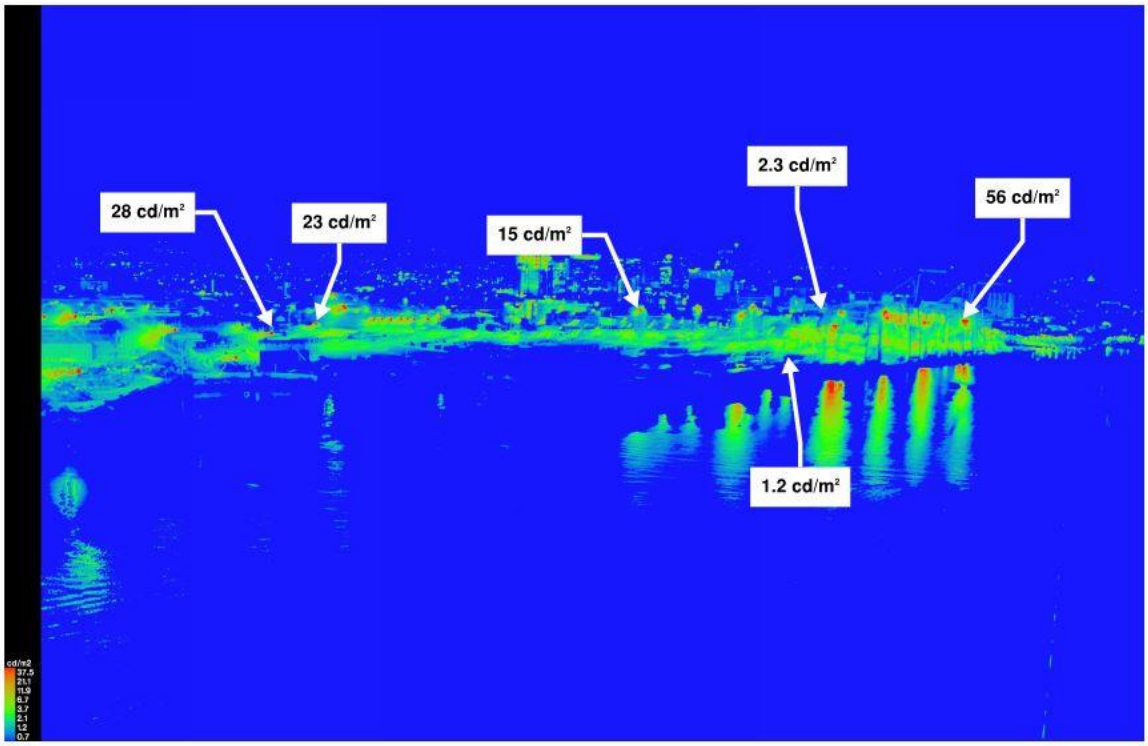


Figure 40: Receptor Site 2 Falsecolor Image

5.3.1.4 Receptor Site 2A – Turning Basin Line-of-Site

Receptor Site 2A was established to provide a line-of-site to the proposed project through the center of the turning basin, though at ground level.

Table 7 provides the results of the spill light measurements for Receptor Site 2A, Figure 41 provides the daytime photo of the view from Receptor Site 2A to the proposed project location, Figure 42 provides the nighttime calibrated high dynamic range image of the view from Receptor Site 2A to the proposed project location, and Figure 43 provides the falsecolor high dynamic range image of the view from Receptor Site 2A to the proposed project location showing the measured luminance values. Note the luminance scale for each HDR image is unique and displayed on the left side of the image in units of cd/m^2.

Receptor Site 2A is located across the estuary and along the line of site through the center of the turning basin. The calibrated images and falsecolor images show that the primary sources of brightness in the field of view are the local dock lighting. From this view, moderate luminance contrast is experienced.

	Vertical Illuminance, [lux]		
	Average	**Max**	**Min**
Receptor Site 2A - Turning Basin Line-of-Sight	5.7	5.7	5.7

Table 7: Receptor Site 2A Existing Spill Light

Figure 41: Receptor Site 2A Daytime Photo

Figure 42: Receptor Site 2A Nighttime Calibrated HDR Image

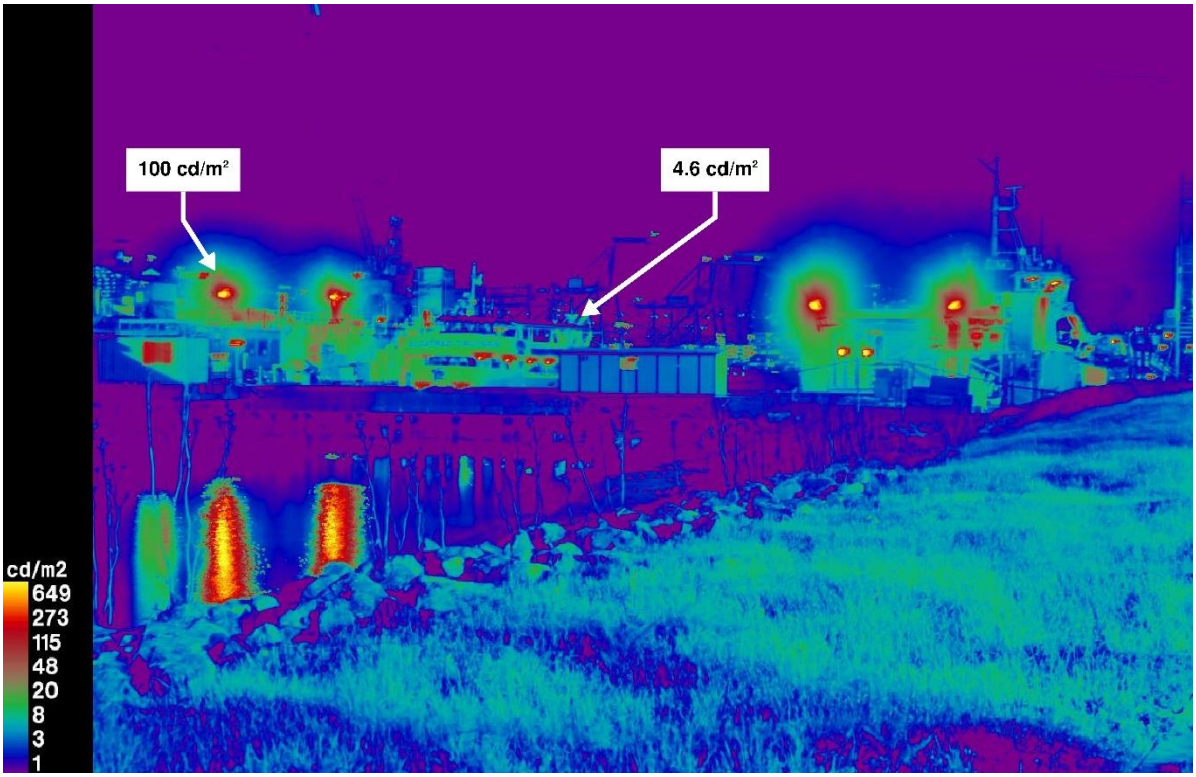


Figure 43: Receptor Site 2A Falsecolor Image

5.3.1.5 Receptor Site 3 – Alameda Dock

Table 8 provides the results of the spill light measurements for Receptor Site 3, Figure 44 provides the daytime photo of the view from Receptor Site 3 to the proposed project location, Figure 45 provides the nighttime calibrated high dynamic range image of the view from Receptor Site 3 to the proposed project location, and Figure 46 provides the falsecolor high dynamic range image of the view from Receptor Site 3 to the proposed project location showing the measured luminance values. Note the luminance scale for each HDR image is unique and displayed on the left side of the image in units of cd/m^2.

Receptor Site 3 is located across the estuary and faces northwest toward the center of the project site. The primary field of view is the estuary with the project site in the background. The calibrated images and falsecolor images show that the primary sources of brightness in the field of view is the existing high mast lighting at the project site and the adjacent properties, which causes reflections in the water. From this view, high luminance contrast is experienced.

	Vertical Illuminance, [lux]		
	Average	**Max**	**Min**
Receptor Site 3 - Alameda Dock	1.1	1.1	1.1

Table 8: Receptor Site 3 Existing Spill Light

Figure 44: Receptor Site 3 Daytime Photo

Figure 45: Receptor Site 3 Nighttime Calibrated HDR Image

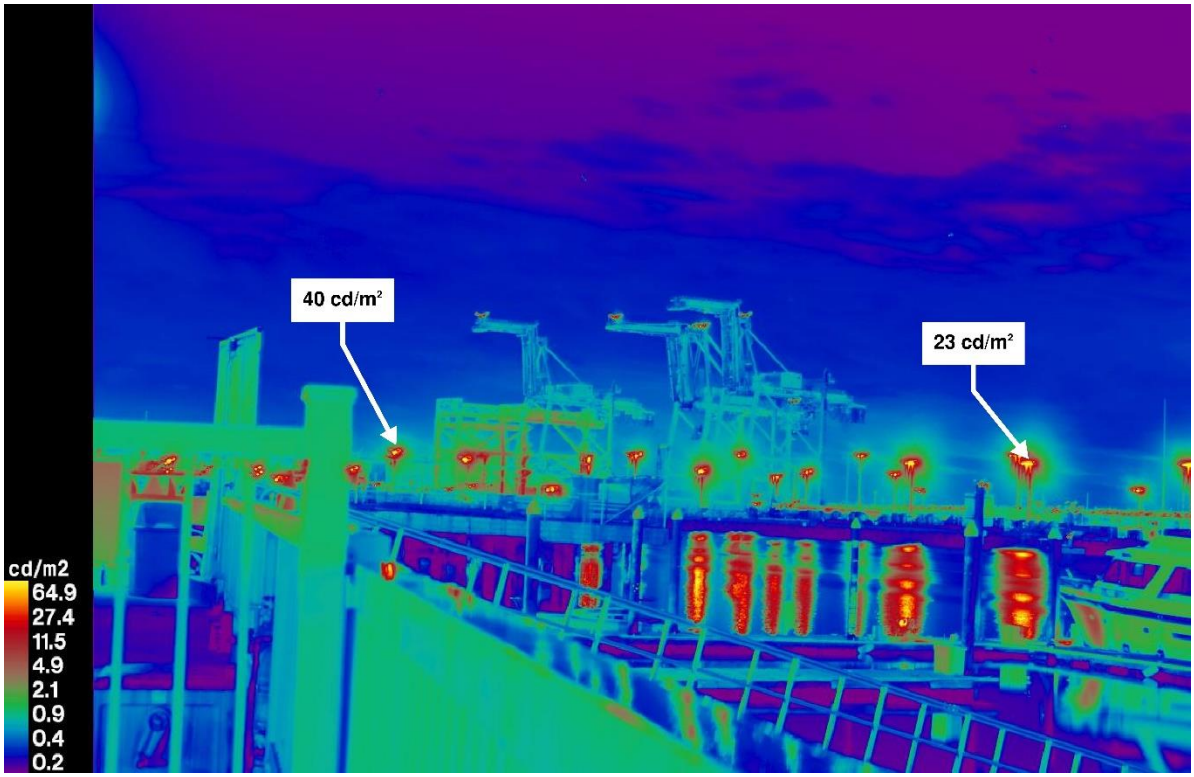


Figure 46: Receptor Site 3 Falsecolor Image

5.3.1.6 Receptor Site 4 – MLK at Embarcadero

Table 9 provides the results of the spill light measurements for Receptor Site 4, Figure 47 provides the daytime photo of the view from Receptor Site 4 to the proposed project location, Figure 48 provides the nighttime calibrated high dynamic range image of the view from Receptor Site 4 to the proposed project location, and Figure 49 provides the falsecolor high dynamic range image of the view from Receptor Site 4 to the proposed project location showing the measured luminance values. Note the luminance scale for each HDR image is unique and displayed on the left side of the image in units of cd/m^2.

Receptor Site 4 is located immediately adjacent to the project site and the primary field of view is the existing site development. The calibrated images and falsecolor images show that the primary sources of brightness in the field of view is the existing high mast lighting at the project site, though many of the existing high mast luminaires were not functioning at the time of measurement. From this view, high luminance contrast is experienced.

	Vertical Illuminance, [lux]		
	Average	**Max**	**Min**
Receptor Site 4 - MLK at Embarcadero	7.2	7.5	7.1

Table 9: Receptor Site 4 Existing Spill Light

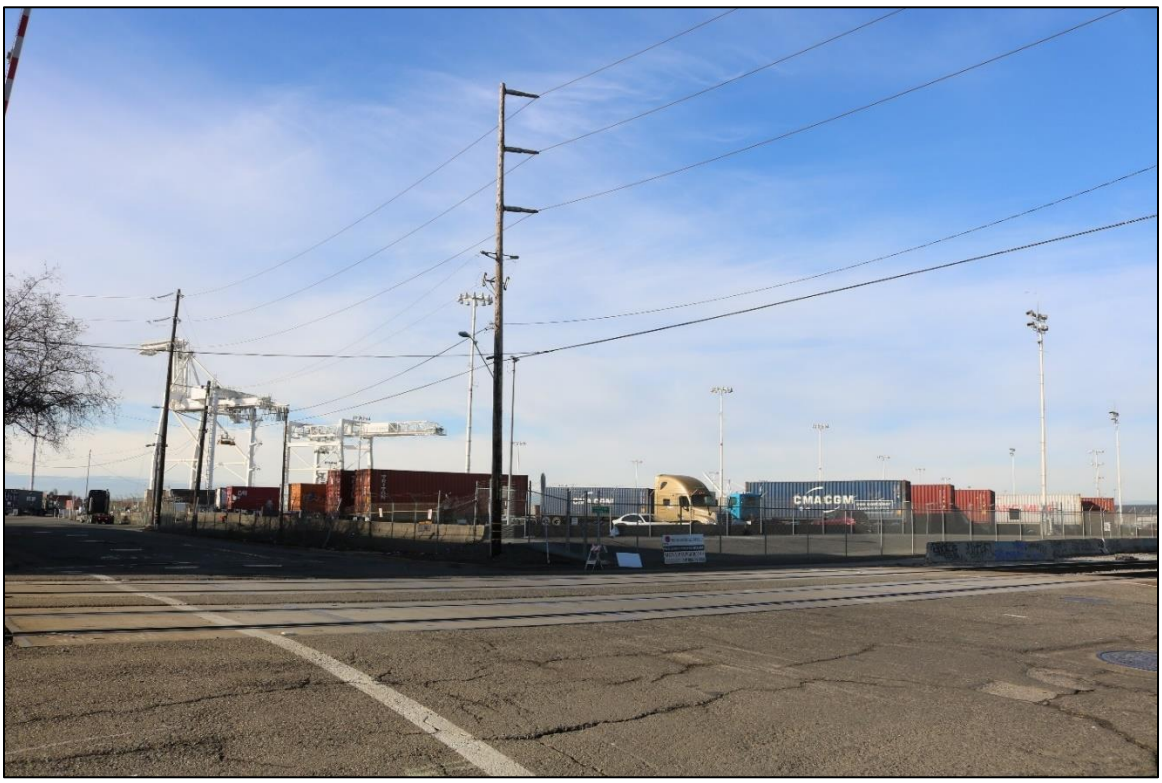


Figure 47: Receptor Site 4 Daytime Photo

Figure 48: Receptor Site 4 Nighttime Calibrated HDR Image

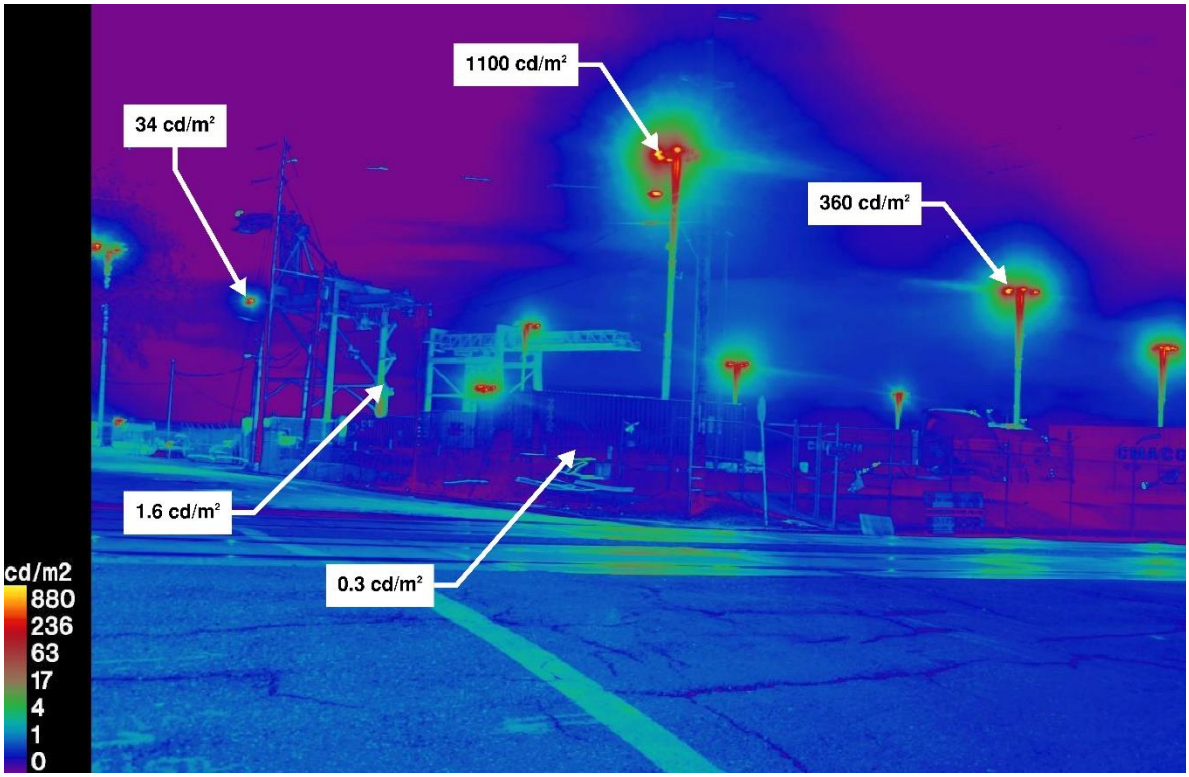


Figure 49: Receptor Site 4 Falsecolor Image

5.3.1.7 Receptor Site 5 – I880 Westbound

Table 10 provides the results of the spill light measurements for Receptor Site 5, and Figure 50 provides the daytime photo of the view from Receptor Site 5 to the proposed project location. No nighttime photos were taken to perform glare analysis due to the inaccessibility of the site.

Receptor Site 5 is located on the elevated freeway and the primary field of view is the existing site development beyond the freeway.

	Vertical Illuminance, [lux]		
	Average	**Max**	**Min**
Receptor Site 5 - I880 Westbound	1.6	1.9	1.2

Table 10: Receptor Site 5 Existing Spill Light

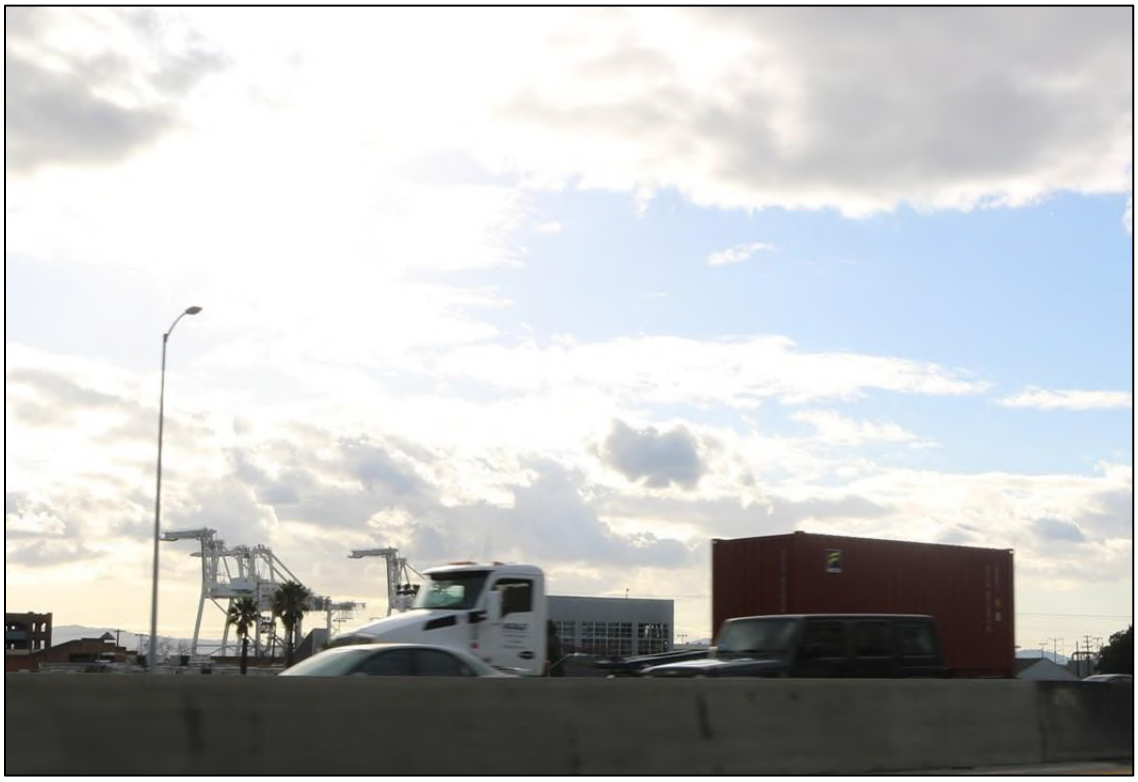


Figure 50: Receptor Site 5 Daytime Photo

5.3.1.8 Receptor Site 5A – 2nd at Washington (Facing Ballpark)

Table 11 provides the results of the spill light measurements for Receptor Site 5A, Figure 51 provides the daytime photo of the view from Receptor Site 5A to the proposed project location, Figure 52 provides the nighttime calibrated high dynamic range image of the view from Receptor Site 5A to the proposed project location, and Figure 53 provides the falsecolor high dynamic range image of the view from Receptor Site 5A to the proposed project location showing the measured luminance values. Note the luminance scale for each HDR image is unique and displayed on the left side of the image in units of cd/m^2.

Receptor Site 5A is located on top of the southwest corner of the parking garage located at 2nd and Washington, and immediately adjacent to the project site. The primary field of view is looking down onto the existing site development. The calibrated images and falsecolor images show that the primary sources of brightness in the field of view is the existing high mast lighting at the project site, though many of the existing high mast luminaires were not functioning at the time of measurement. From this view above the luminaires, moderate luminance contrast is experienced.

	Vertical Illuminance, [lux]		
	Average	**Max**	**Min**
Receptor Site 5A - 2nd at Washington (Facing Ballpark)	2.1	2.2	2.0

Table 11: Receptor Site 5A Existing Spill Light

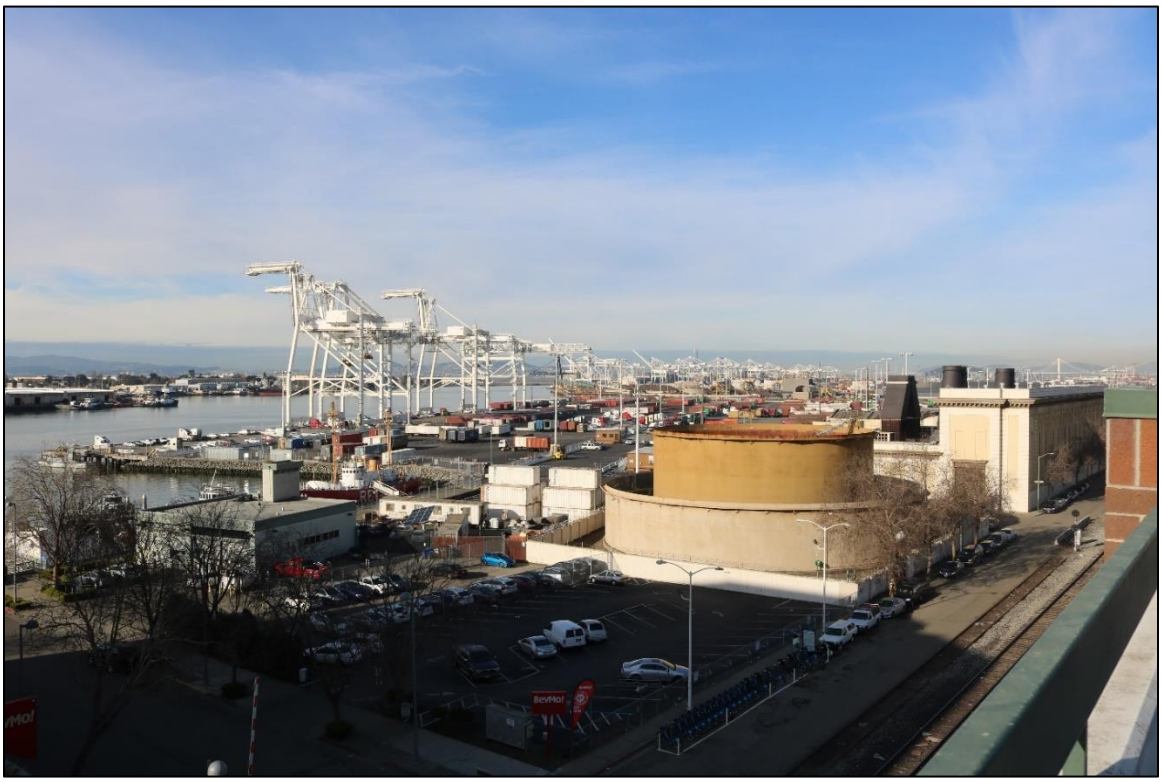


Figure 51: Receptor Site 5A Daytime Photo

Figure 52: Receptor Site 5A Nighttime Calibrated HDR Image

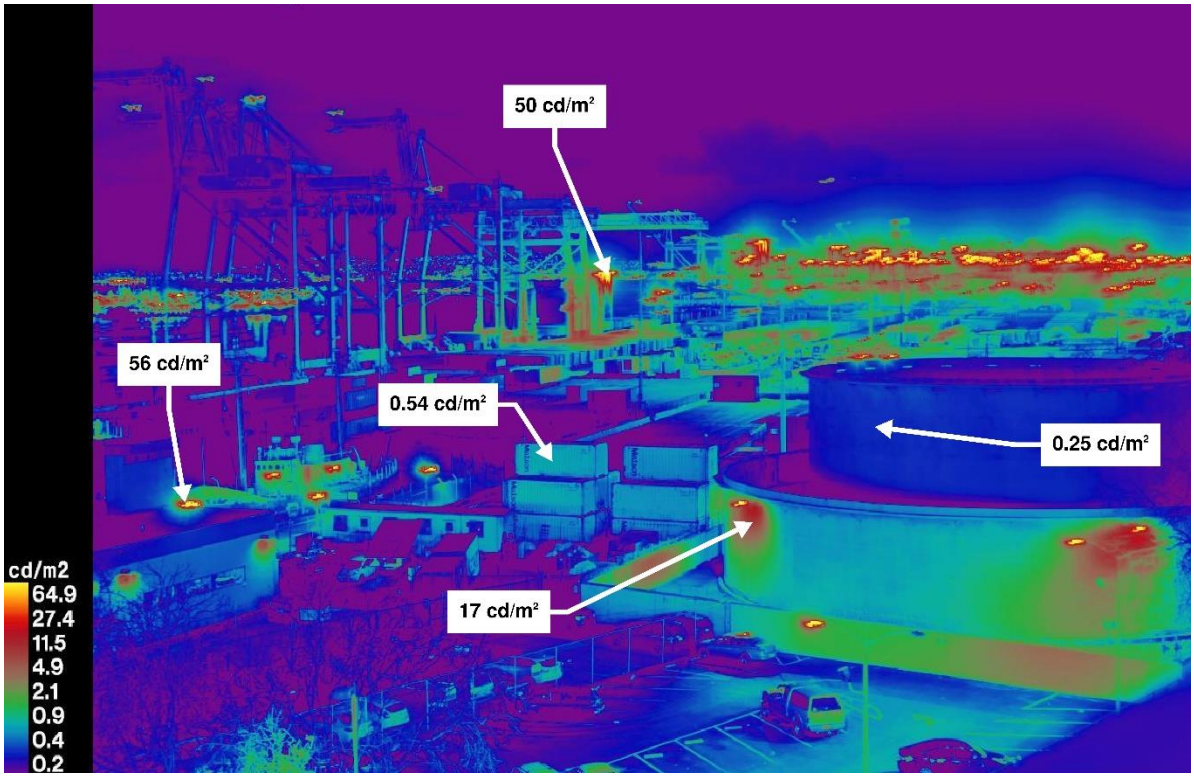


Figure 53: Receptor Site 5A Falsecolor Image

5.3.1.9 Receptor Site 5B – 2nd at Washington (Facing Jack London Square Station)

Table 12 provides the results of the spill light measurements for Receptor Site 5B, Figure 54 provides the daytime photo of the view from Receptor Site 5B to the proposed project location, Figure 55 provides the nighttime calibrated high dynamic range image of the view from Receptor Site 5B to the proposed project location, and Figure 56 provides the falsecolor high dynamic range image of the view from Receptor Site 5B to the proposed project location showing the measured luminance values. Note the luminance scale for each HDR image is unique and displayed on the left side of the image in units of cd/m^2.

Receptor Site 5A is located on top of the southeast corner of the parking garage located at 2nd and Washington, and immediately adjacent to proposed gondola station. The primary field of view is looking down onto the existing roadway. The calibrated images and falsecolor images show that the primary sources of brightness in the field of view is the existing pedestrian pole lights and architectural building-mounted lights. From this view above the luminaires, moderate luminance contrast is experienced.

	Vertical Illuminance, [lux]		
	Average	**Max**	**Min**
Receptor Site 5B - 2nd at Washington (Facing JLS Station)	3.7	3.8	3.6

Table 12: Receptor Site 5B Existing Spill Light

Figure 54: Receptor Site 5B Daytime Photo

Figure 55: Receptor Site 5B Nighttime Calibrated HDR Image

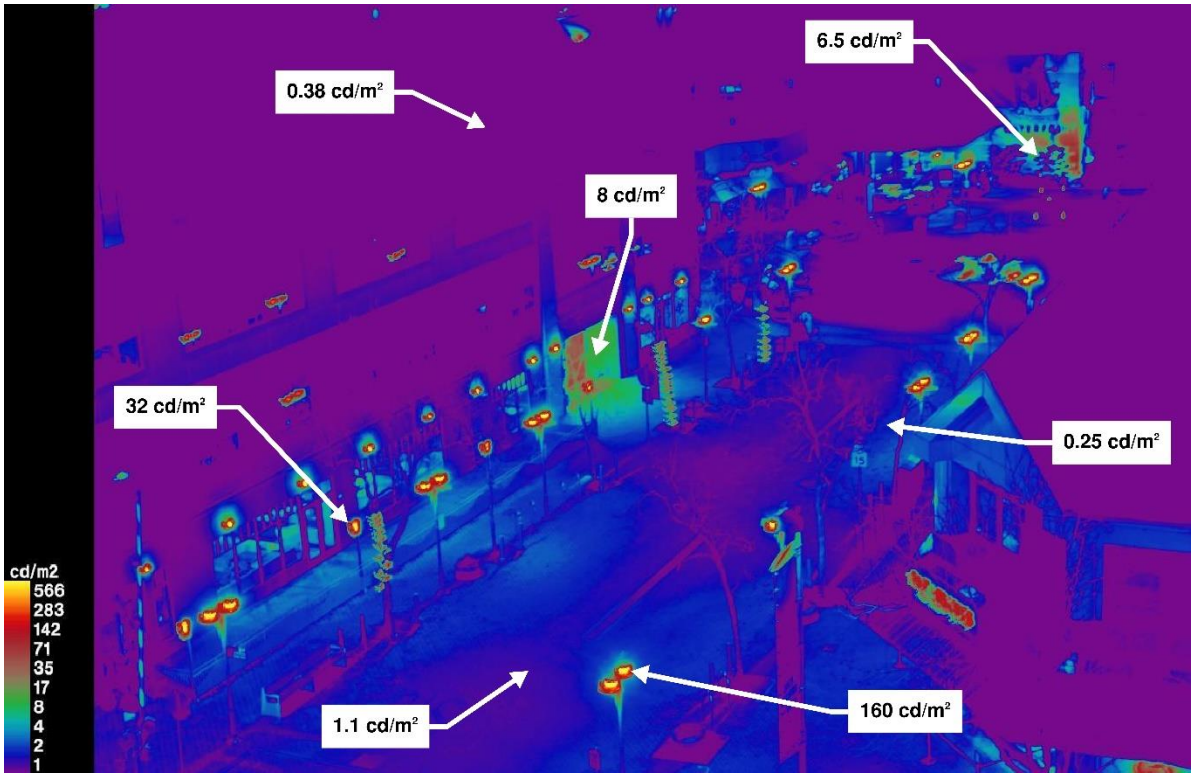


Figure 56: Receptor Site 5B Falsecolor Image

5.3.1.10 Receptor Site 5C – 2nd at Washington (Facing Convention Center Station)

Table 13 provides the results of the spill light measurements for Receptor Site 5C, Figure 57 provides the daytime photo of the view from Receptor Site 5C to the proposed project location, Figure 58 provides the nighttime calibrated high dynamic range image of the view from Receptor Site 5C to the proposed project location, and Figure 59 provides the falsecolor high dynamic range image of the view from Receptor Site 5C to the proposed project location showing the measured luminance values. Note the luminance scale for each HDR image is unique and displayed on the left side of the image in units of cd/m^2.

Receptor Site 5C is located on top of the northeast corner of the parking garage located at 2nd and Washington, looking along Washington St to the proposed gondola mains support pole and the Convention Center station The primary field of view is looking down the Washington Street Corridor. The calibrated images and falsecolor images show that the primary sources of brightness in the field of view is the existing building-mounted signage lighting. From this view above the luminaires, minimal luminance contrast is experienced.

	Vertical Illuminance, [lux]		
	Average	**Max**	**Min**
Receptor Site 5C - 2nd at Washington (Facing Convention Center Station)	3.2	3.2	3.1

Table 13: Receptor Site 5C Existing Spill Light

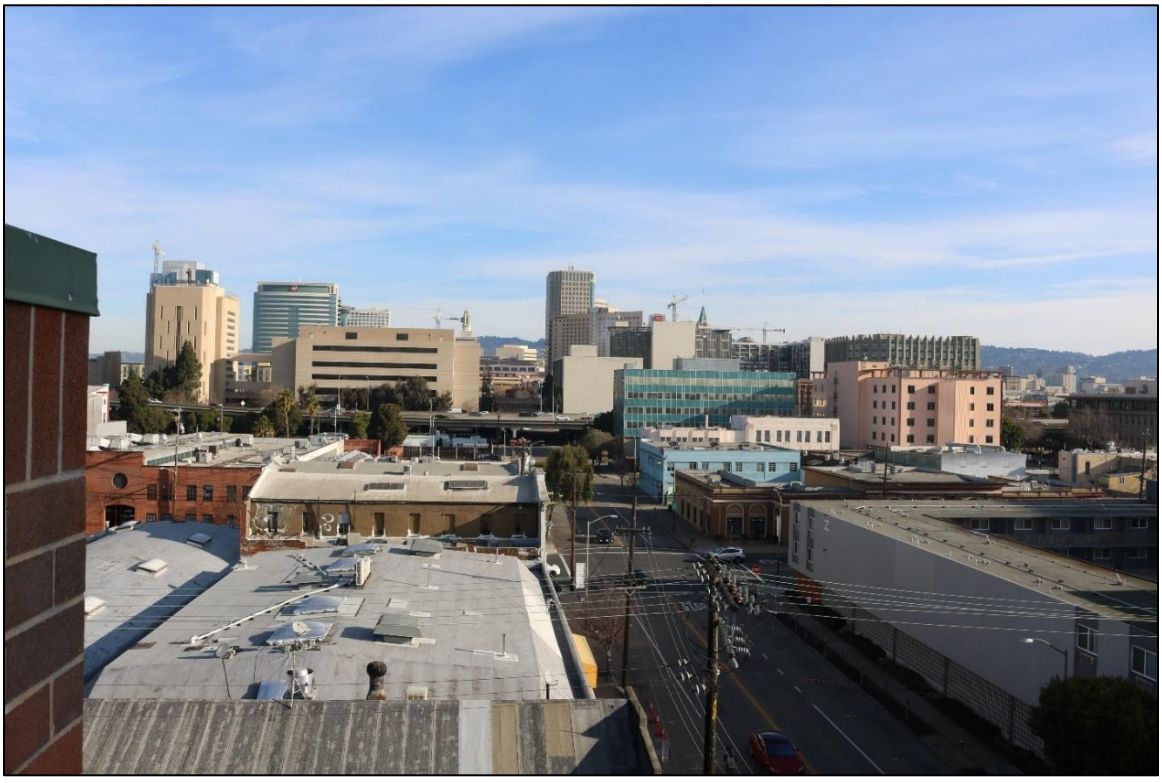


Figure 57: Receptor Site 5C Daytime Photo

Figure 58: Receptor Site 5C Nighttime Calibrated HDR Image

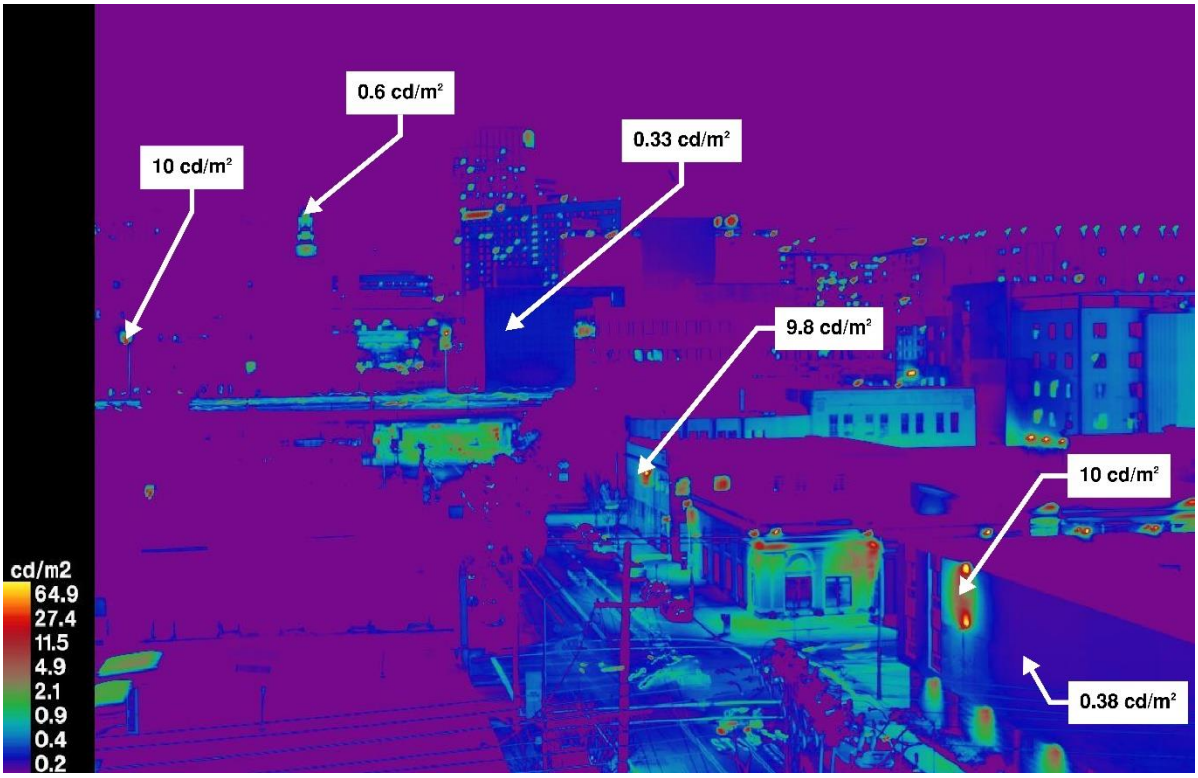


Figure 59: Receptor Site 5C Falsecolor Image

5.3.1.11 Receptor Site 6 – I980 Ramp to Eastbound I880

Table 14 provides the results of the spill light measurements for Receptor Site 6, and Figure 60 provides the daytime photo of the view from Receptor Site 6 to the proposed project location. No nighttime photos were taken to perform glare analysis due to the inaccessibility of the site.

Receptor Site 6 is located on the elevated freeway and the primary field of view is the existing site development, though much of the view is blocked due to the tilt of the on-ramp.

	Vertical Illuminance, [lux]		
	Average	**Max**	**Min**
Receptor Site 6 - I980 Ramp to Eastbound I880	1.2	1.4	1.2

Table 14: Receptor Site 6 Existing Spill Light

Figure 60: Receptor Site 6 Daytime Photo

5.3.1.12 Receptor Site 6A – 7th at Brush

Table 15 provides the results of the spill light measurements for Receptor Site 6A, Figure 61 provides the daytime photo of the view from Receptor Site 6A to the proposed project location, Figure 62 provides the nighttime calibrated high dynamic range image of the view from Receptor Site 6A to the proposed project location, and Figure 63 provides the falsecolor high dynamic range image of the view from Receptor Site 6A to the proposed project location showing the measured luminance values. Note the luminance scale for each HDR image is unique and displayed on the left side of the image in units of cd/m^2.

Receptor Site 6A is located to the west of the I980 ramp to I880 and provides a similarly elevated point of view of the project site. The primary field of view is the immediate development with the project site in the distant background. The calibrated images and falsecolor images show that the primary sources of brightness in the field of view is the local signage, though the distant lighting on the project site's cranes is visible. From this view above the luminaires, minimal luminance contrast is experienced.

	Vertical Illuminance, [lux]		
	Average	**Max**	**Min**
Receptor Site 6A - 7th at Brush	5.1	5.4	4.6

Table 15: Receptor Site 6A Existing Spill Light

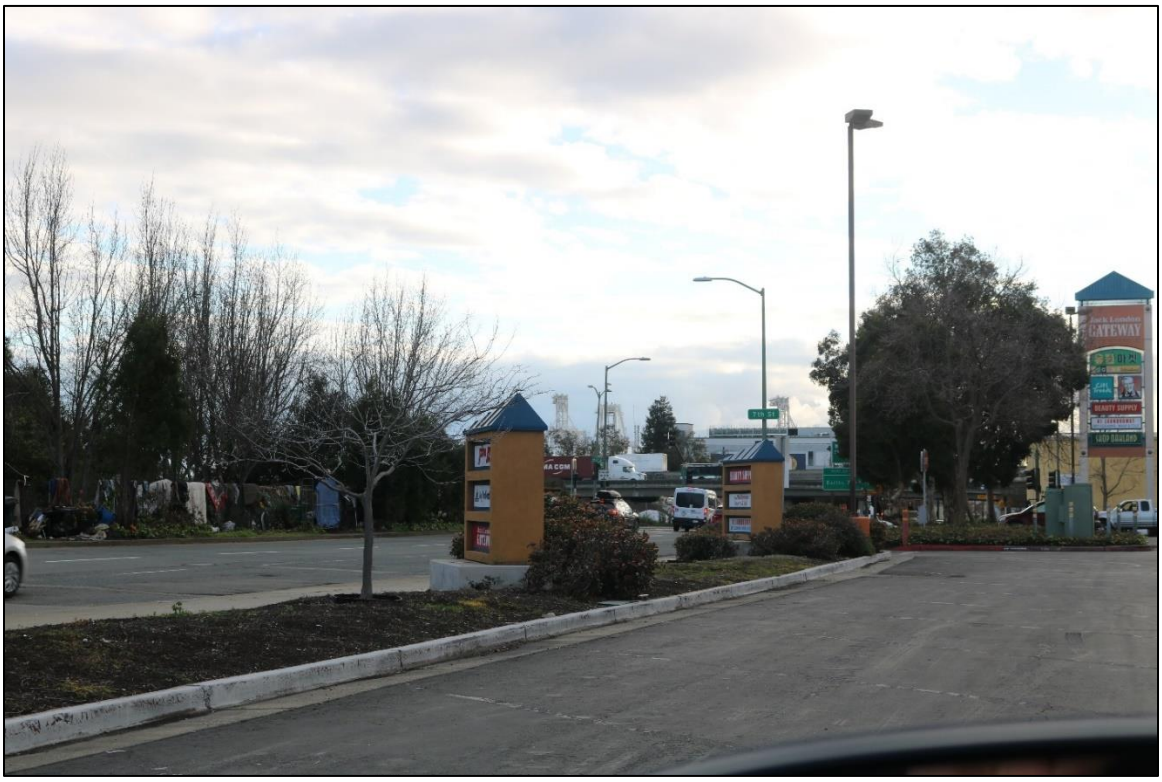


Figure 61: Receptor Site 6A Daytime Photo

Figure 62: Receptor Site 6A Nighttime Calibrated HDR Image

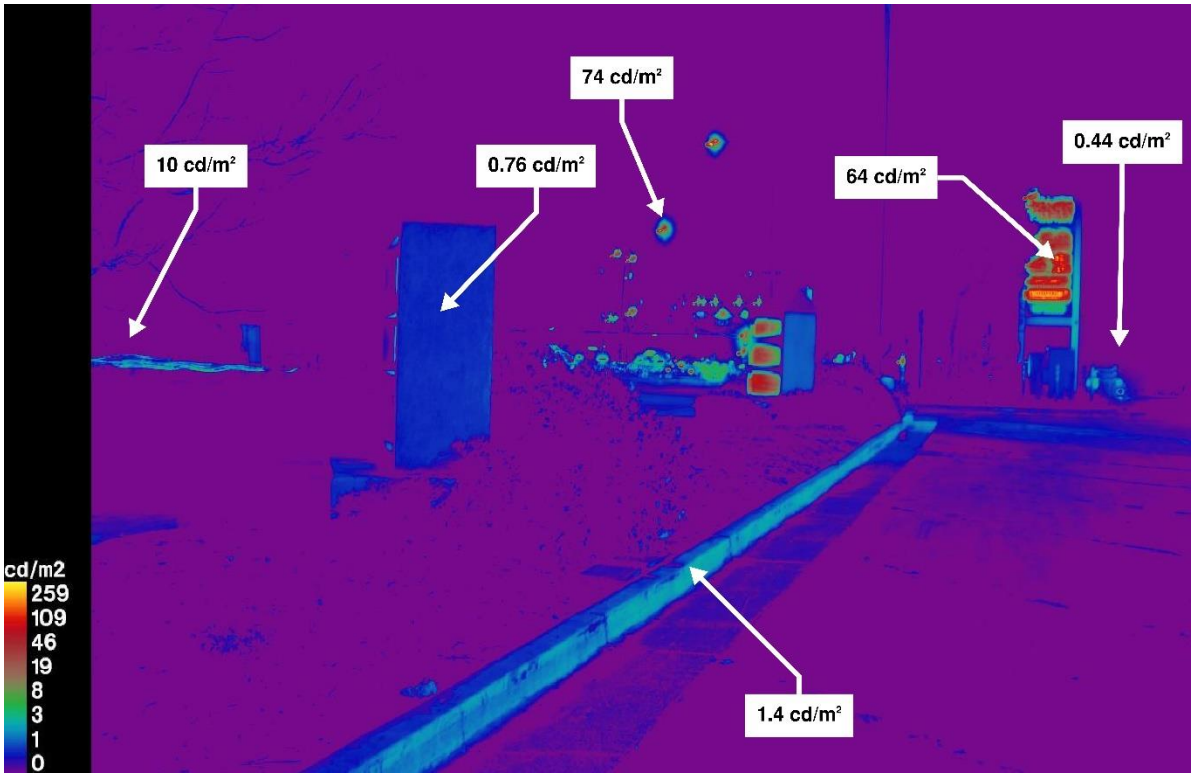


Figure 63: Receptor Site 6A Falsecolor Image

5.3.1.13 Receptor Site 7 – 8th at Washington (Facing Convention Center Station)

Table 16 provides the results of the spill light measurements for Receptor Site 7, Figure 64 provides the daytime photo of the view from Receptor Site 7 to the proposed gondola station, Figure 65 provides the nighttime calibrated high dynamic range image of the view from Receptor Site 7 to the proposed gondola station location, and Figure 66 provides the falsecolor high dynamic range image of the view from Receptor Site 7 to the proposed gondola station location showing the measured luminance values. Note the luminance scale for each HDR image is unique and displayed on the left side of the image in units of cd/m^2.

Receptor Site 7 is located one block south of the proposed gondola station, and the primary field of view is the Washington Street corridor to the terminus at the Convention Center. The calibrated images and falsecolor images show that the primary sources of brightness in the field of view is the pedestrian and roadway lighting poles. From this view, luminance contrast is experienced.

	Vertical Illuminance, [lux]		
	Average	**Max**	**Min**
Receptor Site 7 - 8th at Washington (Facing Convention Center Station)	15.4	16.7	14.0

Table 16: Receptor Site 7 Existing Spill Light

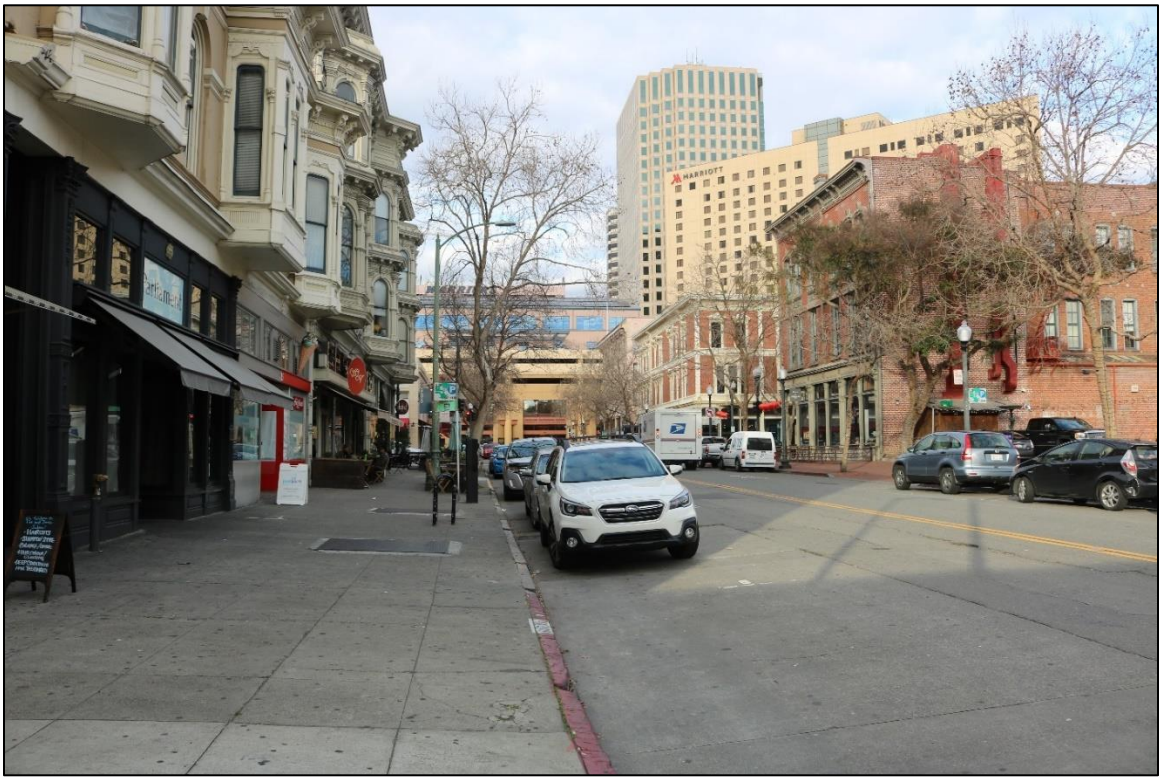


Figure 64: Receptor Site 7 Daytime Photo

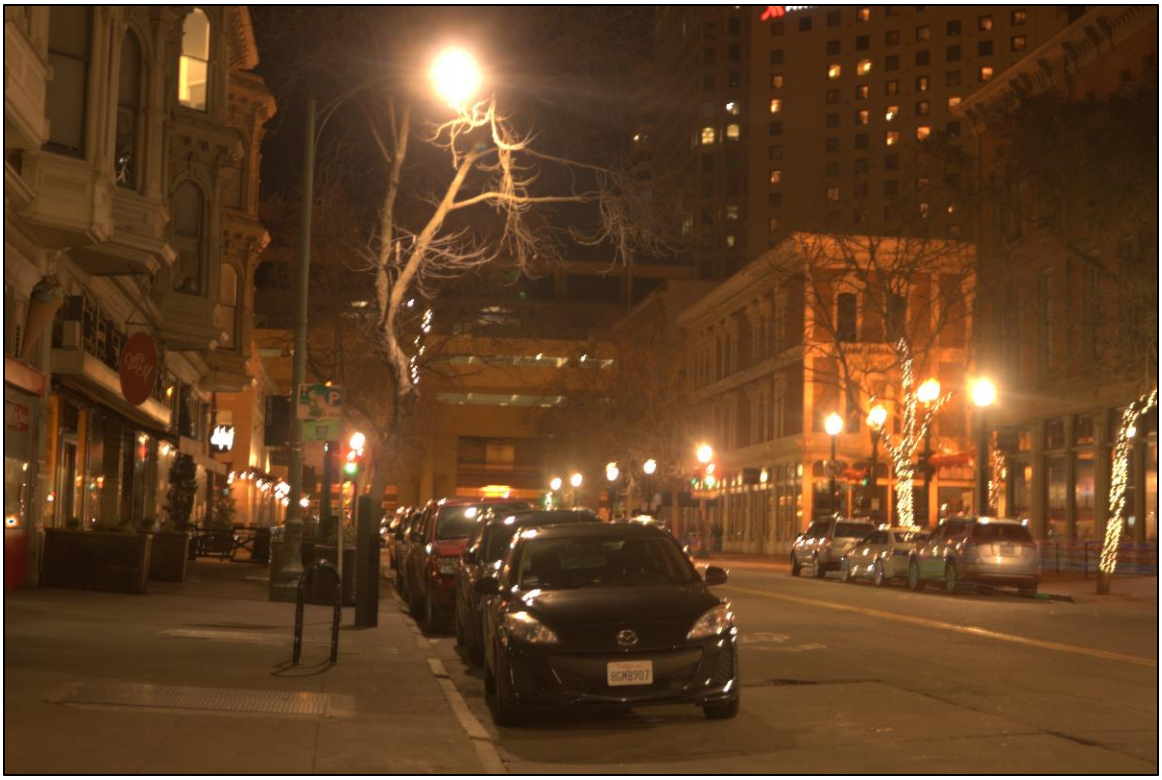


Figure 65: Receptor Site 7 Nighttime Calibrated HDR Image

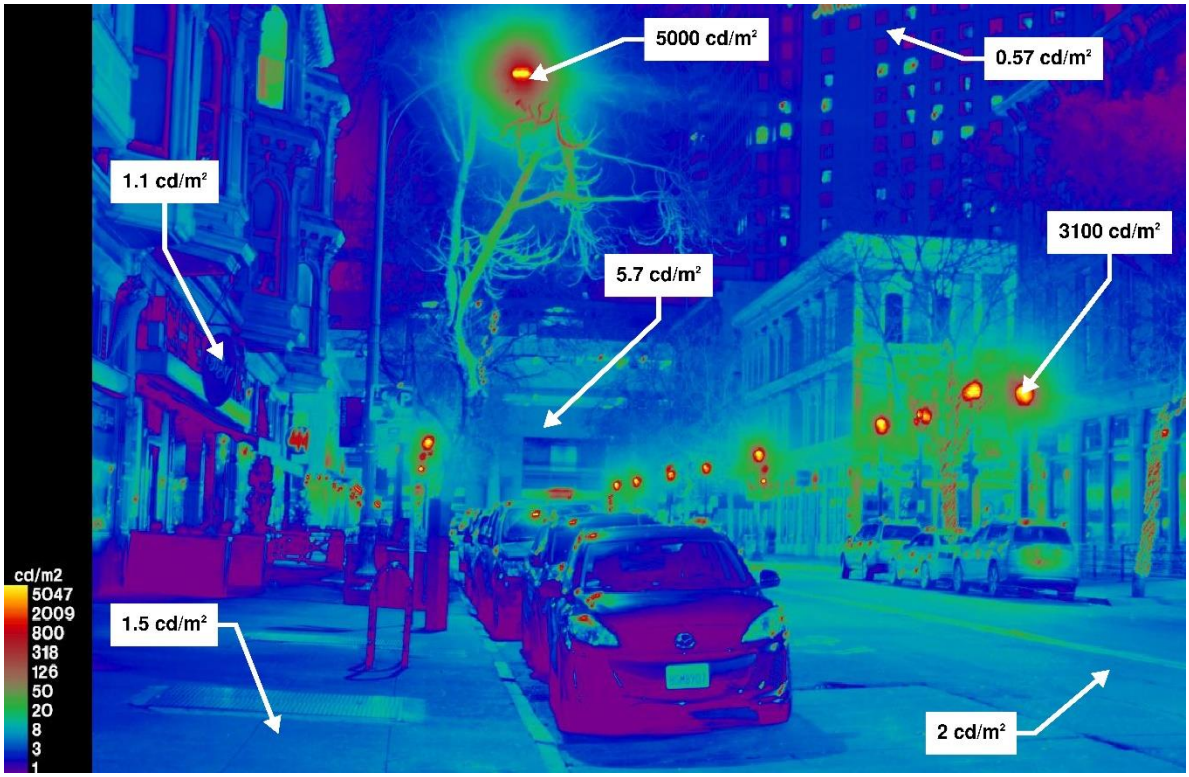


Figure 66: Receptor Site 7 Falsecolor Image

5.3.1.14 Receptor Site 7A – 8th at Washington (Facing Tower)

Table 17 provides the results of the spill light measurements for Receptor Site 7A, Figure 67 provides the daytime photo of the view from Receptor Site 7A to the proposed gondola station, Figure 68 provides the nighttime calibrated high dynamic range image of the view from Receptor Site 7A to the proposed gondola station location, and Figure 69 provides the falsecolor high dynamic range image of the view from Receptor Site 7A to the proposed gondola station location showing the measured luminance values. Note the luminance scale for each HDR image is unique and displayed on the left side of the image in units of cd/m^2.

Receptor Site 7A is located one block south of the proposed gondola station, and the primary field of view is the Washington Street corridor facing south. The calibrated images and falsecolor images show that the primary sources of brightness in the field of view is the roadway lighting poles. From this view, moderate luminance contrast is experienced.

	Vertical Illuminance, [lux]		
	Average	**Max**	**Min**
Receptor Site 7A - 8th at Washington (Facing Tower)	28.0	28.0	28.0

Table 17: Receptor Site 7A Existing Spill Light

Figure 67: Receptor Site 7A Daytime Photo

Figure 68: Receptor Site 7A Nighttime Calibrated HDR Image

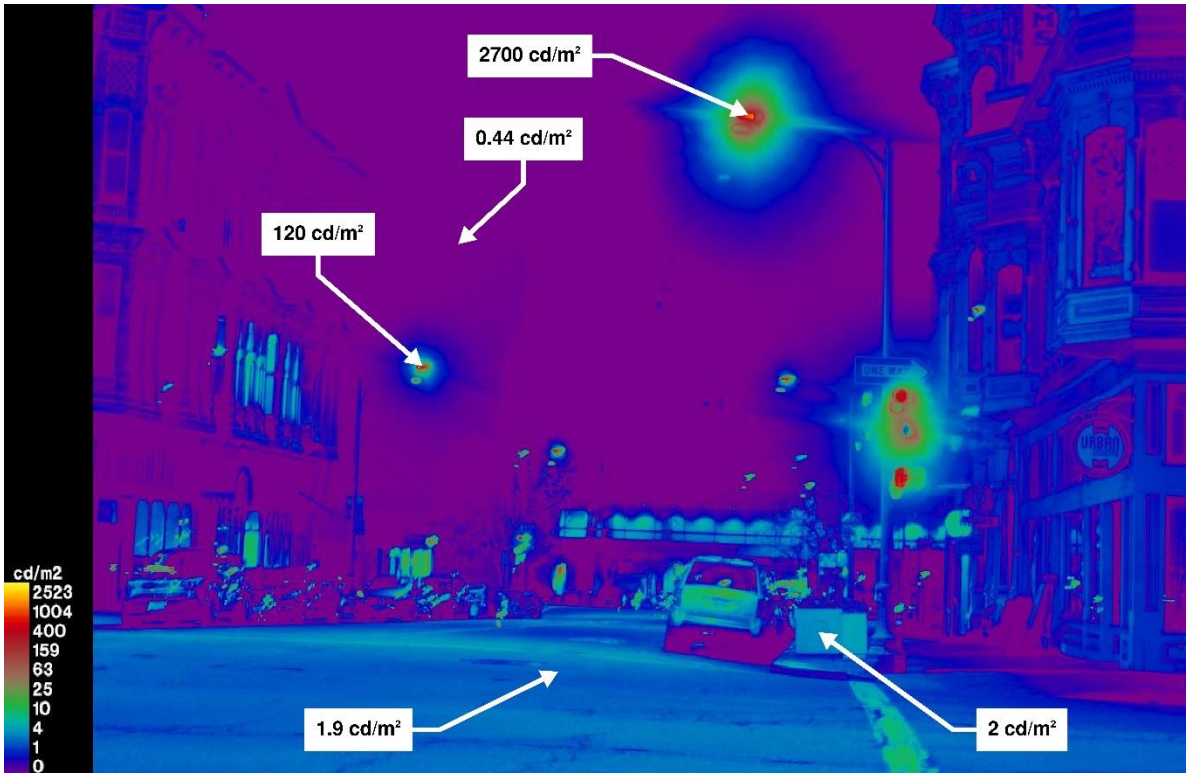


Figure 69: Receptor Site 7A Falsecolor Image

5.4 Sky Glow

The high development density within the Oakland area has created significant light pollution. In particular, the sky glow observed directly over the city is significant. Figure 70 shows an overlay of satellite data in the area, with the scale of brightness shown on the right. As is obvious, the entire Oakland area is currently significantly light polluted with a very bright sky that obscures all but the brightest celestial bodies. Figure 71 shows the existing measured radiance at the site, which is excess of 65e-9 W/cm^2*sr and considered extremely bright.

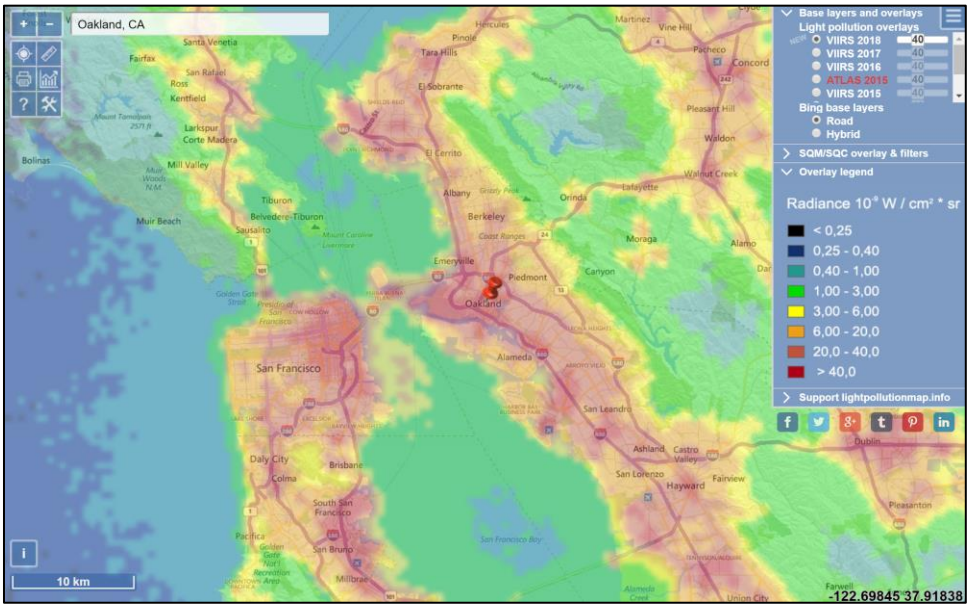


Figure 70: Existing light pollution in the SF bay area based on VIIRS 2018 data (source: https://www.lightpollutionmap.info)

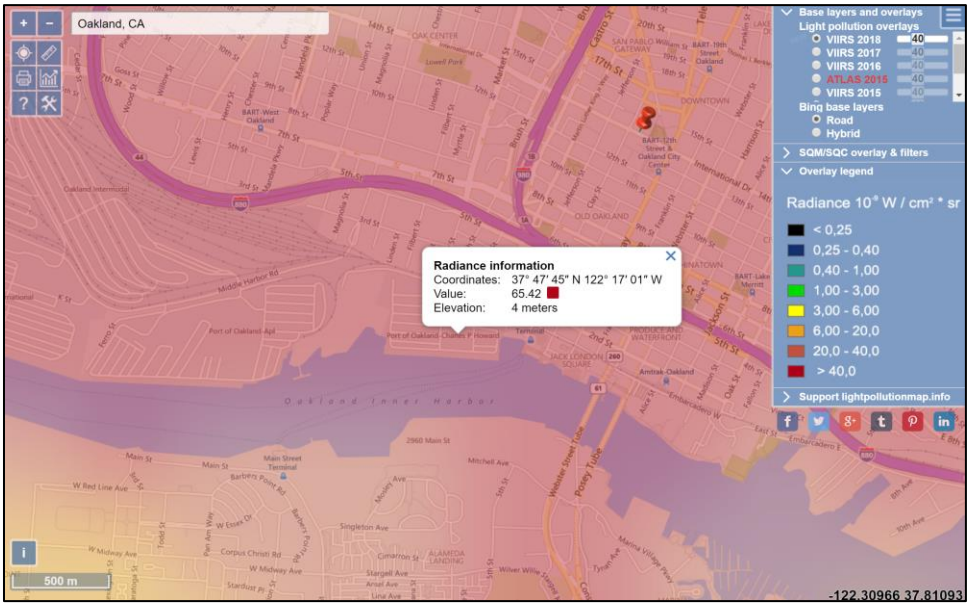


Figure 71: Existing light pollution at the project site based on VIIRS 2018 data (source: https://www.lightpollutionmap.info)

Figure 72 shows the existing zenith luminance measurements in the SF bay area and Figure 73 shows the zenith luminance at the project site. The night sky at the project site is currently a Bortle class 8 to 9 sky condition, where a class 9 sky is the most light polluted sky type observed with the Milky Way completely obscured, minimal other celestial bodies observable with the naked eye, and the entire sky background having a bright glow. Given the extremely bright sky conditions, it is unlikely that the project development will further depreciate the quality of the night sky.

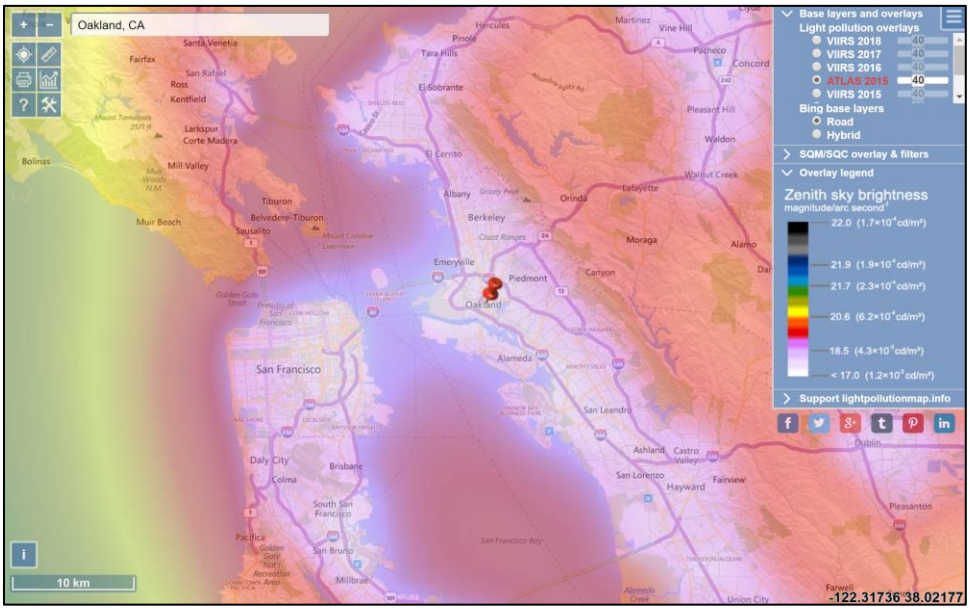


Figure 72: Existing zenith sky brightness in the SF bay area based on ATLAS 2015 data (source: https://www.lightpollutionmap.info)

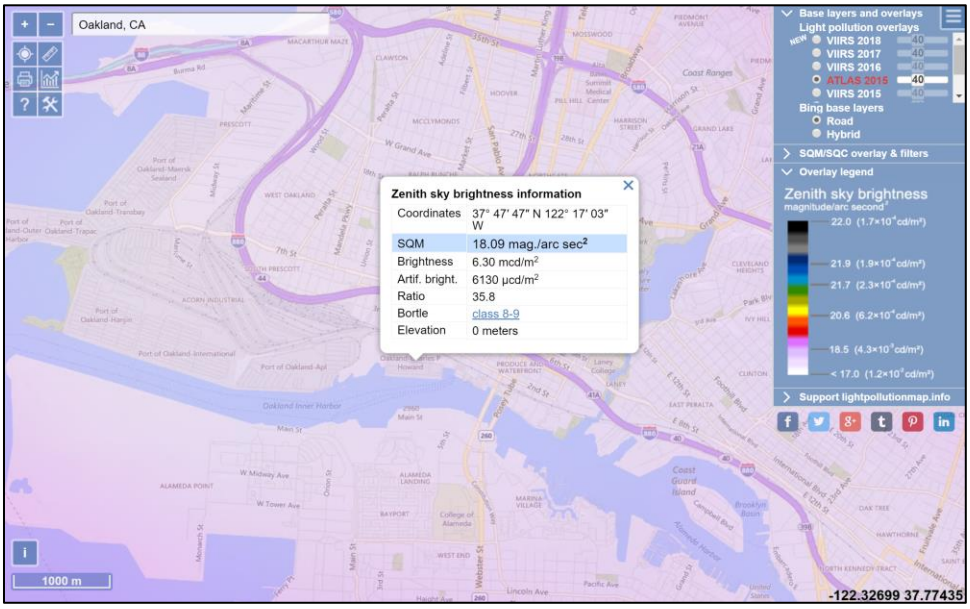


Figure 73: Existing zenith sky brightness at the project based on ATLAS 2015 data (source: https://www.lightpollutionmap.info)

6 Summary of Results

The intent of this technical assessment was to evaluate the existing lighting conditions surrounding the proposed project, and to determine through simulation and analysis if the proposed lighting will contribute to light spill or glare per the Oakland CEQA requirements. Given that the design is in conceptual design, the simulation and analysis of the proposed lighting was based on modeling the effect of light sources, rather than the sources themselves, with the exception of known preliminary sports/house lighting and known preliminary scoreboard/ribbon board locations. The fundamental geometry used for the assessment is preliminary massing and does not include any landscaping features, such as trees, that will likely reduce light spill and glare from pedestrian-level viewpoints. Details of the assessment of the Baseline project can be found in section 8 below and details of the assessment of the MRA project can be found in section 9 below.

6.1 Overview of Results

The results of the assessment indicate that the existing lighting conditions surrounding the project site are poor. The existing project site is not actively serving as a terminal, and therefore the lighting is not being maintained to a level that would be more characteristic of an active terminal. Despite the outages observed, the lighting on the site currently contributes to spill light and glare. The project site is in an area of extremely light-polluted night sky.

The proposed project is anticipated, based on the lighting masterplan, to include design features to minimize light trespass and light pollution, including the use of lower-scale luminaires and architecturally integrated lighting elements.

Refer to Section 6.2 below for analysis of the specific areas of concern, including the Turning Basin.

6.1.1 Spill Light Impact Summary

Table 18 provides a summary of the spill light results for the Baseline Project and Table 19 provides a summary of the spill light results for the MRA Project. Conditions where the spill light is anticipated to exceed the threshold are highlighted red. Existing spill light is also noted for each receptor site. The existing spill light recorded at each receptor site is also reported to provide context for the additional spill light anticipated.

As shown, Receptor Sites 1 is the only site anticipated to exceed the pre-curfew threshold of 25 lux during game nights. Inherently, this is due to a direct view of the scoreboard, ribbon boards, and field of play, and the close proximity of that points to the ballpark itself. Therefore, that particular receptor site exceeding threshold is intrinsically associated with the function of the ballpark and is not unexpected.

During Non-Game Pre-Curfew conditions, the pre-curfew threshold of 25 lux is not anticipated to be exceeded at any receptor site.

During Post-Curfew conditions, the post-curfew threshold of 5 lux is anticipated to be exceeded at Receptor Site 1A, which is facing the gondola station; the assumption is that the gondola station would not be subject to post-curfew dimming requirements due to safety, and thus the exceeded threshold is, in turn, not applicable. Additionally, during Post-Curfew conditions, the post-curfew threshold of 5 lux is also anticipated to be exceeded at Receptor Site 5A, which is in very close proximity to the adjacent mixed-use development located directly across the street. The exceedance of threshold at this location is minor and can be avoided with careful design considerations.

Receptor Site	Existing Spill Light, [lux]	BASELINE PROJECT									
		GAME NIGHTS						NON-GAME PRE-CURFEW		POST-CURFEW	
		Baseline Ballpark Height		Reduced Ballpark Height		Rotated Ballpark		Baseline Ballpark Height		Baseline Ballpark Height	
		Phase 1	Full Buildout	Phase 1	Full Buildout	Phase 1	Full Buildout	Phase 1	Full Buildout	Phase 1	Full Buildout
Receptor Site 1 - Water Street at Clay (Facing Ballpark)	6.0	41.4	41.8	41.2	41.8	42.0	42.6	9.3	9.4	3.6	3.7
Receptor Site 1A - Water Street at Washington (Facing Gondola)	7.3	6.2	6.2	6.2*	6.2*	6.2*	6.2*	6.3	6.2	6.2	6.2
Receptor Site 2 - Inner Harbor Turning Basin @ 190'	1.2	0.8	1.8	0.9	1.9	0.8	1.8	0.7	1.7	0.3	1.1
Receptor Site 2A - Turning Basin Line-of-Sight	5.7	0.2	0.5	0.2	0.5	0.2	0.5	0.2	0.5	0.1	0.4
Receptor Site 2B - Inner Harbor Turning Basin @ 64'	n/a	0.7	1.6	0.8	1.6	0.8	1.7	0.7	1.5	0.3	1.0
Receptor Site 2C - Inner Harbor Turning Basin @ 25'	n/a	0.6	1.5	0.6	1.5	0.7	1.5	0.6	1.5	0.3	1.0
Receptor Site 3 - Alameda Dock	1.1	2.9	3.2	3.4	3.6	3.1	3.4	0.5	0.7	0.3	0.4
Receptor Site 4 - MLK at Embarcadero	7.2	11.6	12.0	11.5	11.6	8.2	8.6	6.8	7.2	3.2	3.5
Receptor Site 5 - I880 Westbound	1.6	0.3	0.5	0.4	0.6	0.2	0.5	0.1	0.3	0.1	0.3
Receptor Site 5A - 2nd at Washington (Facing Ballpark)	2.1	7.0	7.4	7.4	7.8	7.2	7.6	7.0	7.2	5.6	5.8
Receptor Site 5B - 2nd at Washington (Facing JLS Station)	3.7	0.7	0.7	0.7*	0.7*	0.7*	0.7*	0.7	0.7	0.7	0.7
Receptor Site 5C - 2nd at Washington (Facing Convention Center Station)	3.2	0.1	0.1	0.1*	0.1*	0.1*	0.1*	0.0	0.1	0.0	0.1
Receptor Site 6 - I980 Ramp to Eastbound I880	1.2	2.2	2.7	2.3	2.6	1.1	1.6	0.6	1.0	0.4	0.9
Receptor Site 6A - 7th at Brush	5.1	0.3	0.5	0.5	0.6	0.3	0.5	0.2	0.3	0.2	0.3
Receptor Site 7 - 8th at Washington (Facing Convention Center Station)	15.4	0.1	0.1	0.1*	0.1*	0.1*	0.1*	0.1	0.1	0.1	0.1
Receptor Site 7A - 8th at Washington (Facing Tower)	28.0	0.0	0.0	0.0*	0.0*	0.0*	0.0*	0.0	0.0	0.0	0.0

*Anticipated values where points are facing away from the ballpark development and are uneffected by ballpark lighting conditions.

Table 18: Summary of spill light results for Baseline Project [Note: Threshold of significance is 25 lux for Game Nights and Non-Game Pre-Curfew, and 5 lux for Post-Curfew]

Receptor Site	Existing Spill Light, [lux]	MRA PROJECT									
		GAME NIGHTS						NON-GAME PRE-CURFEW		POST-CURFEW	
		Baseline Ballpark Height		Reduced Ballpark Height		Rotated Ballpark		Baseline Ballpark Height		Baseline Ballpark Height	
		Phase 1	Full Buildout	Phase 1	Full Buildout	Phase 1	Full Buildout	Phase 1	Full Buildout	Phase 1	Full Buildout
Receptor Site 1 - Water Street at Clay (Facing Ballpark)	6.0	41.5	41.8	41.4	41.9	42.0	42.6	9.2	9.6	3.6	3.7
Receptor Site 1A - Water Street at Washington (Facing Gondola)	7.3	6.2	6.2	6.2*	6.2*	6.2*	6.2*	6.5	6.1	6.2	6.1
Receptor Site 2 - Inner Harbor Turning Basin @ 190'	1.2	0.8	1.6	0.9	1.7	0.9	1.6	0.7	1.7	0.4	1.1
Receptor Site 2A - Turning Basin Line-of-Sight	5.7	0.2	0.5	0.2	0.5	0.3	0.5	0.2	0.6	0.1	0.4
Receptor Site 2B - Inner Harbor Turning Basin @ 64'	n/a	0.7	1.5	0.8	1.5	0.9	1.6	0.7	1.7	0.4	1.0
Receptor Site 2C - Inner Harbor Turning Basin @ 25'	n/a	0.7	1.4	0.7	1.4	0.8	1.5	0.7	1.6	0.4	1.0
Receptor Site 3 - Alameda Dock	1.1	3.0	3.2	3.4	3.5	3.1	3.3	0.5	0.8	0.3	0.4
Receptor Site 4 - MLK at Embarcadero	7.2	11.7	12.0	11.5	11.9	8.2	8.6	6.8	7.6	3.2	3.5
Receptor Site 5 - I880 Westbound	1.6	0.3	0.5	0.4	0.6	0.2	0.5	0.1	0.7	0.1	0.3
Receptor Site 5A - 2nd at Washington (Facing Ballpark)	2.1	7.1	7.4	7.4	7.8	7.2	7.6	7.0	7.5	5.6	5.8
Receptor Site 5B - 2nd at Washington (Facing JLS Station)	3.7	0.7	0.7	0.7*	0.7*	0.7*	0.7*	0.7	1.0	0.7	0.7
Receptor Site 5C - 2nd at Washington (Facing Convention Center Station)	3.2	0.1	0.1	0.1*	0.1*	0.1*	0.1*	0.0	0.4	0.0	0.1
Receptor Site 6 - I980 Ramp to Eastbound I880	1.2	2.3	2.8	2.3	2.8	1.1	1.6	0.6	1.7	0.4	0.9
Receptor Site 6A - 7th at Brush	5.1	0.3	0.5	0.5	0.6	0.3	0.5	0.2	0.6	0.2	0.3
Receptor Site 7 - 8th at Washington (Facing Convention Center Station)	15.4	0.1	0.1	0.1*	0.1*	0.1*	0.1*	0.1	0.1	0.1	0.1
Receptor Site 7A - 8th at Washington (Facing Tower)	28.0	0.0	0.0	0.0*	0.0*	0.0*	0.0*	0.0	0.2	0.0	0.0

*Anticipated values where points are facing away from the ballpark development and are uneffected by ballpark lighting conditions.

Table 19: Summary of spill light results for MRA Project [Note: Threshold of significance is 25 lux for Game Nights and Non-Game Pre-Curfew, and 5 lux for Post-Curfew]

6.1.2 Glare Impact Summary

Table 20 and Table 21 provide a summary of the glare results for façade lighting and Table 22 and Table 23 provide a summary of the glare results for signs. Conditions where the glare is anticipated to exceed the 25 cd/m^2 threshold for façade lighting and/or 1,000 cd/m^2 for signs are highlighted in red.

During game nights, as shown, the façade lighting for the adjacent mixed-use development buildings is only anticipated to exceed threshold under the potential lowered roof scenario, where the lighting for the field of play is shifted from the “halo” location to the infield poles. As described above, this geometry leads to larger amounts of light reflected from the ballpark roof back onto those facades, increasing the anticipated brightness above threshold when combined with the assumed applied architectural lighting.

As shown, receptor sites that are located in a position where they are likely to experience a direct view of the scoreboard and/or ribbon boards are anticipated to exceed the glare threshold for signs during

game nights. As stated previously in the spill light assessment, those particular receptor sites exceeding threshold is intrinsically associated with the function of the ballpark and is not unexpected.

No receptor sites are anticipated to exceed the glare threshold during all other non-game conditions, including both Pre-Curfew and Post-Curfew.

Receptor Site	Measured Existing Maximum Glare, [cd/m^2]	BASELINE PROJECT									
		GAME NIGHTS						NON-GAME PRE-CURFEW		POST-CURFEW	
		Baseline Ballpark Height		Reduced Ballpark Height		Rotated Ballpark		Baseline Ballpark Height		Baseline Ballpark Height	
		Phase 1	Full Buildout	Phase 1	Full Buildout	Phase 1	Full Buildout	Phase 1	Full Buildout	Phase 1	Full Buildout
Receptor Site 1 - Water Street at Clay (Facing Ballpark)	220	15.9	15.9	38.2	37.4	32.3	35.8	15.9	15.9	5.6	5.6
Receptor Site 1A - Water Street at Washington (Facing Gondola)	1,300	6.4	6.4	6.4*	6.4*	6.4*	6.4*	6.4	6.4	6.4	6.4
Receptor Site 2 - Inner Harbor Turning Basin @ 190'	56	15.9	15.9	15.9	15.9	15.9	15.9	15.9	15.9	5.6	5.6
Receptor Site 2A - Turning Basin Line-of-Sight	100	15.9	15.9	15.9	15.9	15.9	15.9	15.9	15.9	5.6	5.6
Receptor Site 2B - Inner Harbor Turning Basin @ 64'	n/a	15.9	15.9	15.9	15.9	15.9	15.9	15.9	15.9	5.6	5.6
Receptor Site 2C - Inner Harbor Turning Basin @ 25'	n/a	15.9	15.9	15.9	15.9	15.9	15.9	15.9	15.9	5.6	5.6
Receptor Site 3 - Alameda Dock	40	15.9	15.9	38.2	37.4	32.3	35.8	15.9	15.9	5.6	5.6
Receptor Site 4 - MLK at Embarcadero	1,100	15.9	15.9	15.9	15.9	15.9	15.9	15.9	15.9	5.6	5.6
Receptor Site 5 - I880 Westbound	n/a	15.9	15.9	38.2	37.4	32.3	35.8	15.9	15.9	5.6	5.6
Receptor Site 5A - 2nd at Washington (Facing Ballpark)	56	15.9	15.9	38.2	37.4	32.3	35.8	15.9	15.9	5.6	5.6
Receptor Site 5B - 2nd at Washington (Facing JLS Station)	160	6.4	6.4	6.4*	6.4*	6.4*	6.4*	6.4	6.4	6.4	6.4
Receptor Site 5C - 2nd at Washington (Facing Convention Center Station)	10	1.6	1.6	1.6*	1.6*	1.6*	1.6*	0.0	0.0	0.0	0.0
Receptor Site 6 - I980 Ramp to Eastbound I880	n/a	15.9	15.9	15.9	15.9	15.9	15.9	15.9	15.9	5.6	5.6
Receptor Site 6A - 7th at Brush	74	15.9	15.9	15.9	15.9	15.9	15.9	15.9	15.9	5.6	5.6
Receptor Site 7 - 8th at Washington (Facing Convention Center Station)	5,000	6.4	6.4	6.4*	6.4*	6.4*	6.4*	6.4	6.4	6.4	6.4
Receptor Site 7A - 8th at Washington (Facing Tower)	2,700	0.0	0.0	0.0*	0.0*	0.0*	0.0*	0.0	0.0	0.0	0.0

*Anticipated values where points are facing away from the ballpark development and are uneffected by ballpark lighting conditions.

Table 20: Summary of glare results for Façade Lighting for the Baseline Project [Note: Threshold of significance is 25 cd/m^2 for façade lighting]

Receptor Site	Measured Existing Maximum Glare, [cd/m^2]	MRA PROJECT									
		GAME NIGHTS						NON-GAME PRE-CURFEW		POST-CURFEW	
		Baseline Ballpark Height		Reduced Ballpark Height		Rotated Ballpark		Baseline Ballpark Height		Baseline Ballpark Height	
		Phase 1	Full Buildout	Phase 1	Full Buildout	Phase 1	Full Buildout	Phase 1	Full Buildout	Phase 1	Full Buildout
Receptor Site 1 - Water Street at Clay (Facing Ballpark)	220	15.9	15.9	37.9	39.0	31.8	33.0	15.9	15.9	5.6	5.6
Receptor Site 1A - Water Street at Washington (Facing Gondola)	1,300	6.4	6.4	6.4*	6.4*	6.4*	6.4*	6.4	6.4	6.4	6.4
Receptor Site 2 - Inner Harbor Turning Basin @ 190'	56	15.9	15.9	15.9	15.9	15.9	15.9	15.9	15.9	5.6	5.6
Receptor Site 2A - Turning Basin Line-of-Sight	100	15.9	15.9	15.9	15.9	15.9	15.9	15.9	15.9	5.6	5.6
Receptor Site 2B - Inner Harbor Turning Basin @ 64'	n/a	15.9	15.9	15.9	15.9	15.9	15.9	15.9	15.9	5.6	5.6
Receptor Site 2C - Inner Harbor Turning Basin @ 25'	n/a	15.9	15.9	15.9	15.9	15.9	15.9	15.9	15.9	5.6	5.6
Receptor Site 3 - Alameda Dock	40	15.9	15.9	37.9	39.0	31.8	33.0	15.9	15.9	5.6	5.6
Receptor Site 4 - MLK at Embarcadero	1,100	15.9	15.9	15.9	15.9	15.9	15.9	15.9	15.9	5.6	5.6
Receptor Site 5 - I880 Westbound	n/a	15.9	15.9	37.9	39.0	31.8	33.0	15.9	15.9	5.6	5.6
Receptor Site 5A - 2nd at Washington (Facing Ballpark)	56	15.9	15.9	37.9	39.0	31.8	33.0	15.9	15.9	5.6	5.6
Receptor Site 5B - 2nd at Washington (Facing JLS Station)	160	6.4	6.4	6.4*	6.4*	6.4*	6.4*	6.4	6.4	6.4	6.4
Receptor Site 5C - 2nd at Washington (Facing Convention Center Station)	10	1.6	1.6	1.6*	1.6*	1.6*	1.6*	0.0	0.0	0.0	0.0
Receptor Site 6 - I980 Ramp to Eastbound I880	n/a	15.9	15.9	15.9	15.9	15.9	15.9	15.9	15.9	5.6	5.6
Receptor Site 6A - 7th at Brush	74	15.9	15.9	15.9	15.9	15.9	15.9	15.9	15.9	5.6	5.6
Receptor Site 7 - 8th at Washington (Facing Convention Center Station)	5,000	6.4	6.4	6.4*	6.4*	6.4*	6.4*	6.4	6.4	6.4	6.4
Receptor Site 7A - 8th at Washington (Facing Tower)	2,700	0.0	0.0	0.0*	0.0*	0.0*	0.0*	0.0	0.0	0.0	0.0

*Anticipated values where points are facing away from the ballpark development and are uneffected by ballpark lighting conditions.

Table 21: Summary of glare results for Façade Lighting for the MRA Project [Note: Threshold of significance is 25 cd/m^2 for façade lighting]

Receptor Site	Measured Existing Maximum Glare, [cd/m^2]	BASELINE PROJECT									
		GAME NIGHTS						NON-GAME PRE-CURFEW		POST-CURFEW	
		Baseline Ballpark Height		Reduced Ballpark Height		Rotated Ballpark		Baseline Ballpark Height		Baseline Ballpark Height	
		Phase 1	Full Buildout	Phase 1	Full Buildout	Phase 1	Full Buildout	Phase 1	Full Buildout	Phase 1	Full Buildout
Receptor Site 1 - Water Street at Clay (Facing Ballpark)	220	3,500	3,500	3,500	3,500	3,500	3,500	n/a	n/a	n/a	n/a
Receptor Site 1A - Water Street at Washington (Facing Gondola)	1,300	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Receptor Site 2 - Inner Harbor Turning Basin @ 190'	56	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Receptor Site 2A - Turning Basin Line-of-Sight	100	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Receptor Site 2B - Inner Harbor Turning Basin @ 64'	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Receptor Site 2C - Inner Harbor Turning Basin @ 25'	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Receptor Site 3 - Alameda Dock	40	3,500	3,500	3,500	3,500	3,500	3,500	n/a	n/a	n/a	n/a
Receptor Site 4 - MLK at Embarcadero	1,100	3,500	3,500	3,500	3,500	n/a	n/a	n/a	n/a	n/a	n/a
Receptor Site 5 - I880 Westbound	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Receptor Site 5A - 2nd at Washington (Facing Ballpark)	56	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Receptor Site 5B - 2nd at Washington (Facing JLS Station)	160	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Receptor Site 5C - 2nd at Washington (Facing Convention Center Station)	10	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Receptor Site 6 - I980 Ramp to Eastbound I880	n/a	3,500	3,500	3,500	3,500	n/a	n/a	n/a	n/a	n/a	n/a
Receptor Site 6A - 7th at Brush	74	3,500	3,500	3,500	3,500	n/a	n/a	n/a	n/a	n/a	n/a
Receptor Site 7 - 8th at Washington (Facing Convention Center Station)	5,000	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Receptor Site 7A - 8th at Washington (Facing Tower)	2,700	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a

Table 22: Summary of glare results for Signage for the Baseline Project [Note: Threshold of significance is 1,000 cd/m^2 for signage. “n/a” indicates receptor sites that do not have a direct view of the signage]

Receptor Site	Measured Existing Maximum Glare, [cd/m^2]	MRA PROJECT									
		GAME NIGHTS						NON-GAME PRE-CURFEW		POST-CURFEW	
		Baseline Ballpark Height		Reduced Ballpark Height		Rotated Ballpark		Baseline Ballpark Height		Baseline Ballpark Height	
		Phase 1	Full Buildout	Phase 1	Full Buildout	Phase 1	Full Buildout	Phase 1	Full Buildout	Phase 1	Full Buildout
Receptor Site 1 - Water Street at Clay (Facing Ballpark)	220	3,500	3,500	3,500	3,500	3,500	3,500	n/a	n/a	n/a	n/a
Receptor Site 1A - Water Street at Washington (Facing Gondola)	1,300	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Receptor Site 2 - Inner Harbor Turning Basin @ 190'	56	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Receptor Site 2A - Turning Basin Line-of-Sight	100	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Receptor Site 2B - Inner Harbor Turning Basin @ 64'	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Receptor Site 2C - Inner Harbor Turning Basin @ 25'	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Receptor Site 3 - Alameda Dock	40	3,500	3,500	3,500	3,500	3,500	3,500	n/a	n/a	n/a	n/a
Receptor Site 4 - MLK at Embarcadero	1,100	3,500	3,500	3,500	3,500	n/a	n/a	n/a	n/a	n/a	n/a
Receptor Site 5 - I880 Westbound	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Receptor Site 5A - 2nd at Washington (Facing Ballpark)	56	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Receptor Site 5B - 2nd at Washington (Facing JLS Station)	160	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Receptor Site 5C - 2nd at Washington (Facing Convention Center Station)	10	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Receptor Site 6 - I980 Ramp to Eastbound I880	n/a	3,500	3,500	3,500	3,500	n/a	n/a	n/a	n/a	n/a	n/a
Receptor Site 6A - 7th at Brush	74	3,500	3,500	3,500	3,500	n/a	n/a	n/a	n/a	n/a	n/a
Receptor Site 7 - 8th at Washington (Facing Convention Center Station)	5,000	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Receptor Site 7A - 8th at Washington (Facing Tower)	2,700	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a

Table 23: Summary of glare results for Signage for the MRA Project [Note: Threshold of significance is 1,000 cd/m^2 for signage. “n/a” indicates receptor sites that do not have a direct view of the signage]

Table 24 provides a summary of the glare results for sports lighting. Cells labeled as “n/a” indicate receptor sites which do not have a direct view of the sports lighting. As shown, based on the geometry of the ballpark with respect to the receptor site locations, no location with a view of the sports lighting is anticipated to exceed threshold. Post-curfew analysis was not performed because the sports lighting will not be “on” post-curfew.

Receptor Site	Maximum Sports Lighting Intensity in Direction of Receptor Site, [cd]]		
	High Roof Condition	Low Roof Condition	Rotated Ballpark
Receptor Site 1 - Water Street at Clay (Facing Ballpark)	5,383	7,165	6,631
Receptor Site 1A - Water Street at Washington (Facing Gondola)	n/a	n/a	n/a
Receptor Site 2 - Inner Harbor Turning Basin @ 190'	2,700	2,700	2,551
Receptor Site 2A - Turning Basin Line-of-Sight	n/a	3,785	3,761
Receptor Site 2B - Inner Harbor Turning Basin @ 64'	n/a	3,787	3,800
Receptor Site 2C - Inner Harbor Turning Basin @ 25'	n/a	4,281	4,186
Receptor Site 3 - Alameda Dock	3,986	4,868	4,413
Receptor Site 4 - MLK at Embarcadero	6,557	8,951	7,909
Receptor Site 5 - I880 Westbound	3,650	4,474	4,333
Receptor Site 5A - 2nd at Washington (Facing Ballpark)	n/a	n/a	n/a
Receptor Site 5B - 2nd at Washington (Facing JLS Station)	n/a	n/a	n/a
Receptor Site 5C - 2nd at Washington (Facing Convention Center Station)	n/a	n/a	n/a
Receptor Site 6 - I980 Ramp to Eastbound I880	3,704	4,754	3,958
Receptor Site 6A - 7th at Brush	3,752	4,503	3,960
Receptor Site 7 - 8th at Washington (Facing Convention Center Station)	n/a	n/a	n/a
Receptor Site 7A - 8th at Washington (Facing Tower)	n/a	n/a	n/a

Table 24: Summary of glare results from Sports Lighting [Note: Threshold of significance is 25,000 cd for sports lighting. “n/a” indicates receptor sites that do not have a direct view of the sports lighting]

6.1.3 Baseline Ballpark

The analysis of the baseline geometry for both the “Phase 1” and “Full Buildout” scenarios showed that the Game Night lighting is anticipated to have an impact on both light spill and glare due to the open nature of the ballpark. However, due to the thoughtful and intentional orientation of the ballpark, and the relative geometry between the field lighting locations and the ballpark, direct view of the sports lighting is minimized when viewed from the estuary and from the turning basin in particular. For non-game evenings during pre-curfew hours and post-curfew hours, which account for 93% of the annual nighttime hours, the lighting is not anticipated to impact light spill or glare.

6.1.4 Reduced Ballpark Height Design Option

The analysis of the building height design option for both the “Phase 1” and “Full Buildout” scenarios demonstrated increased light spill and glare potential due to the use of pole-mounted infield lighting, which is more exposed than the “halo” lighting assumed in the baseline geometry. To identify the potential impact of the any change in height of the ballpark on the lighting impact of the project, the change in spill light and glare between the Baseline Ballpark Height and Reduced Ballpark Height was reviewed. Table 25 shows that, as a percentage of the spill light threshold, a change in the ballpark height on the influence of architectural lighting on the anticipated spill light is no greater than 4% except at Receptor Site 1 as indicated, indicating that additional minor changes to ballpark height as the design is refined is unlikely to significantly impact spill light results.

Receptor Site	Difference Between Spill Light from Architectural Light Only, [lux]	Difference as a Percentage of Signficance
Receptor Site 1 - Water Street at Clay (Facing Ballpark)	3.5	14.0%
Receptor Site 2 - Inner Harbor Turning Basin @ 190'	0.1	0.4%
Receptor Site 2A - Turning Basin Line-of-Sight	0.0	0.0%
Receptor Site 2B - Inner Harbor Turning Basin @ 64'	0.1	0.4%
Receptor Site 2C - Inner Harbor Turning Basin @ 25'	0.0	0.0%
Receptor Site 3 - Alameda Dock	0.0	0.0%
Receptor Site 4 - MLK at Embarcadero	0.0	0.0%
Receptor Site 5 - I880 Westbound	0.0	0.0%
Receptor Site 5A - 2nd at Washington (Facing Ballpark)	0.1	0.2%
Receptor Site 6 - I980 Ramp to Eastbound I880	1.0	4.0%
Receptor Site 6A - 7th at Brush	0.0	0.0%

Table 25: Ballpark height sensitivity analysis as a percentage of the pre-curfew threshold of significance

Furthermore, from a glare analysis, any changes in geometry which causes the “halo” lighting configuration to become non-viable and requiring the infield lighting to be pole-mounted is anticipated to cause façade luminances to exceed threshold, as discussed in section 6.1.2 above.

6.1.5 Rotated Ballpark Design Option

The analysis of the rotated ballpark design option for both the “Phase 1” and “Full Buildout” scenarios, for both the “Baseline” and “MRA” projects is consistent with the Reduced Ballpark design option indicating that the orientation of the opening has minimal impact. To quantify the potential effect of the rotation of the ballpark on the lighting effect of the project the change in spill light and glare between

the Reduced Ballpark Height design option and Rotated Ballpark design option was reviewed. Table 26 shows that, as a percentage of the spill light threshold, a change in the ballpark orientation on the anticipated spill light is no greater than 5% except at Receptor Site 1 as indicated, demonstrating that any additional minor changes in ballpark orientation as the design is refined is unlikely to significantly affect spill light results.

Receptor Site	Difference Between Spill Light from Architectural Light Only, [lux]	Difference as a Percentage of Signficance
Receptor Site 1 - Water Street at Clay (Facing Ballpark)	3.0	12.0%
Receptor Site 2 - Inner Harbor Turning Basin @ 190'	0.5	2.0%
Receptor Site 2A - Turning Basin Line-of-Sight	0.4	1.6%
Receptor Site 2B - Inner Harbor Turning Basin @ 64'	0.0	0.0%
Receptor Site 2C - Inner Harbor Turning Basin @ 25'	0.0	0.0%
Receptor Site 3 - Alameda Dock	0.3	1.2%
Receptor Site 4 - MLK at Embarcadero	1.2	4.8%
Receptor Site 5 - I880 Westbound	0.1	0.4%
Receptor Site 5A - 2nd at Washington (Facing Ballpark)	0.0	0.1%
Receptor Site 6 - I980 Ramp to Eastbound I880	0.8	3.2%
Receptor Site 6A - 7th at Brush	0.0	0.0%

Table 26: Ballpark orientation sensitivity analysis as a percentage of the pre-curfew threshold of significance

6.1.6 Gondola Variant

The gondola variant was included in the baseline geometry for full assessment. As shown, during pre-curfew conditions (Game Night and Non-Game Night Pre-Curfew), the gondola lighting is not anticipated to impact spill light or glare. During Post-Curfew conditions, it has been assumed that light levels would not be reduced to address potential safety concerns; therefore, the lighting is anticipated to exceed the spill light threshold while complying with the glare threshold. The geometry modeled for the stations, though, is extremely simplified (two floating planes as a platform and ceiling), and therefore true spill light based on refined geometry is likely to change from the modeled spill light.

6.2 Specific Areas of Concern

6.2.1 Impact on Turning Basin (Receptor Site 2, 2B and 2C)

The impact on the turning basin in the estuary has been identified as a specific area of concern. In particular, concerns have been raised about the brightness of the sports lighting equipment and about the overall increase in ambient lighting. Receptor Sites 2, 2B, and 2C were established at the center of the turning basin at heights of 190', 64', and 25' above the water [per ESA email dated 20 September 2019]. The height of Receptor Site 2 was established as the typical eye height on the bridge of the largest container ships in the turning basin, Receptor Site 2B as the typical eye height on the bridge of the smallest container ships, and Receptor Site 2C as the typical eye height on a tug.

Based on a geometric assessment as shown in Figure 74, Figure 75, and Figure 76, it is clear that the baseline geometry results in a situation where the building itself blocks a direct view of the outfield pole

at Receptor Site 2B and 2C for the baseline ballpark geometry. For the baseline ballpark geometry, Receptor Site 2 does have a direct view of the outfield pole structures, and for the reduced ballpark height geometry and rotated ballpark geometry, all three turning basin receptor sites will have a direct view of the outfield pole structures

Comparing these geometries to the spill light results shown in Table 18, it is evident that the sports lighting is anticipated to have minimal impact on spill light. For the Baseline project, Receptor Site 2 is estimated to receive only 0.1 lux from the sports lighting and digital signage combined, and Receptor Sites 2B and 2C are unaffected.

The beam spread for the sports lighting fixtures is very tight due to the long throw distances and high brightness required on the field of play. As a point of view gets further from the center of the beam, the glare caused by intensity of light drops precipitously. Based on the worst-case scenario of fixtures (the brightest anticipated to be used without any external shielding and aimed at the MLB-established maximum tilt angle of 40°) the glare experience at Receptor Site 2 is anticipated to be only 0.4% of the brightness experienced when looking into the fixtures from the field, 1.2% at Receptor Site 2B, and 1.3% at Receptor Site 2C.

When considering the impact of sports lighting on the neighboring activities, evaluation of the potential for Disability Glare is important. Disability Glare is functionally defined as a reduction in the ability to see caused by bright light sources. In common situations of navigation, such as driving, Disability Glare can occur when a task (e.g. seeing an object in the road) is made more difficult or impossible due to the brightness of a light source (e.g. high-beam headlights) occurring in the field of view but offset from the primary visual task. This off-axis light source reduces contrast which reduces visual acuity. In roadway lighting, Disability Glare is evaluated through calculation of the Veiling Luminance caused by a lighting configuration with respect to driver position and direction of view. The Veiling Luminance potential of the sports lighting fixtures was evaluated at the three receptor sites located within the turning basin to determine the potential Disability Glare experienced at those locations due to the sports lighting alone. The results of that analysis are shown in Table 27. For this analysis, the direction of view was assumed to be from the receptor site to the edge of the turning basin along the property line in the direction of the ballpark.

Receptor Site	Veiling Luminance, [cd/m^2]		
	High Roof	Low Roof	Rotated Ballpark
Receptor Site 2 - Inner Harbor Turning Basin @ 190'	0.018	0.054	0.126
Receptor Site 2B - Inner Harbor Turning Basin @ 64'	n/a	0.069	0.069
Receptor Site 2C - Inner Harbor Turning Basin @ 25'	n/a	0.000	0.000

Table 27: Summary of Veiling Luminance anticipated at the Turning Basin Receptor Sites [Note: RE-8-2018 threshold is 0.24 cd/m^2]

ANSI/IES RP-8-2018 provides recommended upper limits in Table 11-1 of the standard for various street types. The majority of the streets bounding the site for the proposed project would be considered 'Local' streets with 'High' Pedestrian Activity, resulting a maximum recommended Veiling Luminance of 0.24 cd/m^2, which is the maximum Veiling Luminance that would be considered acceptable to navigate on that street type without causing Disability Glare. As shown, the Veiling Luminance anticipated from

the entire sports lighting assembly for both the High Roof and Low Roof configurations is not anticipated to exceed the threshold for a 'Local' street with 'High' pedestrian activity at any of the receptor sites, noting that receptor sites 2B and 2C are not anticipated to have a direct view of the sports lighting fixtures in the High Roof configuration.

Additionally, the potential glare from the sports lighting fixtures in the high roof, low roof, and rotated conditions were compared to the glare from the existing high-mast lighting to assess the glare potential per the limits established in CEN EN 12193:2007 as described in Section 2.2.3 above. The photometric file of the existing 1,000W HID fixtures was obtained based on the manufacturer and part number provided by the Port of Oakland via email on 10 December 2019; the photometric report is included in APPENDIX C – EXISTING LIGHTING PHOTOMETRIC REPORT. Based on the observed location of the poles on the existing site per Google Maps and the relationship of the pole location to the Receptor Sites, the intensity in those directions was determined as shown in Table 28. In the low roof and rotated conditions, the brightness of the sports light fixtures from Receptor Site 2C is approximately equal to the current fixture brightness and Receptor Site 2B it is approximately double. Both existing and proposed luminaire intensity is anticipated to be significantly below the threshold of 25,000 cd per CEN EN 12193:2007.

Receptor Site	Intentsity, [cd]			Maximum Intensity of Existing Howard Terminal Lighting in Direction of Receptor Site, [cd]
	High Roof	Low Roof	Rotated Ballpark	
Receptor Site 2 - Inner Harbor Turning Basin @ 190'	2,700	2,700	2,551	(above fixtures - n/a)
Receptor Site 2B - Inner Harbor Turning Basin @ 64'	n/a	3,787	3,800	1,839
Receptor Site 2C - Inner Harbor Turning Basin @ 25'	n/a	4,281	4,186	4,235

Table 28: Summary of Glare Results from Sports Lighting compared to current conditions [Note: Threshold of significance is 25,000 cd for sports lighting per CEN EN 12193:2007]

The potential glare from the sports lighting fixtures in both the high roof and low roof conditions were also compared to glare limitations included in IES RP-37-15 "Outdoor Lighting for Airport Environments". In Paragraph 4.2.4.1 of that standard, the recommended maximum luminaire intensity in the direction of a pilot moving on the airfield is 25,000 cd, aligning with the limitations in CEN EN 12193:2007 and well above both the existing and anticipated maximum luminaire intensity from the sports lighting fixtures per Table 28.

In summary, the anticipated glare at the turning basin receptor sites from the proposed sports lighting in the baseline, reduced height, and rotated ballpark design options is not anticipated to exceed recommended limits per available glare standards (Disability Glare/Veiling Luminance per IES RP-8-18, maximum luminaire intensity in the direction of sensitive sites per EN 12193:2007, and maximum luminaire intensity of airfield luminaires in the direction of pilots of moving aircraft per IES RP-37-15).

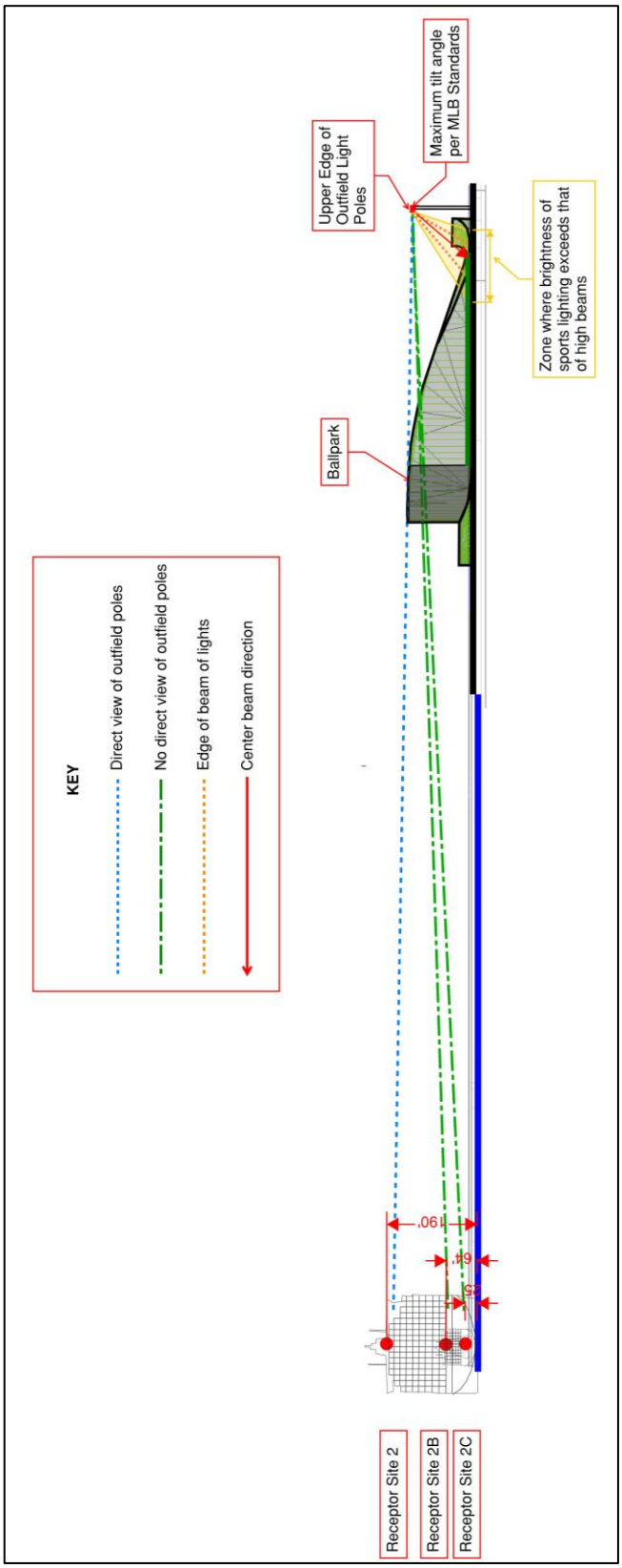


Figure 74: Section through turning basin receptor sites and ballpark showing relationship to the outfield lighting poles for the baseline ballpark geometry

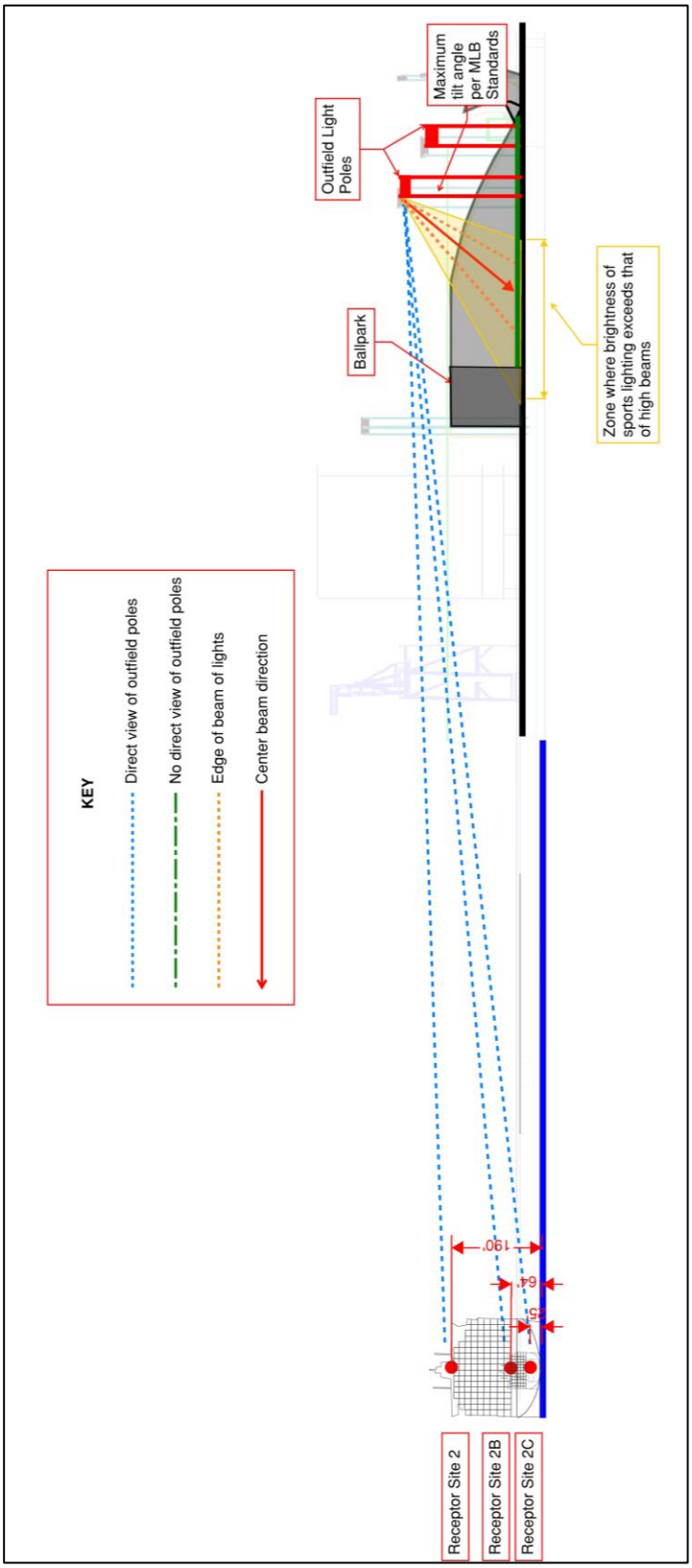


Figure 75: Section through turning basin receptor sites and ballpark showing relationship to the outfield lighting poles for the reduced height ballpark geometry

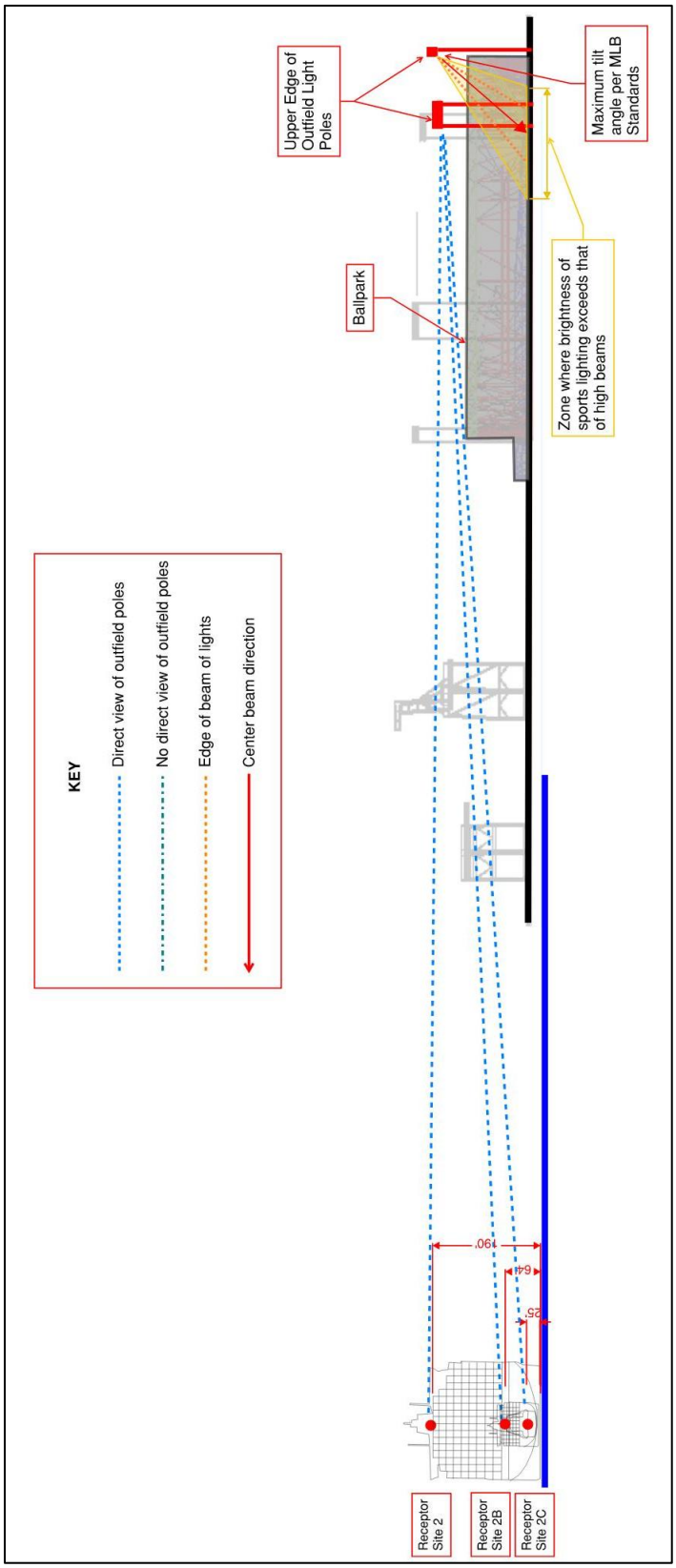


Figure 76: Section through turning basin receptor sites and ballpark showing relationship to the outfield lighting poles for the rotated ballpark geometry

6.2.2 Additional Measurement Sites

In addition to the measurements made for Receptor Site 2, a series of three additional measurements were gathered during the Turning Basin site visit on September 30th, 2019. Figure 77 diagrams the location of the three additional measurement points assessed during the site visit. Point A provided a view of the active terminal site at the mouth of the estuary. Point B provided a view of the active terminal site from within the estuary, and Point C provided a view of Howard Terminal from east of the turning basin site.

As noted above, the existing lighting at Howard Terminal is not at the level required for an active port site due to its current function. Therefore, while the spill light and glare measurements from the turning basin to Howard Terminal help to quantify the current visual experience, they do not reflect the visual experience that would have been likely when Howard Terminal was active. Two of the additional measurement points allow for a comparison of lighting conditions for an active terminal vs an inactive terminal site.

Figure 77: Additional turning basin measurement points

Table 29 provides the spill light measurements recorded at the three additional measurement sites. As shown, the existing spill light at Point A in at the approach to the estuary is minimal. The existing spill light at Point C is very close to that measured at Receptor Site 2, as shown in Table 6 above. The existing spill light at Point B, which faces the active terminal site, is higher which is consistent with the observation that more of the luminaires on the active site were operational.

	Vertical Illuminance, [lux]		
	Average	**Max**	**Min**
Point A - Estuary Approach	0.66	0.67	0.63
Point B - Active Terminal Site	2.2	2.2	2.0
Point C - Howard Terminal Site	1.3	1.4	1.1

Table 29: Existing spill light at additional turning basin measurement points

At each of the additional measurement points, HDR images were recorded to allow the assessment of the existing brightness of an active port site and of an alternate view of Howard Terminal. Figure 78 provides the calibrated HDR image for Point A and Figure 79 provides the associated falsecolor. As shown, the main source of brightness in the field of view is the high-mast pole lighting that serves as the primary light source for the terminal site. However, the majority of the field of view is dominated by the dark water area.

Figure 78: Point A Nighttime Calibrated HDR Image

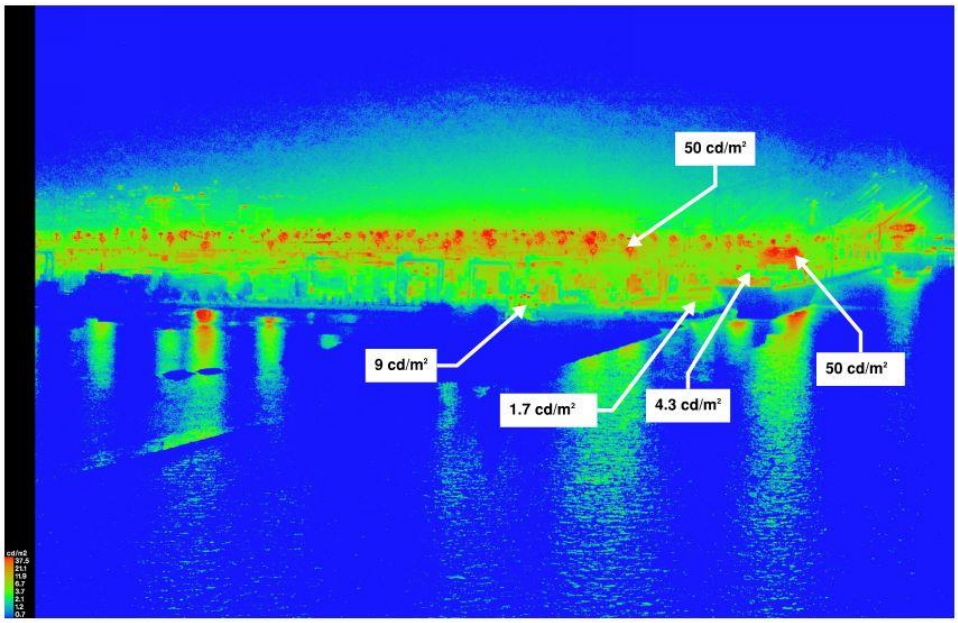


Figure 79: Point A Nighttime Falsecolor Image

Figure 80 provides the calibrated HDR image for Point B and Figure 81 provides the associated falsecolor. As shown, the active port site is considerably more populated with containers compared to Howard Terminal, causing more shadowing between the stacks of containers. At this close proximity to the unshielded pole-mounted fixtures, the brightness of the luminaires was measured to be extremely. High. Due to the light-colored finish of the ground surface, there is also reflected light which likely contributed to the higher spill light measured at this location as compared to the inactive Howard Terminal site.

Figure 80: Point B Nighttime Calibrated HDR Image

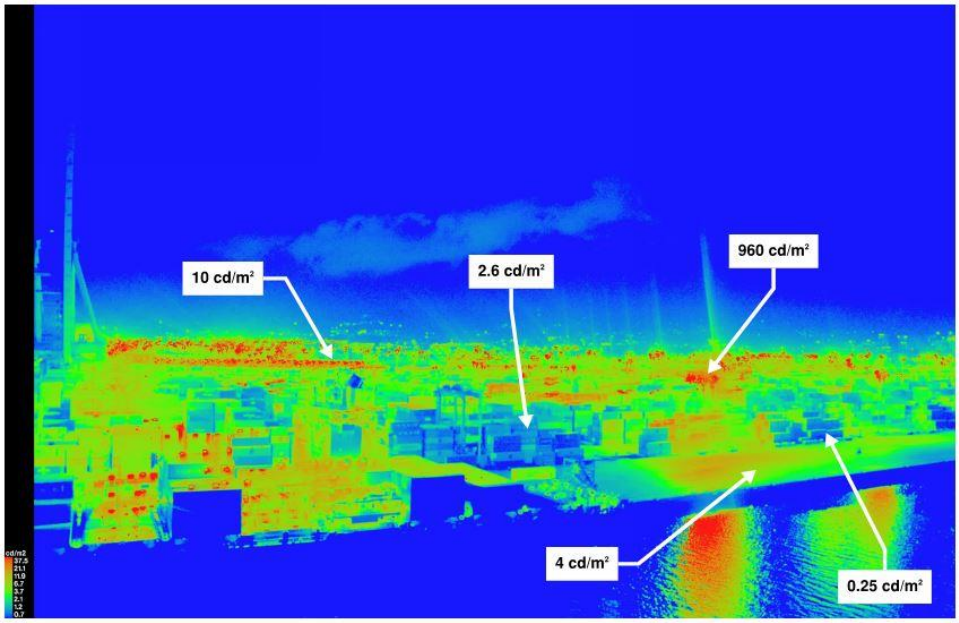


Figure 81: Point B Nighttime Falsecolor Image

Figure 82 provides the calibrated HDR image for Point C and Figure 83 provides the associated falsecolor. From this position, the primary view is the section of Howard Terminal that is more brightly lit. As shown, the existing visual scene is dominated by the very high brightness of the existing high-mast lights and perimeter floodlights. Similar to the observed condition at Point B, the light-colored finish of the ground surface creates large areas of brightness and likely contribute to the spill light measured at this location.

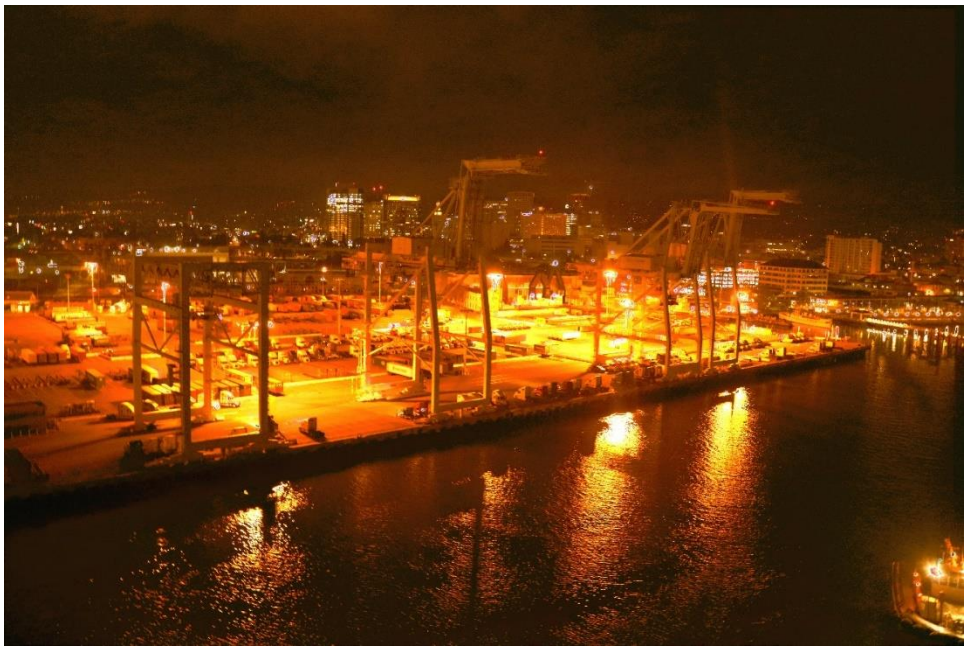


Figure 82: Point C Nighttime Calibrated HDR Image

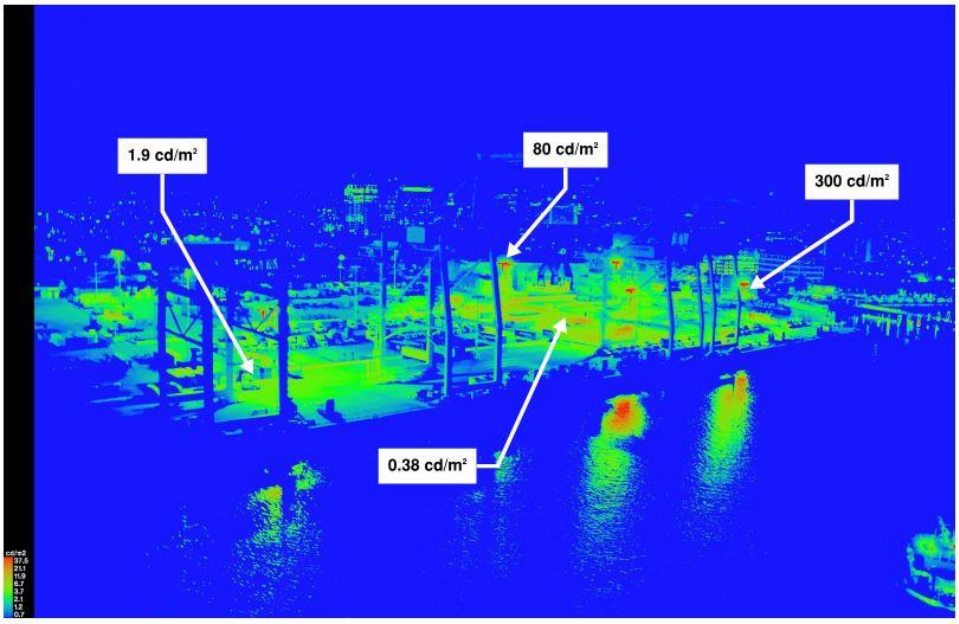


Figure 83: Point C Nighttime Falsecolor Image

6.2.3 Impact on Aviation

The impact on air traffic to and from Oakland International Airport has been identified as a specific area of concern.

Figure 84 shows the measured distance between the control tower and the project site to be approximately 6.9 miles. A that distance, and with the developments on Alameda between, it is highly unlikely that the lighting at the project will significantly impact control tower operations.

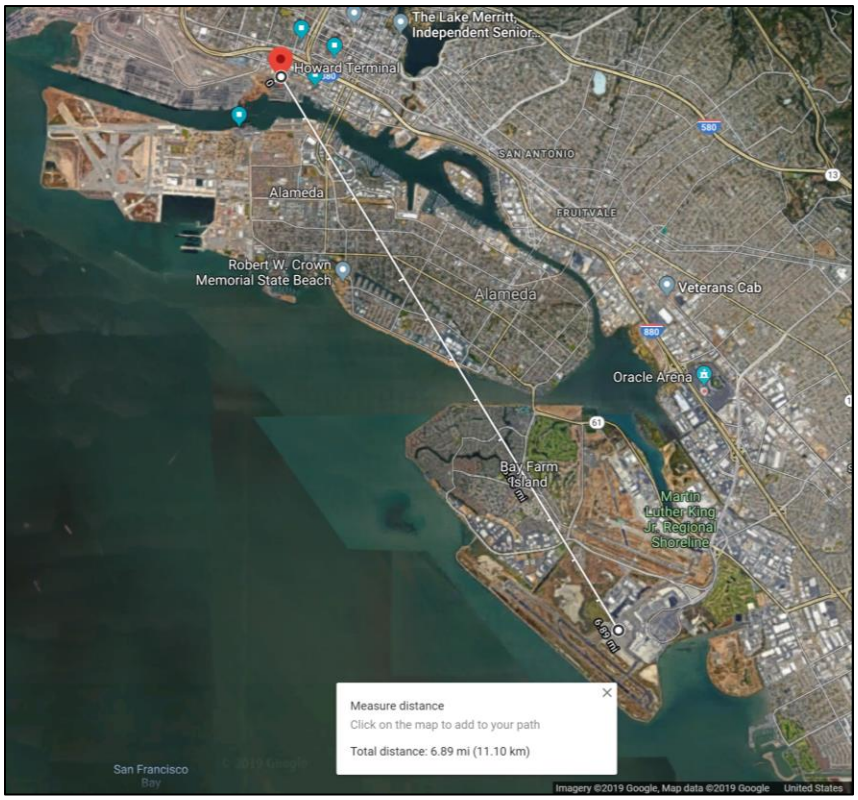


Figure 84: Distance between project site and Oakland International Airport control tower (source: Google Maps)

Assuming the commercial aircraft typically descend at a slower rate than they ascend, the worst-case scenario would be an aircraft with an arrival flight path directly over the development. Typical descent rates for planning purposes is known as the “Rule of 3”, in that 1,000 feet for descent typically takes 3 miles of horizontal travel. Given that ratio, aircraft is likely to be no less than 2 miles above the project site when descending, well above the ballpark. Given that the intent is to provide shielding on the field lighting luminaires, it is unlikely that the field lighting will significantly impact aviation over and around the project site.

6.3 Recommended Additional Optional Measures

The proposed architectural lighting, which excludes the field/house lighting and signage, does not require additional mitigation measures to meet threshold limits. However, further consideration of lighting impacts should continue to be pursued. Such further efforts may include:

- Strategic application of non-signage façade lighting to minimize large areas of lighting, particularly high on the building
- Use of warm color temperature LED sources to minimize blue light emissions, which proportionally contributes more significantly to light pollution than longer wavelength light
- Integration of lighting elements into architecture wherever possible to minimize direct view of light sources
- Reliance to the extent possible on low mounting-height luminaires to reduce the visibility of the luminaire from a distance

6.4 Recommended Digital Signage Requirements

As discussed in section 4.5.4 above, two key digital signage locations were included in the assessment: the double-sided digital scoreboard and the digital ribbon boards. The modeling assumption for those was that the brightness would be maximum allowed per law. It is highly likely that the brightness will be adjusted downward after installation when tuned to the ambient lighting environment.

Since additional signage locations, both static and dynamic, have not yet been determined, it is recommended that the project incorporate mitigation measures that apply to signage as it is developed and installed.

6.4.1 Brightness Limitation

While all signage must comply with the California Vehicle Code requirements for brightness where they are within the field of view for freeway drivers, additional consideration should be made to limit the brightness of signage in general. It is recommended that the project target a maximum luminance of 350 - 1,000 cd/m^2 for all signage applications that are not within the ballpark itself and associated with the function of the ballpark. This would include any dynamic or static signage intended for wayfinding or advertising and is consistent with published studies regarding the effectiveness of digital signage.

6.4.2 Dimming and Controls

All digital signage, including static and dynamic signage, should be provided with dimming capabilities and the associated control infrastructure to dim the sign brightness at night.

6.4.3 Glare Control

All digital signage should include glare control measures to minimize off-axis brightness and upward-directed and wasted light.

6.4.4 Field Verification

The brightness of all digital signage should be verified after installation through photometric measurements to comply with the following limitations:

- No greater than 1,000 cd/m^2 when set to all pixels at bright white
- No greater than 8.0 lux vertical at the property line created by any single digital sign

7 Glossary

Ambient Brightness – Perceived visual brightness of immediate environment or surroundings

Bracketed Images – A set of digital images taken in quick succession varying only exposure level between images.

BUG Rating – A system of rating exterior luminaires to determine the amount of light trespass is produced by a luminaire. The BUG rating was developed by the Illuminating Engineering Society (IES) and International Dark-Sky Association and measures the **B**acklight, **U**plight, and **G**lare emitted from a luminaire assembly.

CIE – The International Commission on Illumination. An international, professional organization which publishes international technical standards for lighting.

CIE 171:2006 Validation Process – A process established by CIE to validate the accuracy of lighting calculation software.

Cloud Ceiling – An approximation of the height from the ground plane to the lowest level of cloud cover where more than half of the sky is covered by clouds.

Contrast Ratio – The difference between the maximum measured luminance value within a field of view and the minimum measured luminance value within the same field of view.

Curfew – The time of day where normal hours of operation are over, businesses are closed, and access to public amenities is limited. The term “curfew” is typically used throughout lighting energy codes and lighting recommendations to define the time at which spaces change from active to inactive.

Diffuse – A material property that describes that light scatters evenly in all directions.

Dusk – The final, or darkest part, of twilight immediately before night begins.

Falsecolor – A colorized image where the various colors along a spectrum are assigned to represent different material properties or ascending/descending associated values.

Field Lighting – The lighting specifically intended to provide light on an athletic playing field.

Floodlight – A type of directional light with a high intensity and broad beam.

Full-Cutoff – A shielded luminaire that produces no light upwards.

Glare – A high amount of perceived brightness which produces visual discomfort or visual disability.

High-Mast Lighting – A type of light where luminaires are affixed to a tall pole and aimed downwards.

High-Pressure Sodium – A type of sodium-vapor lamp where light is produced by exciting sodium and mercury within a vacuum sealed chamber (bulb).

House Lighting – Lighting intended to light areas of pedestrian involvement i.e. seating, circulation, etc.

IES – Illuminating Engineering Society. A professional society dedicated to the science and engineering of light

IES File – A type of file which contains the photometric data for a luminaire. Compatible with the light calculation software AGI32.

Illuminance – The density of light incident on a surface typically reported in units of lux (lumens per square meter) or footcandles (lumens per square foot).

- Vertical – The density of light incident on a vertical plane measured at a point.
- Horizontal – The density of light incident on a horizontal plane measured at a point.
- Example: One 60W incandescent light bulb will generate 1 lux at a distance of approximately 8 meters (26 ft)

Lambertian reflectance – A material property which describes a perfectly diffuse reflecting surface which scatters light evenly in all directions.

LED – A light-emitting diode. A type of light source that emits light by allowing current to flow through a small semiconductor.

Light Loss Factor – A value assigned to represent the depreciation of light from a source at some point in time in the future as compared to the initial light output.

Light Pollution – The negative environmental impacts caused by light at night.

Light Trespass – The measurable amount of light incident on adjacent or distant locations (spill light).

Lighting Power Density – The amount of light measured in watts over a single square foot of area.

Lighting Zone – A lighting designation that categorizes locations based on expected ambient brightness.

Lumen – A fundamental measurement of light quantity.

Luminaires – A complete light fixture assembly.

Luminance – The intensity of light in a given direction typically reported in units of candela per meter squared.

- Example: One 60W incandescent light bulb (frosted) has a luminance of approximately 120,000 cd/m^2
- Luminance describes the photometric brightness of an object, but the perceptual brightness (how bright something seems) is highly dependent on ambient brightness and contrast

Nadir – A direction pointing directly down from or below a given location.

Occupancy-Based Controls – A method of controlling light in response to occupancy.

Overexposure – In photography, the result of extra or excess light entering the camera through the lens to produce an image which is brighter or more washed-out but allows for dark details to be seen.

Parametric – An iterative approach to a process where variables are altered in a regular sequence.

Radiosity – A method of calculating reflected light through diffuse reflection.

Sensitive Receptor Sites – Locations determined as potentially being sensitive to a development.

Sky Glow – The visible brightness of the night sky that obscures view of celestial bodies.

Spill Light – See Light Trespass.

TMY3 Weather Data – Typical Meteorological Year 3 weather data. Data collected the National Renewable Energy Laboratory from locations across the USA between the years 1991-2005.

Underexposure - In photography, the result of limited amounts of light entering the camera through the lens to produce an image which is dark but allows for details to be seen in bright areas.

Uniformity Ratio – The ratio of lighting metrics within a predetermined area.

Veiling Luminance – The luminance that would need to be superimposed on a scene in object space to reduce the scene's contrast by an amount equal to the added retinal illuminance from scattered light on the scene's retinal image. It is most commonly used to describe the contrast-reducing effect of a glare source in the field of view. Sometimes also called veiling luminance or disability glare. [IES RP-16-17 Addendum 1]

8 Assessment of Baseline Project

To assess the potential lighting impact of the proposed Baseline project, a series of simulations were created to model the potential spill light impact and potential impact on glare.

8.1 Baseline Project with Baseline ballpark height condition including gondola variant

The first set of analysis includes the baseline ballpark geometry and the gondola variant.

8.1.1 "Phase 1" Scenario

Per the project description included in section 3.1, the "Phase 1" scenario includes the ballpark, site development immediately adjacent, and a select number of accessory buildings. The bulk of the remaining site is anticipated to be temporary surface parking.

8.1.1.1 Game Nights

As described in section 4.5.8, the Game Night lighting condition is anticipated to include all lighting "on", including sports and house lighting and identified signage locations.

8.1.1.1.1 Spill Light

Table 30 provides the calculation results for the spill light assessment at the receptor sites for this condition. As shown, the proposed lighting **is** anticipated to have a significant impact only at receptor sites 1 , which faces straight into the opening of the ballpark and receive direct lighting from the proposed scoreboard location. The impact on all other receptor sites is well below the level of significance.

Receptor Site	Spill Light, [lux]	Significant
Receptor Site 1 - Water Street at Clay (Facing Ballpark)	**41.4**	**Yes**
Receptor Site 1A - Water Street at Washington (Facing Gondola)	6.2	No
Receptor Site 2 - Inner Harbor Turning Basin @ 190'	0.8	No
Receptor Site 2A - Turning Basin Line-of-Sight	0.2	No
Receptor Site 2B - Inner Harbor Turning Basin @ 64'	0.7	No
Receptor Site 2C - Inner Harbor Turning Basin @ 25'	0.6	No
Receptor Site 3 - Alameda Dock	2.9	No
Receptor Site 4 - MLK at Embarcadero	11.6	No
Receptor Site 5 - I880 Westbound	0.3	No
Receptor Site 5A - 2nd at Washington (Facing Ballpark)	7.0	No
Receptor Site 5B - 2nd at Washington (Facing JLS Station)	0.7	No
Receptor Site 5C - 2nd at Washington (Facing Convention Center Station)	0.1	No
Receptor Site 6 - I980 Ramp to Eastbound I880	2.2	No
Receptor Site 6A - 7th at Brush	0.3	No
Receptor Site 7 - 8th at Washington (Facing Convention Center Station)	0.1	No
Receptor Site 7A - 8th at Washington (Facing Tower)	0.0	No

Table 30: Spill light at receptor sites for Baseline project, Baseline ballpark height, "Phase 1" scenario Game Night lighting condition. [Note: Threshold of significance is 25 lux]

8.1.1.1.2 Spill Light Map

Figure 85 provides a spill light map for this lighting condition. To generate the spill light map, vertical calculation points were arrayed around the project site at 5'-6" AFG and oriented toward the pitcher's mound for reference. The isoline curves show the extent to which vertical light levels are calculated and are reported in lux. As shown, less than 1 vertical lux is expected in the majority of the turning basin. The adjacent estuary is anticipated to experience between 1 and 5 vertical lux, with light levels increasing closer to shore. For reference, one 60W incandescent light bulb will generate 1 lux at a distance of approximately 8 meters (26 ft).

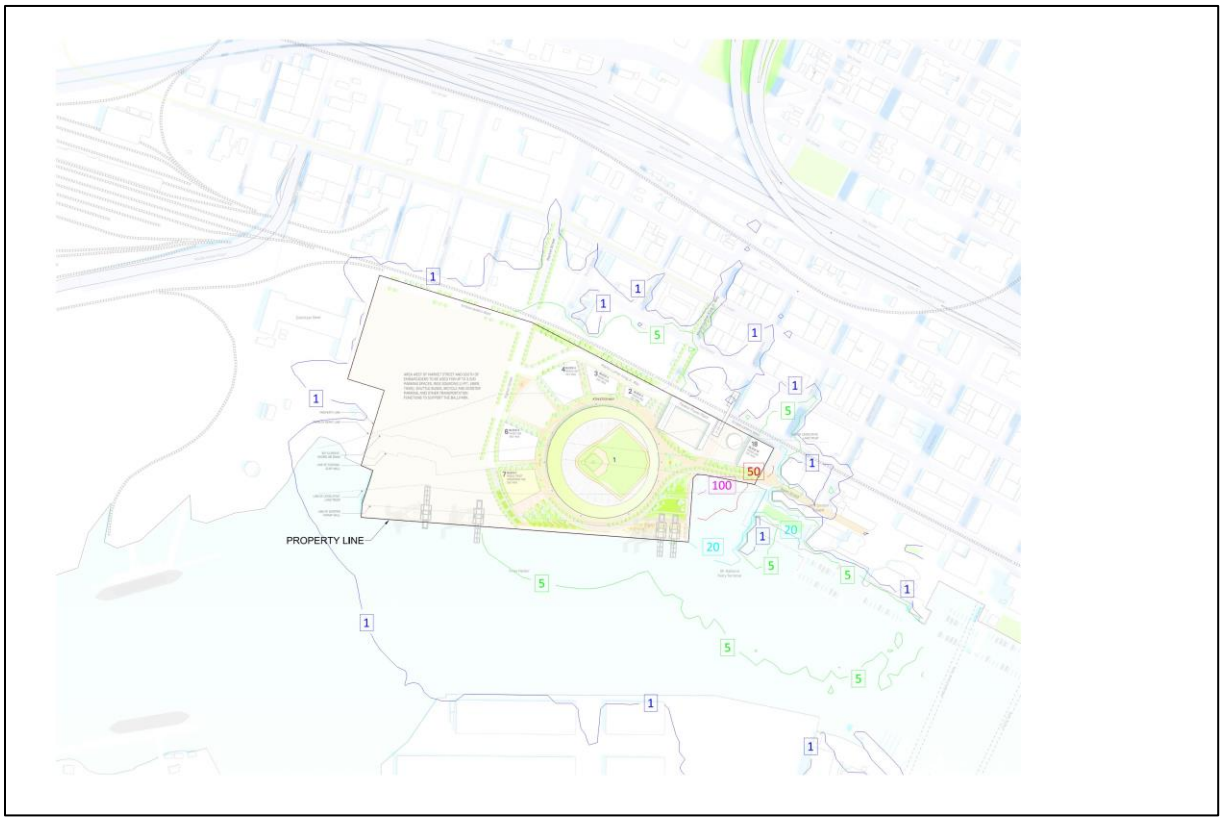


Figure 85: Spill light map for Baseline project, Baseline ballpark height, "Phase 1" scenario Game Night lighting condition indicating vertical illuminance isolines

8.1.1.1.3 Glare

Figure 86 through Figure 101 illustrate the luminances anticipated to be observed from the identified receptor sites for this lighting condition. Note that the scale associated with each receptor site view approximately matches the scale used for the associated site's existing conditions HDR falsecolor images. Table 31 summarizes the anticipated glare significance at the receptor sites. Additionally, as noted in Section 4.5.3, the modeled retail lighting is included for pre-curfew times to capture the impact of interior lighting emanating through windows as a conservative contribution to spill light assessment; the modeled luminance, therefore, is an interior luminance and not subject to glare limitations directly.

Receptor Site	Facades		Signage	
	Maximum, [cd/m^2]	Significant	Maximum, [cd/m^2]	Significant
Receptor Site 1 - Water Street at Clay (Facing Ballpark)	15.9	No	3,500	Yes
Receptor Site 1A - Water Street at Washington (Facing Gondola)	6.4	No	n/a	n/a
Receptor Site 2 - Inner Harbor Turning Basin @ 190'	15.9	No	n/a	n/a
Receptor Site 2A - Turning Basin Line-of-Sight	15.9	No	n/a	n/a
Receptor Site 2B - Inner Harbor Turning Basin @ 64'	15.9	No	n/a	n/a
Receptor Site 2C - Inner Harbor Turning Basin @ 25'	15.9	No	n/a	n/a
Receptor Site 3 - Alameda Dock	15.9	No	3,500	Yes
Receptor Site 4 - MLK at Embarcadero	15.9	No	3,500	Yes
Receptor Site 5 - I880 Westbound	15.9	No	n/a	n/a
Receptor Site 5A - 2nd at Washington (Facing Ballpark)	15.9	No	3,500	Yes
Receptor Site 5B - 2nd at Washington (Facing JLS Station)	6.4	No	n/a	n/a
Receptor Site 5C - 2nd at Washington (Facing Convention Center Station)	1.6	No	n/a	n/a
Receptor Site 6 - I980 Ramp to Eastbound I880	15.9	No	3,500	Yes
Receptor Site 6A - 7th at Brush	15.9	No	3,500	Yes
Receptor Site 7 - 8th at Washington (Facing Convention Center Station)	6.4	No	n/a	n/a
Receptor Site 7A - 8th at Washington (Facing Tower)	0.0	No	n/a	n/a

Table 31: Summary of anticipated glare significance at receptor sites for the Baseline project, Baseline ballpark height, "Phase 1" scenario Game Night lighting conditions. [Note: Threshold of significance is 25 cd/m^2 for façade lighting and 1,000 cd/m^2 for digital signage]

Figure 86 shows the anticipated luminances viewed from Receptor Site 1, which is one of the closest receptor sites. As seen, from this perspective, there is direct line of sight to the scoreboard and ribbon boards. Therefore, façade luminances **are not** anticipated to exceed threshold and signage luminances from this view **are** anticipated to exceed threshold.

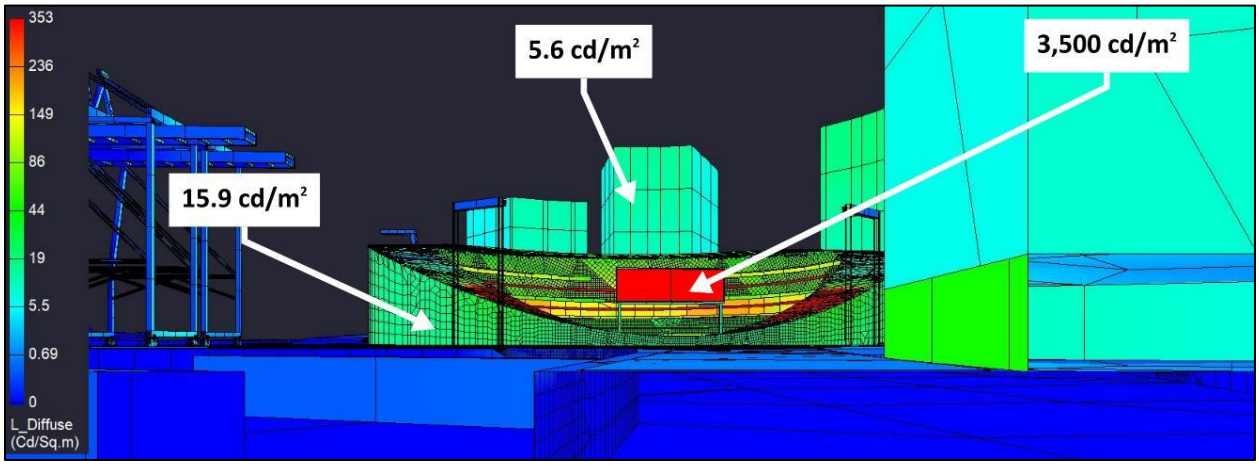


Figure 86: View from Receptor Site 1 for Baseline project, Baseline ballpark height, "Phase 1" scenario Game Night lighting condition

Figure 87 provides a view of the anticipated luminances viewed from Receptor Site 1A, which is facing the proposed gondola station near Jack London Square. Note for calculation purposes, the "sides" of the gondola platform have been turned "off", and the anticipated lighting effect has been applied to the top of the platform floor. Therefore, façade luminances from this view **are not** anticipated to exceed threshold.

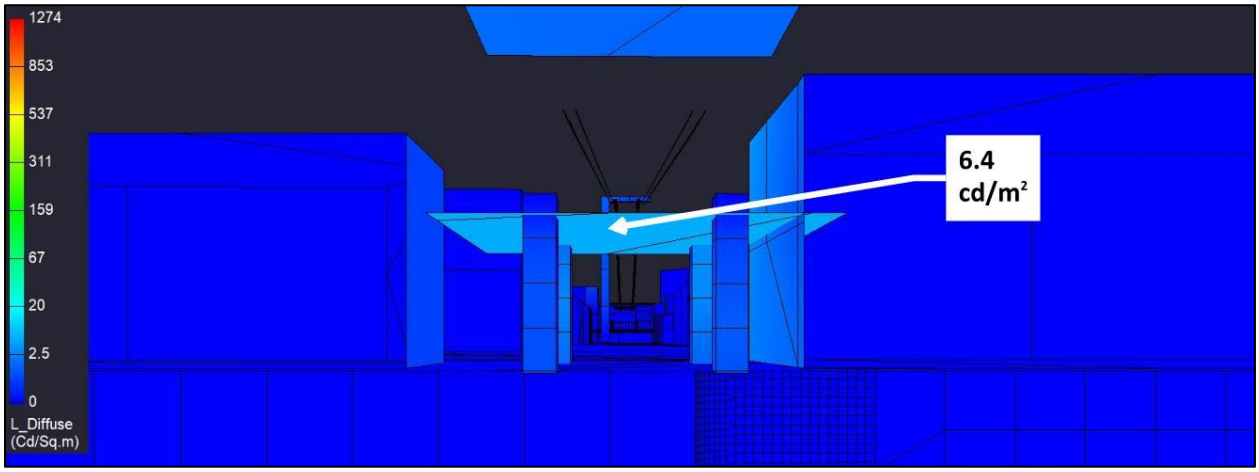


Figure 87: View from Receptor Site 1A for Baseline project, Baseline ballpark height, "Phase 1" scenario Game Night lighting condition

Figure 88 provides the anticipated luminances viewed from Receptor Site 2, which is centered in the turning basin and located 190' above the water line. As shown, based on the ballpark geometry, there is not anticipated to be a direct view of the field luminaires, significantly reducing the observed brightnesses in the field of view. Refer to further discussion on this topic in section 6.2.1 above. The façade luminances from this view **are not** anticipated to exceed threshold.

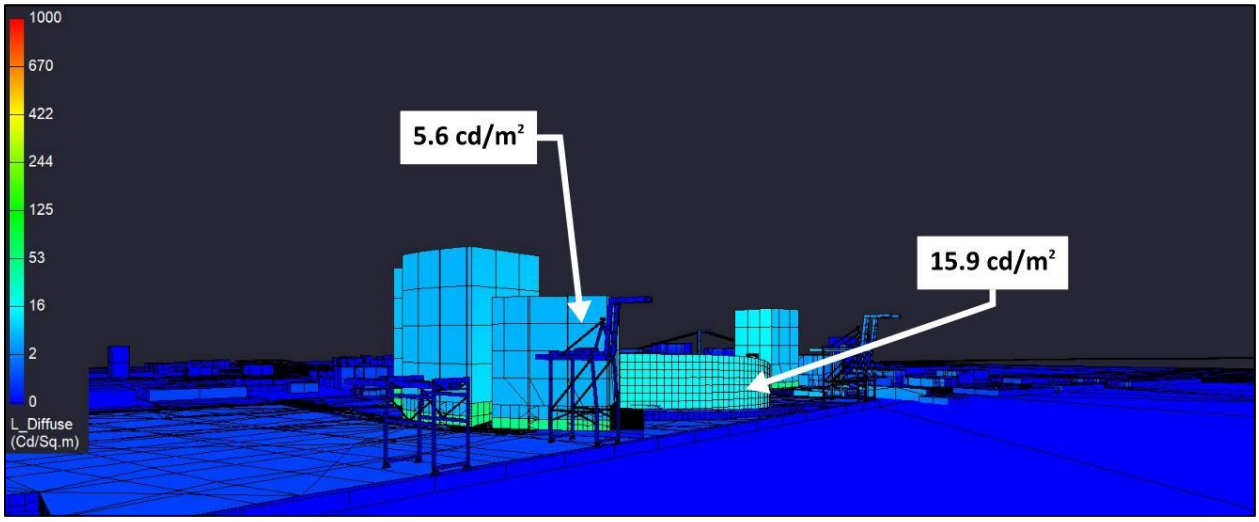


Figure 88: View from Receptor Site 2 for Baseline project, Baseline ballpark height, "Phase 1" scenario Game Night lighting condition

Similar to the view from Receptor Site 2, the view from Receptor Site 2A, shown in Figure 89, of the field lighting is completely blocked by the ballpark geometry. Therefore, façade luminances from this view **are not** anticipated to exceed threshold.

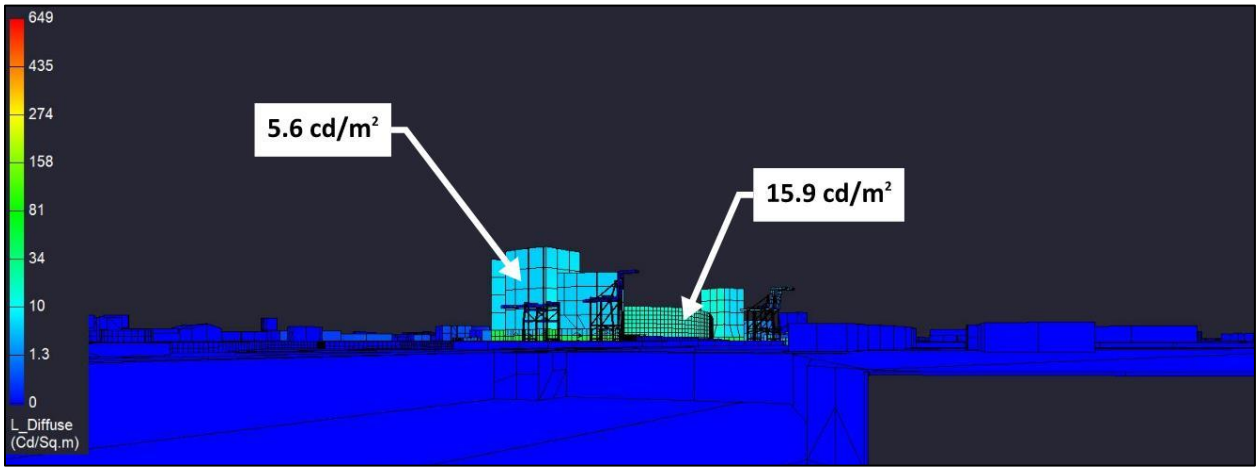


Figure 89: View from Receptor Site 2A for Baseline project, Baseline ballpark height, "Phase 1" scenario Game Night lighting condition

Figure 90 provides the anticipated luminances viewed from Receptor Site 2B, which is centered in the turning basin and located 64’ above the water line. As shown, based on the ballpark geometry, there is not anticipated to be a direct view of the sports lighting, scoreboard or ribbon boards. The façade luminances from this view **are not** anticipated to exceed threshold.

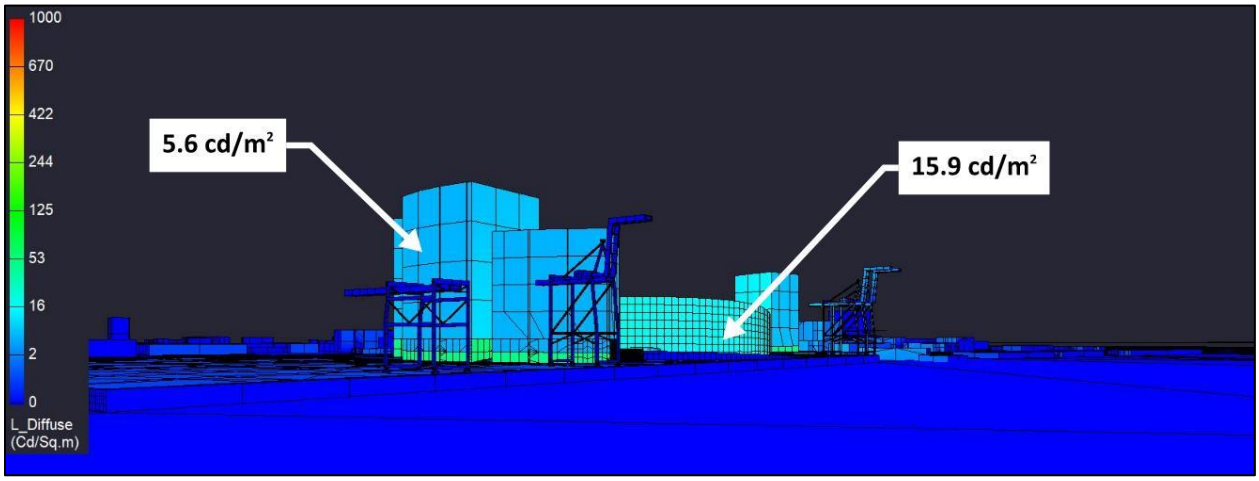


Figure 90: View from Receptor Site 2B for Baseline project, Baseline ballpark height, “Phase 1” scenario Game Night lighting condition

Figure 91 provides the anticipated luminances viewed from Receptor Site 2C, which is centered in the turning basin and located 25’ above the water line. As shown, based on the ballpark geometry, there is not anticipated to be a direct view of the sports lighting, scoreboard or ribbon boards. The façade luminances from this view **are not** anticipated to exceed threshold.

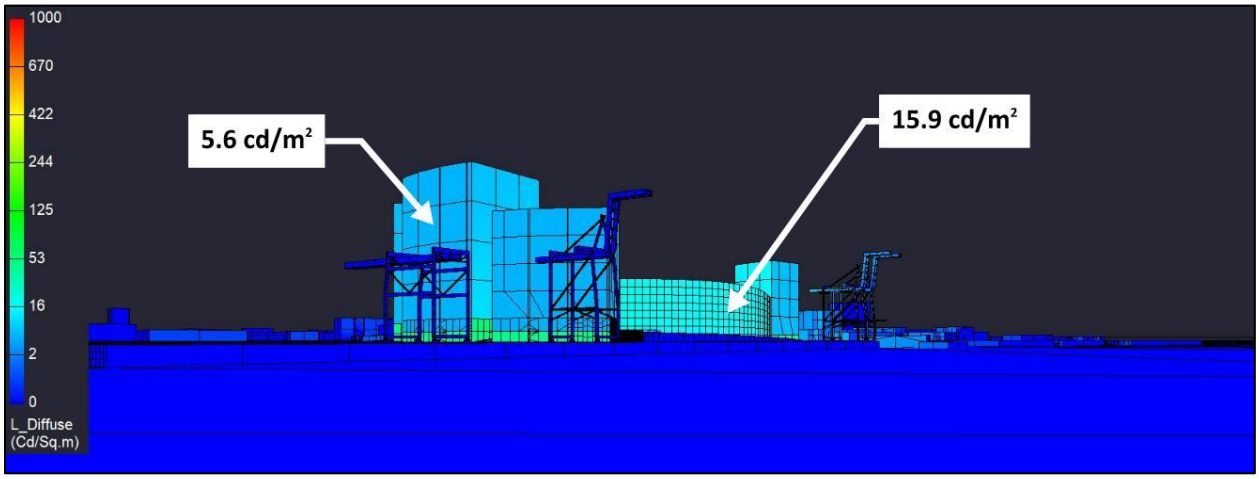


Figure 91: View from Receptor Site 2C for Baseline project, Baseline ballpark height, “Phase 1” scenario Game Night lighting condition

Figure 92 provides the anticipated luminances viewed from Receptor Site 3, which is located on Alameda and facing northwest toward the property. From this position, there is a direct line of site to the scoreboard and ribbon boards. The brightness of those sources, used only during evening games and events, exceeds the established threshold. Therefore, façade luminances **are not** anticipated to exceed threshold and sign luminances from this view **are** anticipated to exceed threshold.

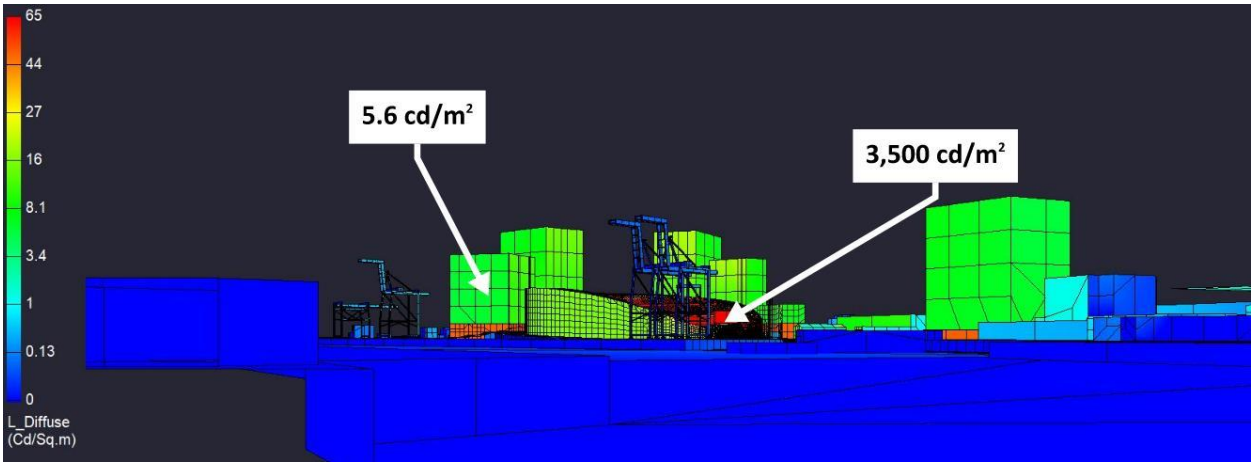


Figure 92: View from Receptor Site 3 for Baseline project, Baseline ballpark height, "Phase 1" scenario Game Night lighting condition

Figure 93 provides the view from Receptor Site 4, which is located at the intersection of MLK and Embarcadero. As shown, a small corner of the scoreboard is anticipated to be viewed from this location, which exceed threshold. Therefore, façade luminances **are not** anticipated to exceed threshold, and sign luminances from this view **are** anticipated to exceed threshold.

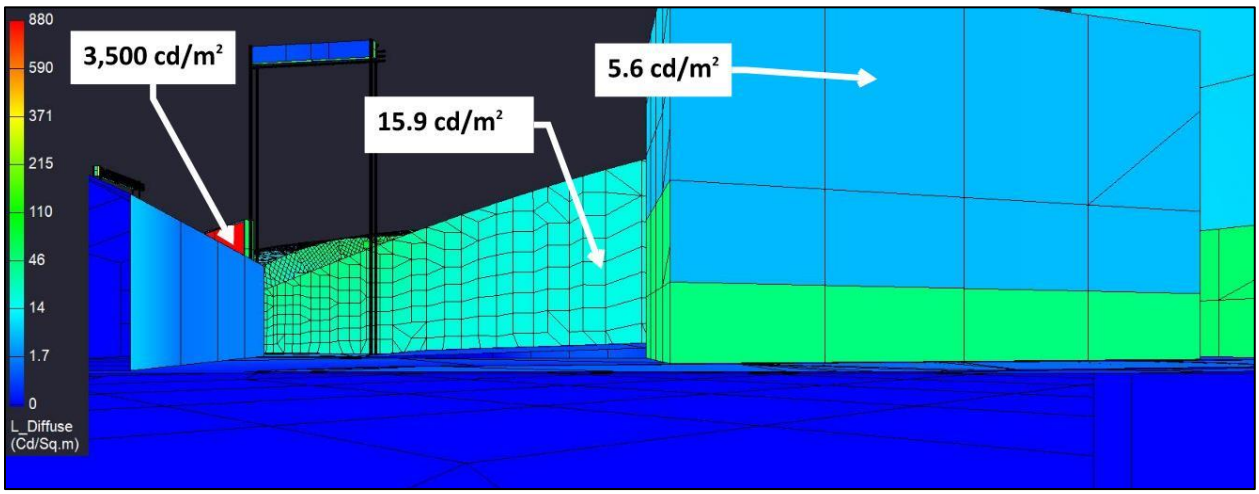


Figure 93: View from Receptor Site 4 for Baseline project, Baseline ballpark height, "Phase 1" scenario Game Night lighting condition

Figure 94 provides the anticipated luminances viewed from Receptor Site 5, which is located on Westbound I880. From this view, the ballpark and sports lighting are anticipated to be almost entirely blocked. The façade lighting of the adjacent mixed-use development and a corner of the ballpark is anticipated to be visible. Therefore, façade luminances from this view **are not** anticipated to exceed threshold.

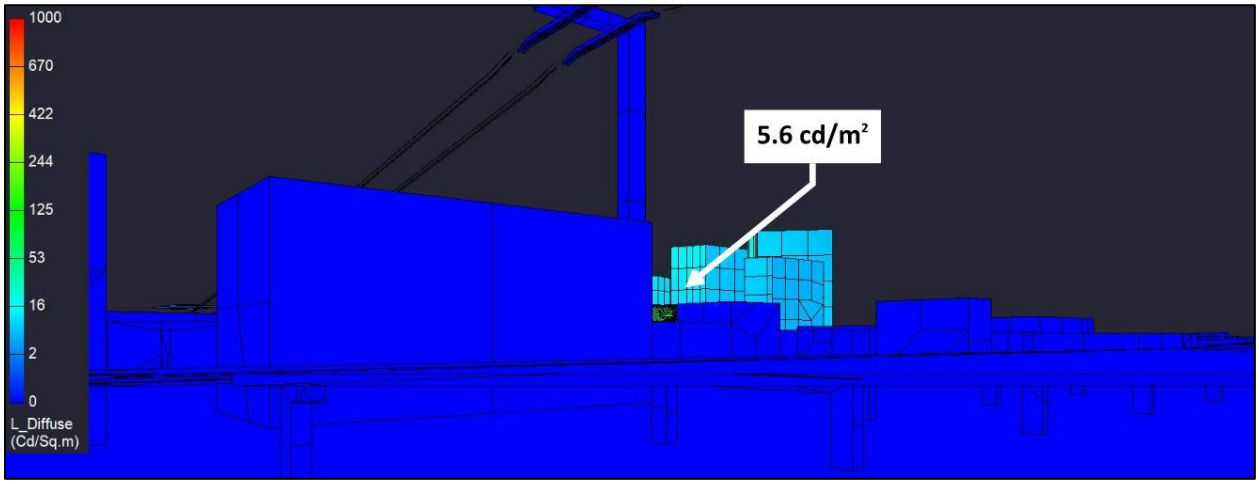


Figure 94: View from Receptor Site 5 for Baseline project, Baseline ballpark height, "Phase 1" scenario Game Night lighting condition

Figure 95 provides the anticipated luminances viewed from Receptor Site 5A, which is located on the southwest corner of the roof of the parking garage located at 2nd and Washington. From this elevated position, there is a direct view down into the ballpark, including a direct view of the ribbon boards, but the majority of the ballpark is blocked. Therefore, façade luminances **are not** anticipated to exceed threshold and sign luminances from this view **are** anticipated to exceed threshold.

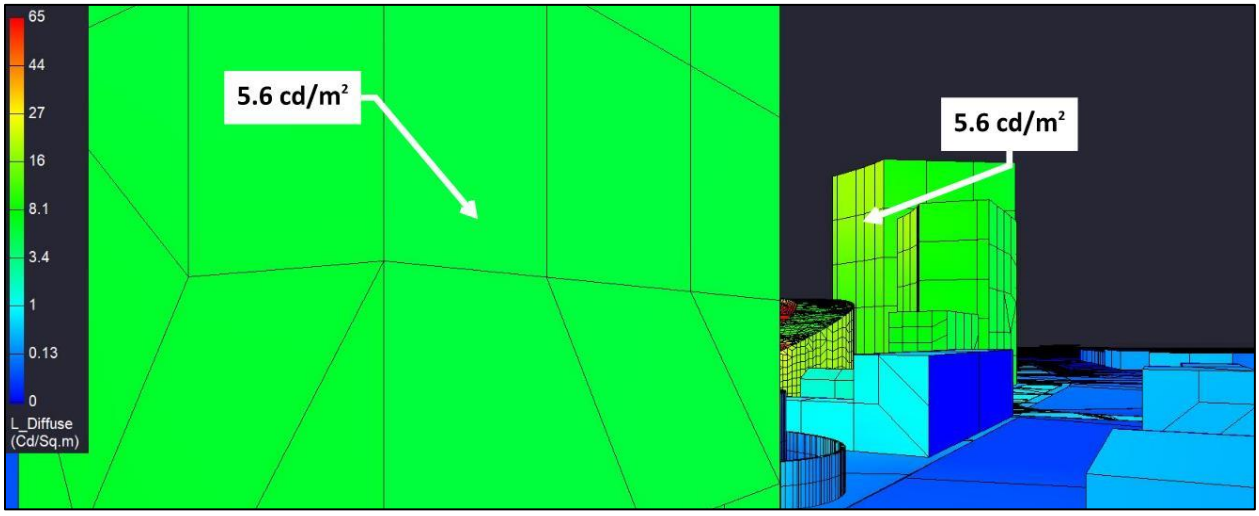


Figure 95: View from Receptor Site 5A for Baseline project, Baseline ballpark height, "Phase 1" scenario Game Night lighting condition

Figure 96 provides the anticipated luminances viewed from Receptor Site 5B, which is located on the southeast corner of the roof of the parking garage looking toward the anticipated gondola station near Jack London Square. Therefore, luminances from this view **are not** anticipated to exceed threshold.

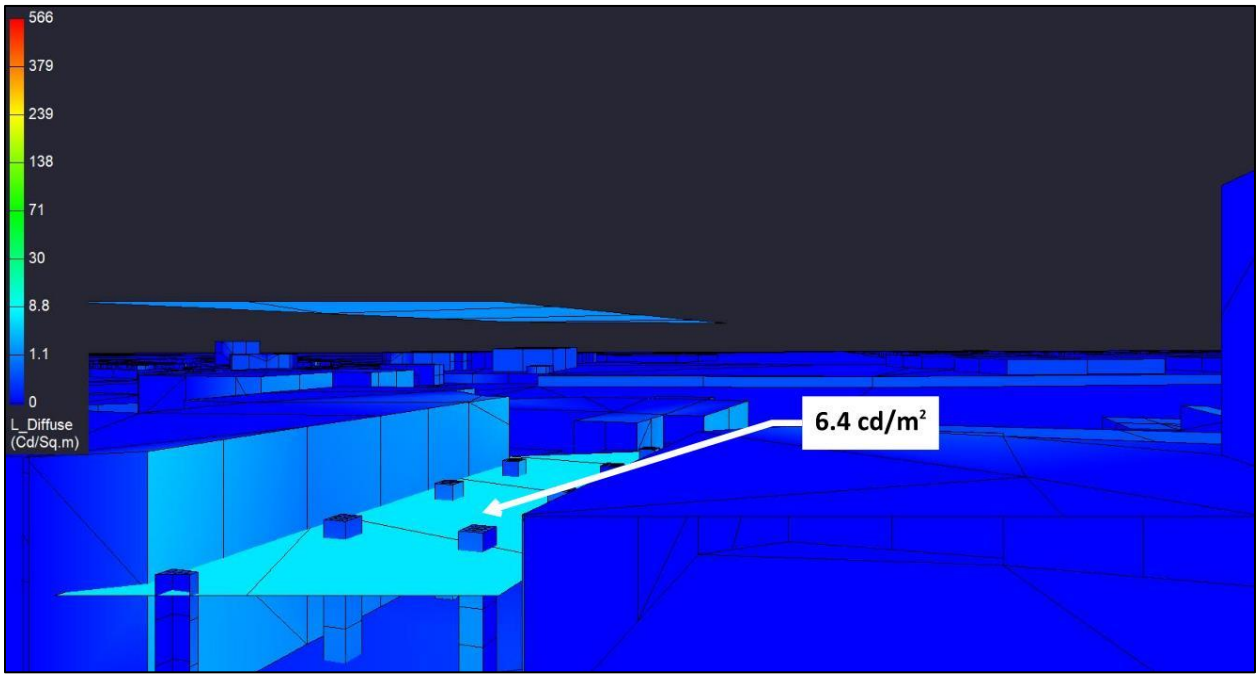


Figure 96: View from Receptor Site 5B for Baseline project, Baseline ballpark height, "Phase 1" scenario Game Night lighting condition

Figure 97 provides the anticipated luminances viewed from Receptor Site 5C, which is located on the northeast corner of the parking garage at 2nd and Washington, looking northeast on the Washington corridor. No architectural lighting is anticipated on the gondola support tower and the Convention Center gondola station is not visible. Therefore, luminances from this view **are not** anticipated to exceed threshold.

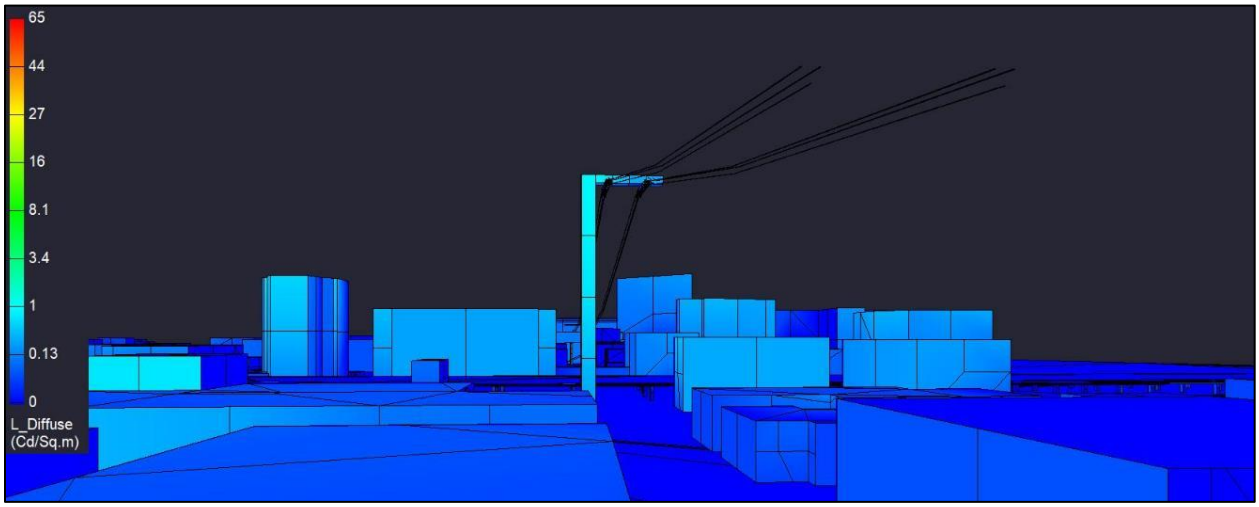


Figure 97: View from Receptor Site 5C for Baseline project, Baseline ballpark height, "Phase 1" scenario Game Night lighting condition

Figure 98 provides the anticipated luminances viewed from Receptor Site 6, which is located on the ramp from I980 to eastbound I880. From this perspective, a direct view of the scoreboard and ribbon boards is anticipated. Therefore, façade luminances **are not** anticipated to exceed threshold, and sign luminances from this view **are** anticipated to exceed threshold.

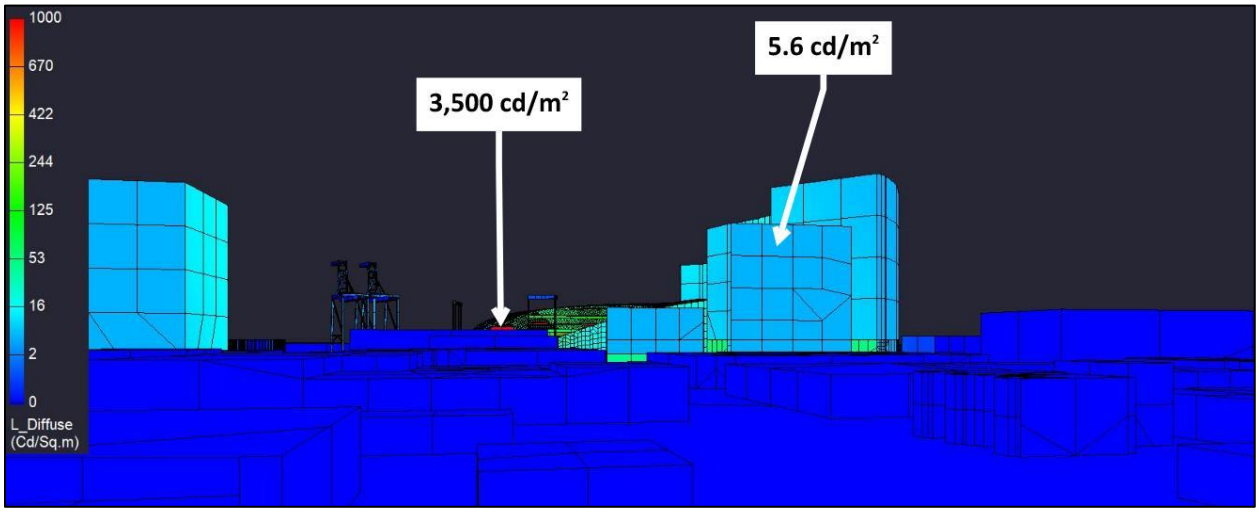


Figure 98: View from Receptor Site 6 for Baseline project, Baseline ballpark height, "Phase 1" scenario Game Night lighting condition

Figure 99 provides the anticipated luminances viewed from Receptor Site 6A, which is located at 7th and Brush. From this perspective, there is anticipated to be a minimal view of the scoreboard. As such, the sign luminances from this view **are** anticipated to exceed threshold.

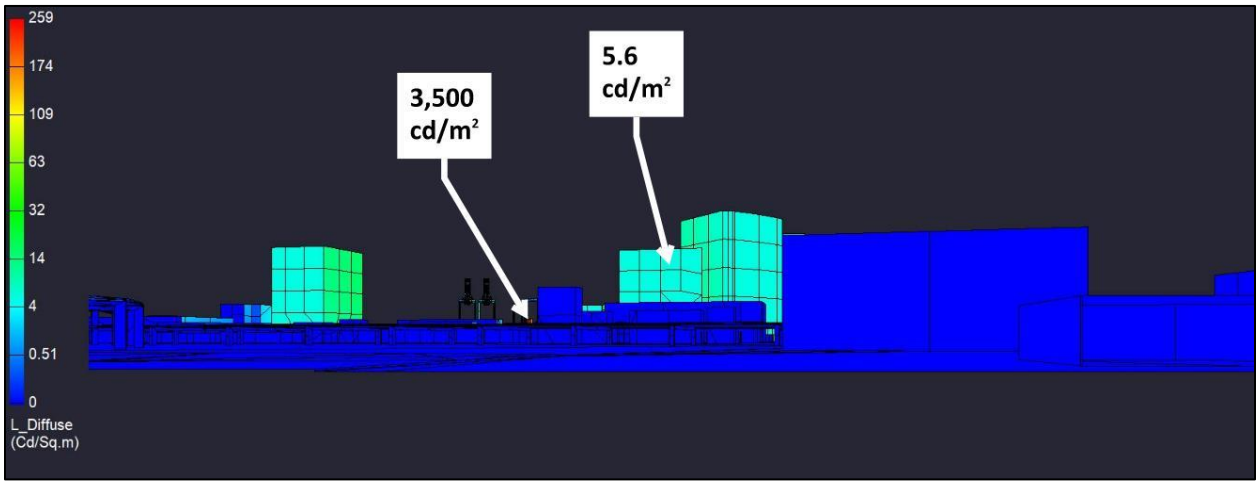


Figure 99: View from Receptor Site 6A for Baseline project, Baseline ballpark height, "Phase 1" scenario Game Night lighting condition

Figure 100 provides the anticipated luminances viewed from Receptor Site 7, which is located at 8th and Washington facing north to the anticipated Convention Center gondola station. From this position, the field of view is anticipated to include the bottom surface of the gondola platform. Therefore, luminances from this view **are not** anticipated to exceed threshold.

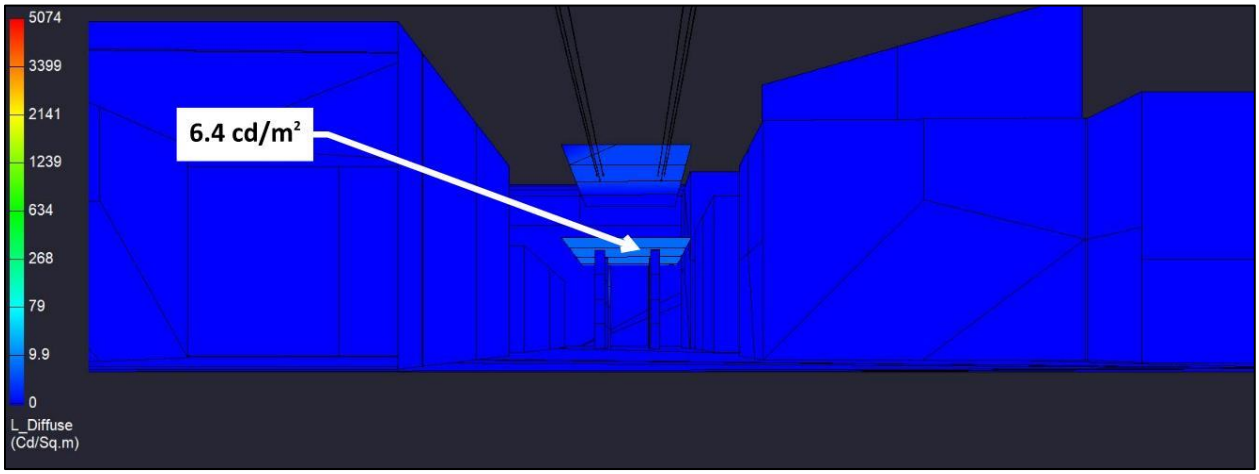


Figure 100: View from Receptor Site 7 for Baseline project, Baseline ballpark height, "Phase 1" scenario Game Night lighting condition

Figure 101 provides the anticipated luminances viewed from Receptor Site 7A, which is located at 8th and Washington facing south toward the gondola support pole. From this position, the field of view is anticipated to include the gondola support pole which is not anticipated to have any architectural lighting. Therefore, luminances from this view **are not** anticipated to exceed threshold.

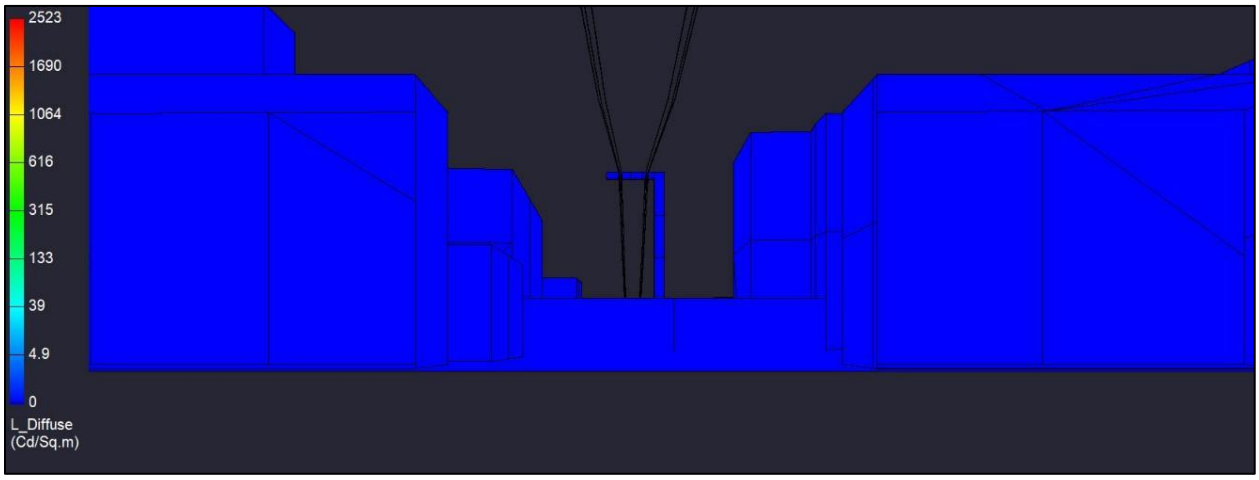


Figure 101: View from Receptor Site 7A for Baseline project, Baseline ballpark height, "Phase 1" scenario Game Night lighting condition

8.1.1.2 Non-Game Nights, Pre-Curfew

As described in section 4.5.8, the Non-Game Nights, Pre-Curfew lighting condition is anticipated to include all architectural lighting "on", but assumes that the sports and house lighting within the ballpark, as well as the scoreboard and ribbon boards, are not "on".

8.1.1.2.1 Spill Light

Table 32 provides the calculation results for the spill light assessment at the receptor sites for this condition. As shown, the proposed lighting **is not** anticipated to have a significant impact at any receptor site.

Receptor Site	Spill Light, [lux]	Significant
Receptor Site 1 - Water Street at Clay (Facing Ballpark)	9.3	No
Receptor Site 1A - Water Street at Washington (Facing Gondola)	6.3	No
Receptor Site 2 - Inner Harbor Turning Basin @ 190'	0.7	No
Receptor Site 2A - Turning Basin Line-of-Sight	0.2	No
Receptor Site 2B - Inner Harbor Turning Basin @ 64'	0.7	No
Receptor Site 2C - Inner Harbor Turning Basin @ 25'	0.6	No
Receptor Site 3 - Alameda Dock	0.5	No
Receptor Site 4 - MLK at Embarcadero	6.8	No
Receptor Site 5 - I880 Westbound	0.1	No
Receptor Site 5A - 2nd at Washington (Facing Ballpark)	7.0	No
Receptor Site 5B - 2nd at Washington (Facing JLS Station)	0.7	No
Receptor Site 5C - 2nd at Washington (Facing Convention Center Station)	0.0	No
Receptor Site 6 - I980 Ramp to Eastbound I880	0.6	No
Receptor Site 6A - 7th at Brush	0.2	No
Receptor Site 7 - 8th at Washington (Facing Convention Center Station)	0.1	No
Receptor Site 7A - 8th at Washington (Facing Tower)	0.0	No

Table 32: Spill light at receptor sites for Baseline project, Baseline ballpark height, "Phase 1" scenario Non-Game Nights, Pre-Curfew lighting condition. [Note: Threshold of significance is 25 lux]

8.1.1.2.2 Spill Light Map

Figure 102 provides a spill light map for this lighting condition. To generate the spill light map, vertical calculation points were arrayed around the project site at 5'-6" AFG and oriented toward the pitcher's mound for reference. The isoline curves show the extent to which vertical light levels are calculated and are reported in lux. As shown, less than 1 vertical lux is expected in the majority of the turning basin. The adjacent estuary is anticipated to experience between 1 and 5 vertical lux, with light levels increasing closer to shore. For reference, one 60W incandescent light bulb will generate 1 lux at a distance of approximately 8 meters (26 ft).

Figure 102: Spill light map for Baseline project, Baseline ballpark height, "Phase 1" scenario Non-Game Night, Pre-Curfew lighting condition indicating vertical illuminance isolines

8.1.1.2.3 Glare

Figure 103 through Figure 118 illustrate the luminances anticipated to be observed from the identified receptor sites for this lighting condition. Note that the scale associated with each receptor site view approximately matches the scale used for the associated site's existing conditions HDR falsecolor images. Table 33 summarizes the anticipated glare significance at the receptor sites. Additionally, as noted in Section 4.5.3, the modeled retail lighting is included for pre-curfew times to capture the impact of interior lighting emanating through windows as a conservative contribution to spill light assessment; the modeled luminance, therefore, is an interior luminance and not subject to glare limitations directly.

Receptor Site	Facades		Signage	
	Maximum, [cd/m^2]	Significant	Maximum, [cd/m^2]	Significant
Receptor Site 1 - Water Street at Clay (Facing Ballpark)	15.9	No	n/a	n/a
Receptor Site 1A - Water Street at Washington (Facing Gondola)	6.4	No	n/a	n/a
Receptor Site 2 - Inner Harbor Turning Basin @ 190'	15.9	No	n/a	n/a
Receptor Site 2A - Turning Basin Line-of-Sight	15.9	No	n/a	n/a
Receptor Site 2B - Inner Harbor Turning Basin @ 64'	15.9	No	n/a	n/a
Receptor Site 2C - Inner Harbor Turning Basin @ 25'	15.9	No	n/a	n/a
Receptor Site 3 - Alameda Dock	15.9	No	n/a	n/a
Receptor Site 4 - MLK at Embarcadero	15.9	No	n/a	n/a
Receptor Site 5 - I880 Westbound	15.9	No	n/a	n/a
Receptor Site 5A - 2nd at Washington (Facing Ballpark)	15.9	No	n/a	n/a
Receptor Site 5B - 2nd at Washington (Facing JLS Station)	6.4	No	n/a	n/a
Receptor Site 5C - 2nd at Washington (Facing Convention Center Station)	0.0	No	n/a	n/a
Receptor Site 6 - I980 Ramp to Eastbound I880	15.9	No	n/a	n/a
Receptor Site 6A - 7th at Brush	15.9	No	n/a	n/a
Receptor Site 7 - 8th at Washington (Facing Convention Center Station)	6.4	No	n/a	n/a
Receptor Site 7A - 8th at Washington (Facing Tower)	0.0	No	n/a	n/a

Table 33: Summary of anticipated glare significance at receptor sites for the Baseline project, Baseline ballpark height, "Phase 1" scenario Non-Game Night Pre-Curfew lighting conditions. [Note: Threshold of significance is 25 cd/m^2 for façade lighting and 1,000 cd/m^2 for digital signage]

Figure 103 shows the anticipated luminances viewed from Receptor Site 1, which is one of the closest receptor sites. As seen, from this perspective, without the field lighting and scoreboard/ribbon boards, "on", overall brightnesses are reduced. Therefore, façade luminances from this view **<u>are not</u>** anticipated to exceed threshold.

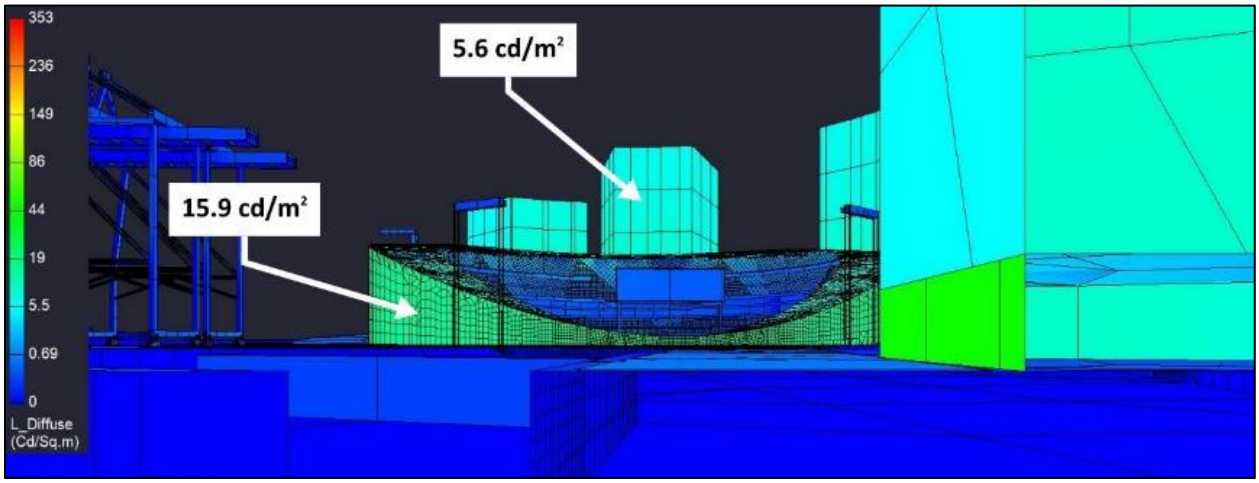


Figure 103: View from Receptor Site 1 for Baseline project, Baseline ballpark height, "Phase 1" scenario Non-Game Pre-Curfew lighting condition

Figure 104 provides a view of the anticipated luminances viewed from Receptor Site 1A, which is facing the proposed gondola station near Jack London Square. Note for calculation purposes, the "sides" of the gondola platform have been turned "off", and the anticipated lighting effect has been applied to the top of the platform floor. Therefore, façade luminances from this view **<u>are not</u>** anticipated to exceed threshold.

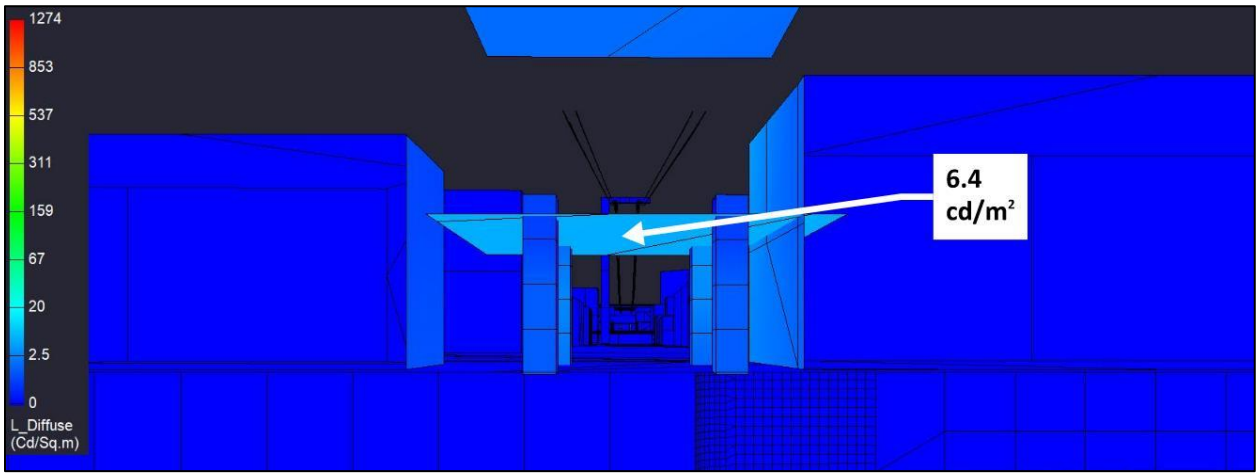


Figure 104: View from Receptor Site 1A for Baseline project, Baseline ballpark height, "Phase 1" scenario Non-Game Pre-Curfew lighting condition

Figure 105 provides the anticipated luminances viewed from Receptor Site 2, which is centered in the turning basin and located 190' above the water line. Façade luminances from this view **are not** anticipated to exceed threshold.

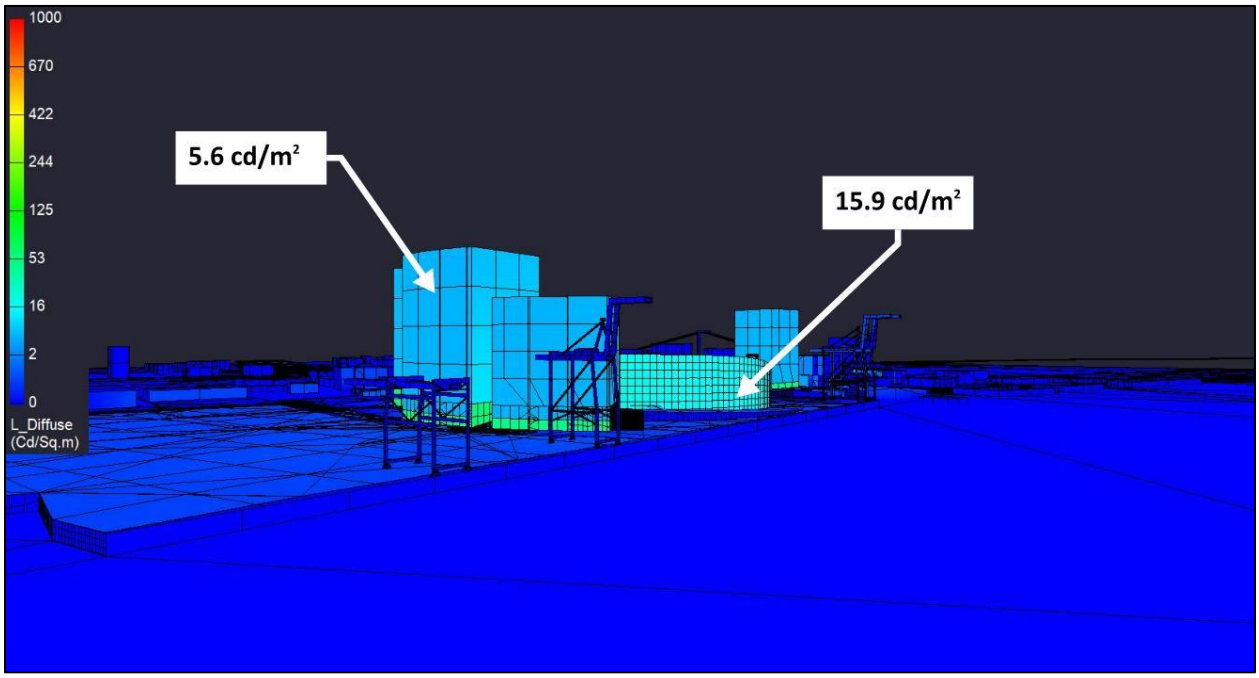


Figure 105: View from Receptor Site 2 for Baseline project, Baseline ballpark height, "Phase 1" scenario Non-Game Pre-Curfew lighting condition

Figure 106 provides the anticipated luminances viewed from Receptor Site 2A, which is on Alameda with a direct line of site through the center of the turning basin. Façade luminances from this view **are not** anticipated to exceed threshold.

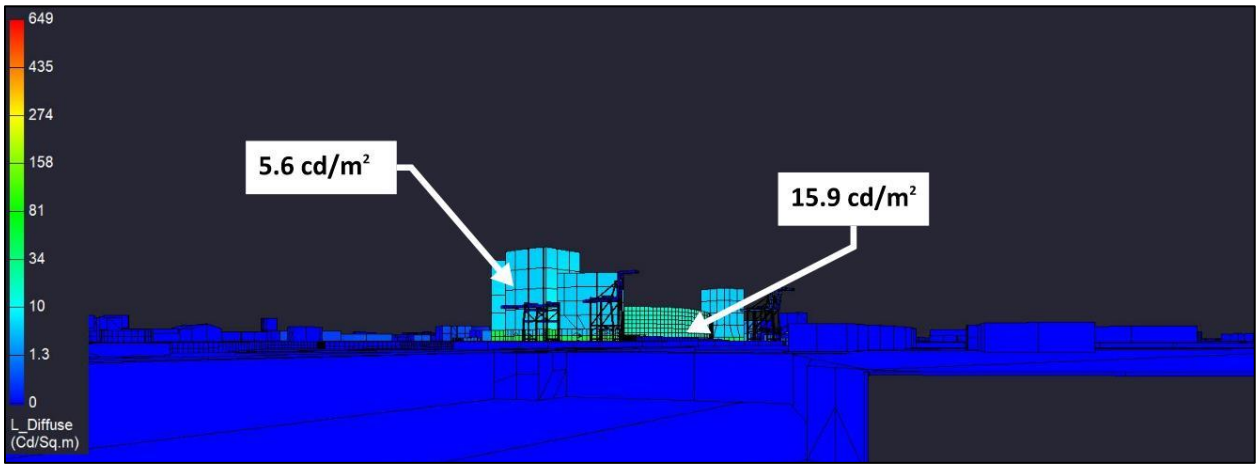


Figure 106: View from Receptor Site 2A for Baseline project, Baseline ballpark height, "Phase 1" scenario Non-Game Pre-Curfew lighting condition

Figure 107 provides the anticipated luminances viewed from Receptor Site 2B, which is centered in the turning basin and located 64’ above the water line. Façade luminances from this view **are not** anticipated to exceed threshold.

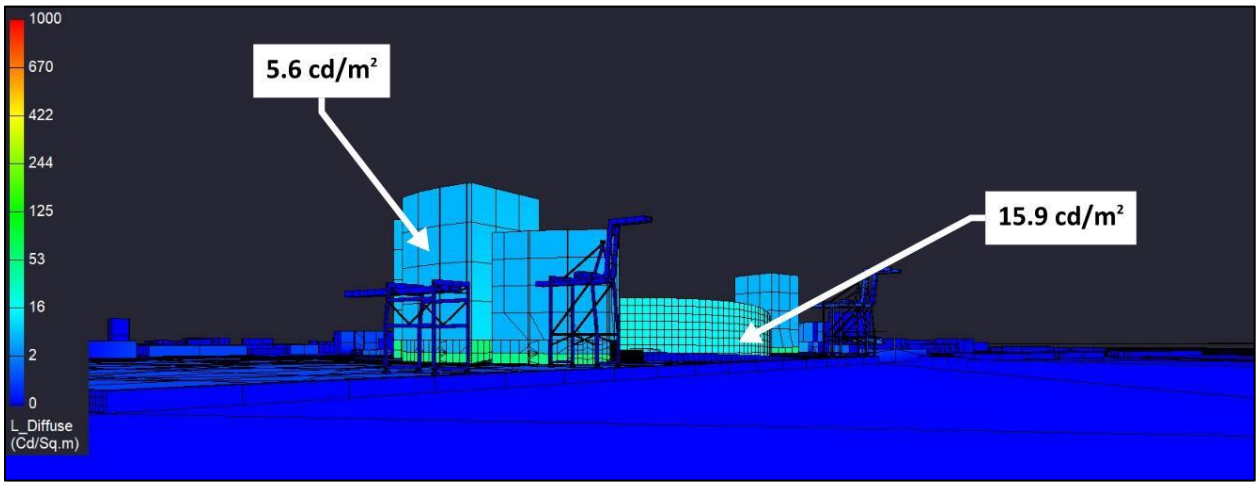


Figure 107: View from Receptor Site 2B for Baseline project, Baseline ballpark height, “Phase 1” scenario Non-Game Pre-Curfew lighting condition

Figure 108 provides the anticipated luminances viewed from Receptor Site 2C, which is centered in the turning basin and located 25’ above the water line. Façade luminances from this view **are not** anticipated to exceed threshold.

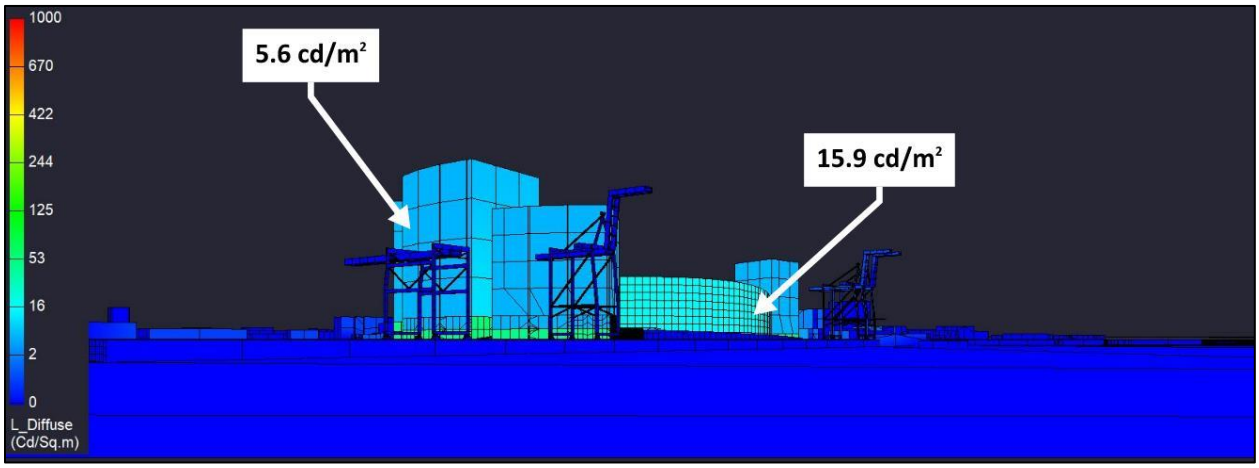


Figure 108: View from Receptor Site 2C for Baseline project, Baseline ballpark height, “Phase 1” scenario Non-Game Pre-Curfew lighting condition

Figure 109 provides the anticipated luminances viewed from Receptor Site 3, which is located on Alameda and facing northwest toward the property. Facade luminances from this view **are not** anticipated to exceed threshold.

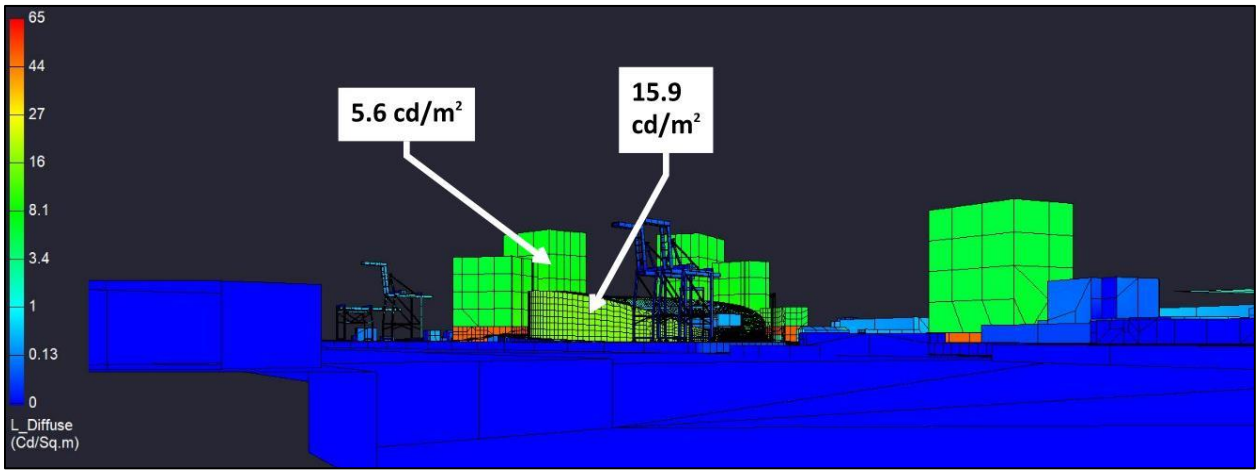


Figure 109: View from Receptor Site 3 for Baseline project, Baseline ballpark height, "Phase 1" scenario Non-Game Pre-Curfew lighting condition

Figure 110 provides the view from Receptor Site 4, which is located at the intersection of MLK and Embarcadero. Facade luminances from this view **are not** anticipated to exceed threshold.

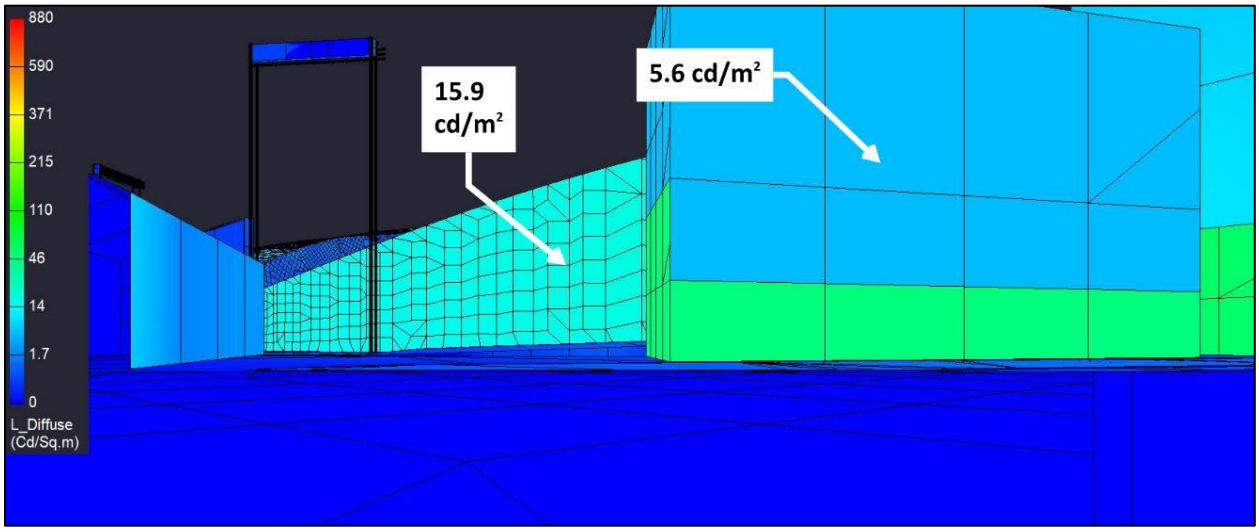


Figure 110: View from Receptor Site 4 for Baseline project, Baseline ballpark height, "Phase 1" scenario Non-Game Pre-Curfew lighting condition

Figure 111 provides the anticipated luminances viewed from Receptor Site 5, which is located on Westbound I880. From this view, the ballpark is anticipated to be mostly blocked. The façade lighting of the adjacent mixed-use development is anticipated to be visible. Therefore, façade luminances from this view **are not** anticipated to exceed threshold.

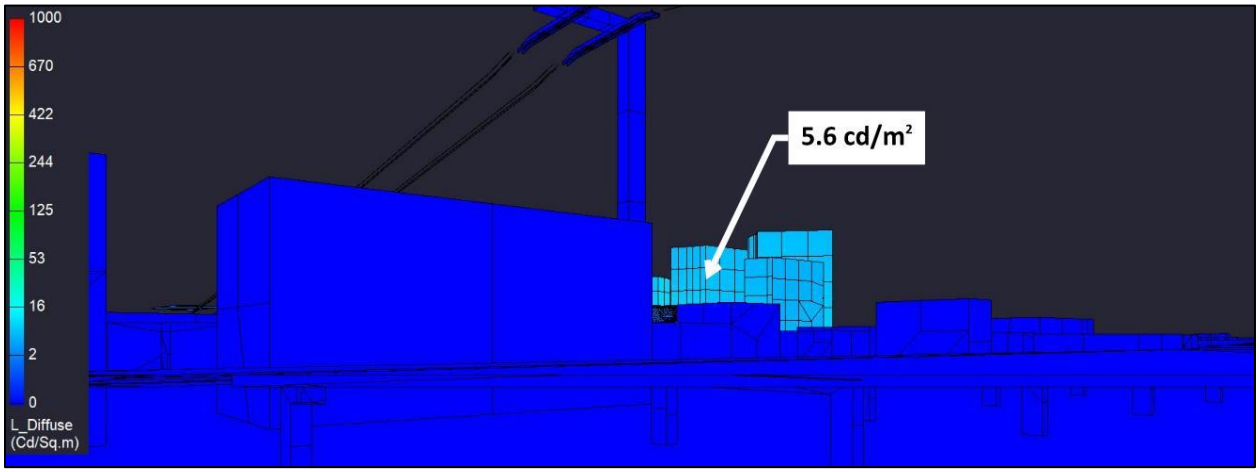


Figure 111: View from Receptor Site 5 for Baseline project, Baseline ballpark height, "Phase 1" scenario Non-Game Pre-Curfew lighting condition

Figure 112 provides the anticipated luminances viewed from Receptor Site 5A, which is located on the southwest corner of the roof of the parking garage located at 2nd and Washington. Façade luminances from this view **are not** anticipated to exceed threshold.

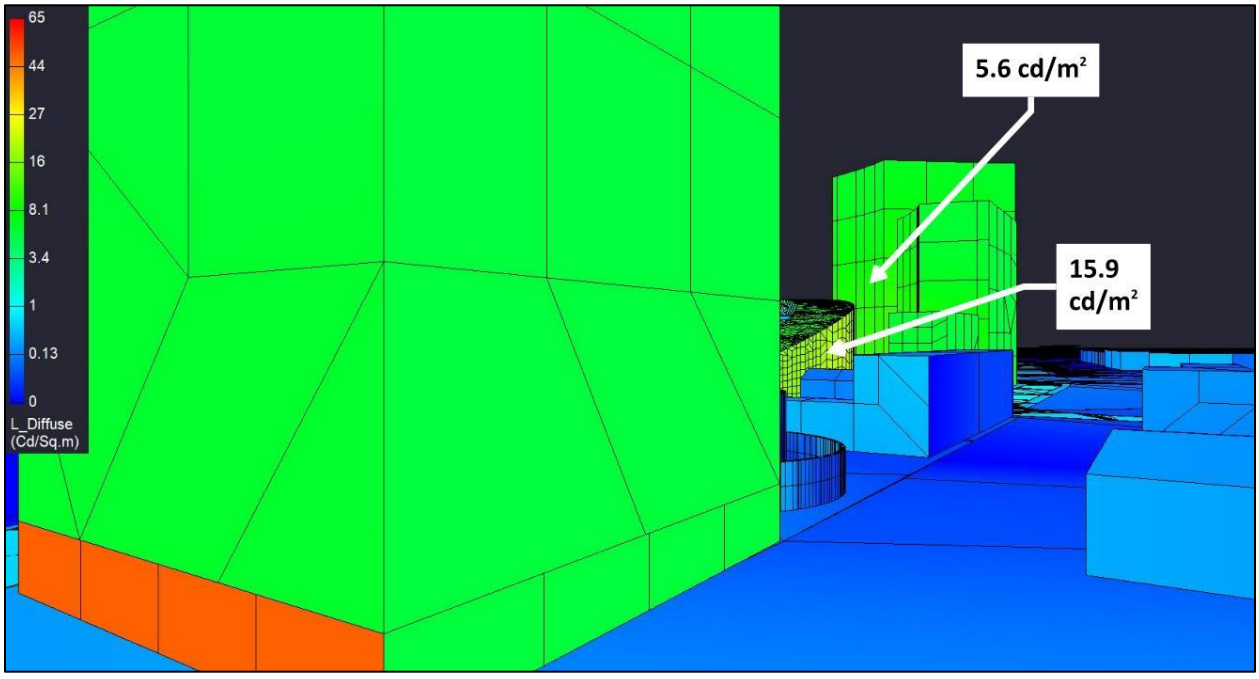


Figure 112: View from Receptor Site 5A for Baseline project, Baseline ballpark height, "Phase 1" scenario Non-Game Pre-Curfew lighting condition

Figure 113 provides the anticipated luminances viewed from Receptor Site 5B, which is located on the southeast corner of the roof of the parking garage looking toward the anticipated gondola station near Jack London Square. Façade luminances from this view **are not** anticipated to exceed threshold.

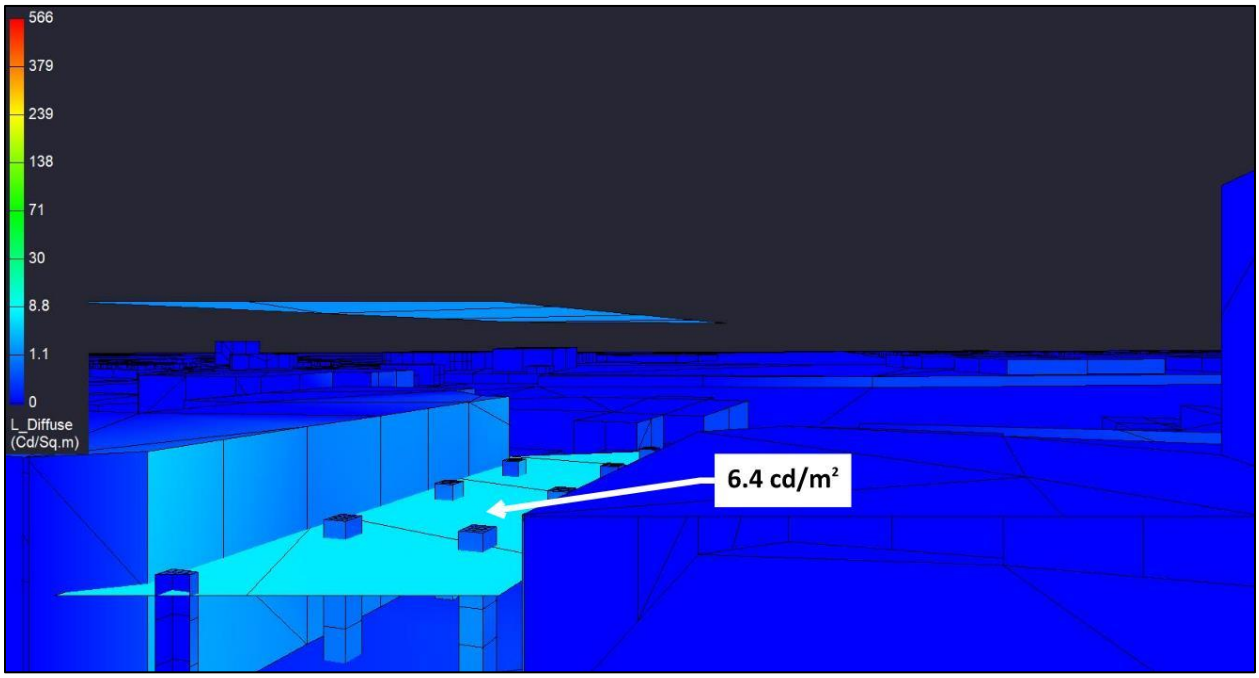


Figure 113: View from Receptor Site 5B for Baseline project, Baseline ballpark height, "Phase 1" scenario Non-Game Pre-Curfew lighting condition

Figure 114 provides the anticipated luminances viewed from Receptor Site 5C, which is located on the northeast corner of the parking garage at 2nd and Washington, looking northeast on the Washington corridor. No architectural lighting is anticipated on the gondola support tower and the Convention Center gondola station is not visible. Therefore, luminances from this view **are not** anticipated to exceed threshold.

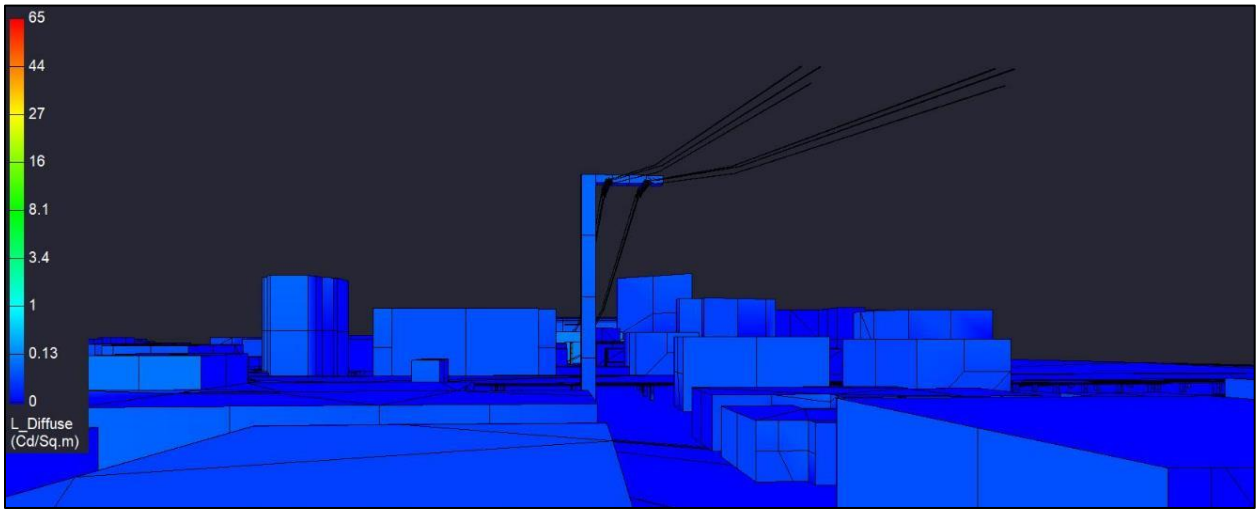


Figure 114: View from Receptor Site 5C for Baseline project, Baseline ballpark height, "Phase 1" scenario Non-Game Pre-Curfew lighting condition

Figure 115 provides the anticipated luminances viewed from Receptor Site 6, which is located on the ramp from I980 to eastbound I880. Façade luminances from this view **are not** anticipated to exceed threshold.

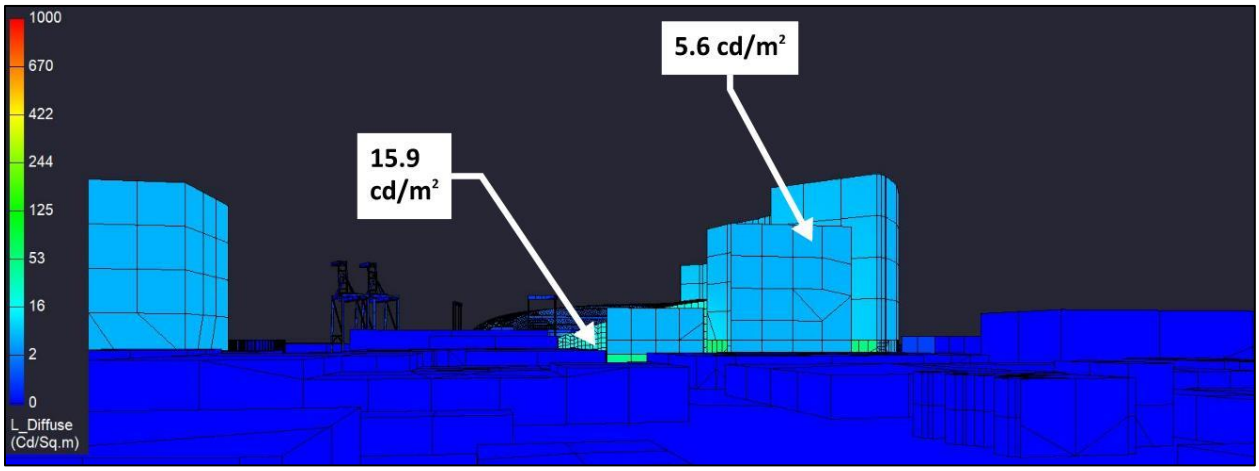


Figure 115: View from Receptor Site 6 for Baseline project, Baseline ballpark height, "Phase 1" scenario Non-Game Pre-Curfew lighting condition

Figure 116 provides the anticipated luminances viewed from Receptor Site 6A, which is located at 7th and Brush. The luminances from this view **are not** anticipated to exceed threshold.

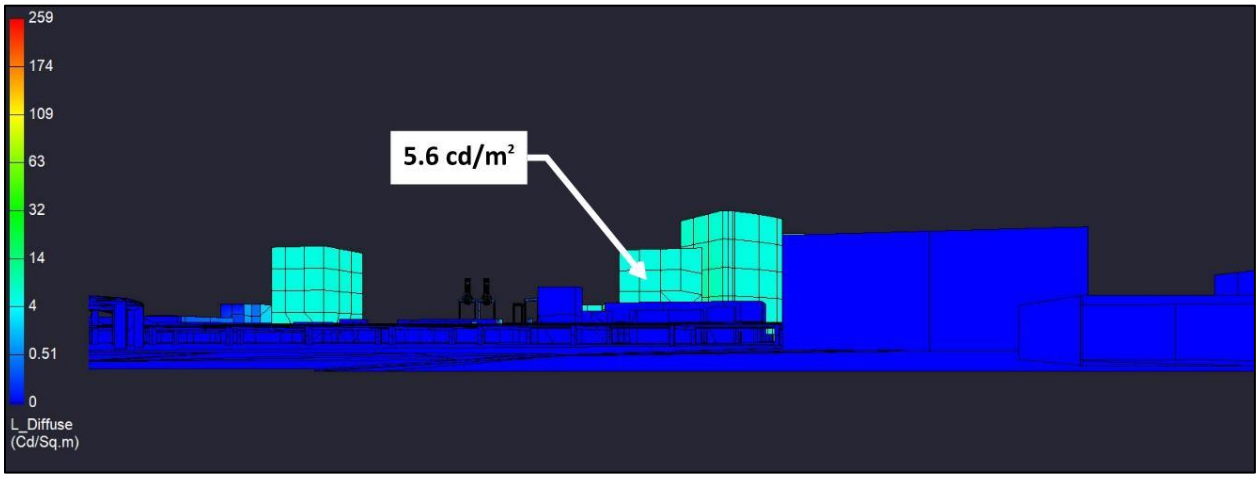


Figure 116: View from Receptor Site 6A for Baseline project, Baseline ballpark height, "Phase 1" scenario Non-Game Pre-Curfew lighting condition

Figure 117 provides the anticipated luminances viewed from Receptor Site 7, which is located at 8th and Washington facing north to the anticipated Convention Center gondola station. From this position, the field of view is anticipated to include the bottom surface of the gondola platform. Therefore, façade luminances from this view **are not** anticipated to exceed threshold.

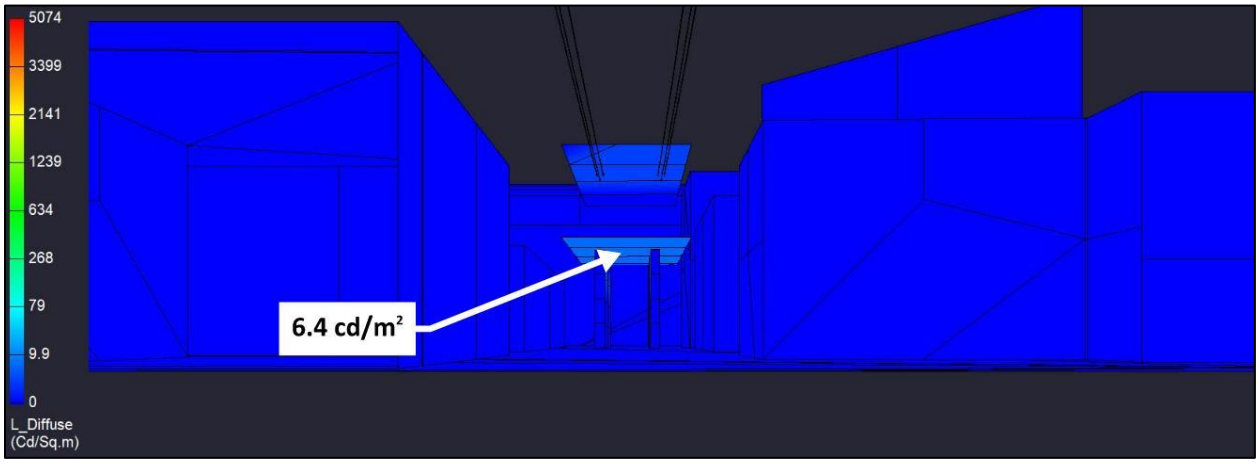


Figure 117: View from Receptor Site 7 for Baseline project, Baseline ballpark height, "Phase 1" scenario Non-Game Pre-Curfew lighting condition

Figure 118 provides the anticipated luminances viewed from Receptor Site 7A, which is located at 8th and Washington facing south toward the gondola support pole. From this position, the field of view is anticipated to include the gondola support pole which is not anticipated to have any architectural lighting. Therefore, façade luminances from this view **are not** anticipated to exceed threshold.

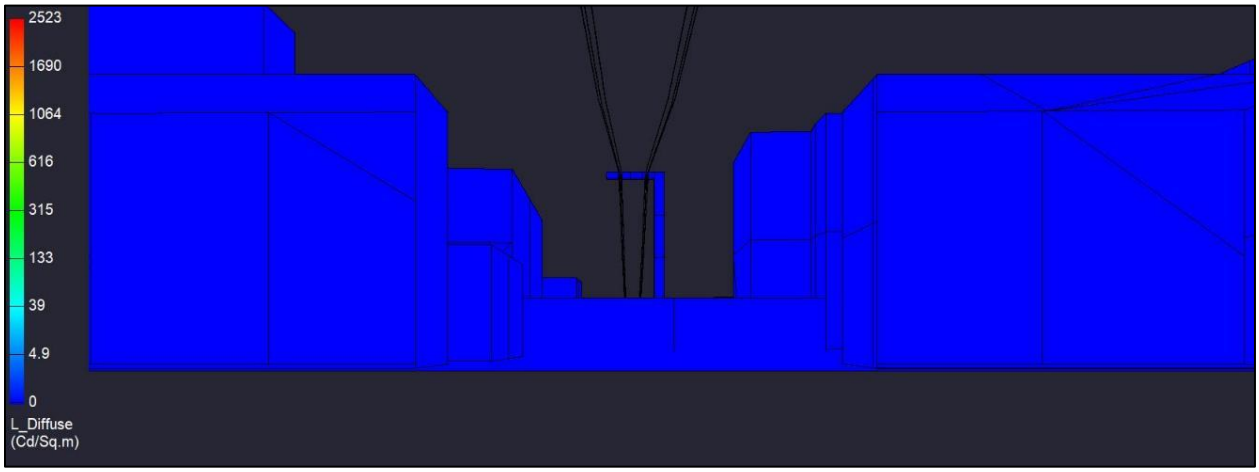


Figure 118: View from Receptor Site 7A for Baseline project, Baseline ballpark height, "Phase 1" scenario Non-Game Pre-Curfew lighting condition

8.1.1.3 Post-Curfew

As described in section 4.5.8, the Post-Curfew lighting condition is anticipated to capture the lighting impacts from curfew to dawn, with architectural and area lighting at reduced levels to respond to reduced activity.

8.1.1.3.1 Spill Light

Table 34 provides the calculation results for the spill light assessment at the receptor sites for this condition. As shown, the proposed lighting **is** anticipated to exceed the lower post-curfew threshold at Receptor Site 1A; however, the lighting for the gondola platform is not anticipated to dim post-curfew based on safety concerns. Additionally, the proposed lighting is anticipated to exceed the lower post-curfew threshold at Receptor Site 5A; this site is very close to the façade of the adjacent mixed-use building, and the impact on this receptor site can likely be reduced through further design refinement. The anticipated spill light at the remaining receptor sites **are not** anticipated to exceed the post-curfew threshold.

Receptor Site	Spill Light, [lux]	Significant
Receptor Site 1 - Water Street at Clay (Facing Ballpark)	3.6	No
Receptor Site 1A - Water Street at Washington (Facing Gondola)	**6.2**	Yes
Receptor Site 2 - Inner Harbor Turning Basin @ 190'	0.3	No
Receptor Site 2A - Turning Basin Line-of-Sight	0.1	No
Receptor Site 2B - Inner Harbor Turning Basin @ 64'	0.3	No
Receptor Site 2C - Inner Harbor Turning Basin @ 25'	0.3	No
Receptor Site 3 - Alameda Dock	0.3	No
Receptor Site 4 - MLK at Embarcadero	3.2	No
Receptor Site 5 - I880 Westbound	0.1	No
Receptor Site 5A - 2nd at Washington (Facing Ballpark)	**5.6**	Yes
Receptor Site 5B - 2nd at Washington (Facing JLS Station)	0.7	No
Receptor Site 5C - 2nd at Washington (Facing Convention Center Station)	0.0	No
Receptor Site 6 - I980 Ramp to Eastbound I880	0.4	No
Receptor Site 6A - 7th at Brush	0.2	No
Receptor Site 7 - 8th at Washington (Facing Convention Center Station)	0.1	No
Receptor Site 7A - 8th at Washington (Facing Tower)	0.0	No

Table 34: Spill light at receptor sites for Baseline project, Baseline ballpark height, “Phase 1” scenario Post-Curfew lighting condition. [Note: Threshold of significance is 5 lux]

8.1.1.3.2 Spill Light Map

Figure 119 provides a spill light map for this lighting condition. To generate the spill light map, vertical calculation points were arrayed around the project site at 5’-6” AFG and oriented toward the pitcher’s mound for reference. The isoline curves show the extent to which vertical light levels are calculated and are reported in lux. As shown, less than 1 vertical lux is expected in the turning basin. The adjacent estuary is anticipated to experience less than 1 vertical lux generally, with light levels increasing closer to shore. For reference, one 60W incandescent light bulb will generate 1 lux at a distance of approximately 8 meters (26 ft).

Figure 119: Spill light map for Baseline project, Baseline ballpark height, “Phase 1” scenario Post-Curfew lighting condition indicating vertical illuminance isolines

8.1.1.3.3 Glare

Figure 120 through Figure 135 illustrate the luminances anticipated to be observed from the identified receptor sites for this lighting condition. Note that the scale associated with each receptor site view approximately matches the scale used for the associated site's existing conditions HDR falsecolor images. Table 35 summarizes the anticipated glare significance at the receptor sites. Additionally, as noted in Section 4.5.3, the modeled retail lighting is included for post-curfew times to capture the impact of exterior façade lighting (assuming interior retail lighting is off) and is subject to glare limitations.

Receptor Site	Facades		Signage	
	Maximum, [cd/m^2]	Significant	Maximum, [cd/m^2]	Significant
Receptor Site 1 - Water Street at Clay (Facing Ballpark)	5.6	No	n/a	n/a
Receptor Site 1A - Water Street at Washington (Facing Gondola)	6.4	No	n/a	n/a
Receptor Site 2 - Inner Harbor Turning Basin @ 190'	5.6	No	n/a	n/a
Receptor Site 2A - Turning Basin Line-of-Sight	5.6	No	n/a	n/a
Receptor Site 2B - Inner Harbor Turning Basin @ 64'	5.6	No	n/a	n/a
Receptor Site 2C - Inner Harbor Turning Basin @ 25'	5.6	No	n/a	n/a
Receptor Site 3 - Alameda Dock	5.6	No	n/a	n/a
Receptor Site 4 - MLK at Embarcadero	5.6	No	n/a	n/a
Receptor Site 5 - I880 Westbound	5.6	No	n/a	n/a
Receptor Site 5A - 2nd at Washington (Facing Ballpark)	5.6	No	n/a	n/a
Receptor Site 5B - 2nd at Washington (Facing JLS Station)	6.4	No	n/a	n/a
Receptor Site 5C - 2nd at Washington (Facing Convention Center Station)	0.0	No	n/a	n/a
Receptor Site 6 - I980 Ramp to Eastbound I880	5.6	No	n/a	n/a
Receptor Site 6A - 7th at Brush	5.6	No	n/a	n/a
Receptor Site 7 - 8th at Washington (Facing Convention Center Station)	6.4	No	n/a	n/a
Receptor Site 7A - 8th at Washington (Facing Tower)	0.0	No	n/a	n/a

Table 35: Summary of anticipated glare significance at receptor sites for the Baseline project, Baseline ballpark height, "Phase 1" scenario Post-Curfew lighting conditions. [Note: Threshold of significance is 25 cd/m^2 for façade lighting and 1,000 cd/m^2 for digital signage]

Figure 120 shows the anticipated luminances viewed from Receptor Site 1, which is one of the closest receptor sites. As seen, from this perspective, without the scoreboard/ribbon boards, "on", overall brightnesses are reduced. Therefore, luminances from this view **<u>are not</u>** anticipated to exceed threshold.

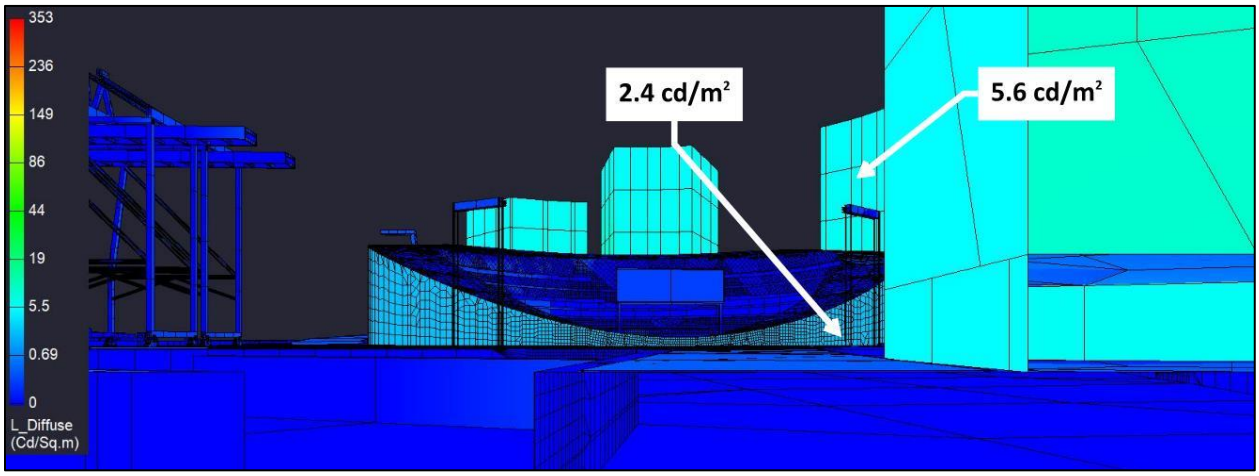


Figure 120: View from Receptor Site 1 for Baseline project, Baseline ballpark height, "Phase 1" scenario Post-Curfew lighting condition

Figure 121 provides a view of the anticipated luminances viewed from Receptor Site 1A, which is facing the proposed gondola station near Jack London Square. Note for calculation purposes, the "sides" of the gondola platform have been turned "off", and the anticipated lighting effect has been applied to the top of the platform floor. Therefore, luminances from this view **<u>are</u>** anticipated to exceed threshold.

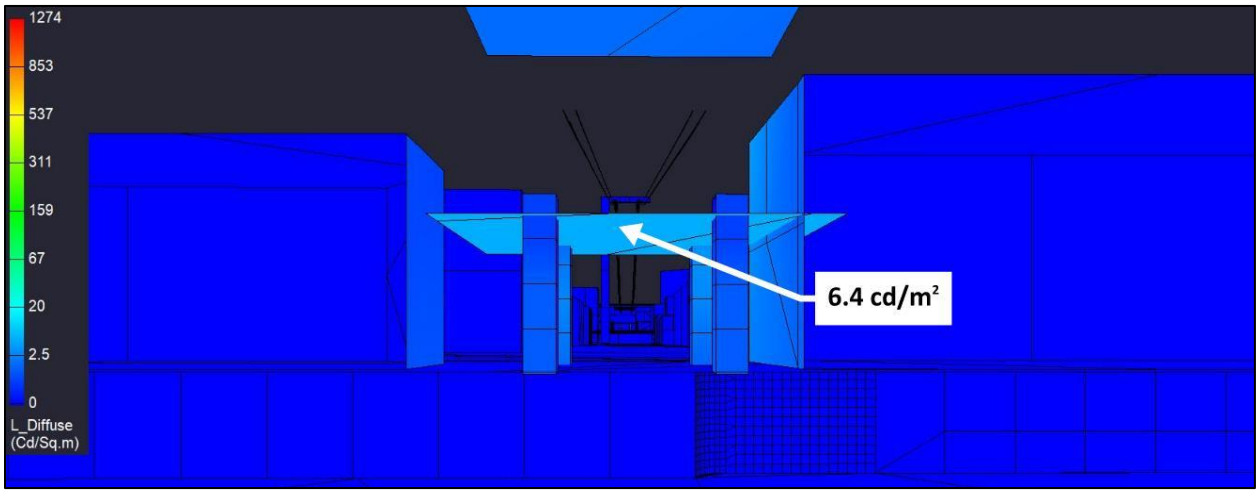


Figure 121: View from Receptor Site 1A for Baseline project, Baseline ballpark height, "Phase 1" scenario Post-Curfew lighting condition

Figure 122 provides the anticipated luminances viewed from Receptor Site 2, which is centered in the turning basin and located 190’ above the water line. Façade luminances from this view **are not** anticipated to exceed threshold.

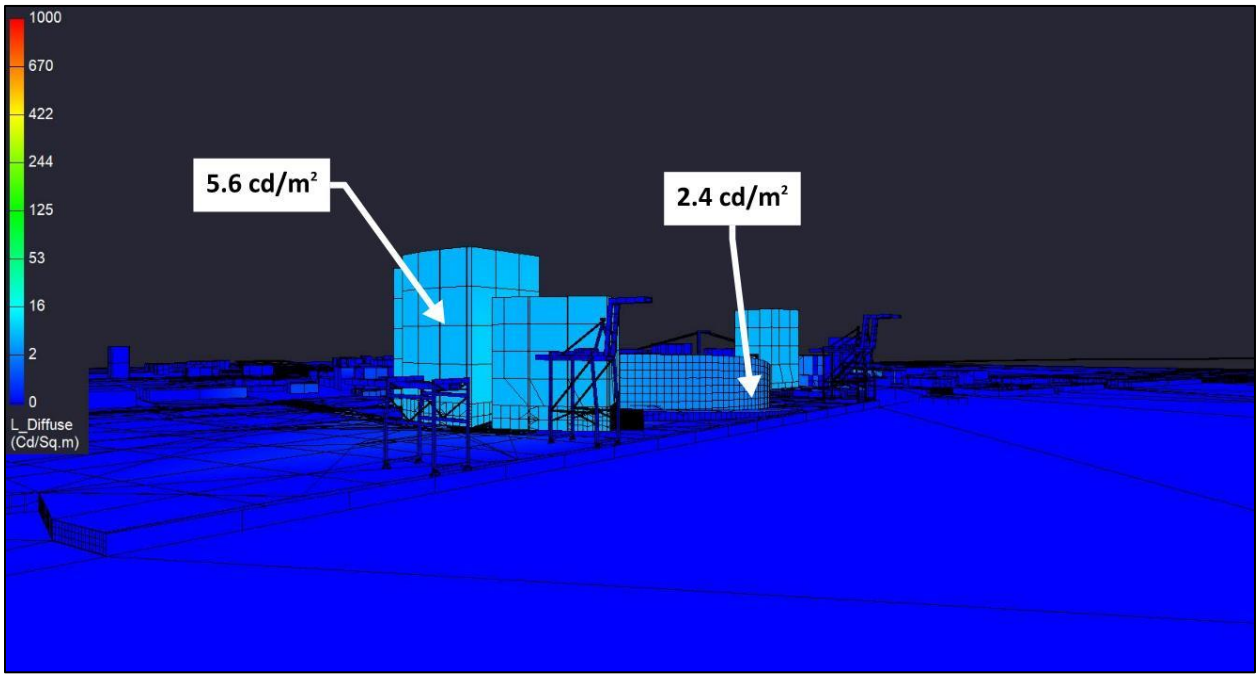


Figure 122: View from Receptor Site 2 for Baseline project, Baseline ballpark height, “Phase 1” scenario Post-Curfew lighting condition

Figure 123 provides the anticipated luminances viewed from Receptor Site 2A, which is on Alameda with a direct line of site through the center of the turning basin. From this view **are not** anticipated to exceed threshold.

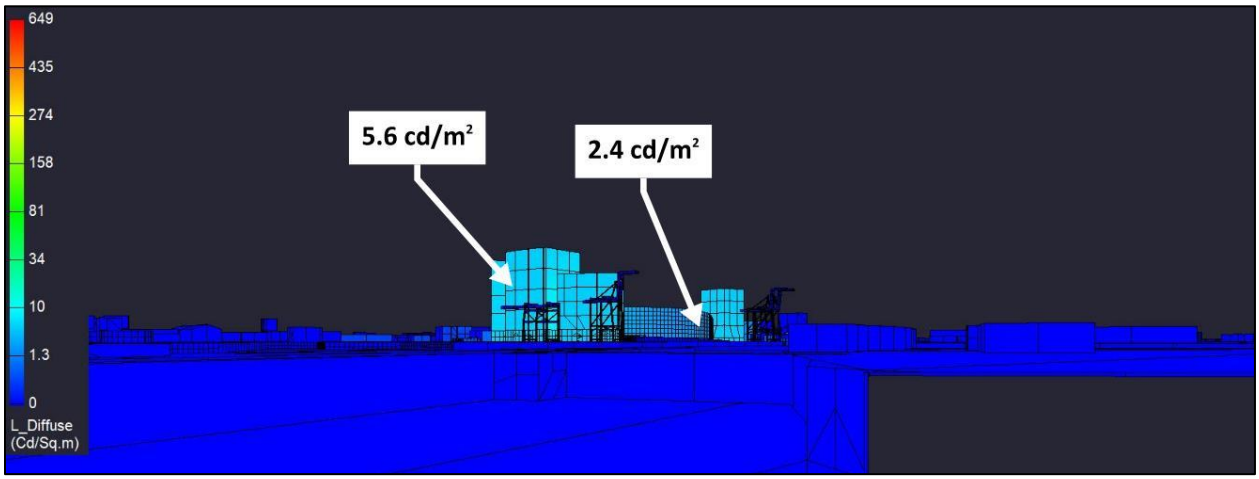


Figure 123: View from Receptor Site 2A for Baseline project, Baseline ballpark height, “Phase 1” scenario Post-Curfew lighting condition

Figure 124 provides the anticipated luminances viewed from Receptor Site 2B, which is centered in the turning basin and located 64’ above the water line. Façade luminances from this view **are not** anticipated to exceed threshold.

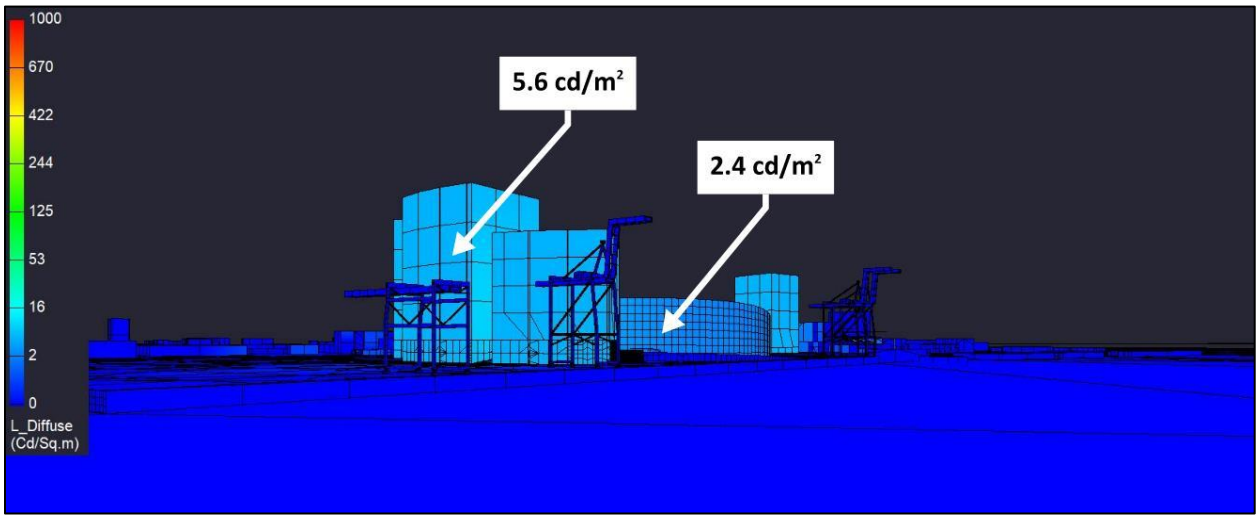


Figure 124: View from Receptor Site 2B for Baseline project, Baseline ballpark height, “Phase 1” scenario Post-Curfew lighting condition

Figure 125 provides the anticipated luminances viewed from Receptor Site 2C, which is centered in the turning basin and located 25’ above the water line. Façade luminances from this view **are not** anticipated to exceed threshold.

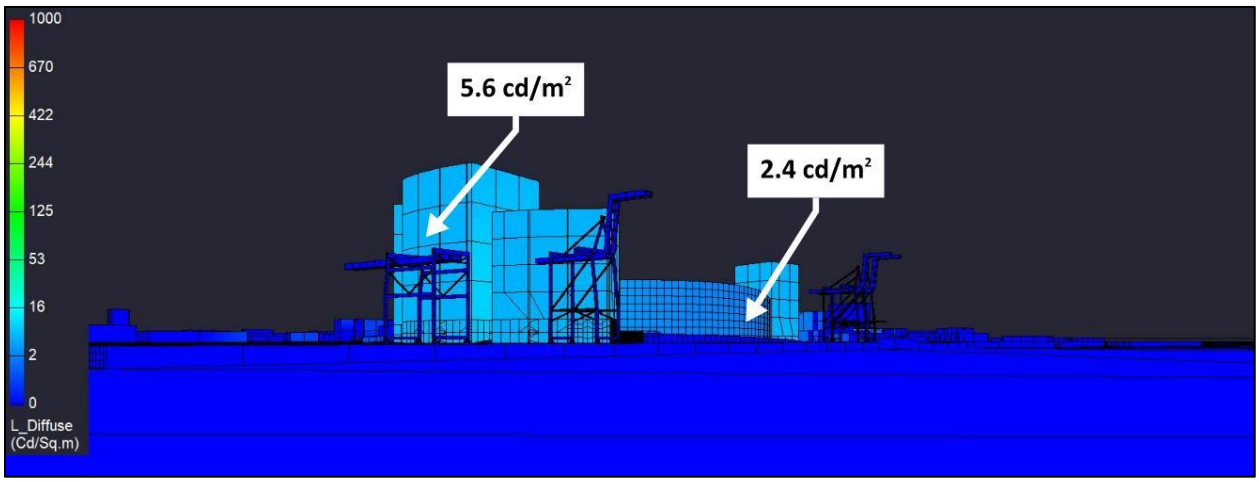


Figure 125: View from Receptor Site 2C for Baseline project, Baseline ballpark height, “Phase 1” scenario Post-Curfew lighting condition

Figure 126 provides the anticipated luminances viewed from Receptor Site 3, which is located on Alameda and facing northwest toward the property. Luminances from this view **are not** anticipated to exceed threshold.

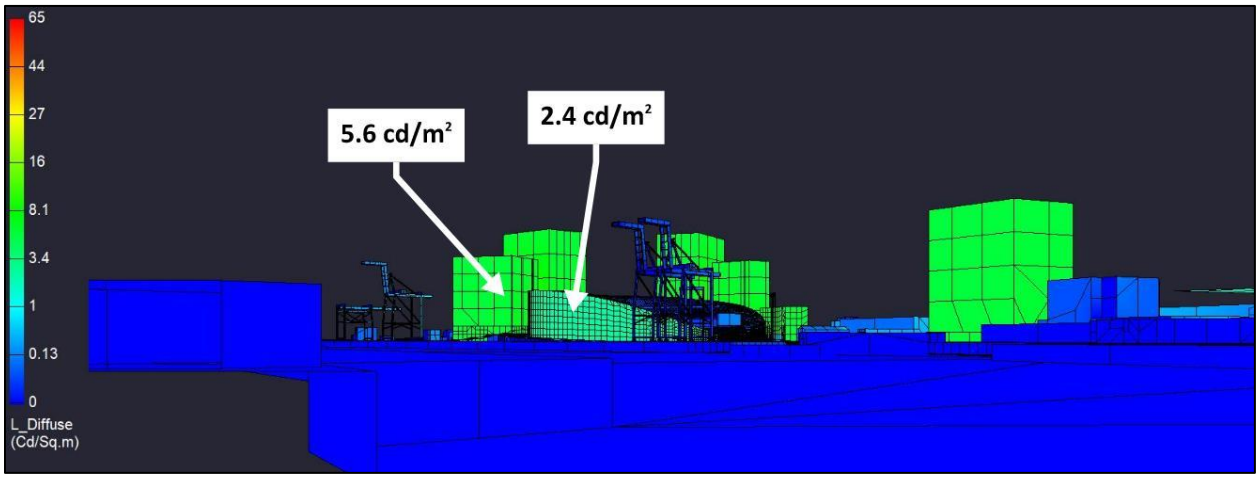


Figure 126: View from Receptor Site 3 for Baseline project Hight Roof "Phase 1" scenario Post-Curfew lighting condition

Figure 93 provides the view from Receptor Site 4, which is located at the intersection of MLK and Embarcadero. Luminances from this view **are not** anticipated to exceed threshold.

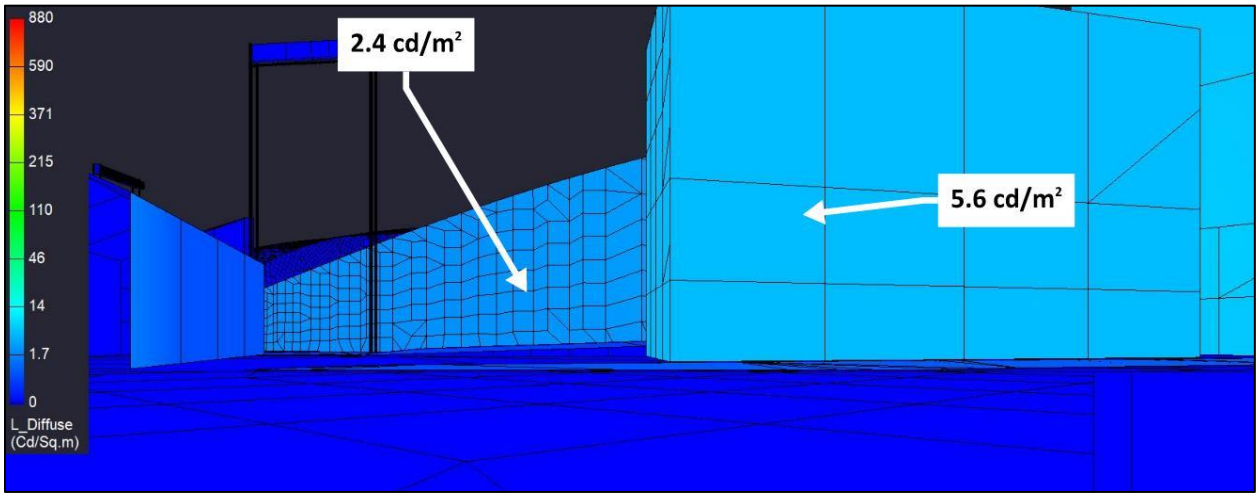


Figure 127: View from Receptor Site 4 for Baseline project, Baseline ballpark height, "Phase 1" scenario Post-Curfew lighting condition

Figure 128 provides the anticipated luminances viewed from Receptor Site 5, which is located on Westbound I880. From this view, the ballpark and sports lighting are anticipated to be almost entirely blocked. The façade lighting of the adjacent mixed-use development is anticipated to be visible. Therefore, luminances from this view, excluding the interior retail lighting, **are not** anticipated to exceed threshold.

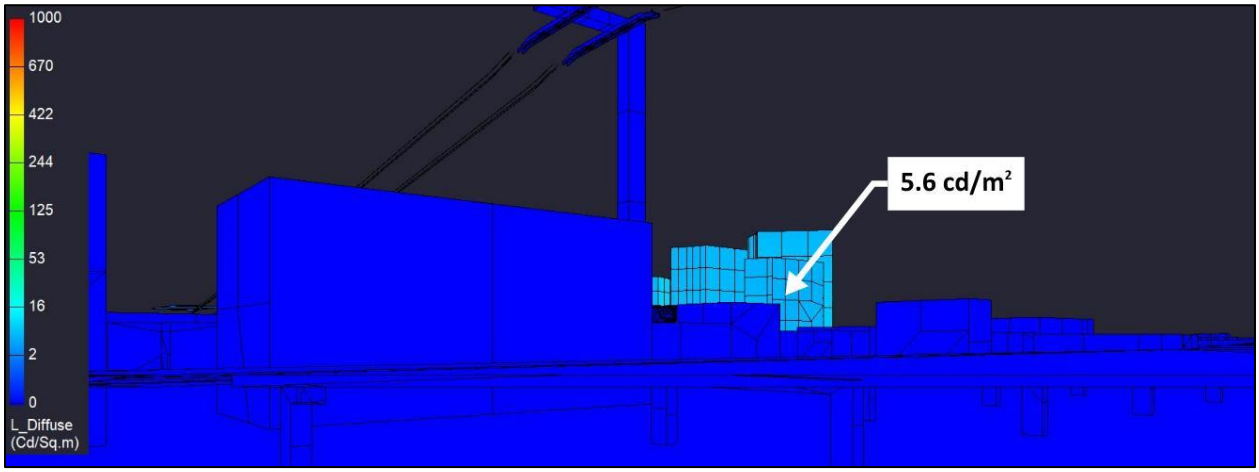


Figure 128: View from Receptor Site 5 for Baseline project, Baseline ballpark height, "Phase 1" scenario Post-Curfew lighting condition

Figure 129 provides the anticipated luminances viewed from Receptor Site 5A, which is located on the southwest corner of the roof of the parking garage located at 2nd and Washington. Luminances from this view **are not** anticipated to exceed threshold.

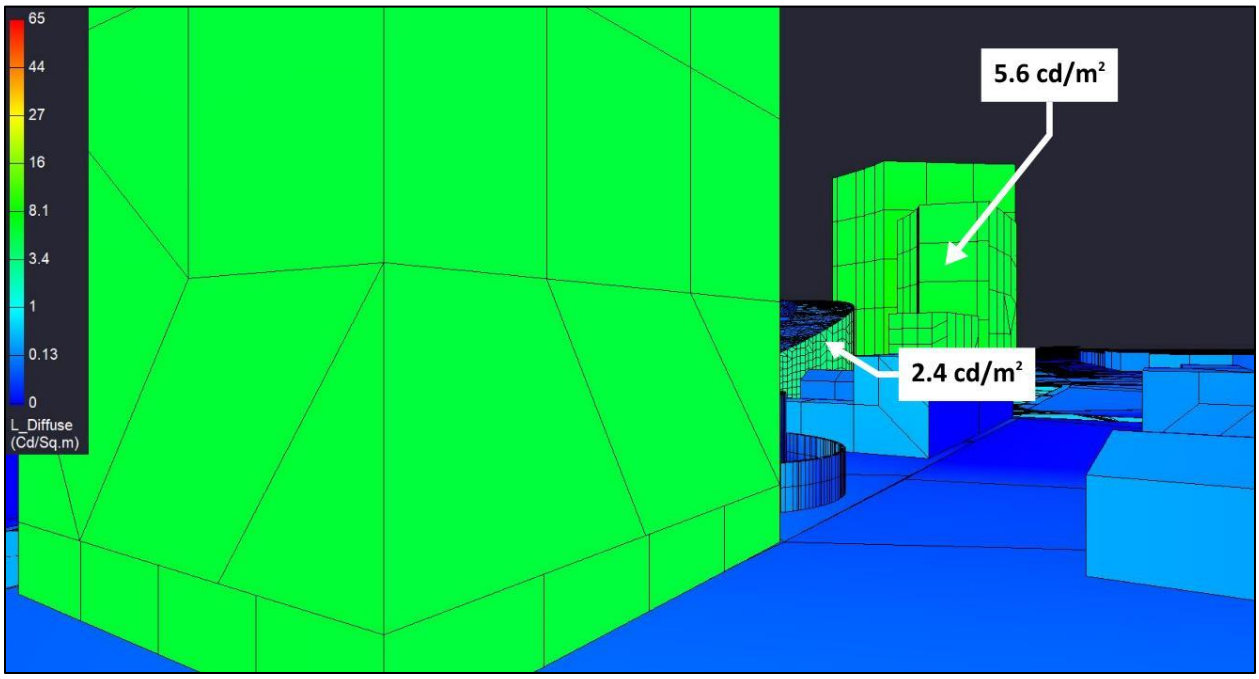


Figure 129: View from Receptor Site 5A for Baseline project, Baseline ballpark height, "Phase 1" scenario Post-Curfew lighting condition

Figure 130 provides the anticipated luminances viewed from Receptor Site 5B, which is located on the southeast corner of the roof of the parking garage looking toward the anticipated gondola station near Jack London Square. Luminances from this view **are not** anticipated to exceed threshold.

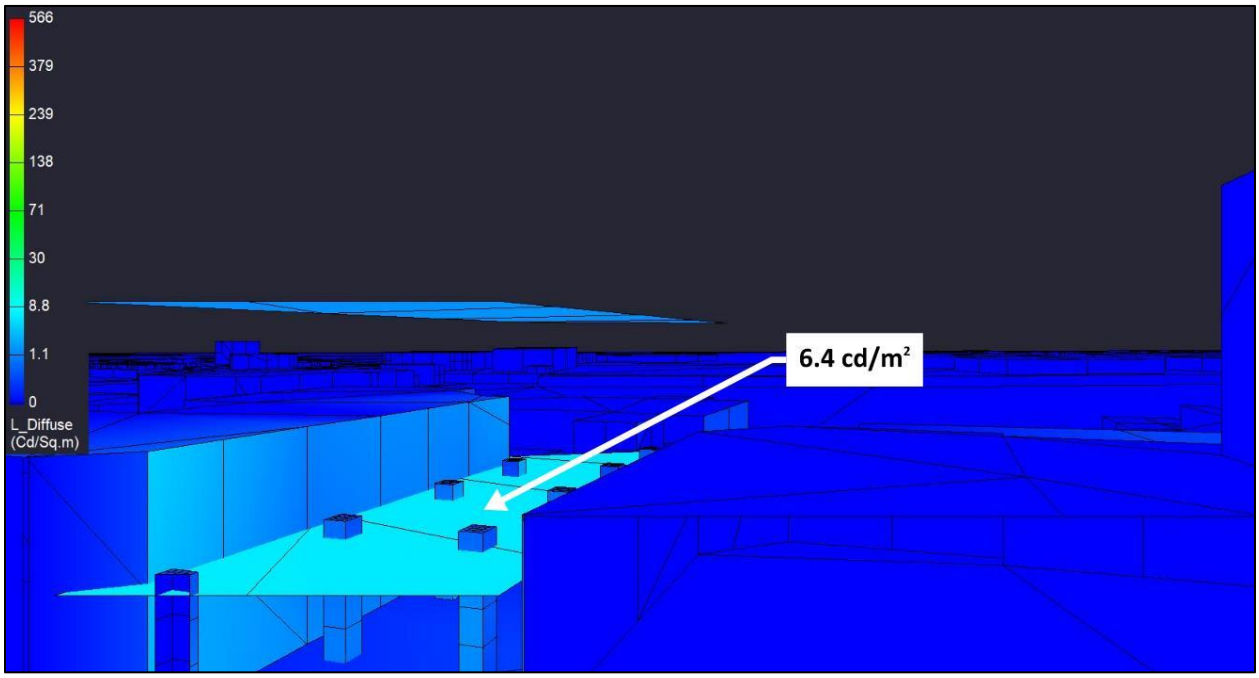


Figure 130: View from Receptor Site 5B for Baseline project, Baseline ballpark height, "Phase 1" scenario Post-Curfew lighting condition

Figure 131 provides the anticipated luminances viewed from Receptor Site 5C, which is located on the northeast corner of the parking garage at 2nd and Washington, looking northeast on the Washington corridor. No architectural lighting is anticipated on the gondola support tower and the Convention Center gondola station is not visible. Therefore, luminances from this view **are not** anticipated to exceed threshold.

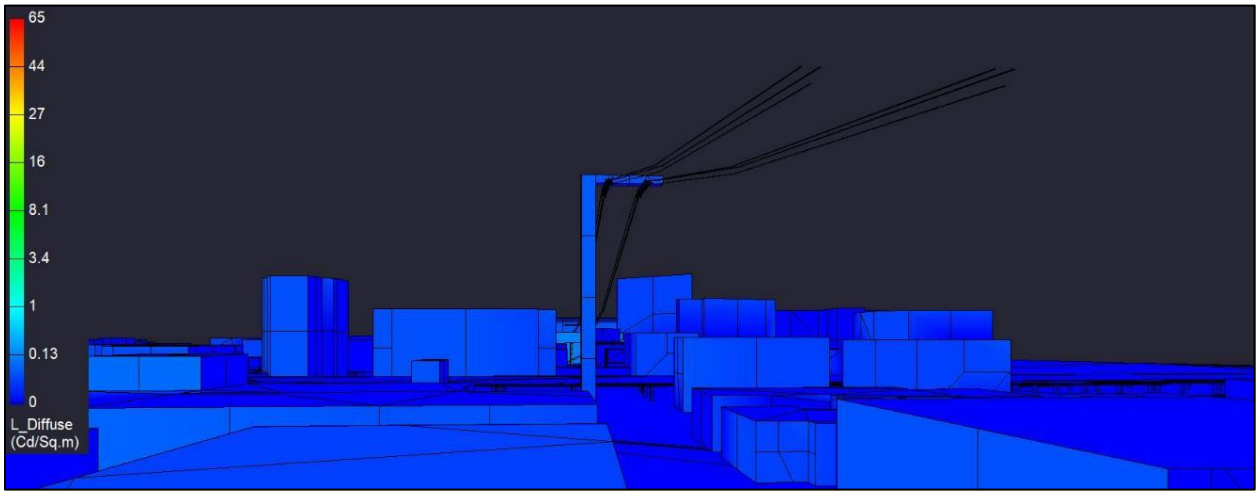


Figure 131: View from Receptor Site 5C for Baseline project, Baseline ballpark height, "Phase 1" scenario Post-Curfew lighting condition

Figure 132 provides the anticipated luminances viewed from Receptor Site 6, which is located on the ramp from I980 to eastbound I880. Luminances from this view **are not** anticipated to exceed threshold.

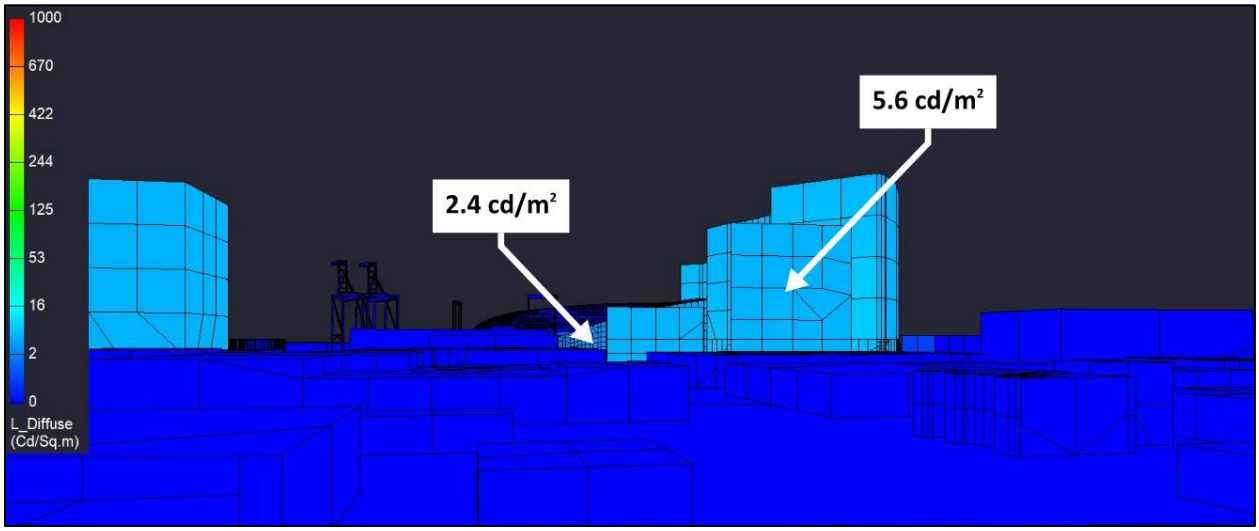


Figure 132: View from Receptor Site 6 for Baseline project, Baseline ballpark height, "Phase 1" scenario Post-Curfew lighting condition

Figure 133 provides the anticipated luminances viewed from Receptor Site 6A, which is located at 7th and Brush. The luminances from this view **are not** anticipated to exceed threshold.

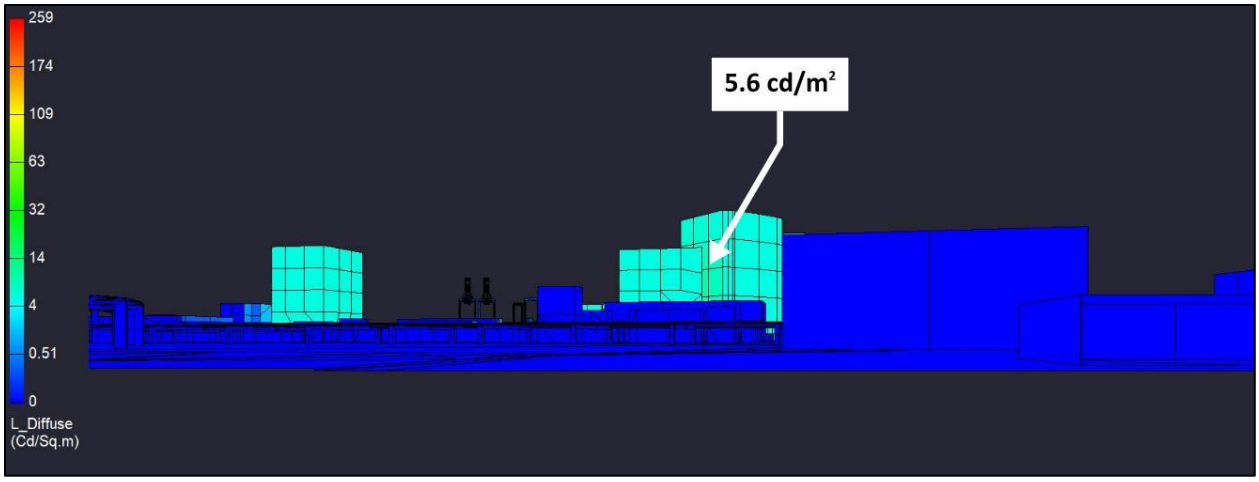


Figure 133: View from Receptor Site 6A for Baseline project, Baseline ballpark height, "Phase 1" scenario Post-Curfew lighting condition

Figure 134 provides the anticipated luminances viewed from Receptor Site 7, which is located at 8th and Washington facing north to the anticipated Convention Center gondola station. From this position, the field of view is anticipated to include the bottom surface of the gondola platform. Therefore, luminances from this view **are not** anticipated to exceed threshold.

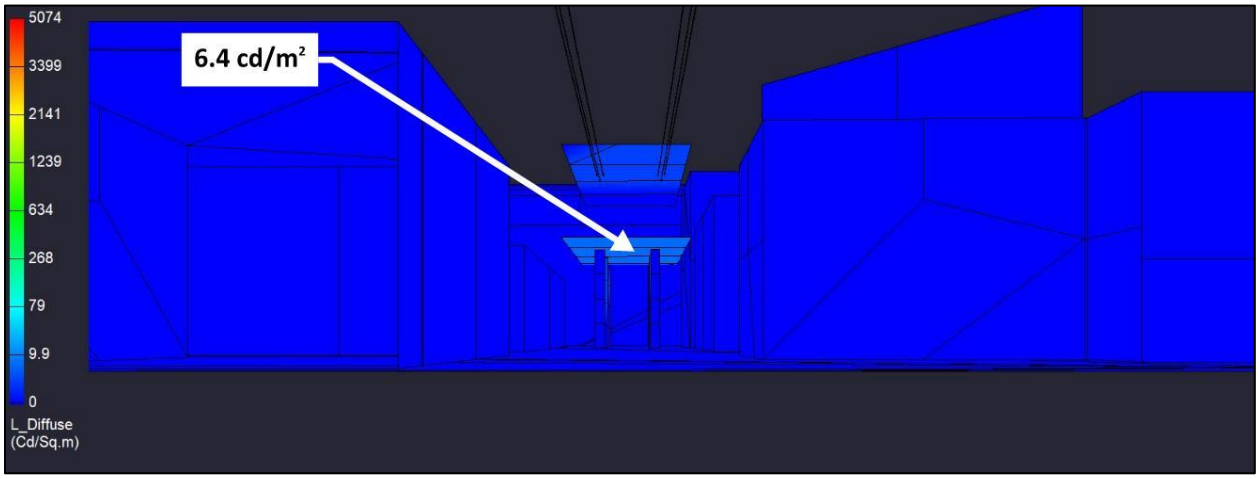


Figure 134: View from Receptor Site 7 for Baseline project, Baseline ballpark height, "Phase 1" scenario Post-Curfew lighting condition

Figure 135 provides the anticipated luminances viewed from Receptor Site 7A, which is located at 8th and Washington facing south toward the gondola support pole. From this position, the field of view is anticipated to include the gondola support pole which is not anticipated to have any architectural lighting. Therefore, luminances from this view **are not** anticipated to exceed threshold.

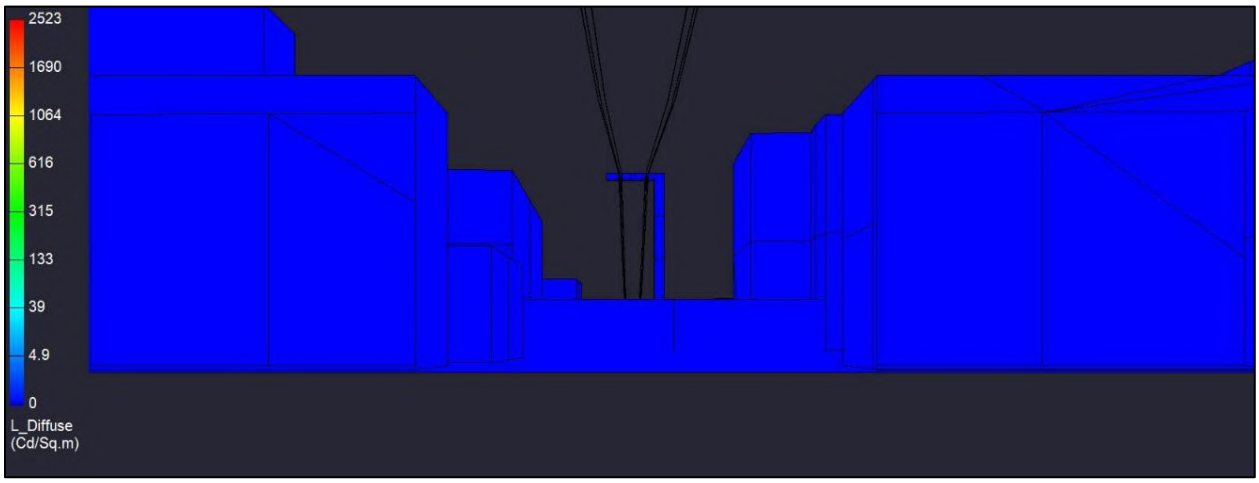


Figure 135: View from Receptor Site 7A for Baseline project, Baseline ballpark height, "Phase 1" scenario Post-Curfew lighting condition

8.1.2 "Full Buildout" Scenario

Per the project description included in section 03.1, the "Full Buildout" scenario includes the ballpark and the full site buildout. This scenario is intended to capture the cumulative effects of the entire development.

8.1.2.1 Game Nights

As described in section 4.5.8, the Game Night lighting condition is anticipated to include all lighting "on", including sports and house lighting, and included identified signage locations.

8.1.2.1.1 Spill Light

Table 36 provides the calculation results for the spill light assessment at the receptor sites for this condition. As shown, the proposed lighting **is** anticipated to exceed the spill light threshold at Receptor Site 1, which has a direct view of the scoreboard and ribbon boards, and "halo" sports lights. All other receptor site spill light **is not** anticipated to exceed threshold.

Receptor Site	Spill Light, [lux]	Significant
Receptor Site 1 - Water Street at Clay (Facing Ballpark)	**41.8**	**Yes**
Receptor Site 1A - Water Street at Washington (Facing Gondola)	6.2	No
Receptor Site 2 - Inner Harbor Turning Basin @ 190'	1.8	No
Receptor Site 2A - Turning Basin Line-of-Sight	0.5	No
Receptor Site 2B - Inner Harbor Turning Basin @ 64'	1.6	No
Receptor Site 2C - Inner Harbor Turning Basin @ 25'	1.5	No
Receptor Site 3 - Alameda Dock	3.2	No
Receptor Site 4 - MLK at Embarcadero	12.0	No
Receptor Site 5 - I880 Westbound	0.5	No
Receptor Site 5A - 2nd at Washington (Facing Ballpark)	7.4	No
Receptor Site 5B - 2nd at Washington (Facing JLS Station)	0.7	No
Receptor Site 5C - 2nd at Washington (Facing Convention Center Station)	0.1	No
Receptor Site 6 - I980 Ramp to Eastbound I880	2.7	No
Receptor Site 6A - 7th at Brush	0.5	No
Receptor Site 7 - 8th at Washington (Facing Convention Center Station)	0.1	No
Receptor Site 7A - 8th at Washington (Facing Tower)	0.0	No

Table 36: Spill light at receptor sites for Baseline project, Baseline ballpark height, "Full Buildout" scenario Game Night lighting condition. [Note: Threshold of significance is 25 lux]

8.1.2.1.2 Spill Light Map

Figure 136 provides a spill light map for this lighting condition. To generate the spill light map, vertical calculation points were arrayed around the project site at 5’-6” AFG and oriented toward the pitcher’s mound for reference. The isoline curves show the extent to which vertical light levels are calculated and are reported in lux. As shown, less than 1 vertical lux is expected in the majority of the turning basin. The adjacent estuary is anticipated to experience between 1 and 5 vertical lux generally, with light levels increasing closer to shore. For reference, one 60W incandescent light bulb will generate 1 lux at a distance of approximately 8 meters (26 ft).

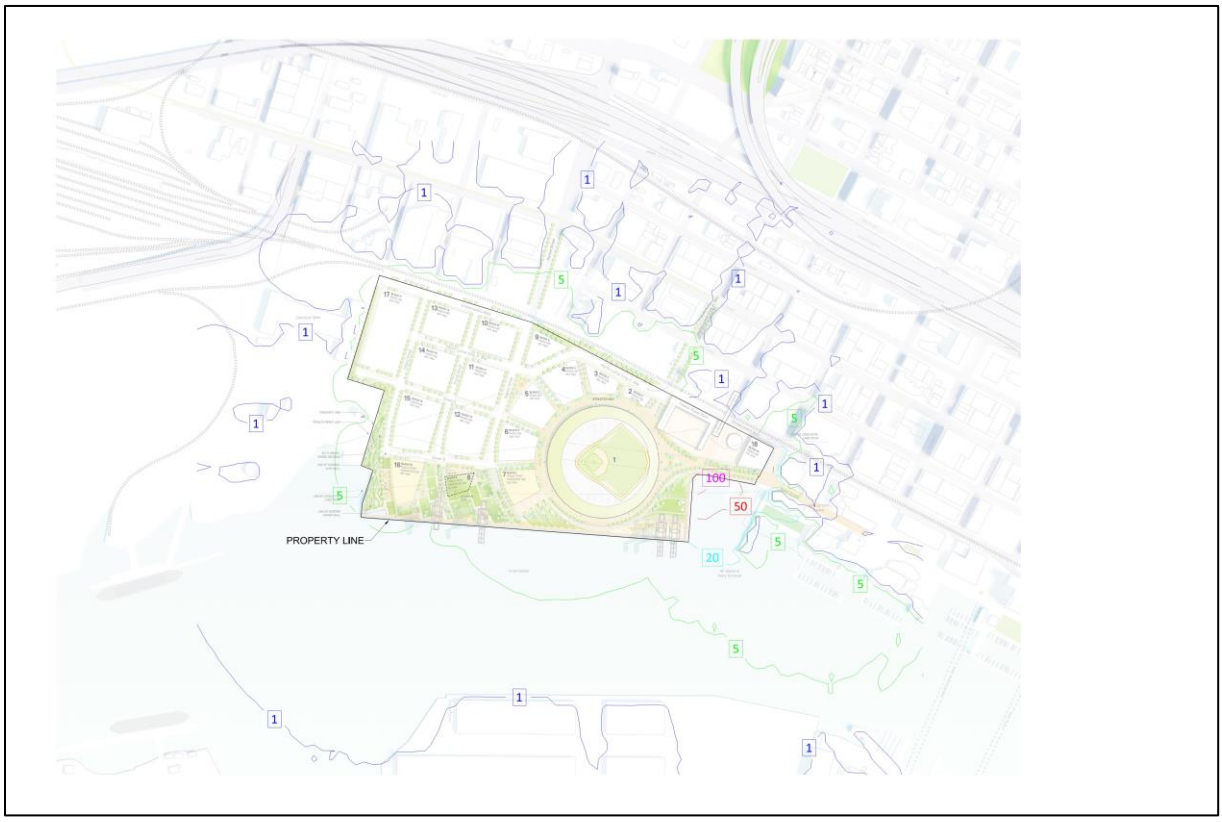


Figure 136: Spill light map for Baseline project, Baseline ballpark height, “Full Buildout” scenario Game Night lighting condition indicating vertical illuminance isolines

8.1.2.1.3 Glare

Figure 137 through Figure 152 illustrate the luminances anticipated to be observed from the identified receptor sites for this lighting condition. Note that the scale associated with each receptor site view approximately matches the scale used for the associated site's existing conditions HDR falsecolor images. Table 37 summarizes the anticipated glare significance at the receptor sites. Additionally, as noted in Section 4.5.3, the modeled retail lighting is included for pre-curfew times to capture the impact of interior lighting emanating through windows as a conservative contribution to spill light assessment; the modeled luminance, therefore, is an interior luminance and not subject to glare limitations directly.

Receptor Site	Facades		Signage	
	Maximum, [cd/m^2]	Significant	Maximum, [cd/m^2]	Significant
Receptor Site 1 - Water Street at Clay (Facing Ballpark)	15.9	No	3,500	Yes
Receptor Site 1A - Water Street at Washington (Facing Gondola)	6.4	No	n/a	n/a
Receptor Site 2 - Inner Harbor Turning Basin @ 190'	15.9	No	n/a	n/a
Receptor Site 2A - Turning Basin Line-of-Sight	15.9	No	n/a	n/a
Receptor Site 2B - Inner Harbor Turning Basin @ 64'	15.9	No	n/a	n/a
Receptor Site 2C - Inner Harbor Turning Basin @ 25'	15.9	No	n/a	n/a
Receptor Site 3 - Alameda Dock	15.9	No	3,500	Yes
Receptor Site 4 - MLK at Embarcadero	15.9	No	3,500	Yes
Receptor Site 5 - I880 Westbound	15.9	No	n/a	n/a
Receptor Site 5A - 2nd at Washington (Facing Ballpark)	15.9	No	3,500	Yes
Receptor Site 5B - 2nd at Washington (Facing JLS Station)	6.4	No	n/a	n/a
Receptor Site 5C - 2nd at Washington (Facing Convention Center Station)	1.6	No	n/a	n/a
Receptor Site 6 - I980 Ramp to Eastbound I880	15.9	No	3,500	Yes
Receptor Site 6A - 7th at Brush	15.9	No	3,500	Yes
Receptor Site 7 - 8th at Washington (Facing Convention Center Station)	6.4	No	n/a	n/a
Receptor Site 7A - 8th at Washington (Facing Tower)	0.0	No	n/a	n/a

Table 37: Summary of anticipated glare significance at receptor sites for the Baseline project, Baseline ballpark height, "Full Buildout" scenario Game Night lighting conditions. [Note: Threshold of significance is 25 cd/m^2 for façade lighting and 1,000 cd/m^2 for digital signage]

Figure 137 shows the anticipated luminances viewed from Receptor Site 1, which is one of the closest receptor sites. As seen, from this perspective, there is a direct view into the ballpark, and of the scoreboard and ribbon boards. Therefore, façade luminances **are not** anticipated to exceed threshold and luminances from this view **are** anticipated to exceed threshold.

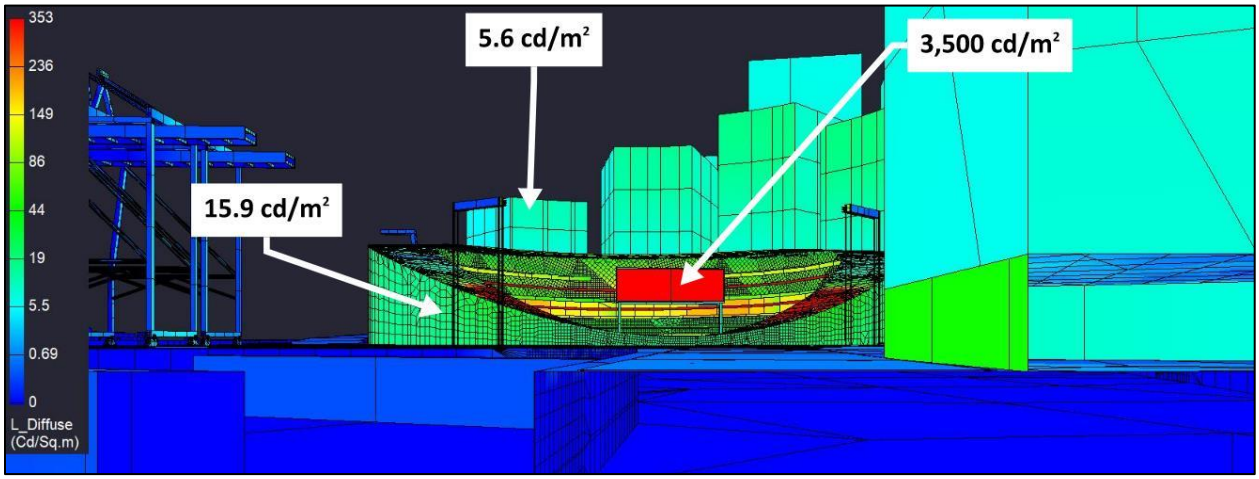


Figure 137: View from Receptor Site 1 for Baseline project, Baseline ballpark height, "Full Buildout" scenario Game Night lighting condition

Figure 138 provides a view of the anticipated luminances viewed from Receptor Site 1A, which is facing the proposed gondola station near Jack London Square. Note for calculation purposes, the "sides" of the gondola platform have been turned "off", and the anticipated lighting effect has been applied to the top of the platform floor. Therefore, façade luminances from this view **are not** anticipated to exceed threshold.

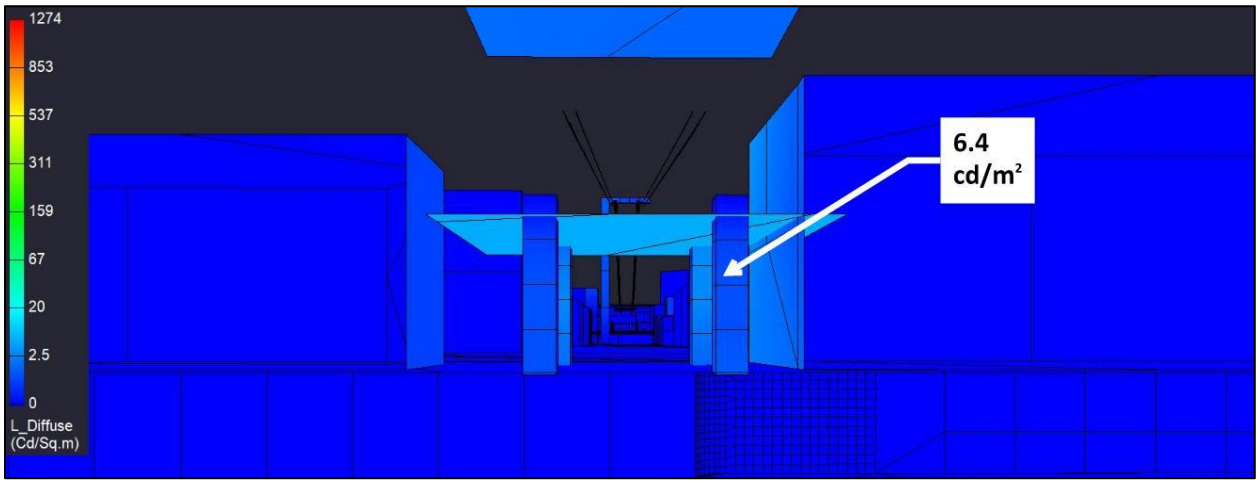


Figure 138: View from Receptor Site 1A for Baseline project, Baseline ballpark height, "Full Buildout" scenario Game Night lighting condition

Figure 139 provides the anticipated luminances viewed from Receptor Site 2, which is centered in the turning basin and located 190’ above the water line. As shown, based on the ballpark geometry, there is not anticipated to be a direct view of the field luminaires, significantly reducing the observed brightnesses in the field of view. Refer to further discussion on this topic in section 6.2.1 above. The façade luminances from this view **are not** anticipated to exceed threshold.

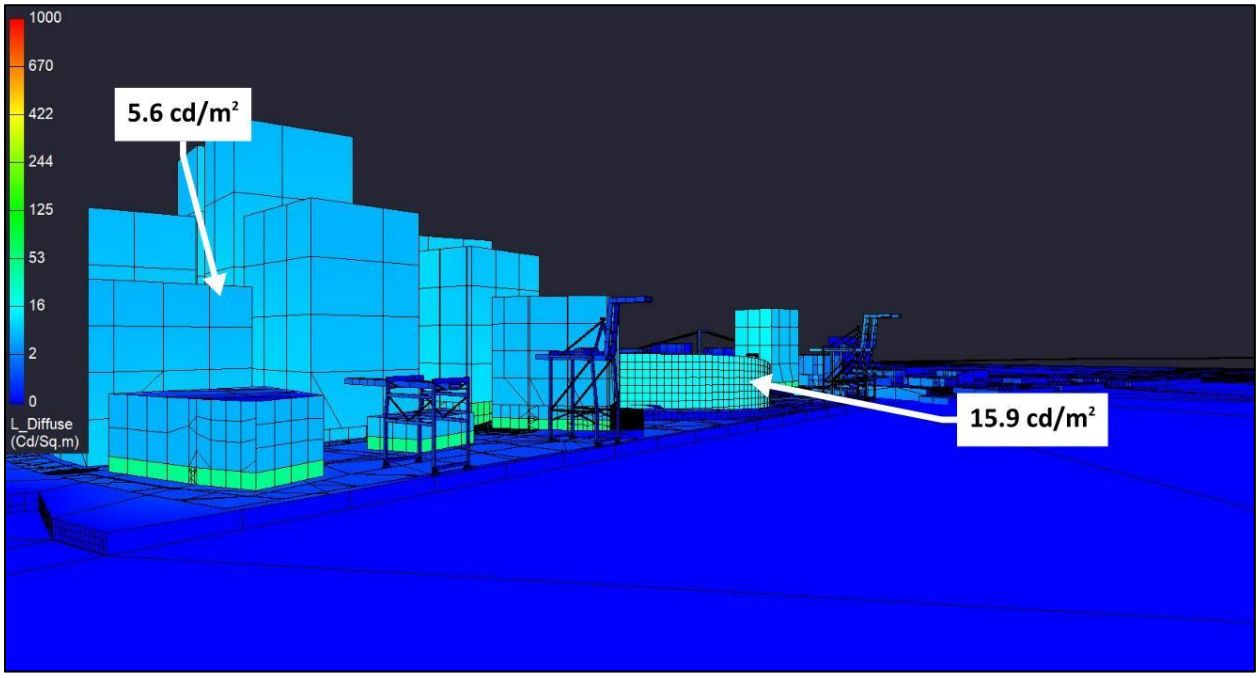


Figure 139: View from Receptor Site 2 for Baseline project, Baseline ballpark height, “Full Buildout” scenario Game Night lighting condition

Figure 140 provides the anticipated luminances viewed from Receptor Site 2A, which is on Alameda with a direct line of site through the center of the turning basin. Similar to Receptor Site 2, based on the ballpark geometry, there is no direct line of site to the scoreboard or ribbon boards. façade luminances from this view **are not** anticipated to exceed threshold.

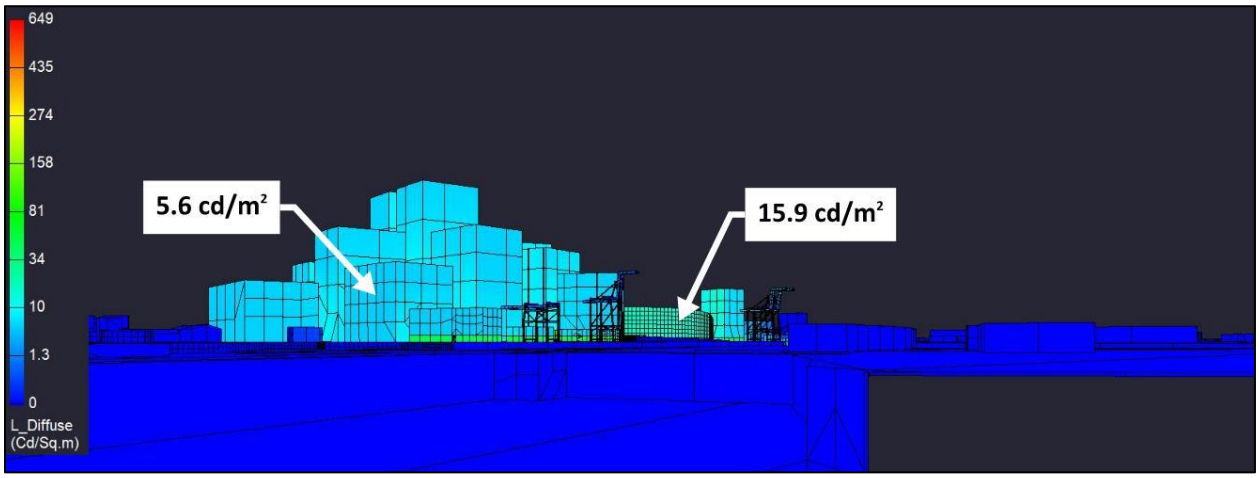


Figure 140: View from Receptor Site 2A for Baseline project, Baseline ballpark height, “Full Buildout” scenario Game Night lighting condition

Figure 141 provides the anticipated luminances viewed from Receptor Site 2B, which is centered in the turning basin and located 64' above the water line. As shown, based on the ballpark geometry, there is not anticipated to be a direct view of the sports lighting, scoreboard or ribbon boards. The façade luminances from this view **are not** anticipated to exceed threshold.

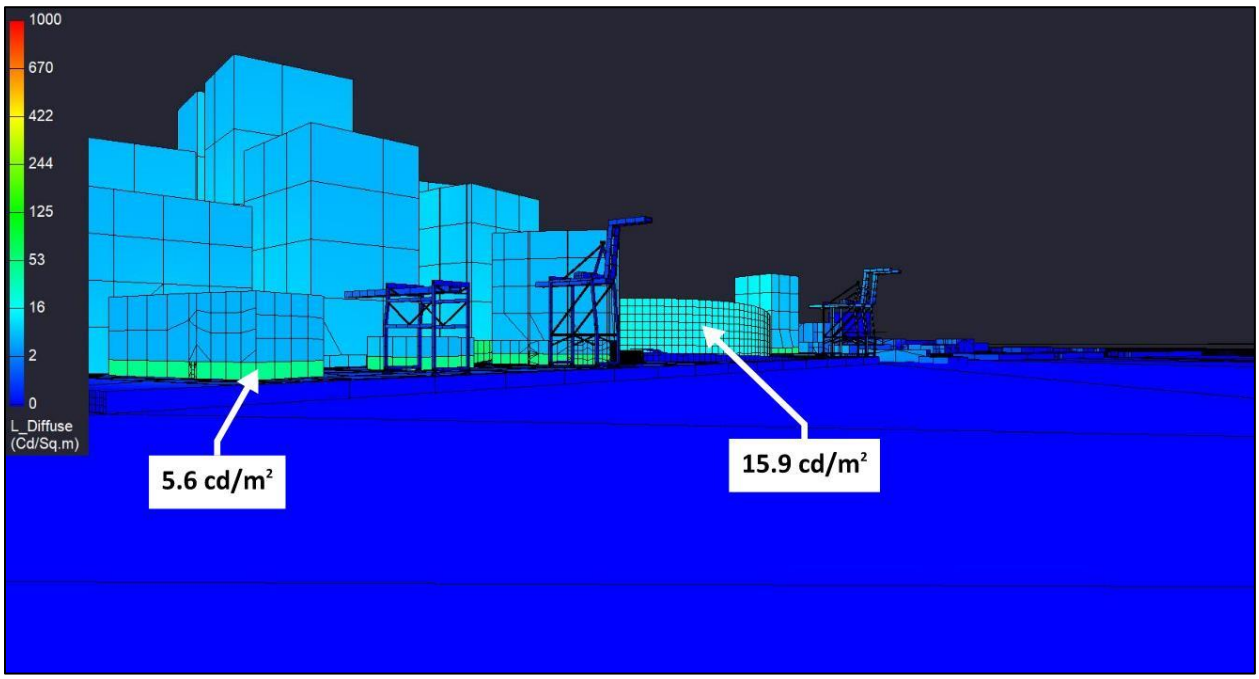


Figure 141: View from Receptor Site 2B for Baseline project, Baseline ballpark height, "Full Buildout" scenario Game Night lighting condition

Figure 142 provides the anticipated luminances viewed from Receptor Site 2C, which is centered in the turning basin and located 25' above the water line. As shown, based on the ballpark geometry, there is not anticipated to be a direct view of the sports lighting, scoreboard or ribbon boards. The façade luminances from this view **are not** anticipated to exceed threshold.

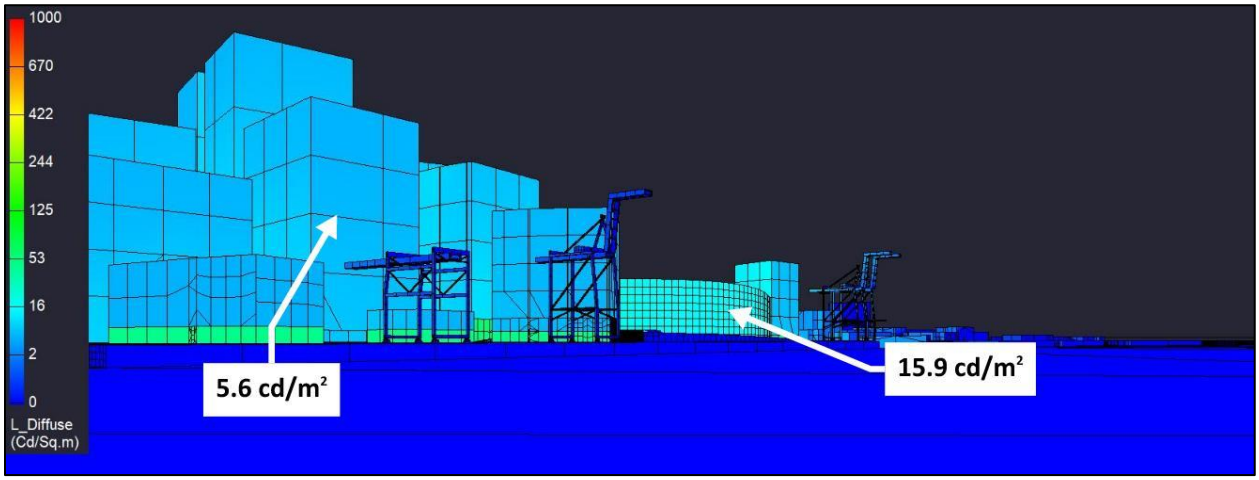


Figure 142: View from Receptor Site 2C for Baseline project, Baseline ballpark height, "Full Buildout" scenario Game Night lighting condition

Figure 143 provides the anticipated luminances viewed from Receptor Site 3, which is located on Alameda and facing northwest toward the property. From this position, there is a direct line of site to the scoreboard and ribbon boards. Therefore, façade luminances **are not** anticipated to exceed threshold and sign luminances from this view **are** anticipated to exceed threshold.

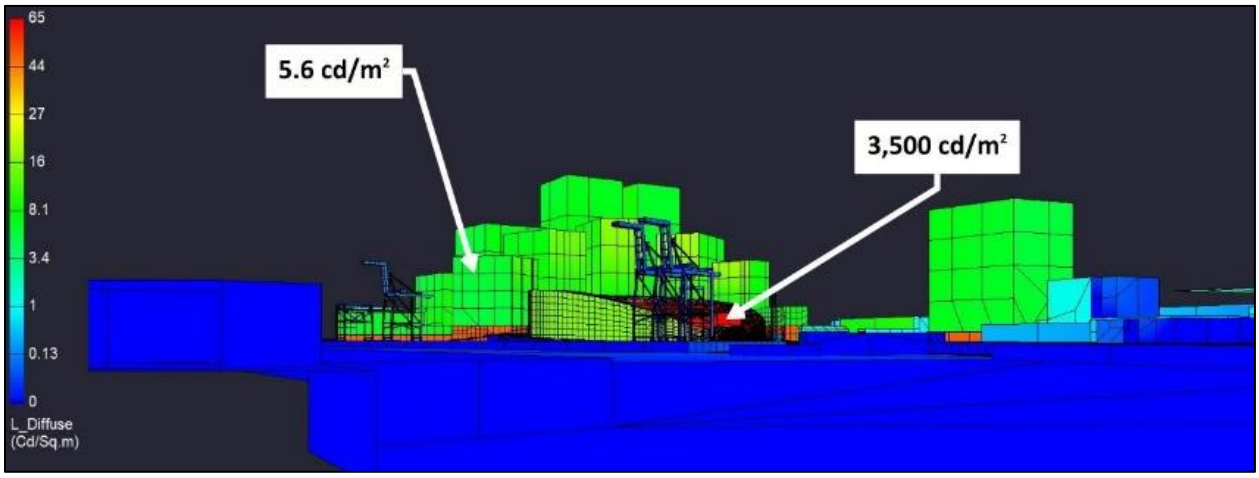


Figure 143: View from Receptor Site 3 for Baseline project, Baseline ballpark height, "Full Buildout" scenario Game Night lighting condition

Figure 144 provides the view from Receptor Site 4, which is located at the intersection of MLK and Embarcadero. As shown, a small corner of the scoreboard is anticipated to be viewed from this location, which exceed threshold. Therefore, façade luminances **are not** anticipated to exceed threshold and sign luminances from this view **are** anticipated to exceed threshold.

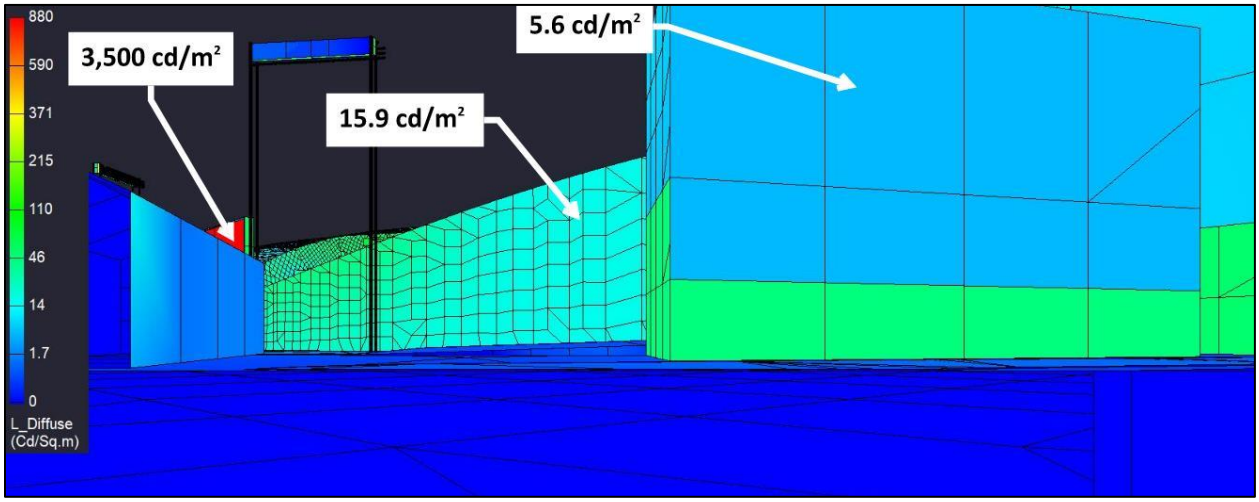


Figure 144: View from Receptor Site 4 for Baseline project, Baseline ballpark height, "Full Buildout" scenario Game Night lighting condition

Figure 145 provides the anticipated luminances viewed from Receptor Site 5, which is located on Westbound I880. From this view, the ballpark is anticipated to be almost entirely blocked. The façade lighting of the adjacent mixed-use development is anticipated to be visible. Therefore, façade luminances from this view **are not** anticipated to exceed threshold.

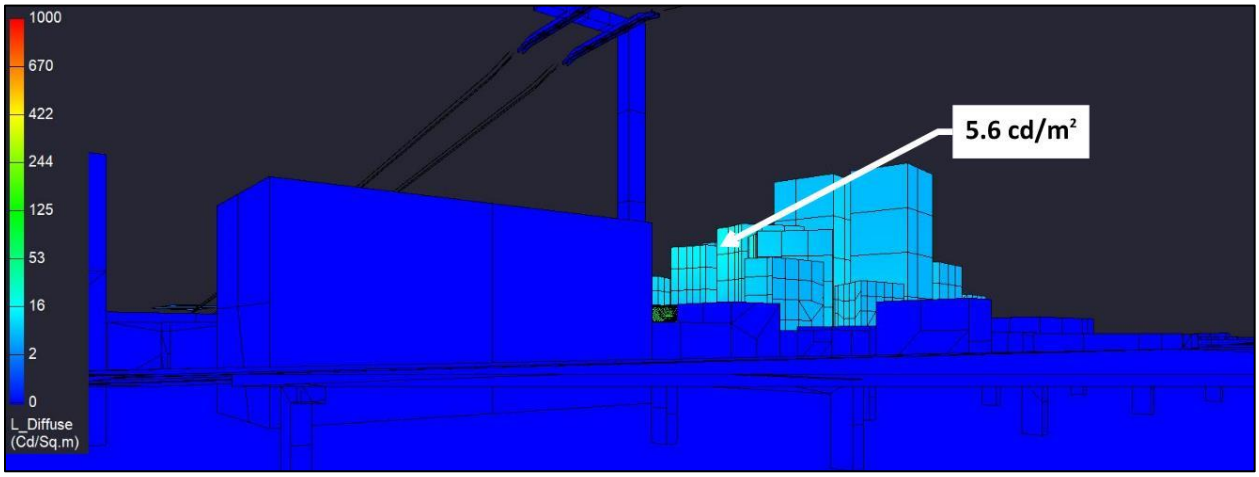


Figure 145: View from Receptor Site 5 for Baseline project, Baseline ballpark height, "Full Buildout" scenario Game Night lighting condition

Figure 146 provides the anticipated luminances viewed from Receptor Site 5A, which is located on the southwest corner of the roof of the parking garage located at 2nd and Washington. From this elevated position, there is a direct view down into the ballpark, including a direct view of the ribbon boards. Therefore, façade luminances **are not** anticipated to exceed threshold, and sign luminances from this view **are** anticipated to exceed threshold.

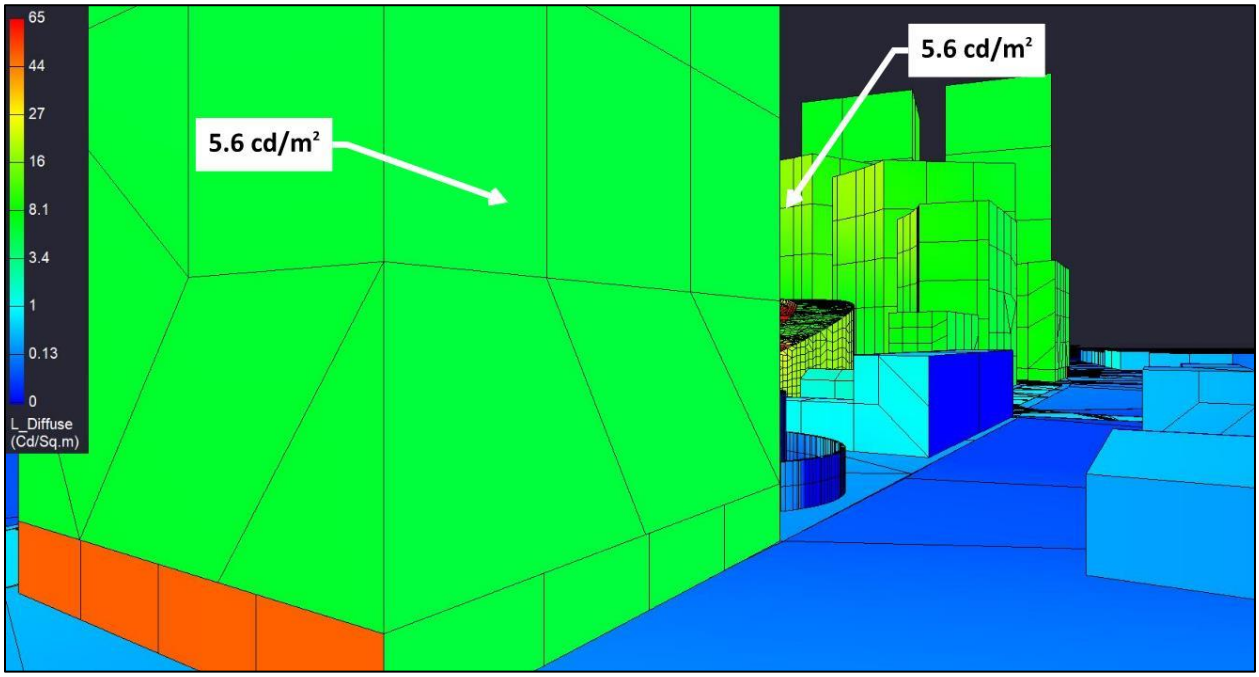


Figure 146: View from Receptor Site 5A for Baseline project, Baseline ballpark height, "Full Buildout" scenario Game Night lighting condition

Figure 147 provides the anticipated luminances viewed from Receptor Site 5B, which is located on the southeast corner of the roof of the parking garage looking toward the anticipated gondola station near Jack London Square. Luminances from this view **are not** anticipated to exceed threshold.

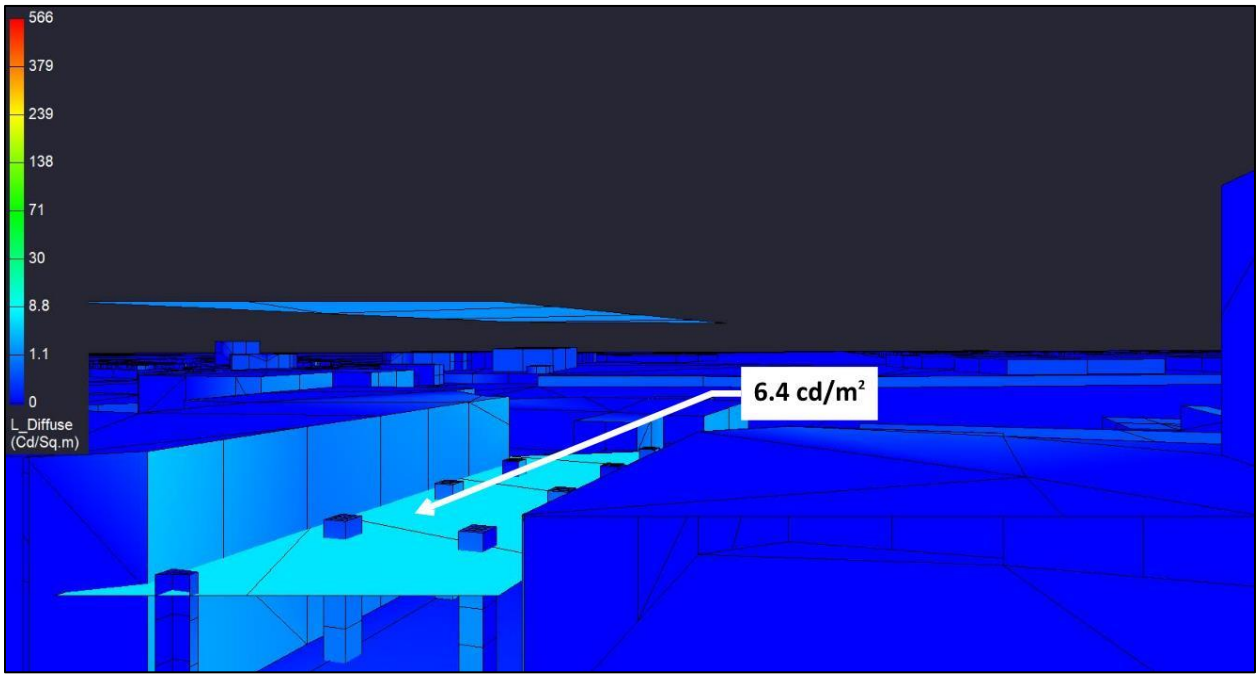


Figure 147: View from Receptor Site 5B for Baseline project, Baseline ballpark height, "Full Buildout" scenario Game Night lighting condition

Figure 148 provides the anticipated luminances viewed from Receptor Site 5C, which is located on the northeast corner of the parking garage at 2nd and Washington, looking northeast on the Washington corridor. No architectural lighting is anticipated on the gondola support tower and the Convention Center gondola station is not visible. Therefore, luminances from this view **are not** anticipated to exceed threshold.

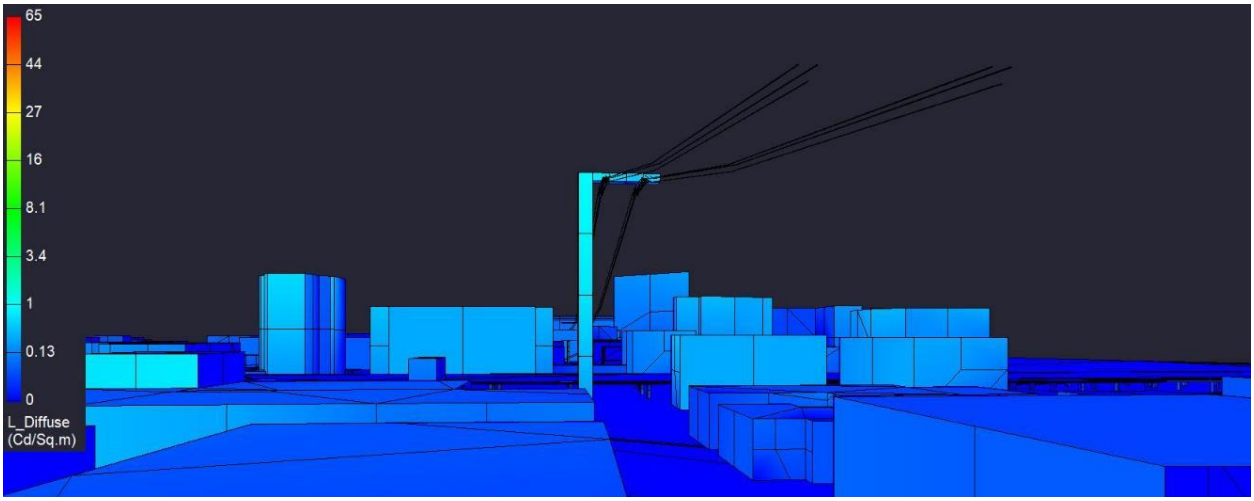


Figure 148: View from Receptor Site 5C for Baseline project, Baseline ballpark height, "Full Buildout" scenario Game Night lighting condition

Figure 149 provides the anticipated luminances viewed from Receptor Site 6, which is located on the ramp from I980 to eastbound I880. From this perspective, a direct view of the scoreboard and ribbon boards is anticipated. Therefore, façade luminances from this view **are not** anticipated to exceed threshold and sign luminances from this view **are** anticipated to exceed threshold.

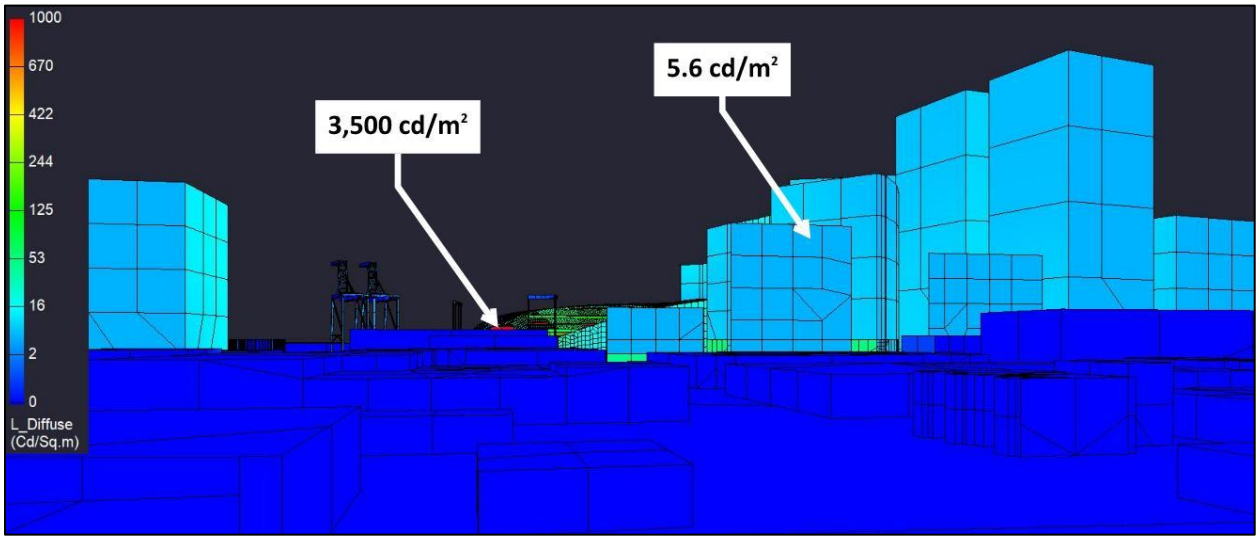


Figure 149: View from Receptor Site 6 for Baseline project, Baseline ballpark height, "Full Buildout" scenario Game Night lighting condition

Figure 99 provides the anticipated luminances viewed from Receptor Site 6A, which is located at 7th and Brush. From this perspective, there is anticipated to be a minimal view of the scoreboard. As such, the luminances from this view **are** anticipated to exceed threshold.

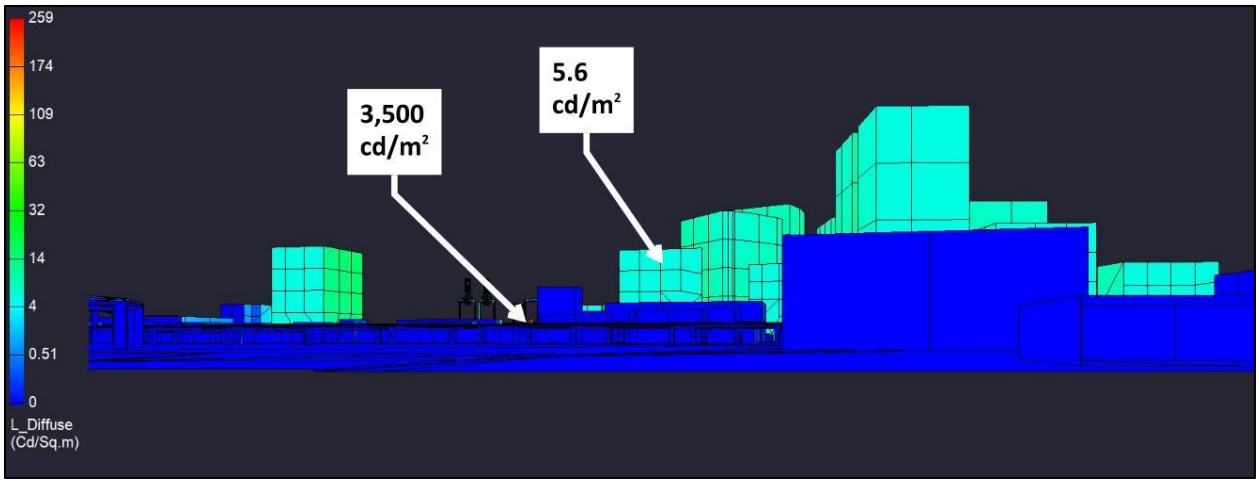


Figure 150: View from Receptor Site 6A for Baseline project, Baseline ballpark height, "Full Buildout" scenario Game Night lighting condition

Figure 151 provides the anticipated luminances viewed from Receptor Site 7, which is located at 8th and Washington facing north to the anticipated Convention Center gondola station. From this position, the field of view is anticipated to include the bottom surface of the gondola platform. Therefore, luminances from this view **are not** anticipated to exceed threshold.

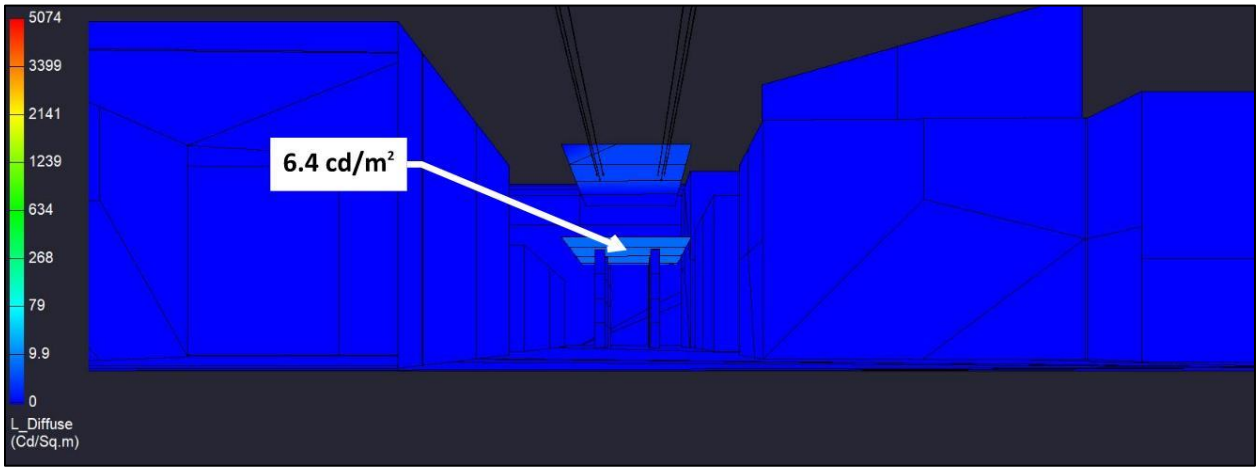


Figure 151: View from Receptor Site 7 for Baseline project, Baseline ballpark height, "Full Buildout" scenario Game Night lighting condition

Figure 152 provides the anticipated luminances viewed from Receptor Site 7A, which is located at 8th and Washington facing south toward the gondola support pole. From this position, the field of view is anticipated to include the gondola support pole which is not anticipated to have any architectural lighting. Therefore, luminances from this view **are not** anticipated to exceed threshold.

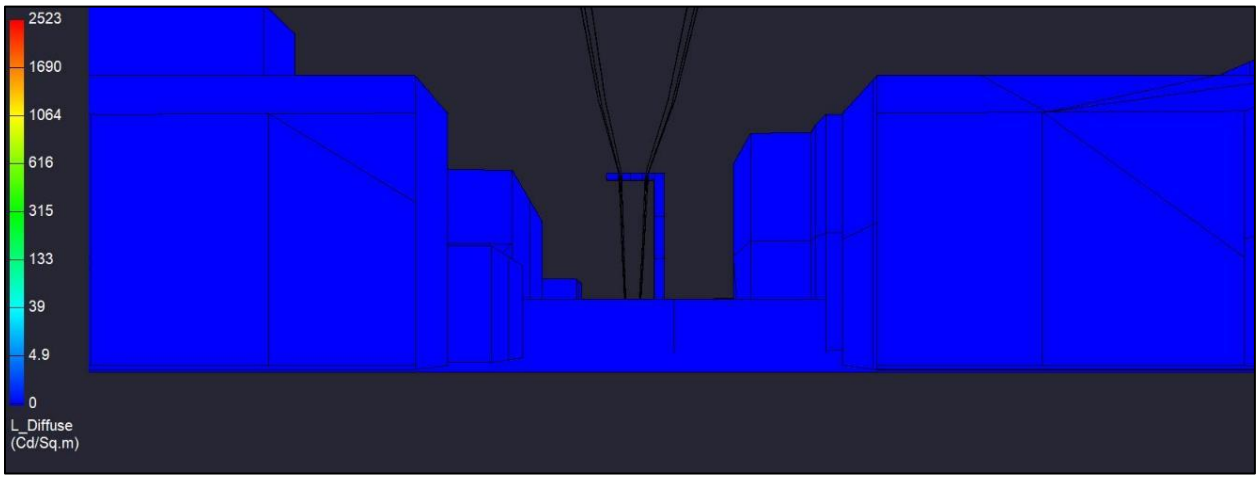


Figure 152: View from Receptor Site 7A for Baseline project, Baseline ballpark height, "Full Buildout" scenario Game Night lighting condition

8.1.2.2 Non-Game Nights, Pre-Curfew

As described in section 4.5.8, the Non-Game Nights, Pre-Curfew lighting condition is anticipated to include all architectural lighting "on", but assumes that the sports and house lighting within the ballpark, as well as the scoreboard and ribbon boards are not "on".

8.1.2.2.1 Spill Light

Table 38 provides the calculation results for the spill light assessment at the receptor sites for this condition. As shown, the proposed lighting **is not** anticipated to exceed the spill light threshold at any receptor sites.

Receptor Site	Spill Light, [lux]	Significant
Receptor Site 1 - Water Street at Clay (Facing Ballpark)	9.4	No
Receptor Site 1A - Water Street at Washington (Facing Gondola)	6.2	No
Receptor Site 2 - Inner Harbor Turning Basin @ 190'	1.7	No
Receptor Site 2A - Turning Basin Line-of-Sight	0.5	No
Receptor Site 2B - Inner Harbor Turning Basin @ 64'	1.5	No
Receptor Site 2C - Inner Harbor Turning Basin @ 25'	1.5	No
Receptor Site 3 - Alameda Dock	0.7	No
Receptor Site 4 - MLK at Embarcadero	7.2	No
Receptor Site 5 - I880 Westbound	0.3	No
Receptor Site 5A - 2nd at Washington (Facing Ballpark)	7.2	No
Receptor Site 5B - 2nd at Washington (Facing JLS Station)	0.7	No
Receptor Site 5C - 2nd at Washington (Facing Convention Center Station)	0.1	No
Receptor Site 6 - I980 Ramp to Eastbound I880	1.0	No
Receptor Site 6A - 7th at Brush	0.3	No
Receptor Site 7 - 8th at Washington (Facing Convention Center Station)	0.1	No
Receptor Site 7A - 8th at Washington (Facing Tower)	0.0	No

Table 38: Spill light at receptor sites for Baseline project, Baseline ballpark height, "Full Buildout" scenario Non-Game Night, Pre-Curfew lighting condition. [Note: Threshold of significance is 25 lux]

8.1.2.2.2 Spill Light Map

Figure 153 provides a spill light map for this lighting condition. To generate the spill light map, vertical calculation points were arrayed around the project site at 5’-6” AFG and oriented toward the pitcher’s mound for reference. The isoline curves show the extent to which vertical light levels are calculated and are reported in lux. As shown, less than 1 vertical lux is expected in the turning basin. The adjacent estuary is anticipated to experience less than 1 vertical lux generally, with light levels increasing closer to shore. For reference, one 60W incandescent light bulb will generate 1 lux at a distance of approximately 8 meters (26 ft).

Figure 153: Spill light map for Baseline project, Baseline ballpark height, “Full Buildout” scenario Non-Game Nights Pre-Curfew lighting condition indicating vertical illuminance isolines

8.1.2.2.3 Glare

Figure 154 through Figure 169 illustrate the luminances anticipated to be observed from the identified receptor sites for this lighting condition. Note that the scale associated with each receptor site view approximately matches the scale used for the associated site's existing conditions HDR falsecolor images. Table 39 summarizes the anticipated glare significance at the receptor sites. Additionally, as noted in Section 4.5.3, the modeled retail lighting is included for pre-curfew times to capture the impact of interior lighting emanating through windows as a conservative contribution to spill light assessment; the modeled luminance, therefore, is an interior luminance and not subject to glare limitations directly.

Receptor Site	Facades		Signage	
	Maximum, [cd/m^2]	Significant	Maximum, [cd/m^2]	Significant
Receptor Site 1 - Water Street at Clay (Facing Ballpark)	15.9	No	n/a	n/a
Receptor Site 1A - Water Street at Washington (Facing Gondola)	6.4	No	n/a	n/a
Receptor Site 2 - Inner Harbor Turning Basin @ 190'	15.9	No	n/a	n/a
Receptor Site 2A - Turning Basin Line-of-Sight	15.9	No	n/a	n/a
Receptor Site 2B - Inner Harbor Turning Basin @ 64'	15.9	No	n/a	n/a
Receptor Site 2C - Inner Harbor Turning Basin @ 25'	15.9	No	n/a	n/a
Receptor Site 3 - Alameda Dock	15.9	No	n/a	n/a
Receptor Site 4 - MLK at Embarcadero	15.9	No	n/a	n/a
Receptor Site 5 - I880 Westbound	15.9	No	n/a	n/a
Receptor Site 5A - 2nd at Washington (Facing Ballpark)	15.9	No	n/a	n/a
Receptor Site 5B - 2nd at Washington (Facing JLS Station)	6.4	No	n/a	n/a
Receptor Site 5C - 2nd at Washington (Facing Convention Center Station)	0.0	No	n/a	n/a
Receptor Site 6 - I980 Ramp to Eastbound I880	15.9	No	n/a	n/a
Receptor Site 6A - 7th at Brush	15.9	No	n/a	n/a
Receptor Site 7 - 8th at Washington (Facing Convention Center Station)	6.4	No	n/a	n/a
Receptor Site 7A - 8th at Washington (Facing Tower)	0.0	No	n/a	n/a

Table 39: Summary of anticipated glare significance at receptor sites for the Baseline project, Baseline ballpark height, "Full Buildout" scenario Non-Game Night Pre-Curfew lighting conditions. [Note: Threshold of significance is 25 cd/m^2 for façade lighting and 1,000 cd/m^2 for digital signage]

Figure 154 shows the anticipated luminances viewed from Receptor Site 1, which is one of the closest receptor sites. As seen, from this perspective, without the scoreboard/ribbon boards “on”, overall brightnesses are reduced. Therefore, luminances from this view **are not** anticipated to exceed threshold.

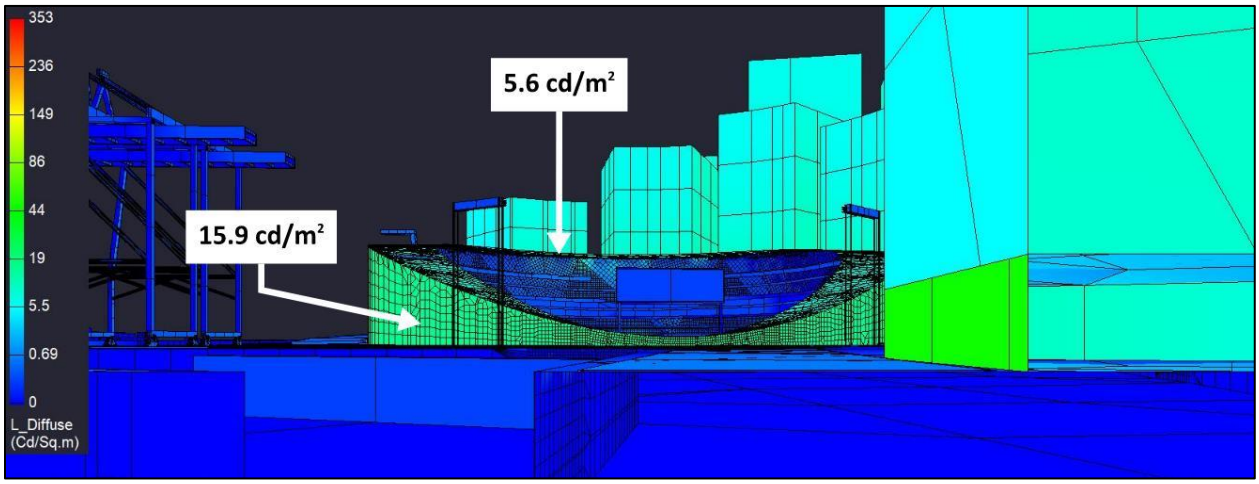


Figure 154: View from Receptor Site 1 for Baseline project, Baseline ballpark height, “Full Buildout” scenario Non-Game Night Pre-Curfew lighting condition

Figure 155 provides a view of the anticipated luminances viewed from Receptor Site 1A, which is facing the proposed gondola station near Jack London Square. Note for calculation purposes, the “sides” of the gondola platform have been turned “off”, and the anticipated lighting effect has been applied to the top of the platform floor. Therefore, luminances from this view **are not** anticipated to exceed threshold.

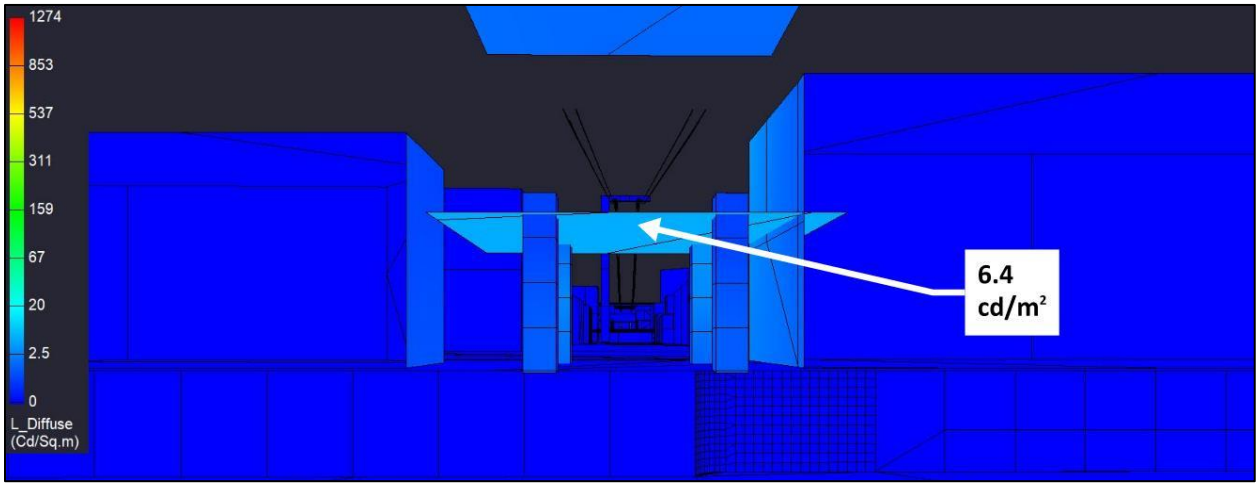


Figure 155: View from Receptor Site 1A for Baseline project, Baseline ballpark height, “Full Buildout” scenario Non-Game Night Pre-Curfew lighting condition

Figure 156 provides the anticipated luminances viewed from Receptor Site 2, which is centered in the turning basin and located 190’ above the water line. Façade luminances from this view **are not** anticipated to exceed threshold.

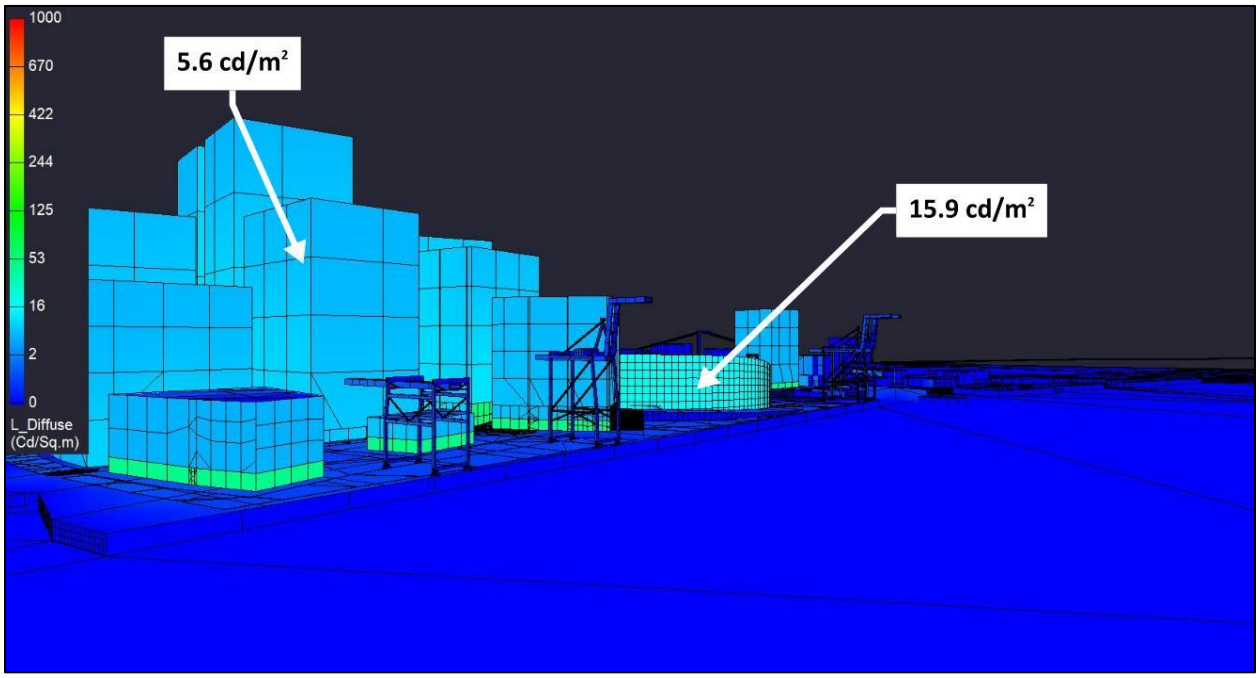


Figure 156: View from Receptor Site 2 for Baseline project, Baseline ballpark height, “Full Buildout” scenario Non-Game Night Pre-Curfew lighting condition

Figure 157 provides the anticipated luminances viewed from Receptor Site 2A, which is on Alameda with a direct line of site through the center of the turning basin. Luminances from this view **are not** anticipated to exceed threshold.

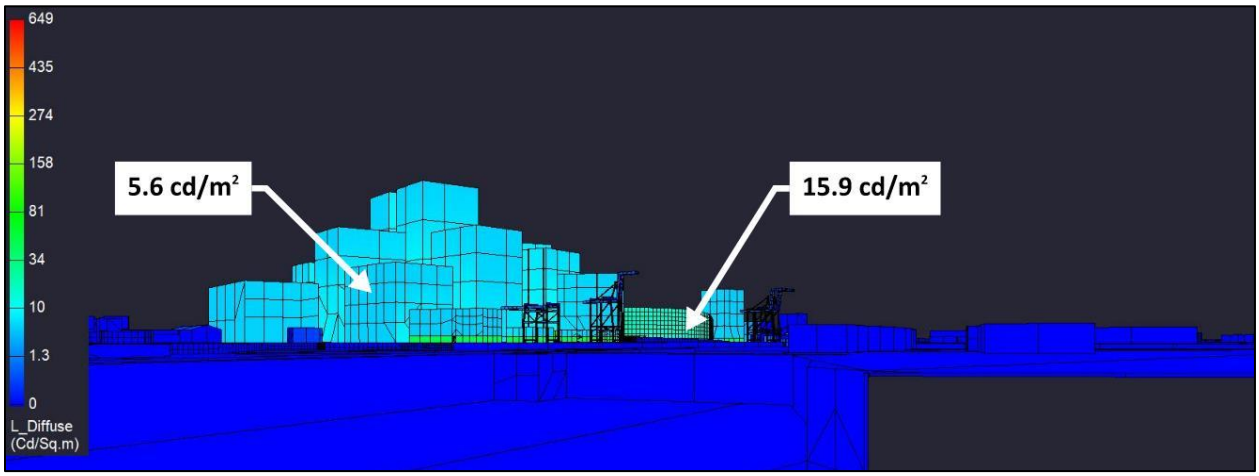


Figure 157: View from Receptor Site 2A for Baseline project, Baseline ballpark height, “Full Buildout” scenario Non-Game Night Pre-Curfew lighting condition

Figure 158 provides the anticipated luminances viewed from Receptor Site 2B, which is centered in the turning basin and located 64’ above the water line. Façade luminances from this view **are not** anticipated to exceed threshold.

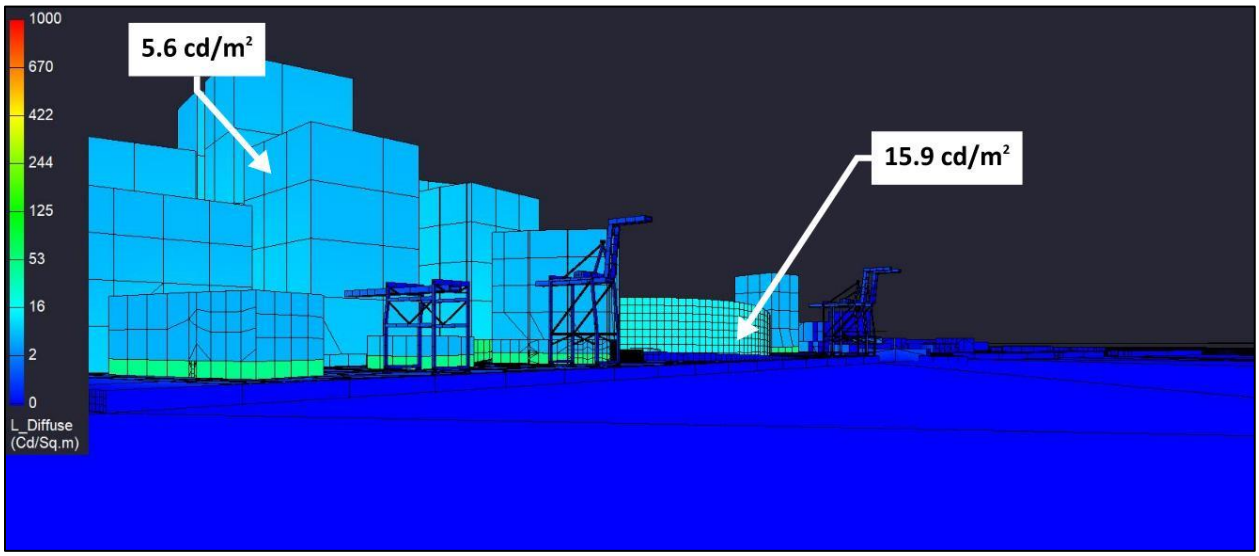


Figure 158: View from Receptor Site 2B for Baseline project, Baseline ballpark height, “Full Buildout” scenario Non-Game Night Pre-Curfew lighting condition

Figure 159 provides the anticipated luminances viewed from Receptor Site 2C, which is centered in the turning basin and located 25’ above the water line. Façade luminances from this view **are not** anticipated to exceed threshold.

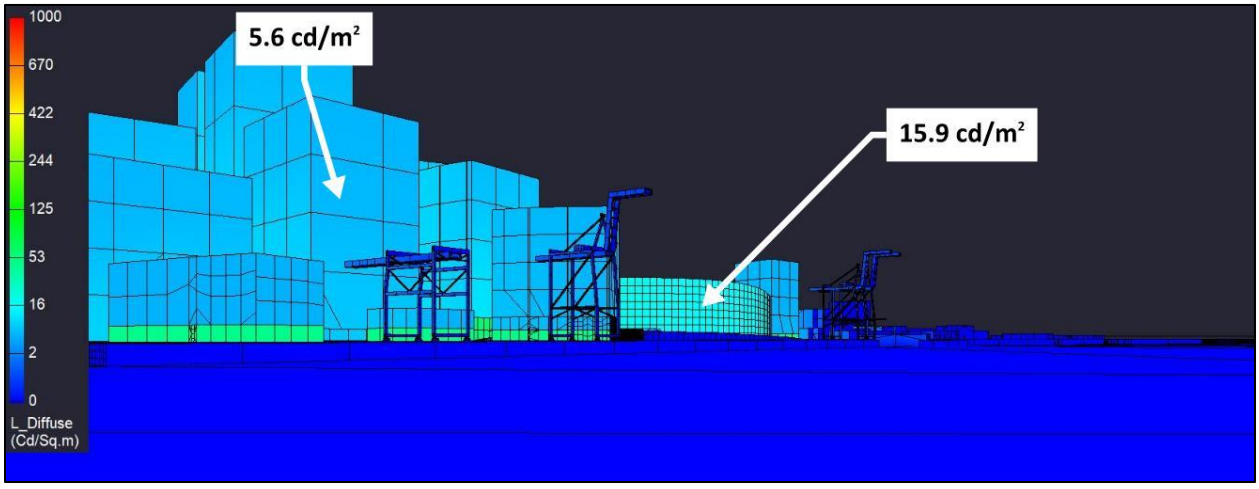


Figure 159: View from Receptor Site 2C for Baseline project, Baseline ballpark height, “Full Buildout” scenario Non-Game Night Pre-Curfew lighting condition

Figure 160 provides the anticipated luminances viewed from Receptor Site 3, which is located on Alameda and facing northwest toward the property. Luminances from this view **are not** anticipated to exceed threshold.

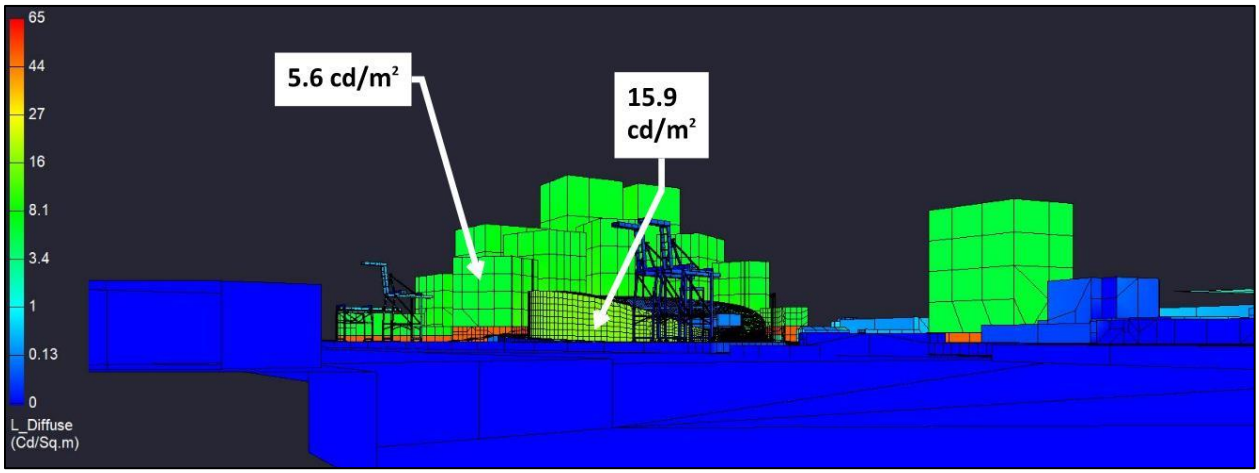


Figure 160: View from Receptor Site 3 for Baseline project, Baseline ballpark height, "Full Buildout" scenario Non-Game Night Pre-Curfew lighting condition

Figure 161 provides the view from Receptor Site 4, which is located at the intersection of MLK and Embarcadero. Luminances from this view **are not** anticipated to exceed threshold.

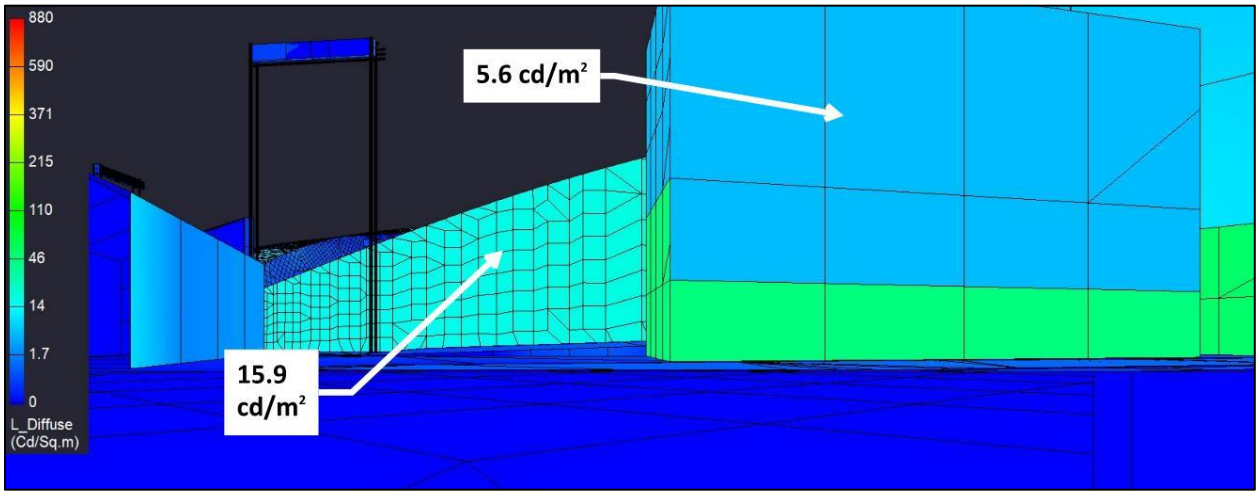


Figure 161: View from Receptor Site 4 for Baseline project, Baseline ballpark height, "Full Buildout" scenario Non-Game Night Pre-Curfew lighting condition

Figure 162 provides the anticipated luminances viewed from Receptor Site 5, which is located on Westbound I880. From this view, the ballpark and sports lighting are anticipated to be almost entirely blocked. The façade lighting of the adjacent mixed-use development is anticipated to be visible. Therefore, luminances from this view **are not** anticipated to exceed threshold.

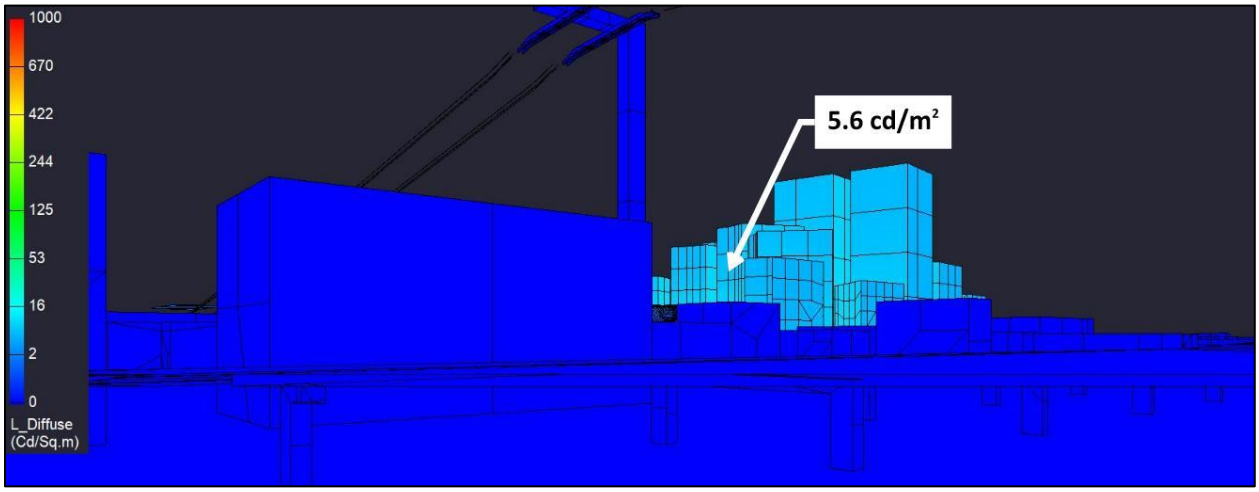


Figure 162: View from Receptor Site 5 for Baseline project, Baseline ballpark height, "Full Buildout" scenario Non-Game Night Pre-Curfew lighting condition

Figure 163 provides the anticipated luminances viewed from Receptor Site 5A, which is located on the southwest corner of the roof of the parking garage located at 2nd and Washington. Luminances from this view **are not** anticipated to exceed threshold.

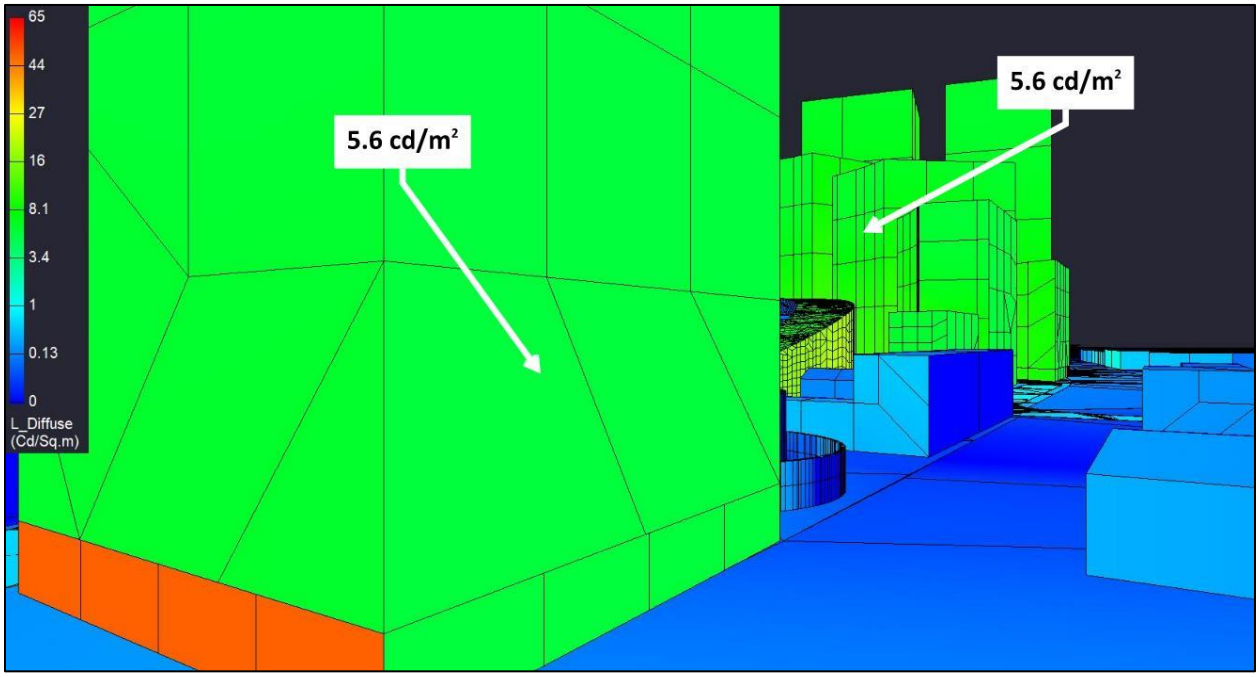


Figure 163: View from Receptor Site 5A for Baseline project, Baseline ballpark height, "Full Buildout" scenario Non-Game Night Pre-Curfew lighting condition

Figure 164 provides the anticipated luminances viewed from Receptor Site 5B, which is located on the southeast corner of the roof of the parking garage looking toward the anticipated gondola station near Jack London Square. Luminances from this view **are not** anticipated to exceed threshold.

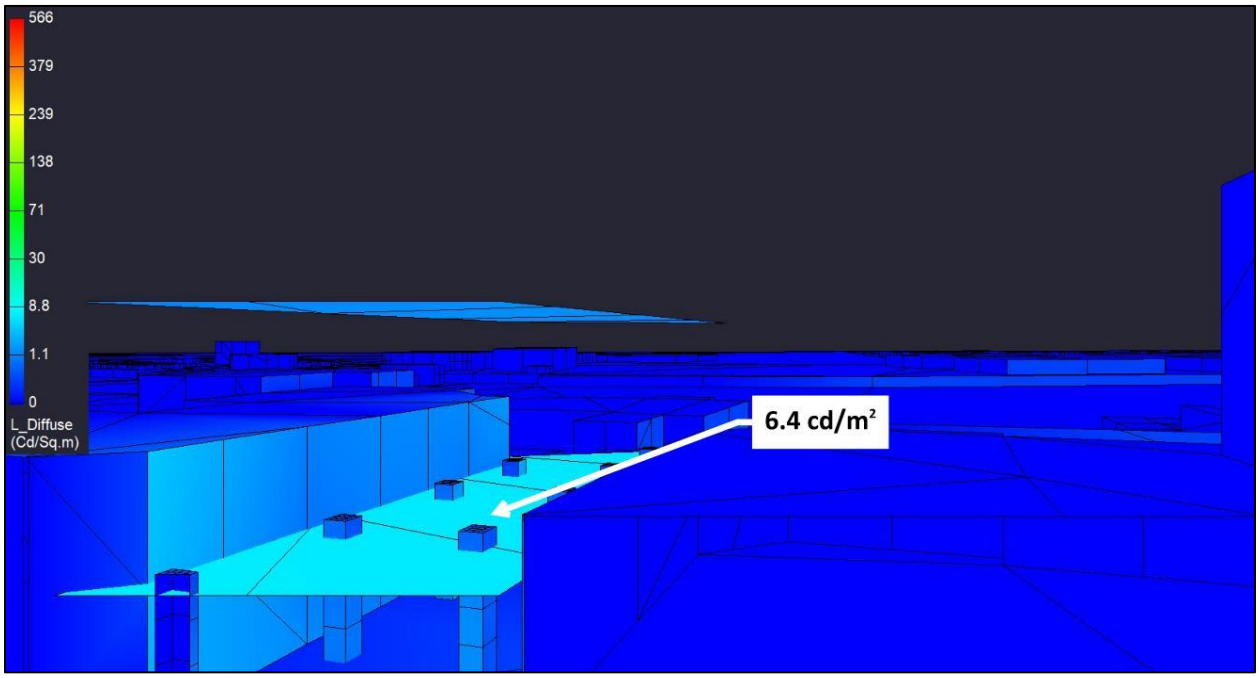


Figure 164: View from Receptor Site 5B for Baseline project, Baseline ballpark height, "Full Buildout" scenario Non-Game Night Pre-Curfew lighting condition

Figure 165 provides the anticipated luminances viewed from Receptor Site 5C, which is located on the northeast corner of the parking garage at 2nd and Washington, looking northeast on the Washington corridor. No architectural lighting is anticipated on the gondola support tower and the Convention Center gondola station is not visible. Therefore, luminances from this view **are not** anticipated to exceed threshold.

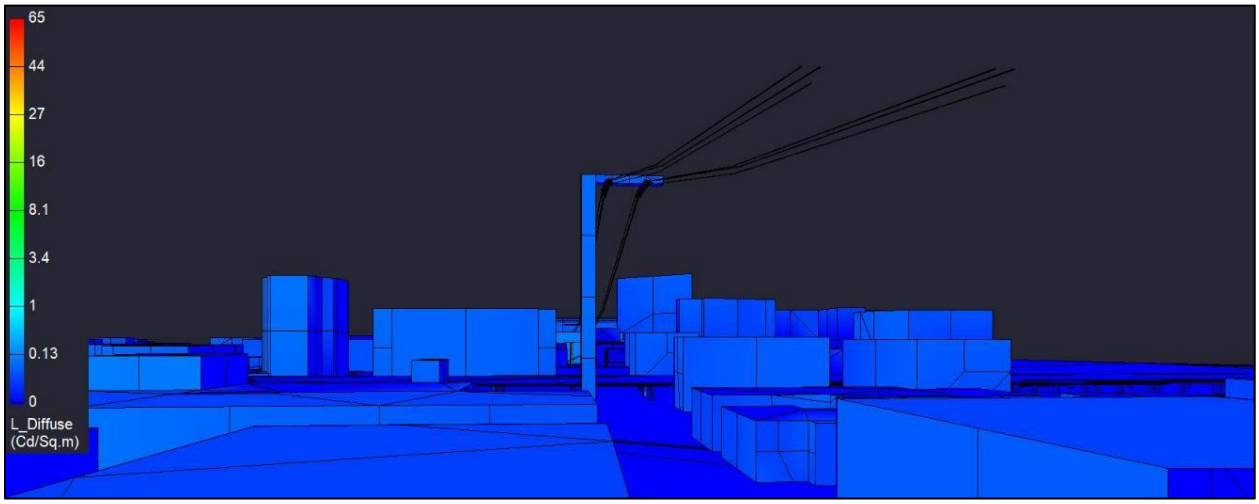


Figure 165: View from Receptor Site 5C for Baseline project, Baseline ballpark height, "Full Buildout" scenario Non-Game Night Pre-Curfew lighting condition

Figure 166 provides the anticipated luminances viewed from Receptor Site 6, which is located on the ramp from I980 to eastbound I880. Luminances from this view **are not** anticipated to exceed threshold.

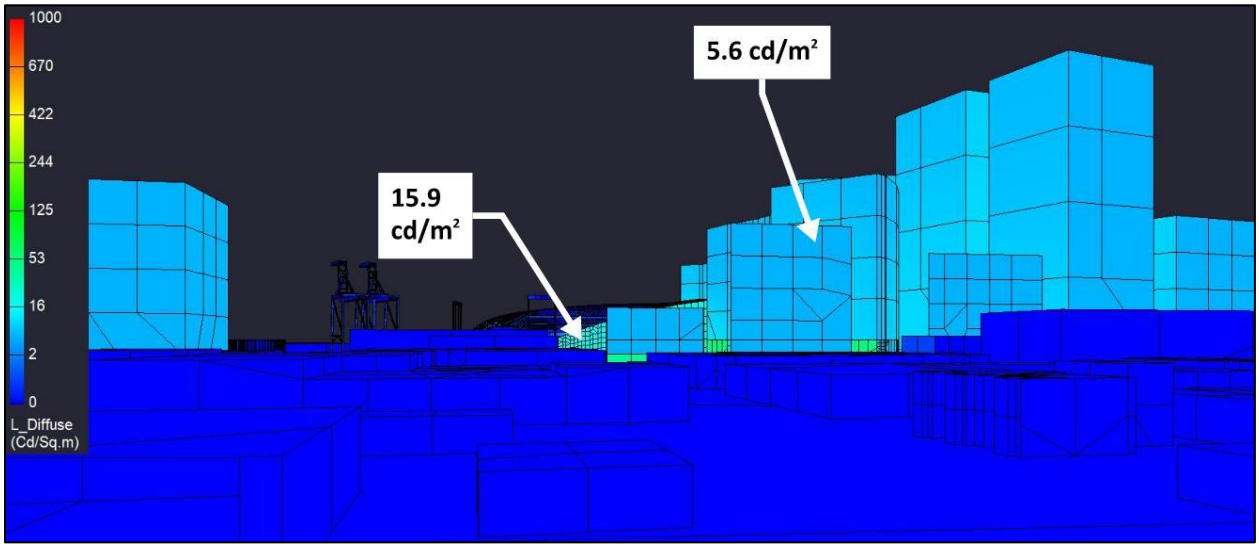


Figure 166: View from Receptor Site 6 for Baseline project, Baseline ballpark height, "Full Buildout" scenario Non-Game Night Pre-Curfew lighting condition

Figure 167 provides the anticipated luminances viewed from Receptor Site 6A, which is located at 7th and Brush. The luminances from this view **are not** anticipated to exceed threshold.

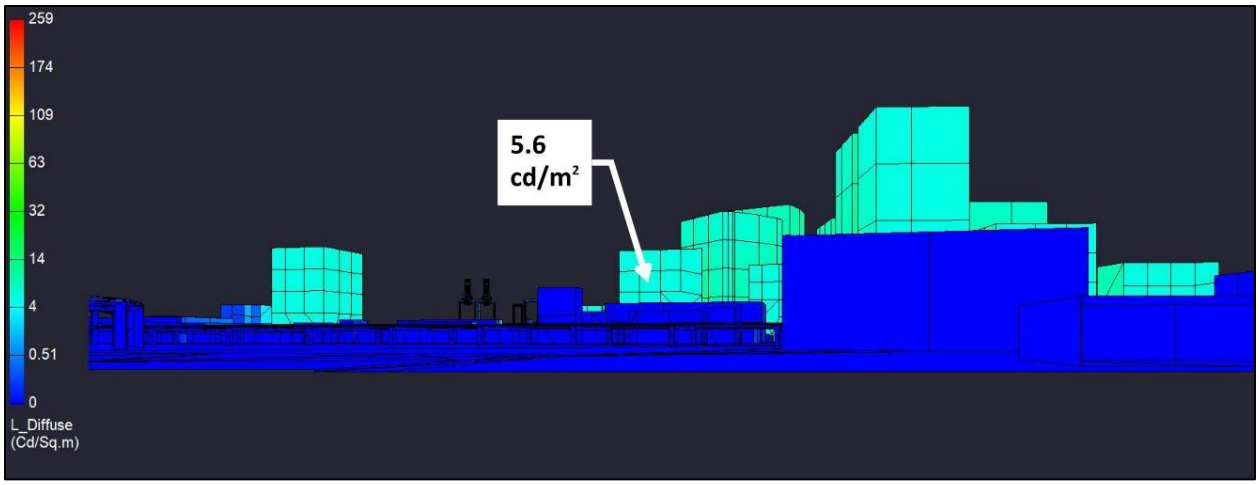


Figure 167: View from Receptor Site 6A for Baseline project, Baseline ballpark height, "Full Buildout" scenario Non-Game Night Pre-Curfew lighting condition

Figure 168 provides the anticipated luminances viewed from Receptor Site 7, which is located at 8th and Washington facing north to the anticipated Convention Center gondola station. From this position, the field of view is anticipated to include the bottom surface of the gondola platform. Therefore, luminances from this view **are not** anticipated to exceed threshold.

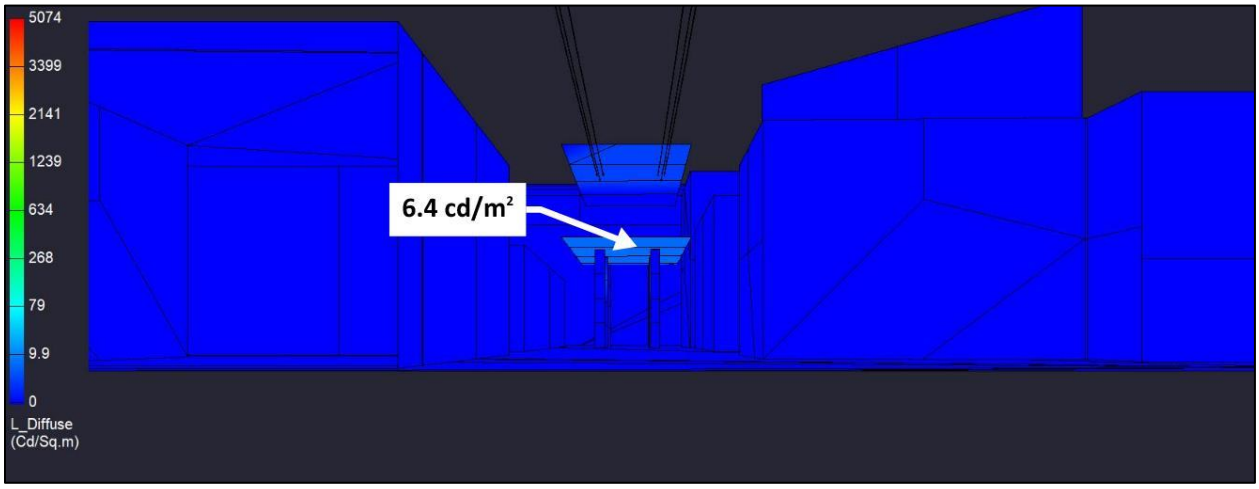


Figure 168: View from Receptor Site 7 for Baseline project, Baseline ballpark height, "Full Buildout" scenario Non-Game Night Pre-Curfew lighting condition

Figure 169 provides the anticipated luminances viewed from Receptor Site 7A, which is located at 8th and Washington facing south toward the gondola support pole. From this position, the field of view is anticipated to include the gondola support pole which is not anticipated to have any architectural lighting. Therefore, luminances from this view **are not** anticipated to exceed threshold.

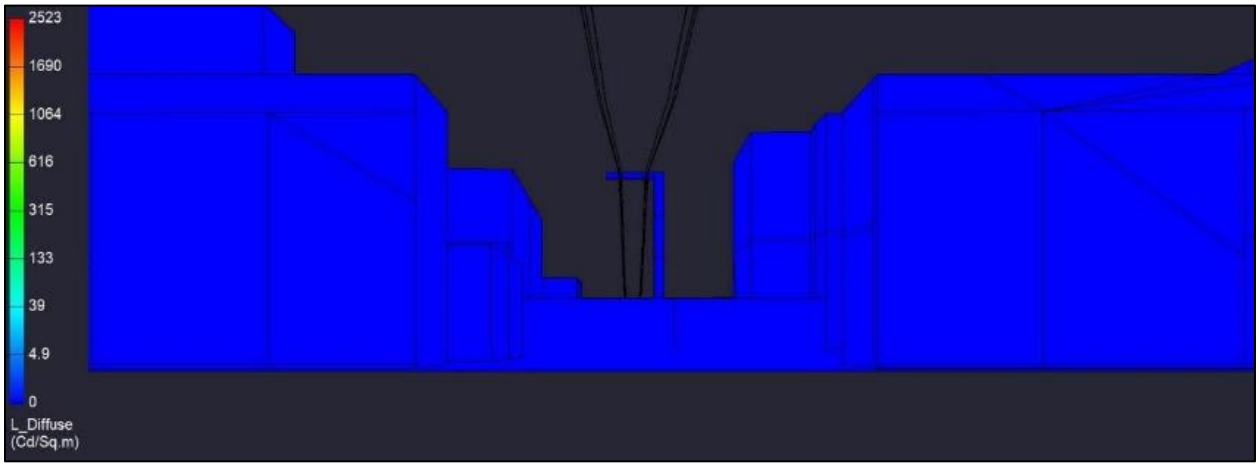


Figure 169: View from Receptor Site 7A for Baseline project, Baseline ballpark height, "Full Buildout" scenario Non-Game Night Pre-Curfew lighting condition

8.1.2.3 Post-Curfew

As described in section 4.5.8, the Post-Curfew lighting condition is anticipated to capture the lighting impacts from curfew to dawn, with architectural and area lighting at reduced levels to respond to reduced activity.

8.1.2.3.1 Spill Light

Table 40Table 34 provides the calculation results for the spill light assessment at the receptor sites for this condition. As shown, the proposed lighting **is** anticipated to exceed the lower post-curfew threshold at Receptor Site 1A; however, the lighting for the gondola platform is not anticipated to dim post-curfew based on safety concerns. Additionally, the proposed lighting **is** anticipated to exceed the lower post-curfew threshold at Receptor Site 5A; this site is very close to the façade of the adjacent mixed-use building, and the impact on this receptor site can likely be reduced through further design refinement. The anticipated spill light at the remaining receptor sites **are not** anticipated to exceed the post-curfew threshold.

Receptor Site	Spill Light, [lux]	Significant
Receptor Site 1 - Water Street at Clay (Facing Ballpark)	3.7	No
Receptor Site 1A - Water Street at Washington (Facing Gondola)	**6.2**	**Yes**
Receptor Site 2 - Inner Harbor Turning Basin @ 190'	1.1	No
Receptor Site 2A - Turning Basin Line-of-Sight	0.4	No
Receptor Site 2B - Inner Harbor Turning Basin @ 64'	1.0	No
Receptor Site 2C - Inner Harbor Turning Basin @ 25'	1.0	No
Receptor Site 3 - Alameda Dock	0.4	No
Receptor Site 4 - MLK at Embarcadero	3.5	No
Receptor Site 5 - I880 Westbound	0.3	No
Receptor Site 5A - 2nd at Washington (Facing Ballpark)	**5.8**	**Yes**
Receptor Site 5B - 2nd at Washington (Facing JLS Station)	0.7	No
Receptor Site 5C - 2nd at Washington (Facing Convention Center Station)	0.1	No
Receptor Site 6 - I980 Ramp to Eastbound I880	0.9	No
Receptor Site 6A - 7th at Brush	0.3	No
Receptor Site 7 - 8th at Washington (Facing Convention Center Station)	0.1	No
Receptor Site 7A - 8th at Washington (Facing Tower)	0.0	No

Table 40: Spill light at receptor sites for Baseline project, Baseline ballpark height, “Full Buildout” scenario Post-Curfew lighting condition. [Note: Threshold of significance is 5 lux]

8.1.2.3.2 Spill Light Map

Figure 170 provides a spill light map for this lighting condition. To generate the spill light map, vertical calculation points were arrayed around the project site at 5’-6” AFG and oriented toward the pitcher’s mound for reference. The isoline curves show the extent to which vertical light levels are calculated and are reported in lux. As shown, less than 1 vertical lux is expected in the turning basin. The adjacent estuary is anticipated to experience less than 1 vertical lux generally, with light levels increasing closer to shore. Vertical light levels exceeding 5 lux are not anticipated in the estuary. For reference, one 60W incandescent light bulb will generate 1 lux at a distance of approximately 8 meters (26 ft).

Figure 170: Spill light map for Baseline project, Baseline ballpark height, “Full Buildout” scenario Post-Curfew lighting condition indicating vertical illuminance isolines

8.1.2.3.3 Glare

Figure 171 through Figure 186 illustrate the luminances anticipated to be observed from the identified receptor sites for this lighting condition. Note that the scale associated with each receptor site view approximately matches the scale used for the associated site's existing conditions HDR falsecolor images. Table 41 summarizes the anticipated glare significance at the receptor sites. Additionally, as noted in Section 4.5.3, the modeled retail lighting is included for post-curfew times to capture the impact of exterior façade lighting (assuming interior retail lighting is off) and is subject to glare limitations.

Receptor Site	Facades		Signage	
	Maximum, [cd/m^2]	Significant	Maximum, [cd/m^2]	Significant
Receptor Site 1 - Water Street at Clay (Facing Ballpark)	5.6	No	n/a	n/a
Receptor Site 1A - Water Street at Washington (Facing Gondola)	6.4	No	n/a	n/a
Receptor Site 2 - Inner Harbor Turning Basin @ 190'	5.6	No	n/a	n/a
Receptor Site 2A - Turning Basin Line-of-Sight	5.6	No	n/a	n/a
Receptor Site 2B - Inner Harbor Turning Basin @ 64'	5.6	No	n/a	n/a
Receptor Site 2C - Inner Harbor Turning Basin @ 25'	5.6	No	n/a	n/a
Receptor Site 3 - Alameda Dock	5.6	No	n/a	n/a
Receptor Site 4 - MLK at Embarcadero	5.6	No	n/a	n/a
Receptor Site 5 - I880 Westbound	5.6	No	n/a	n/a
Receptor Site 5A - 2nd at Washington (Facing Ballpark)	5.6	No	n/a	n/a
Receptor Site 5B - 2nd at Washington (Facing JLS Station)	6.4	No	n/a	n/a
Receptor Site 5C - 2nd at Washington (Facing Convention Center Station)	0.0	No	n/a	n/a
Receptor Site 6 - I980 Ramp to Eastbound I880	5.6	No	n/a	n/a
Receptor Site 6A - 7th at Brush	5.6	No	n/a	n/a
Receptor Site 7 - 8th at Washington (Facing Convention Center Station)	6.4	No	n/a	n/a
Receptor Site 7A - 8th at Washington (Facing Tower)	0.0	No	n/a	n/a

Table 41: Summary of anticipated glare significance at receptor sites for the Baseline project, Baseline ballpark height, "Full Buildout" scenario Post-Curfew lighting conditions. [Note: Threshold of significance is 25 cd/m^2 for façade lighting and 1,000 cd/m^2 for digital signage]

Figure 171 shows the anticipated luminances viewed from Receptor Site 1, which is one of the closest receptor sites. As seen, from this perspective, without the field lighting and scoreboard/ribbon boards, "on", overall brightnesses are reduced. Therefore, luminances from this view **are not** anticipated to exceed threshold.

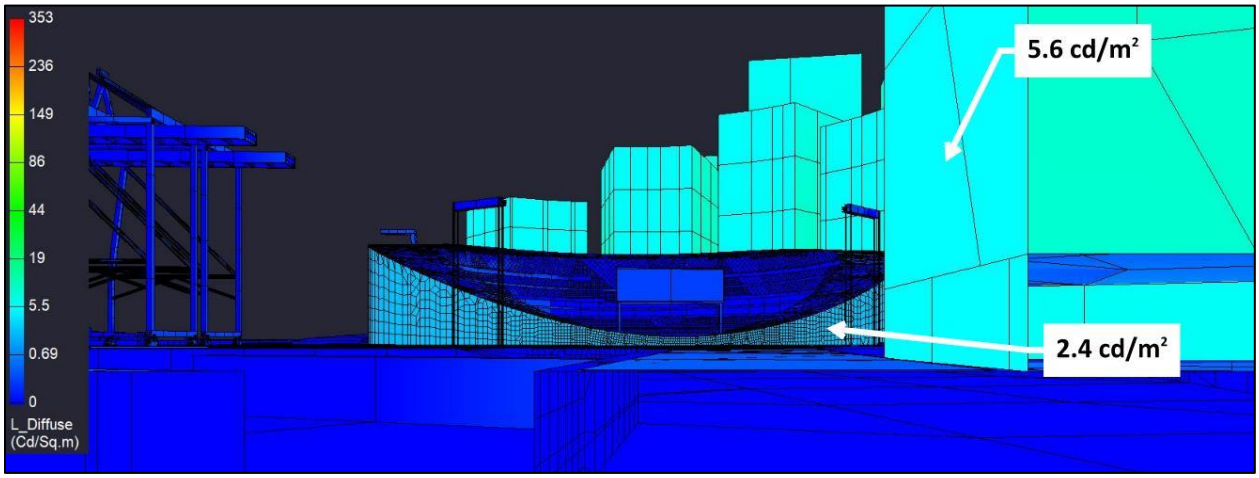


Figure 171: View from Receptor Site 1 for Baseline project, Baseline ballpark height, "Full Buildout" scenario Post-Curfew lighting condition

Figure 172 provides a view of the anticipated luminances viewed from Receptor Site 1A, which is facing the proposed gondola station near Jack London Square. Note for calculation purposes, the "sides" of the gondola platform have been turned "off", and the anticipated lighting effect has been applied to the top of the platform floor. Therefore, luminances from this view **are not** anticipated to exceed threshold.

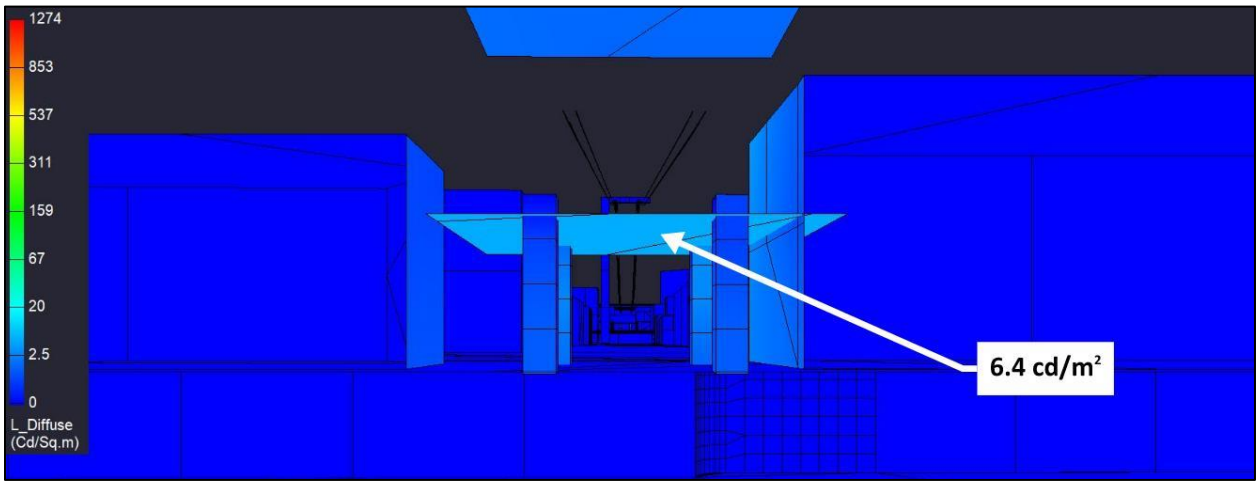


Figure 172: View from Receptor Site 1A for Baseline project, Baseline ballpark height, "Full Buildout" scenario Post-Curfew lighting condition

Figure 173 provides the anticipated luminances viewed from Receptor Site 2, which is centered in the turning basin and located 190’ above the water line. Façade luminances from this view **are not** anticipated to exceed threshold.

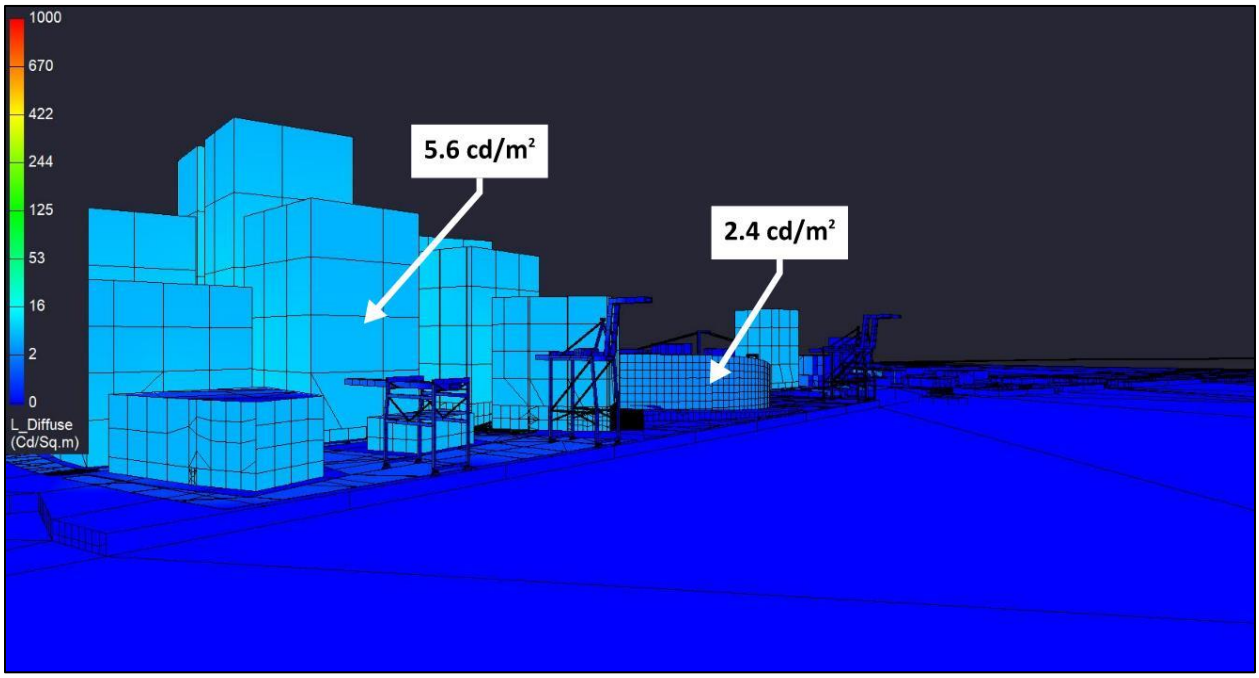


Figure 173: View from Receptor Site 2 for Baseline project, Baseline ballpark height, “Full Buildout” scenario Post-Curfew lighting condition

Figure 174 provides the anticipated luminances viewed from Receptor Site 2A, which is on Alameda with a direct line of site through the center of the turning basin. Excluding the interior retail lighting, luminances from this view **are not** anticipated to exceed threshold.

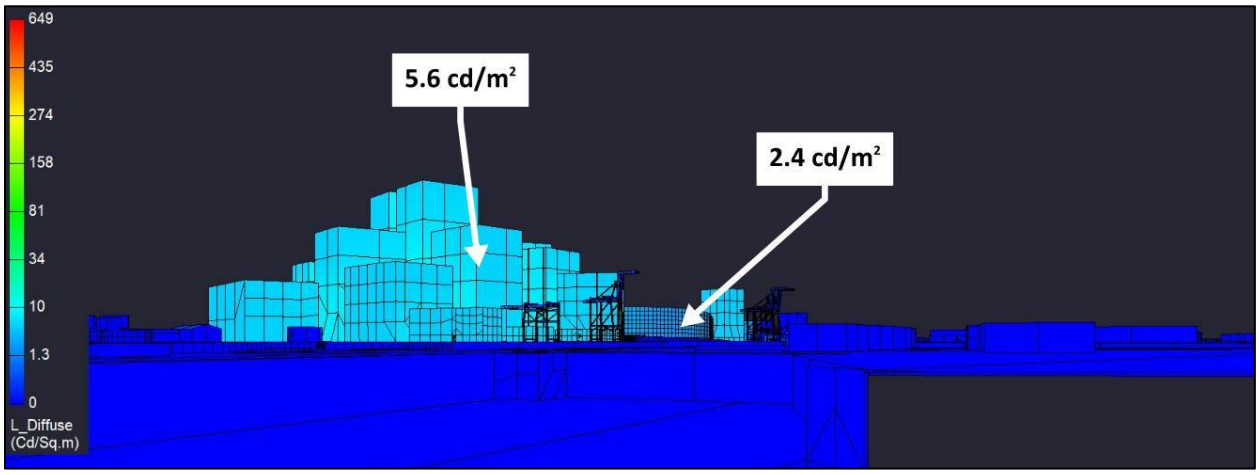


Figure 174: View from Receptor Site 2A for Baseline project, Baseline ballpark height, “Full Buildout” scenario Post-Curfew lighting condition

Figure 175 provides the anticipated luminances viewed from Receptor Site 2B, which is centered in the turning basin and located 64’ above the water line. Façade luminances from this view **are not** anticipated to exceed threshold.

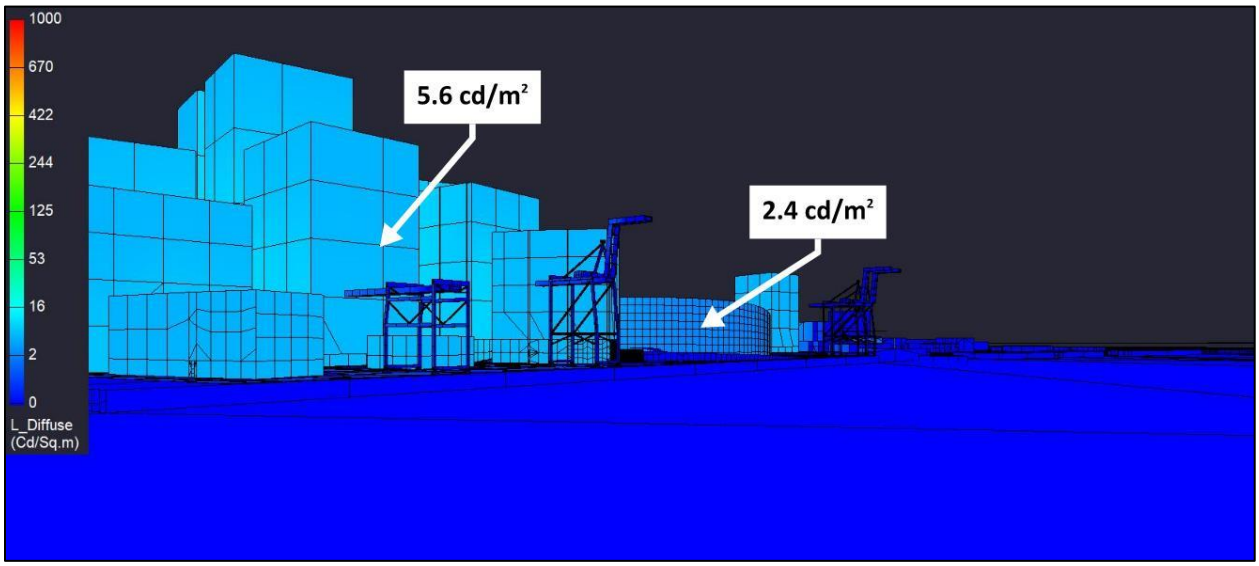


Figure 175: View from Receptor Site 2B for Baseline project, Baseline ballpark height, “Full Buildout” scenario Post-Curfew lighting condition

Figure 176 provides the anticipated luminances viewed from Receptor Site 2C, which is centered in the turning basin and located 25’ above the water line. Façade luminances from this view **are not** anticipated to exceed threshold.

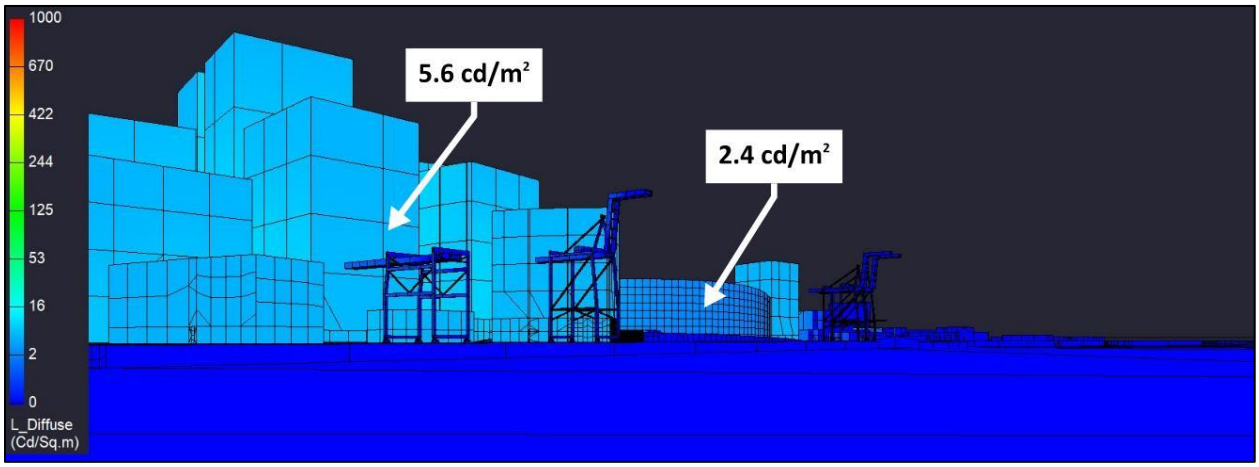


Figure 176: View from Receptor Site 2C for Baseline project, Baseline ballpark height, “Full Buildout” scenario Post-Curfew lighting condition

Figure 177 provides the anticipated luminances viewed from Receptor Site 3, which is located on Alameda and facing northwest toward the property. Luminances from this view **are not** anticipated to exceed threshold.

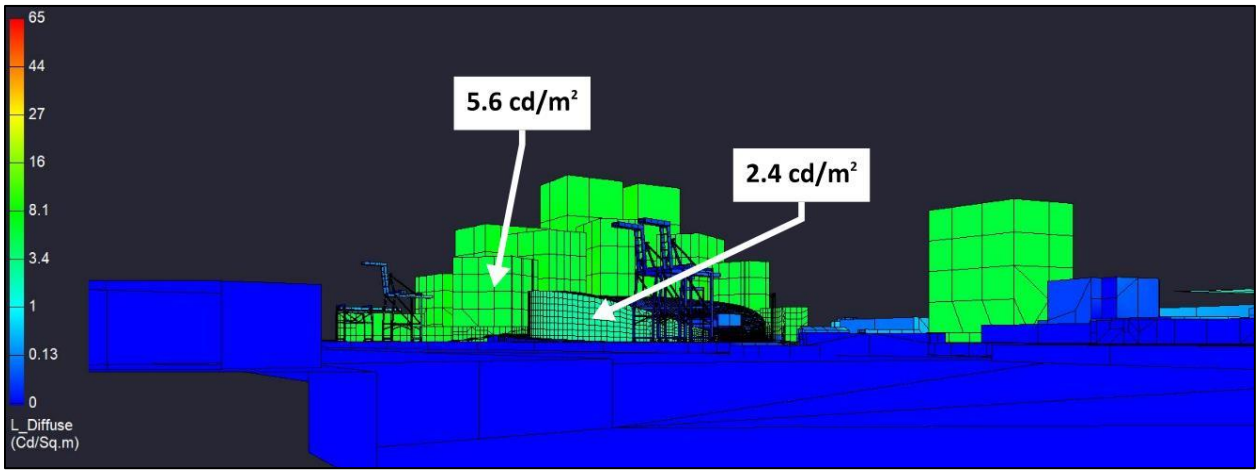


Figure 177: View from Receptor Site 3 for Baseline project, Baseline ballpark height, "Full Buildout" scenario Post-Curfew lighting condition

Figure 178 provides the view from Receptor Site 4, which is located at the intersection of MLK and Embarcadero. Luminances from this view **are not** anticipated to exceed threshold.

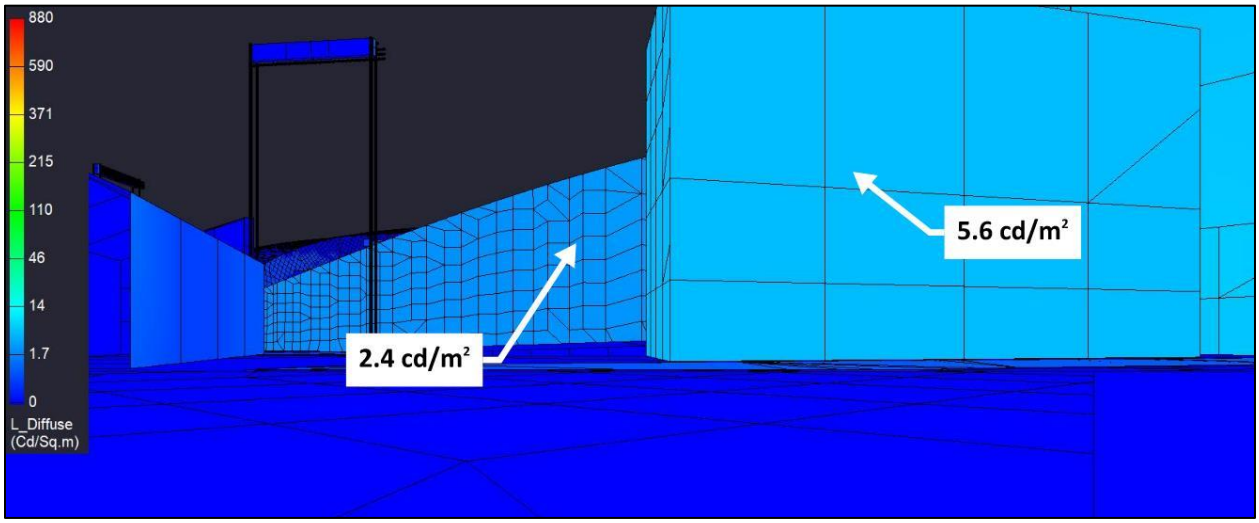


Figure 178: View from Receptor Site 4 for Baseline project, Baseline ballpark height, "Full Buildout" scenario Post-Curfew lighting condition

Figure 179 provides the anticipated luminances viewed from Receptor Site 5, which is located on Westbound I880. From this view, the ballpark and sports lighting are anticipated to be almost entirely blocked. The façade lighting of the adjacent mixed-use development is anticipated to be visible. Therefore, luminances from this view, excluding the interior retail lighting, **are not** anticipated to exceed threshold.

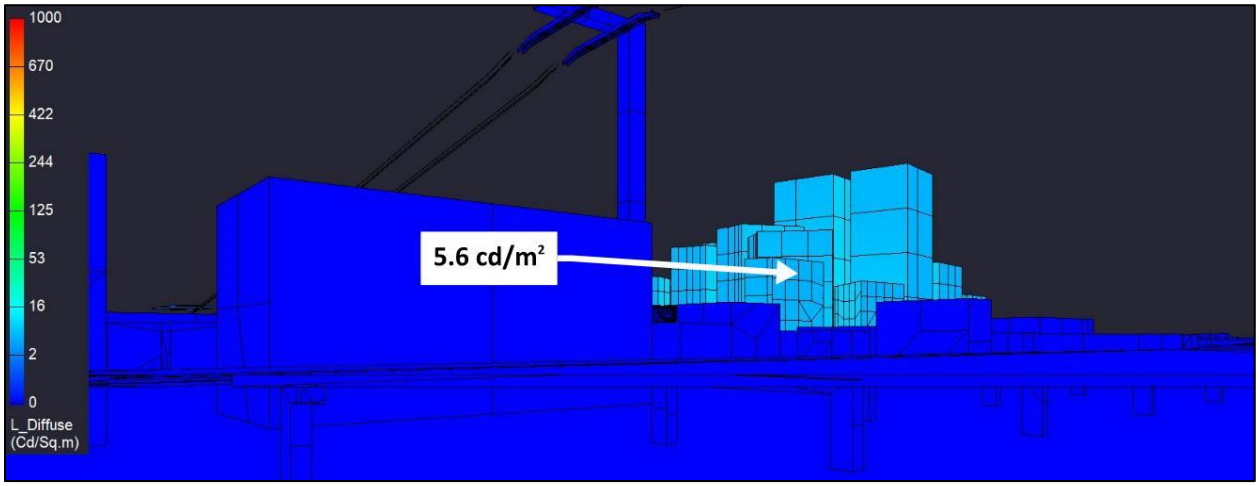


Figure 179: View from Receptor Site 5 for Baseline project, Baseline ballpark height, "Full Buildout" scenario Post-Curfew lighting condition

Figure 180 provides the anticipated luminances viewed from Receptor Site 5A, which is located on the southwest corner of the roof of the parking garage located at 2nd and Washington. Luminances from this view **are not** anticipated to exceed threshold.

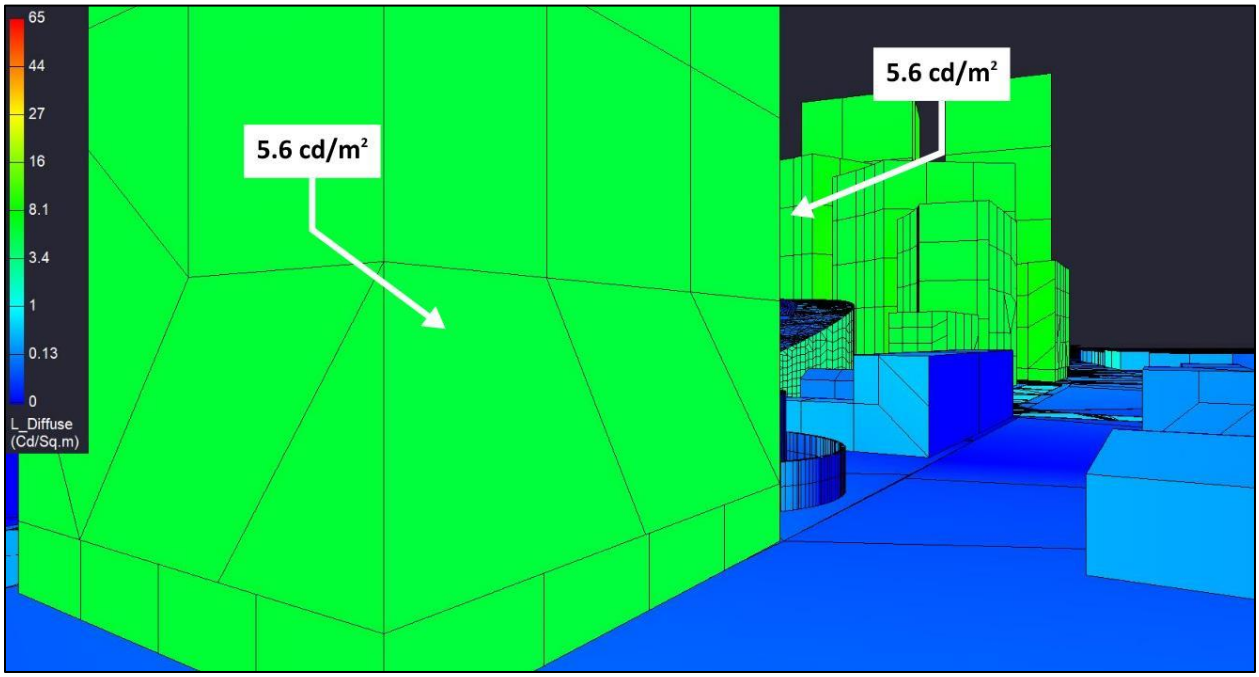


Figure 180: View from Receptor Site 5A for Baseline project, Baseline ballpark height, "Full Buildout" scenario Post-Curfew lighting condition

Figure 181 provides the anticipated luminances viewed from Receptor Site 5B, which is located on the southeast corner of the roof of the parking garage looking toward the anticipated gondola station near Jack London Square. Luminances from this view **<u>are not</u>** anticipated to exceed threshold.

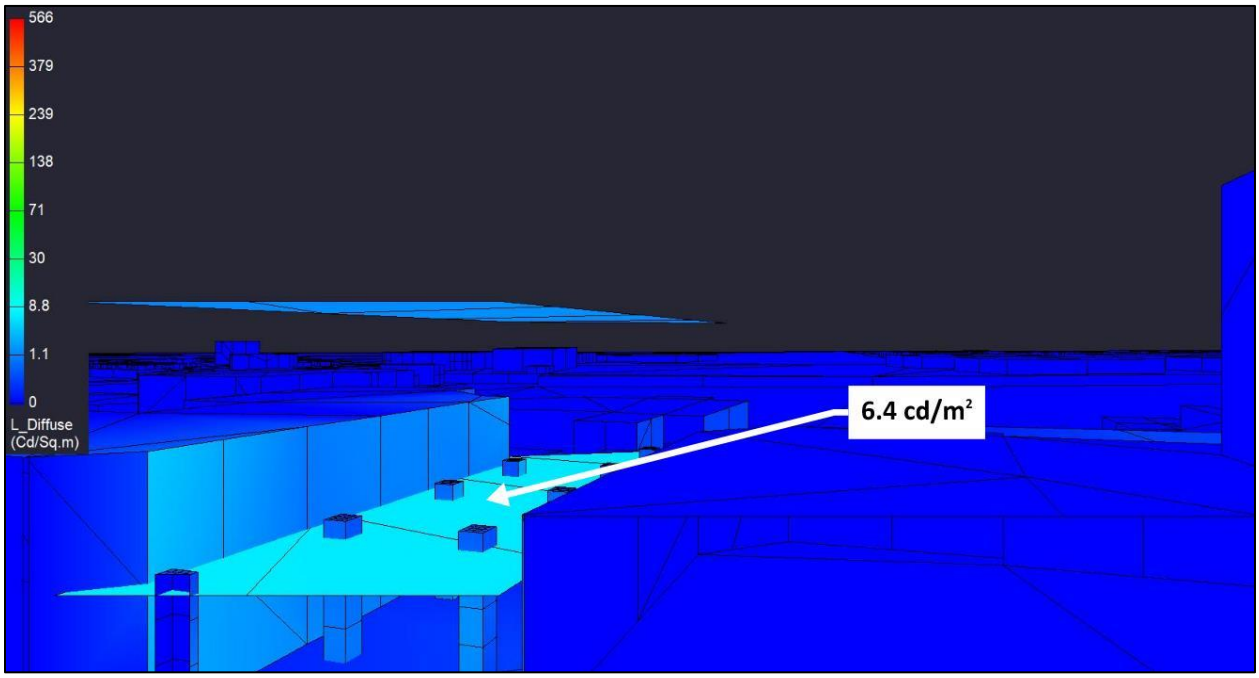


Figure 181: View from Receptor Site 5B for Baseline project, Baseline ballpark height, "Full Buildout" scenario Post-Curfew lighting condition

Figure 182 provides the anticipated luminances viewed from Receptor Site 5C, which is located on the northeast corner of the parking garage at 2nd and Washington, looking northeast on the Washington corridor. No architectural lighting is anticipated on the gondola support tower and the Convention Center gondola station is not visible. Therefore, luminances from this view **<u>are not</u>** anticipated to exceed threshold.

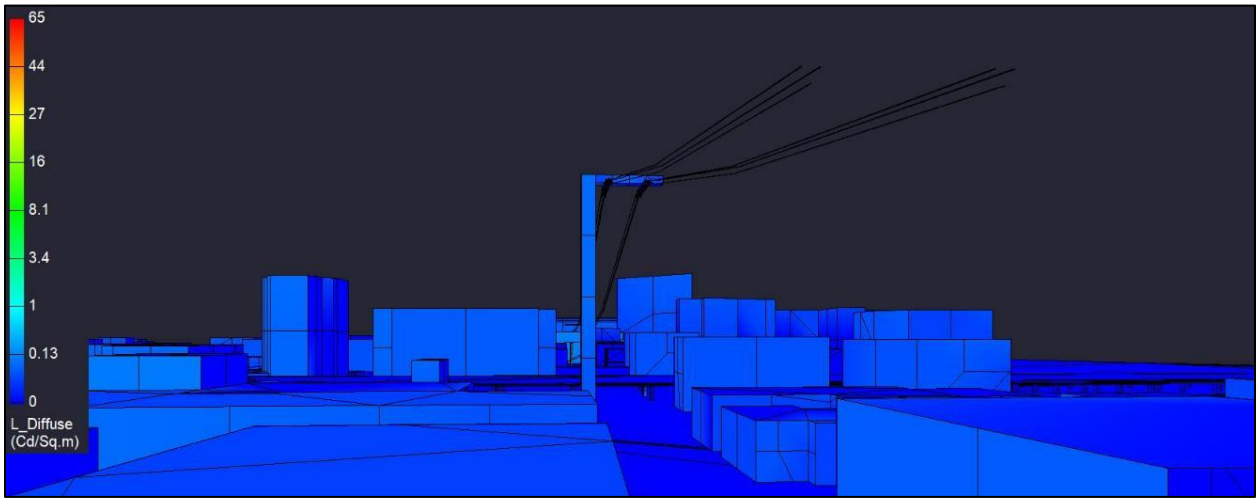


Figure 182: View from Receptor Site 5C for Baseline project, Baseline ballpark height, "Full Buildout" scenario Post-Curfew lighting condition

Figure 183 provides the anticipated luminances viewed from Receptor Site 6, which is located on the ramp from I980 to eastbound I880. Luminances from this view **are not** anticipated to exceed threshold.

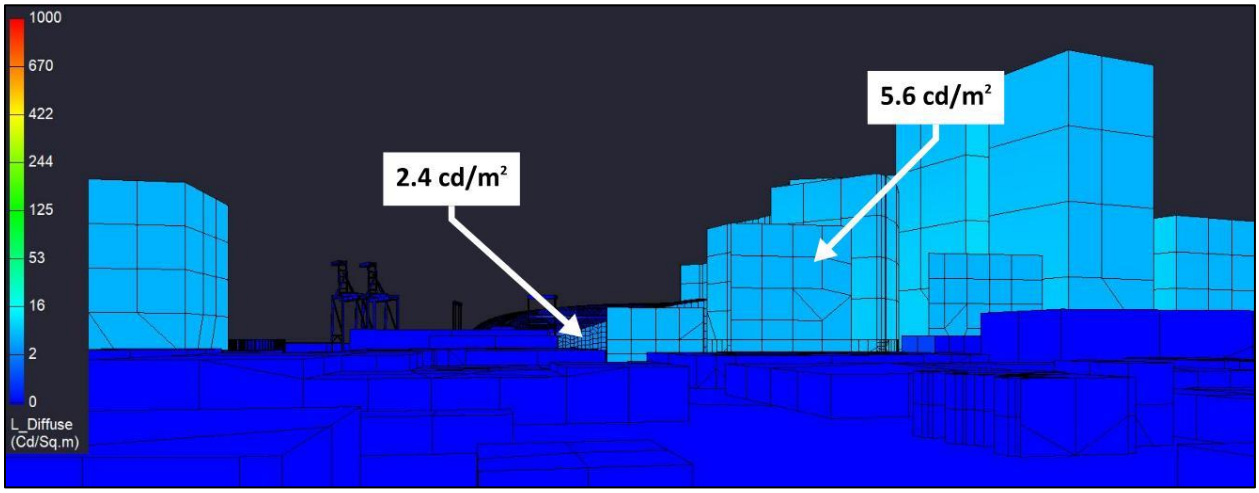


Figure 183: View from Receptor Site 6 for Baseline project, Baseline ballpark height, "Full Buildout" scenario Post-Curfew lighting condition

Figure 184 provides the anticipated luminances viewed from Receptor Site 6A, which is located at 7th and Brush. The luminances from this view **are not** anticipated to exceed threshold.

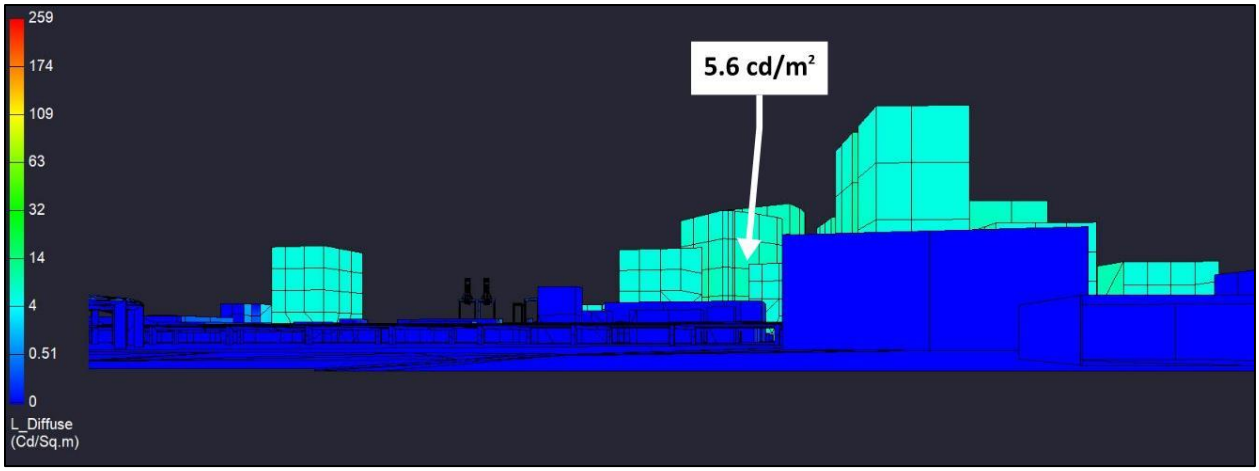


Figure 184: View from Receptor Site 6A for Baseline project, Baseline ballpark height, "Full Buildout" scenario Post-Curfew lighting condition

Figure 185 provides the anticipated luminances viewed from Receptor Site 7, which is located at 8th and Washington facing north to the anticipated Convention Center gondola station. From this position, the field of view is anticipated to include the bottom surface of the gondola platform. Therefore, luminances from this view **are not** anticipated to exceed threshold.

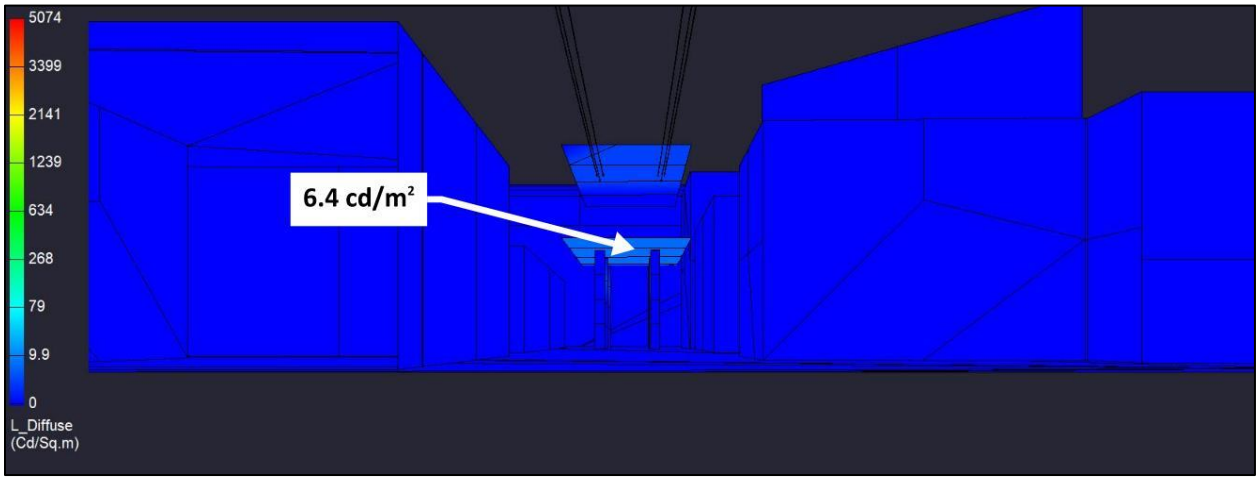


Figure 185: View from Receptor Site 7 for Baseline project, Baseline ballpark height, "Full Buildout" scenario Post-Curfew lighting condition

Figure 186 provides the anticipated luminances viewed from Receptor Site 7A, which is located at 8th and Washington facing south toward the gondola support pole. From this position, the field of view is anticipated to include the gondola support pole which is not anticipated to have any architectural lighting. Therefore, luminances from this view **are not** anticipated to exceed threshold.

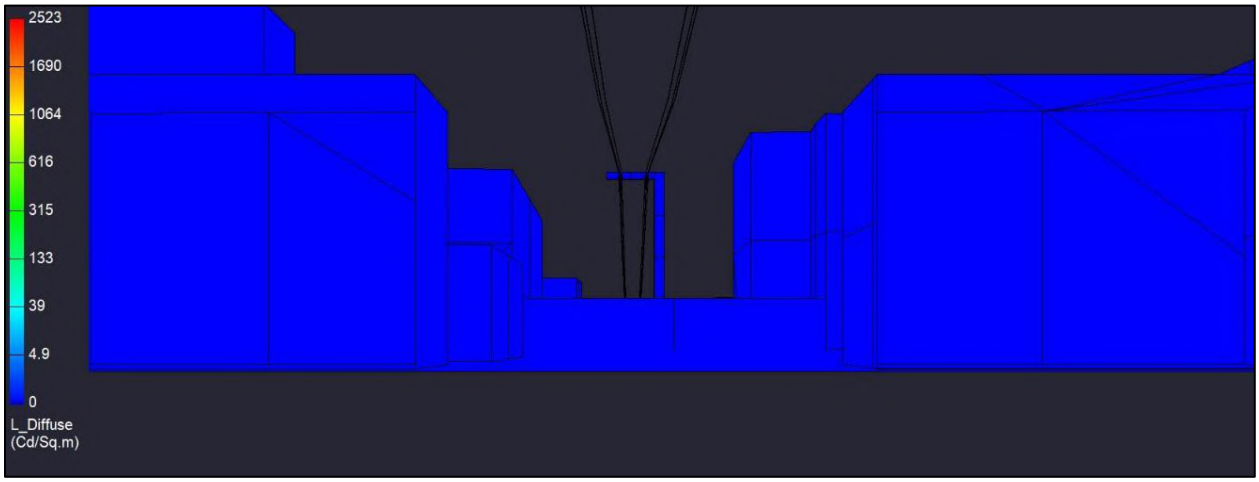


Figure 186: View from Receptor Site 7A for Baseline project, Baseline ballpark height, "Full Buildout" scenario Post-Curfew lighting condition

8.2 Project Design Option – Reduced Ballpark Height

The second set of analysis includes the project design option of the reduced ballpark height within the Baseline project, but does not include the gondola variant.

8.2.1 "Phase 1" Scenario

Per the project description included in section 3.1, the "Phase 1" scenario includes the ballpark, site development immediately adjacent, and a select number of accessory buildings. The bulk of the remaining site is anticipated to be temporary surface parking.

8.2.1.1 Game Nights

As described in section 4.5.8, the Game Night lighting condition is anticipated to include all lighting "on", including sports and house lighting, and included identified signage locations.

8.2.1.1.1 Spill Light

Table 42 provides the calculation results for the spill light assessment at the receptor sites for this condition. As shown, the proposed lighting **is** anticipated to exceed the spill light threshold at Receptor Site 1, which has a direct view of the ribbon boards. All other receptor site spill light **is not** anticipated to exceed threshold.

Receptor Site	Spill Light, [lux]	Significant
Receptor Site 1 - Water Street at Clay (Facing Ballpark)	**41.2**	**Yes**
Receptor Site 2 - Inner Harbor Turning Basin @ 190'	0.9	No
Receptor Site 2A - Turning Basin Line-of-Sight	0.2	No
Receptor Site 2B - Inner Harbor Turning Basin @ 64'	0.8	No
Receptor Site 2C - Inner Harbor Turning Basin @ 25'	0.6	No
Receptor Site 3 - Alameda Dock	3.4	No
Receptor Site 4 - MLK at Embarcadero	11.5	No
Receptor Site 5 - I880 Westbound	0.4	No
Receptor Site 5A - 2nd at Washington (Facing Ballpark)	7.4	No
Receptor Site 6 - I980 Ramp to Eastbound I880	2.3	No
Receptor Site 6A - 7th at Brush	0.5	No

Table 42: Spill light at receptor sites for Baseline project, Reduced ballpark height, "Phase 1" scenario Game Night lighting condition. [Note: Threshold of significance is 25 lux]

8.2.1.1.2 Spill Light Map

Figure 187 provides a spill light map for this lighting condition. To generate the spill light map, vertical calculation points were arrayed around the project site at 5’-6” AFG and oriented toward the pitcher’s mound for reference. The isoline curves show the extent to which vertical light levels are calculated and are reported in lux. As shown, less than 1 vertical lux is expected in the turning basin. For reference, one 60W incandescent light bulb will generate 1 lux at a distance of approximately 8 meters (26 ft).

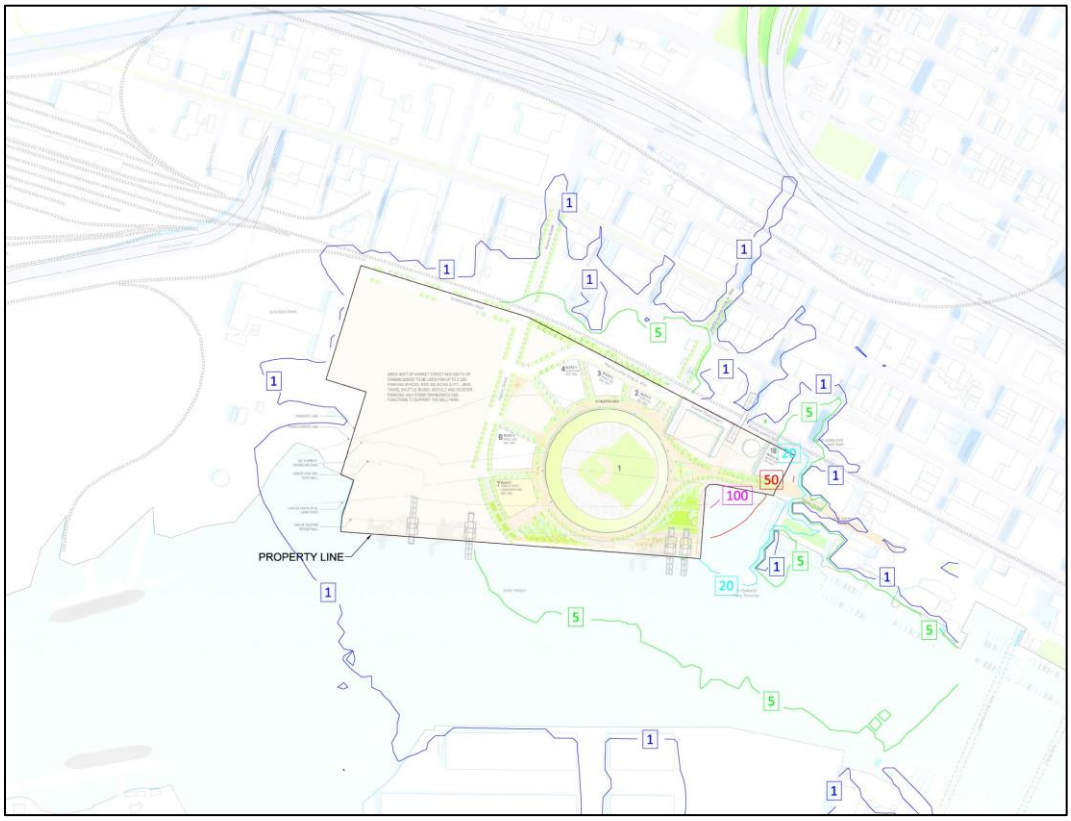


Figure 187: Spill light map for Baseline project, Reduced ballpark height, “Phase 1” scenario Game Night lighting condition indicating vertical illuminance isolines

8.2.1.1.3 Glare

Figure 188 through Figure 198 illustrate the luminances anticipated to be observed from the identified receptor sites for this lighting condition. Note that the scale associated with each receptor site view approximately matches the scale used for the associated site's existing conditions HDR falsecolor images. Receptor Sites 1A, 5B, 5C, 7 and 7A have been excluded since the gondola variant is not included in this model. Table 43 summarizes the anticipated glare significance at the receptor sites. Additionally, as noted in Section 4.5.3, the modeled retail lighting is included for pre-curfew times to capture the impact of interior lighting emanating through windows as a conservative contribution to spill light assessment; the modeled luminance, therefore, is an interior luminance and not subject to glare limitations directly.

Receptor Site	Facades		Signage	
	Maximum, [cd/m^2]	Significant	Maximum, [cd/m^2]	Significant
Receptor Site 1 - Water Street at Clay (Facing Ballpark)	38.2	Yes	3,500	Yes
Receptor Site 2 - Inner Harbor Turning Basin @ 190'	15.9	No	n/a	n/a
Receptor Site 2A - Turning Basin Line-of-Sight	15.9	No	n/a	n/a
Receptor Site 2B - Inner Harbor Turning Basin @ 64'	15.9	No	n/a	n/a
Receptor Site 2C - Inner Harbor Turning Basin @ 25'	15.9	No	n/a	n/a
Receptor Site 3 - Alameda Dock	38.2	Yes	3,500	Yes
Receptor Site 4 - MLK at Embarcadero	15.9	No	3,500	Yes
Receptor Site 5 - I880 Westbound	38.2	Yes	n/a	n/a
Receptor Site 5A - 2nd at Washington (Facing Ballpark)	38.2	Yes	3,500	Yes
Receptor Site 6 - I980 Ramp to Eastbound I880	15.9	No	3,500	Yes
Receptor Site 6A - 7th at Brush	15.9	No	3,500	Yes

Table 43: Summary of anticipated glare significance at receptor sites for the Baseline project, Reduced ballpark height, "Phase 1" scenario Game Night lighting conditions. [Note: Threshold of significance is 25 cd/m^2 for façade lighting and 1,000 cd/m^2 for digital signage]

Figure 188 shows the anticipated luminances viewed from Receptor Site 1, which is one of the closest receptor sites. As seen, from this perspective, there is a direct view of the scoreboard/ribbon boards. With the sports field lights shifted from the "halo" configuration to the pole-mounted configuration, increased luminance on the adjacent building facades is expected due to reflection from the roof. Therefore, façade luminances from this view **are** anticipated to exceed threshold and sign luminances from this view **are** anticipated to exceed threshold.

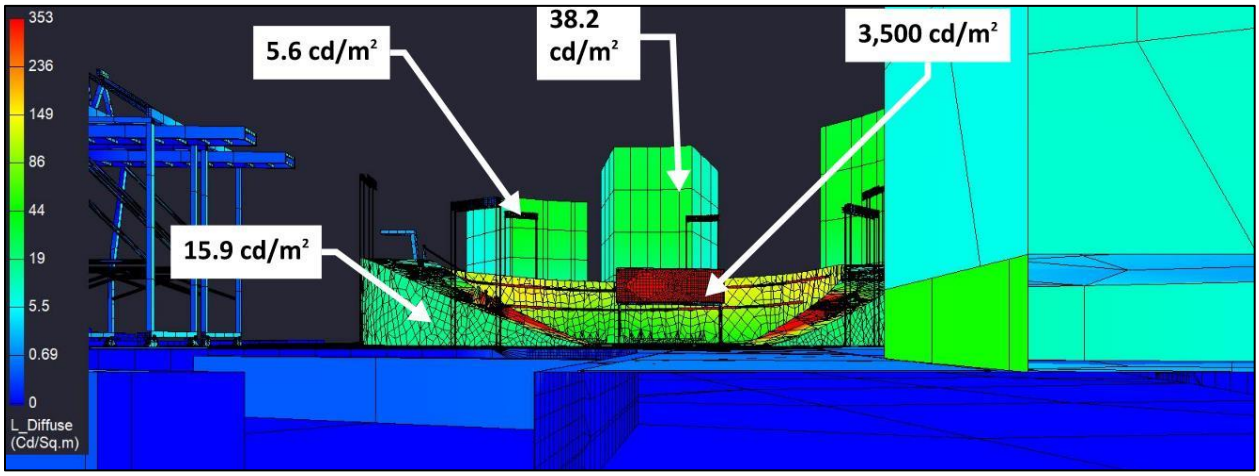


Figure 188: View from Receptor Site 1 for Baseline project, Reduced ballpark height, "Phase 1" scenario Game Night lighting condition

Figure 189 provides the anticipated luminances viewed from Receptor Site 2, which is centered in the turning basin and located 190' above the water line. As shown, based on the ballpark geometry, there is not anticipated to be a direct view of the field luminaires, significantly reducing the observed brightnesses in the field of view. Refer to further discussion on this topic in section 6.2.1 above. The façade luminances from this view **are not** anticipated to exceed threshold.

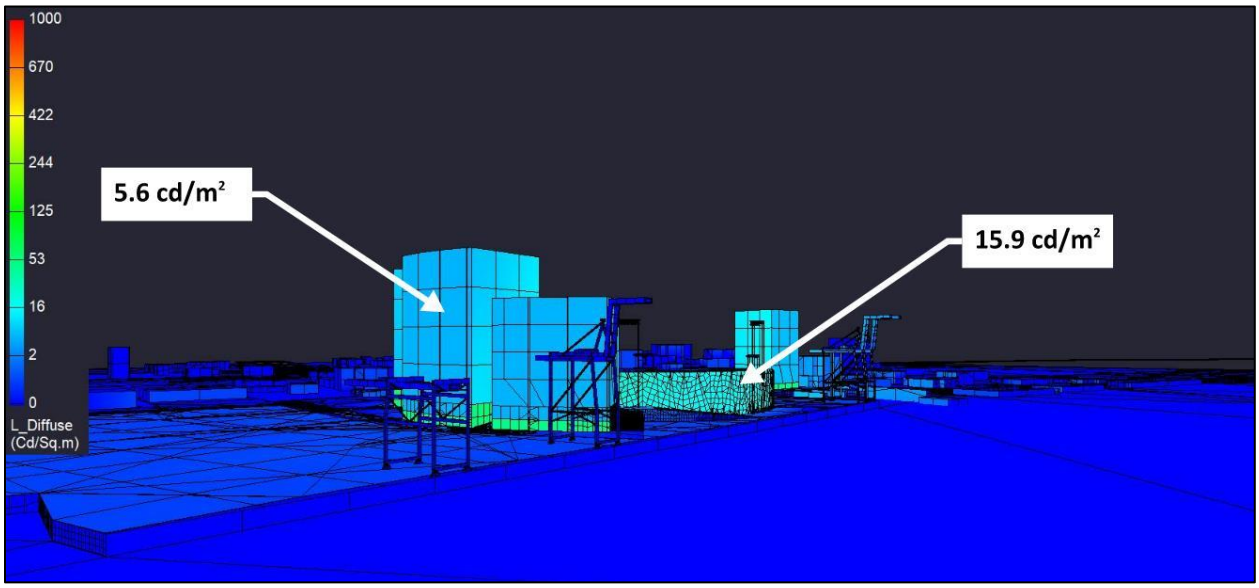


Figure 189: View from Receptor Site 2 for Baseline project, Reduced ballpark height, "Phase 1" scenario Game Night lighting condition

Figure 190 provides the anticipated luminances viewed from Receptor Site 2A, which is on Alameda with a direct line of site through the center of the turning basin. Similar to Receptor Site 2, the lower roof height is not expected to provide a direct line of sight to the scoreboard. Therefore, luminances from this view **are not** anticipated to exceed threshold.

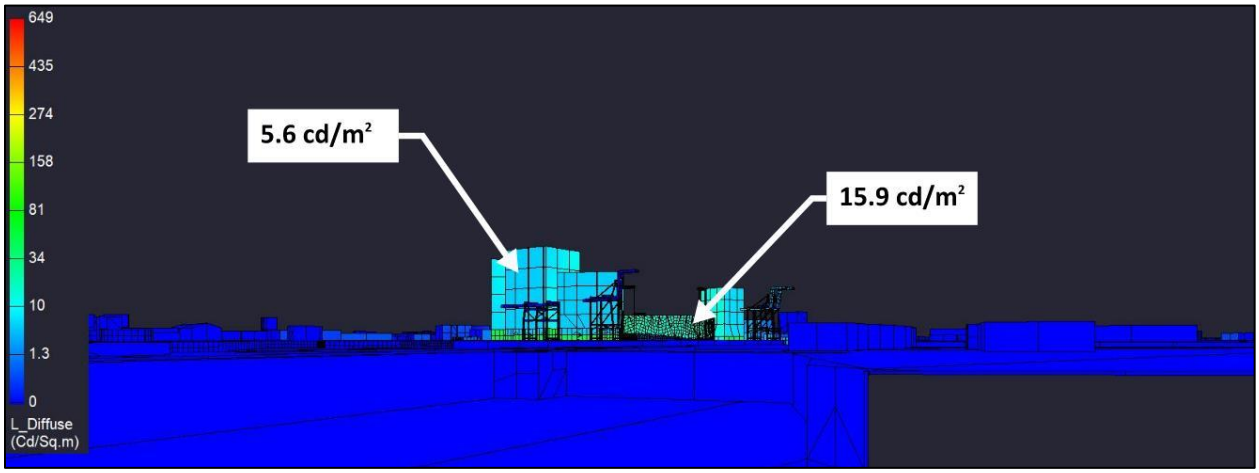


Figure 190: View from Receptor Site 2A for Baseline project, Reduced ballpark height, "Phase 1" scenario Game Night lighting condition

Figure 191 provides the anticipated luminances viewed from Receptor Site 2B, which is centered in the turning basin and located 64' above the water line. As shown, based on the ballpark geometry, there is not anticipated to be a direct view of the sports lighting, scoreboard or ribbon boards. The façade luminances from this view **are not** anticipated to exceed threshold.

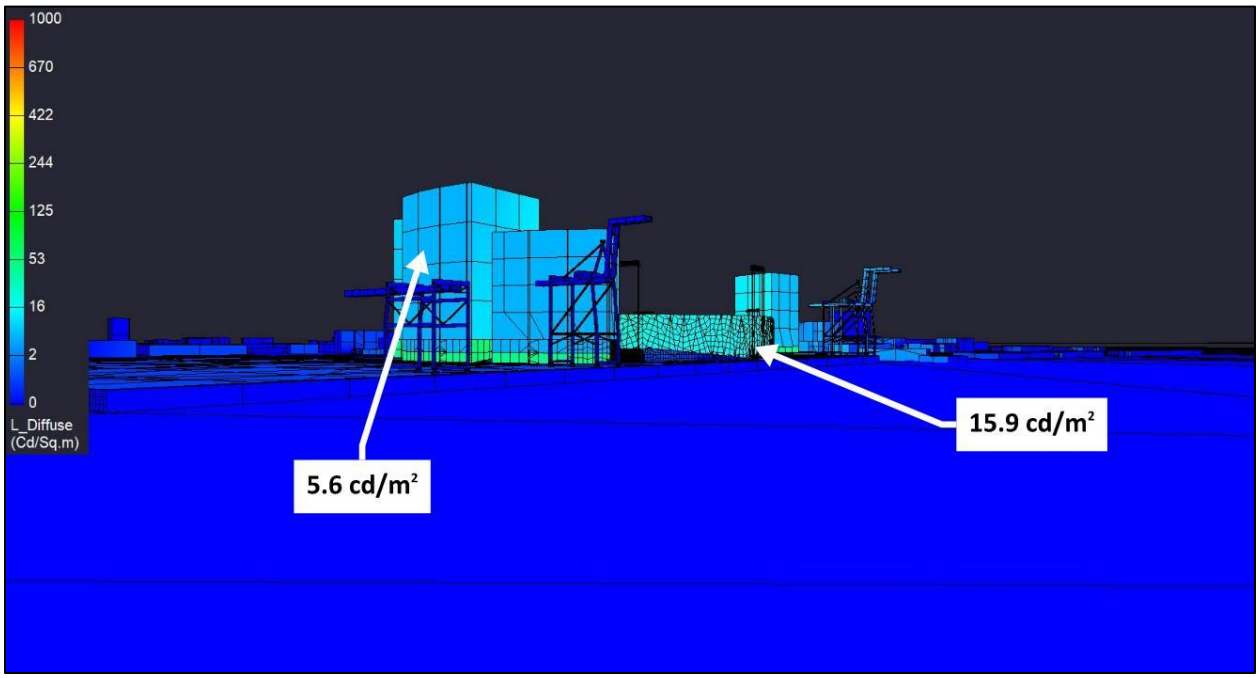


Figure 191: View from Receptor Site 2B for Baseline project, Reduced ballpark height, "Phase 1" scenario Game Night lighting condition

Figure 192 provides the anticipated luminances viewed from Receptor Site 2C, which is centered in the turning basin and located 25' above the water line. As shown, based on the ballpark geometry, there is not anticipated to be a direct view of the sports lighting, scoreboard or ribbon boards. The façade luminances from this view **are not** anticipated to exceed threshold.

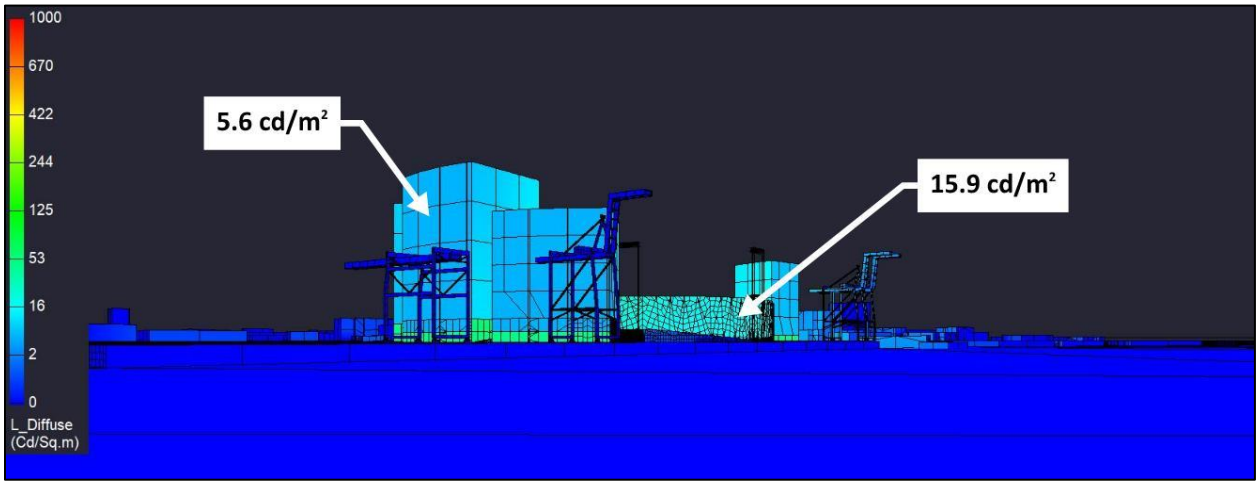


Figure 192: View from Receptor Site 2C for Baseline project, Reduced ballpark height, "Phase 1" scenario Game Night lighting condition

Figure 193 provides the anticipated luminances viewed from Receptor Site 3, which is located on Alameda and facing northwest toward the property. From this position, there is a direct line of site to the scoreboard/ribbon boards. With the sports field lights shifted from the "halo" configuration to the pole-mounted configuration, increased luminance on the adjacent building facades is expected due to reflection from the roof. Therefore, façade luminances from this view **are** anticipated to exceed threshold and sign luminances from this view **are** anticipated to exceed threshold.

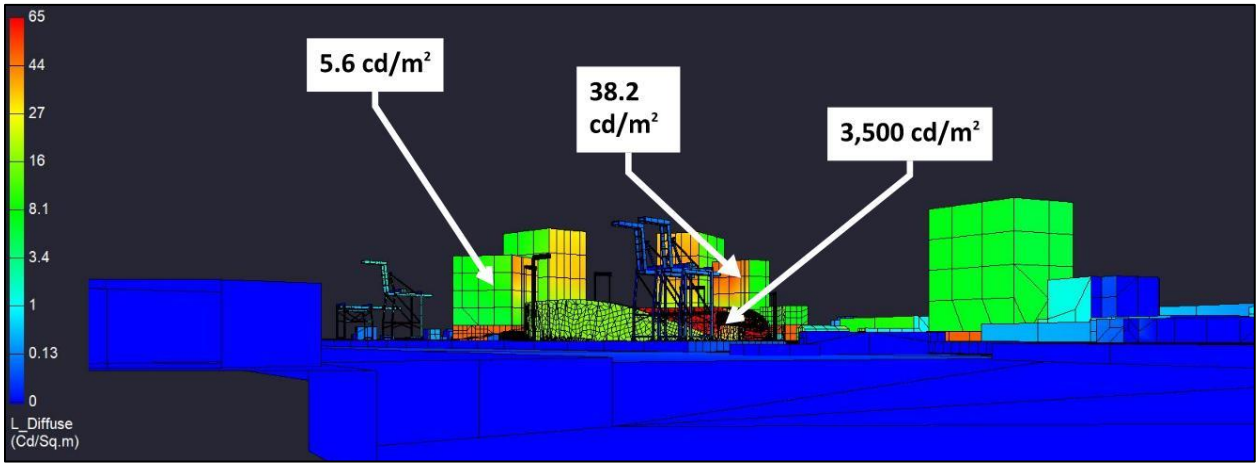


Figure 193: View from Receptor Site 3 for Baseline project, Reduced ballpark height, "Phase 1" scenario Game Night lighting condition

Figure 194 provides the view from Receptor Site 4, which is located at the intersection of MLK and Embarcadero. As shown, a small corner of the scoreboard is anticipated to be viewed from this location, which exceed threshold. Therefore, façade luminances from this view **are not** anticipated to exceed threshold and sign luminances from this view **are** anticipated to exceed threshold.

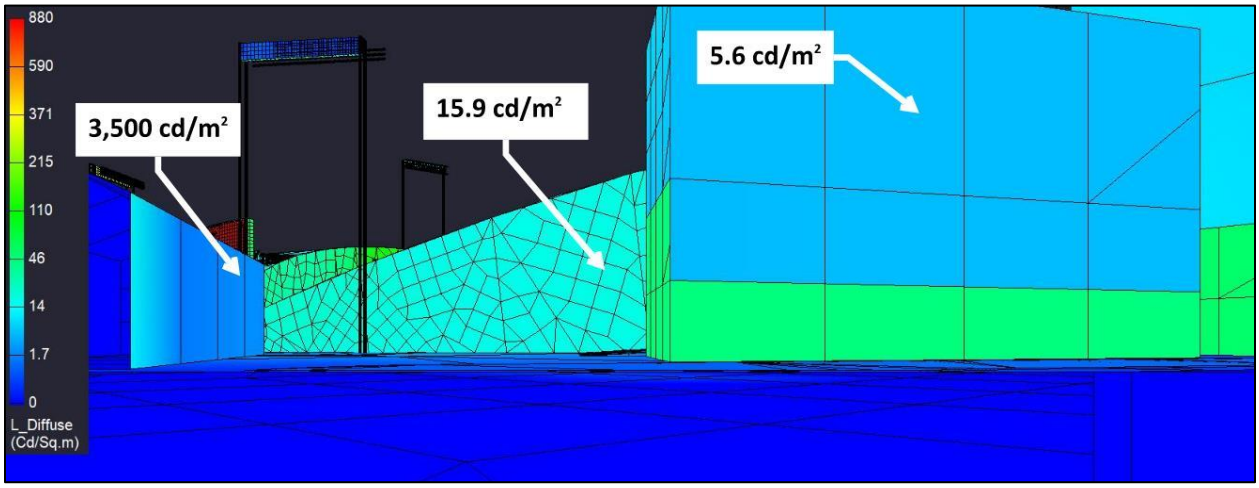


Figure 194: View from Receptor Site 4 for Baseline project, Reduced ballpark height, "Phase 1" scenario Game Night lighting condition

Figure 195 provides the anticipated luminances viewed from Receptor Site 5, which is located on Westbound I880. The façade lighting of the adjacent mixed-use development is anticipated to be visible. With the sports field lights shifted from the "halo" configuration to the pole-mounted configuration, increased luminance on the adjacent building facades is expected due to reflection from the roof. Therefore, façade luminances from this view **are** anticipated to exceed threshold and sign luminances from this view **are** anticipated to exceed threshold.

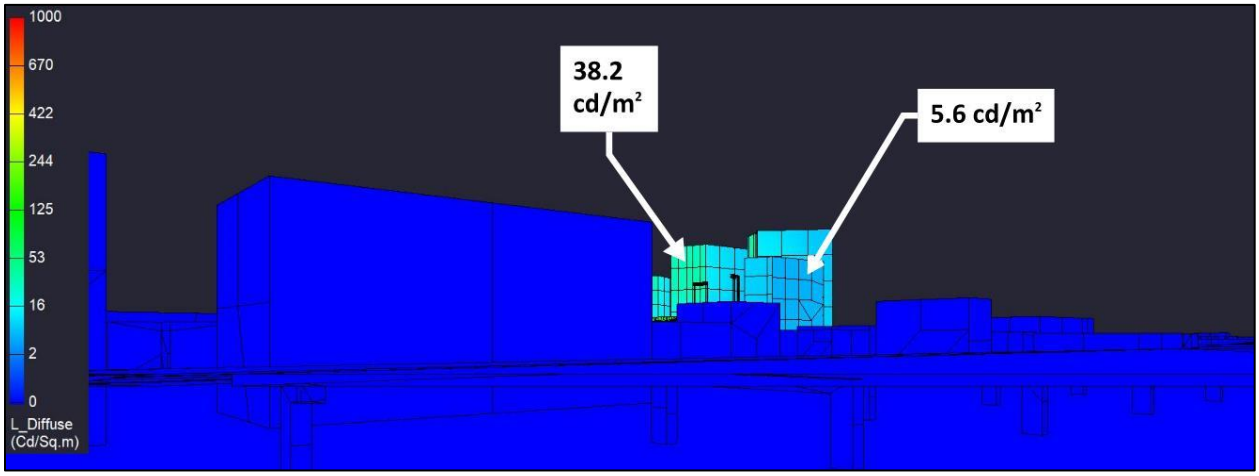


Figure 195: View from Receptor Site 5 for Baseline project, Reduced ballpark height, "Phase 1" scenario Game Night lighting condition

Figure 196 provides the anticipated luminances viewed from Receptor Site 5A, which is located on the southwest corner of the roof of the parking garage located at 2nd and Washington. From this elevated position, there is a direct view down into the ballpark, including a direct view of the ribbon boards. With the sports field lights shifted from the "halo" configuration to the pole-mounted configuration, increased luminance on the adjacent building facades is expected due to reflection from the roof. Therefore, façade luminances from this view **are** anticipated to exceed threshold and sign luminances from this view **are** anticipated to exceed threshold.

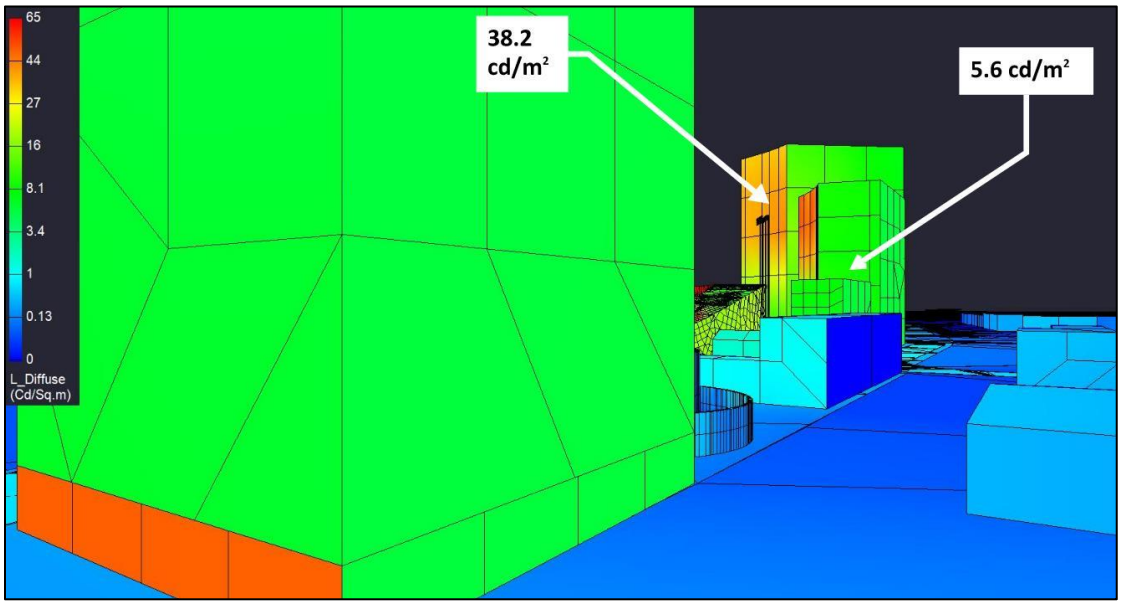


Figure 196: View from Receptor Site 5A for Baseline project, Reduced ballpark height, "Phase 1" scenario Game Night lighting condition

Figure 197 provides the anticipated luminances viewed from Receptor Site 6, which is located on the ramp from I980 to eastbound I880. From this perspective, a direct view of the scoreboard/ribbon boards is anticipated. Therefore, façade luminances from this view **are not** anticipated to exceed threshold and sign luminances from this view **are** anticipated to exceed threshold.

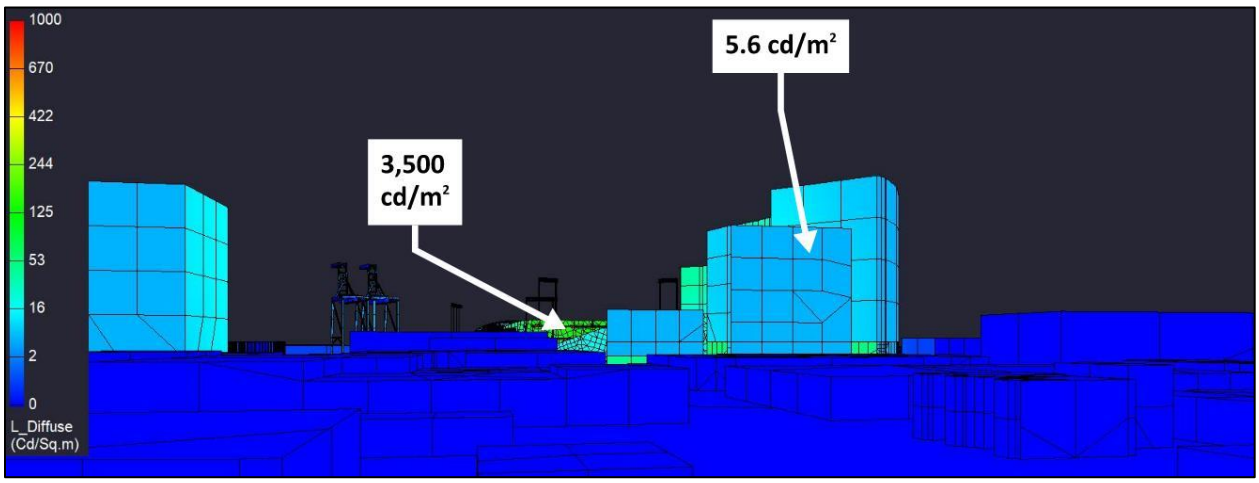


Figure 197: View from Receptor Site 6 for Baseline project, Reduced ballpark height, "Phase 1" scenario Game Night lighting condition

Figure 198 provides the anticipated luminances viewed from Receptor Site 6A, which is located at 7th and Brush. From this perspective, there is anticipated to be a minimal view of the scoreboard. Therefore, façade luminances from this view **are not** anticipated to exceed threshold and sign luminances from this view **are** anticipated to exceed threshold.

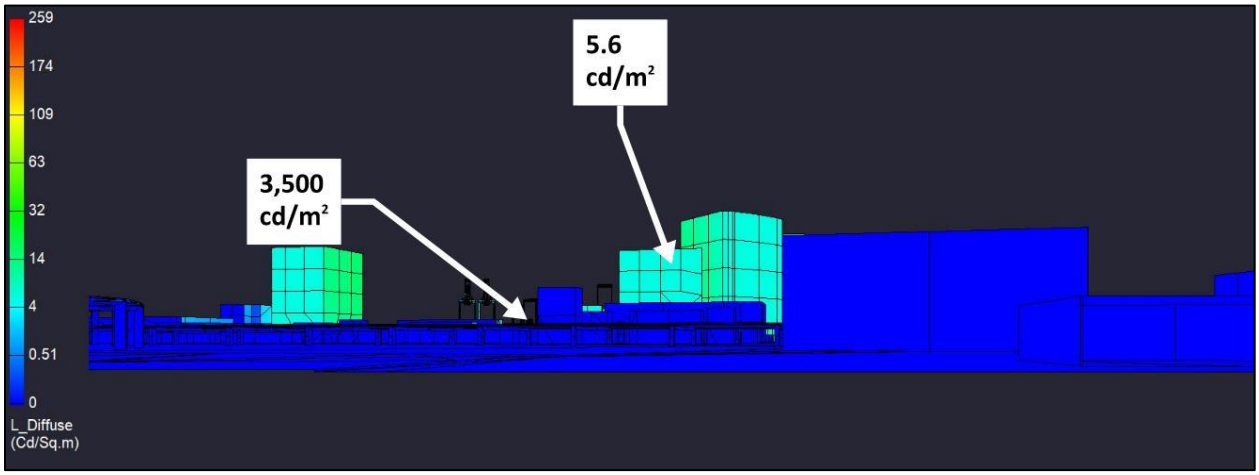


Figure 198: View from Receptor Site 6A for Baseline project, Reduced ballpark height, "Phase 1" scenario Game Night lighting condition

8.2.2 "Full Buildout" Scenario

8.2.2.1 Game Nights

As described in section 4.5.8, the Game Night lighting condition is anticipated to include all lighting "on", including sports and house lighting, and included identified signage locations.

8.2.2.1.1 Spill Light

Table 44 provides the calculation results for the spill light assessment at the receptor sites for this condition. As shown, the proposed lighting **is** anticipated to exceed the spill light threshold at Receptor Sites 1, which has a direct view of the ribbon boards and pole-mounted infield sports lights. All other receptor site spill light **is not** anticipated to exceed threshold.

Receptor Site	Spill Light, [lux]	Significant
Receptor Site 1 - Water Street at Clay (Facing Ballpark)	**41.8**	**Yes**
Receptor Site 2 - Inner Harbor Turning Basin @ 190'	1.9	No
Receptor Site 2A - Turning Basin Line-of-Sight	0.5	No
Receptor Site 2B - Inner Harbor Turning Basin @ 64'	1.6	No
Receptor Site 2C - Inner Harbor Turning Basin @ 25'	1.5	No
Receptor Site 3 - Alameda Dock	3.6	No
Receptor Site 4 - MLK at Embarcadero	11.6	No
Receptor Site 5 - I880 Westbound	0.6	No
Receptor Site 5A - 2nd at Washington (Facing Ballpark)	7.8	No
Receptor Site 6 - I980 Ramp to Eastbound I880	2.6	No
Receptor Site 6A - 7th at Brush	0.6	No

Table 44: Spill light at receptor sites for Baseline project, Reduced ballpark height, "Full Buildout" scenario Game Night lighting condition. [Note: Threshold of significance is 25 lux]

8.2.2.1.2 Spill Light Map

Figure 199 provides a spill light map for this lighting condition. To generate the spill light map, vertical calculation points were arrayed around the project site at 5’-6” AFG and oriented toward the pitcher’s mound for reference. The isoline curves show the extent to which vertical light levels are calculated and are reported in lux. As shown, less than 1 vertical lux is expected in the turning basin. The adjacent estuary is anticipated to experience less than 1 vertical lux generally, with light levels increasing closer to shore. For reference, one 60W incandescent light bulb will generate 1 lux at a distance of approximately 8 meters (26 ft).

Figure 199: Spill light map for Baseline project, Reduced ballpark height, “Full Buildout” scenario Game Night lighting condition indicating vertical illuminance isolines

8.2.2.1.3 Glare

Figure 200 through Figure 210 illustrate the luminances anticipated to be observed from the identified receptor sites for this lighting condition. Note that the scale associated with each receptor site view approximately matches the scale used for the associated site's existing conditions HDR falsecolor images. Receptor Sites 1A, 5A, 5B, 7 and 7A have been excluded since the gondola variant is not included in this model. Table 45 summarizes the anticipated glare significance at the receptor sites. Additionally, as noted in Section 4.5.3, the modeled retail lighting is included for pre-curfew times to capture the impact of interior lighting emanating through windows as a conservative contribution to spill light assessment; the modeled luminance, therefore, is an interior luminance and not subject to glare limitations directly.

Receptor Site	Facades		Signage	
	Maximum, [cd/m^2]	Significant	Maximum, [cd/m^2]	Significant
Receptor Site 1 - Water Street at Clay (Facing Ballpark)	37.4	Yes	3,500	Yes
Receptor Site 2 - Inner Harbor Turning Basin @ 190'	15.9	No	n/a	n/a
Receptor Site 2A - Turning Basin Line-of-Sight	15.9	No	n/a	n/a
Receptor Site 2B - Inner Harbor Turning Basin @ 64'	15.9	No	n/a	n/a
Receptor Site 2C - Inner Harbor Turning Basin @ 25'	15.9	No	n/a	n/a
Receptor Site 3 - Alameda Dock	37.4	Yes	3,500	Yes
Receptor Site 4 - MLK at Embarcadero	15.9	No	3,500	Yes
Receptor Site 5 - I880 Westbound	37.4	Yes	n/a	n/a
Receptor Site 5A - 2nd at Washington (Facing Ballpark)	37.4	No	3,500	Yes
Receptor Site 6 - I980 Ramp to Eastbound I880	15.9	No	3,500	Yes
Receptor Site 6A - 7th at Brush	15.9	No	3,500	Yes

Table 45: Summary of anticipated glare significance at receptor sites for the Baseline project, Reduced ballpark height, "Full Buildout" scenario Game Night lighting conditions. [Note: Threshold of significance is 25 cd/m^2 for façade lighting and 1,000 cd/m^2 for digital signage]

Figure 200 shows the anticipated luminances viewed from Receptor Site 1, which is one of the closest receptor sites. From this position, a direct view of the scoreboard and ribbon boards is anticipated. With the sports field lights shifted from the "halo" configuration to the pole-mounted configuration, increased luminance on the adjacent building facades is expected due to reflection from the roof. Therefore, façade luminances from this view **are** anticipated to exceed threshold and sign luminances from this view **are** anticipated to exceed threshold.

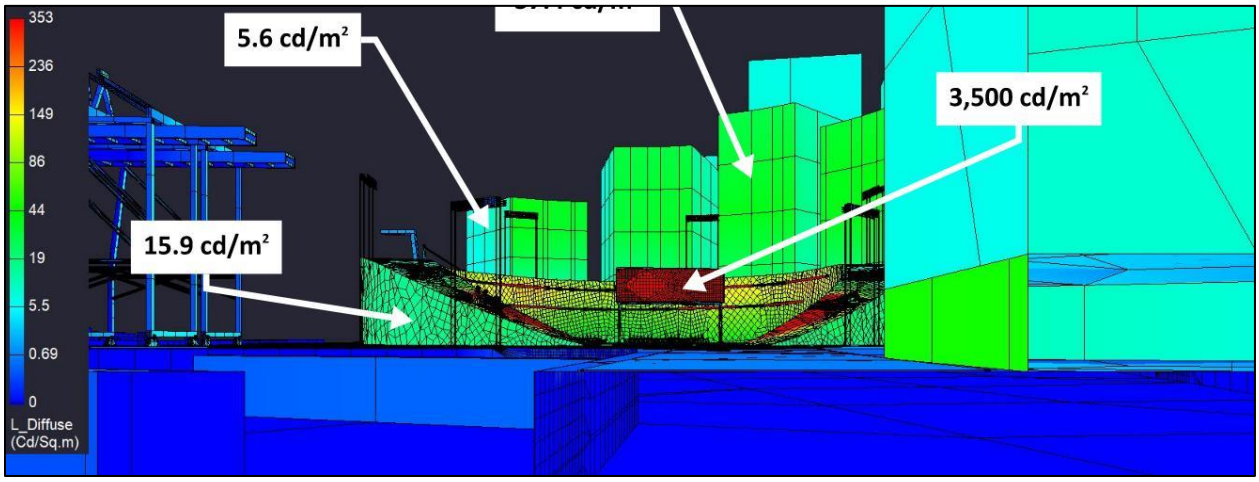


Figure 200: View from Receptor Site 1 for Baseline project, Reduced ballpark height, "Full Buildout" scenario Game Night lighting condition

Figure 201 provides the anticipated luminances viewed from Receptor Site 2, which is centered in the turning basin and located 190' above the water line. As shown, based on the ballpark geometry, there is not anticipated to be a direct view of the field luminaires, significantly reducing the observed brightnesses in the field of view. Refer to further discussion on this topic in section 6.2.1 above. The façade luminances from this view **are not** anticipated to exceed threshold.

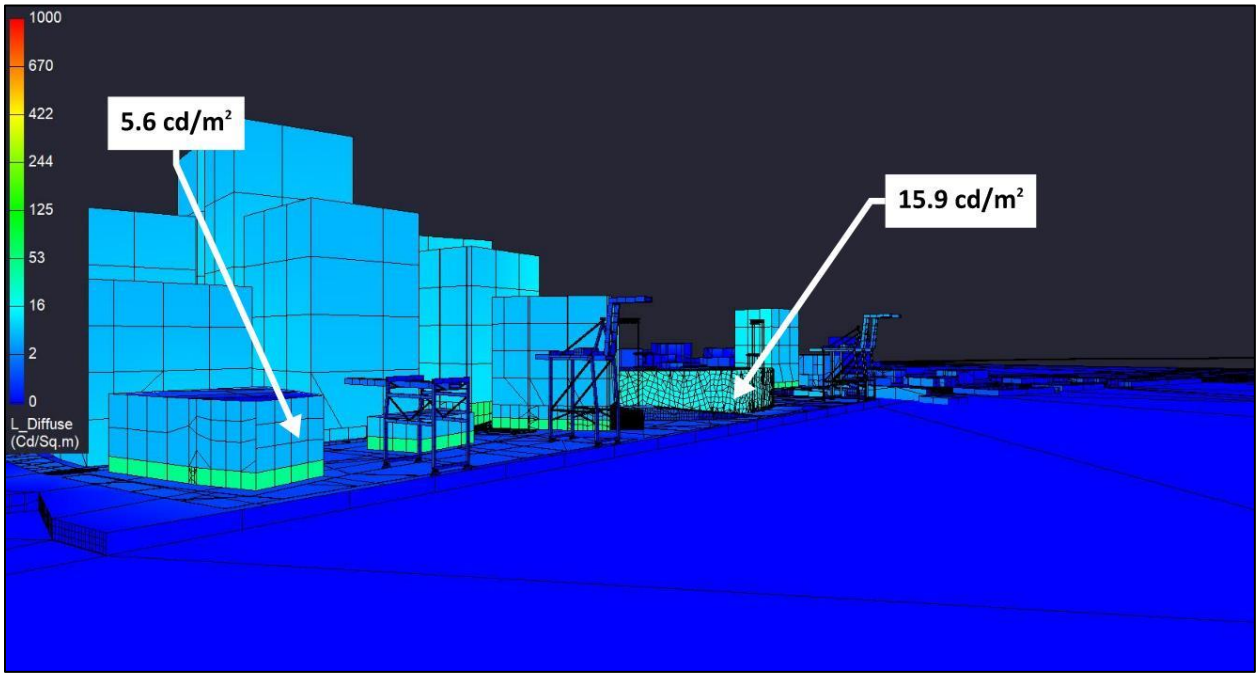


Figure 201: View from Receptor Site 2 for Baseline project, Reduced ballpark height, “Full Buildout” scenario Game Night lighting condition

Figure 202 provides the anticipated luminances viewed from Receptor Site 2A, which is on Alameda with a direct line of site through the center of the turning basin. Similar to Receptor Site 2, the lower roof height is not expected to provide a direct view of the scoreboard. Therefore, luminances from this view **are not** anticipated to exceed threshold.

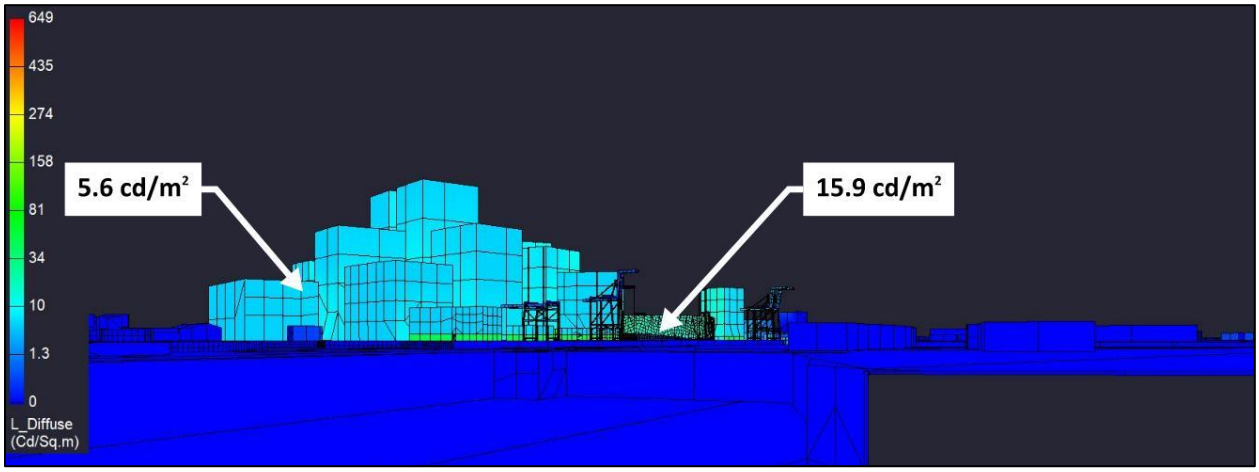


Figure 202: View from Receptor Site 2A for Baseline project, Reduced ballpark height, “Full Buildout” scenario Game Night lighting condition

Figure 203 provides the anticipated luminances viewed from Receptor Site 2B, which is centered in the turning basin and located 64’ above the water line. As shown, based on the ballpark geometry, there is not anticipated to be a direct view of the sports lighting, scoreboard or ribbon boards. The façade luminances from this view **are not** anticipated to exceed threshold.

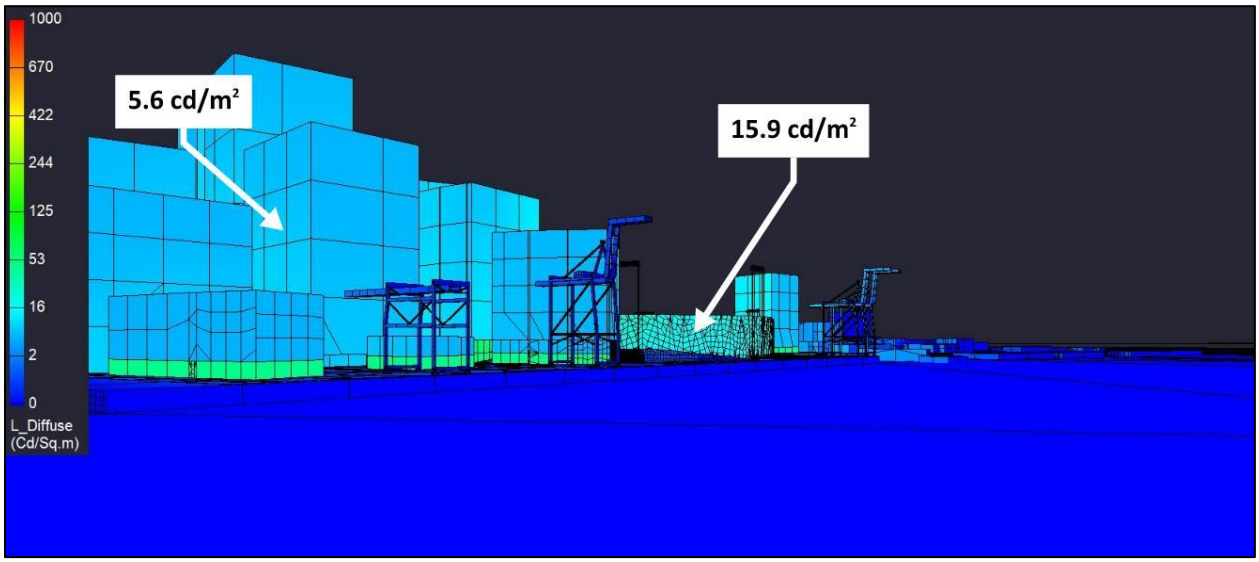


Figure 203: View from Receptor Site 2B for Baseline project, Reduced ballpark height, “Full Buildout” scenario Game Night lighting condition

Figure 204 provides the anticipated luminances viewed from Receptor Site 2C, which is centered in the turning basin and located 25' above the water line. As shown, based on the ballpark geometry, there is not anticipated to be a direct view of the sports lighting, scoreboard or ribbon boards. The façade luminances from this view **are not** anticipated to exceed threshold.

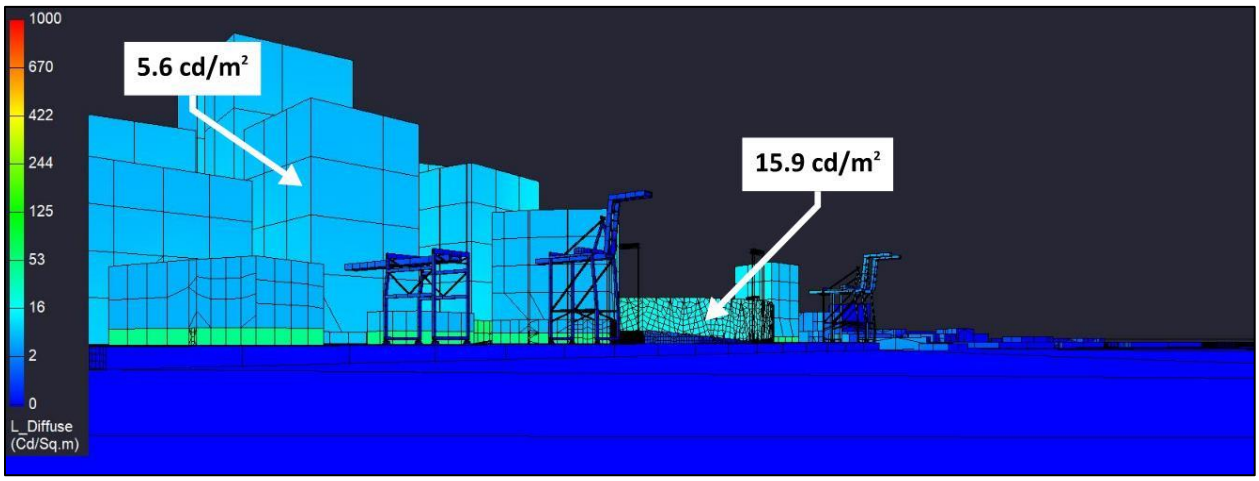


Figure 204: View from Receptor Site 2C for Baseline project, Reduced ballpark height, "Full Buildout" scenario Game Night lighting condition

Figure 205 provides the anticipated luminances viewed from Receptor Site 3, which is located on Alameda and facing northwest toward the property. From this position, there is a direct line of site to the scoreboard/ribbon boards. With the sports field lights shifted from the "halo" configuration to the pole-mounted configuration, increased luminance on the adjacent building facades is expected due to reflection from the roof. Therefore, façade luminances from this view **are** anticipated to exceed threshold and sign luminances from this view **are** anticipated to exceed threshold.

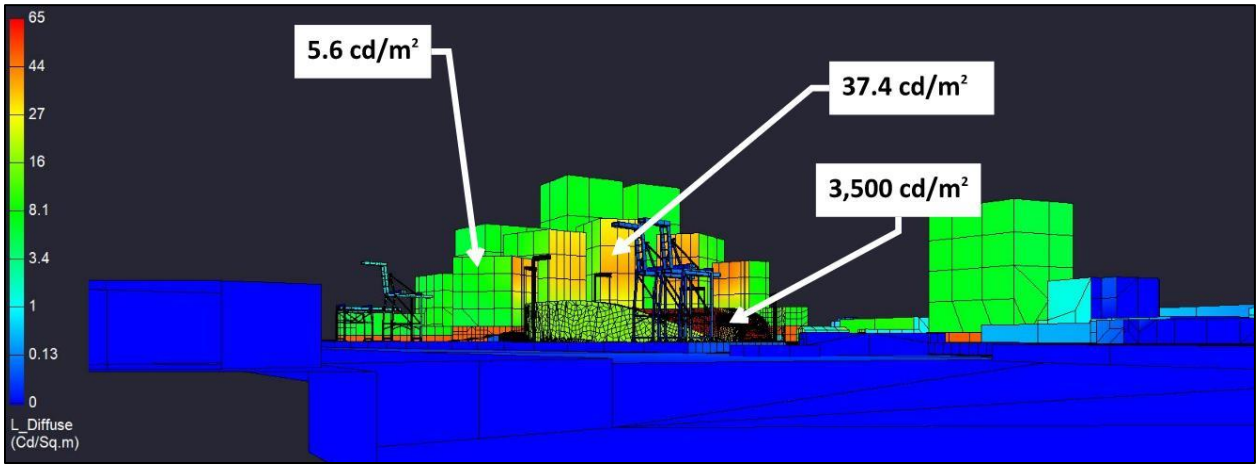


Figure 205: View from Receptor Site 3 for Baseline project, Reduced ballpark height, "Full Buildout" scenario Game Night lighting condition

Figure 206 provides the view from Receptor Site 4, which is located at the intersection of MLK and Embarcadero. As shown, a small corner of the scoreboard is anticipated to be viewed from this location, which exceed threshold. Therefore, façade luminances from this view **are not** anticipated to exceed threshold and sign luminances from this view **are** anticipated to exceed threshold.

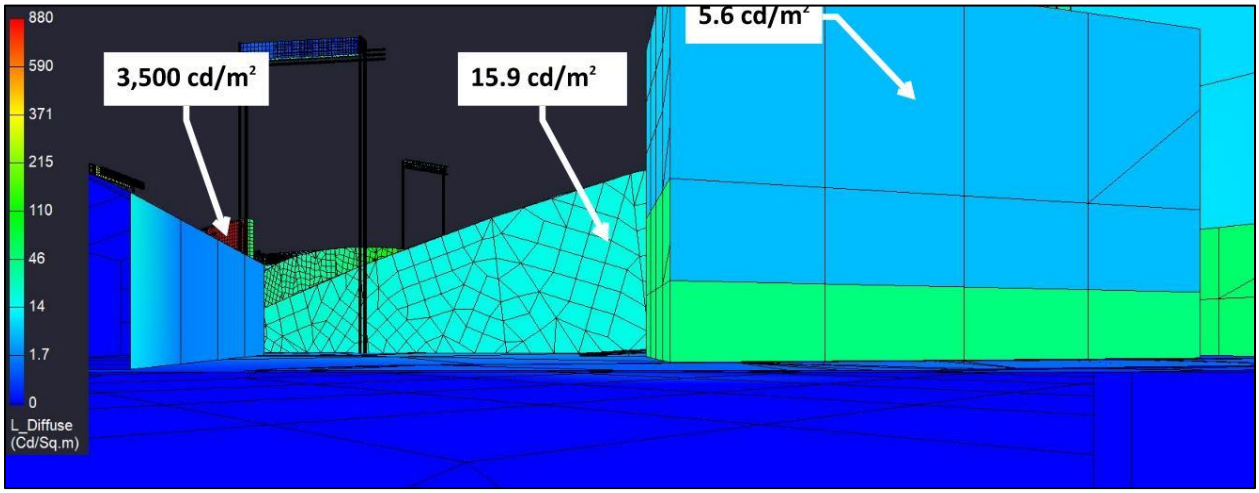


Figure 206: View from Receptor Site 4 for Baseline project, Reduced ballpark height, "Full Buildout" scenario Game Night lighting condition

Figure 207 provides the anticipated luminances viewed from Receptor Site 5, which is located on Westbound I880. The façade lighting of the adjacent mixed-use development is anticipated to be visible. With the sports field lights shifted from the "halo" configuration to the pole-mounted configuration, increased luminance on the adjacent building facades is expected due to reflection from the roof. Therefore, façade luminances from this view **are** anticipated to exceed threshold and sign luminances from this view **are not** anticipated to exceed threshold.

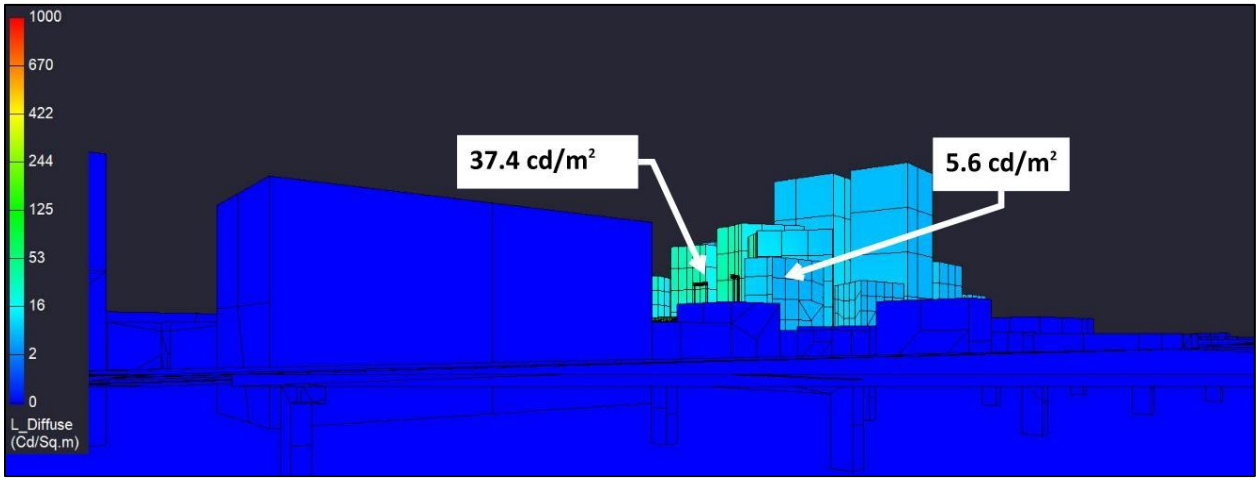


Figure 207: View from Receptor Site 5 for Baseline project, Reduced ballpark height, "Full Buildout" scenario Game Night lighting condition

Figure 208 provides the anticipated luminances viewed from Receptor Site 5A, which is located on the southwest corner of the roof of the parking garage located at 2nd and Washington. From this elevated position, there is a direct view down into the ballpark, including a direct view of the ribbon boards. Therefore, façade luminances from this view **are not** anticipated to exceed threshold and sign luminances from this view **are** anticipated to exceed threshold.

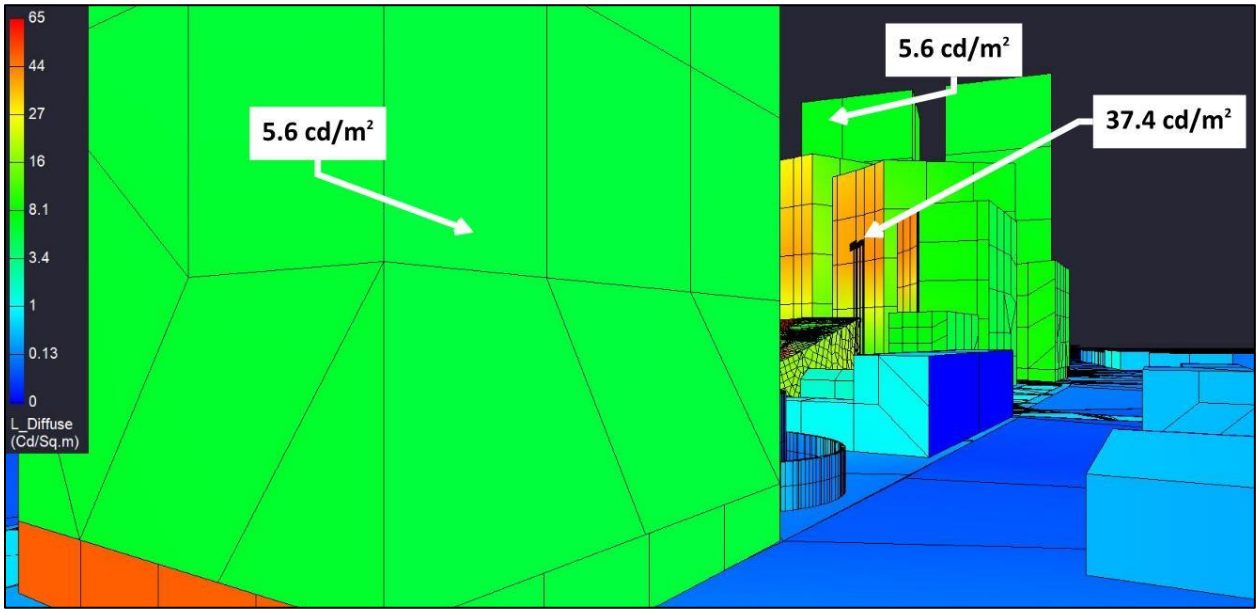


Figure 208: View from Receptor Site 5A for Baseline project, Reduced ballpark height, "Full Buildout" scenario Game Night lighting condition

Figure 209 provides the anticipated luminances viewed from Receptor Site 6, which is located on the ramp from I980 to eastbound I880. From this perspective, a direct view of the scoreboard/ribbon boards is anticipated. Therefore, façade luminances from this view **are not** anticipated to exceed threshold and sign luminances from this view **are** anticipated to exceed threshold.

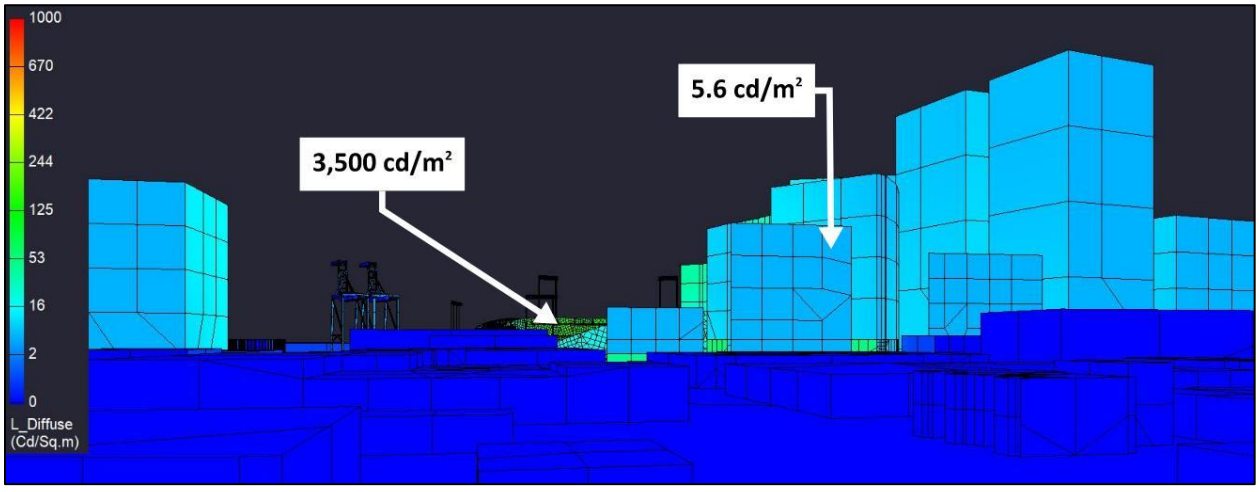


Figure 209: View from Receptor Site 6 for Baseline project, Reduced ballpark height, "Full Buildout" scenario Game Night lighting condition

Figure 198 provides the anticipated luminances viewed from Receptor Site 6A, which is located at 7th and Brush. From this perspective, there is anticipated to be a minimal view of the scoreboard. Therefore, façade luminances from this view **are not** anticipated to exceed threshold and sign luminances from this view **are** anticipated to exceed threshold.

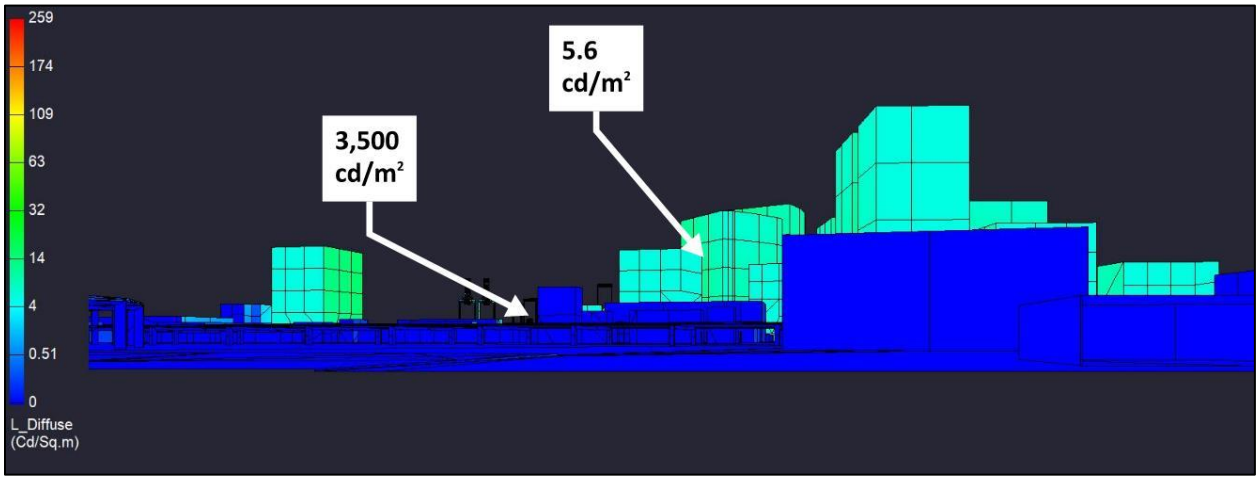


Figure 210: View from Receptor Site 6A for Baseline project, Reduced ballpark height, "Full Buildout" scenario Game Night lighting condition

8.3 Project Design Option – Rotated Ballpark

The second set of analysis includes the project design option of the rotated ballpark within the Baseline project

8.3.1 "Phase 1" Scenario

Per the project description included in section 3.1, the "Phase 1" scenario includes the ballpark, site development immediately adjacent, and a select number of accessory buildings. The bulk of the remaining site is anticipated to be temporary surface parking.

8.3.1.1 Game Nights

As described in section 4.5.8, the Game Night lighting condition is anticipated to include all lighting "on", including sports and house lighting, and included identified signage locations.

8.3.1.1.1 Spill Light

Table 46 provides the calculation results for the spill light assessment at the receptor sites for this condition. As shown, the proposed lighting **is** anticipated to exceed the spill light threshold at Receptor Site 1, which has a direct view of the ribbon boards. All other receptor site spill light **is not** anticipated to exceed threshold.

Receptor Site	Spill Light, [lux]	Significant
Receptor Site 1 - Water Street at Clay (Facing Ballpark)	**42.00**	**Yes**
Receptor Site 2 - Inner Harbor Turning Basin @ 190'	0.8	No
Receptor Site 2A - Turning Basin Line-of-Sight	0.2	No
Receptor Site 2B - Inner Harbor Turning Basin @ 64'	0.8	No
Receptor Site 2C - Inner Harbor Turning Basin @ 25'	0.7	No
Receptor Site 3 - Alameda Dock	3.1	No
Receptor Site 4 - MLK at Embarcadero	8.2	No
Receptor Site 5 - I880 Westbound	0.2	No
Receptor Site 5A - 2nd at Washington (Facing Ballpark)	7.2	No
Receptor Site 6 - I980 Ramp to Eastbound I880	1.1	No
Receptor Site 6A - 7th at Brush	0.3	No

Table 46: Spill light at receptor sites for Baseline project, Rotated Ballpark design option, "Phase 1" scenario Game Night lighting condition. [Note: Threshold of significance is 25 lux]

8.3.1.1.2 Spill Light Map

Figure 211 provides a spill light map for this lighting condition. To generate the spill light map, vertical calculation points were arrayed around the project site at 5’-6” AFG and oriented toward the pitcher’s mound for reference. The isoline curves show the extent to which vertical light levels are calculated and are reported in lux. As shown, less than 1 vertical lux is expected in the majority of the turning basin. For reference, one 60W incandescent light bulb will generate 1 lux at a distance of approximately 8 meters (26 ft).

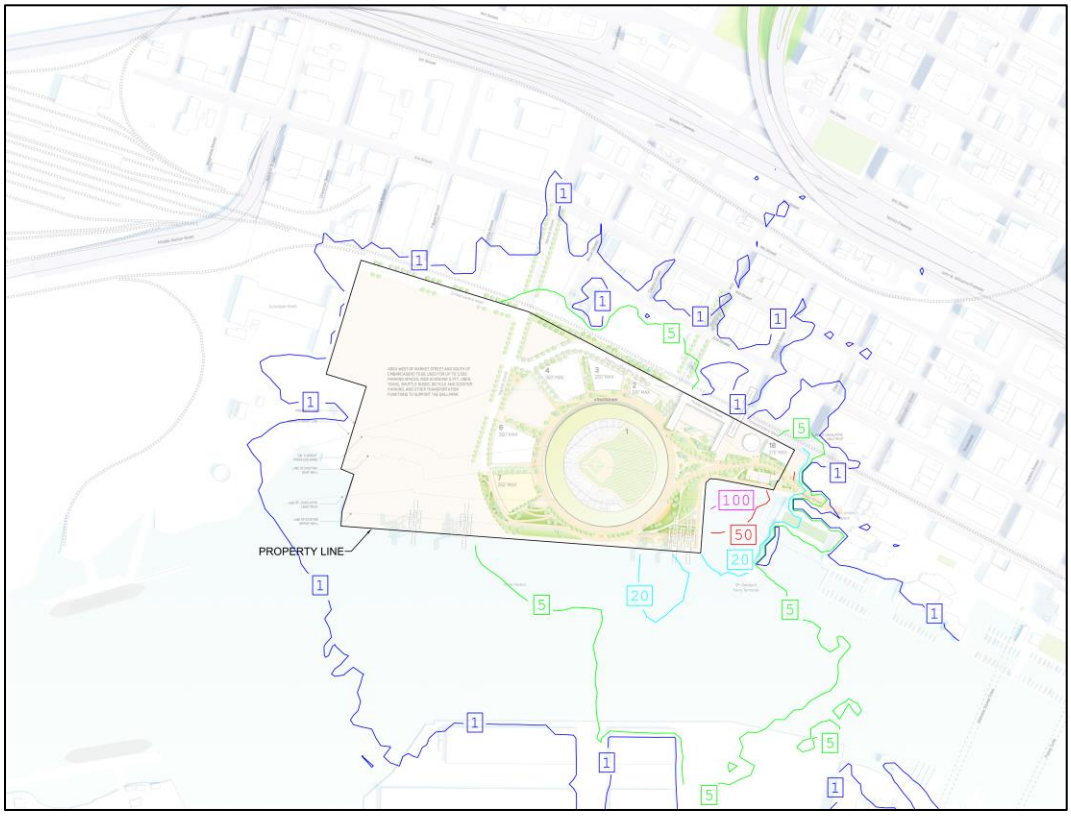


Figure 211: Spill light map for Baseline project, Rotated Ballpark design option, “Phase 1” scenario Game Night lighting condition indicating vertical illuminance isolines

8.3.1.1.3 Glare

Figure 212 through Figure 222 illustrate the luminances anticipated to be observed from the identified receptor sites for this lighting condition. Note that the scale associated with each receptor site view approximately matches the scale used for the associated site's existing conditions HDR falsecolor images. Receptor Sites 1A, 5B, 5C, 7 and 7A have been excluded since the gondola variant is not included in this model. Table 47 summarizes the anticipated glare significance at the receptor sites. Additionally, as noted in Section 4.5.3, the modeled retail lighting is included for pre-curfew times to capture the impact of interior lighting emanating through windows as a conservative contribution to spill light assessment; the modeled luminance, therefore, is an interior luminance and not subject to glare limitations directly.

Receptor Site	Facades		Signage	
	Maximum, [cd/m^2]	Significant	Maximum, [cd/m^2]	Significant
Receptor Site 1 - Water Street at Clay (Facing Ballpark)	32.3	Yes	3,500	Yes
Receptor Site 2 - Inner Harbor Turning Basin @ 190'	15.9	No	n/a	n/a
Receptor Site 2A - Turning Basin Line-of-Sight	15.9	No	n/a	n/a
Receptor Site 2B - Inner Harbor Turning Basin @ 64'	15.9	No	n/a	n/a
Receptor Site 2C - Inner Harbor Turning Basin @ 25'	15.9	No	n/a	n/a
Receptor Site 3 - Alameda Dock	32.3	Yes	3,500	Yes
Receptor Site 4 - MLK at Embarcadero	15.9	No	n/a	n/a
Receptor Site 5 - I880 Westbound	32.3	Yes	n/a	n/a
Receptor Site 5A - 2nd at Washington (Facing Ballpark)	32.3	Yes	n/a	n/a
Receptor Site 6 - I980 Ramp to Eastbound I880	15.9	No	n/a	n/a
Receptor Site 6A - 7th at Brush	15.9	No	n/a	n/a

Table 47: Summary of anticipated glare significance at receptor sites for the Baseline project, Rotated Ballpark design option, "Phase 1" scenario Game Night lighting conditions. [Note: Threshold of significance is 25 cd/m^2 for façade lighting and 1,000 cd/m^2 for digital signage]

Figure 212 shows the anticipated luminances viewed from Receptor Site 1, which is one of the closest receptor sites. As seen, from this perspective, there is a direct view of the digital display. With the sports field lights shifted from the "halo" configuration to the pole-mounted configuration, increased luminance on the adjacent building facades is expected due to reflection from the roof. Therefore, façade luminances from this view **are** anticipated to exceed threshold and sign luminances from this view **are** anticipated to exceed threshold.

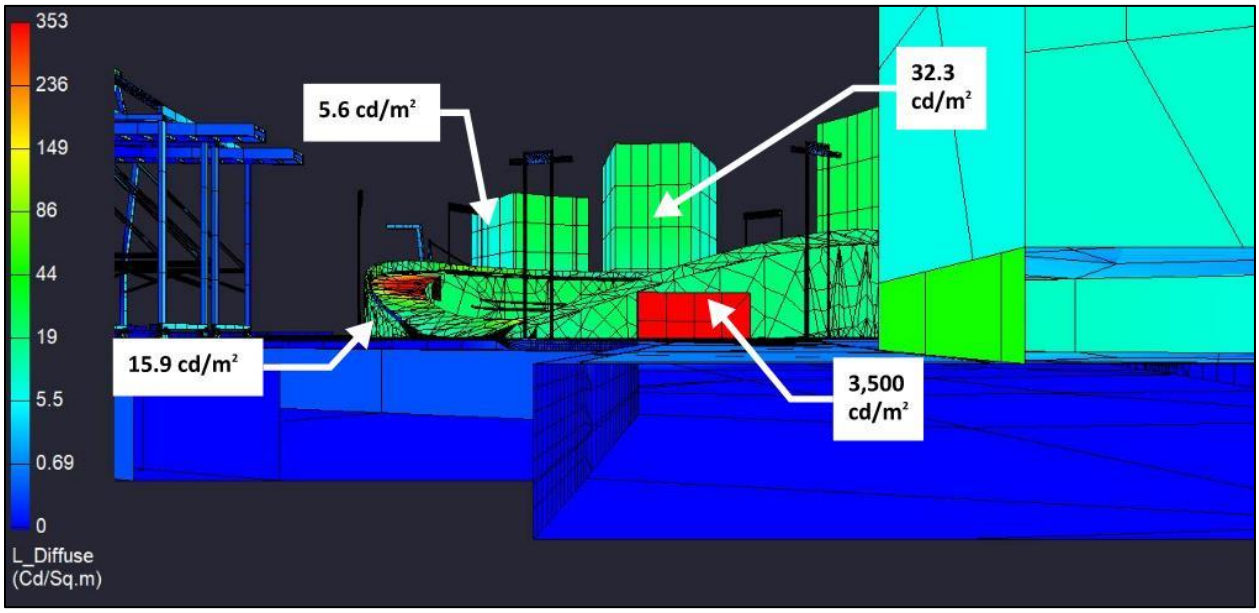


Figure 212: View from Receptor Site 1 for Baseline project, Rotated Ballpark design option, "Phase 1" scenario Game Night lighting condition

Figure 213 provides the anticipated luminances viewed from Receptor Site 2, which is centered in the turning basin and located 190’ above the water line. As shown, based on the ballpark geometry, there is not anticipated to be a direct view of the digital display. The façade luminances and sign luminances from this view **are not** anticipated to exceed threshold.

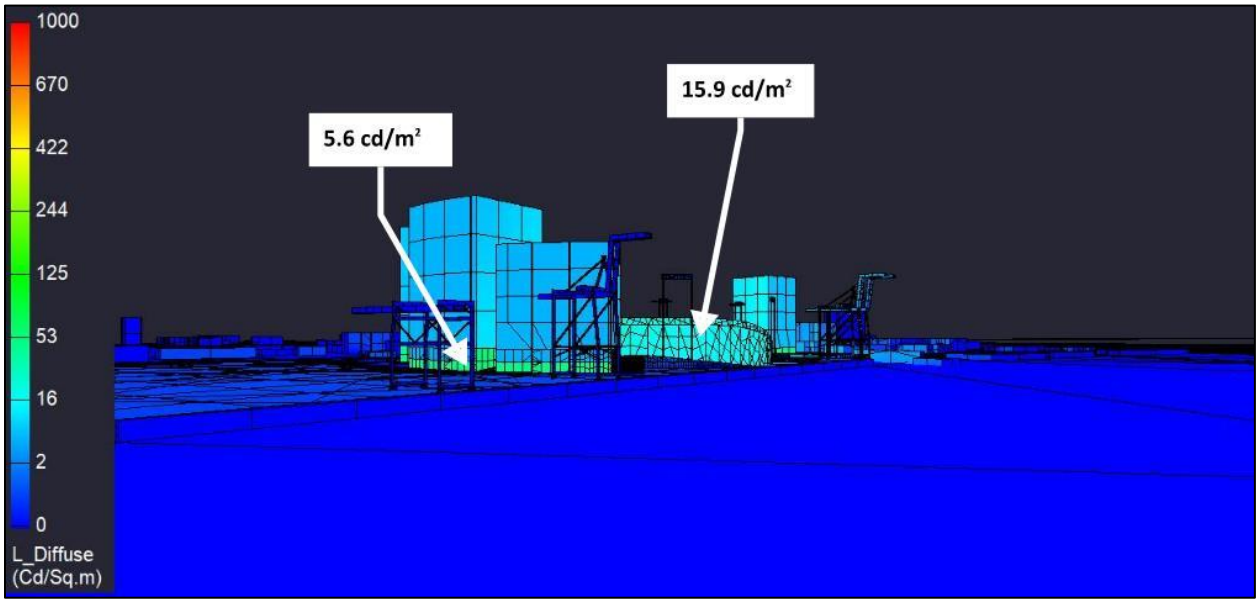


Figure 213: View from Receptor Site 2 for Baseline project, Rotated Ballpark design option, “Phase 1” scenario Game Night lighting condition

Figure 214 provides the anticipated luminances viewed from Receptor Site 2A, which is on Alameda with a direct line of site through the center of the turning basin. Similar to Receptor Site 2, the lower roof height is not expected to provide a direct line of sight to the digital display. Luminances from this view **are not** anticipated to exceed threshold.

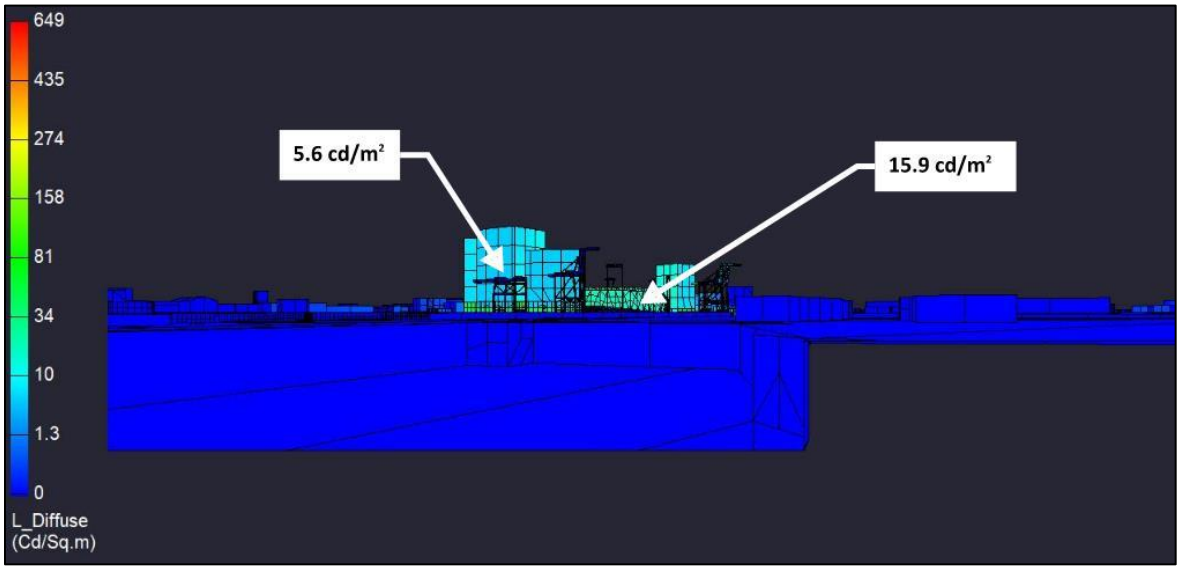


Figure 214: View from Receptor Site 2A for Baseline project, Rotated Ballpark design option, “Phase 1” scenario Game Night lighting condition

Figure 215 provides the anticipated luminances viewed from Receptor Site 2B, which is centered in the turning basin and located 64’ above the water line. As shown, based on the ballpark geometry, there is not anticipated to be a direct view of the digital display. Luminances from this view **<u>are not</u>** anticipated to exceed threshold.

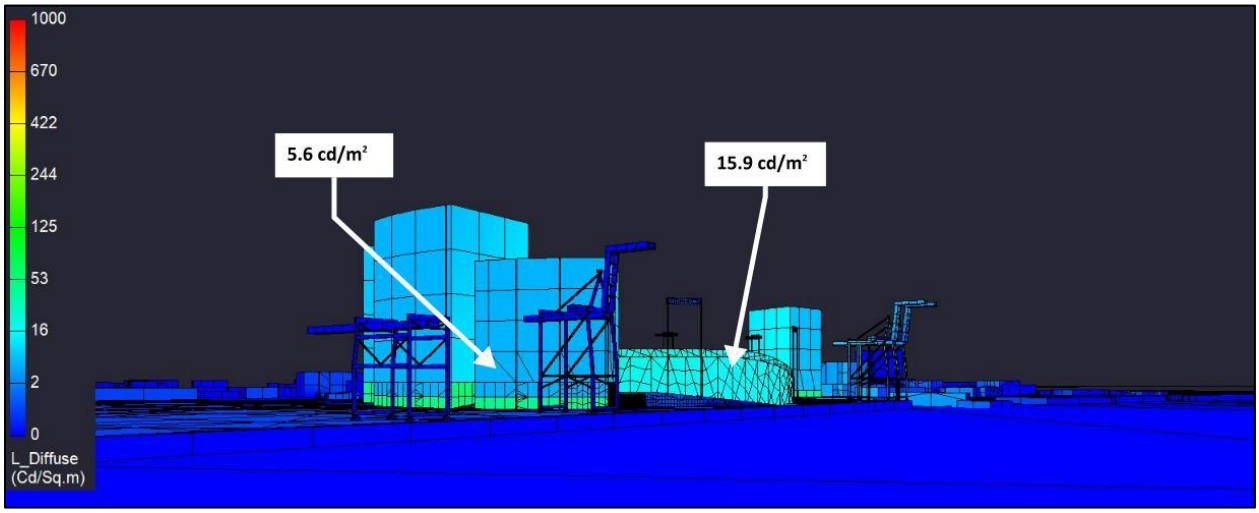


Figure 215: View from Receptor Site 2B for Baseline project, Rotated Ballpark design option, “Phase 1” scenario Game Night lighting condition

Figure 216 provides the anticipated luminances viewed from Receptor Site 2C, which is centered in the turning basin and located 25’ above the water line. As shown, based on the ballpark geometry, there is not anticipated to be a direct view of the digital display. Luminances from this view **<u>are not</u>** anticipated to exceed threshold.

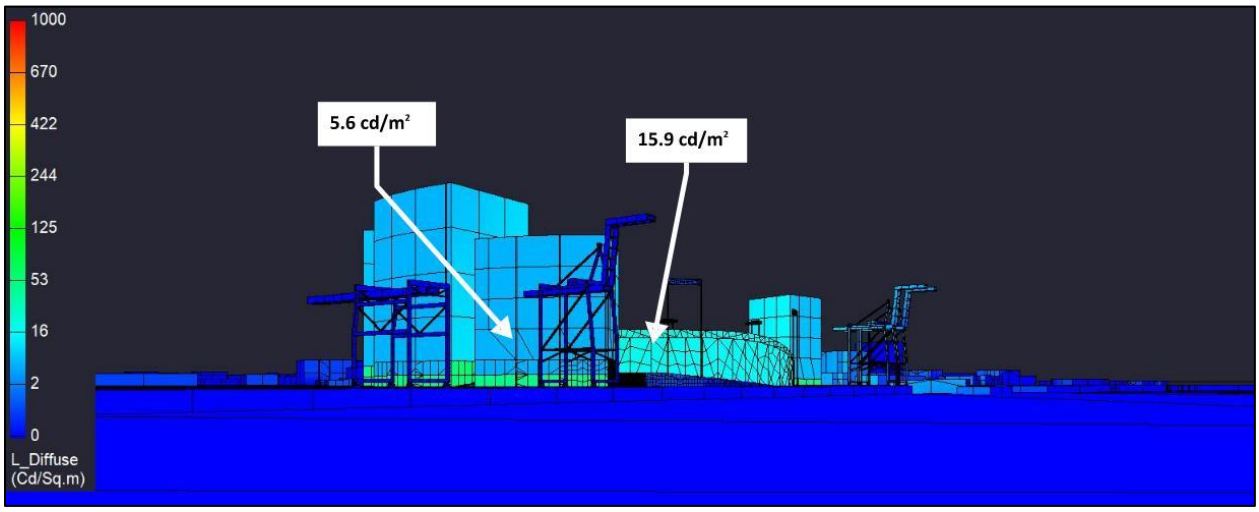


Figure 216: View from Receptor Site 2C for Baseline project, Rotated Ballpark design option, “Phase 1” scenario Game Night lighting condition

Figure 127 provides the anticipated luminances viewed from Receptor Site 3, which is located on Alameda and facing northwest toward the property. From this position, there is a direct line of site to the digital displays. With the sports field lights shifted from the "halo" configuration to the pole-mounted configuration, increased luminance on the adjacent building facades is expected due to reflection from the roof. Therefore, façade luminances from this view **are** anticipated to exceed threshold and sign luminances from this view **are** anticipated to exceed threshold.

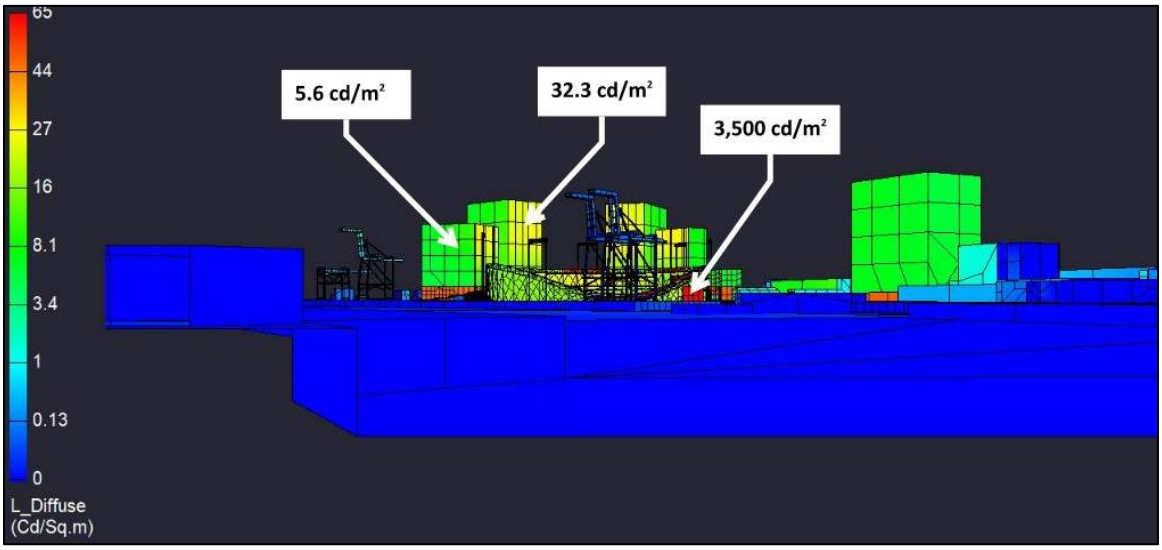


Figure 217: View from Receptor Site 3 for Baseline project, Rotated Ballpark design option, "Phase 1" scenario Game Night lighting condition

Figure 218 provides the view from Receptor Site 4, which is located at the intersection of MLK and Embarcadero. As shown, the digital displays are not visible from this location. Façade luminances and sign luminances from this view **are not** anticipated to exceed threshold.

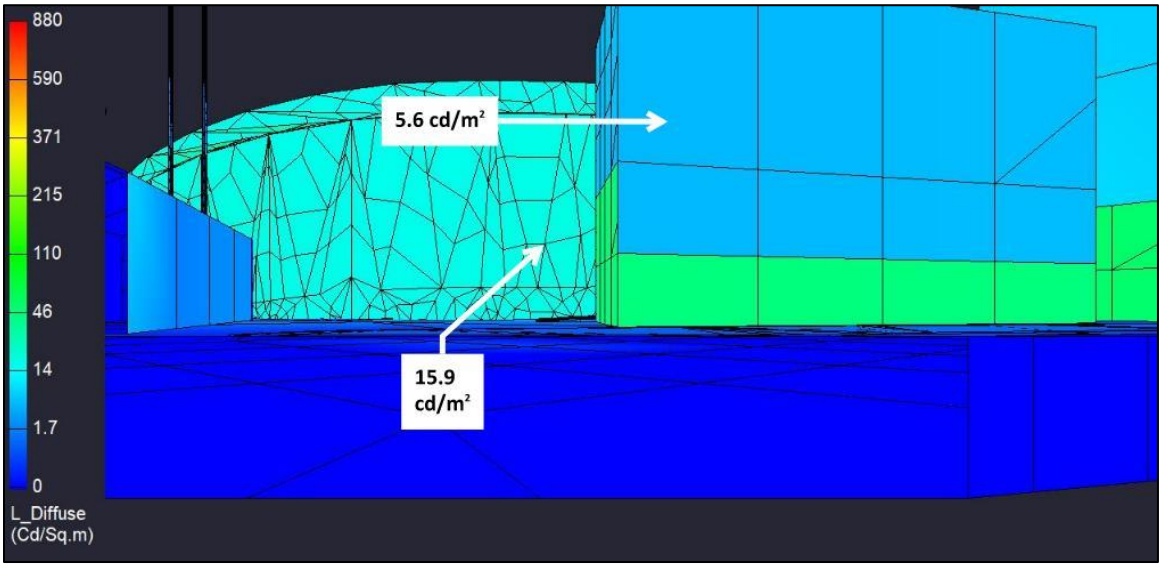


Figure 218: View from Receptor Site 4 for Baseline project, Rotated Ballpark design option, "Phase 1" scenario Game Night lighting condition

Figure 219 provides the anticipated luminances viewed from Receptor Site 5, which is located on Westbound I880. With the sports field lights shifted from the "halo" configuration to the pole-mounted configuration, increased luminance on the adjacent building facades is expected due to reflection from the roof. Therefore, façade luminances from this view **are** anticipated to exceed threshold and sign luminances from this view **are not** anticipated to exceed threshold.

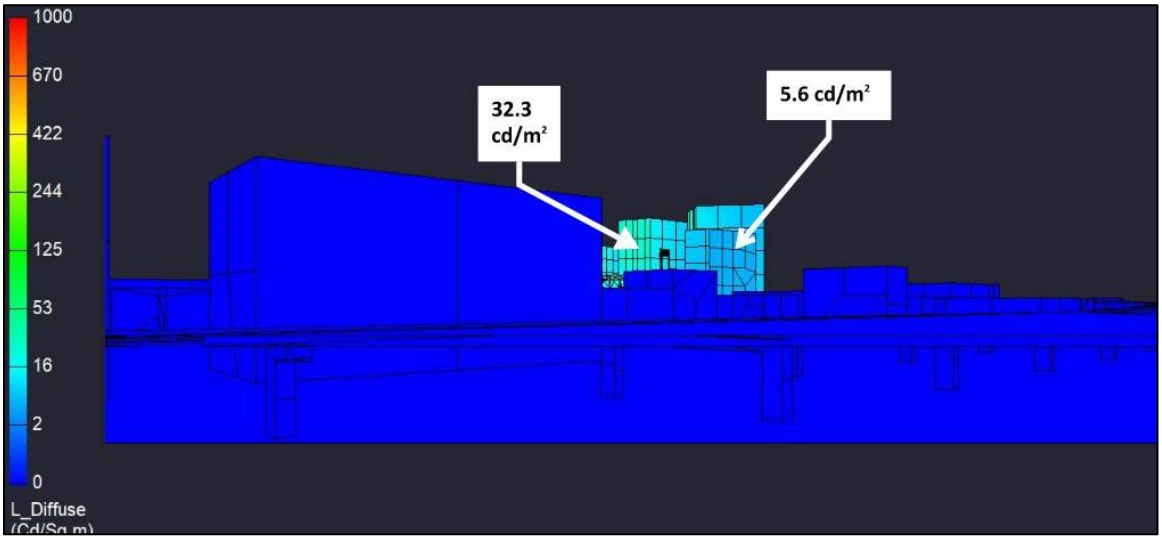


Figure 219: View from Receptor Site 5 for Baseline project, Rotated Ballpark design option, "Phase 1" scenario Game Night lighting condition

Figure 220 provides the anticipated luminances viewed from Receptor Site 5A, which is located on the southwest corner of the roof of the parking garage located at 2nd and Washington. With the sports field lights shifted from the "halo" configuration to the pole-mounted configuration, increased luminance on the adjacent building facades is expected due to reflection from the roof. Therefore, façade luminances from this view **are** anticipated to exceed threshold and sign luminances from this view **are not** anticipated to exceed threshold.

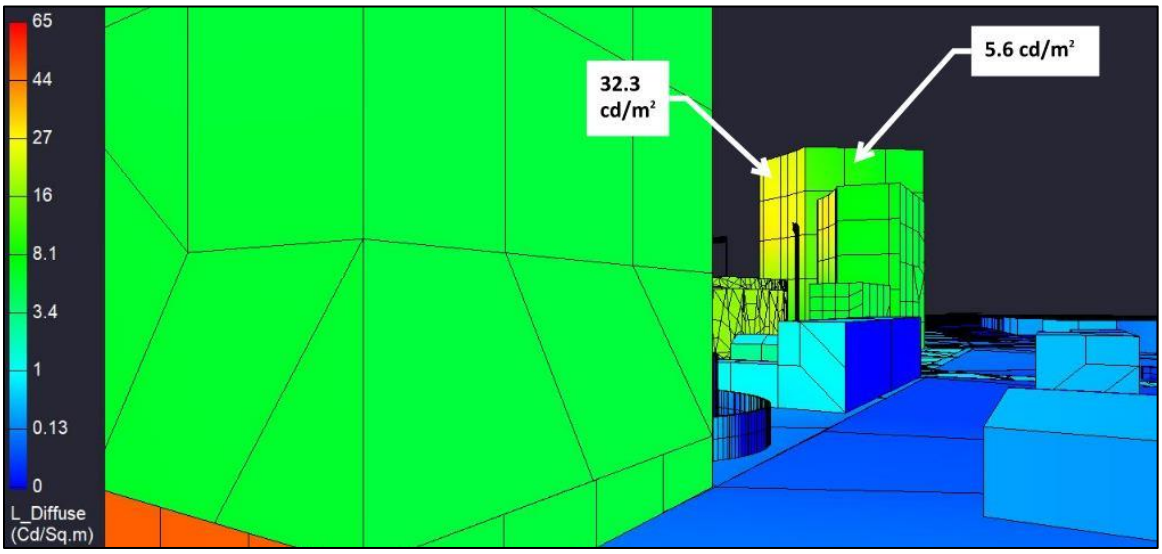


Figure 220: View from Receptor Site 5A for Baseline project, Rotated Ballpark design option, "Phase 1" scenario Game Night lighting condition

Figure 221 provides the anticipated luminances viewed from Receptor Site 6, which is located on the ramp from I980 to eastbound I880. From this perspective, a direct view of the digital display is not anticipated. Luminances from this view **are not** anticipated to exceed threshold.

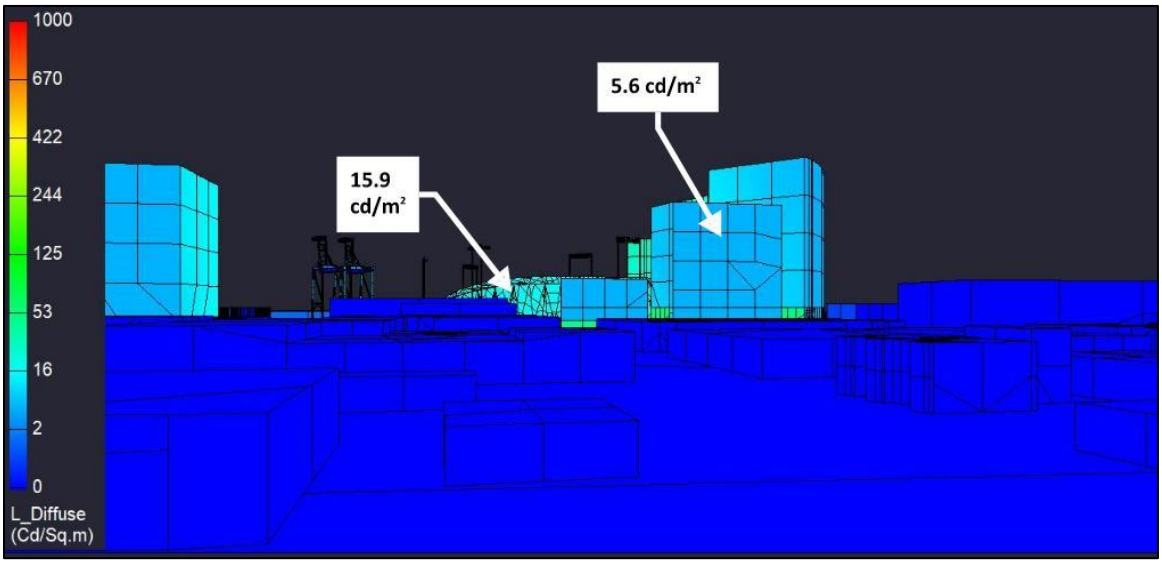


Figure 221: View from Receptor Site 6 for Baseline project, Rotated Ballpark design option, "Phase 1" scenario Game Night lighting condition

Figure 222 provides the anticipated luminances viewed from Receptor Site 6A, which is located at 7th and Brush. From this perspective, there is anticipated to be no view of the digital displays. Luminances from this view **are not** anticipated to exceed threshold.

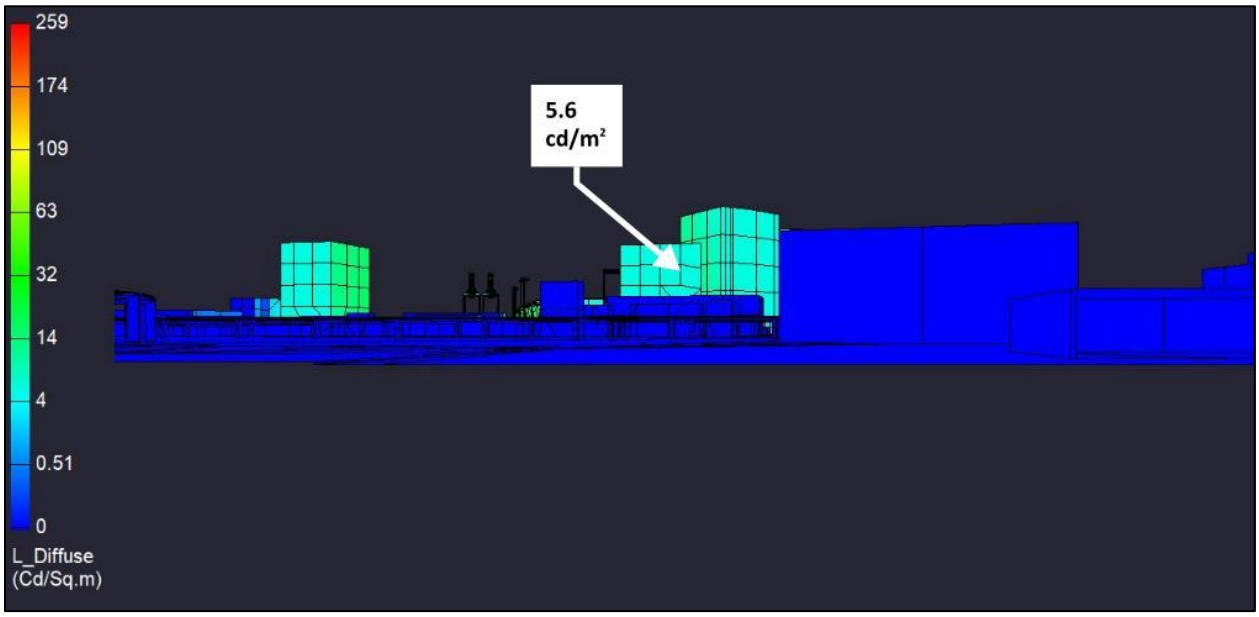


Figure 222: View from Receptor Site 6A for Baseline project, Rotated Ballpark design option, "Phase 1" scenario Game Night lighting condition

8.3.2 "Full Buildout" Scenario

8.3.2.1 Game Nights

As described in section 4.5.8, the Game Night lighting condition is anticipated to include all lighting "on", including sports and house lighting, and included identified signage locations.

8.3.2.1.1 Spill Light

Table 48 provides the calculation results for the spill light assessment at the receptor sites for this condition. As shown, the proposed lighting **is** anticipated to exceed the spill light threshold at Receptor Site 1 in Jack London Square on Water Street, which has a direct view of the ribbon boards and pole-mounted infield sports lights. For ll other receptor sites including those in the turning basin, spill light **is not** anticipated to exceed threshold.

Receptor Site	Spill Light, [lux]	Significant
Receptor Site 1 - Water Street at Clay (Facing Ballpark)	**42.60**	**Yes**
Receptor Site 2 - Inner Harbor Turning Basin @ 190'	1.8	No
Receptor Site 2A - Turning Basin Line-of-Sight	0.5	No
Receptor Site 2B - Inner Harbor Turning Basin @ 64'	1.7	No
Receptor Site 2C - Inner Harbor Turning Basin @ 25'	1.5	No
Receptor Site 3 - Alameda Dock	3.4	No
Receptor Site 4 - MLK at Embarcadero	8.6	No
Receptor Site 5 - I880 Westbound	0.5	No
Receptor Site 5A - 2nd at Washington (Facing Ballpark)	7.6	No
Receptor Site 6 - I980 Ramp to Eastbound I880	1.6	No
Receptor Site 6A - 7th at Brush	0.5	No

Table 48: Spill light at receptor sites for Baseline project, Rotated Ballpark design option, "Full Buildout" scenario Game Night lighting condition. [Note: Threshold of significance is 25 lux]

8.3.2.1.2 Spill Light Map

Figure 223 provides a spill light map for this lighting condition. To generate the spill light map, vertical calculation points were arrayed around the project site at 5'-6" AFG and oriented toward the pitcher's mound for reference. The isoline curves show the extent to which vertical light levels are calculated and are reported in lux. As shown, approximately 1 vertical lux is expected in the turning basin. The adjacent estuary is anticipated to experience less than 1 vertical lux generally, with light levels increasing closer to shore. For reference, one 60W incandescent light bulb will generate 1 lux at a distance of approximately 8 meters (26 ft).

Figure 223: Spill light map for Baseline project, Rotated Ballpark design option, "Full Buildout" scenario Game Night lighting condition indicating vertical illuminance isolines

8.3.2.1.3 Glare

Figure 224 through Figure 234 illustrate the luminances anticipated to be observed from the identified receptor sites for this lighting condition. Note that the scale associated with each receptor site view approximately matches the scale used for the associated site's existing conditions HDR falsecolor images. Receptor Sites 1A, 5A, 5B, 7 and 7A have been excluded since the gondola variant is not included in this model. Table 49 summarizes the anticipated glare significance at the receptor sites. Additionally, as noted in Section 4.5.3, the modeled retail lighting is included for pre-curfew times to capture the impact of interior lighting emanating through windows as a conservative contribution to spill light assessment; the modeled luminance, therefore, is an interior luminance and not subject to glare limitations directly.

Receptor Site	Facades		Signage	
	Maximum, [cd/m^2]	Significant	Maximum, [cd/m^2]	Significant
Receptor Site 1 - Water Street at Clay (Facing Ballpark)	35.8	Yes	3,500	Yes
Receptor Site 2 - Inner Harbor Turning Basin @ 190'	15.9	No	n/a	n/a
Receptor Site 2A - Turning Basin Line-of-Sight	15.9	No	n/a	n/a
Receptor Site 2B - Inner Harbor Turning Basin @ 64'	15.9	No	n/a	n/a
Receptor Site 2C - Inner Harbor Turning Basin @ 25'	15.9	No	n/a	n/a
Receptor Site 3 - Alameda Dock	35.8	Yes	3,500	Yes
Receptor Site 4 - MLK at Embarcadero	15.9	No	n/a	n/a
Receptor Site 5 - I880 Westbound	35.8	Yes	n/a	n/a
Receptor Site 5A - 2nd at Washington (Facing Ballpark)	35.8	No	n/a	n/a
Receptor Site 6 - I980 Ramp to Eastbound I880	15.9	No	n/a	n/a
Receptor Site 6A - 7th at Brush	15.9	No	n/a	n/a

Table 49: Summary of anticipated glare significance at receptor sites for the Baseline project, Rotated Ballpark design option, "Full Buildout" scenario Game Night lighting conditions. [Note: Threshold of significance is 25 cd/m^2 for façade lighting and 1,000 cd/m^2 for digital signage]

Figure 224 shows the anticipated luminances viewed from Receptor Site 1, which is one of the closest receptor sites. From this position, a direct view of the digital displays is anticipated. With the sports field lights shifted from the "halo" configuration to the pole-mounted configuration, increased luminance on the adjacent building facades is expected due to reflection from the roof. Therefore, façade luminances from this view **are** anticipated to exceed threshold and sign luminances from this view **are** anticipated to exceed threshold.

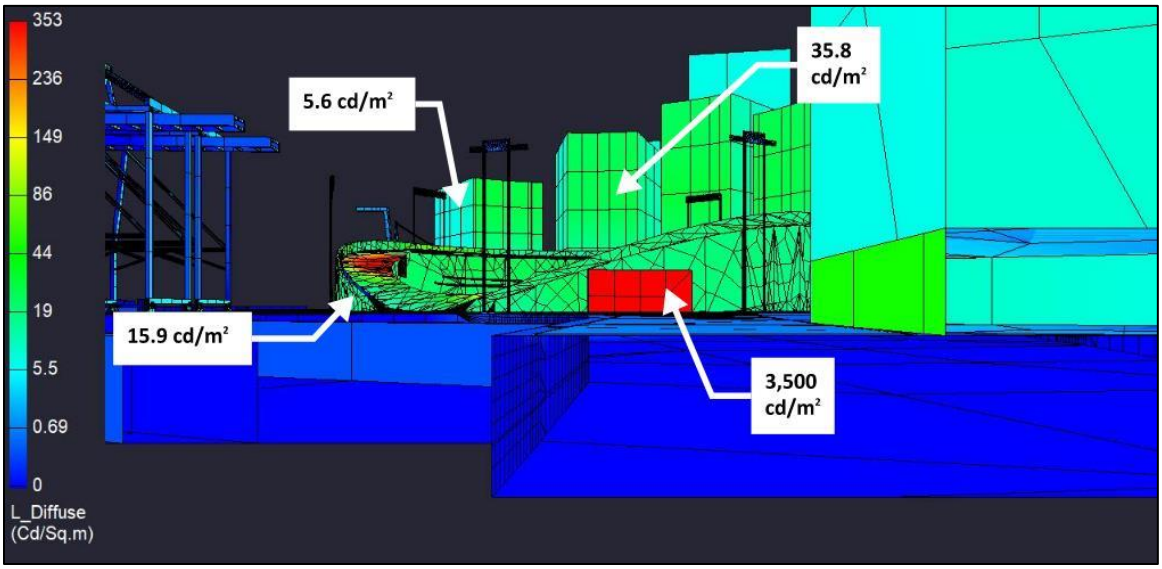


Figure 224: View from Receptor Site 1 for Baseline project, Rotated Ballpark design option, "Full Buildout" scenario Game Night lighting condition

Figure 225 provides the anticipated luminances viewed from Receptor Site 2, which is centered in the turning basin and located 190' above the water line. As shown, based on the ballpark geometry, there is not anticipated to be a direct view of the digital display. Luminances from this view **are not** anticipated to exceed threshold.

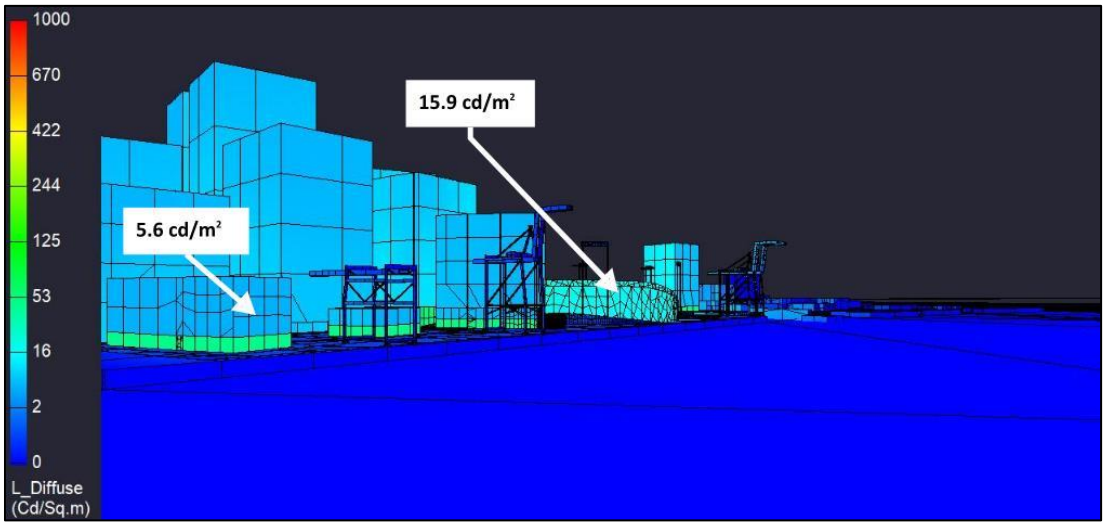


Figure 225: View from Receptor Site 2 for Baseline project, Rotated Ballpark design option, "Full Buildout" scenario Game Night lighting condition

Figure 226 provides the anticipated luminances viewed from Receptor Site 2A, which is on Alameda with a direct line of site through the center of the turning basin. Similar to Receptor Site 2, the lower roof height is not expected to provide a direct view of the digital display. Luminances from this view **are not** anticipated to exceed threshold.

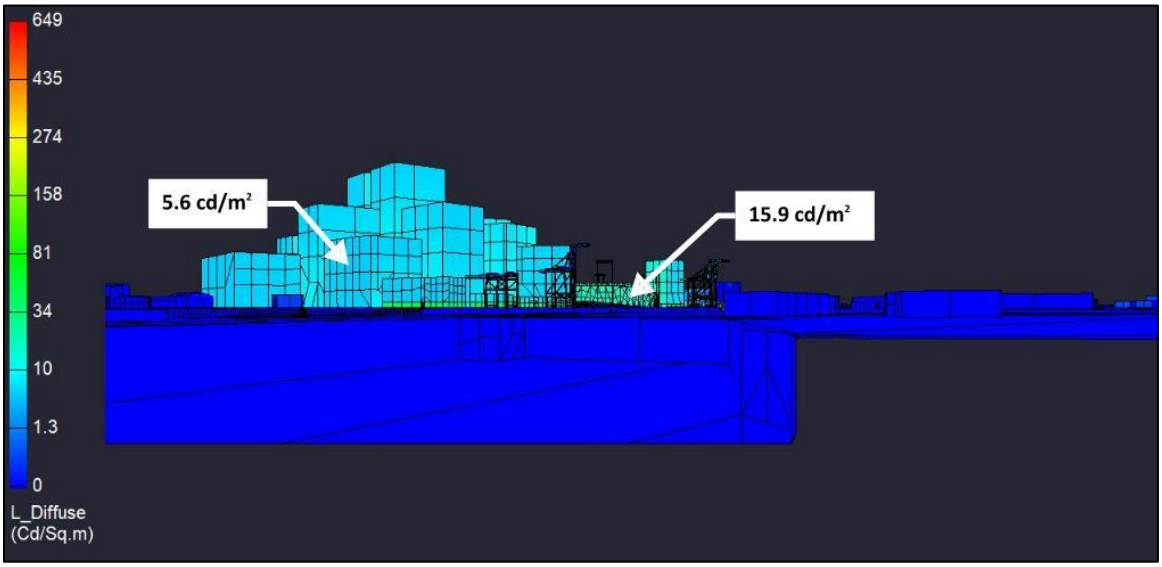


Figure 226: View from Receptor Site 2A for Baseline project, Rotated Ballpark design option, "Full Buildout" scenario Game Night lighting condition

Figure 227 provides the anticipated luminances viewed from Receptor Site 2B, which is centered in the turning basin and located 64' above the water line. As shown, based on the ballpark geometry, there is not anticipated to be a direct view of the digital display. Luminances from this view **are not** anticipated to exceed threshold.

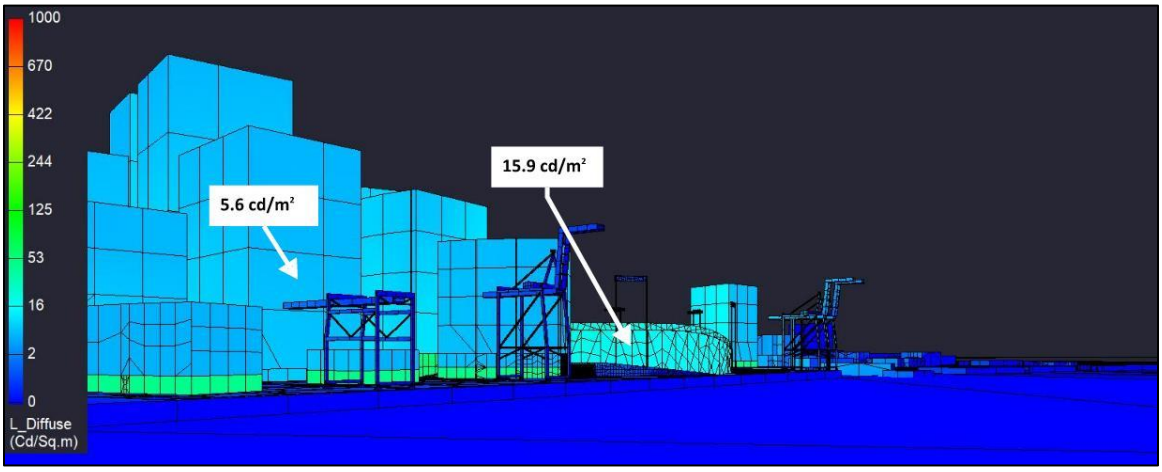


Figure 227: View from Receptor Site 2B for Baseline project, Rotated Ballpark design option, "Full Buildout" scenario Game Night lighting condition

Figure 228 provides the anticipated luminances viewed from Receptor Site 2C, which is centered in the turning basin and located 25' above the water line. As shown, based on the ballpark geometry, there is not anticipated to be a direct view of the digital display. Luminances from this view **are not** anticipated to exceed threshold.

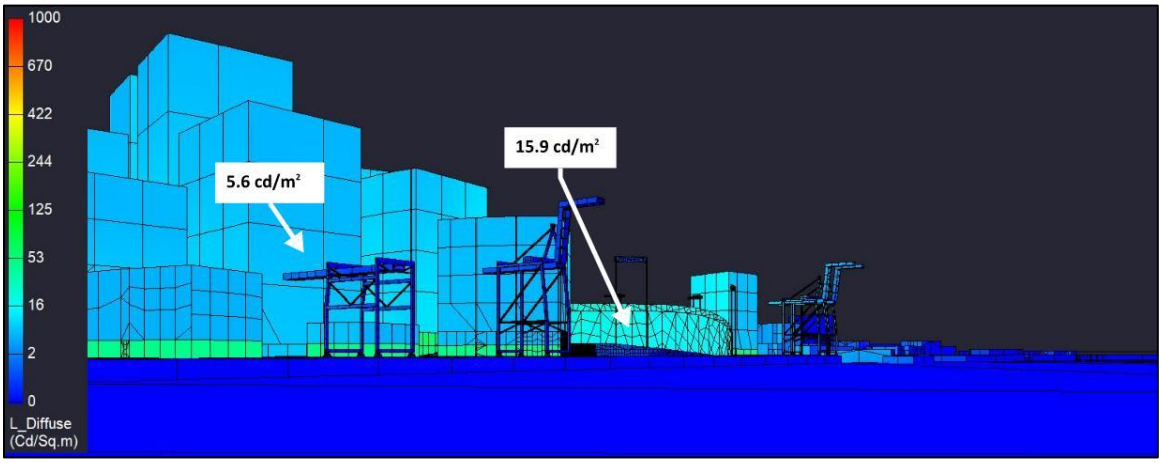


Figure 228: View from Receptor Site 2C for Baseline project, Rotated Ballpark design option, "Full Buildout" scenario Game Night lighting condition

Figure 229 provides the anticipated luminances viewed from Receptor Site 3, which is located on Alameda and facing northwest toward the property. From this position, there is a direct line of site to the digital displays. With the sports field lights shifted from the "halo" configuration to the pole-mounted configuration, increased luminance on the adjacent building facades is expected due to reflection from the roof. Therefore, façade luminances from this view **are** anticipated to exceed threshold and sign luminances from this view **are** anticipated to exceed threshold.

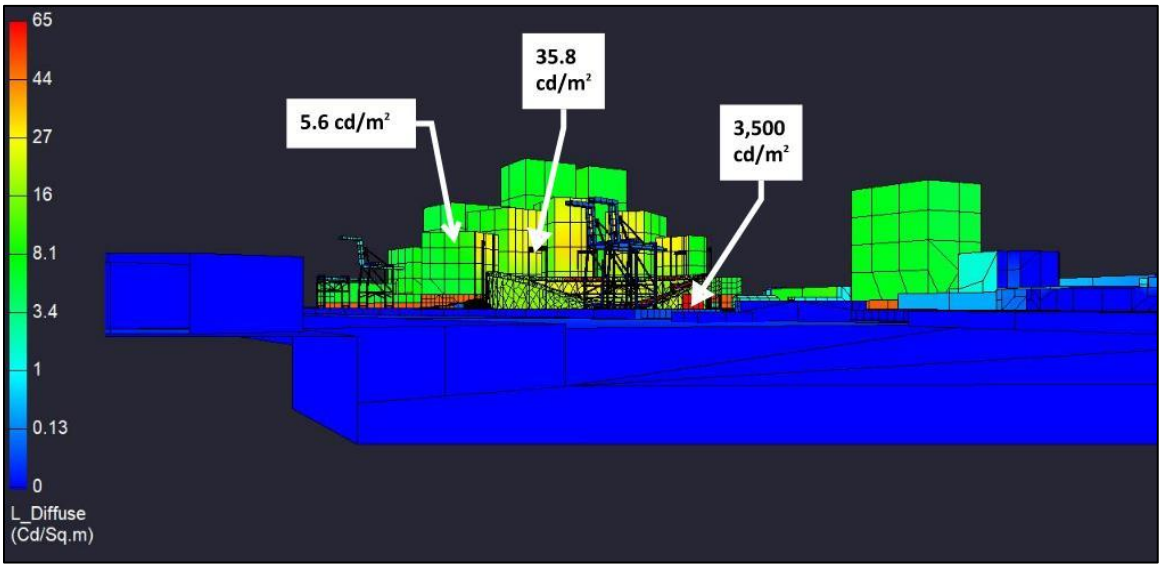


Figure 229: View from Receptor Site 3 for Baseline project, Rotated Ballpark design option, "Full Buildout" scenario Game Night lighting condition

Figure 230 provides the view from Receptor Site 4, which is located at the intersection of MLK and Embarcadero. As shown, no direct view of the digital display is anticipated. Luminances from this view **are not** anticipated to exceed threshold.

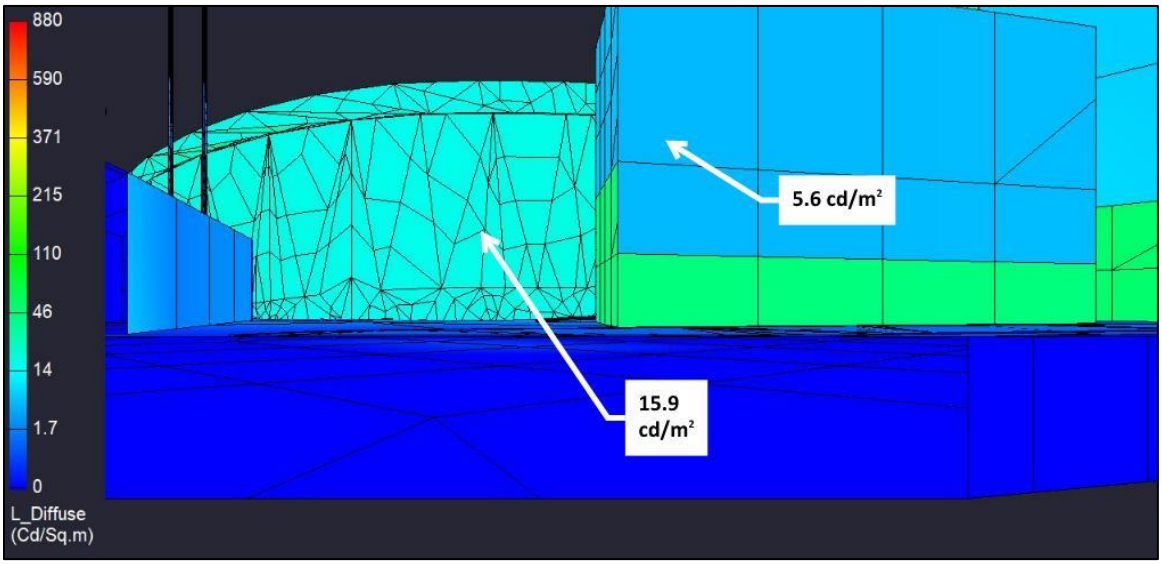


Figure 230: View from Receptor Site 4 for Baseline project, Rotated Ballpark design option, "Full Buildout" scenario Game Night lighting condition

Figure 231 provides the anticipated luminances viewed from Receptor Site 5, which is located on Westbound I880. the sports field lights shifted from the "halo" configuration to the pole-mounted configuration, increased luminance on the adjacent building facades is expected due to reflection from the roof. Therefore, façade luminances from this view **are** anticipated to exceed threshold and sign luminances from this view **are not** anticipated to exceed threshold.

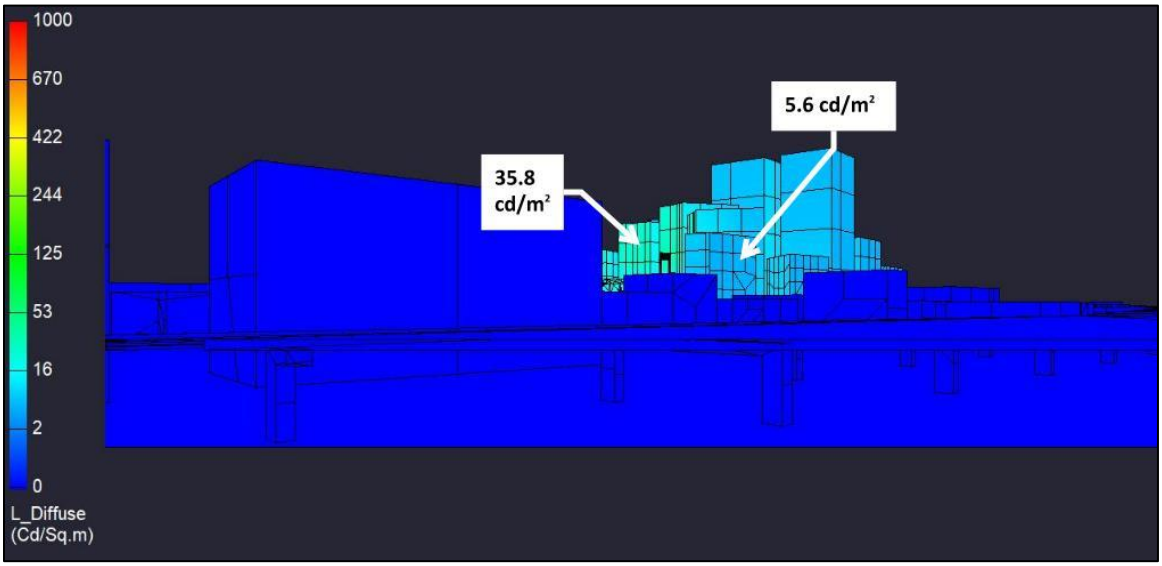


Figure 231: View from Receptor Site 5 for Baseline project, Rotated Ballpark design option, "Full Buildout" scenario Game Night lighting condition

Figure 232 provides the anticipated luminances viewed from Receptor Site 5A, which is located on the southwest corner of the roof of the parking garage located at 2nd and Washington. Façade luminances **are** anticipated to exceed threshold and sign luminances from this view **are not** anticipated to exceed threshold.

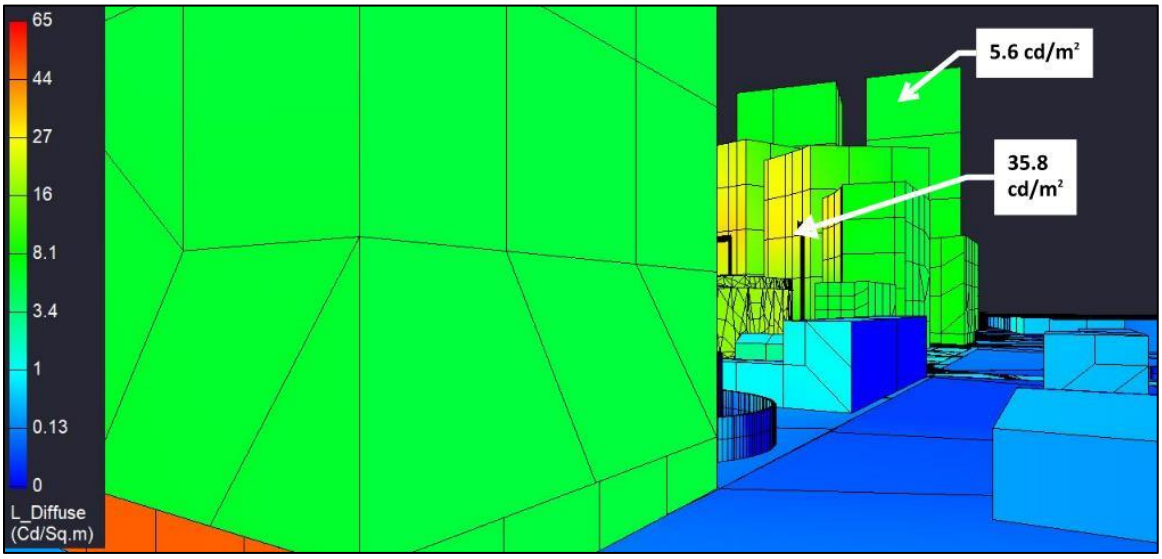


Figure 232: View from Receptor Site 5A for Baseline project, Rotated Ballpark design option, "Full Buildout" scenario Game Night lighting condition

Figure 233 provides the anticipated luminances viewed from Receptor Site 6, which is located on the ramp from I980 to eastbound I880. Luminances from this view **are not** anticipated to exceed threshold.

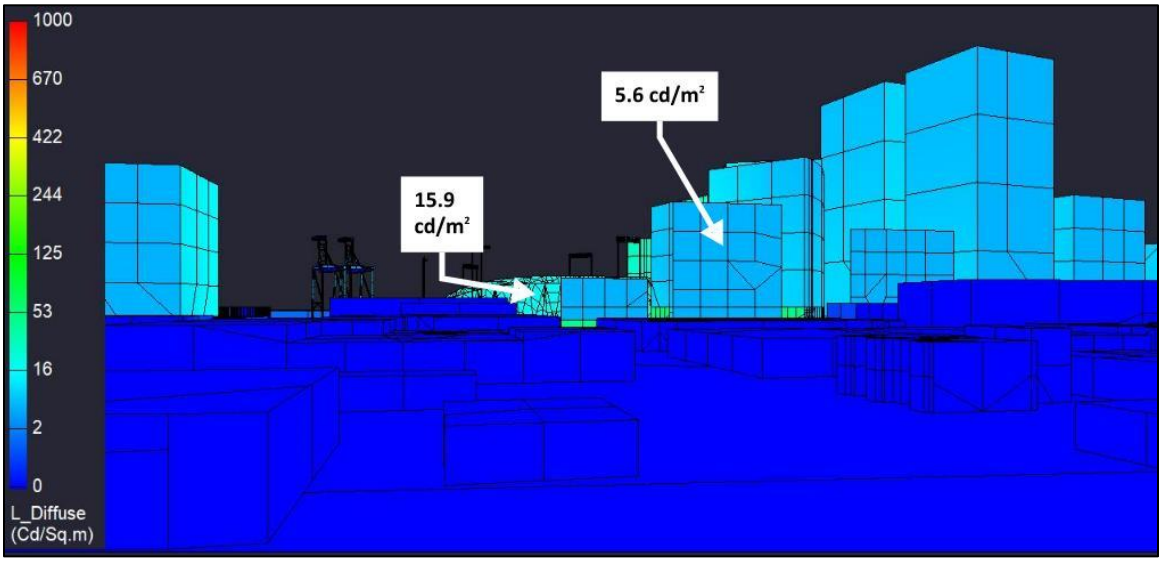


Figure 233: View from Receptor Site 6 for Baseline project, Rotated Ballpark design option, "Full Buildout" scenario Game Night lighting condition

Figure 234 provides the anticipated luminances viewed from Receptor Site 6A, which is located at 7th and Brush. From this perspective, there is no anticipated view of the digital displays. Luminances from this view **are not** anticipated to exceed threshold.

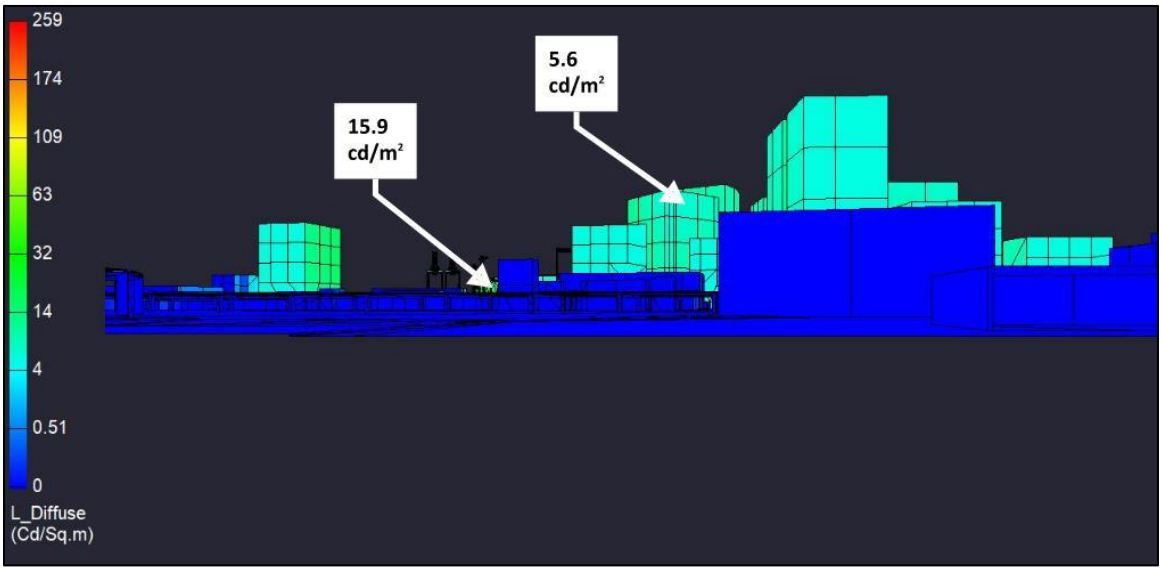


Figure 234: View from Receptor Site 6A for Baseline project, Rotated Ballpark design option, "Full Buildout" scenario Game Night lighting condition

8.4 Impact of Cloud Cover

To assess the potential impact of cloud cover, a series of parametric analyses were conducted to determine the likely impact on spill light at the receptor site locations.

Figure 235 through Figure 240 show the anticipated receptor site spill light vertical illuminance values as a function of could ceiling height. As shown, low cloud ceilings increase spill light anticipated at the receptor sites until the ceiling height reaches approximately 3,000 ft, at which time the cloud ceiling has minimal further impact.

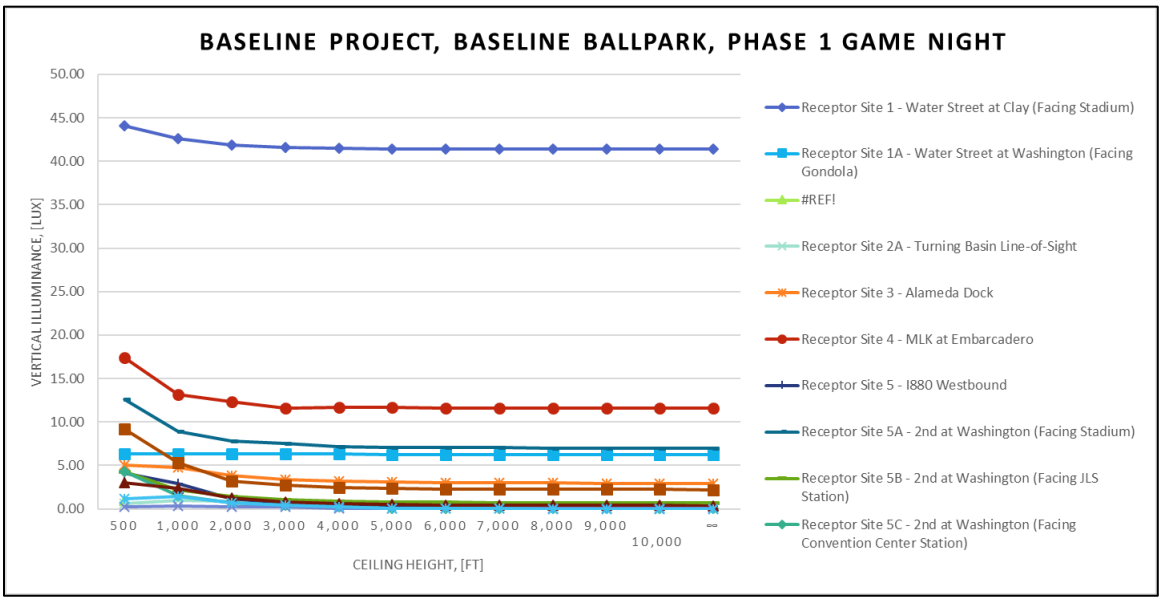


Figure 235: Impact of cloud ceiling height on spill light calculations at receptor sites for the Baseline project, baseline ballpark height, “Phase 1” scenario Game Night lighting condition

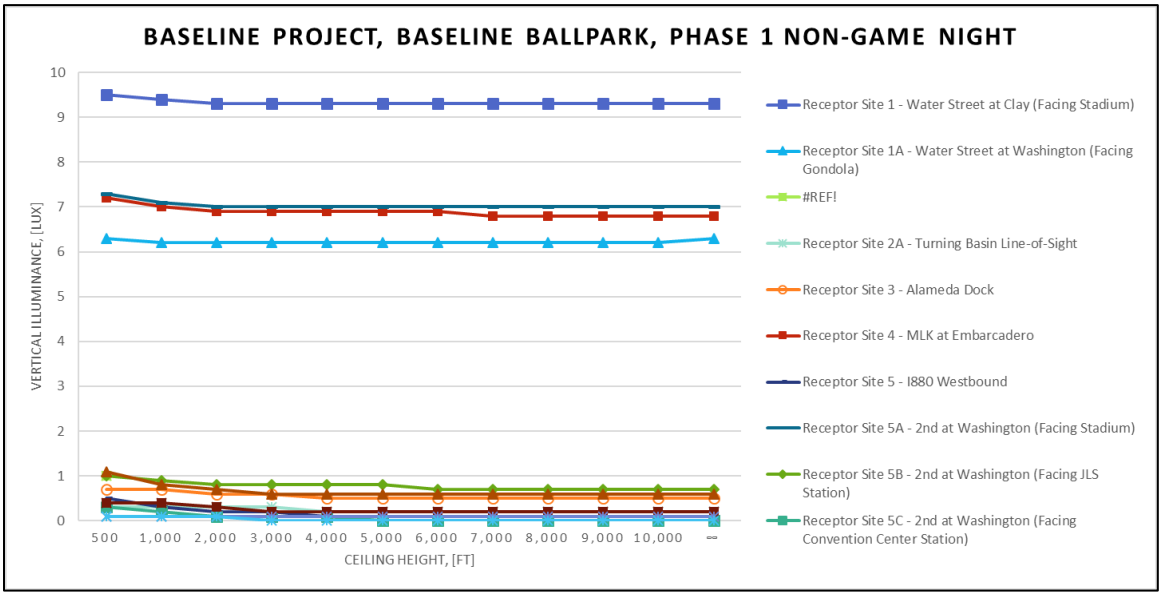


Figure 236: Impact of cloud ceiling height on spill light calculations at receptor sites for the Baseline project, Baseline ballpark height, “Phase 1” scenario Non-Game Night Pre-Curfew lighting condition

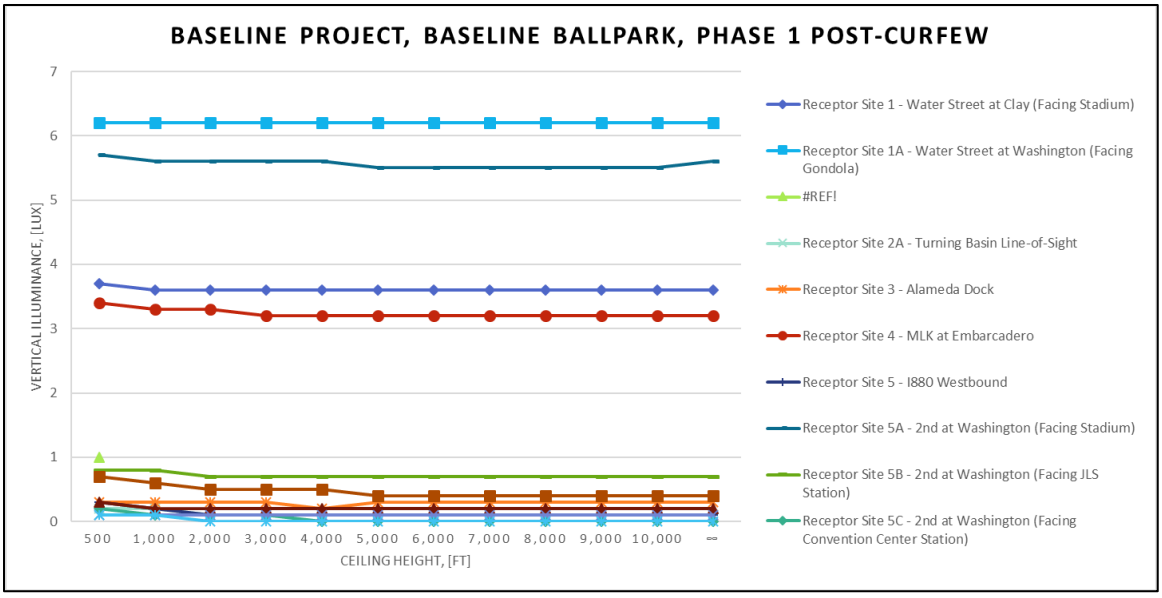


Figure 237: Impact of cloud ceiling height on spill light calculations at receptor sites for the Baseline project, Baseline ballpark height, “Phase 1” scenario Post-Curfew lighting condition

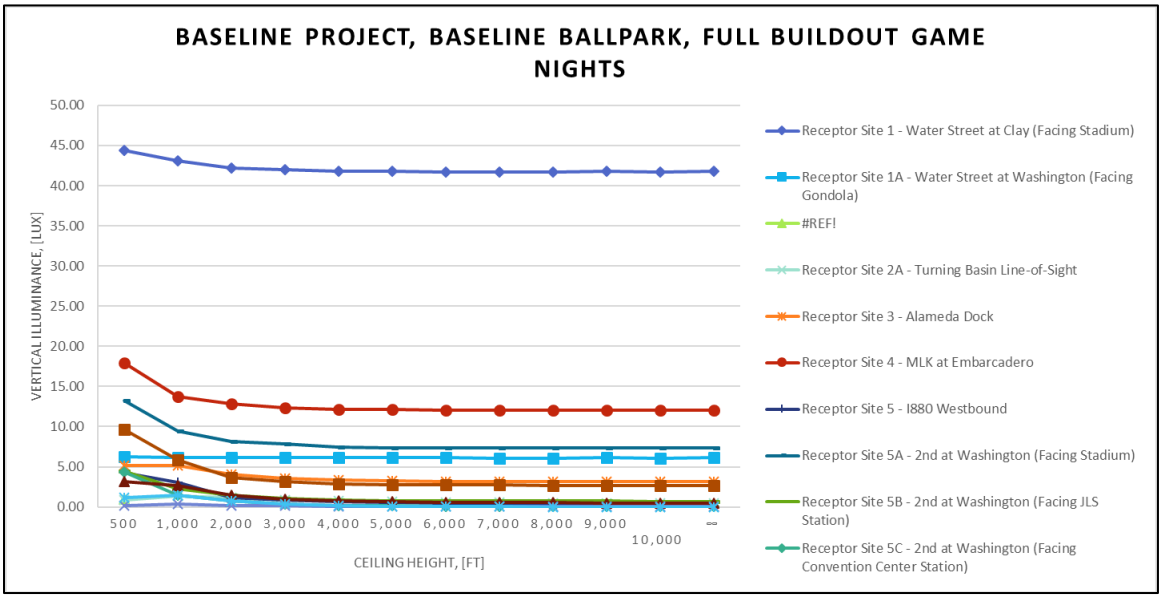


Figure 238: Impact of cloud ceiling height on spill light calculations at receptor sites for the Baseline project, Baseline ballpark height, “Full Buildout” scenario Game Night lighting condition

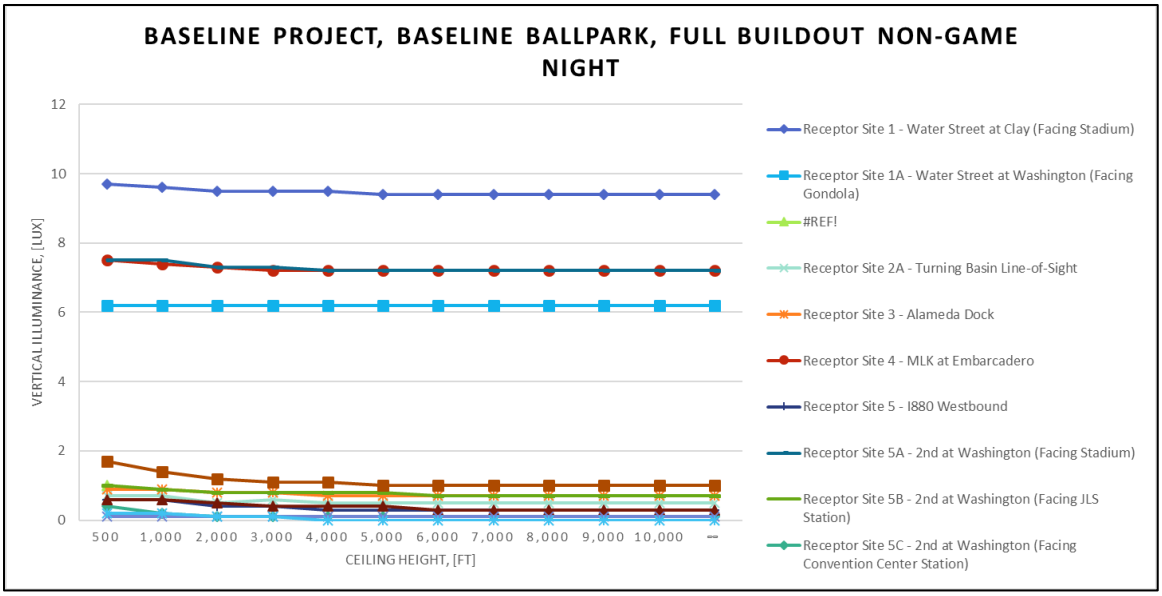


Figure 239: Impact of cloud ceiling height on spill light calculations at receptor sites for the Baseline project, Baseline ballpark height, “Full Buildout” scenario Non-Game Night Pre-Curfew lighting condition

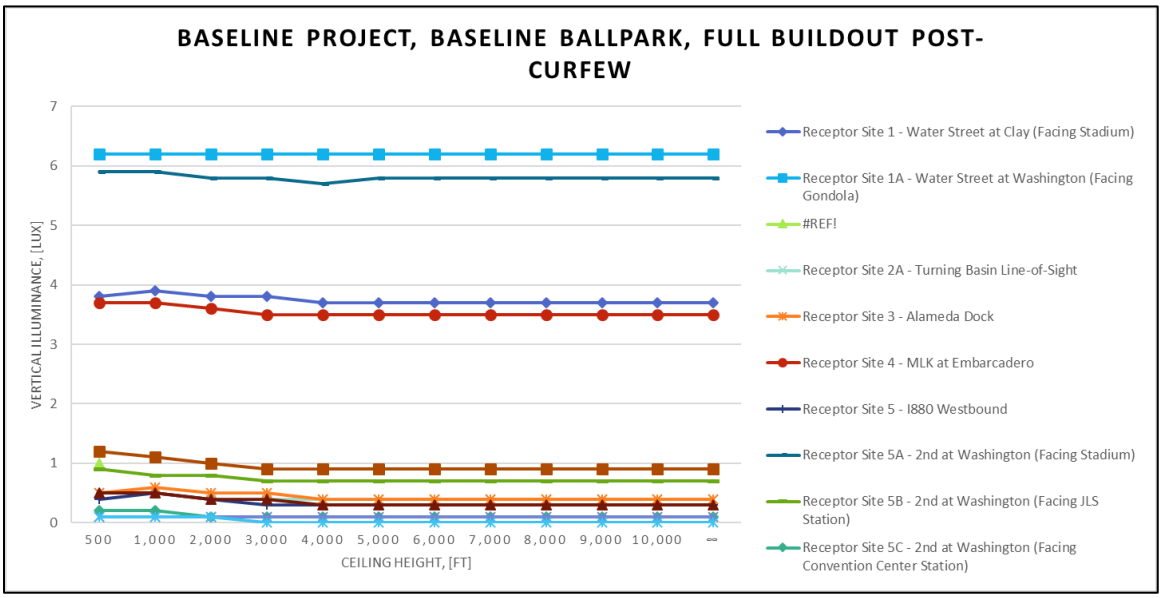


Figure 240: Impact of cloud ceiling height on spill light calculations at receptor sites for the Baseline project, Baseline ballpark height, “Full Buildout” scenario Post-Curfew lighting condition

9 Assessment of "Maritime Reservation Area" Project

To assess the potential lighting impact of the Maritime Reservation Area (MRA) project, a series of simulations were created to model the potential spill light impact and potential impact on glare.

9.1 Baseline project, Baseline ballpark height, Condition Including Gondola Variant

The first set of analysis includes the baseline ballpark geometry and the gondola variant.

9.1.1 "Phase 1" Scenario

Per the project description included in section 3.1, the "Phase 1" scenario includes the ballpark, site development immediately adjacent, and a select number of accessory buildings. The bulk of the remaining site is anticipated to be temporary surface parking.

9.1.1.1 Game Nights

As described in section 4.5.8, the Game Night lighting condition is anticipated to include all lighting "on", including sports and house lighting and identified signage locations.

9.1.1.1.1 Spill Light

Table 50 provides the calculation results for the spill light assessment at the receptor sites for this condition. As shown, the proposed lighting **is** anticipated to have a significant impact at Receptor Site 1, which faces straight into the opening of the ballpark and receive direct lighting from the proposed scoreboard location and have a direct view of the field of play. The impact on all other receptor sites is well below the level of significance.

Receptor Site	Spill Light, [lux]	Significant
Receptor Site 1 - Water Street at Clay (Facing Ballpark)	**41.5**	Yes
Receptor Site 1A - Water Street at Washington (Facing Gondola)	6.2	No
Receptor Site 2 - Inner Harbor Turning Basin @ 190'	0.8	No
Receptor Site 2A - Turning Basin Line-of-Sight	0.2	No
Receptor Site 2B - Inner Harbor Turning Basin @ 64'	0.7	No
Receptor Site 2C - Inner Harbor Turning Basin @ 25'	0.7	No
Receptor Site 3 - Alameda Dock	3.0	No
Receptor Site 4 - MLK at Embarcadero	11.7	No
Receptor Site 5 - I880 Westbound	0.3	No
Receptor Site 5A - 2nd at Washington (Facing Ballpark)	7.1	No
Receptor Site 5B - 2nd at Washington (Facing JLS Station)	0.7	No
Receptor Site 5C - 2nd at Washington (Facing Convention Center Station)	0.1	No
Receptor Site 6 - I980 Ramp to Eastbound I880	2.3	No
Receptor Site 6A - 7th at Brush	0.3	No
Receptor Site 7 - 8th at Washington (Facing Convention Center Station)	0.1	No
Receptor Site 7A - 8th at Washington (Facing Tower)	0.0	No

Table 50: Spill light at receptor sites for MRA project, Baseline ballpark height, "Phase 1" scenario Game Night lighting condition. [Note: Threshold of significance is 25 lux]

9.1.1.1.2 Spill Light Map

Figure 241 provides a spill light map for this lighting condition. To generate the spill light map, vertical calculation points were arrayed around the project site at 5’-6” AFG and oriented toward the pitcher’s mound for reference. The isoline curves show the extent to which vertical light levels are calculated and are reported in lux. As shown, less than 1 vertical lux is expected in the majority of the turning basin. The adjacent estuary is anticipated to experience between 1 and 5 vertical lux, with light levels increasing closer to shore. For reference, one 60W incandescent light bulb will generate 1 lux at a distance of approximately 8 meters (26 ft).

Figure 241: Spill light map for MRA project, Baseline ballpark height, “Phase 1” scenario Game Night lighting condition indicating vertical illuminance isolines

9.1.1.1.3 Glare

Figure 242 through Figure 257 illustrate the luminances anticipated to be observed from the identified receptor sites for this lighting condition. Note that the scale associated with each receptor site view approximately matches the scale used for the associated site's existing conditions HDR falsecolor images. Table 51 summarizes the anticipated glare significance at the receptor sites. Additionally, as noted in Section 4.5.3, the modeled retail lighting is included for pre-curfew times to capture the impact of interior lighting emanating through windows as a conservative contribution to spill light assessment; the modeled luminance, therefore, is an interior luminance and not subject to glare limitations directly.

Receptor Site	Facades		Signage	
	Maximum, [cd/m^2]	Significant	Maximum, [cd/m^2]	Significant
Receptor Site 1 - Water Street at Clay (Facing Ballpark)	15.9	No	3,500	Yes
Receptor Site 1A - Water Street at Washington (Facing Gondola)	6.4	No	n/a	n/a
Receptor Site 2 - Inner Harbor Turning Basin @ 190'	15.9	No	n/a	n/a
Receptor Site 2A - Turning Basin Line-of-Sight	15.9	No	n/a	n/a
Receptor Site 2B - Inner Harbor Turning Basin @ 64'	15.9	No	n/a	n/a
Receptor Site 2C - Inner Harbor Turning Basin @ 25'	15.9	No	n/a	n/a
Receptor Site 3 - Alameda Dock	15.9	No	3,500	Yes
Receptor Site 4 - MLK at Embarcadero	15.9	No	3,500	Yes
Receptor Site 5 - I880 Westbound	15.9	No	n/a	n/a
Receptor Site 5A - 2nd at Washington (Facing Ballpark)	15.9	No	3,500	Yes
Receptor Site 5B - 2nd at Washington (Facing JLS Station)	6.4	No	n/a	n/a
Receptor Site 5C - 2nd at Washington (Facing Convention Center Station)	1.6	No	n/a	n/a
Receptor Site 6 - I980 Ramp to Eastbound I880	15.9	No	3,500	Yes
Receptor Site 6A - 7th at Brush	15.9	No	3,500	Yes
Receptor Site 7 - 8th at Washington (Facing Convention Center Station)	6.4	No	n/a	n/a
Receptor Site 7A - 8th at Washington (Facing Tower)	0.0	No	n/a	n/a

Table 51: Summary of anticipated glare significance at receptor sites for the MRA project, Baseline ballpark height, "Phase 1" scenario Game Night lighting conditions. [Note: Threshold of significance is 25 cd/m^2 for façade lighting and 1,000 cd/m^2 for digital signage]

Figure 242 shows the anticipated luminances viewed from Receptor Site 1, which is one of the closest receptor sites. As seen, from this perspective, there is direct line of sight to the ballpark interior, "halo" field lighting, and the scoreboard and ribbon boards. Therefore, façade luminances from this view **are not** anticipated to exceed threshold and sign luminances from this view **are** anticipated to exceed threshold.

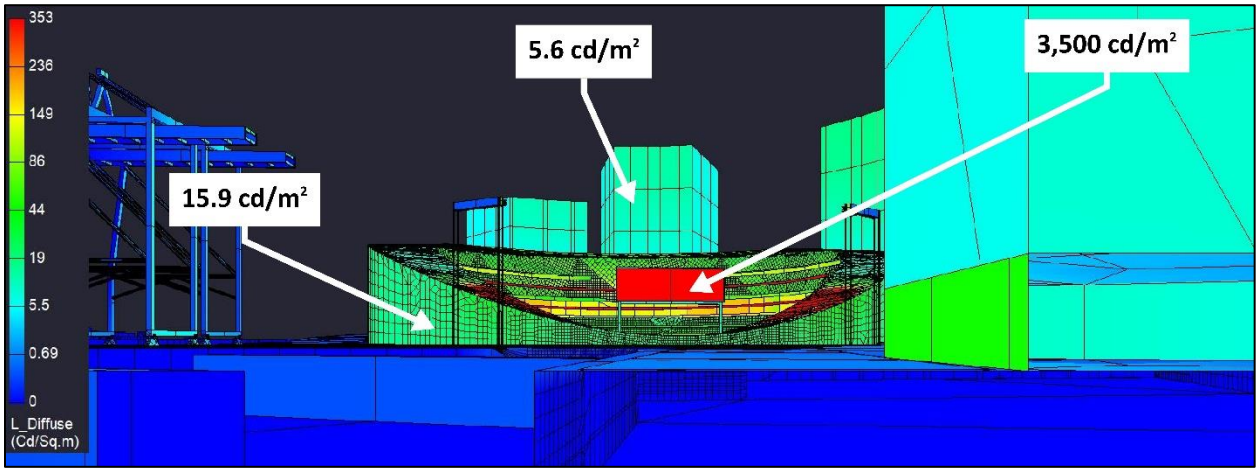


Figure 242: View from Receptor Site 1 for MRA project, Baseline ballpark height, "Phase 1" scenario Game Night lighting condition

Figure 243 provides a view of the anticipated luminances viewed from Receptor Site 1A, which is facing the proposed gondola station near Jack London Square. Note for calculation purposes, the "sides" of the gondola platform have been turned "off", and the anticipated lighting effect has been applied to the top of the platform floor. Therefore, luminances from this view **are not** anticipated to exceed threshold.

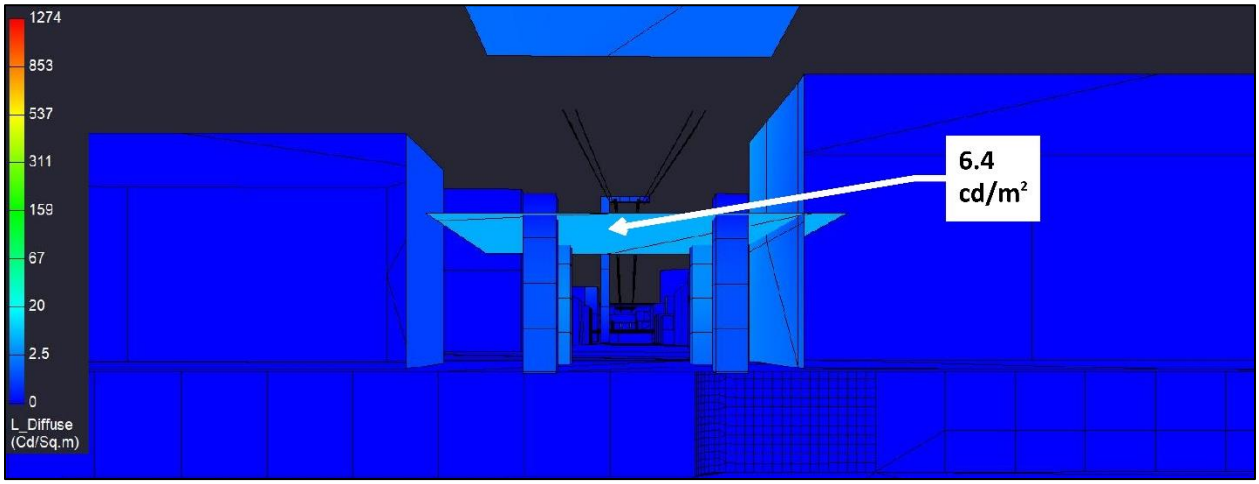


Figure 243: View from Receptor Site 1A for MRA project, Baseline ballpark height, "Phase 1" scenario Game Night lighting condition

Figure 244 provides the anticipated luminances viewed from Receptor Site 2, which is centered in the turning basin and located 190' above the water line. As shown, based on the ballpark geometry, there is not anticipated to be a direct view of the field luminaires, significantly reducing the observed brightnesses in the field of view. Refer to further discussion on this topic in section 6.2.1 above. The façade luminances from this view **are not** anticipated to exceed threshold.

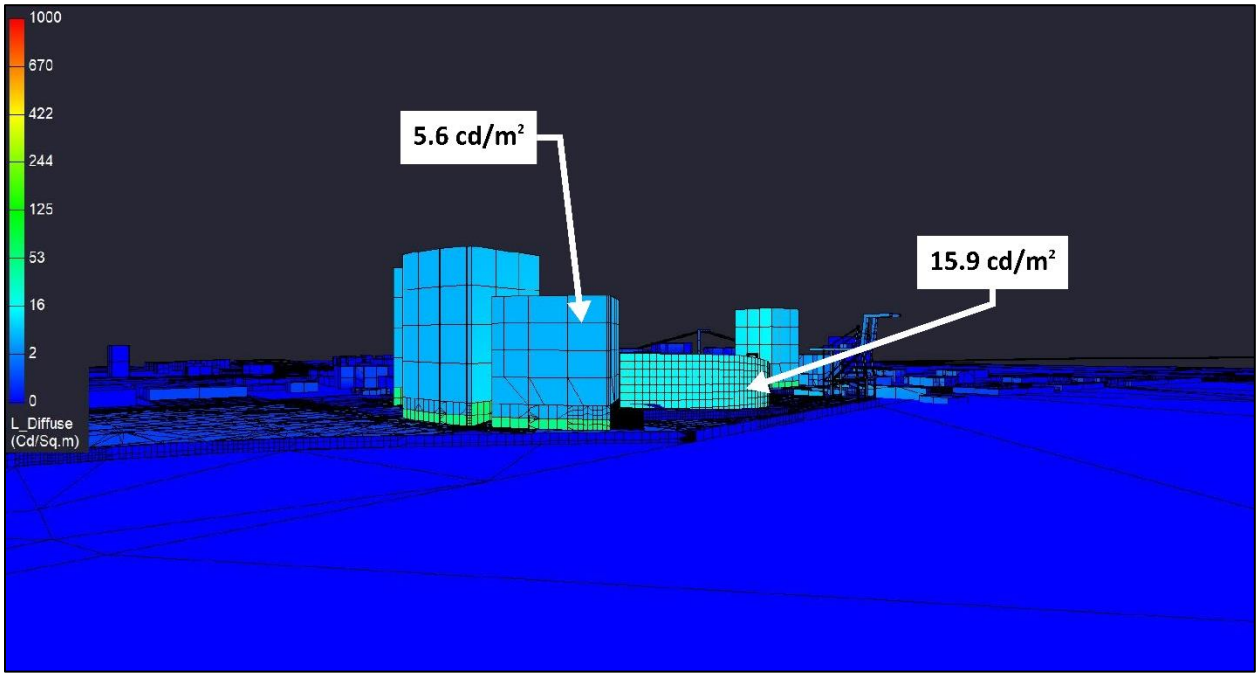


Figure 244: View from Receptor Site 2 for MRA project, Baseline ballpark height, "Phase 1" scenario Game Night lighting condition

Similar to the view from Receptor Site 2, the view from Receptor Site 2A, shown in Figure 245, of the field lighting is completely blocked by the ballpark geometry. Therefore, from this view **are not** anticipated to exceed threshold.

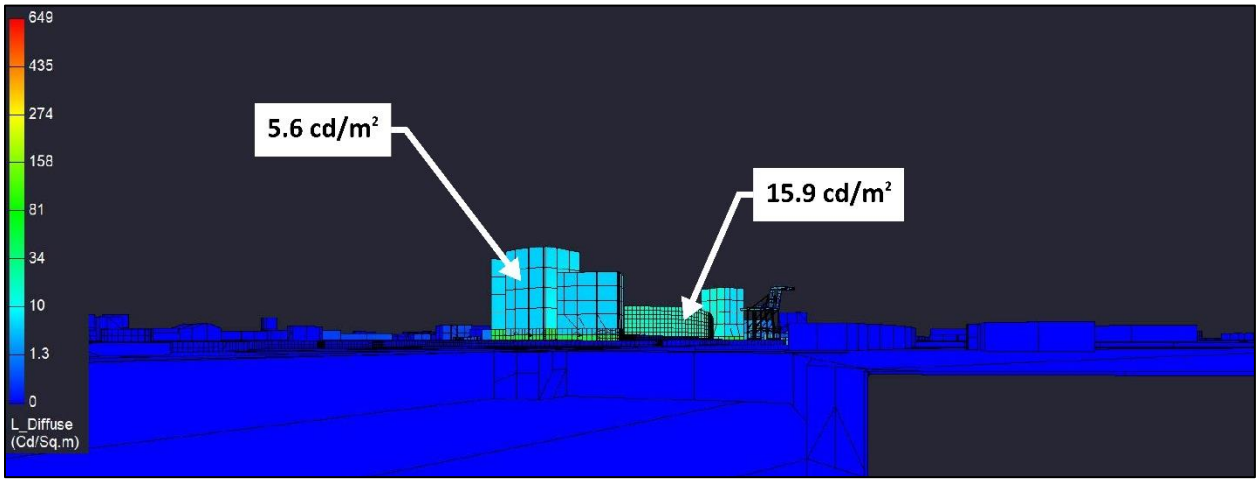


Figure 245: View from Receptor Site 2A for MRA project, Baseline ballpark height, "Phase 1" scenario Game Night lighting condition

Figure 246 provides the anticipated luminances viewed from Receptor Site 2B, which is centered in the turning basin and located 64' above the water line. As shown, based on the ballpark geometry, there is not anticipated to be a direct view of the sports lighting, scoreboard or ribbon boards. The façade luminances from this view **are not** anticipated to exceed threshold.

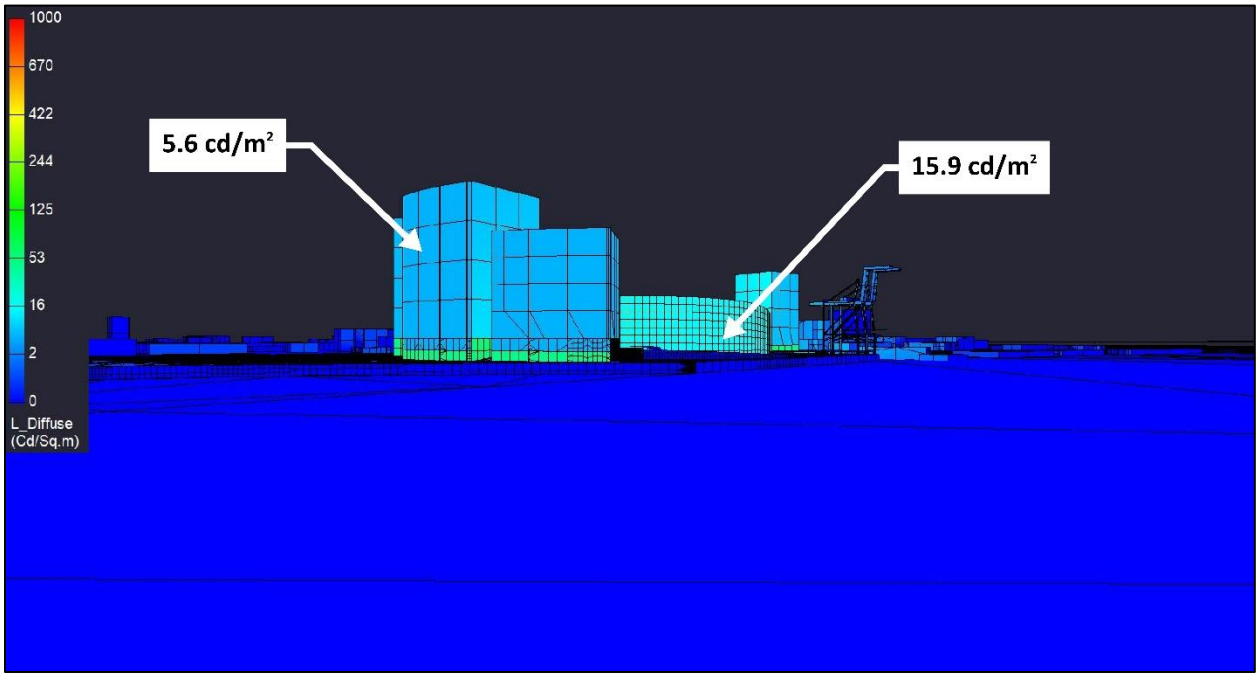


Figure 246: View from Receptor Site 2B for MRA project, Baseline ballpark height, "Phase 1" scenario Game Night lighting condition

Figure 247 provides the anticipated luminances viewed from Receptor Site 2C, which is centered in the turning basin and located 25' above the water line. As shown, based on the ballpark geometry, there is not anticipated to be a direct view of the sports lighting, scoreboard or ribbon boards. The façade luminances from this view **are not** anticipated to exceed threshold.

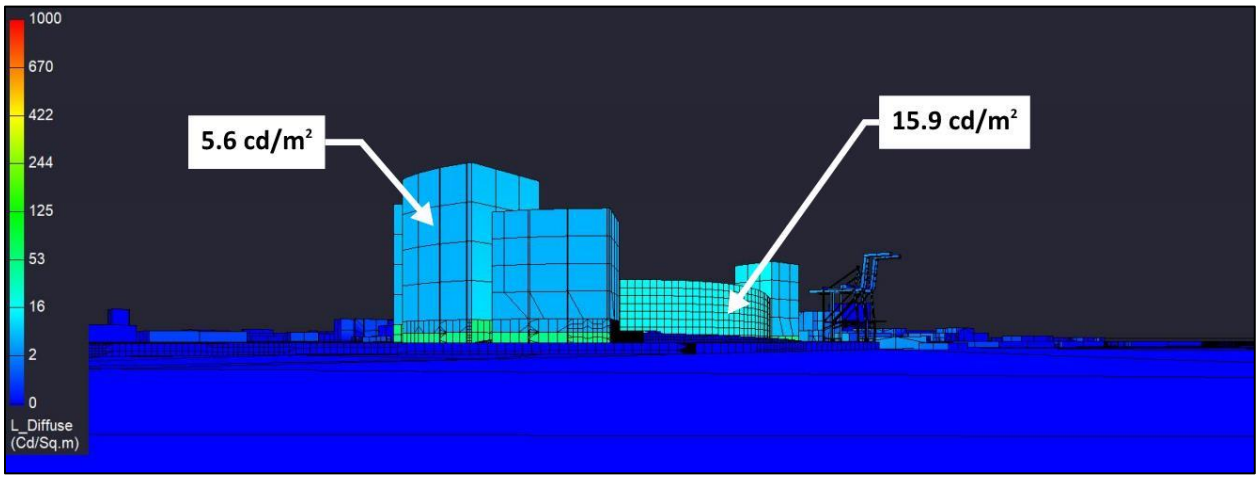


Figure 247: View from Receptor Site 2C for MRA project, Baseline ballpark height, "Phase 1" scenario Game Night lighting condition

Figure 248 provides the anticipated luminances viewed from Receptor Site 3, which is located on Alameda and facing northwest toward the property. From this position, there is a direct line of site to the scoreboard and ribbon boards. Therefore, façade luminances from this view **are not** anticipated to exceed threshold and sign luminances from this view **are** anticipated to exceed threshold.

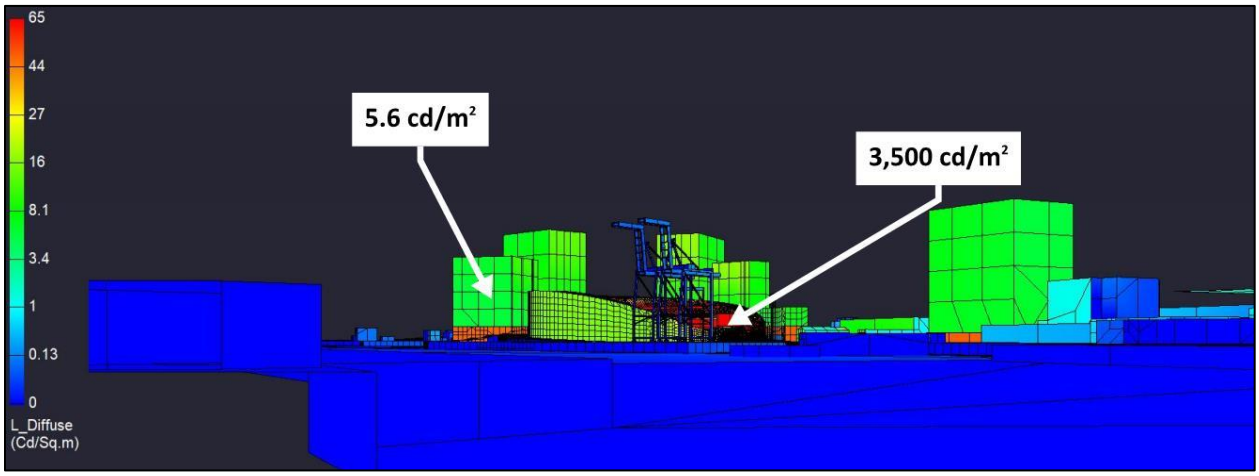


Figure 248: View from Receptor Site 3 for MRA project, Baseline ballpark height, "Phase 1" scenario Game Night lighting condition

Figure 249 provides the view from Receptor Site 4, which is located at the intersection of MLK and Embarcadero. As shown, a small corner of the scoreboard is anticipated to be viewed from this location, which exceed threshold. Therefore, façade luminances from this view **are not** anticipated to exceed threshold and sign luminances from this view **are** anticipated to exceed threshold.

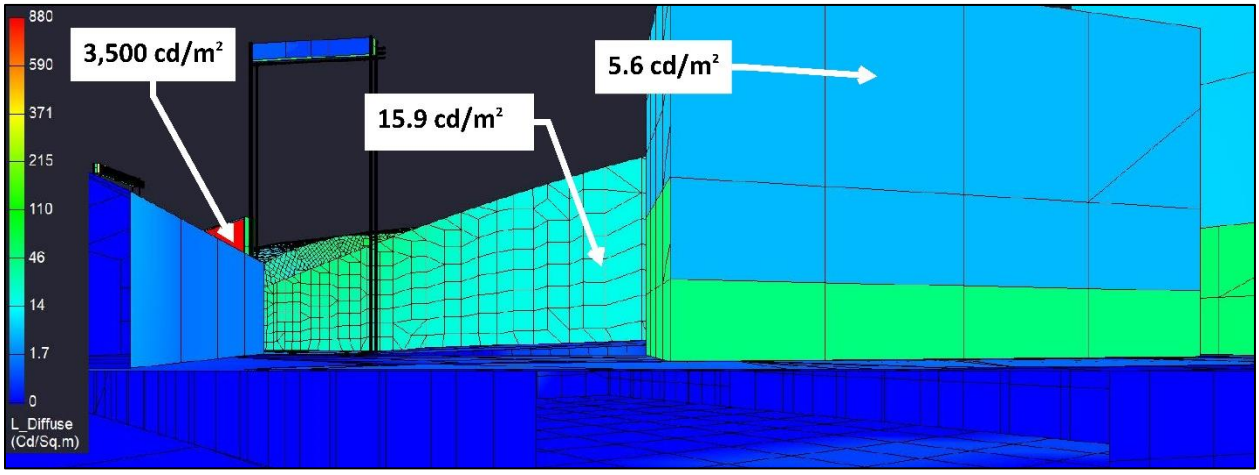


Figure 249: View from Receptor Site 4 for MRA project, Baseline ballpark height, "Phase 1" scenario Game Night lighting condition

Figure 250 provides the anticipated luminances viewed from Receptor Site 5, which is located on Westbound I880. From this view, the ballpark and sports lighting are anticipated to be almost entirely blocked. The façade lighting of the adjacent mixed-use development is anticipated to be visible. Therefore, luminances from this view **are not** anticipated to exceed threshold.

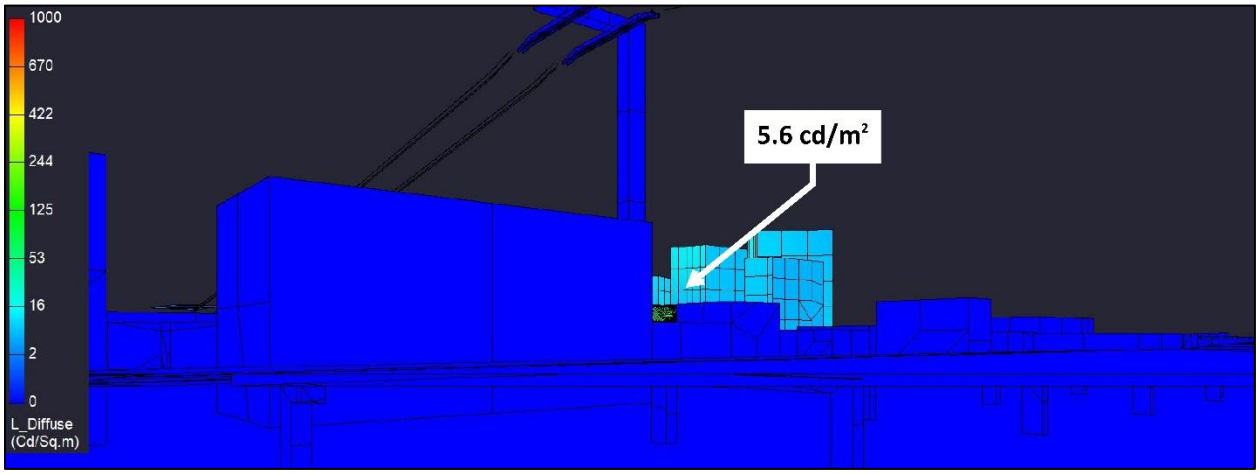


Figure 250: View from Receptor Site 5 for MRA project, Baseline ballpark height, "Phase 1" scenario Game Night lighting condition

Figure 251 provides the anticipated luminances viewed from Receptor Site 5A, which is located on the southwest corner of the roof of the parking garage located at 2nd and Washington. From this elevated position, there is a direct view down into the ballpark, including a direct view of the boards. Therefore, façade luminances from this view **are not** anticipated to exceed threshold and sign luminances from this view **are** anticipated to exceed threshold.

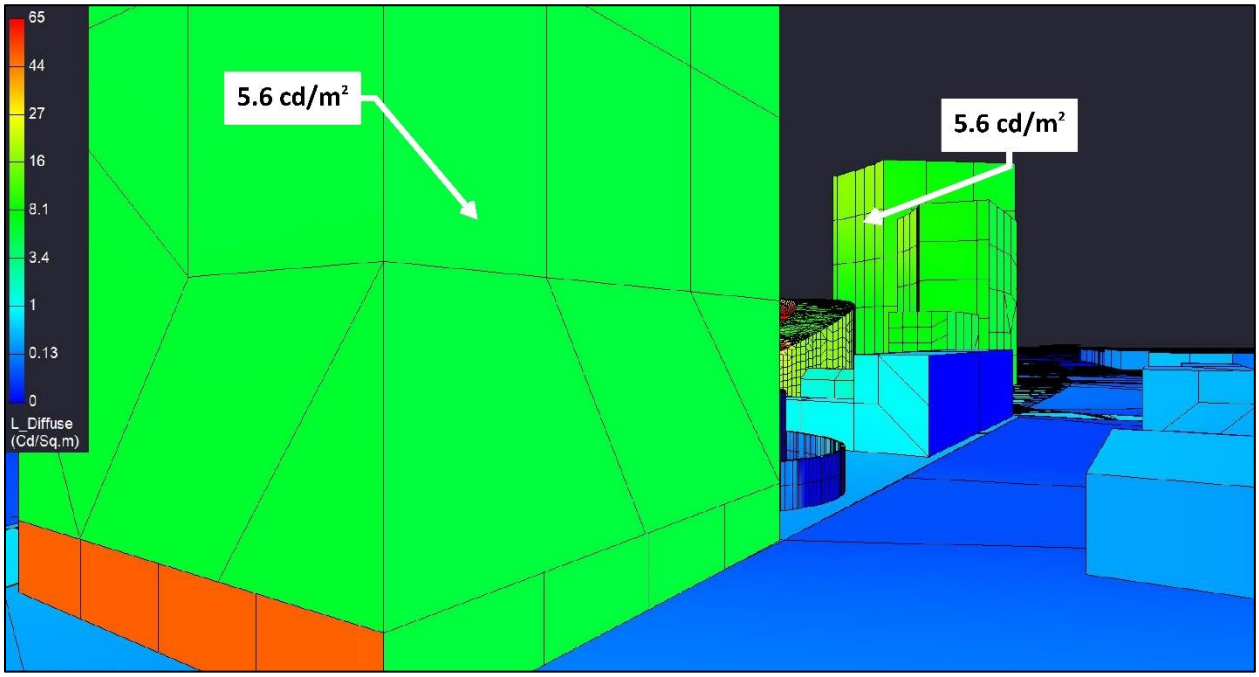


Figure 251: View from Receptor Site 5A for MRA project, Baseline ballpark height, "Phase 1" scenario Game Night lighting condition

Figure 252 provides the anticipated luminances viewed from Receptor Site 5B, which is located on the southeast corner of the roof of the parking garage looking toward the anticipated gondola station near Jack London Square. Therefore, luminances from this view **are not** anticipated to exceed threshold.

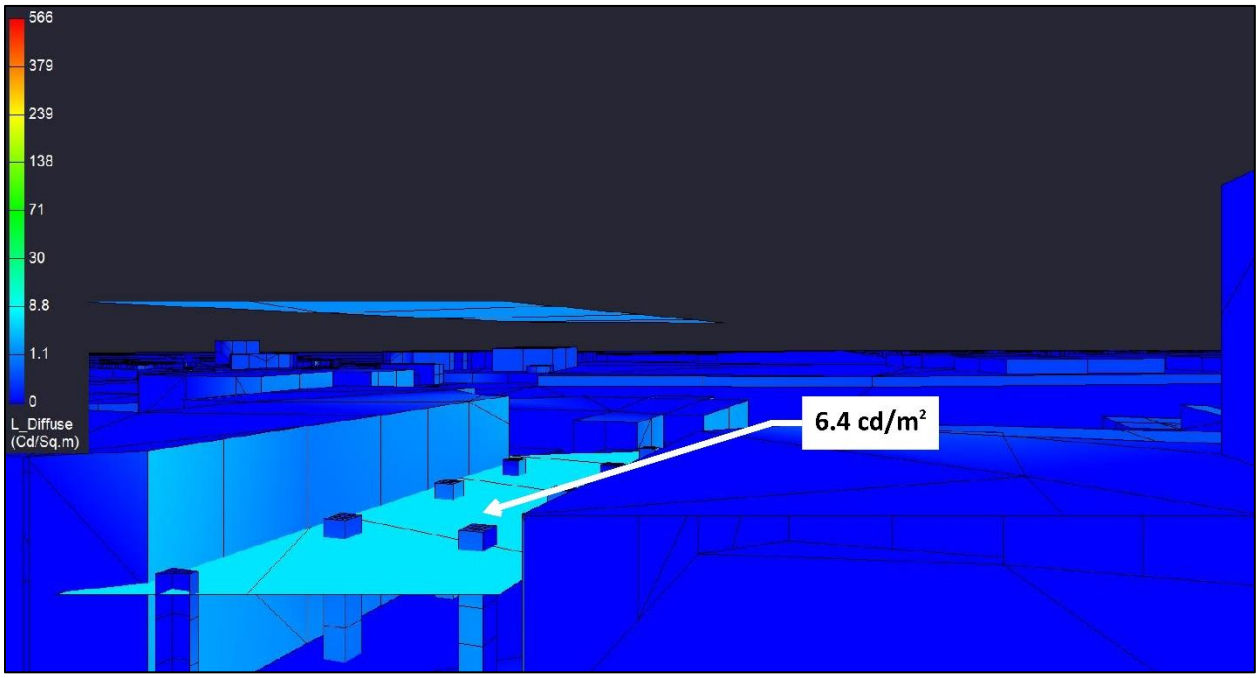


Figure 252: View from Receptor Site 5B for MRA project, Baseline ballpark height, "Phase 1" scenario Game Night lighting condition

Figure 253 provides the anticipated luminances viewed from Receptor Site 5C, which is located on the northeast corner of the parking garage at 2nd and Washington, looking northeast on the Washington corridor. No architectural lighting is anticipated on the gondola support tower and the Convention Center gondola station is not visible. Therefore, luminances from this view **are not** anticipated to exceed threshold.

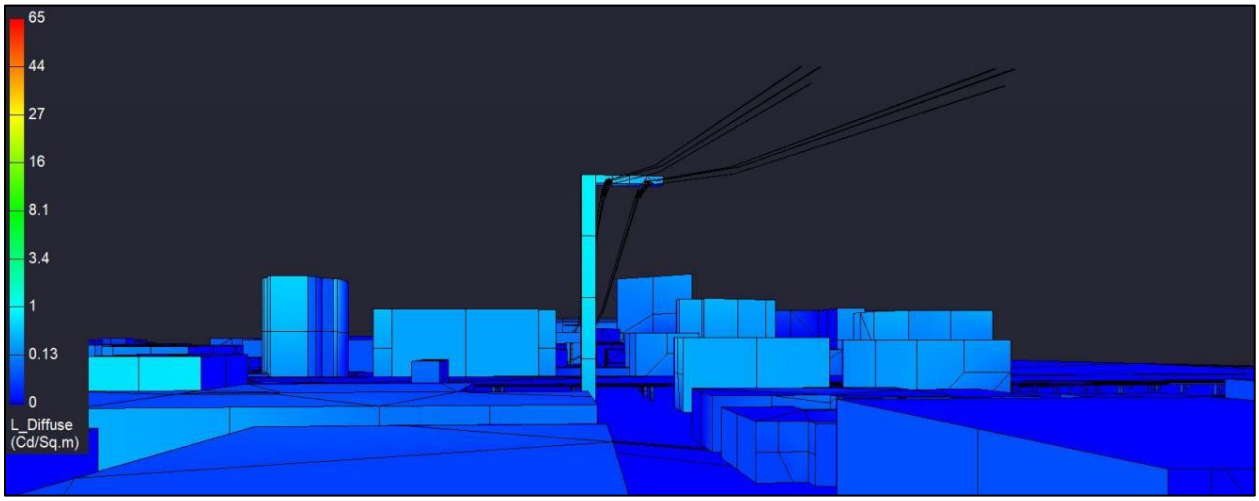


Figure 253: View from Receptor Site 5C for MRA project, Baseline ballpark height, "Phase 1" scenario Game Night lighting condition

Figure 254 provides the anticipated luminances viewed from Receptor Site 6, which is located on the ramp from I980 to eastbound I880. From this perspective, a direct view of the scoreboard and ribbon boards is anticipated. Therefore, façade luminances from this view **are not** anticipated to exceed threshold and sign luminances from this view **are** anticipated to exceed threshold.

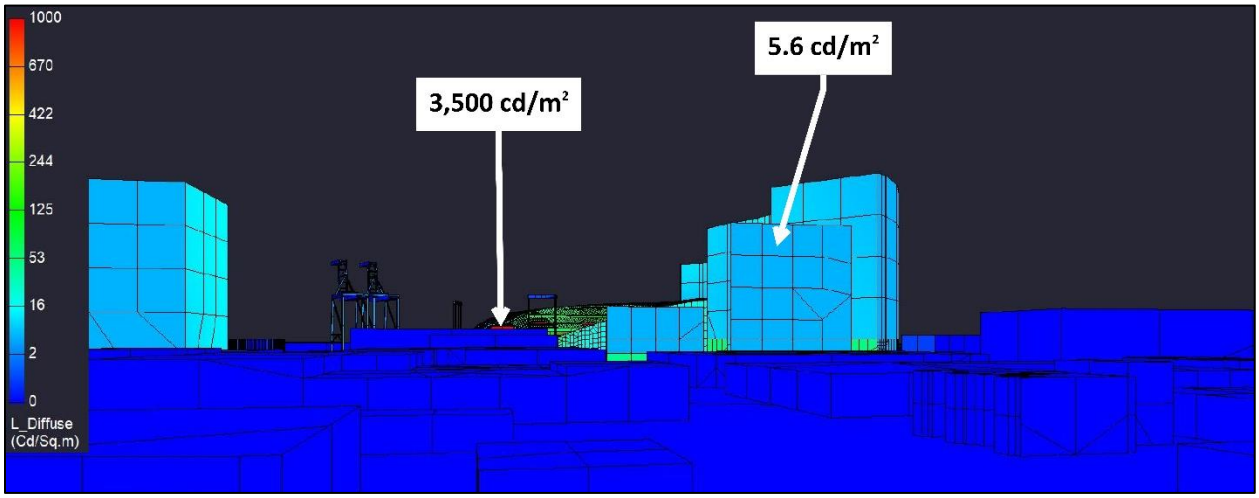


Figure 254: View from Receptor Site 6 for MRA project, Baseline ballpark height, "Phase 1" scenario Game Night lighting condition

Figure 255 provides the anticipated luminances viewed from Receptor Site 6A, which is located at 7th and Brush. From this perspective, there is anticipated to be a minimal view of the scoreboard and outfield light posts. Therefore, façade luminances from this view **are not** anticipated to exceed threshold and sign luminances from this view **are** anticipated to exceed threshold.

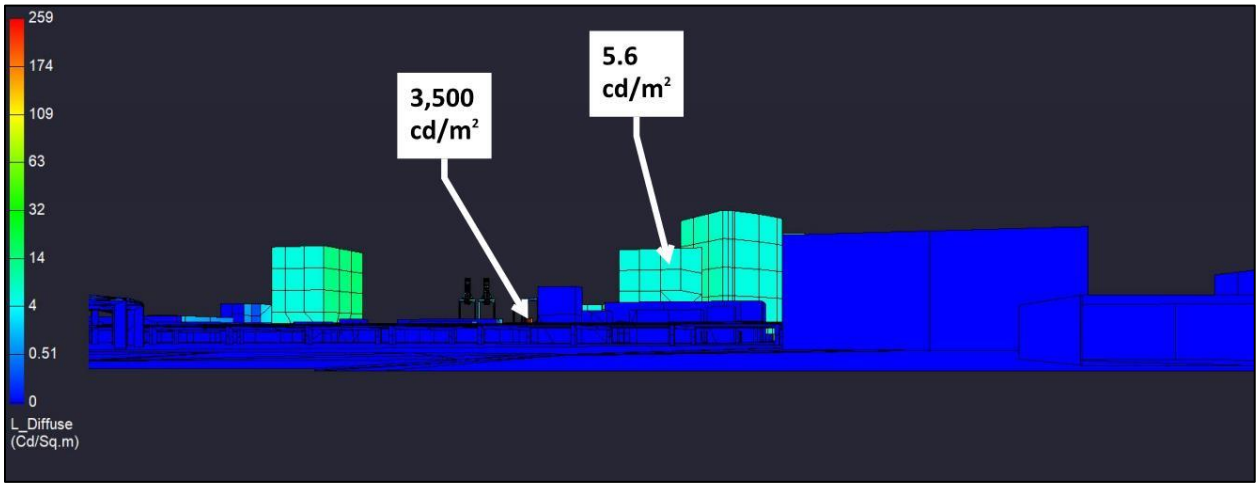


Figure 255: View from Receptor Site 6A for MRA project, Baseline ballpark height, "Phase 1" scenario Game Night lighting condition

Figure 256 provides the anticipated luminances viewed from Receptor Site 7, which is located at 8th and Washington facing north to the anticipated Convention Center gondola station. From this position, the field of view is anticipated to include the bottom surface of the gondola platform. Therefore, luminances from this view **are not** anticipated to exceed threshold.

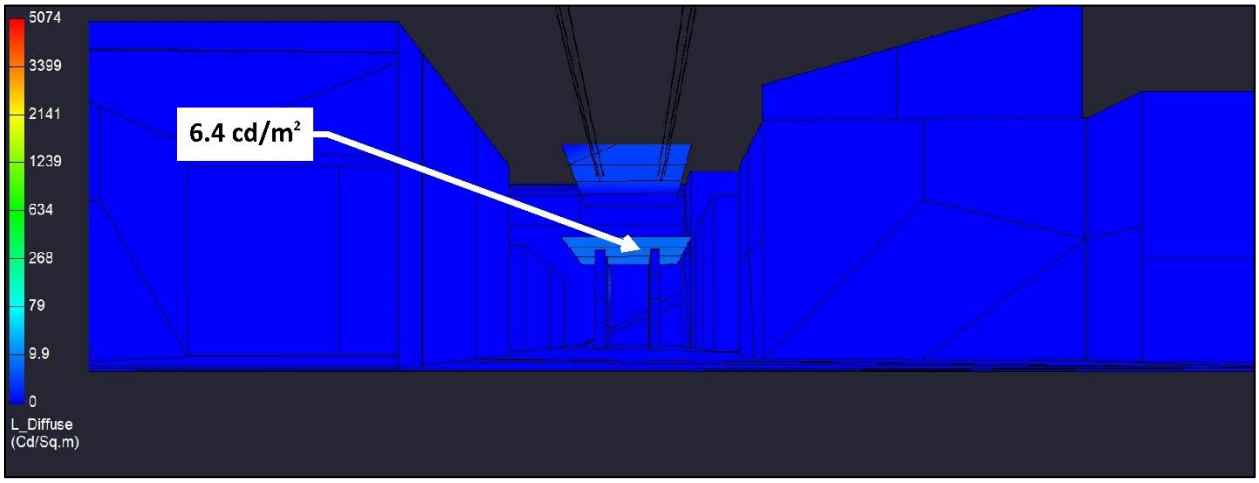


Figure 256: View from Receptor Site 7 for MRA project, Baseline ballpark height, "Phase 1" scenario Game Night lighting condition

Figure 257 provides the anticipated luminances viewed from Receptor Site 7A, which is located at 8th and Washington facing south toward the gondola support pole. From this position, the field of view is anticipated to include the gondola support pole which is not anticipated to have any architectural lighting. Therefore, luminances from this view **are not** anticipated to exceed threshold.

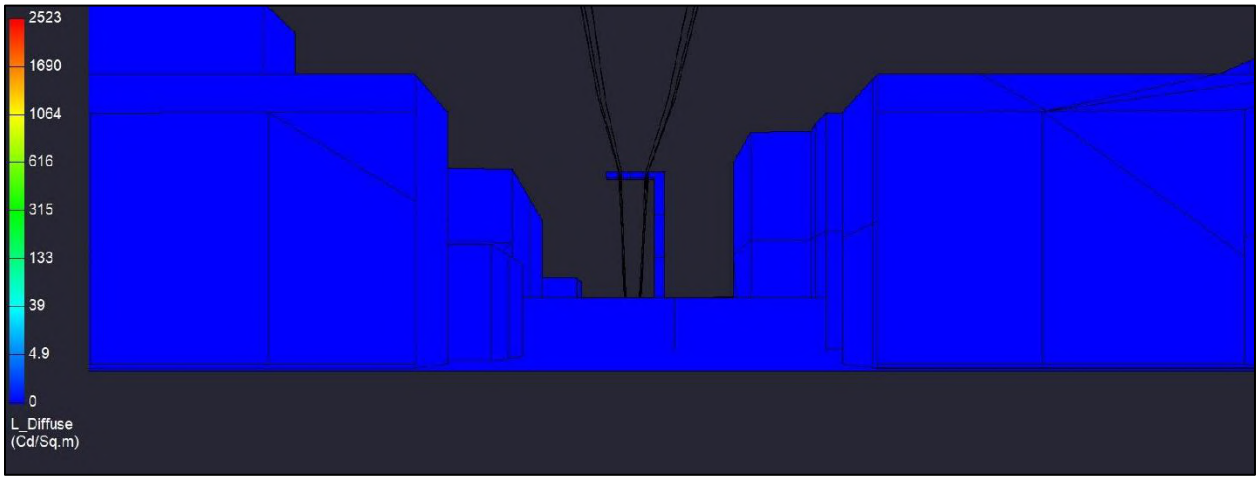


Figure 257: View from Receptor Site 7A for MRA project, Baseline ballpark height, "Phase 1" scenario Game Night lighting condition

9.1.1.2 Non-Game Nights, Pre-Curfew

As described in section 4.5.8, the Non-Game Nights, Pre-Curfew lighting condition is anticipated to include all architectural lighting "on", but assumes that the sports and house lighting within the ballpark, as well as the scoreboard and ribbon boards, are not "on".

9.1.1.2.1 Spill Light

Table 52 provides the calculation results for the spill light assessment at the receptor sites for this condition. As shown, the proposed lighting **is not** anticipated to have a significant impact at any receptor site.

Receptor Site	Spill Light, [lux]	Significant
Receptor Site 1 - Water Street at Clay (Facing Ballpark)	9.2	No
Receptor Site 1A - Water Street at Washington (Facing Gondola)	6.5	No
Receptor Site 2 - Inner Harbor Turning Basin @ 190'	0.7	No
Receptor Site 2A - Turning Basin Line-of-Sight	0.2	No
Receptor Site 2B - Inner Harbor Turning Basin @ 64'	0.7	No
Receptor Site 2C - Inner Harbor Turning Basin @ 25'	0.7	No
Receptor Site 3 - Alameda Dock	0.5	No
Receptor Site 4 - MLK at Embarcadero	6.8	No
Receptor Site 5 - I880 Westbound	0.1	No
Receptor Site 5A - 2nd at Washington (Facing Ballpark)	7.0	No
Receptor Site 5B - 2nd at Washington (Facing JLS Station)	0.7	No
Receptor Site 5C - 2nd at Washington (Facing Convention Center Station)	0.0	No
Receptor Site 6 - I980 Ramp to Eastbound I880	0.6	No
Receptor Site 6A - 7th at Brush	0.2	No
Receptor Site 7 - 8th at Washington (Facing Convention Center Station)	0.1	No
Receptor Site 7A - 8th at Washington (Facing Tower)	0.0	No

Table 52: Spill light at receptor sites for MRA project, Baseline ballpark height, "Phase 1" scenario Non-Game Nights, Pre-Curfew lighting condition. [Note: Threshold of significance is 25 lux]

9.1.1.2.2 Spill Light Map

Figure 258 provides a spill light map for this lighting condition. To generate the spill light map, vertical calculation points were arrayed around the project site at 5'-6" AFG and oriented toward the pitcher's mound for reference. The isoline curves show the extent to which vertical light levels are calculated and are reported in lux. As shown, less than 1 vertical lux is expected in the majority of the turning basin. The adjacent estuary is anticipated to experience between 1 and 5 vertical lux, with light levels increasing closer to shore. For reference, one 60W incandescent light bulb will generate 1 lux at a distance of approximately 8 meters (26 ft).

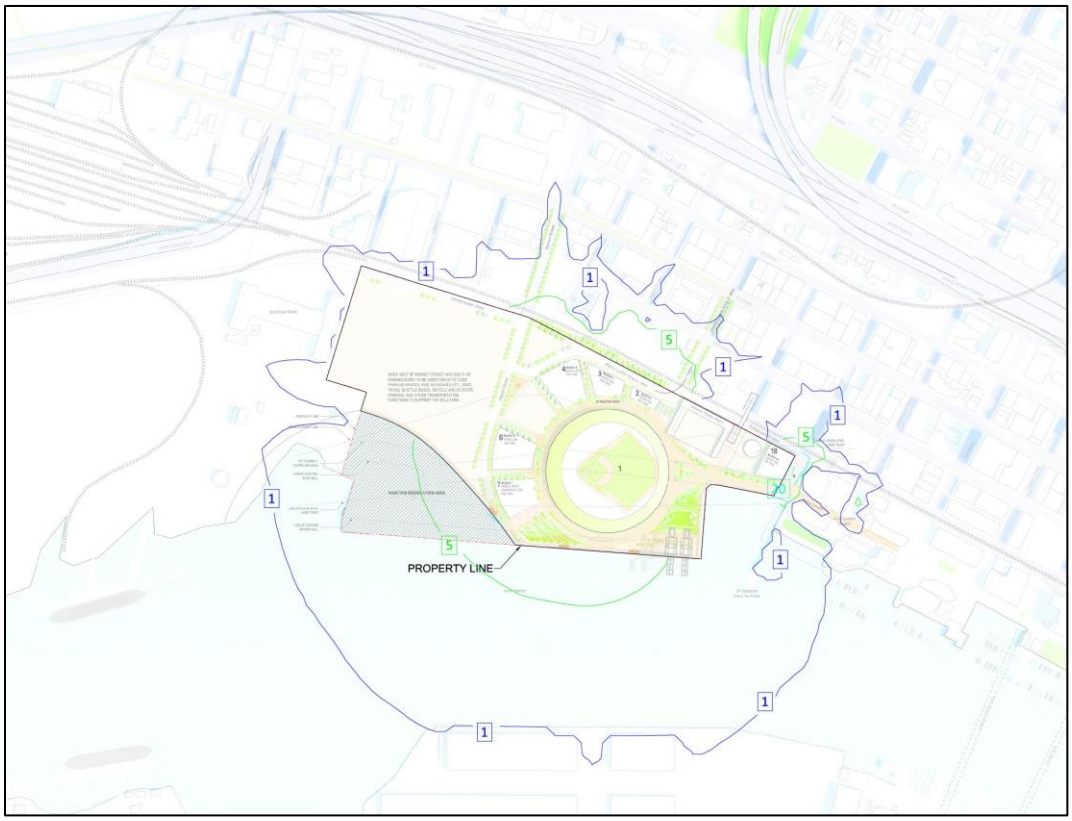


Figure 258: Spill light map for MRA project, Baseline ballpark height, "Phase 1" scenario Non-Game Night, Pre-Curfew lighting condition indicating vertical illuminance isolines

9.1.1.2.3 Glare

Figure 259 and Figure 274 illustrate the luminances anticipated to be observed from the identified receptor sites for this lighting condition. Note that the scale associated with each receptor site view approximately matches the scale used for the associated site's existing conditions HDR falsecolor images. Table 53 summarizes the anticipated glare significance at the receptor sites. Additionally, as noted in Section 4.5.3, the modeled retail lighting is included for pre-curfew times to capture the impact of interior lighting emanating through windows as a conservative contribution to spill light assessment; the modeled luminance, therefore, is an interior luminance and not subject to glare limitations directly.

Receptor Site	Facades		Signage	
	Maximum, [cd/m^2]	Significant	Maximum, [cd/m^2]	Significant
Receptor Site 1 - Water Street at Clay (Facing Ballpark)	15.9	No	n/a	n/a
Receptor Site 1A - Water Street at Washington (Facing Gondola)	6.4	No	n/a	n/a
Receptor Site 2 - Inner Harbor Turning Basin @ 190'	15.9	No	n/a	n/a
Receptor Site 2A - Turning Basin Line-of-Sight	15.9	No	n/a	n/a
Receptor Site 2B - Inner Harbor Turning Basin @ 64'	15.9	No	n/a	n/a
Receptor Site 2C - Inner Harbor Turning Basin @ 25'	15.9	No	n/a	n/a
Receptor Site 3 - Alameda Dock	15.9	No	n/a	n/a
Receptor Site 4 - MLK at Embarcadero	15.9	No	n/a	n/a
Receptor Site 5 - I880 Westbound	15.9	No	n/a	n/a
Receptor Site 5A - 2nd at Washington (Facing Ballpark)	15.9	No	n/a	n/a
Receptor Site 5B - 2nd at Washington (Facing JLS Station)	6.4	No	n/a	n/a
Receptor Site 5C - 2nd at Washington (Facing Convention Center Station)	0.0	No	n/a	n/a
Receptor Site 6 - I980 Ramp to Eastbound I880	15.9	No	n/a	n/a
Receptor Site 6A - 7th at Brush	15.9	No	n/a	n/a
Receptor Site 7 - 8th at Washington (Facing Convention Center Station)	6.4	No	n/a	n/a
Receptor Site 7A - 8th at Washington (Facing Tower)	0.0	No	n/a	n/a

Table 53: Summary of anticipated glare significance at receptor sites for the MRA project, Baseline ballpark height, "Phase 1" scenario Non-Game Night Pre-Curfew lighting conditions. [Note: Threshold of significance is 25 cd/m^2 for façade lighting and 1,000 cd/m^2 for digital signage]

Figure 259 shows the anticipated luminances viewed from Receptor Site 1, which is one of the closest receptor sites. As seen, from this perspective, without the field lighting and scoreboard/ribbon boards, "on", overall brightnesses are reduced. Therefore, luminances from this view **are not** anticipated to exceed threshold.

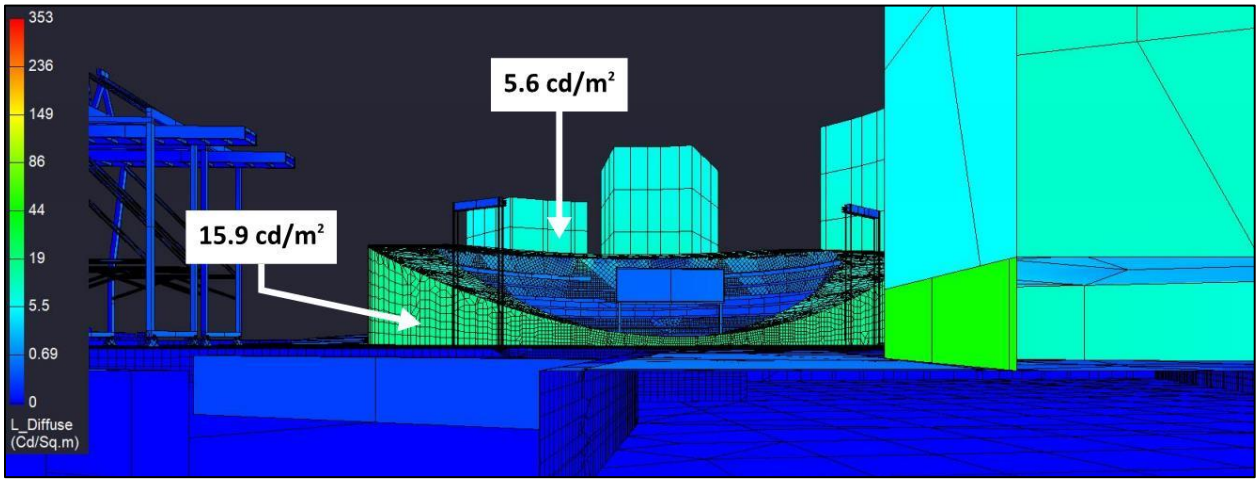


Figure 259: View from Receptor Site 1 for MRA project, Baseline ballpark height, "Phase 1" scenario Non-Game Pre-Curfew lighting condition

Figure 260 provides a view of the anticipated luminances viewed from Receptor Site 1A, which is facing the proposed gondola station near Jack London Square. Note for calculation purposes, the "sides" of the gondola platform have been turned "off", and the anticipated lighting effect has been applied to the top of the platform floor. Therefore, luminances from this view **are not** anticipated to exceed threshold.

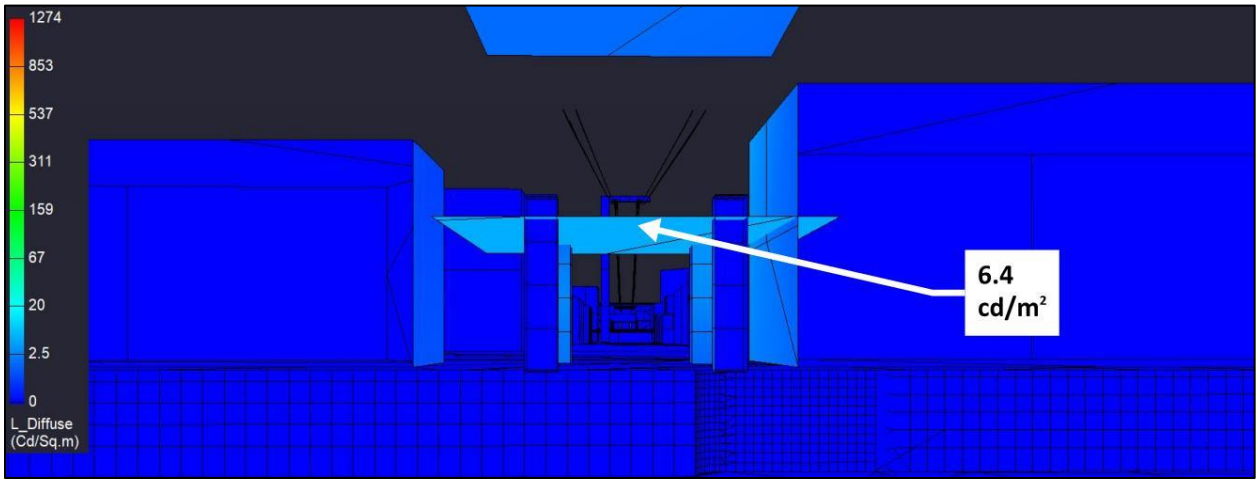


Figure 260: View from Receptor Site 1A for MRA project, Baseline ballpark height, "Phase 1" scenario Non-Game Pre-Curfew lighting condition

Figure 261 provides the anticipated luminances viewed from Receptor Site 2, which is centered in the turning basin and located 190' above the water line. Façade luminances from this view **are not** anticipated to exceed threshold.

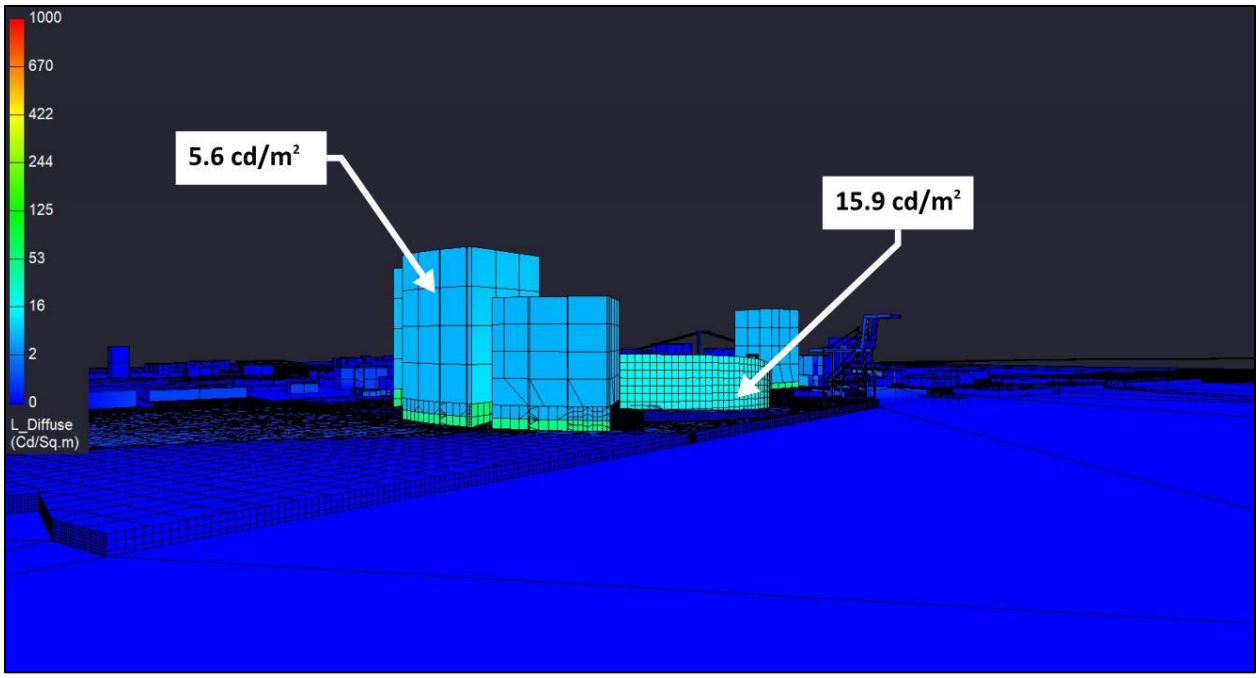


Figure 261: View from Receptor Site 2 for MRA project, Baseline ballpark height, "Phase 1" scenario Non-Game Pre-Curfew lighting condition

Figure 262 provides the anticipated luminances viewed from Receptor Site 2A, which is on Alameda with a direct line of site through the center of the turning basin. Luminances from this view **are not** anticipated to exceed threshold.

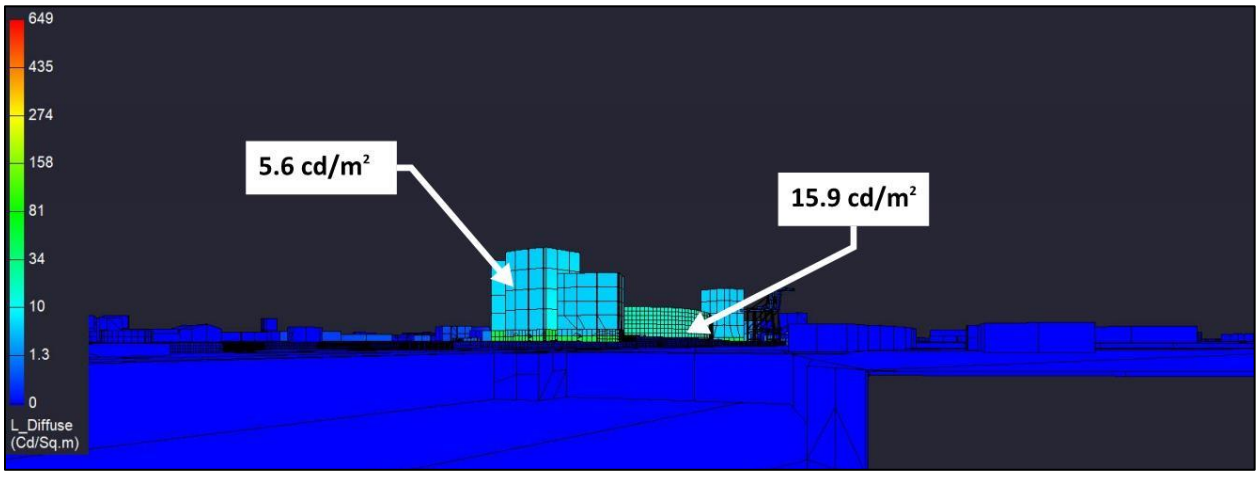


Figure 262: View from Receptor Site 2A for MRA project, Baseline ballpark height, "Phase 1" scenario Non-Game Pre-Curfew lighting condition

Figure 263 provides the anticipated luminances viewed from Receptor Site 2B, which is centered in the turning basin and located 64’ above the water line. Façade luminances from this view **are not** anticipated to exceed threshold.

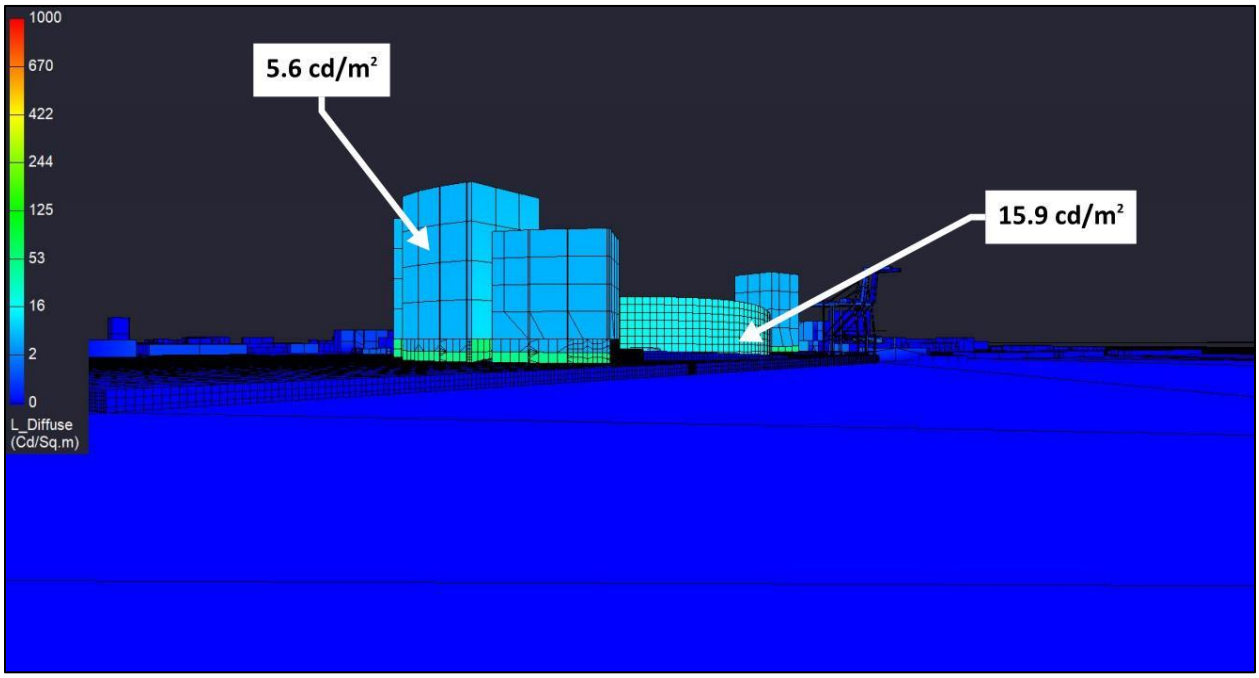


Figure 263: View from Receptor Site 2B for MRA project, Baseline ballpark height, “Phase 1” scenario Non-Game Pre-Curfew lighting condition

Figure 264 provides the anticipated luminances viewed from Receptor Site 2C, which is centered in the turning basin and located 25’ above the water line. Façade luminances from this view **are not** anticipated to exceed threshold.

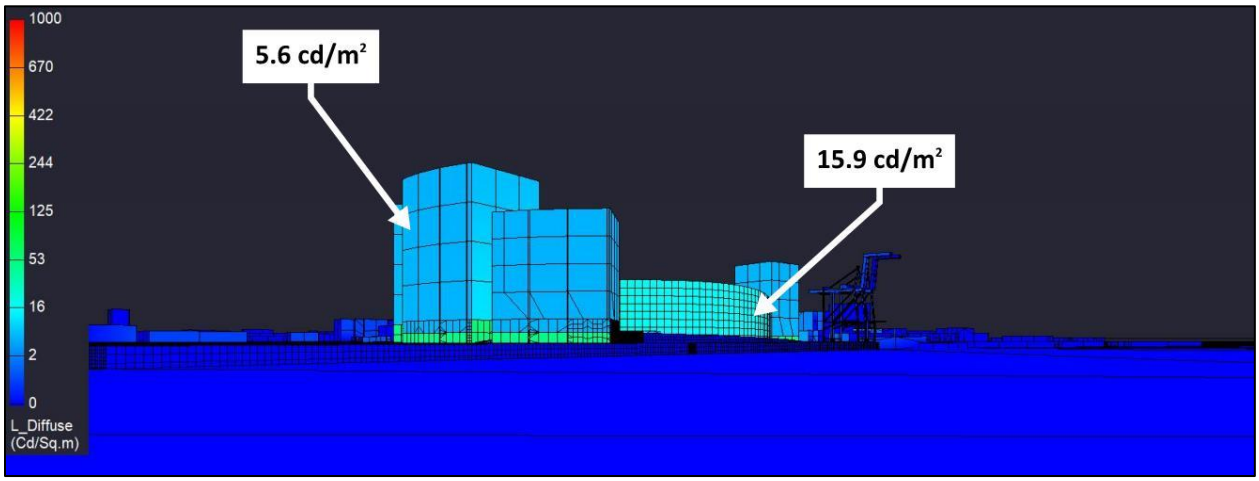


Figure 264: View from Receptor Site 2C for MRA project, Baseline ballpark height, “Phase 1” scenario Non-Game Pre-Curfew lighting condition

Figure 265 provides the anticipated luminances viewed from Receptor Site 3, which is located on Alameda and facing northwest toward the property. Retail facades are anticipated to be visible. Therefore, luminances from this view **are not** anticipated to exceed threshold.

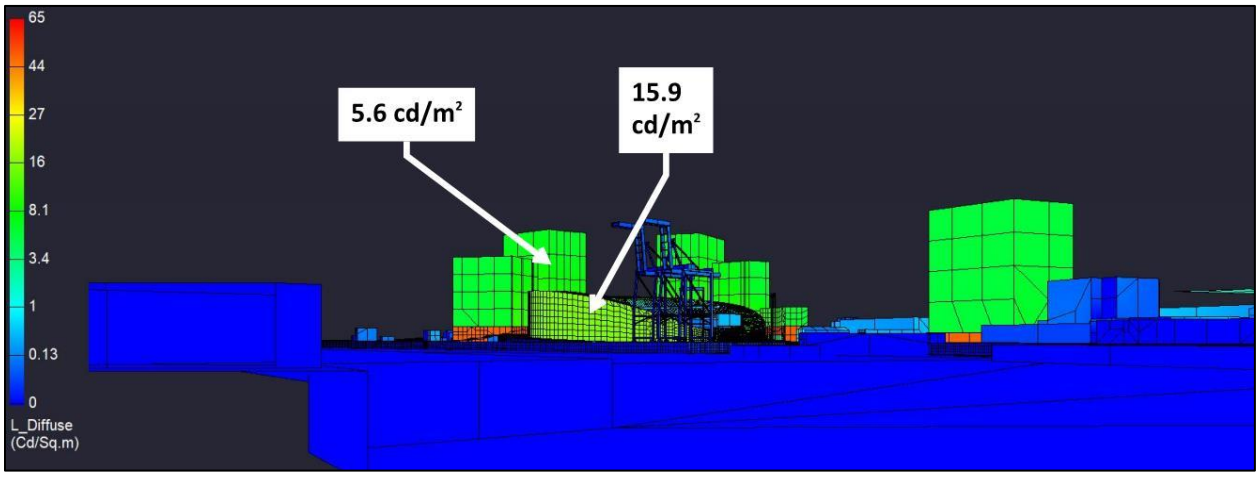


Figure 265: View from Receptor Site 3 for MRA project, Baseline ballpark height, "Phase 1" scenario Non-Game Pre-Curfew lighting condition

Figure 266 provides the view from Receptor Site 4, which is located at the intersection of MLK and Embarcadero. As shown, there is a direct view of retail anticipated on the ground floor. Therefore, from this view **are not** anticipated to exceed threshold.

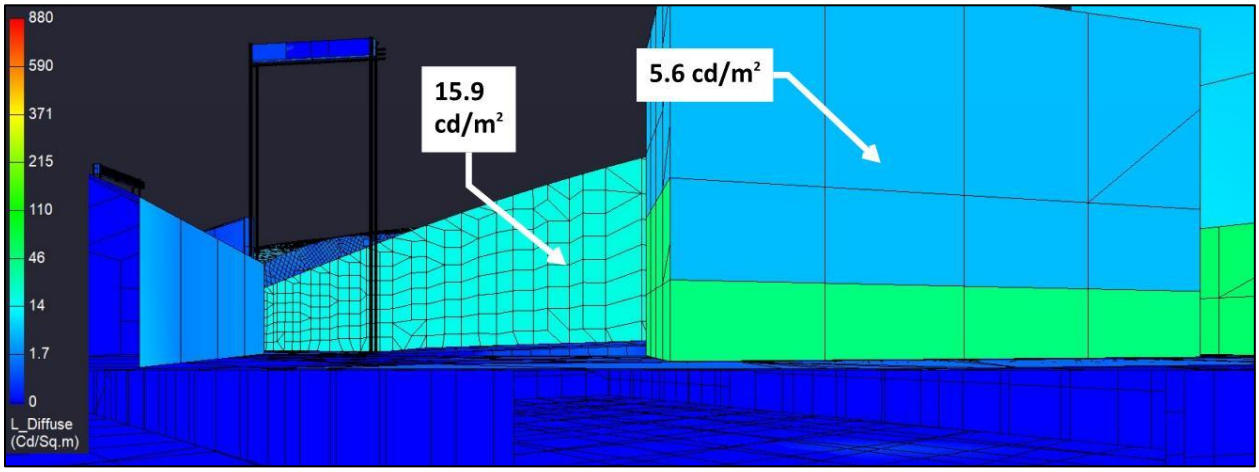


Figure 266: View from Receptor Site 4 for MRA project, Baseline ballpark height, "Phase 1" scenario Non-Game Pre-Curfew lighting condition

Figure 267 provides the anticipated luminances viewed from Receptor Site 5, which is located on Westbound I880. The façade lighting of the adjacent mixed-use development is anticipated to be visible. Therefore, luminances from this view **are not** anticipated to exceed threshold.

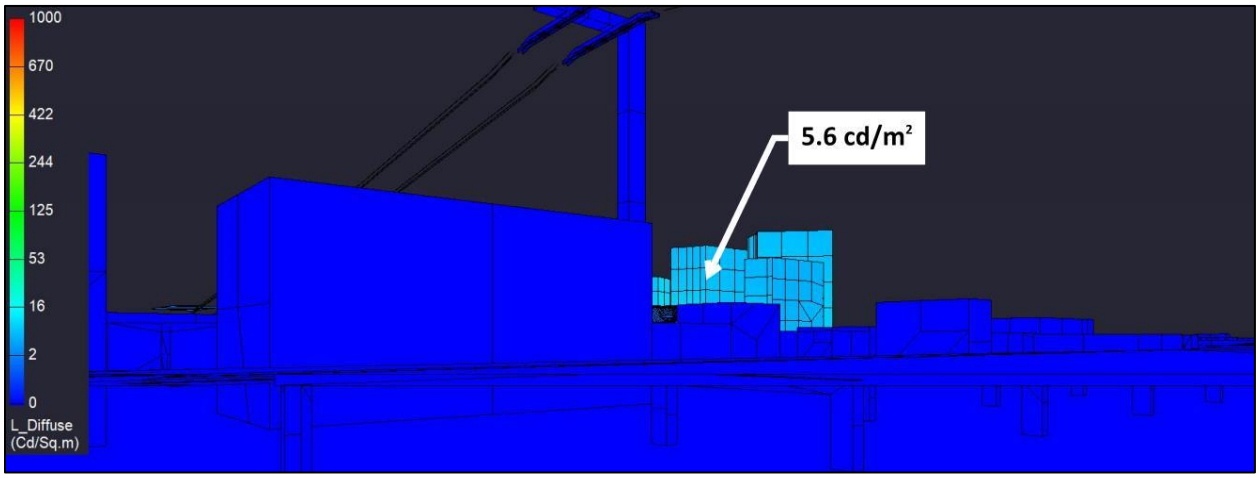


Figure 267: View from Receptor Site 5 for MRA project, Baseline ballpark height, "Phase 1" scenario Non-Game Pre-Curfew lighting condition

Figure 268 provides the anticipated luminances viewed from Receptor Site 5A, which is located on the southwest corner of the roof of the parking garage located at 2nd and Washington. Luminances from this view **are not** anticipated to exceed threshold.

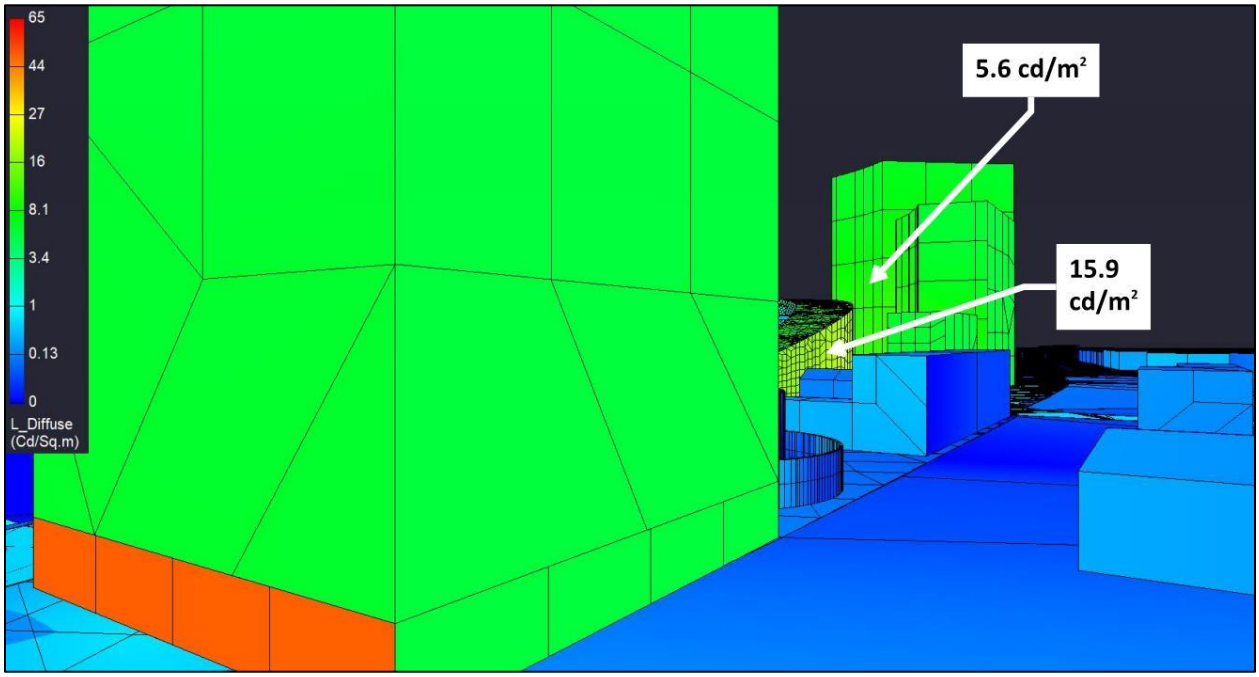


Figure 268: View from Receptor Site 5A for MRA project, Baseline ballpark height, "Phase 1" scenario Non-Game Pre-Curfew lighting condition

Figure 269 provides the anticipated luminances viewed from Receptor Site 5B, which is located on the southeast corner of the roof of the parking garage looking toward the anticipated gondola station near Jack London Square. Luminances from this view **are not** anticipated to exceed threshold.

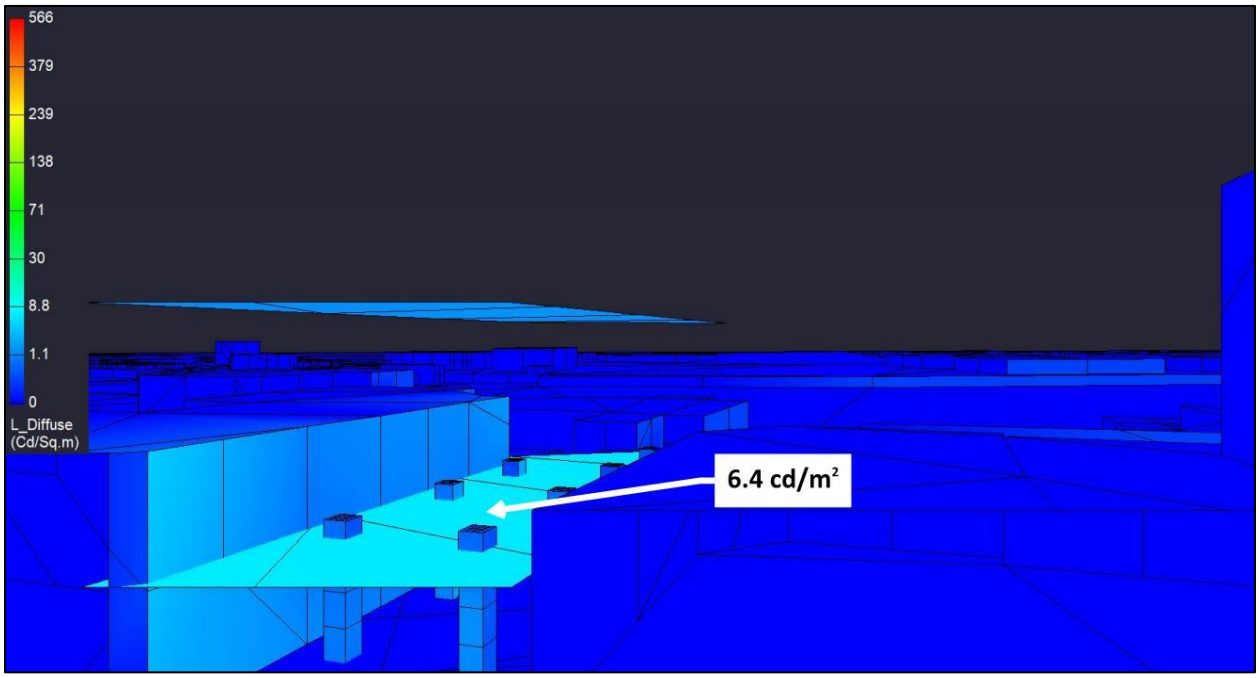


Figure 269: View from Receptor Site 5B for MRA project, Baseline ballpark height, "Phase 1" scenario Non-Game Pre-Curfew lighting condition

Figure 270 provides the anticipated luminances viewed from Receptor Site 5C, which is located on the northeast corner of the parking garage at 2nd and Washington, looking northeast on the Washington corridor. No architectural lighting is anticipated on the gondola support tower and the Convention Center gondola station is not visible. Therefore, luminances from this view **are not** anticipated to exceed threshold.

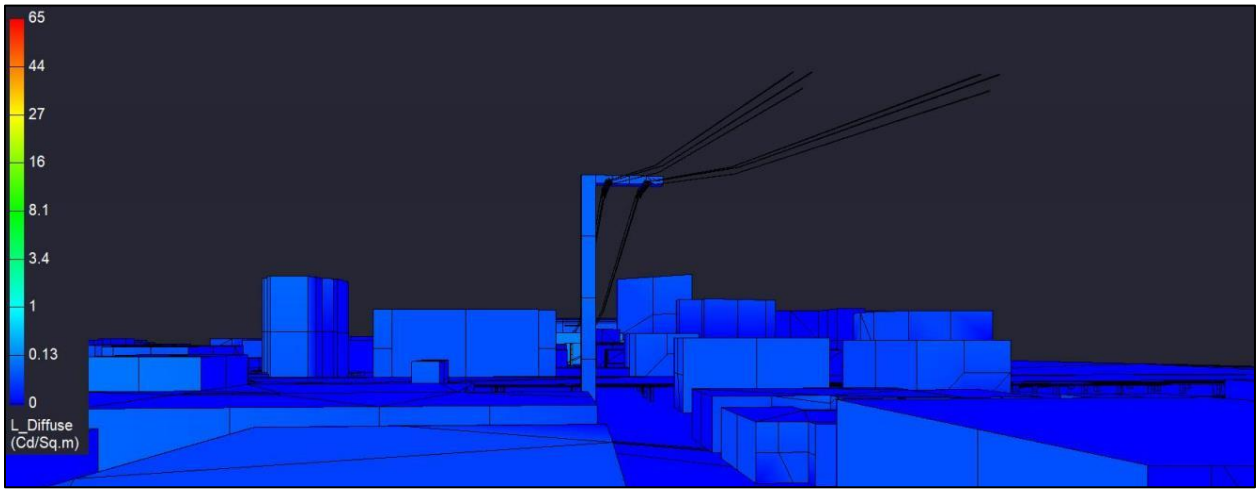


Figure 270: View from Receptor Site 5C for MRA project, Baseline ballpark height, "Phase 1" scenario Non-Game Pre-Curfew lighting condition

Figure 271 provides the anticipated luminances viewed from Receptor Site 6, which is located on the ramp from I980 to eastbound I880. Luminances from this view, excluding interior retail lighting, **<u>are not</u>** anticipated to exceed threshold.

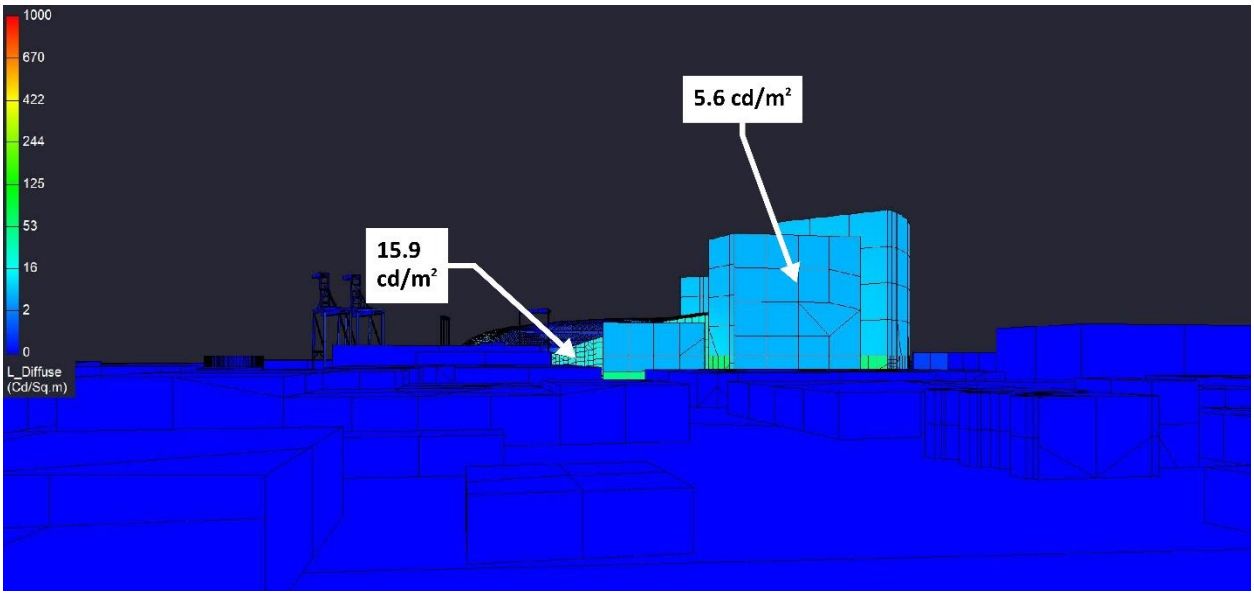


Figure 271: View from Receptor Site 6 for MRA project, Baseline ballpark height, "Phase 1" scenario Non-Game Pre-Curfew lighting condition

Figure 272 provides the anticipated luminances viewed from Receptor Site 6A, which is located at 7th and Brush. The luminances from this view **<u>are not</u>** anticipated to exceed threshold.

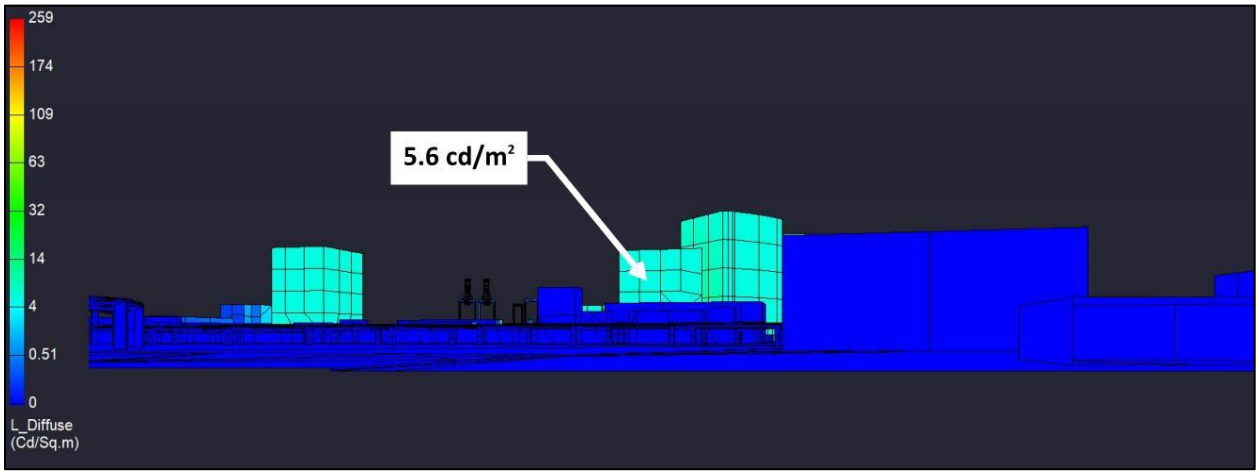


Figure 272: View from Receptor Site 6A for MRA project, Baseline ballpark height, "Phase 1" scenario Non-Game Pre-Curfew lighting condition

Figure 273 provides the anticipated luminances viewed from Receptor Site 7, which is located at 8th and Washington facing north to the anticipated Convention Center gondola station. From this position, the field of view is anticipated to include the bottom surface of the gondola platform. Therefore, luminances from this view **are not** anticipated to exceed threshold.

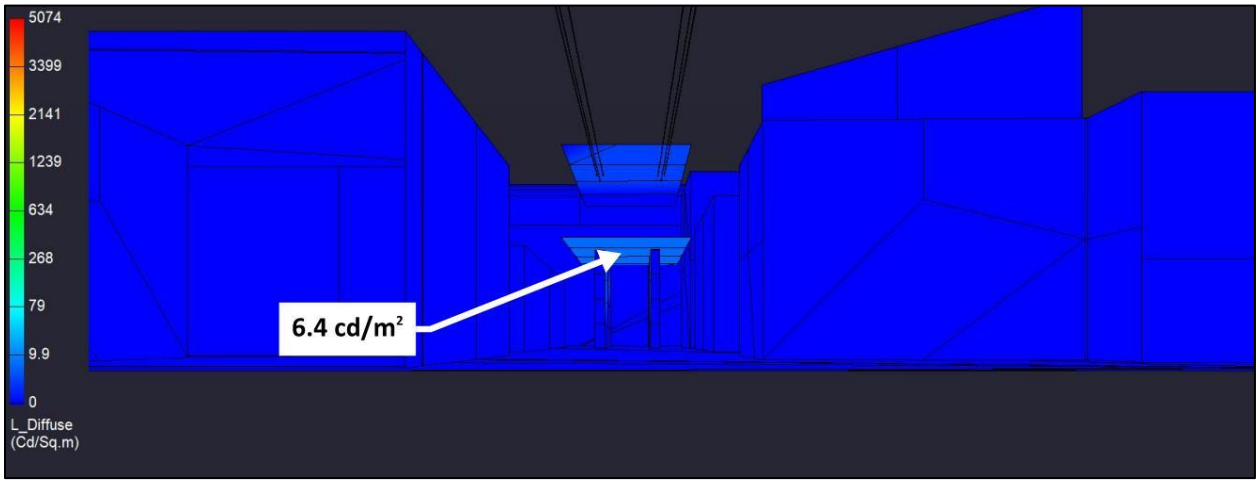


Figure 273: View from Receptor Site 7 for MRA project, Baseline ballpark height, "Phase 1" scenario Non-Game Pre-Curfew lighting condition

Figure 274 provides the anticipated luminances viewed from Receptor Site 7A, which is located at 8th and Washington facing south toward the gondola support pole. From this position, the field of view is anticipated to include the gondola support pole which is not anticipated to have any architectural lighting. Therefore, luminances from this view **are not** anticipated to exceed threshold.

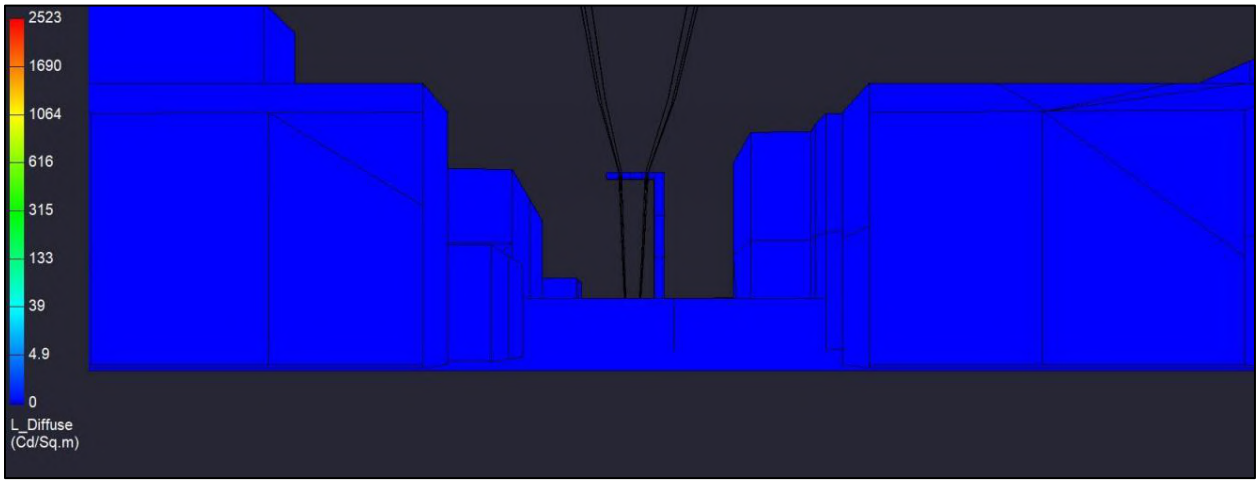


Figure 274: View from Receptor Site 7A for MRA project, Baseline ballpark height, "Phase 1" scenario Non-Game Pre-Curfew lighting condition

9.1.1.3 Post-Curfew

As described in section 4.5.8, the Post-Curfew lighting condition is anticipated to capture the lighting impacts from curfew to dawn, with architectural and area lighting at reduced levels to respond to reduced activity.

9.1.1.3.1 Spill Light

Table 54 provides the calculation results for the spill light assessment at the receptor sites for this condition. As shown, the proposed lighting **is** anticipated to exceed the lower post-curfew threshold at Receptor Site 1A; however, the lighting for the gondola platform is not anticipated to dim post-curfew based on safety concerns. Additionally, the proposed lighting **is** anticipated to exceed the lower post-curfew threshold at Receptor Site 5A; this site is very close to the façade of the adjacent mixed-use building, and the impact on this receptor site can likely be reduced through further design refinement. The anticipated spill light at the remaining receptor sites **are not** anticipated to exceed the post-curfew threshold.

Receptor Site	Spill Light, [lux]	Significant
Receptor Site 1 - Water Street at Clay (Facing Ballpark)	3.6	No
Receptor Site 1A - Water Street at Washington (Facing Gondola)	**6.2**	Yes
Receptor Site 2 - Inner Harbor Turning Basin @ 190'	0.4	No
Receptor Site 2A - Turning Basin Line-of-Sight	0.1	No
Receptor Site 2B - Inner Harbor Turning Basin @ 64'	0.4	No
Receptor Site 2C - Inner Harbor Turning Basin @ 25'	0.4	No
Receptor Site 3 - Alameda Dock	0.3	No
Receptor Site 4 - MLK at Embarcadero	3.2	No
Receptor Site 5 - I880 Westbound	0.1	No
Receptor Site 5A - 2nd at Washington (Facing Ballpark)	**5.6**	Yes
Receptor Site 5B - 2nd at Washington (Facing JLS Station)	0.7	No
Receptor Site 5C - 2nd at Washington (Facing Convention Center Station)	0.0	No
Receptor Site 6 - I980 Ramp to Eastbound I880	0.4	No
Receptor Site 6A - 7th at Brush	0.2	No
Receptor Site 7 - 8th at Washington (Facing Convention Center Station)	0.1	No
Receptor Site 7A - 8th at Washington (Facing Tower)	0.0	No

Table 54: Spill light at receptor sites for MRA project, Baseline ballpark height, “Phase 1” scenario Post-Curfew lighting condition. [Note: Threshold of significance is 5 lux]

9.1.1.3.2 Spill Light Map

Figure 275 provides a spill light map for this lighting condition. To generate the spill light map, vertical calculation points were arrayed around the project site at 5'-6" AFG and oriented toward the pitcher's mound for reference. The isoline curves show the extent to which vertical light levels are calculated and are reported in lux. As shown, less than 1 vertical lux is expected in the turning basin. The adjacent estuary is anticipated to experience less than 1 vertical lux generally, with light levels increasing closer to shore. For reference, one 60W incandescent light bulb will generate 1 lux at a distance of approximately 8 meters (26 ft).

Figure 275: Spill light map for MRA project, Baseline ballpark height, "Phase 1" scenario Post-Curfew lighting condition indicating vertical illuminance isolines

9.1.1.3.3 Glare

Figure 276 through Figure 291 illustrate the luminances anticipated to be observed from the identified receptor sites for this lighting condition. Note that the scale associated with each receptor site view approximately matches the scale used for the associated site's existing conditions HDR falsecolor images. Table 55 summarizes the anticipated glare significance at the receptor sites. Additionally, as noted in Section 4.5.3, the modeled retail lighting is included for post-curfew times to capture the impact of exterior façade lighting (assuming interior retail lighting is off) and is subject to glare limitations.

Receptor Site	Facades		Signage	
	Maximum, [cd/m^2]	Significant	Maximum, [cd/m^2]	Significant
Receptor Site 1 - Water Street at Clay (Facing Ballpark)	5.6	No	n/a	n/a
Receptor Site 1A - Water Street at Washington (Facing Gondola)	6.4	No	n/a	n/a
Receptor Site 2 - Inner Harbor Turning Basin @ 190'	5.6	No	n/a	n/a
Receptor Site 2A - Turning Basin Line-of-Sight	5.6	No	n/a	n/a
Receptor Site 2B - Inner Harbor Turning Basin @ 64'	5.6	No	n/a	n/a
Receptor Site 2C - Inner Harbor Turning Basin @ 25'	5.6	No	n/a	n/a
Receptor Site 3 - Alameda Dock	5.6	No	n/a	n/a
Receptor Site 4 - MLK at Embarcadero	5.6	No	n/a	n/a
Receptor Site 5 - I880 Westbound	5.6	No	n/a	n/a
Receptor Site 5A - 2nd at Washington (Facing Ballpark)	5.6	No	n/a	n/a
Receptor Site 5B - 2nd at Washington (Facing JLS Station)	6.4	No	n/a	n/a
Receptor Site 5C - 2nd at Washington (Facing Convention Center Station)	0.0	No	n/a	n/a
Receptor Site 6 - I980 Ramp to Eastbound I880	5.6	No	n/a	n/a
Receptor Site 6A - 7th at Brush	5.6	No	n/a	n/a
Receptor Site 7 - 8th at Washington (Facing Convention Center Station)	6.4	No	n/a	n/a
Receptor Site 7A - 8th at Washington (Facing Tower)	0.0	No	n/a	n/a

Table 55: Summary of anticipated glare significance at receptor sites for the MRA project, Baseline ballpark height, "Phase 1" scenario Post-Curfew lighting conditions. [Note: Threshold of significance is 25 cd/m^2 for façade lighting and 1,000 cd/m^2 for digital signage]

Figure 276 shows the anticipated luminances viewed from Receptor Site 1, which is one of the closest receptor sites. As seen, from this perspective, without the field lighting and scoreboard/ribbon boards, "on", overall brightnesses are reduced. Therefore, luminances from this view **are not** anticipated to exceed threshold.

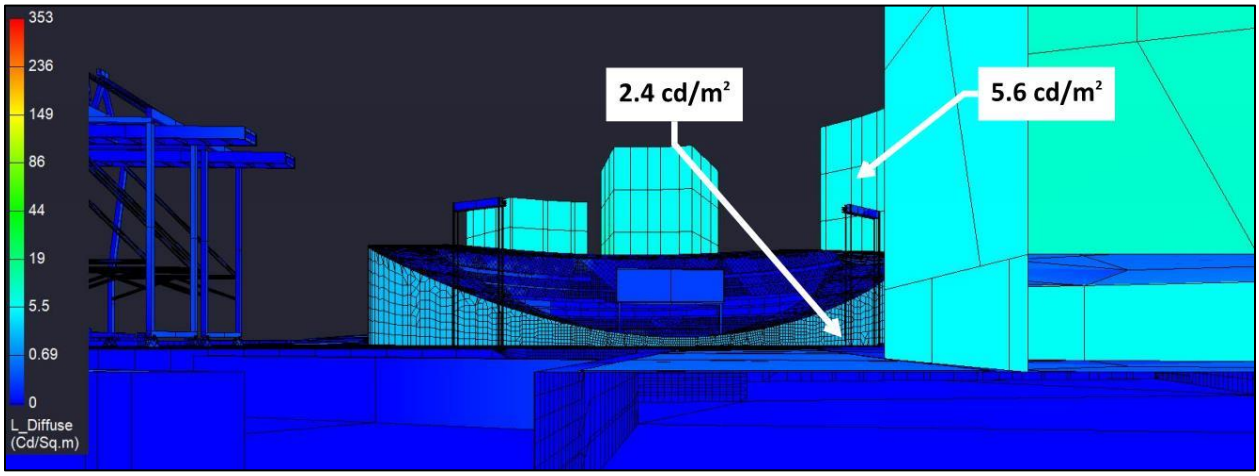


Figure 276: View from Receptor Site 1 for MRA project, Baseline ballpark height, "Phase 1" scenario Post-Curfew lighting condition

Figure 277 provides a view of the anticipated luminances viewed from Receptor Site 1A, which is facing the proposed gondola station near Jack London Square. Note for calculation purposes, the "sides" of the gondola platform have been turned "off", and the anticipated lighting effect has been applied to the top of the platform floor. Therefore, luminances from this view **are not** anticipated to exceed threshold.

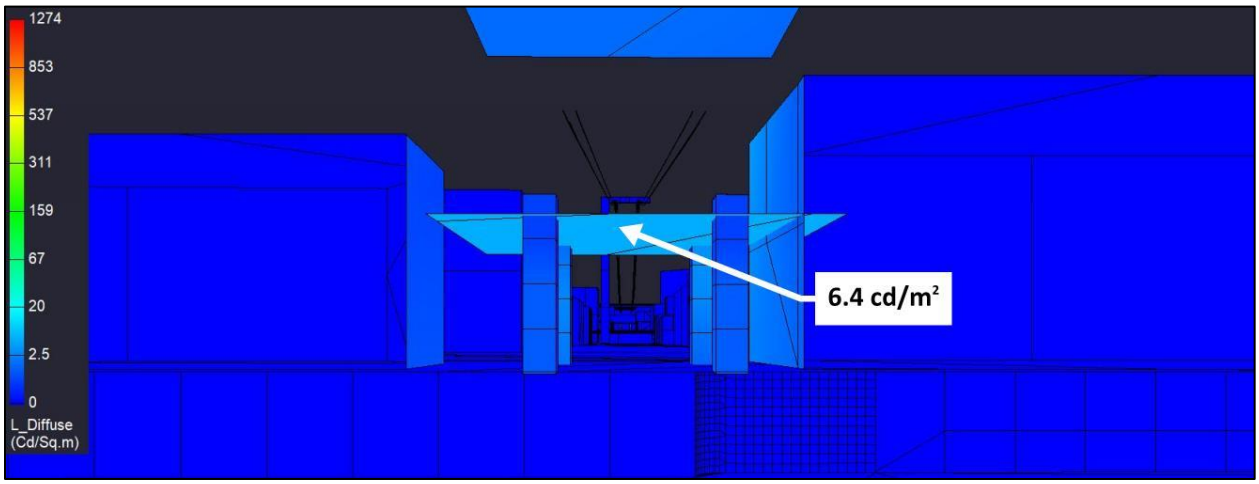


Figure 277: View from Receptor Site 1A for MRA project, Baseline ballpark height, "Phase 1" scenario Post-Curfew lighting condition

Figure 278 provides the anticipated luminances viewed from Receptor Site 2, which is centered in the turning basin and located 190’ above the water line. Façade luminances from this view **are not** anticipated to exceed threshold.

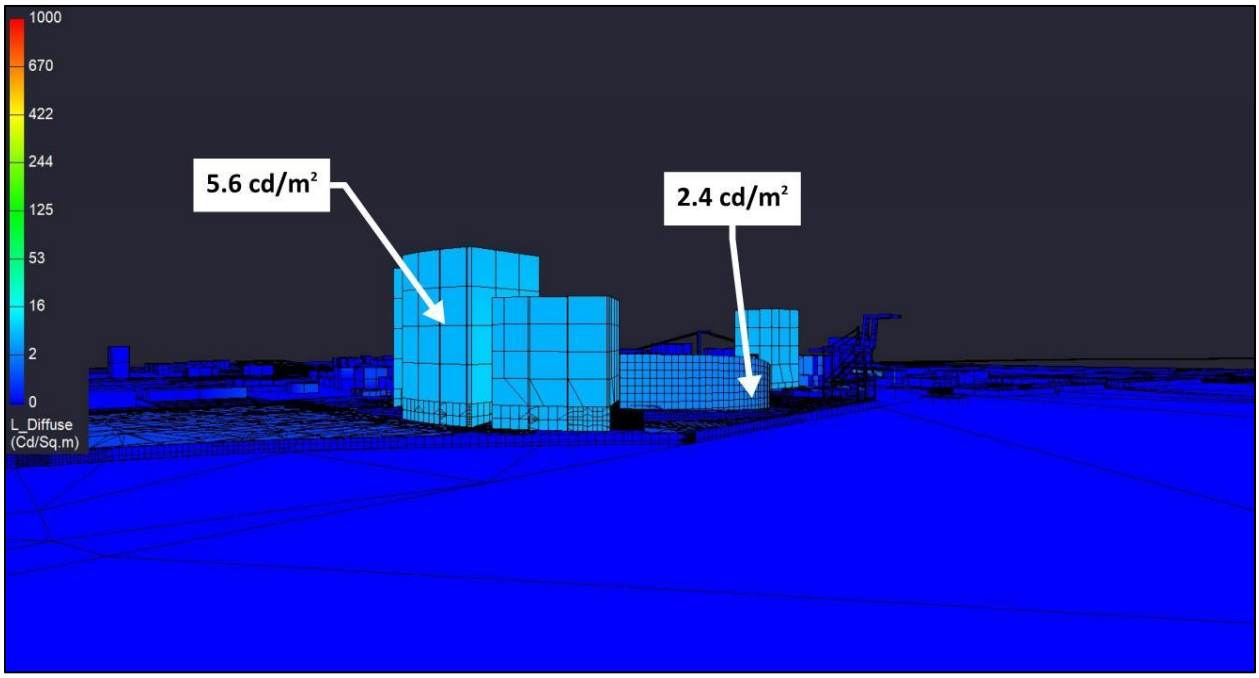


Figure 278: View from Receptor Site 2 for MRA project, Baseline ballpark height, “Phase 1” scenario Post-Curfew lighting condition

Figure 279 provides the anticipated luminances viewed from Receptor Site 2A, which is on Alameda with a direct line of site through the center of the turning basin. From this view **are not** anticipated to exceed threshold.

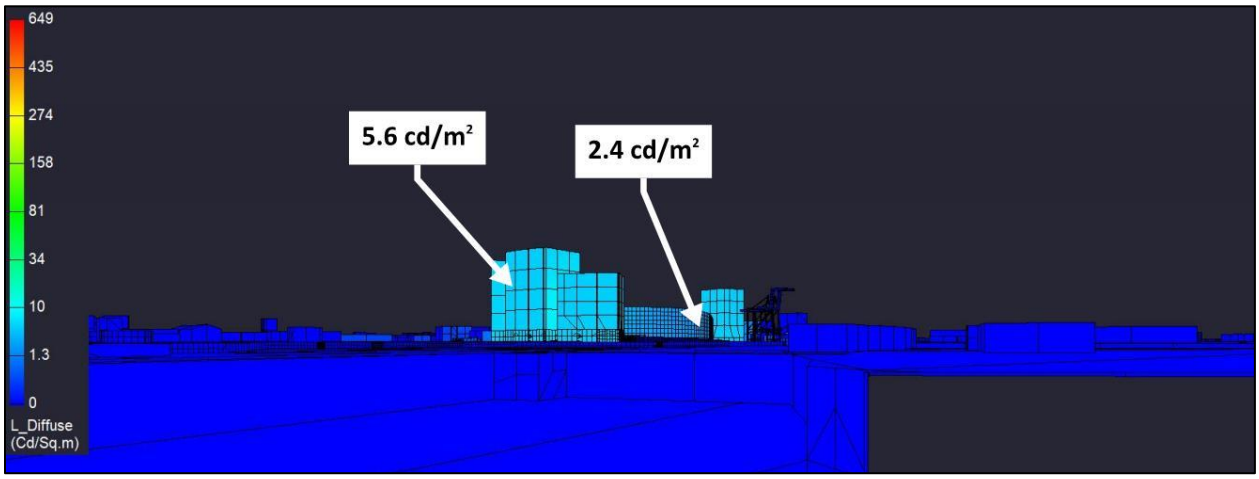


Figure 279: View from Receptor Site 2A for MRA project, Baseline ballpark height, “Phase 1” scenario Post-Curfew lighting condition

Figure 280 provides the anticipated luminances viewed from Receptor Site 2B, which is centered in the turning basin and located 64’ above the water line. Façade luminances from this view **are not** anticipated to exceed threshold.

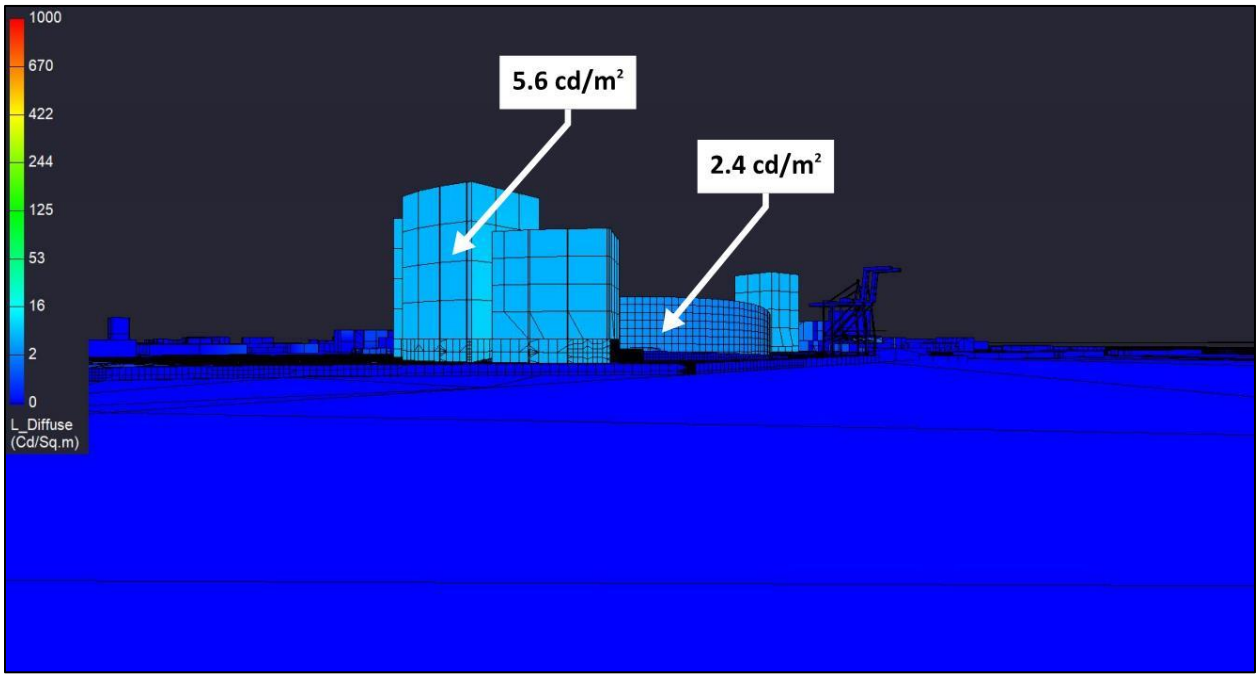


Figure 280: View from Receptor Site 2B for MRA project, Baseline ballpark height, “Phase 1” scenario Post-Curfew lighting condition

Figure 281 provides the anticipated luminances viewed from Receptor Site 2C, which is centered in the turning basin and located 25’ above the water line. Façade luminances from this view **are not** anticipated to exceed threshold.

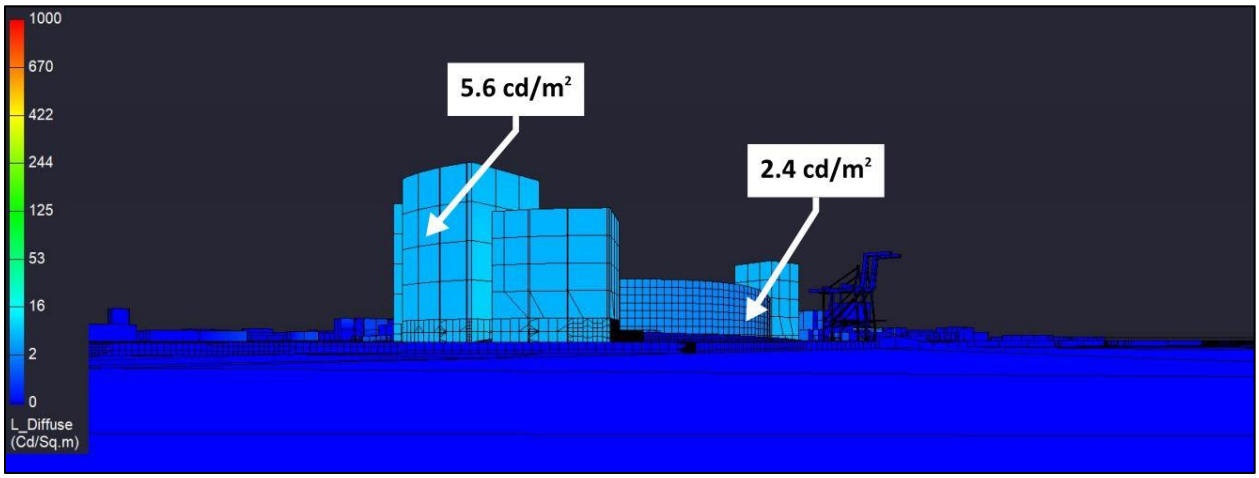


Figure 281: View from Receptor Site 2C for MRA project, Baseline ballpark height, “Phase 1” scenario Post-Curfew lighting condition

Figure 282 provides the anticipated luminances viewed from Receptor Site 3, which is located on Alameda and facing northwest toward the property. Luminances from this view **are not** anticipated to exceed threshold.

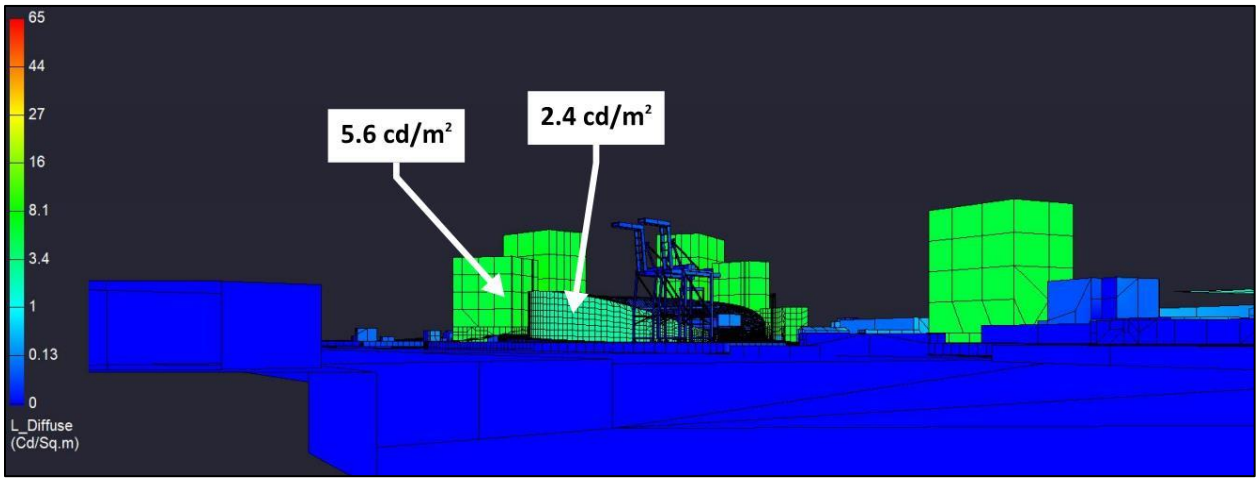


Figure 282: View from Receptor Site 3 for MRA project Hight Roof "Phase 1" scenario Post-Curfew lighting condition

Figure 283 provides the view from Receptor Site 4, which is located at the intersection of MLK and Embarcadero. Luminances from this view **are not** anticipated to exceed threshold.

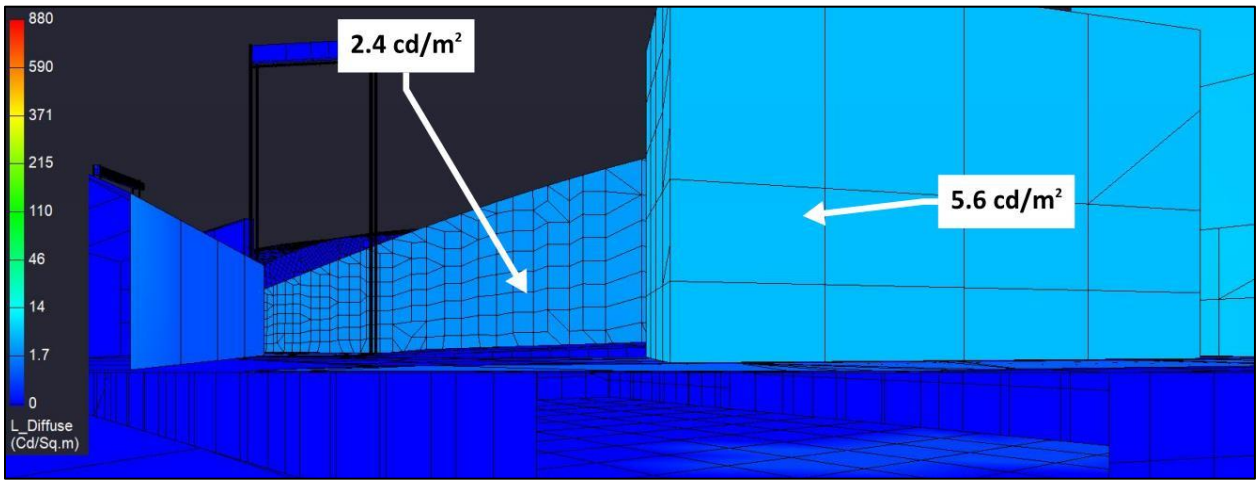


Figure 283: View from Receptor Site 4 for MRA project, Baseline ballpark height, "Phase 1" scenario Post-Curfew lighting condition

Figure 284 provides the anticipated luminances viewed from Receptor Site 5, which is located on Westbound I880. From this view, the ballpark and sports lighting are anticipated to be almost entirely blocked. The façade lighting of the adjacent mixed-use development is anticipated to be visible. Therefore, luminances from this view, excluding the interior retail lighting, **are not** anticipated to exceed threshold.

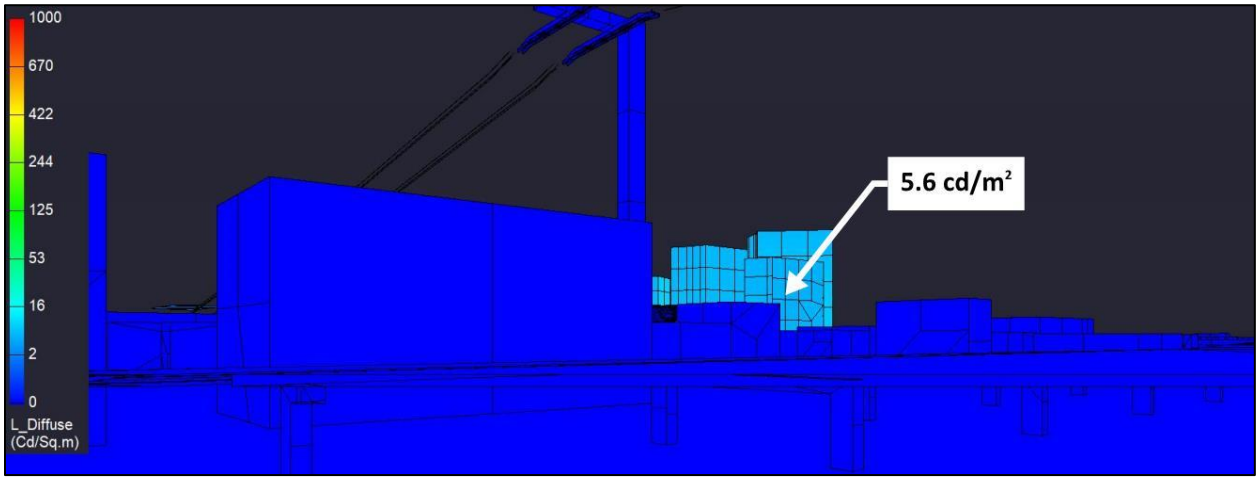


Figure 284: View from Receptor Site 5 for MRA project, Baseline ballpark height, "Phase 1" scenario Post-Curfew lighting condition

Figure 285 provides the anticipated luminances viewed from Receptor Site 5A, which is located on the southwest corner of the roof of the parking garage located at 2nd and Washington. Luminances from this view **are not** anticipated to exceed threshold.

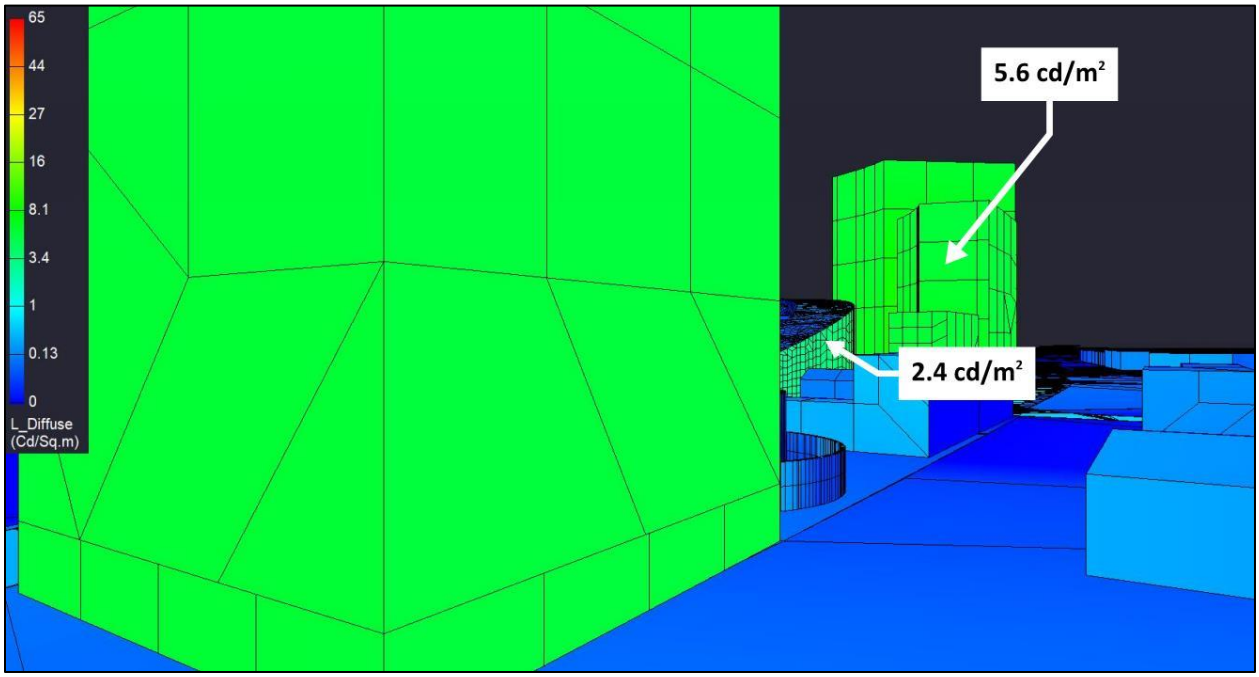


Figure 285: View from Receptor Site 5A for MRA project, Baseline ballpark height, "Phase 1" scenario Post-Curfew lighting condition

Figure 286 provides the anticipated luminances viewed from Receptor Site 5B, which is located on the southeast corner of the roof of the parking garage looking toward the anticipated gondola station near Jack London Square. Luminances from this view **are not** anticipated to exceed threshold.

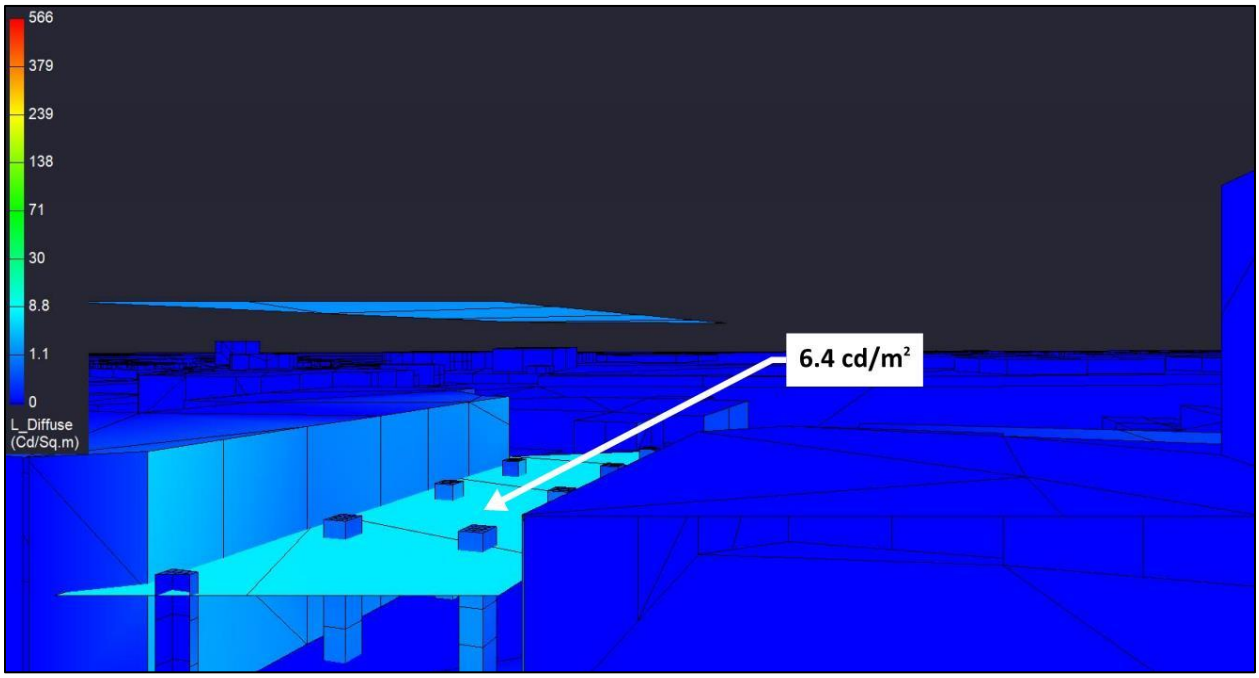


Figure 286: View from Receptor Site 5B for MRA project, Baseline ballpark height, "Phase 1" scenario Post-Curfew lighting condition

Figure 287 provides the anticipated luminances viewed from Receptor Site 5C, which is located on the northeast corner of the parking garage at 2nd and Washington, looking northeast on the Washington corridor. No architectural lighting is anticipated on the gondola support tower and the Convention Center gondola station is not visible. Therefore, luminances from this view **are not** anticipated to exceed threshold.

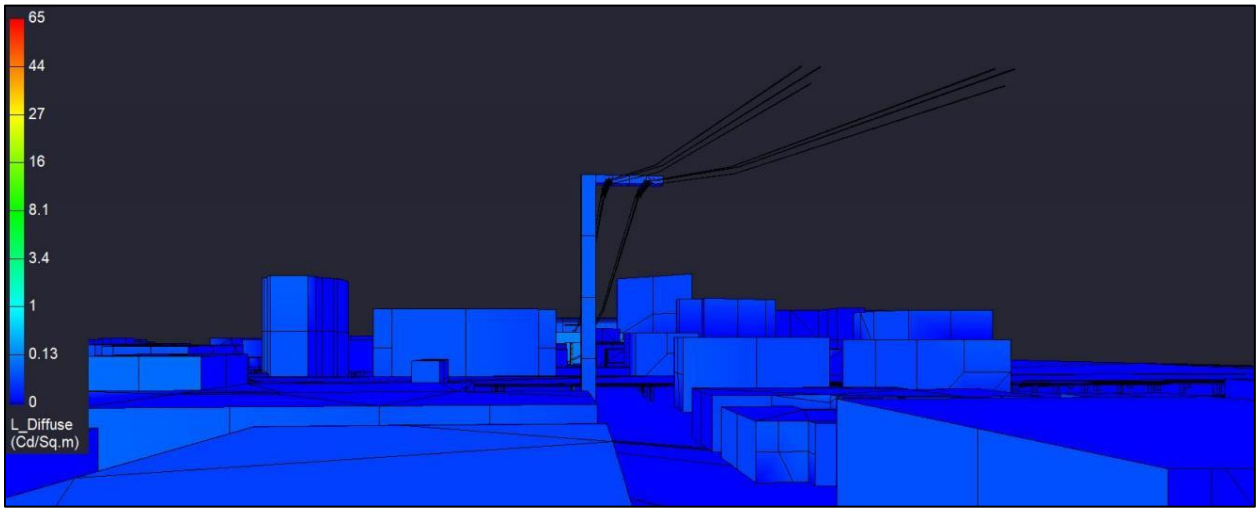


Figure 287: View from Receptor Site 5C for MRA project, Baseline ballpark height, "Phase 1" scenario Post-Curfew lighting condition

Figure 288 provides the anticipated luminances viewed from Receptor Site 6, which is located on the ramp from I980 to eastbound I880. Luminances from this view **are not** anticipated to exceed threshold.

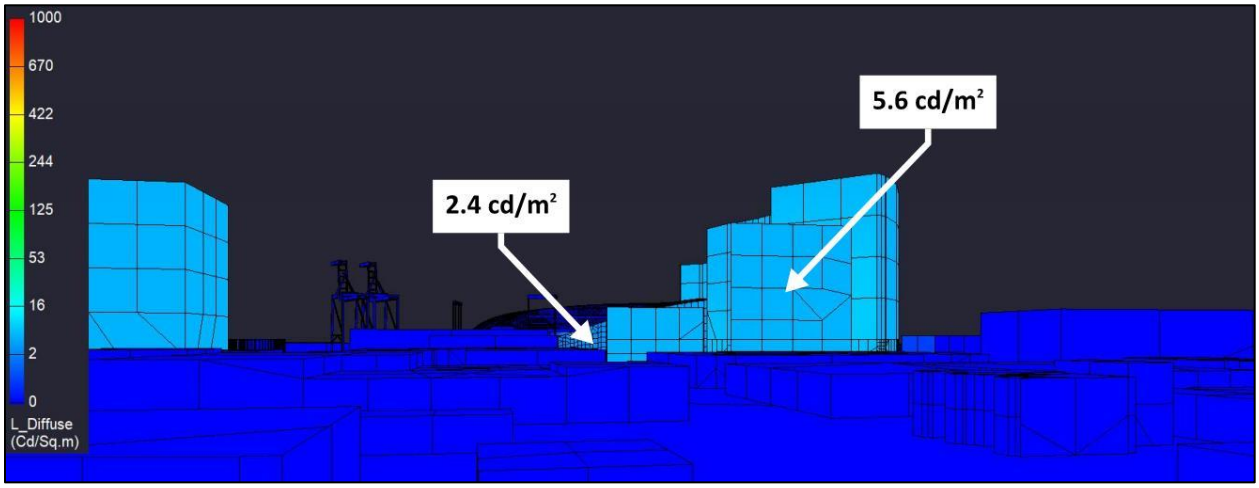


Figure 288: View from Receptor Site 6 for MRA project, Baseline ballpark height, "Phase 1" scenario Post-Curfew lighting condition

Figure 289 provides the anticipated luminances viewed from Receptor Site 6A, which is located at 7th and Brush. The luminances from this view **are not** anticipated to exceed threshold.

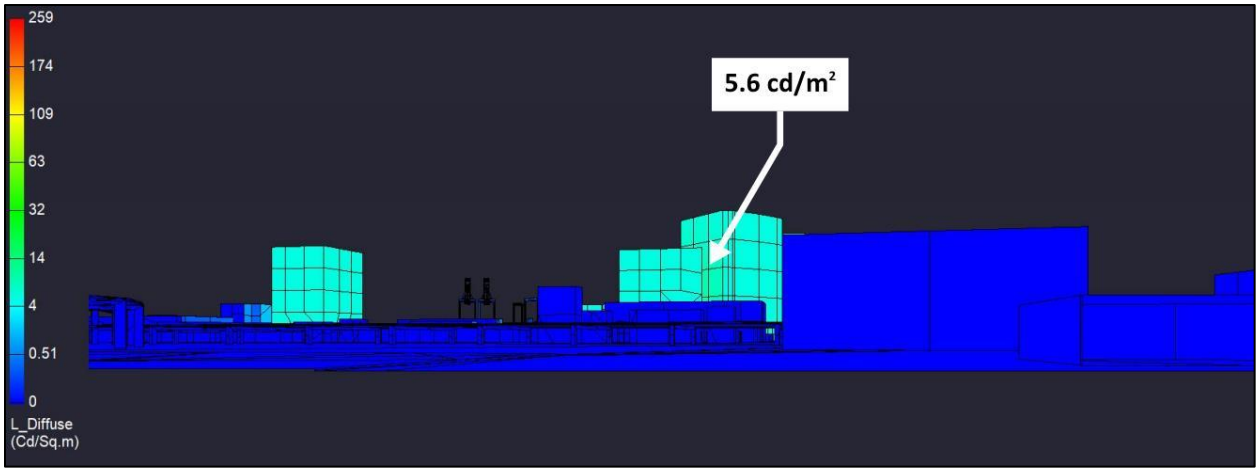


Figure 289: View from Receptor Site 6A for MRA project, Baseline ballpark height, "Phase 1" scenario Post-Curfew lighting condition

Figure 290 provides the anticipated luminances viewed from Receptor Site 7, which is located at 8th and Washington facing north to the anticipated Convention Center gondola station. From this position, the field of view is anticipated to include the bottom surface of the gondola platform. Therefore, luminances from this view **are not** anticipated to exceed threshold.

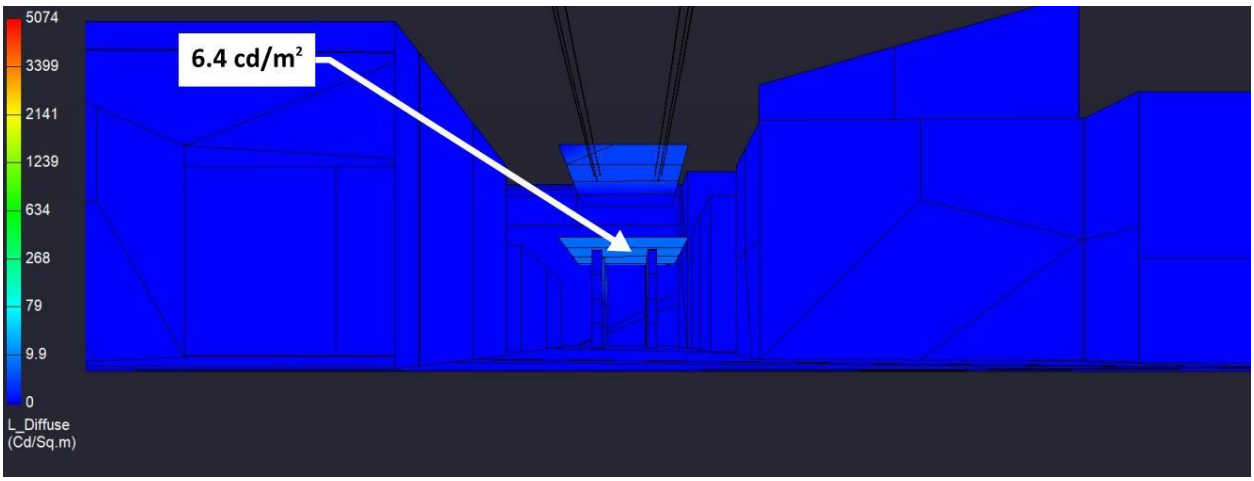


Figure 290: View from Receptor Site 7 for MRA project, Baseline ballpark height, "Phase 1" scenario Post-Curfew lighting condition

Figure 291 provides the anticipated luminances viewed from Receptor Site 7A, which is located at 8th and Washington facing south toward the gondola support pole. From this position, the field of view is anticipated to include the gondola support pole which is not anticipated to have any architectural lighting. Therefore, luminances from this view **are not** anticipated to exceed threshold.

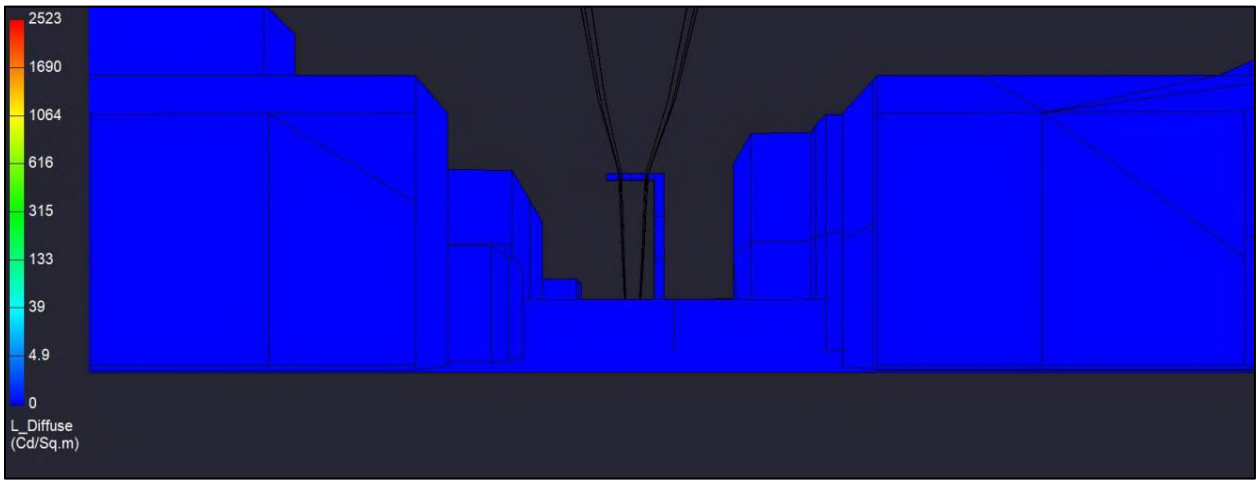


Figure 291: View from Receptor Site 7A for MRA project, Baseline ballpark height, "Phase 1" scenario Post-Curfew lighting condition

9.1.2 "Full Buildout" Scenario

Per the project description included in section 3.1, the "Full Buildout" scenario includes the ballpark and the full site buildout. This scenario is intended to capture the cumulative effects of the entire development.

9.1.2.1 Game Nights

As described in section 4.5.8, the Game Night lighting condition is anticipated to include all lighting "on", including sports and house lighting, and included identified signage locations.

9.1.2.1.1 Spill Light

Table 56 provides the calculation results for the spill light assessment at the receptor sites for this condition. As shown, the proposed lighting **is** anticipated to exceed the spill light threshold at Receptor Site 1 which has a direct view of the scoreboard, ribbon boards, and "halo" sports lights. All other receptor site spill light **is not** anticipated to exceed threshold.

Receptor Site	Spill Light, [lux]	Significant
Receptor Site 1 - Water Street at Clay (Facing Ballpark)	**41.8**	Yes
Receptor Site 1A - Water Street at Washington (Facing Gondola)	6.2	No
Receptor Site 2 - Inner Harbor Turning Basin @ 190'	1.6	No
Receptor Site 2A - Turning Basin Line-of-Sight	0.5	No
Receptor Site 2B - Inner Harbor Turning Basin @ 64'	1.5	No
Receptor Site 2C - Inner Harbor Turning Basin @ 25'	1.4	No
Receptor Site 3 - Alameda Dock	3.2	No
Receptor Site 4 - MLK at Embarcadero	12.0	No
Receptor Site 5 - I880 Westbound	0.5	No
Receptor Site 5A - 2nd at Washington (Facing Ballpark)	7.4	No
Receptor Site 5B - 2nd at Washington (Facing JLS Station)	0.7	No
Receptor Site 5C - 2nd at Washington (Facing Convention Center Station)	0.1	No
Receptor Site 6 - I980 Ramp to Eastbound I880	2.8	No
Receptor Site 6A - 7th at Brush	0.5	No
Receptor Site 7 - 8th at Washington (Facing Convention Center Station)	0.1	No
Receptor Site 7A - 8th at Washington (Facing Tower)	0.0	No

Table 56: Spill light at receptor sites for MRA project, Baseline ballpark height, "Full Buildout" scenario Game Night lighting condition. [Note: Threshold of significance is 25 lux]

9.1.2.1.2 Spill Light Map

Figure 292 provides a spill light map for this lighting condition. To generate the spill light map, vertical calculation points were arrayed around the project site at 5’-6” AFG and oriented toward the pitcher’s mound for reference. The isoline curves show the extent to which vertical light levels are calculated and are reported in lux. As shown, less than 1 vertical lux is expected in the majority of the turning basin. The adjacent estuary is anticipated to experience between 1 and 5 vertical lux generally, with light levels increasing closer to shore. For reference, one 60W incandescent light bulb will generate 1 lux at a distance of approximately 8 meters (26 ft).

Figure 292: Spill light map for MRA project, Baseline ballpark height, “Full Buildout” scenario Game Night lighting condition indicating vertical illuminance isolines

9.1.2.1.3 Glare

Figure 293 through Figure 308 illustrate the luminances anticipated to be observed from the identified receptor sites for this lighting condition. Note that the scale associated with each receptor site view approximately matches the scale used for the associated site's existing conditions HDR falsecolor images. Table 57 summarizes the anticipated glare significance at the receptor sites. Additionally, as noted in Section 4.5.3, the modeled retail lighting is included for pre-curfew times to capture the impact of interior lighting emanating through windows as a conservative contribution to spill light assessment; the modeled luminance, therefore, is an interior luminance and not subject to glare limitations directly.

Receptor Site	Facades		Signage	
	Maximum, [cd/m^2]	Significant	Maximum, [cd/m^2]	Significant
Receptor Site 1 - Water Street at Clay (Facing Ballpark)	15.9	No	3,500	Yes
Receptor Site 1A - Water Street at Washington (Facing Gondola)	6.4	No	n/a	n/a
Receptor Site 2 - Inner Harbor Turning Basin @ 190'	15.9	No	n/a	n/a
Receptor Site 2A - Turning Basin Line-of-Sight	15.9	No	n/a	n/a
Receptor Site 2B - Inner Harbor Turning Basin @ 64'	15.9	No	n/a	n/a
Receptor Site 2C - Inner Harbor Turning Basin @ 25'	15.9	No	n/a	n/a
Receptor Site 3 - Alameda Dock	15.9	No	3,500	Yes
Receptor Site 4 - MLK at Embarcadero	15.9	No	3,500	Yes
Receptor Site 5 - I880 Westbound	15.9	No	n/a	n/a
Receptor Site 5A - 2nd at Washington (Facing Ballpark)	15.9	No	3,500	Yes
Receptor Site 5B - 2nd at Washington (Facing JLS Station)	6.4	No	n/a	n/a
Receptor Site 5C - 2nd at Washington (Facing Convention Center Station)	1.6	No	n/a	n/a
Receptor Site 6 - I980 Ramp to Eastbound I880	15.9	No	3,500	Yes
Receptor Site 6A - 7th at Brush	15.9	No	3,500	Yes
Receptor Site 7 - 8th at Washington (Facing Convention Center Station)	6.4	No	n/a	n/a
Receptor Site 7A - 8th at Washington (Facing Tower)	0.0	No	n/a	n/a

Table 57: Summary of anticipated glare significance at receptor sites for the MRA project, Baseline ballpark height, "Full Buildout" scenario Game Night lighting conditions. [Note: Threshold of significance is 25 cd/m^2 for façade lighting and 1,000 cd/m^2 for digital signage]

Figure 293 shows the anticipated luminances viewed from Receptor Site 1, which is one of the closest receptor sites. As seen, from this perspective, there is a direct view into the ballpark, and of the scoreboard/ribbon boards. Therefore, façade luminances from this view **are not** anticipated to exceed threshold and sign luminances from this view **are** anticipated to exceed threshold.

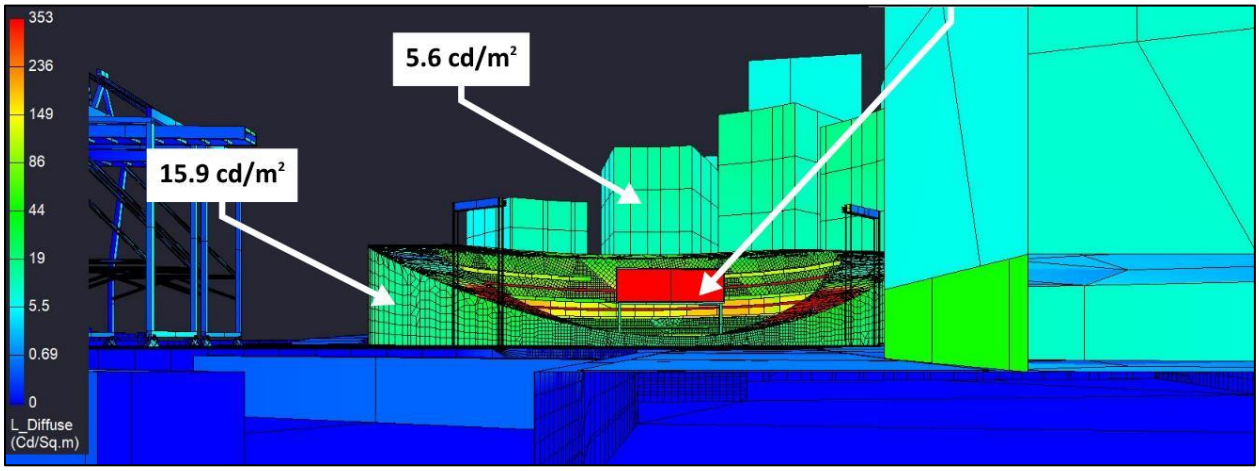


Figure 293: View from Receptor Site 1 for MRA project, Baseline ballpark height, "Full Buildout" scenario Game Night lighting condition

Figure 294 provides a view of the anticipated luminances viewed from Receptor Site 1A, which is facing the proposed gondola station near Jack London Square. Note for calculation purposes, the "sides" of the gondola platform have been turned "off", and the anticipated lighting effect has been applied to the top of the platform floor. Therefore, luminances from this view **are not** anticipated to exceed threshold.

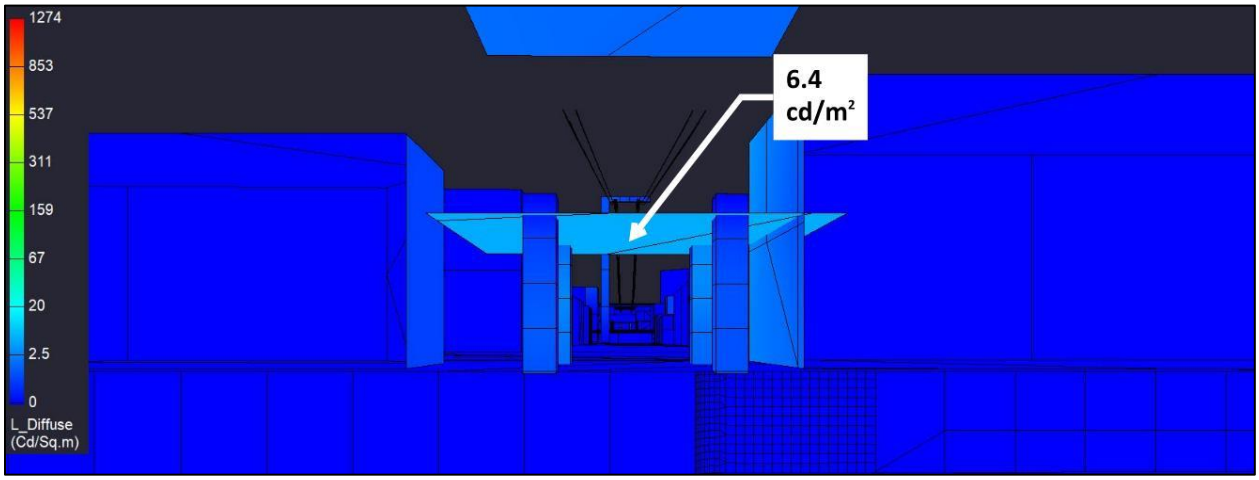


Figure 294: View from Receptor Site 1A for MRA project, Baseline ballpark height, "Full Buildout" scenario Game Night lighting condition

Figure 295 provides the anticipated luminances viewed from Receptor Site 2, which is centered in the turning basin and located 190' above the water line. As shown, based on the ballpark geometry, there is not anticipated to be a direct view of the field luminaires, significantly reducing the observed brightnesses in the field of view. Refer to further discussion on this topic in section 6.2.1 above. The façade luminances from this view **are not** anticipated to exceed threshold.

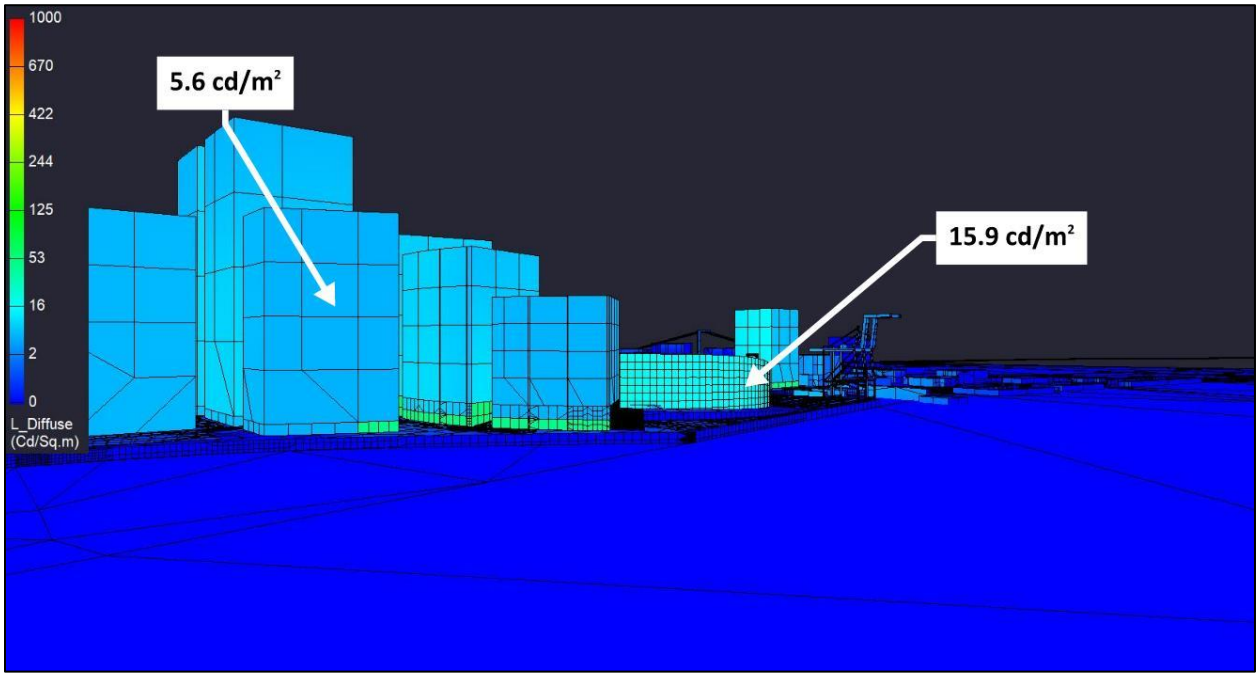


Figure 295: View from Receptor Site 2 for MRA project, Baseline ballpark height, "Full Buildout" scenario Game Night lighting condition

Figure 296 provides the anticipated luminances viewed from Receptor Site 2A, which is on Alameda with a direct line of site through the center of the turning basin. Similar to Receptor Site 2, based on the ballpark geometry, there is no direct line of site to the scoreboard. Luminances from this view **are not** anticipated to exceed threshold.

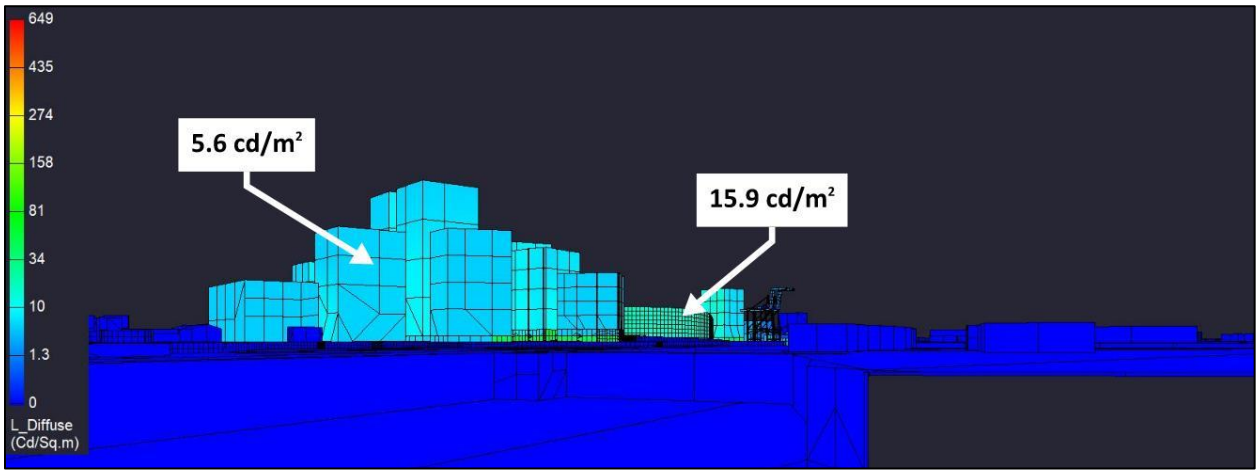


Figure 296: View from Receptor Site 2A for MRA project, Baseline ballpark height, "Full Buildout" scenario Game Night lighting condition

Figure 297 provides the anticipated luminances viewed from Receptor Site 2B, which is centered in the turning basin and located 64' above the water line. As shown, based on the ballpark geometry, there is not anticipated to be a direct view of the sports lighting, scoreboard or ribbon boards. The façade luminances from this view **are not** anticipated to exceed threshold.

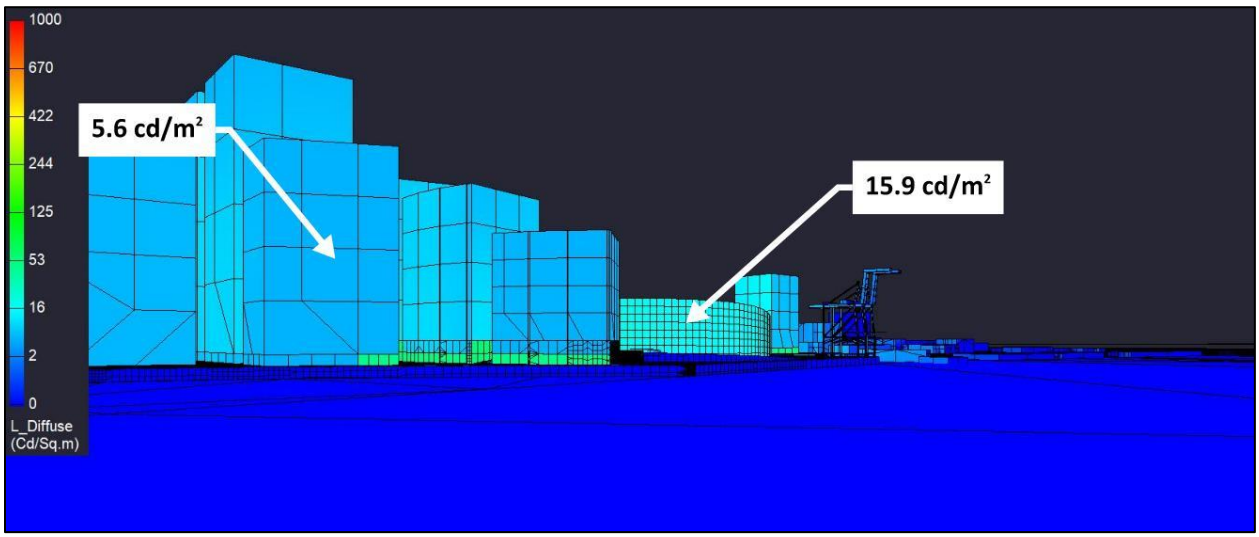


Figure 297: View from Receptor Site 2B for MRA project, Baseline ballpark height, "Full Buildout" scenario Game Night lighting condition

Figure 298 provides the anticipated luminances viewed from Receptor Site 2C, which is centered in the turning basin and located 25' above the water line. As shown, based on the ballpark geometry, there is not anticipated to be a direct view of the sports lighting, scoreboard or ribbon boards. The façade luminances from this view **are not** anticipated to exceed threshold.

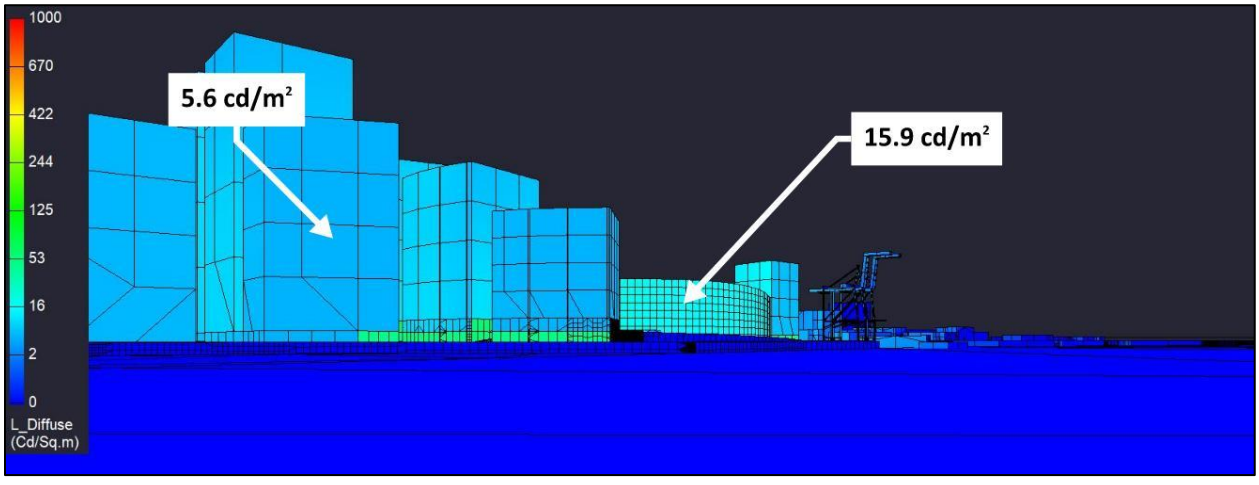


Figure 298: View from Receptor Site 2C for MRA project, Baseline ballpark height, "Full Buildout" scenario Game Night lighting condition

Figure 299 provides the anticipated luminances viewed from Receptor Site 3, which is located on Alameda and facing northwest toward the property. From this position, there is a direct line of site to the scoreboard, ribbon boards, and "halo" field lighting. Therefore, façade luminances from this view **are not** anticipated to exceed threshold and sign luminances from this view **are** anticipated to exceed threshold.

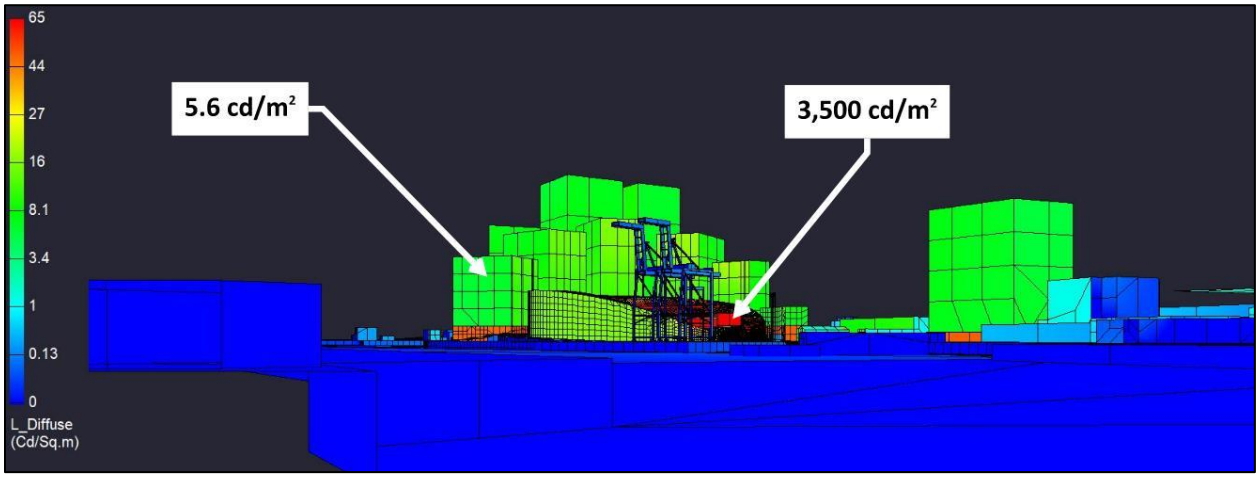


Figure 299: View from Receptor Site 3 for MRA project, Baseline ballpark height, "Full Buildout" scenario Game Night lighting condition

Figure 300 provides the view from Receptor Site 4, which is located at the intersection of MLK and Embarcadero. As shown, a small corner of the scoreboard is anticipated to be viewed from this location, which exceed threshold. Therefore, façade luminances from this view **are not** anticipated to exceed threshold and sign luminances from this view **are** anticipated to exceed threshold.

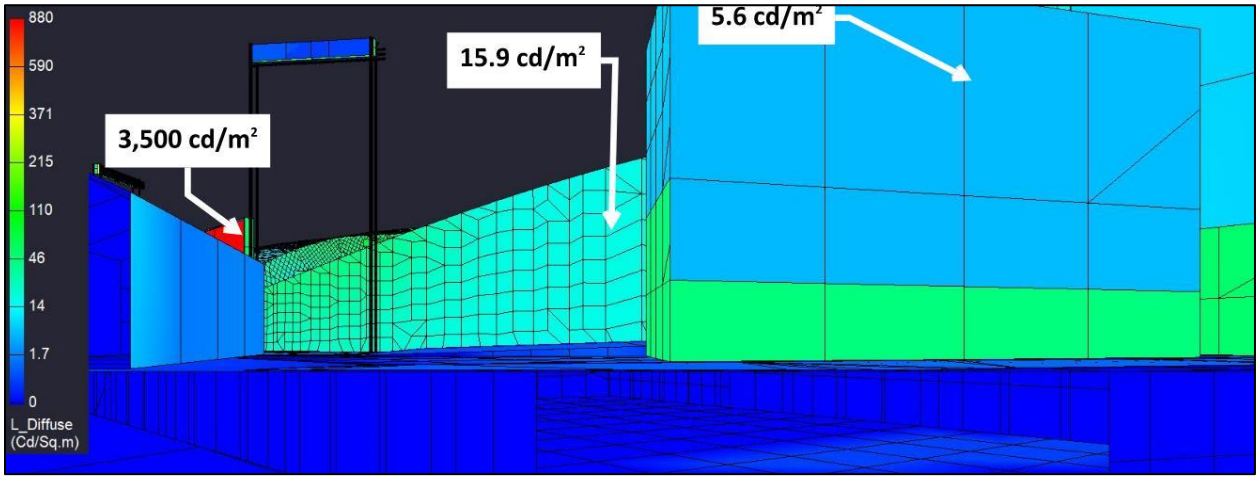


Figure 300: View from Receptor Site 4 for MRA project, Baseline ballpark height, "Full Buildout" scenario Game Night lighting condition

Figure 301 provides the anticipated luminances viewed from Receptor Site 5, which is located on Westbound I880. From this view, the ballpark and sports lighting are anticipated to be almost entirely blocked. Luminances from this view **are not** anticipated to exceed threshold.

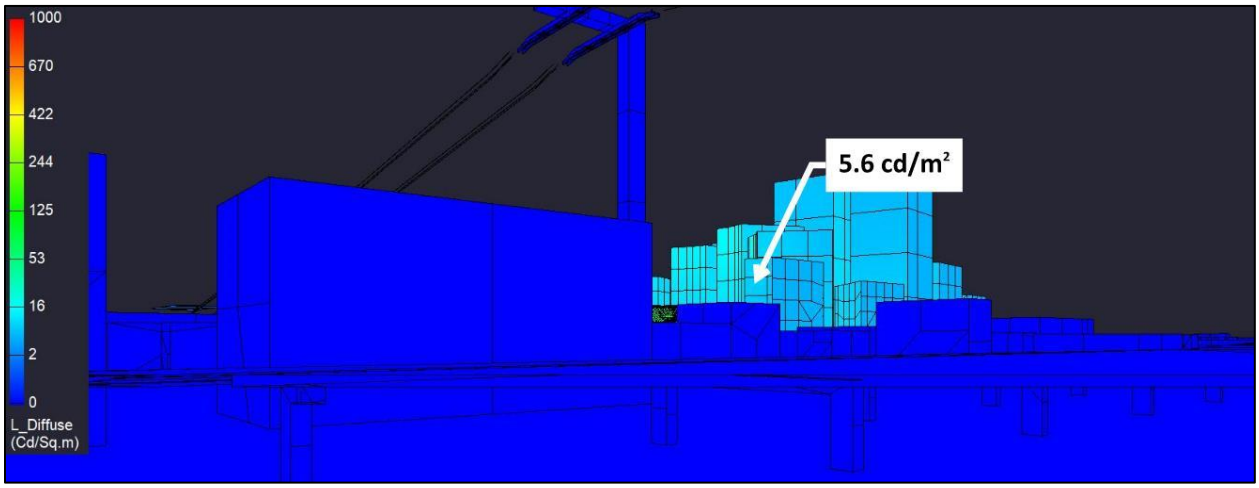


Figure 301: View from Receptor Site 5 for MRA project, Baseline ballpark height, "Full Buildout" scenario Game Night lighting condition

Figure 302 provides the anticipated luminances viewed from Receptor Site 5A, which is located on the southwest corner of the roof of the parking garage located at 2nd and Washington. From this elevated position, there is a direct view down into the ballpark, including a direct view of the ribbon boards and field lighting. Therefore, façade luminances from this view **are not** anticipated to exceed threshold and sign luminances from this view **are** anticipated to exceed threshold.

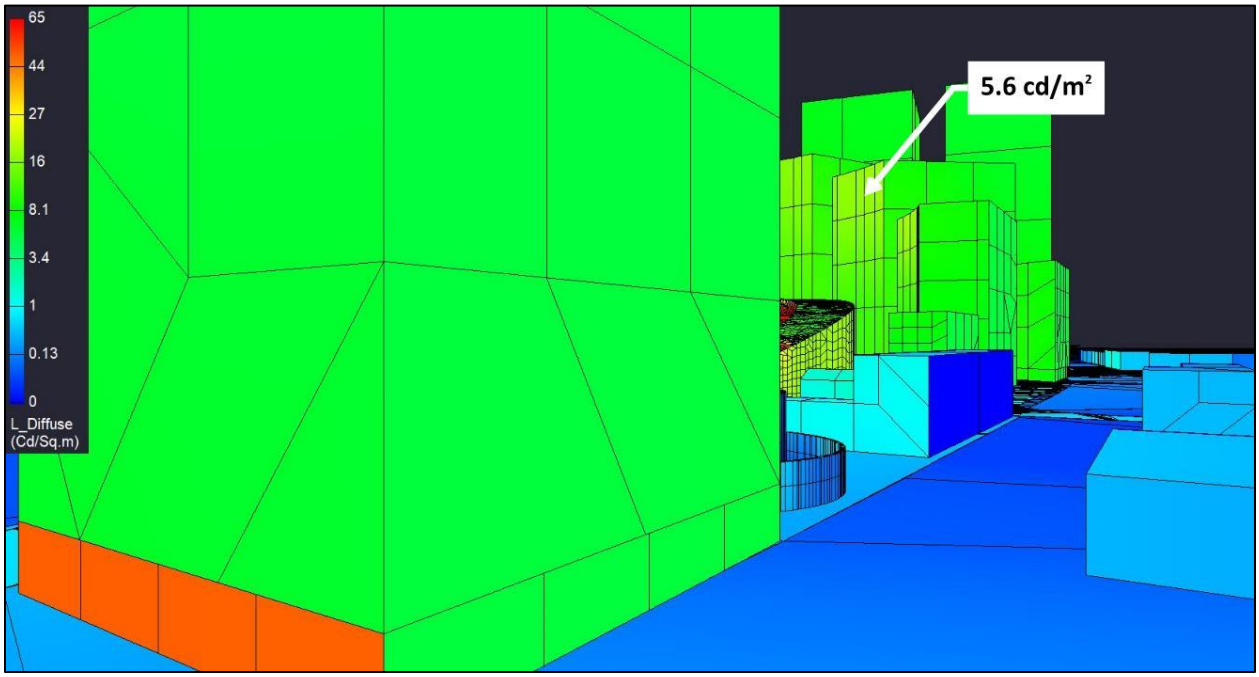


Figure 302: View from Receptor Site 5A for MRA project, Baseline ballpark height, "Full Buildout" scenario Game Night lighting condition

Figure 303 provides the anticipated luminances viewed from Receptor Site 5B, which is located on the southeast corner of the roof of the parking garage looking toward the anticipated gondola station near Jack London Square. Luminances from this view **are not** anticipated to exceed threshold.

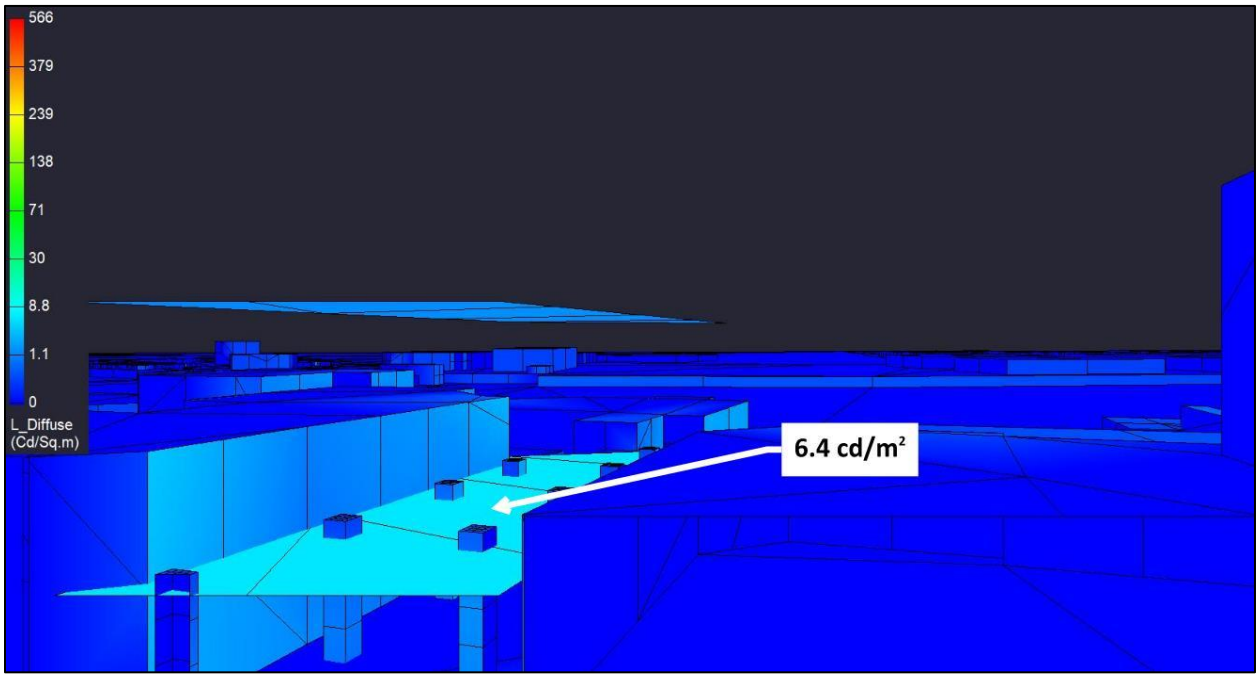


Figure 303: View from Receptor Site 5B for MRA project, Baseline ballpark height, "Full Buildout" scenario Game Night lighting condition

Figure 304 provides the anticipated luminances viewed from Receptor Site 5C, which is located on the northeast corner of the parking garage at 2nd and Washington, looking northeast on the Washington corridor. No architectural lighting is anticipated on the gondola support tower and the Convention Center gondola station is not visible. Therefore, luminances from this view **are not** anticipated to exceed threshold.

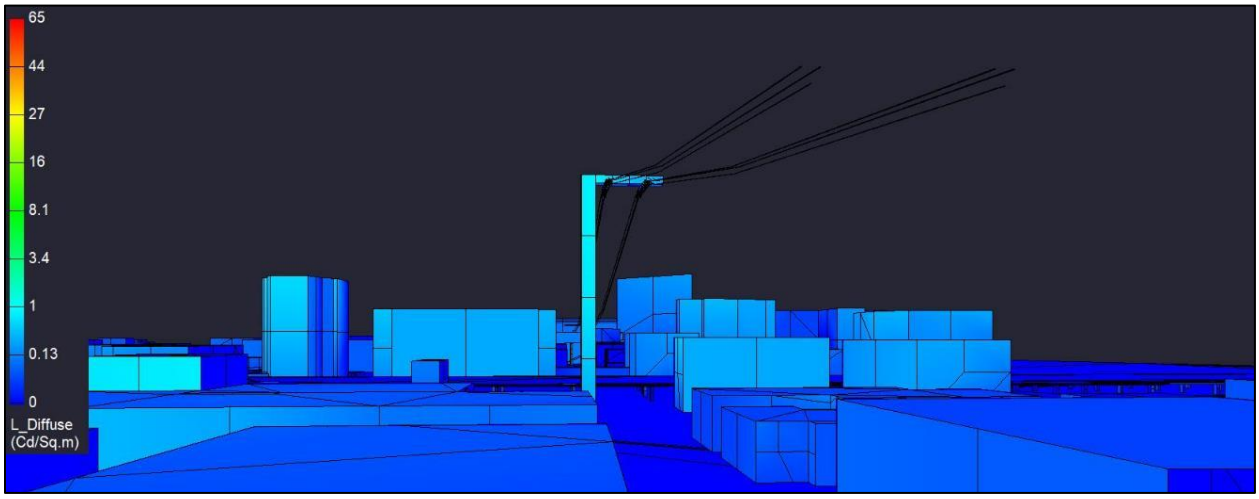


Figure 304: View from Receptor Site 5C for MRA project, Baseline ballpark height, "Full Buildout" scenario Game Night lighting condition

Figure 305 provides the anticipated luminances viewed from Receptor Site 6, which is located on the ramp from I980 to eastbound I880. From this perspective, a direct view of the scoreboard and ribbon boards is anticipated. Therefore, façade luminances from this view **are not** anticipated to exceed threshold and sign luminances from this view **are** anticipated to exceed threshold.

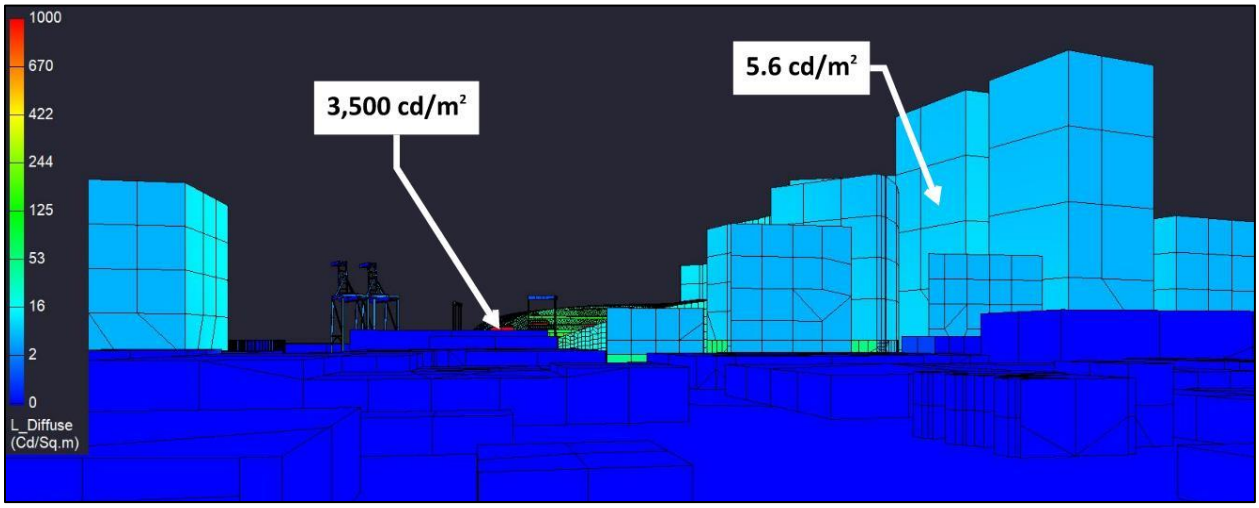


Figure 305: View from Receptor Site 6 for MRA project, Baseline ballpark height, "Full Buildout" scenario Game Night lighting condition

Figure 306 provides the anticipated luminances viewed from Receptor Site 6A, which is located at 7th and Brush. From this perspective, there is anticipated to be a minimal view of the scoreboard. Therefore, façade luminances from this view **are not** anticipated to exceed threshold and sign luminances from this view **are** anticipated to exceed threshold.

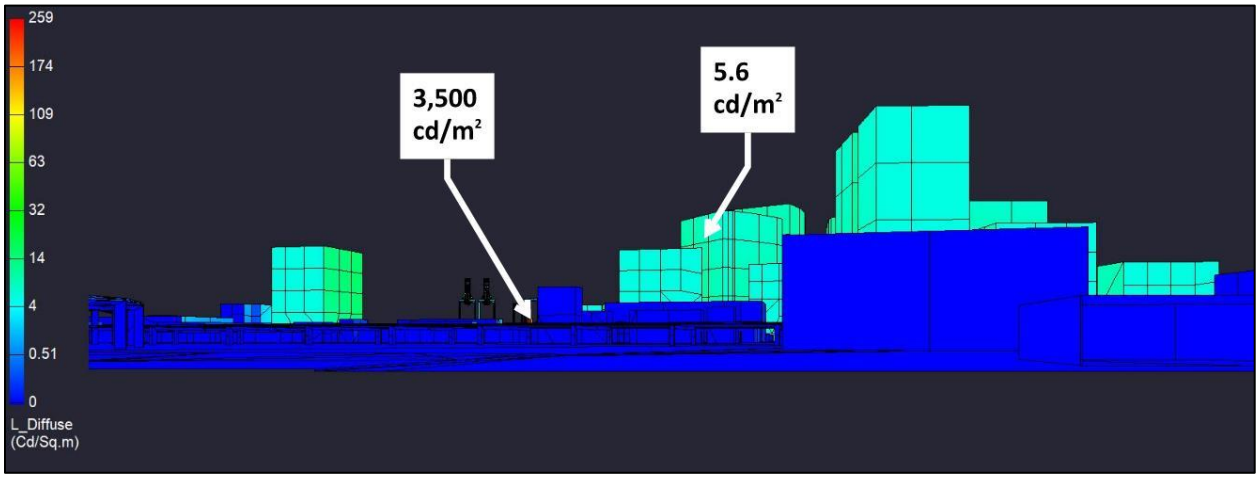


Figure 306: View from Receptor Site 6A for MRA project, Baseline ballpark height, "Full Buildout" scenario Game Night lighting condition

Figure 307 provides the anticipated luminances viewed from Receptor Site 7, which is located at 8th and Washington facing north to the anticipated Convention Center gondola station. From this position, the field of view is anticipated to include the bottom surface of the gondola platform. Therefore, luminances from this view **are not** anticipated to exceed threshold.

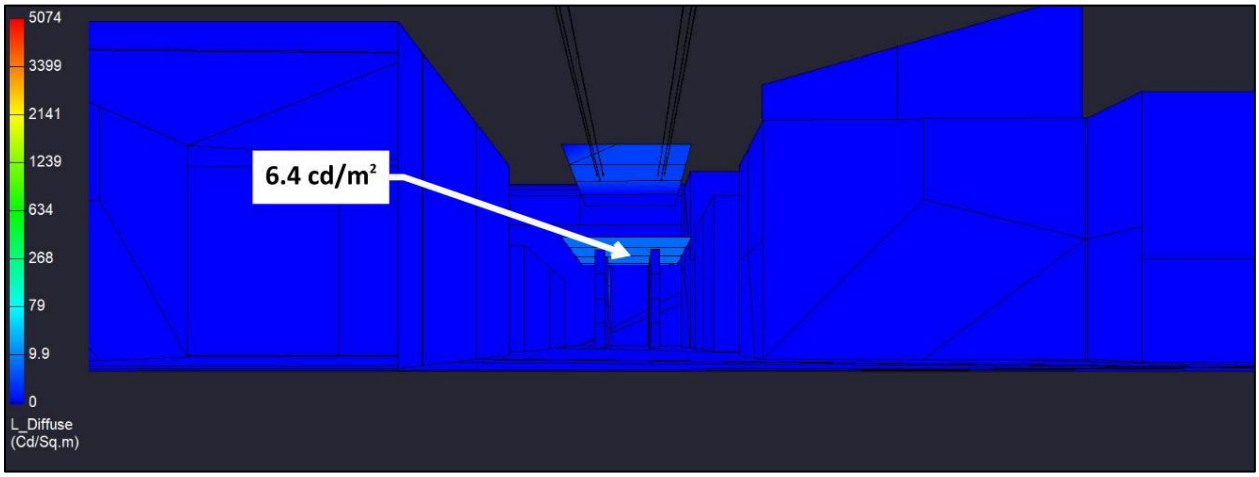


Figure 307: View from Receptor Site 7 for MRA project, Baseline ballpark height, "Full Buildout" scenario Game Night lighting condition

Figure 308 provides the anticipated luminances viewed from Receptor Site 7A, which is located at 8th and Washington facing south toward the gondola support pole. From this position, the field of view is anticipated to include the gondola support pole which is not anticipated to have any architectural lighting. Therefore, luminances from this view **are not** anticipated to exceed threshold.

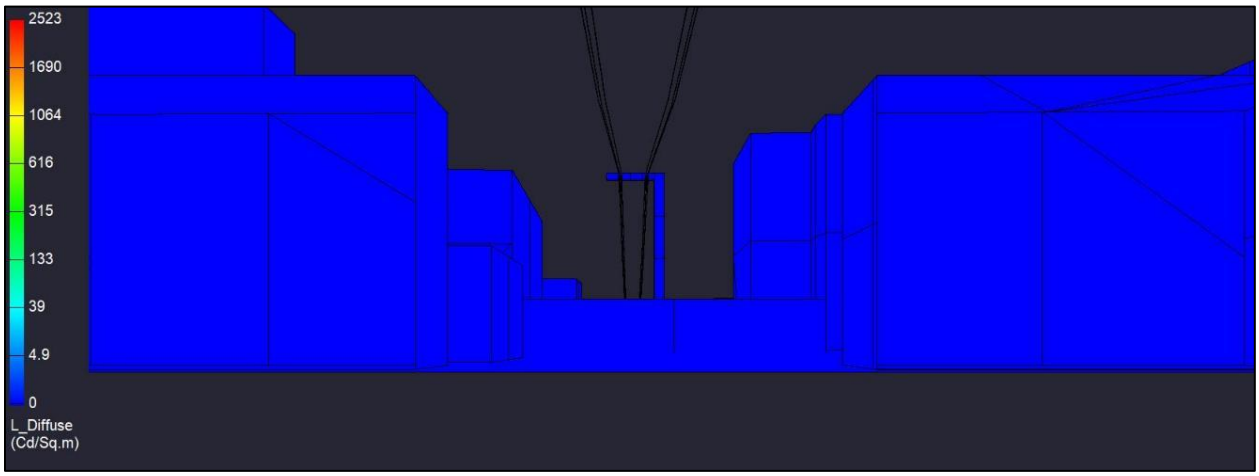


Figure 308: View from Receptor Site 7A for MRA project, Baseline ballpark height, "Full Buildout" scenario Game Night lighting condition

9.1.2.2 Non-Game Nights, Pre-Curfew

As described in section 4.5.8, the Non-Game Nights, Pre-Curfew lighting condition is anticipated to include all architectural lighting "on", but assumes that the sports and house lighting within the ballpark, as well as the scoreboard and ribbon boards are not "on".

9.1.2.2.1 Spill Light

Table 58 provides the calculation results for the spill light assessment at the receptor sites for this condition. As shown, the proposed lighting **is not** anticipated to exceed the spill light threshold at any receptor sites.

Receptor Site	Spill Light, [lux]	Significant
Receptor Site 1 - Water Street at Clay (Facing Ballpark)	9.6	No
Receptor Site 1A - Water Street at Washington (Facing Gondola)	6.1	No
Receptor Site 2 - Inner Harbor Turning Basin @ 190'	1.7	No
Receptor Site 2A - Turning Basin Line-of-Sight	0.6	No
Receptor Site 2B - Inner Harbor Turning Basin @ 64'	1.7	No
Receptor Site 2C - Inner Harbor Turning Basin @ 25'	1.6	No
Receptor Site 3 - Alameda Dock	0.8	No
Receptor Site 4 - MLK at Embarcadero	7.6	No
Receptor Site 5 - I880 Westbound	0.7	No
Receptor Site 5A - 2nd at Washington (Facing Ballpark)	7.5	No
Receptor Site 5B - 2nd at Washington (Facing JLS Station)	1.0	No
Receptor Site 5C - 2nd at Washington (Facing Convention Center Station)	0.4	No
Receptor Site 6 - I980 Ramp to Eastbound I880	1.7	No
Receptor Site 6A - 7th at Brush	0.6	No
Receptor Site 7 - 8th at Washington (Facing Convention Center Station)	0.1	No
Receptor Site 7A - 8th at Washington (Facing Tower)	0.2	No

Table 58: Spill light at receptor sites for MRA project, Baseline ballpark height, "Full Buildout" scenario Non-Game Night, Pre-Curfew lighting condition. [Note: Threshold of significance is 25 lux]

9.1.2.2.2 Spill Light Map

Figure 309 provides a spill light map for this lighting condition. To generate the spill light map, vertical calculation points were arrayed around the project site at 5'-6" AFG and oriented toward the pitcher's mound for reference. The isoline curves show the extent to which vertical light levels are calculated and are reported in lux. As shown, less than 1 vertical lux is expected in the turning basin. The adjacent estuary is anticipated to experience less than 1 vertical lux generally, with light levels increasing closer to shore. For reference, one 60W incandescent light bulb will generate 1 lux at a distance of approximately 8 meters (26 ft).

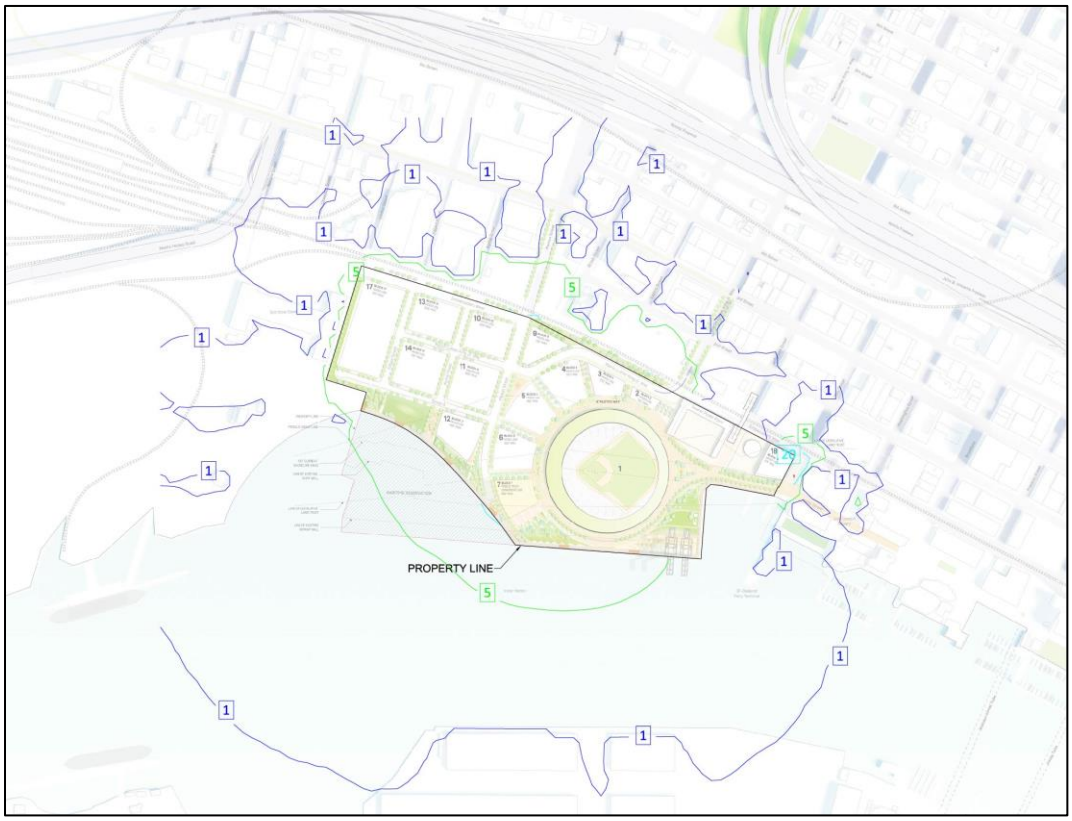


Figure 309: Spill light map for MRA project, Baseline ballpark height, "Full Buildout" scenario Non-Game Nights Pre-Curfew lighting condition indicating vertical illuminance isolines

9.1.2.2.3 Glare

Figure 310 through Figure 325 illustrate the luminances anticipated to be observed from the identified receptor sites for this lighting condition. Note that the scale associated with each receptor site view approximately matches the scale used for the associated site's existing conditions HDR falsecolor images. Table 59 summarizes the anticipated glare significance at the receptor sites. Additionally, as noted in Section 4.5.3, the modeled retail lighting is included for pre-curfew times to capture the impact of interior lighting emanating through windows as a conservative contribution to spill light assessment; the modeled luminance, therefore, is an interior luminance and not subject to glare limitations directly.

Receptor Site	Facades		Signage	
	Maximum, [cd/m^2]	Significant	Maximum, [cd/m^2]	Significant
Receptor Site 1 - Water Street at Clay (Facing Ballpark)	15.9	No	n/a	n/a
Receptor Site 1A - Water Street at Washington (Facing Gondola)	6.4	No	n/a	n/a
Receptor Site 2 - Inner Harbor Turning Basin @ 190'	15.9	No	n/a	n/a
Receptor Site 2A - Turning Basin Line-of-Sight	15.9	No	n/a	n/a
Receptor Site 2B - Inner Harbor Turning Basin @ 64'	15.9	No	n/a	n/a
Receptor Site 2C - Inner Harbor Turning Basin @ 25'	15.9	No	n/a	n/a
Receptor Site 3 - Alameda Dock	15.9	No	n/a	n/a
Receptor Site 4 - MLK at Embarcadero	15.9	No	n/a	n/a
Receptor Site 5 - I880 Westbound	15.9	No	n/a	n/a
Receptor Site 5A - 2nd at Washington (Facing Ballpark)	15.9	No	n/a	n/a
Receptor Site 5B - 2nd at Washington (Facing JLS Station)	6.4	No	n/a	n/a
Receptor Site 5C - 2nd at Washington (Facing Convention Center Station)	0.0	No	n/a	n/a
Receptor Site 6 - I980 Ramp to Eastbound I880	15.9	No	n/a	n/a
Receptor Site 6A - 7th at Brush	15.9	No	n/a	n/a
Receptor Site 7 - 8th at Washington (Facing Convention Center Station)	6.4	No	n/a	n/a
Receptor Site 7A - 8th at Washington (Facing Tower)	0.0	No	n/a	n/a

Table 59: Summary of anticipated glare significance at receptor sites for the MRA project, Baseline ballpark height, "Full Buildout" scenario Non-Game Night Pre-Curfew lighting conditions. [Note: Threshold of significance is 25 cd/m^2 for façade lighting and 1,000 cd/m^2 for digital signage]

Figure 310 shows the anticipated luminances viewed from Receptor Site 1, which is one of the closest receptor sites. As seen, from this perspective, without the field lighting and scoreboard/ribbon boards, "on", overall brightnesses are reduced. Therefore, luminances from this view **are not** anticipated to exceed threshold.

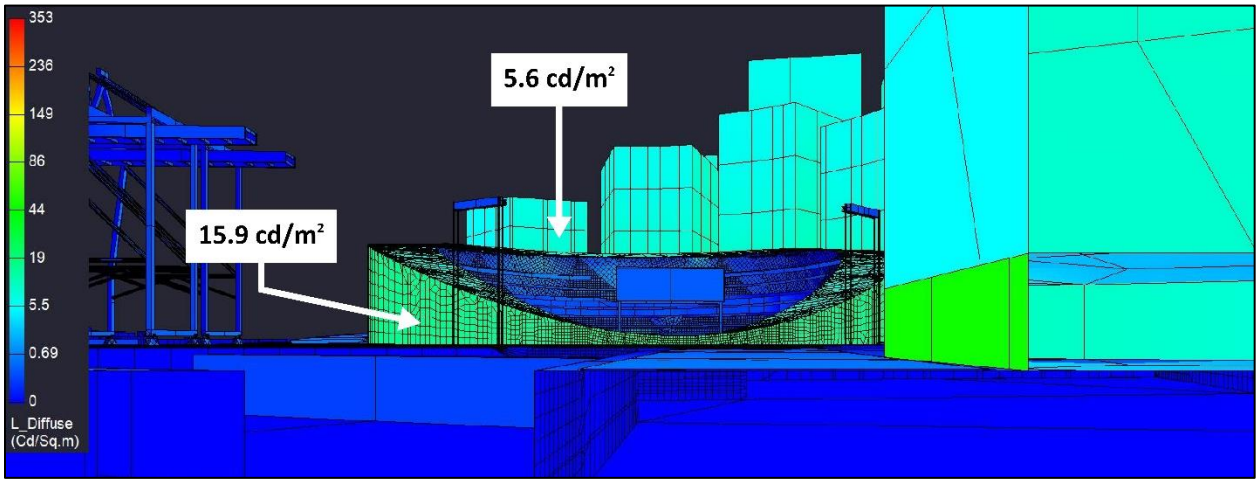


Figure 310: View from Receptor Site 1 for MRA project, Baseline ballpark height, "Full Buildout" scenario Non-Game Night Pre-Curfew lighting condition

Figure 311 provides a view of the anticipated luminances viewed from Receptor Site 1A, which is facing the proposed gondola station near Jack London Square. Note for calculation purposes, the "sides" of the gondola platform have been turned "off", and the anticipated lighting effect has been applied to the top of the platform floor. Therefore, luminances from this view **are not** anticipated to exceed threshold.

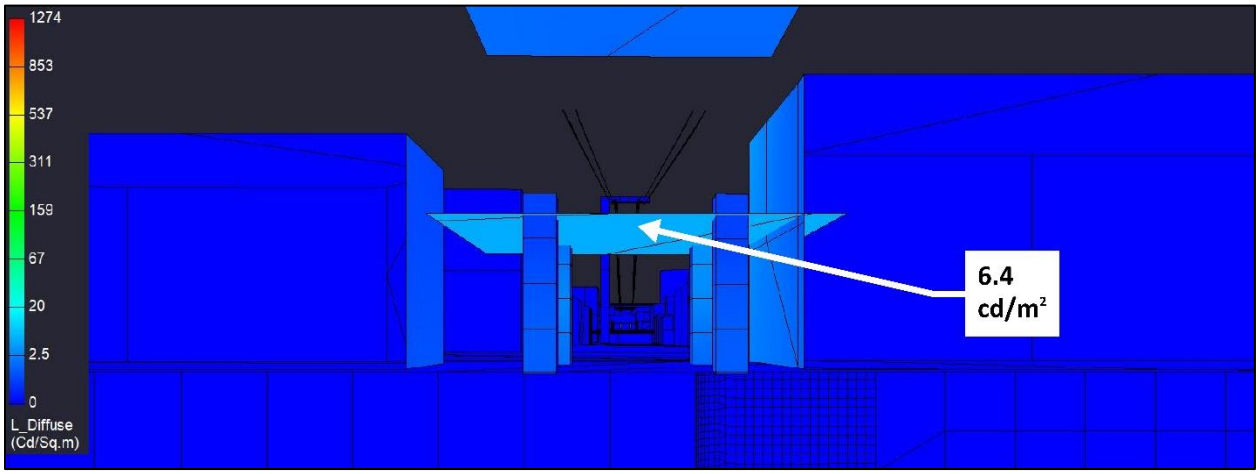


Figure 311: View from Receptor Site 1A for MRA project, Baseline ballpark height, "Full Buildout" scenario Non-Game Night Pre-Curfew lighting condition

Figure 312 provides the anticipated luminances viewed from Receptor Site 2, which is centered in the turning basin and located 190’ above the water line. Façade luminances from this view **are not** anticipated to exceed threshold.

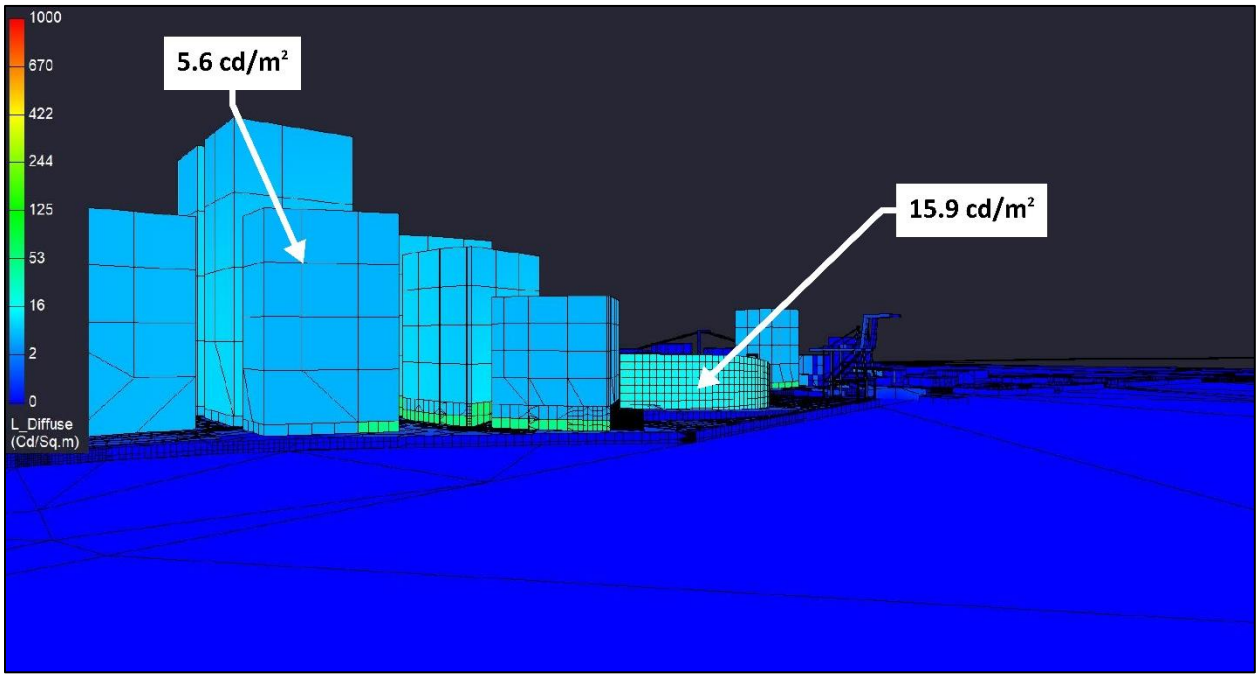


Figure 312: View from Receptor Site 2 for MRA project, Baseline ballpark height, “Full Buildout” scenario Non-Game Night Pre-Curfew lighting condition

Figure 313 provides the anticipated luminances viewed from Receptor Site 2A, which is on Alameda with a direct line of site through the center of the turning basin. Luminances from this view **are not** anticipated to exceed threshold.

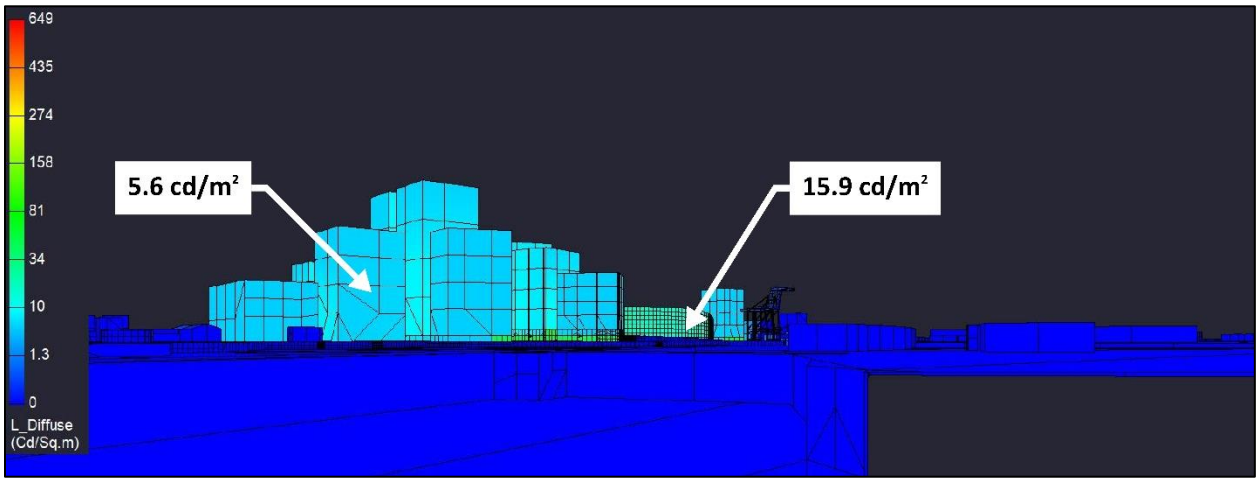


Figure 313: View from Receptor Site 2A for MRA project, Baseline ballpark height, “Full Buildout” scenario Non-Game Night Pre-Curfew lighting condition

Figure 314 provides the anticipated luminances viewed from Receptor Site 2B, which is centered in the turning basin and located 64’ above the water line. Façade luminances from this view **are not** anticipated to exceed threshold.

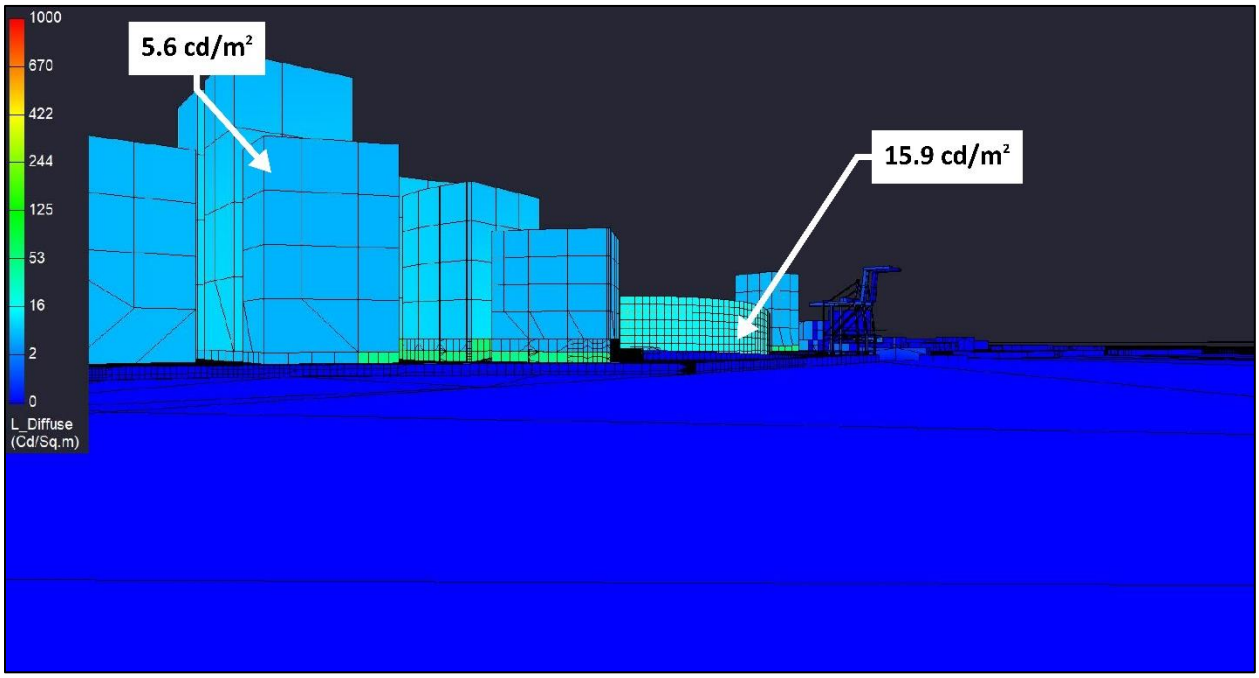


Figure 314: View from Receptor Site 2B for MRA project, Baseline ballpark height, “Full Buildout” scenario Non-Game Night Pre-Curfew lighting condition

Figure 315 provides the anticipated luminances viewed from Receptor Site 2C, which is centered in the turning basin and located 25’ above the water line. Façade luminances from this view **are not** anticipated to exceed threshold.

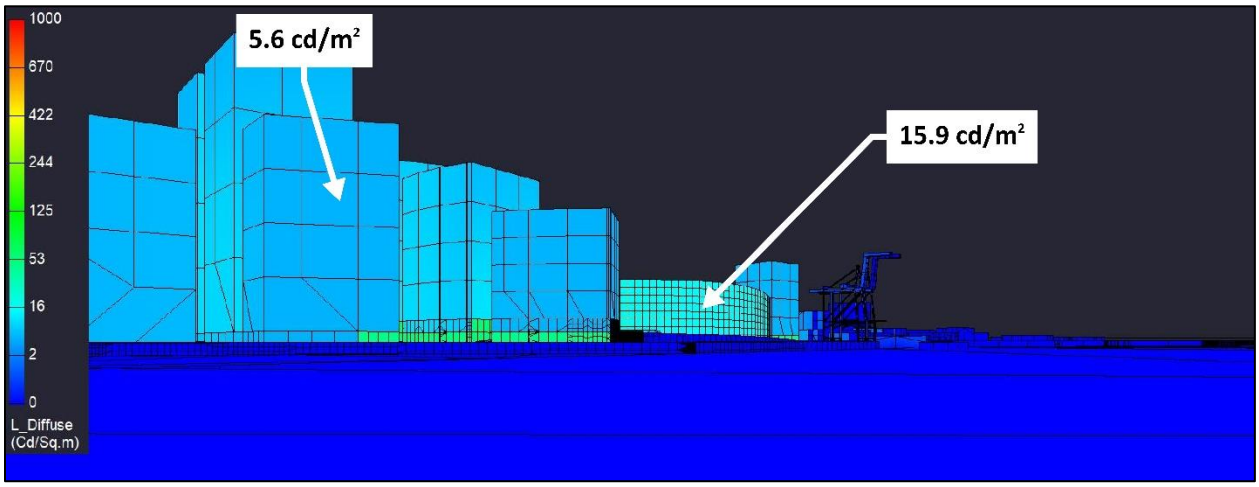


Figure 315: View from Receptor Site 2C for MRA project, Baseline ballpark height, “Full Buildout” scenario Non-Game Night Pre-Curfew lighting condition

Figure 316 provides the anticipated luminances viewed from Receptor Site 3, which is located on Alameda and facing northwest toward the property. Luminances from this view **are not** anticipated to exceed threshold.

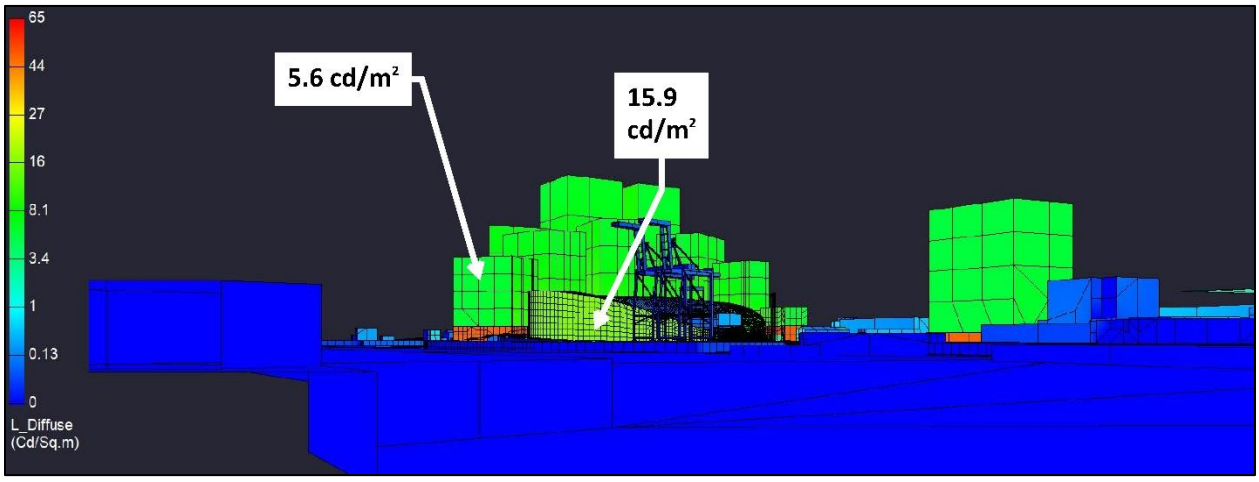


Figure 316: View from Receptor Site 3 for MRA project, Baseline ballpark height, "Full Buildout" scenario Non-Game Night Pre-Curfew lighting condition

Figure 317 provides the view from Receptor Site 4, which is located at the intersection of MLK and Embarcadero. Luminances from this view **are not** anticipated to exceed threshold.

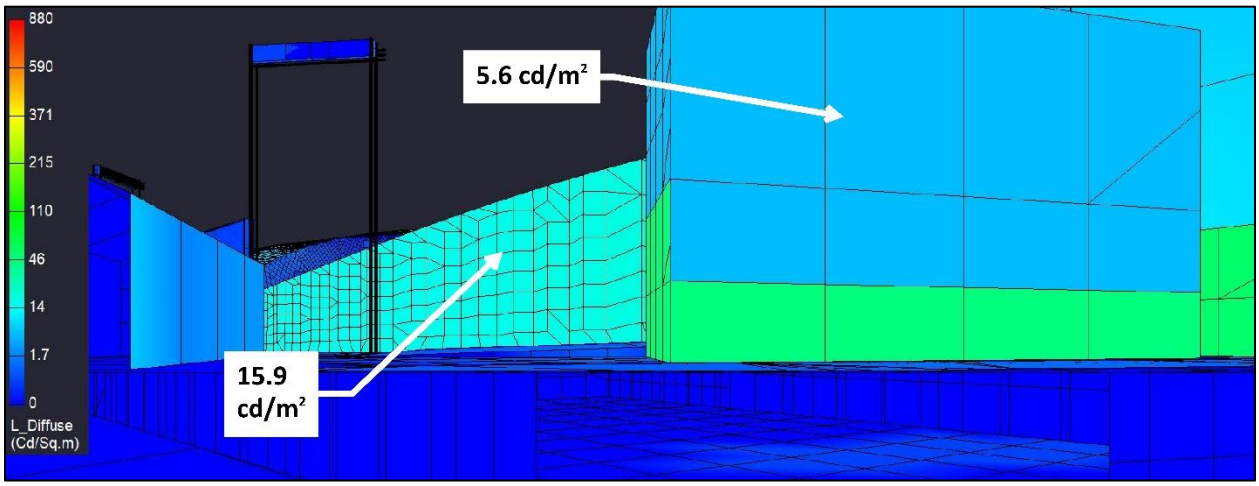


Figure 317: View from Receptor Site 4 for MRA project, Baseline ballpark height, "Full Buildout" scenario Non-Game Night Pre-Curfew lighting condition

Figure 318 provides the anticipated luminances viewed from Receptor Site 5, which is located on Westbound I880. From this view, the ballpark and sports lighting are anticipated to be almost entirely blocked. Luminances from this view **are not** anticipated to exceed threshold.

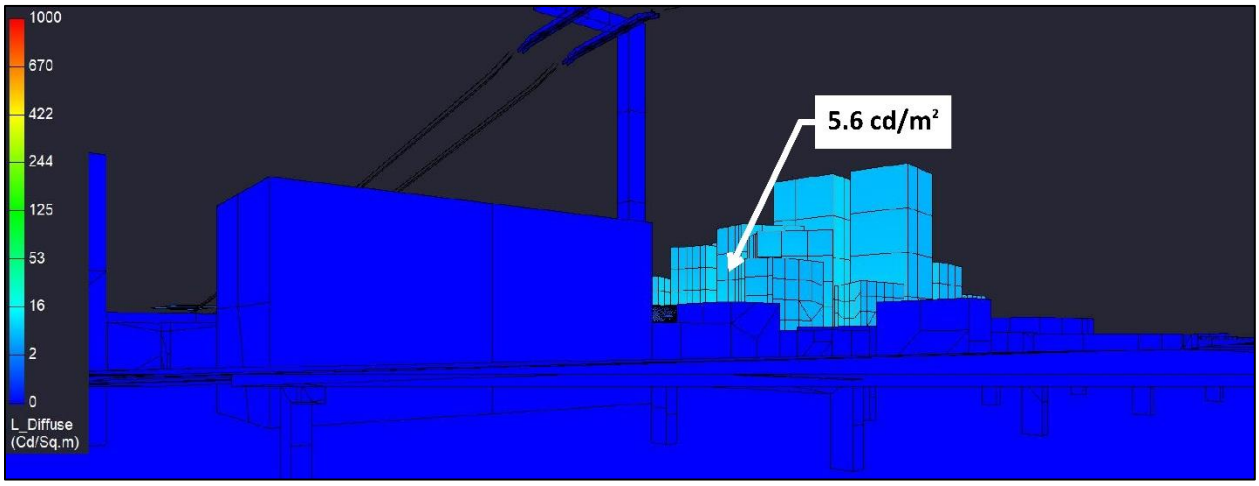


Figure 318: View from Receptor Site 5 for MRA project, Baseline ballpark height, "Full Buildout" scenario Non-Game Night Pre-Curfew lighting condition

Figure 319 provides the anticipated luminances viewed from Receptor Site 5A, which is located on the southwest corner of the roof of the parking garage located at 2nd and Washington. Luminances from this view **are not** anticipated to exceed threshold.

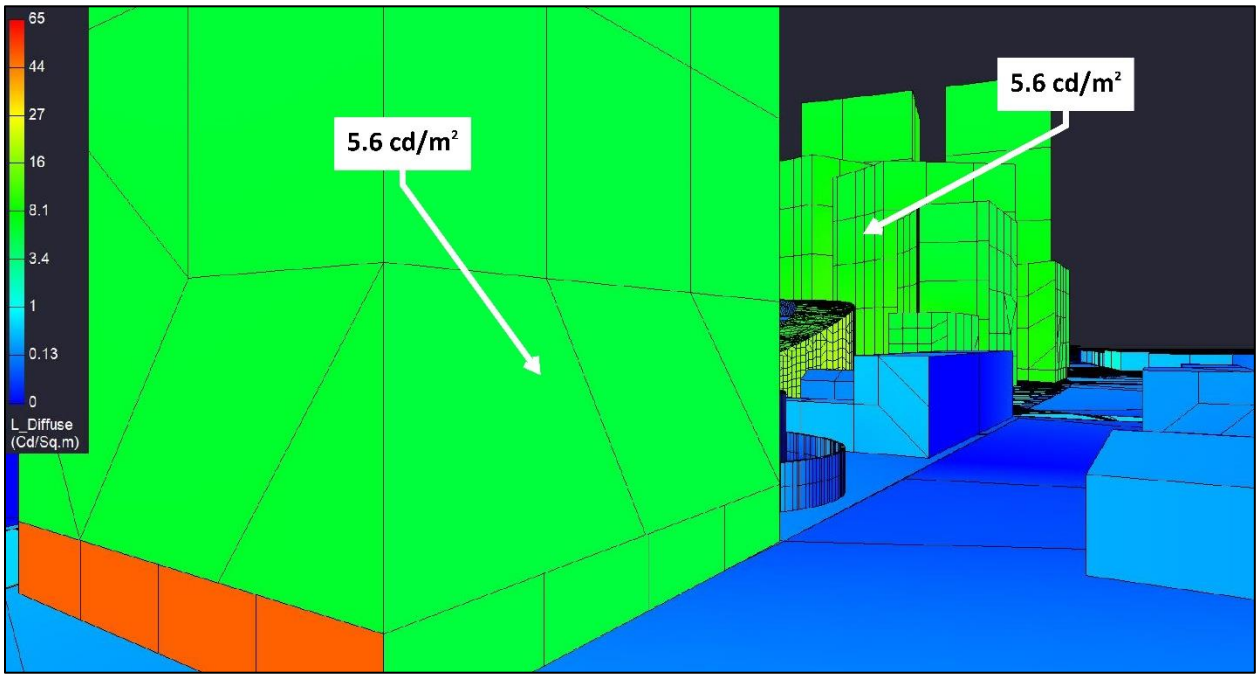


Figure 319: View from Receptor Site 5A for MRA project, Baseline ballpark height, "Full Buildout" scenario Non-Game Night Pre-Curfew lighting condition

Figure 320 provides the anticipated luminances viewed from Receptor Site 5B, which is located on the southeast corner of the roof of the parking garage looking toward the anticipated gondola station near Jack London Square. Luminances from this view **are not** anticipated to exceed threshold.

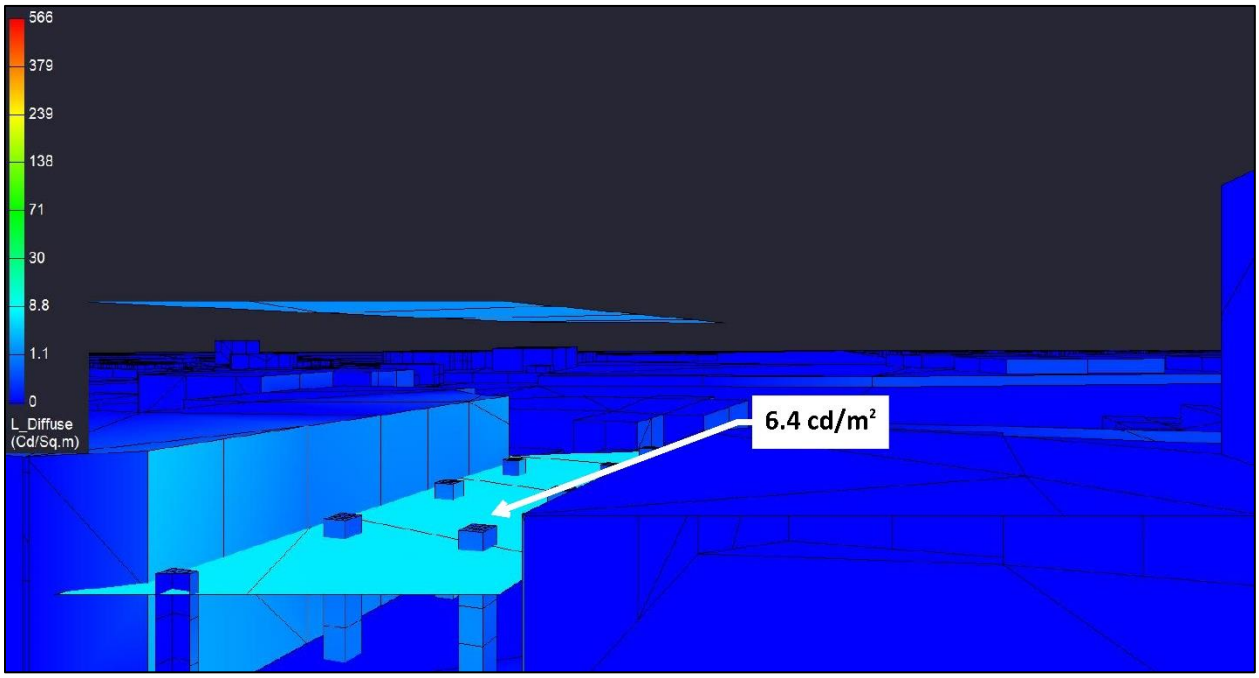


Figure 320: View from Receptor Site 5B for MRA project, Baseline ballpark height, "Full Buildout" scenario Non-Game Night Pre-Curfew lighting condition

Figure 321 provides the anticipated luminances viewed from Receptor Site 5C, which is located on the northeast corner of the parking garage at 2nd and Washington, looking northeast on the Washington corridor. No architectural lighting is anticipated on the gondola support tower and the Convention Center gondola station is not visible. Therefore, luminances from this view **are not** anticipated to exceed threshold.

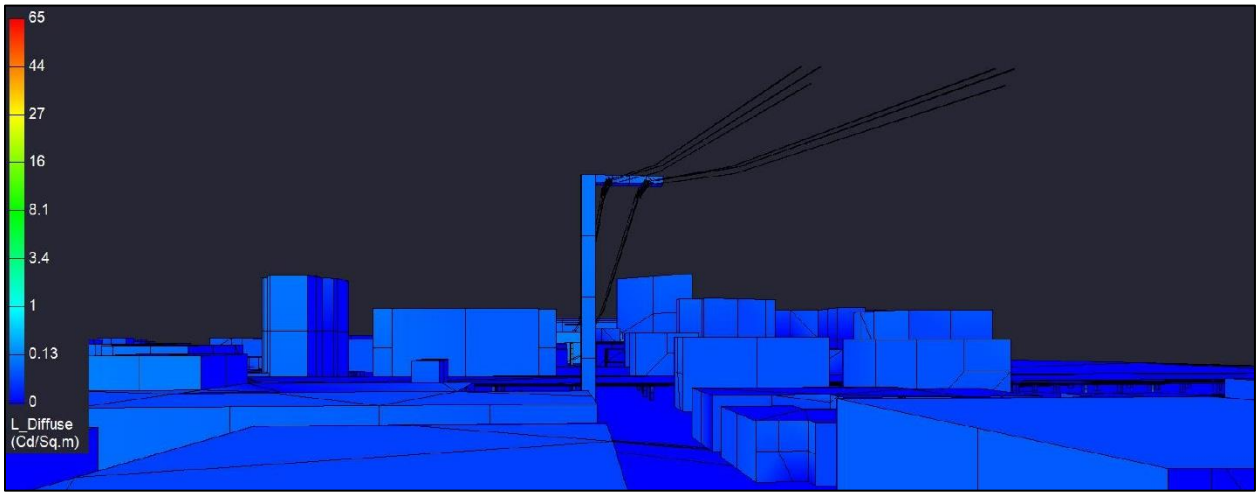


Figure 321: View from Receptor Site 5C for MRA project, Baseline ballpark height, "Full Buildout" scenario Non-Game Night Pre-Curfew lighting condition

Figure 322 provides the anticipated luminances viewed from Receptor Site 6, which is located on the ramp from I980 to eastbound I880. Luminances from this view **are not** anticipated to exceed threshold.

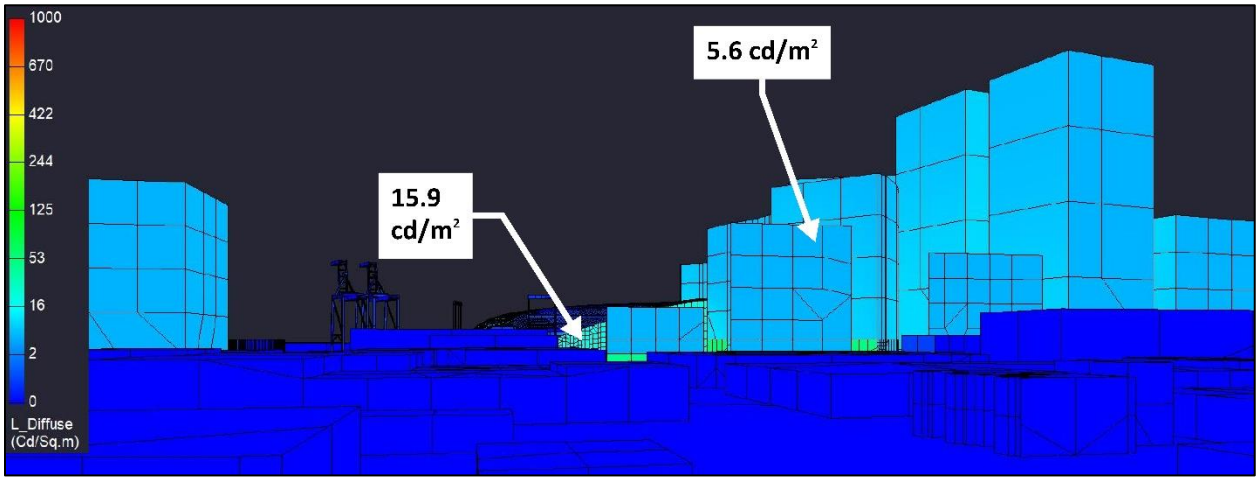


Figure 322: View from Receptor Site 6 for MRA project, Baseline ballpark height, "Full Buildout" scenario Non-Game Night Pre-Curfew lighting condition

Figure 323 provides the anticipated luminances viewed from Receptor Site 6A, which is located at 7th and Brush. The luminances from this view **are not** anticipated to exceed threshold.

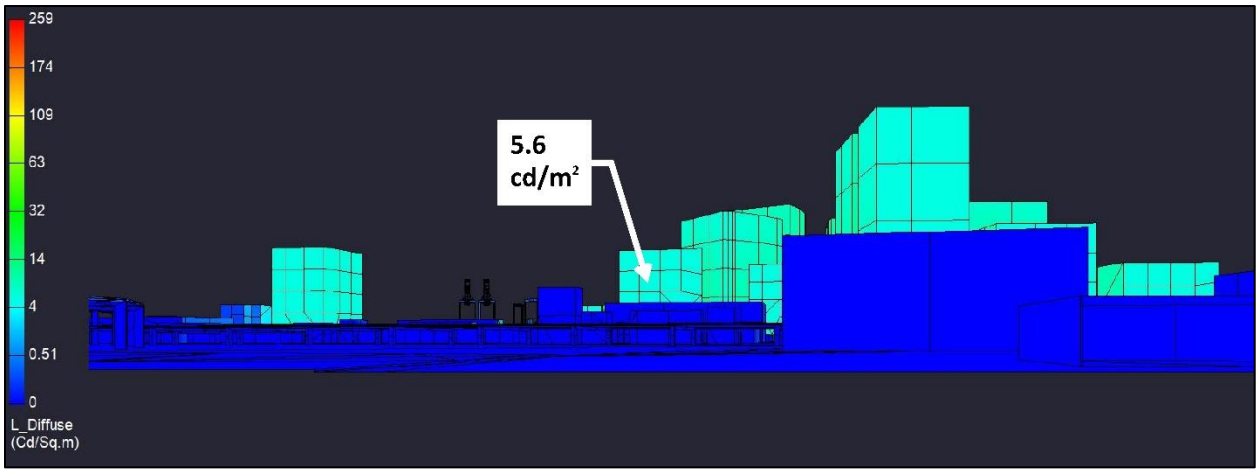


Figure 323: View from Receptor Site 6A for MRA project, Baseline ballpark height, "Full Buildout" scenario Non-Game Night Pre-Curfew lighting condition

Figure 324 provides the anticipated luminances viewed from Receptor Site 7, which is located at 8th and Washington facing north to the anticipated Convention Center gondola station. From this position, the field of view is anticipated to include the bottom surface of the gondola platform. Therefore, luminances from this view **are not** anticipated to exceed threshold.

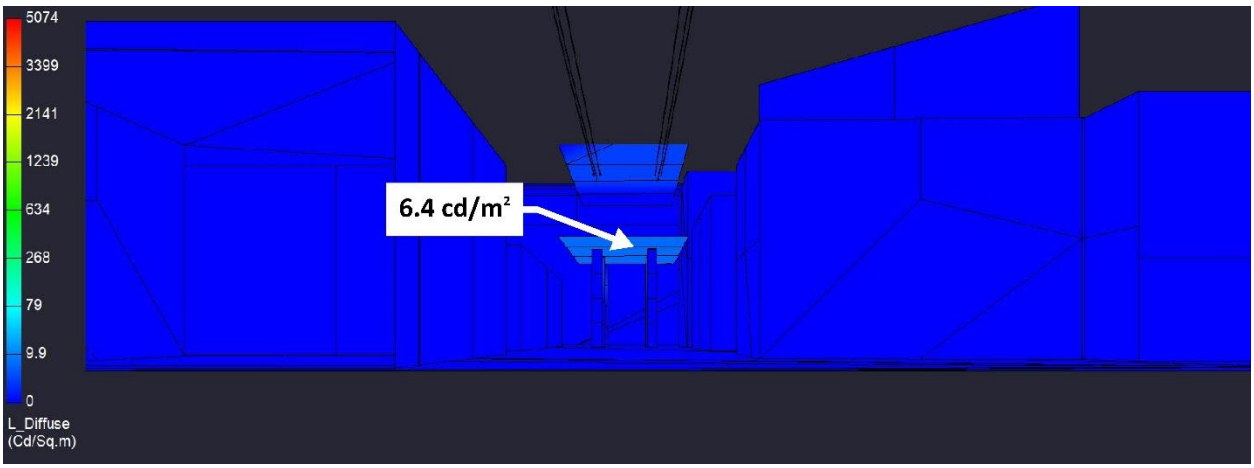


Figure 324: View from Receptor Site 7 for MRA project, Baseline ballpark height, "Full Buildout" scenario Non-Game Night Pre-Curfew lighting condition

Figure 325 provides the anticipated luminances viewed from Receptor Site 7A, which is located at 8th and Washington facing south toward the gondola support pole. From this position, the field of view is anticipated to include the gondola support pole which is not anticipated to have any architectural lighting. Therefore, luminances from this view **are not** anticipated to exceed threshold.

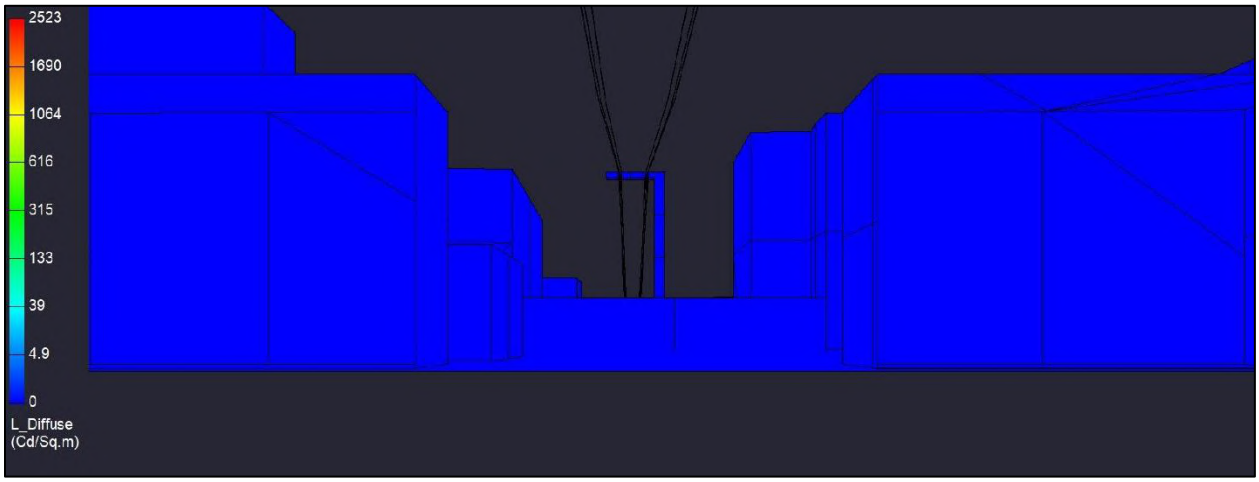


Figure 325: View from Receptor Site 7A for MRA project, Baseline ballpark height, "Full Buildout" scenario Non-Game Night Pre-Curfew lighting condition

9.1.2.3 Post-Curfew

As described in section 4.5.8, the Post-Curfew lighting condition is anticipated to capture the lighting impacts from curfew to dawn, with architectural and area lighting at reduced levels to respond to reduced activity.

9.1.2.3.1 Spill Light

Table 60 provides the calculation results for the spill light assessment at the receptor sites for this condition. As shown, the proposed lighting **is** anticipated to exceed the lower post-curfew threshold at Receptor Site 1A; however, the lighting for the gondola platform is not anticipated to dim post-curfew based on safety concerns. Additionally, the proposed lighting **is** anticipated to exceed the lower post-curfew threshold at Receptor Site 5A; this site is very close to the façade of the adjacent mixed-use building, and the impact on this receptor site can likely be reduced through further design refinement. The anticipated spill light at the remaining receptor sites **are not** anticipated to exceed the post-curfew threshold.

Receptor Site	Spill Light, [lux]	Significant
Receptor Site 1 - Water Street at Clay (Facing Ballpark)	3.7	No
Receptor Site 1A - Water Street at Washington (Facing Gondola)	**6.1**	**Yes**
Receptor Site 2 - Inner Harbor Turning Basin @ 190'	1.1	No
Receptor Site 2A - Turning Basin Line-of-Sight	0.4	No
Receptor Site 2B - Inner Harbor Turning Basin @ 64'	1.0	No
Receptor Site 2C - Inner Harbor Turning Basin @ 25'	1.0	No
Receptor Site 3 - Alameda Dock	0.4	No
Receptor Site 4 - MLK at Embarcadero	3.5	No
Receptor Site 5 - I880 Westbound	0.3	No
Receptor Site 5A - 2nd at Washington (Facing Ballpark)	**5.8**	**Yes**
Receptor Site 5B - 2nd at Washington (Facing JLS Station)	0.7	No
Receptor Site 5C - 2nd at Washington (Facing Convention Center Station)	0.1	No
Receptor Site 6 - I980 Ramp to Eastbound I880	0.9	No
Receptor Site 6A - 7th at Brush	0.3	No
Receptor Site 7 - 8th at Washington (Facing Convention Center Station)	0.1	No
Receptor Site 7A - 8th at Washington (Facing Tower)	0.0	No

Table 60: Spill light at receptor sites for MRA project, Baseline ballpark height, “Full Buildout” scenario Post-Curfew lighting condition. [Note: Threshold of significance is 5 lux]

9.1.2.3.2 Spill Light Map

Figure 326 provides a spill light map for this lighting condition. To generate the spill light map, vertical calculation points were arrayed around the project site at 5'-6" AFG and oriented toward the pitcher's mound for reference. The isoline curves show the extent to which vertical light levels are calculated and are reported in lux. As shown, less than 1 vertical lux is expected in the turning basin. The adjacent estuary is anticipated to experience less than 1 vertical lux generally, with light levels increasing closer to shore. For reference, one 60W incandescent light bulb will generate 1 lux at a distance of approximately 8 meters (26 ft).

Figure 326: Spill light map for MRA project, Baseline ballpark height, "Full Buildout" scenario Post-Curfew lighting condition indicating vertical illuminance isolines

9.1.2.3.3 Glare

Figure 327 through Figure 342 illustrate the luminances anticipated to be observed from the identified receptor sites for this lighting condition. Note that the scale associated with each receptor site view approximately matches the scale used for the associated site's existing conditions HDR falsecolor images. Table 61 summarizes the anticipated glare significance at the receptor sites. Additionally, as noted in Section 4.5.3, the modeled retail lighting is included for post-curfew times to capture the impact of exterior façade lighting (assuming interior retail lighting is off) and is subject to glare limitations.

Receptor Site	Facades		Signage	
	Maximum, [cd/m^2]	Significant	Maximum, [cd/m^2]	Significant
Receptor Site 1 - Water Street at Clay (Facing Ballpark)	5.6	No	n/a	n/a
Receptor Site 1A - Water Street at Washington (Facing Gondola)	6.4	No	n/a	n/a
Receptor Site 2 - Inner Harbor Turning Basin @ 190'	5.6	No	n/a	n/a
Receptor Site 2A - Turning Basin Line-of-Sight	5.6	No	n/a	n/a
Receptor Site 2B - Inner Harbor Turning Basin @ 64'	5.6	No	n/a	n/a
Receptor Site 2C - Inner Harbor Turning Basin @ 25'	5.6	No	n/a	n/a
Receptor Site 3 - Alameda Dock	5.6	No	n/a	n/a
Receptor Site 4 - MLK at Embarcadero	5.6	No	n/a	n/a
Receptor Site 5 - I880 Westbound	5.6	No	n/a	n/a
Receptor Site 5A - 2nd at Washington (Facing Ballpark)	5.6	No	n/a	n/a
Receptor Site 5B - 2nd at Washington (Facing JLS Station)	6.4	No	n/a	n/a
Receptor Site 5C - 2nd at Washington (Facing Convention Center Station)	0.0	No	n/a	n/a
Receptor Site 6 - I980 Ramp to Eastbound I880	5.6	No	n/a	n/a
Receptor Site 6A - 7th at Brush	5.6	No	n/a	n/a
Receptor Site 7 - 8th at Washington (Facing Convention Center Station)	6.4	No	n/a	n/a
Receptor Site 7A - 8th at Washington (Facing Tower)	0.0	No	n/a	n/a

Table 61: Summary of anticipated glare significance at receptor sites for the MRA project, Baseline ballpark height, "Full Buildout" scenario Post-Curfew lighting conditions. [Note: Threshold of significance is 25 cd/m^2 for façade lighting and 1,000 cd/m^2 for digital signage]

Figure 327 shows the anticipated luminances viewed from Receptor Site 1, which is one of the closest receptor sites. As seen, from this perspective, without the field lighting and scoreboard/ribbon boards, "on", overall brightnesses are reduced. Therefore, luminances from this view **are not** anticipated to exceed threshold.

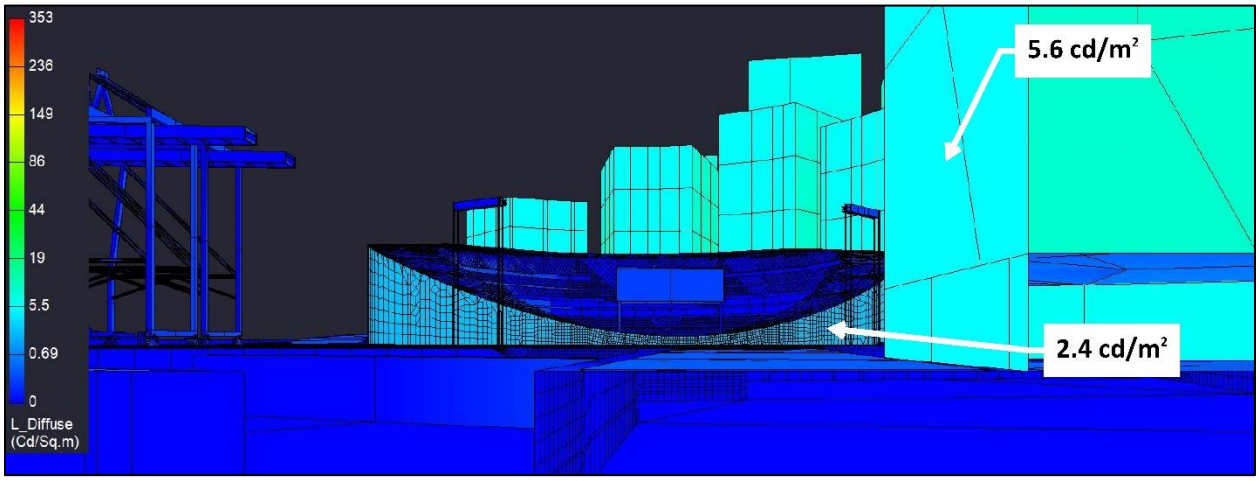


Figure 327: View from Receptor Site 1 for MRA project, Baseline ballpark height, "Full Buildout" scenario Post-Curfew lighting condition

Figure 328 provides a view of the anticipated luminances viewed from Receptor Site 1A, which is facing the proposed gondola station near Jack London Square. Note for calculation purposes, the "sides" of the gondola platform have been turned "off", and the anticipated lighting effect has been applied to the top of the platform floor. Therefore, luminances from this view **are not** anticipated to exceed threshold.

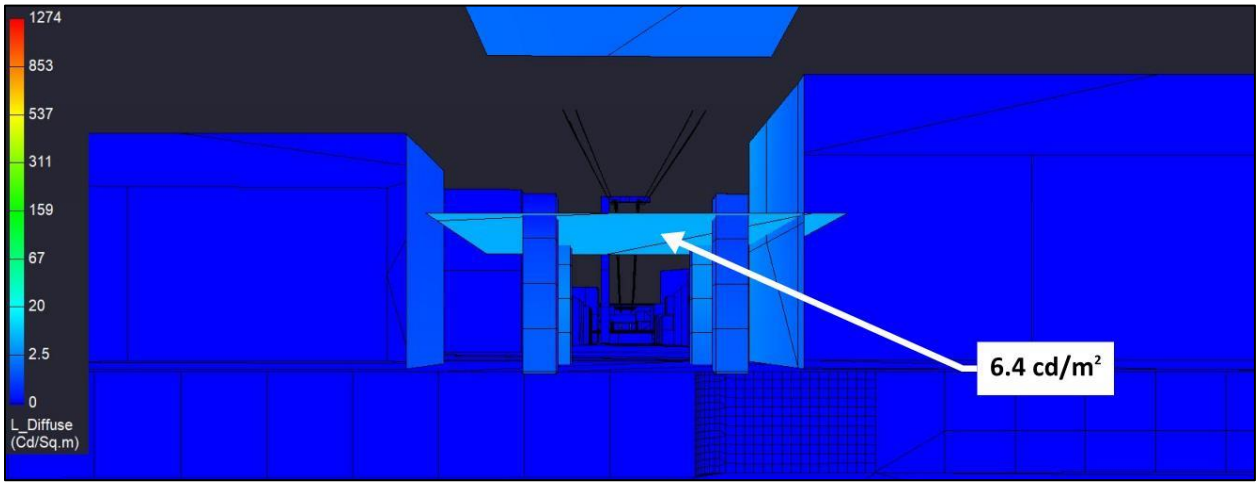


Figure 328: View from Receptor Site 1A for MRA project, Baseline ballpark height, "Full Buildout" scenario Post-Curfew lighting condition

Figure 329 provides the anticipated luminances viewed from Receptor Site 2, which is centered in the turning basin and located 190’ above the water line. Façade luminances from this view **are not** anticipated to exceed threshold.

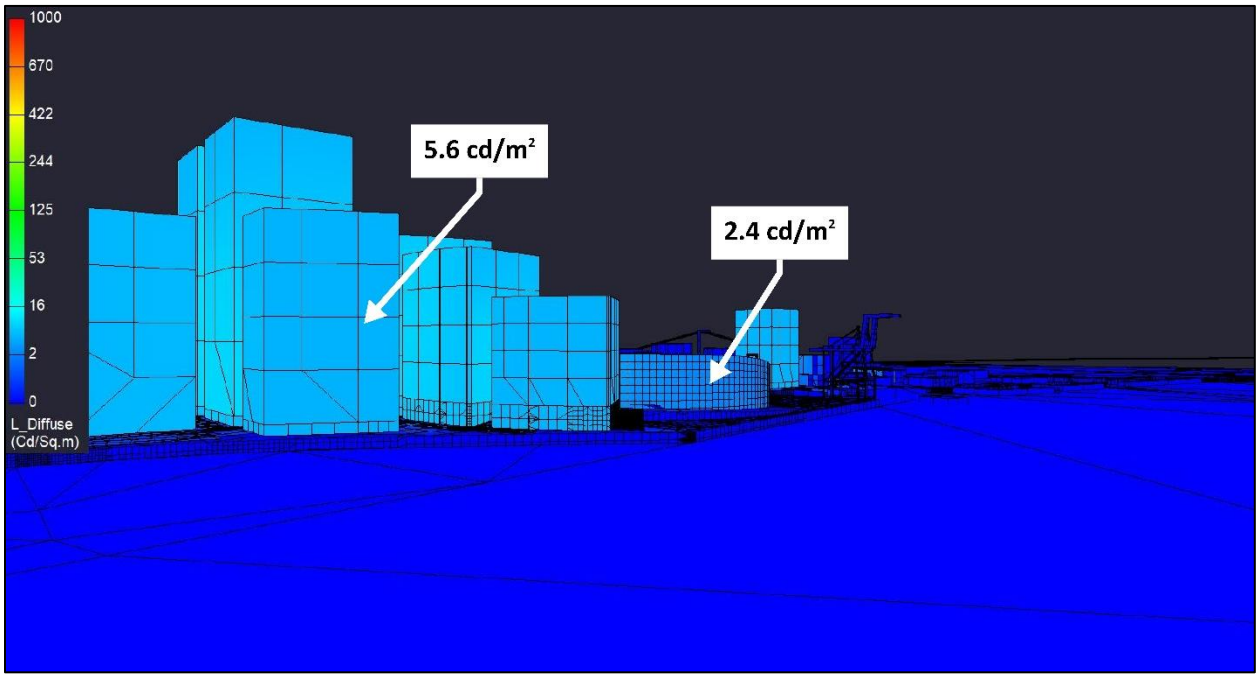


Figure 329: View from Receptor Site 2 for MRA project, Baseline ballpark height, “Full Buildout” scenario Post-Curfew lighting condition

Figure 330 provides the anticipated luminances viewed from Receptor Site 2A, which is on Alameda with a direct line of site through the center of the turning basin. Excluding the interior retail lighting, luminances from this view **are not** anticipated to exceed threshold.

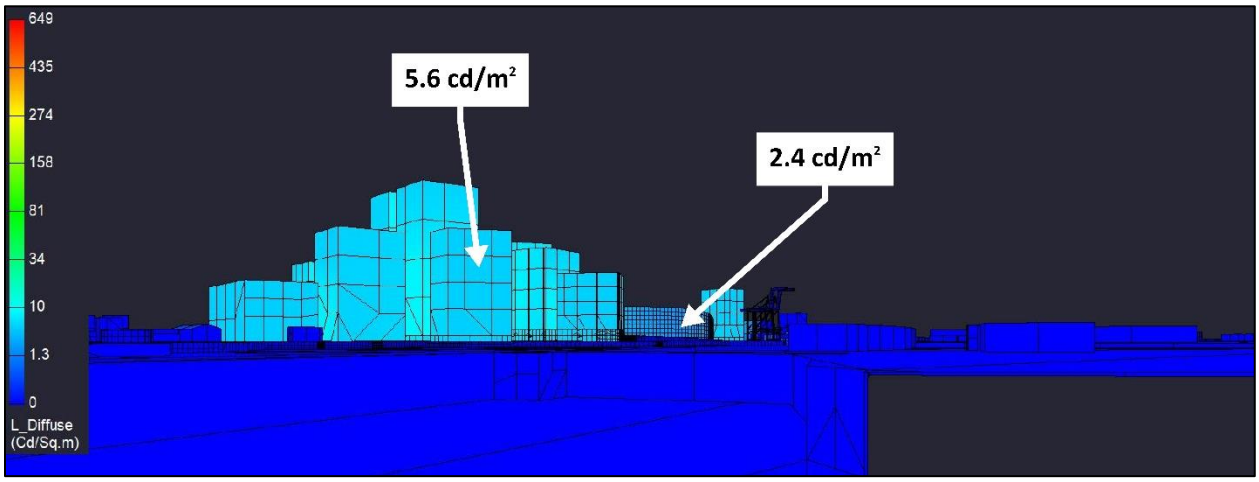


Figure 330: View from Receptor Site 2A for MRA project, Baseline ballpark height, “Full Buildout” scenario Post-Curfew lighting condition

Figure 331 provides the anticipated luminances viewed from Receptor Site 2B, which is centered in the turning basin and located 64’ above the water line. Façade luminances from this view **are not** anticipated to exceed threshold.

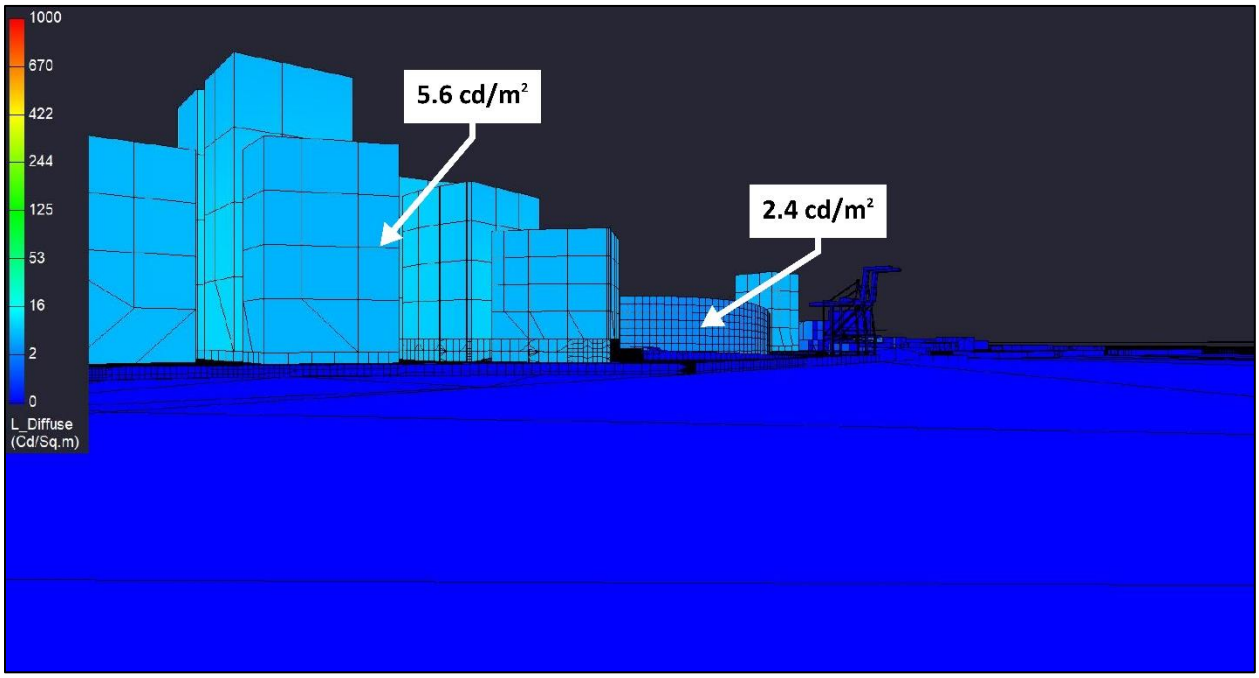


Figure 331: View from Receptor Site 2B for MRA project, Baseline ballpark height, “Full Buildout” scenario Post-Curfew lighting condition

Figure 332 provides the anticipated luminances viewed from Receptor Site 2C, which is centered in the turning basin and located 25’ above the water line. Façade luminances from this view **are not** anticipated to exceed threshold.

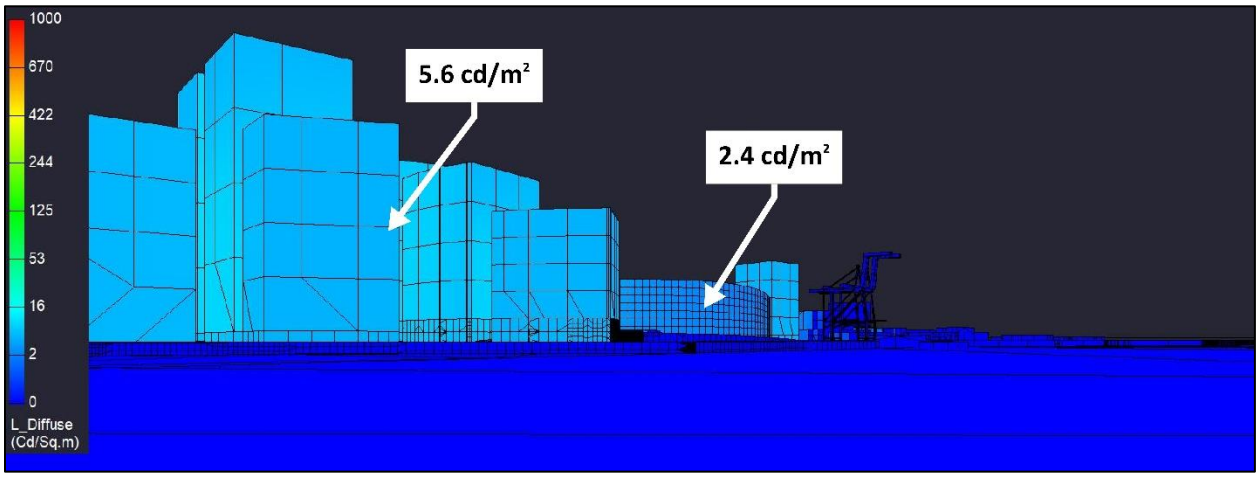


Figure 332: View from Receptor Site 2C for MRA project, Baseline ballpark height, “Full Buildout” scenario Post-Curfew lighting condition

Figure 333 provides the anticipated luminances viewed from Receptor Site 3, which is located on Alameda and facing northwest toward the property. Luminances from this view **are not** anticipated to exceed threshold.

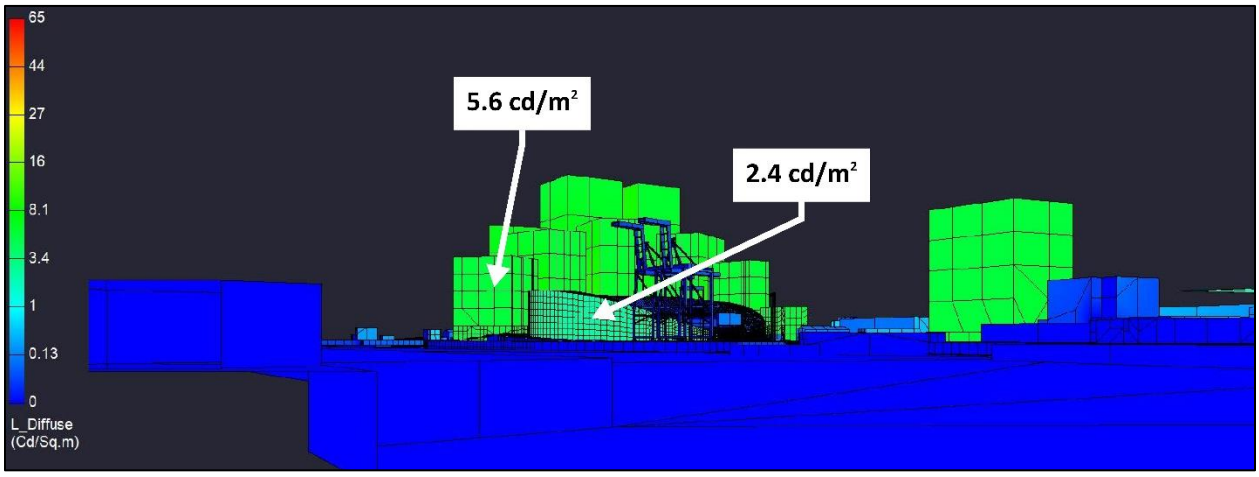


Figure 333: View from Receptor Site 3 for MRA project, Baseline ballpark height, "Full Buildout" scenario Post-Curfew lighting condition

Figure 334 provides the view from Receptor Site 4, which is located at the intersection of MLK and Embarcadero. Luminances from this view **are not** anticipated to exceed threshold.

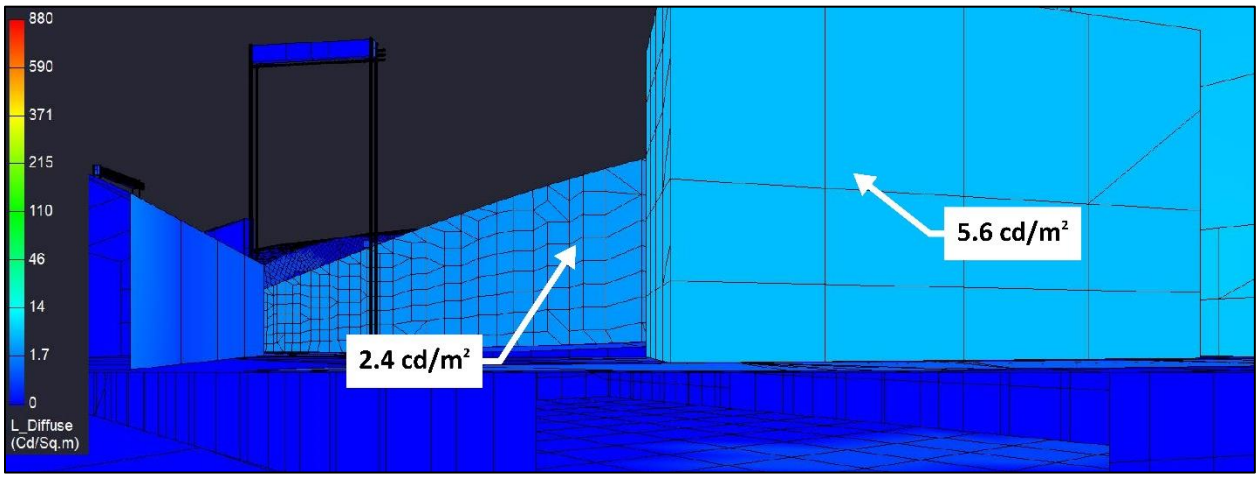


Figure 334: View from Receptor Site 4 for MRA project, Baseline ballpark height, "Full Buildout" scenario Post-Curfew lighting condition

Figure 335 provides the anticipated luminances viewed from Receptor Site 5, which is located on Westbound I880. From this view, the ballpark and sports lighting are anticipated to be almost entirely blocked. The façade lighting of the adjacent mixed-use development is anticipated to be visible. Therefore, luminances from this view, excluding the interior retail lighting, **are not** anticipated to exceed threshold.

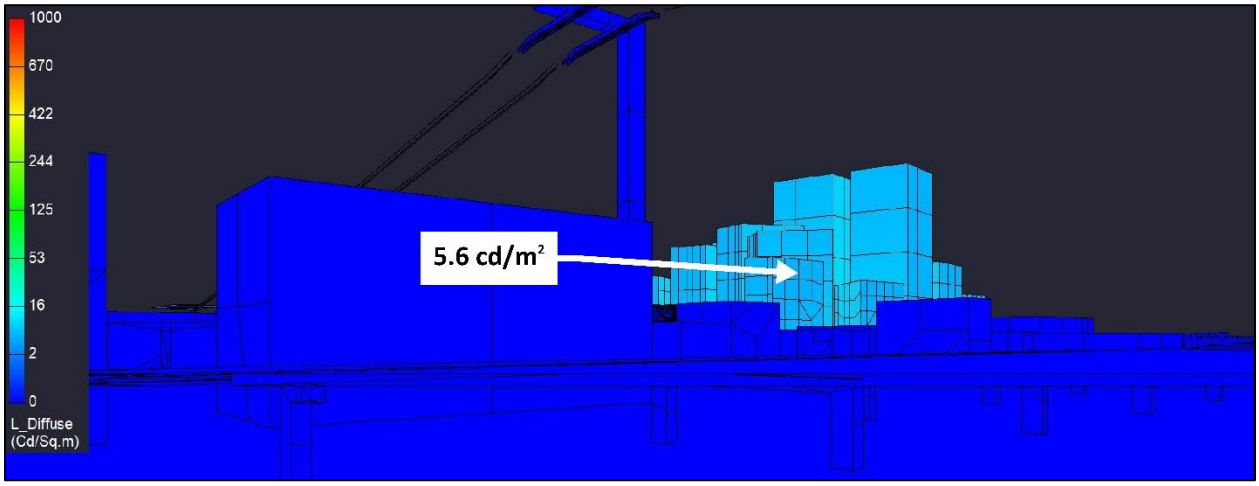


Figure 335: View from Receptor Site 5 for MRA project, Baseline ballpark height, "Full Buildout" scenario Post-Curfew lighting condition

Figure 336 provides the anticipated luminances viewed from Receptor Site 5A, which is located on the southwest corner of the roof of the parking garage located at 2nd and Washington. Luminances from this view **are not** anticipated to exceed threshold.

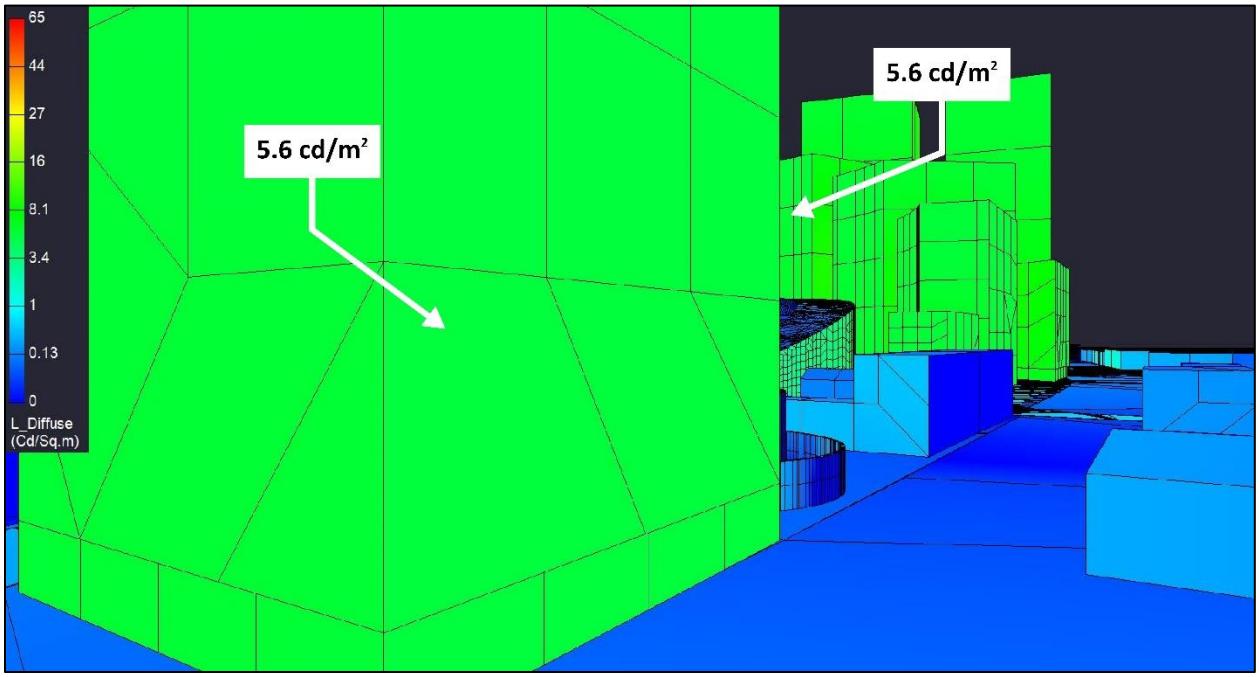


Figure 336: View from Receptor Site 5A for MRA project, Baseline ballpark height, "Full Buildout" scenario Post-Curfew lighting condition

Figure 337 provides the anticipated luminances viewed from Receptor Site 5B, which is located on the southeast corner of the roof of the parking garage looking toward the anticipated gondola station near Jack London Square. Luminances from this view **are not** anticipated to exceed threshold.

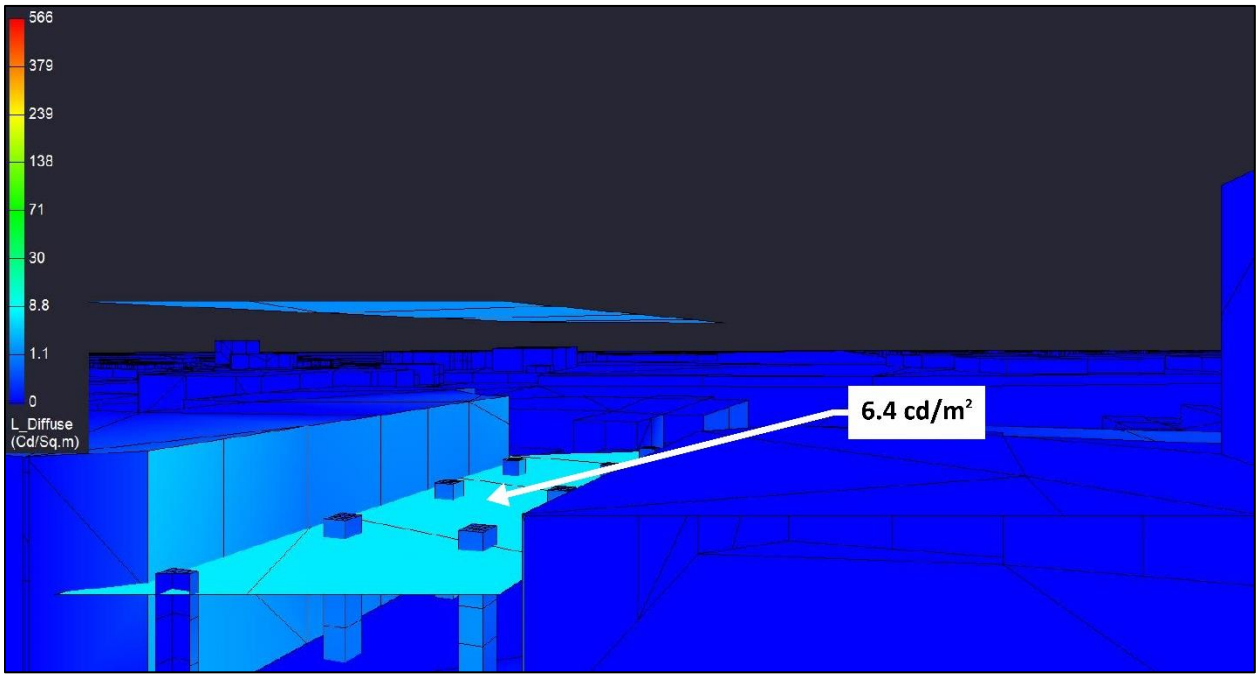


Figure 337: View from Receptor Site 5B for MRA project, Baseline ballpark height, "Full Buildout" scenario Post-Curfew lighting condition

Figure 338 provides the anticipated luminances viewed from Receptor Site 5C, which is location on the northeast corner of the parking garage at 2nd and Washington, looking northeast on the Washington corridor. No architectural lighting is anticipated on the gondola support tower and the Convention Center gondola station is not visible. Therefore, luminances from this view **are not** anticipated to exceed threshold.

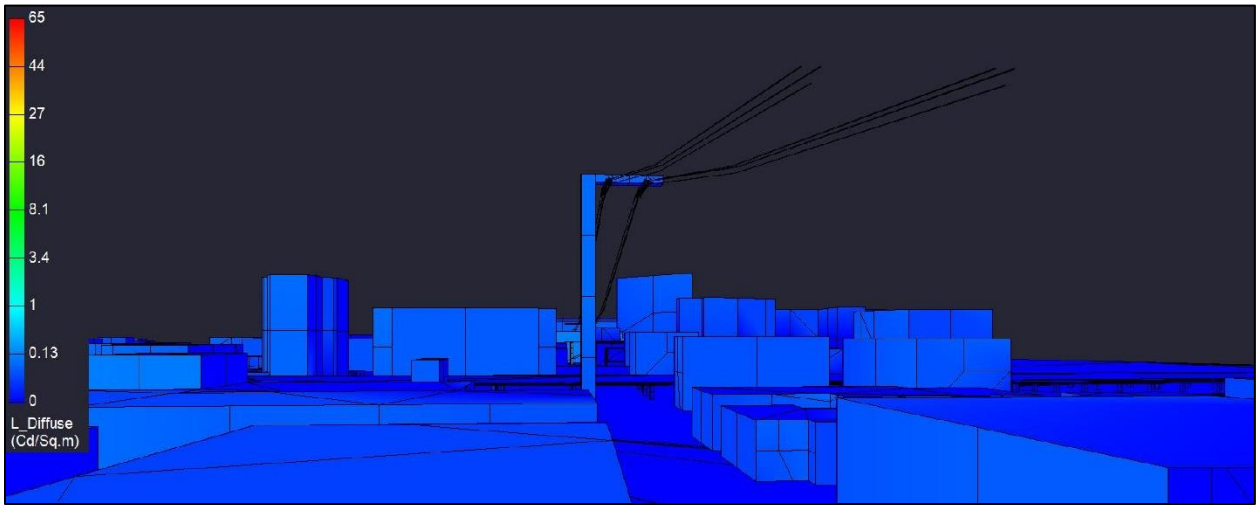


Figure 338: View from Receptor Site 5C for MRA project, Baseline ballpark height, "Full Buildout" scenario Post-Curfew lighting condition

Figure 339 provides the anticipated luminances viewed from Receptor Site 6, which is located on the ramp from I980 to eastbound I880. Luminances from this view **are not** anticipated to exceed threshold.

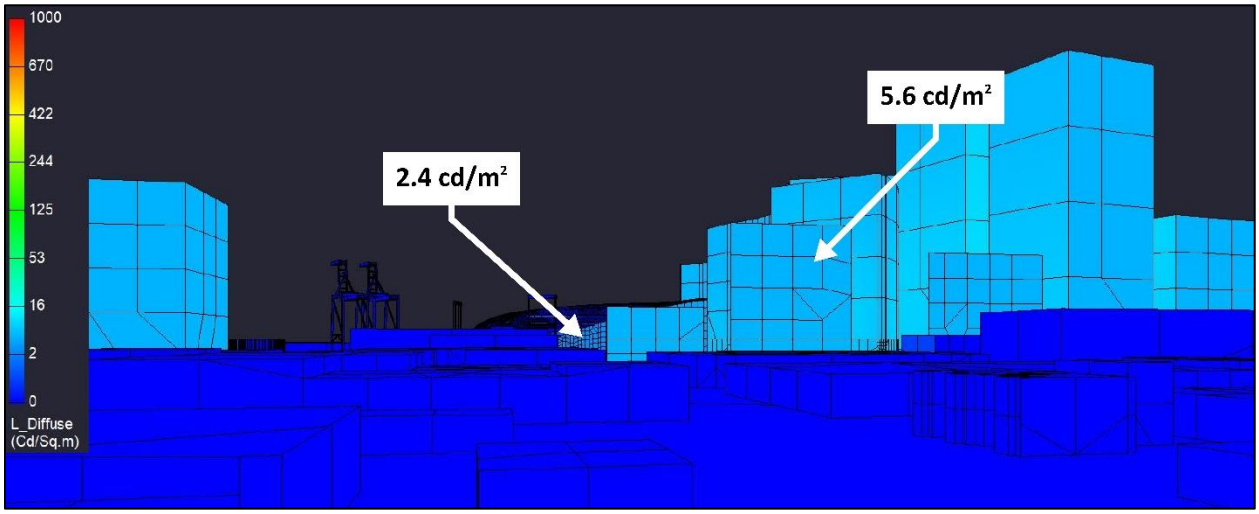


Figure 339: View from Receptor Site 6 for MRA project, Baseline ballpark height, "Full Buildout" scenario Post-Curfew lighting condition

Figure 340 provides the anticipated luminances viewed from Receptor Site 6A, which is located at 7th and Brush. The luminances from this view **are not** anticipated to exceed threshold.

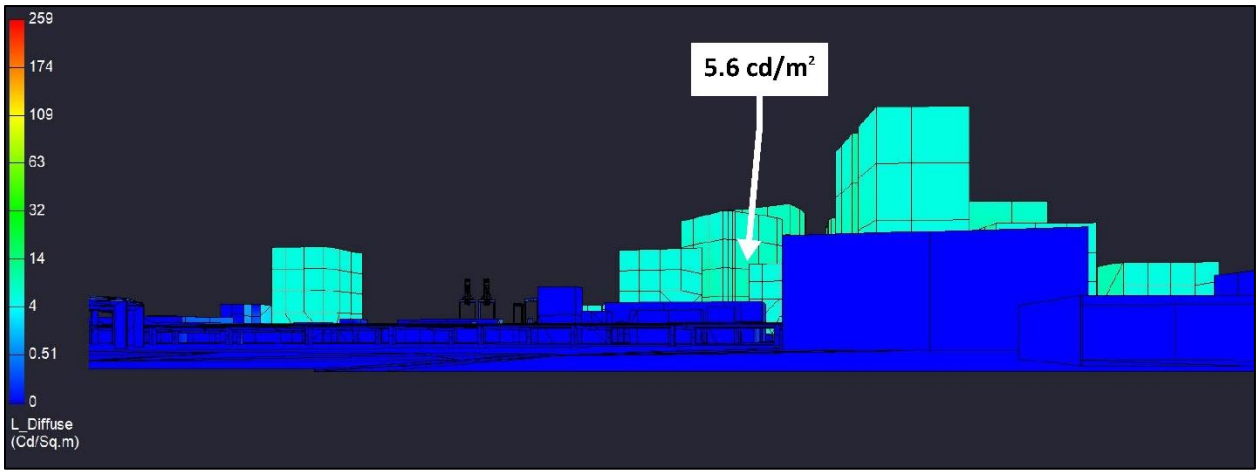


Figure 340: View from Receptor Site 6A for MRA project, Baseline ballpark height, "Full Buildout" scenario Post-Curfew lighting condition

Figure 341 provides the anticipated luminances viewed from Receptor Site 7, which is located at 8th and Washington facing north to the anticipated Convention Center gondola station. From this position, the field of view is anticipated to include the bottom surface of the gondola platform. Therefore, luminances from this view **are not** anticipated to exceed threshold.

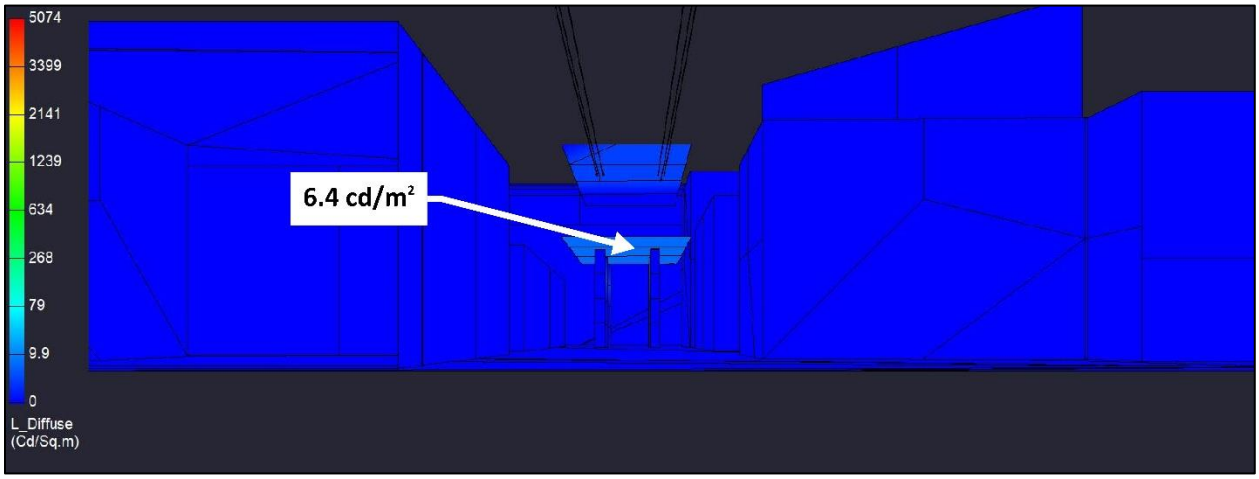


Figure 341: View from Receptor Site 7 for MRA project, Baseline ballpark height, "Full Buildout" scenario Post-Curfew lighting condition

Figure 342 provides the anticipated luminances viewed from Receptor Site 7A, which is located at 8th and Washington facing south toward the gondola support pole. From this position, the field of view is anticipated to include the gondola support pole which is not anticipated to have any architectural lighting. Therefore, luminances from this view **are not** anticipated to exceed threshold.

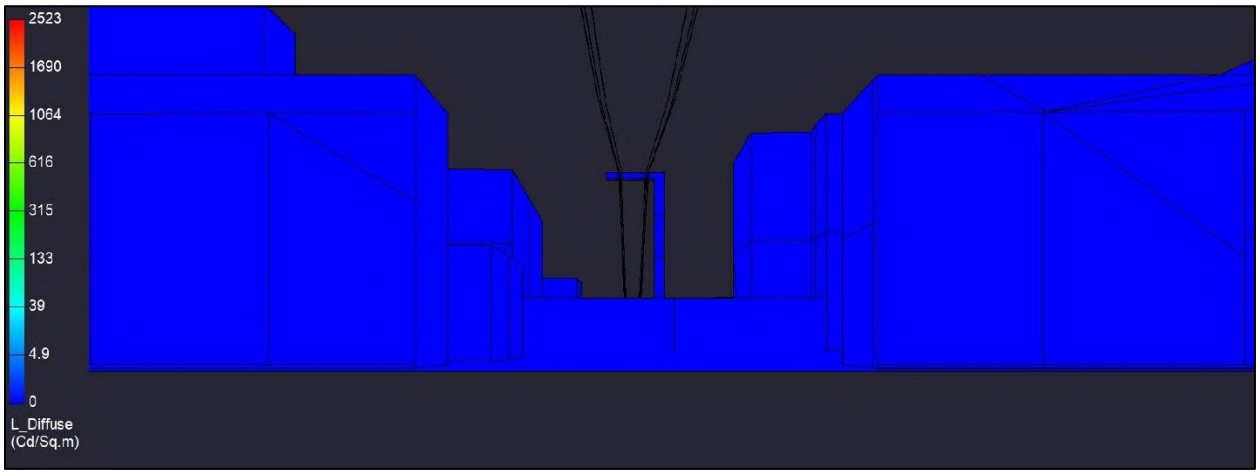


Figure 342: View from Receptor Site 7A for MRA project, Baseline ballpark height, "Full Buildout" scenario Post-Curfew lighting condition

9.2 Project Design Option – Reduced Ballpark Height

The second set of analysis includes the project design option of the reduced ballpark height within the MRA project and does not include the gondola variant.

9.2.1 "Phase 1" Scenario

Per the project description included in section 3.1, the "Phase 1" scenario includes the ballpark, site development immediately adjacent, and a select number of accessory buildings. The bulk of the remaining site is anticipated to be temporary surface parking.

9.2.1.1 Game Nights

As described in section 4.5.8, the Game Night lighting condition is anticipated to include all lighting "on", including sports and house lighting, and included identified signage locations.

9.2.1.1.1 Spill Light

Table 62 provides the calculation results for the spill light assessment at the receptor sites for this condition. As shown, the proposed lighting **is** anticipated to exceed the spill light threshold at Receptor Site 1 which has a direct view of the scoreboard, ribbon boards, and pole-mounted infield sports lights. All other receptor site spill light **is not** anticipated to exceed threshold.

Receptor Site	Spill Light, [lux]	Significant
Receptor Site 1 - Water Street at Clay (Facing Ballpark)	**41.4**	Yes
Receptor Site 2 - Inner Harbor Turning Basin @ 190'	0.9	No
Receptor Site 2A - Turning Basin Line-of-Sight	0.2	No
Receptor Site 2B - Inner Harbor Turning Basin @ 64'	0.8	No
Receptor Site 2C - Inner Harbor Turning Basin @ 25'	0.7	No
Receptor Site 3 - Alameda Dock	3.4	No
Receptor Site 4 - MLK at Embarcadero	11.5	No
Receptor Site 5 - I880 Westbound	0.4	No
Receptor Site 5A - 2nd at Washington (Facing Ballpark)	7.4	No
Receptor Site 6 - I980 Ramp to Eastbound I880	2.3	No
Receptor Site 6A - 7th at Brush	0.5	No

Table 62: Spill light at receptor sites for MRA project, Reduced ballpark height, "Phase 1" scenario Game Night lighting condition. [Note: Threshold of significance is 25 lux]

9.2.1.1.2 Spill Light Map

Figure 343 provides a spill light map for this lighting condition. To generate the spill light map, vertical calculation points were arrayed around the project site at 5’-6” AFG and oriented toward the pitcher’s mound for reference. The isoline curves show the extent to which vertical light levels are calculated and are reported in lux. As shown, less than 1 vertical lux is expected in the turning basin. The adjacent estuary is anticipated to experience less than 1 vertical lux generally, with light levels increasing closer to shore. For reference, one 60W incandescent light bulb will generate 1 lux at a distance of approximately 8 meters (26 ft).

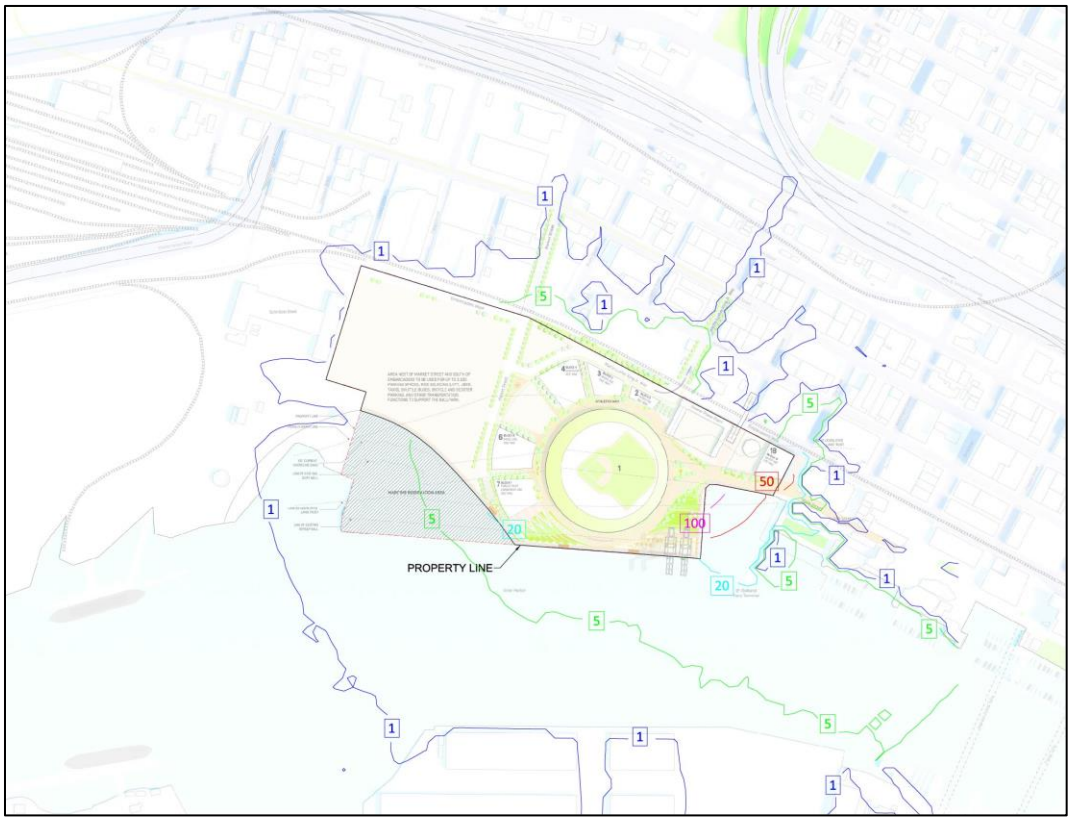


Figure 343: Spill light map for MRA project, Reduced ballpark height, “Phase 1” scenario Game Night lighting condition indicating vertical illuminance isolines

9.2.1.1.3 Glare

Figure 344 through Figure 354 illustrate the luminances anticipated to be observed from the identified receptor sites for this lighting condition. Note that the scale associated with each receptor site view approximately matches the scale used for the associated site's existing conditions HDR falsecolor images. Receptor Sites 1A, 5B, 5C, 7 and 7A have been excluded since the gondola variant is not included in this model. Table 63 summarizes the anticipated glare significance at the receptor sites. Additionally, as noted in Section 4.5.3, the modeled retail lighting is included for pre-curfew times to capture the impact of interior lighting emanating through windows as a conservative contribution to spill light assessment; the modeled luminance, therefore, is an interior luminance and not subject to glare limitations directly.

Receptor Site	Facades		Signage	
	Maximum, [cd/m^2]	Significant	Maximum, [cd/m^2]	Significant
Receptor Site 1 - Water Street at Clay (Facing Ballpark)	37.9	Yes	3,500	Yes
Receptor Site 2 - Inner Harbor Turning Basin @ 190'	15.9	No	n/a	n/a
Receptor Site 2A - Turning Basin Line-of-Sight	15.9	No	n/a	n/a
Receptor Site 2B - Inner Harbor Turning Basin @ 64'	15.9	No	n/a	n/a
Receptor Site 2C - Inner Harbor Turning Basin @ 25'	15.9	No	n/a	n/a
Receptor Site 3 - Alameda Dock	37.9	Yes	3,500	Yes
Receptor Site 4 - MLK at Embarcadero	15.9	No	3,500	Yes
Receptor Site 5 - I880 Westbound	37.9	Yes	n/a	n/a
Receptor Site 5A - 2nd at Washington (Facing Ballpark)	37.9	Yes	3,500	Yes
Receptor Site 6 - I980 Ramp to Eastbound I880	37.9	Yes	3,500	Yes
Receptor Site 6A - 7th at Brush	37.9	Yes	3,500	Yes

Table 63: Summary of anticipated glare significance at receptor sites for the MRA project, Reduced ballpark height, "Phase 1" scenario Game Night lighting conditions. [Note: Threshold of significance is 25 cd/m^2 for façade lighting and 1,000 cd/m^2 for digital signage]

Figure 344 shows the anticipated luminances viewed from Receptor Site 1, which is one of the closest receptor sites. As seen, from this perspective, there is a direct view of the field lighting and scoreboard/ribbon boards. Additionally, with the sports field lights shifted from the "halo" configuration to the pole-mounted configuration, increased luminance on the adjacent building facades is expected due to reflection from the roof. Therefore, façade luminances from this view **are** anticipated to exceed threshold and sign luminances from this view **are** anticipated to exceed threshold.

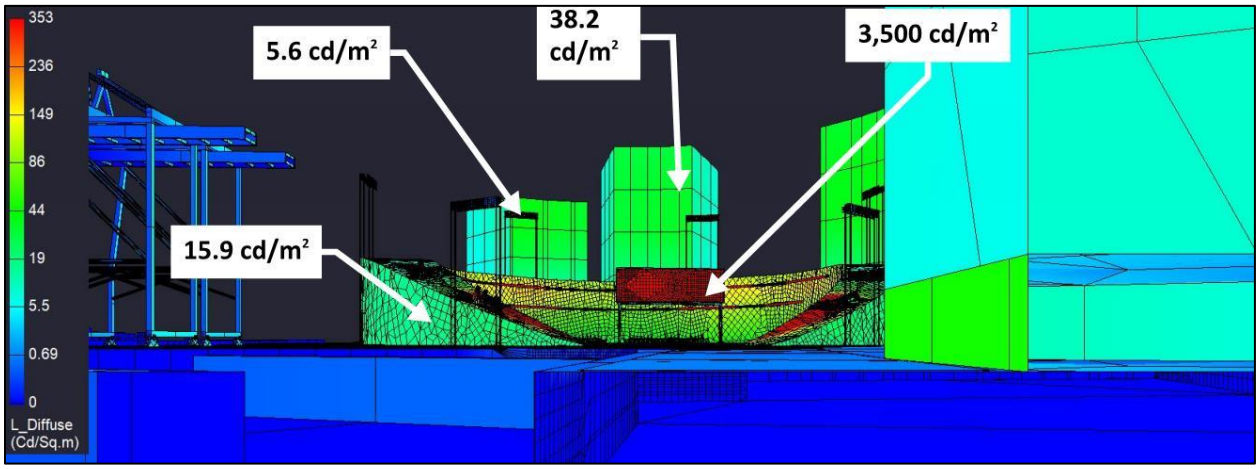


Figure 344: View from Receptor Site 1 for MRA project, Reduced ballpark height, "Phase 1" scenario Game Night lighting condition

Figure 345 provides the anticipated luminances viewed from Receptor Site 2, which is centered in the turning basin and located 190' above the water line. As shown, based on the ballpark geometry, there is not anticipated to be a direct view of the field luminaires, significantly reducing the observed brightnesses in the field of view. Refer to further discussion on this topic in section 6.2.1 above. The façade luminances from this view **are not** anticipated to exceed threshold.

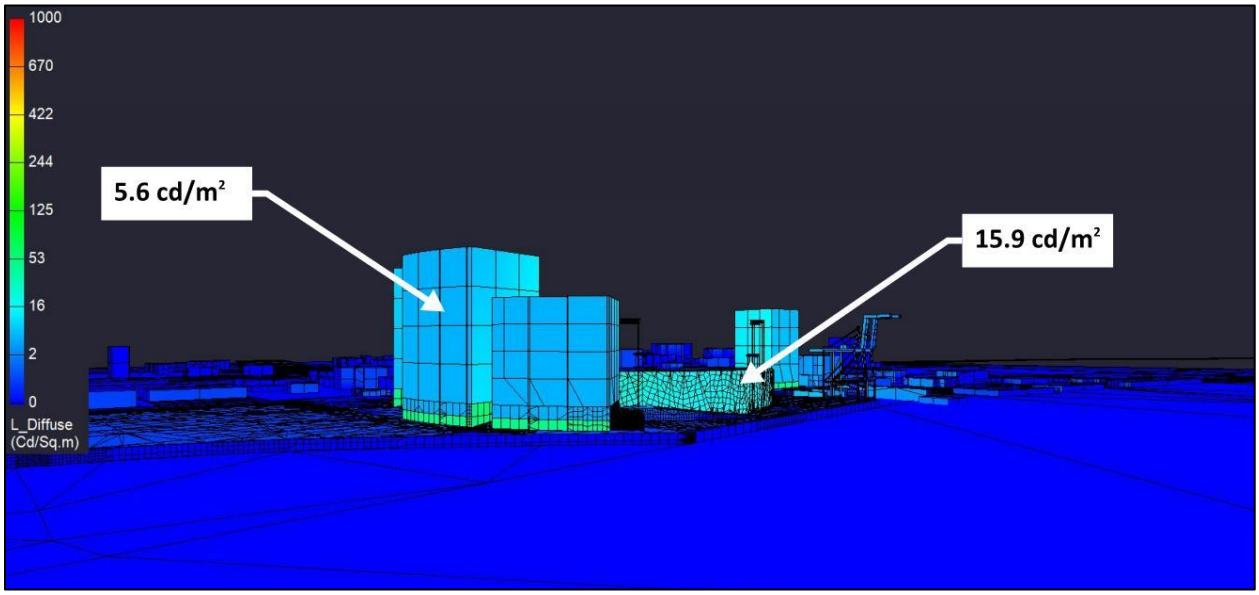


Figure 345: View from Receptor Site 2 for MRA project, Reduced ballpark height, "Phase 1" scenario Game Night lighting condition

Figure 346 provides the anticipated luminances viewed from Receptor Site 2A, which is on Alameda with a direct line of site through the center of the turning basin. Luminances from this view **are not** anticipated to exceed threshold.

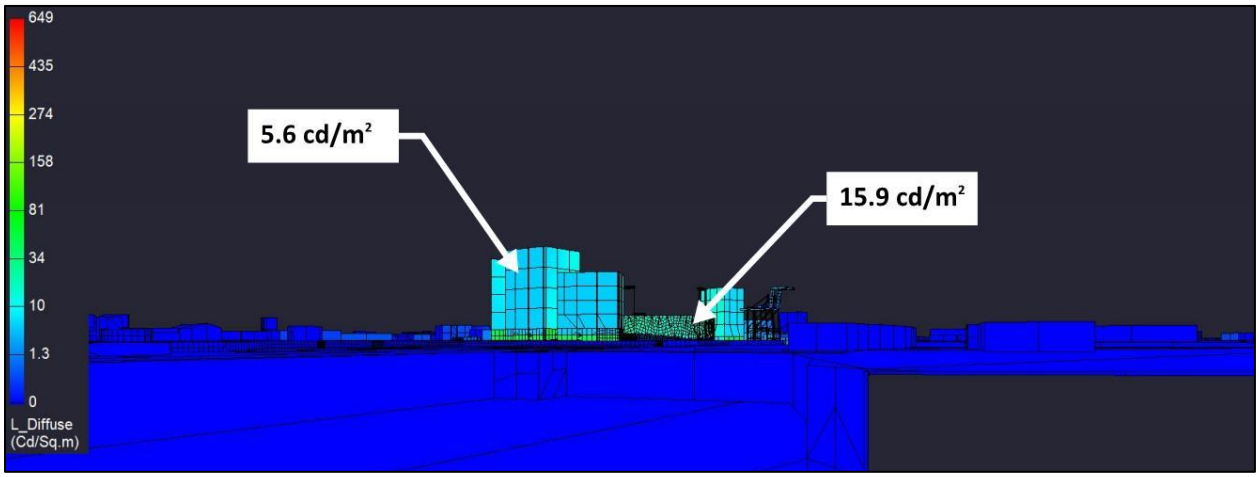


Figure 346: View from Receptor Site 2A for MRA project, Reduced ballpark height, "Phase 1" scenario Game Night lighting condition

Figure 347 provides the anticipated luminances viewed from Receptor Site 2B, which is centered in the turning basin and located 64' above the water line. As shown, based on the ballpark geometry, there is not anticipated to be a direct view of the sports lighting, scoreboard or ribbon boards. The façade luminances from this view **are not** anticipated to exceed threshold.

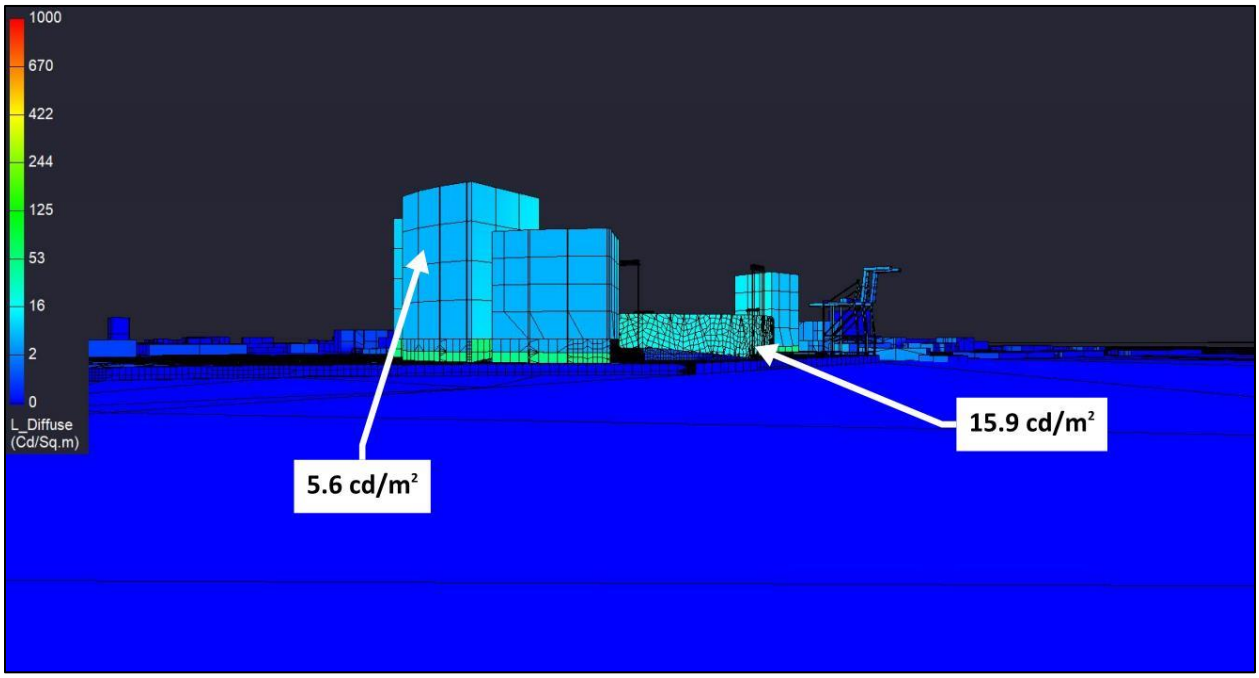


Figure 347: View from Receptor Site 2B for MRA project, Reduced ballpark height, "Phase 1" scenario Game Night lighting condition

Figure 348 provides the anticipated luminances viewed from Receptor Site 2C, which is centered in the turning basin and located 25' above the water line. As shown, based on the ballpark geometry, there is not anticipated to be a direct view of the sports lighting, scoreboard or ribbon boards. The façade luminances from this view **are not** anticipated to exceed threshold.

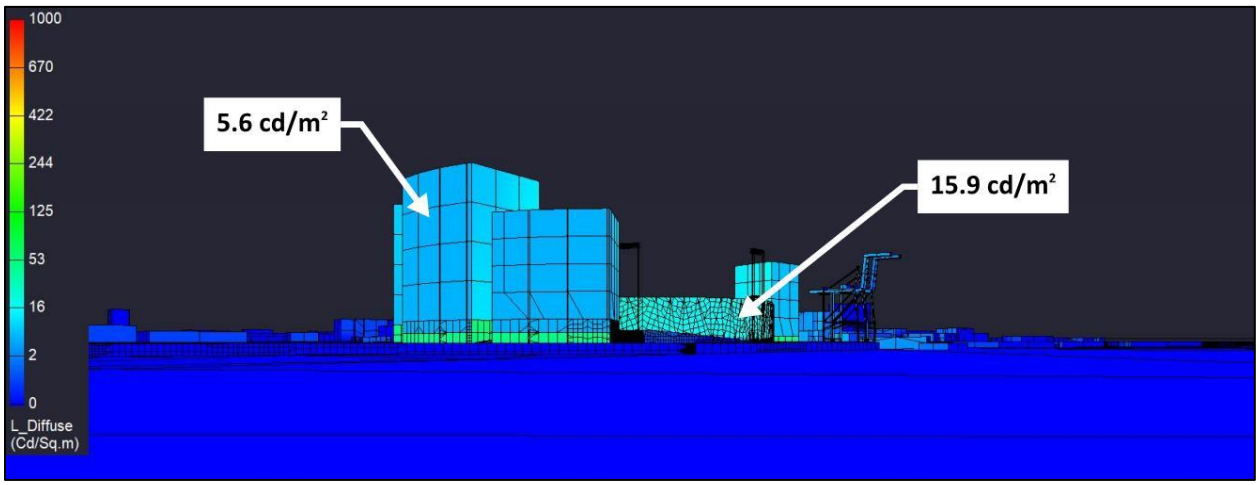


Figure 348: View from Receptor Site 2C for MRA project, Reduced ballpark height, "Phase 1" scenario Game Night lighting condition

Figure 349 provides the anticipated luminances viewed from Receptor Site 3, which is located on Alameda and facing northwest toward the property. From this position, there is a direct line of site to the scoreboard and ribbon boards. Additionally, with the sports field lights shifted from the "halo" configuration to the pole-mounted configuration, increased luminance on the adjacent building facades is expected due to reflection from the roof. Therefore, façade luminances from this view **are** anticipated to exceed threshold and sign luminances from this view **are** anticipated to exceed threshold.

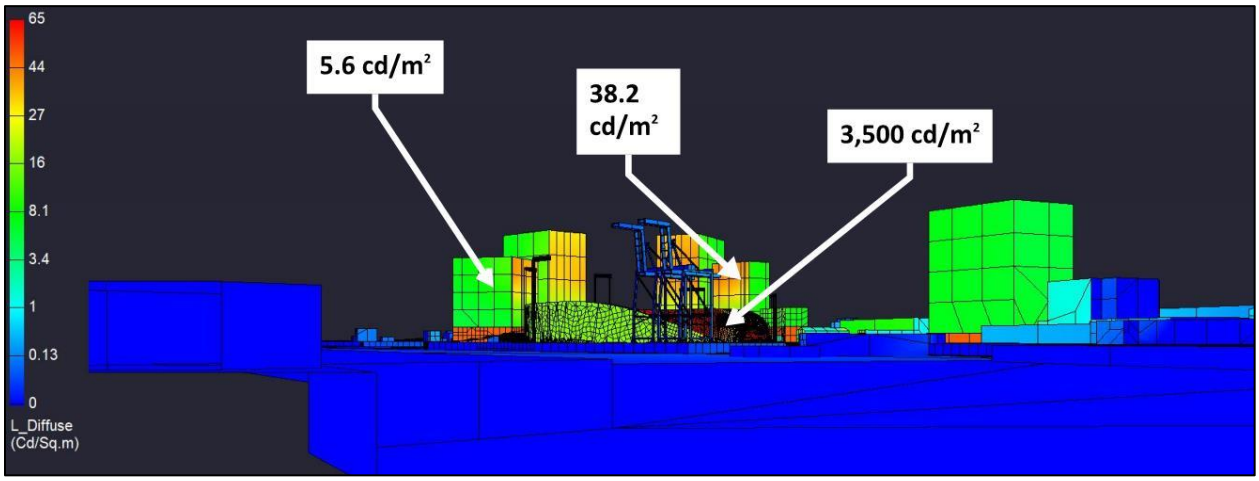


Figure 349: View from Receptor Site 3 for MRA project, Reduced ballpark height, "Phase 1" scenario Game Night lighting condition

Figure 350 provides the view from Receptor Site 4, which is located at the intersection of MLK and Embarcadero. As shown, a small corner of the scoreboard is anticipated to be viewed from this location, which exceed threshold. Façade luminances from this view **are not** anticipated to exceed threshold and sign luminances from this view **are** anticipated to exceed threshold.

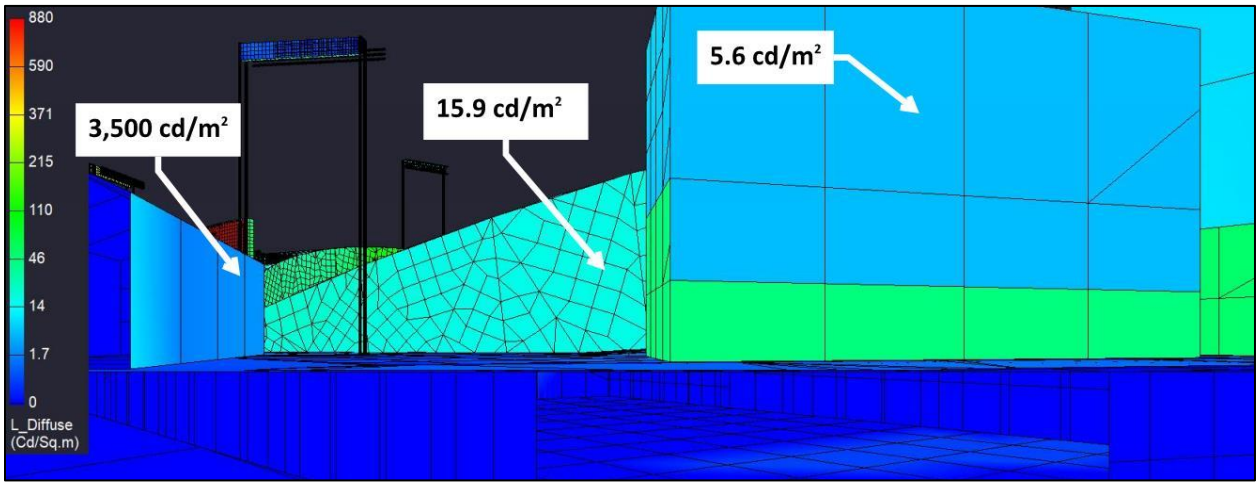


Figure 350: View from Receptor Site 4 for MRA project, Reduced ballpark height, "Phase 1" scenario Game Night lighting condition

Figure 351 provides the anticipated luminances viewed from Receptor Site 5, which is located on Westbound I880. From this view, the infield poles for field lighting are within a direct view. The façade lighting of the adjacent mixed-use development is anticipated to be visible. With the sports field lights shifted from the "halo" configuration to the pole-mounted configuration, increased luminance on the adjacent building facades is expected due to reflection from the roof. Therefore, façade luminances from this view **are** anticipated to exceed threshold and sign luminances from this view **are not** anticipated to exceed threshold.

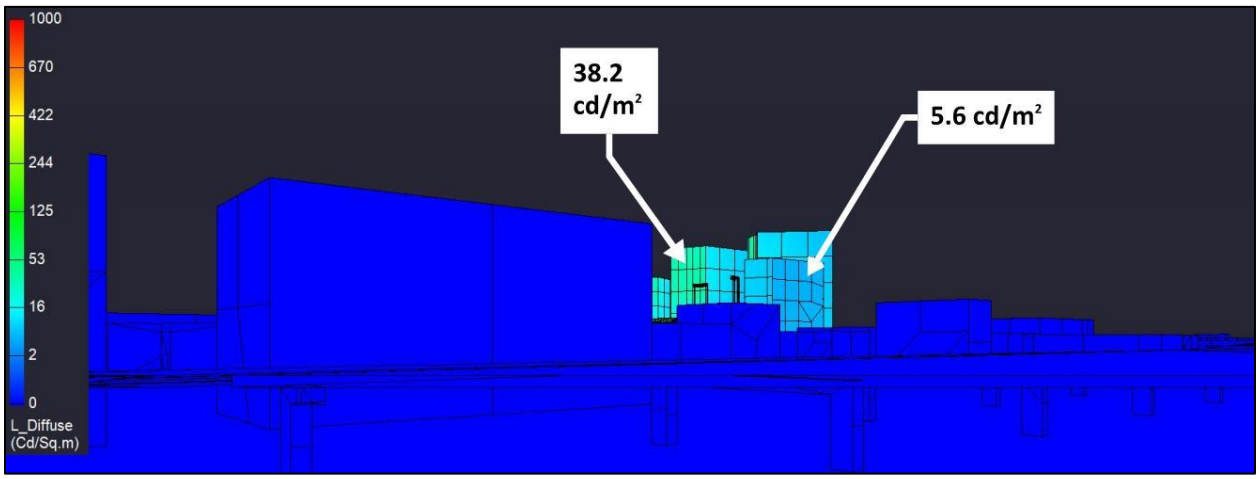


Figure 351: View from Receptor Site 5 for MRA project, Reduced ballpark height, "Phase 1" scenario Game Night lighting condition

Figure 352 provides the anticipated luminances viewed from Receptor Site 5A, which is located on the southwest corner of the roof of the parking garage located at 2nd and Washington. From this elevated position, there is a direct view down into the ballpark, including a direct view of the ribbon boards. With the sports field lights shifted from the "halo" configuration to the pole-mounted configuration, increased luminance on the adjacent building facades is expected due to reflection from the roof. Therefore, façade luminances from this view **are** anticipated to exceed threshold and sign luminances from this view **are** anticipated to exceed threshold.

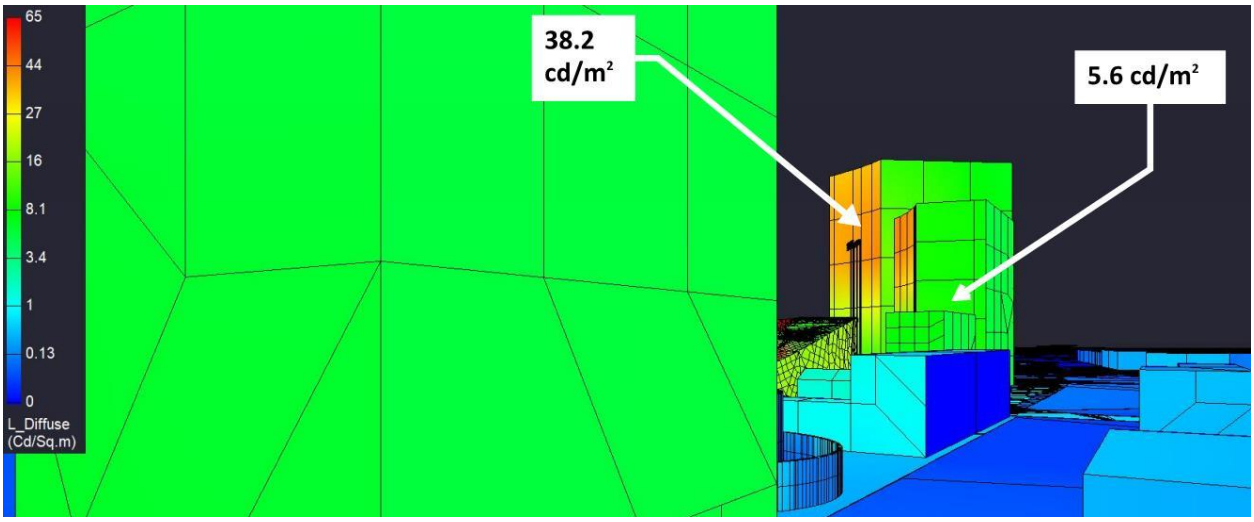


Figure 352: View from Receptor Site 5A for MRA project, Reduced ballpark height, "Phase 1" scenario Game Night lighting condition

Figure 353 provides the anticipated luminances viewed from Receptor Site 6, which is located on the ramp from I980 to eastbound I880. From this perspective, a direct view of the scoreboard, ribbon boards, and infield light poles is anticipated. With the sports field lights shifted from the "halo" configuration to the pole-mounted configuration, increased luminance on the adjacent building facades is expected due to reflection from the roof. Therefore, façade luminances from this view **are** anticipated to exceed threshold and sign luminances from this view **are** anticipated to exceed threshold.

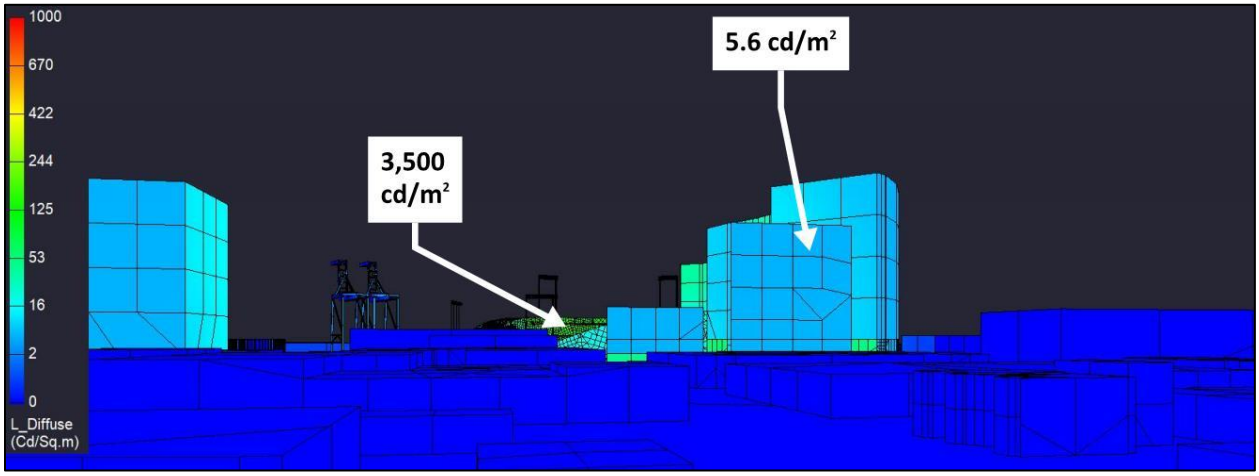


Figure 353: View from Receptor Site 6 for MRA project, Reduced ballpark height, "Phase 1" scenario Game Night lighting condition

Figure 354 provides the anticipated luminances viewed from Receptor Site 6A, which is located at 7th and Brush. From this perspective, there is anticipated to be a minimal view of the scoreboard. With the sports field lights shifted from the "halo" configuration to the pole-mounted configuration, increased luminance on the adjacent building facades is expected due to reflection from the roof. Therefore, façade luminances from this view **are** anticipated to exceed threshold and sign luminances from this view **are** anticipated to exceed threshold.

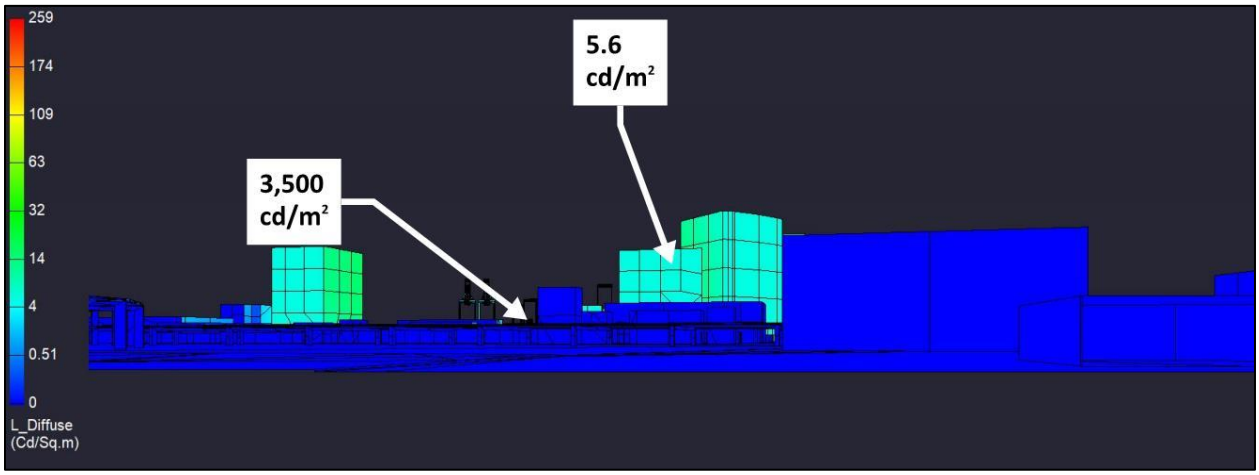


Figure 354: View from Receptor Site 6A for MRA project, Reduced ballpark height, "Phase 1" scenario Game Night lighting condition

9.2.2 "Full Buildout" Scenario

9.2.2.1 Game Nights

As described in section 4.5.8, the Game Night lighting condition is anticipated to include all lighting "on", including sports and house lighting, and included identified signage locations.

9.2.2.1.1 Spill Light

Table 64 provides the calculation results for the spill light assessment at the receptor sites for this condition. As shown, the proposed lighting **is** anticipated to exceed the spill light threshold at Receptor Site 1, which has a direct view of the scoreboard, ribbon boards, and pole-mounted infield sports lights. All other receptor site spill light **is not** anticipated to exceed threshold.

Receptor Site	Spill Light, [lux]	Significant
Receptor Site 1 - Water Street at Clay (Facing Ballpark)	**41.9**	**Yes**
Receptor Site 2 - Inner Harbor Turning Basin @ 190'	1.7	No
Receptor Site 2A - Turning Basin Line-of-Sight	0.5	No
Receptor Site 2B - Inner Harbor Turning Basin @ 64'	1.5	No
Receptor Site 2C - Inner Harbor Turning Basin @ 25'	1.4	No
Receptor Site 3 - Alameda Dock	3.5	No
Receptor Site 4 - MLK at Embarcadero	11.9	No
Receptor Site 5 - I880 Westbound	0.6	No
Receptor Site 5A - 2nd at Washington (Facing Ballpark)	7.8	No
Receptor Site 6 - I980 Ramp to Eastbound I880	2.8	No
Receptor Site 6A - 7th at Brush	0.6	No

Table 64: Spill light at receptor sites for MRA project, Reduced ballpark height, "Full Buildout" scenario Game Night lighting condition. [Note: Threshold of significance is 25 lux]

9.2.2.1.2 Spill Light Map

Figure 355 provides a spill light map for this lighting condition. To generate the spill light map, vertical calculation points were arrayed around the project site at 5'-6" AFG and oriented toward the pitcher's mound for reference. The isoline curves show the extent to which vertical light levels are calculated and are reported in lux. As shown, less than 1 vertical lux is expected in the turning basin. The adjacent estuary is anticipated to experience less than 1 vertical lux generally, with light levels increasing closer to shore. For reference, one 60W incandescent light bulb will generate 1 lux at a distance of approximately 8 meters (26 ft).

Figure 355: Spill light map for MRA project, Reduced ballpark height, "Full Buildout" scenario Game Night lighting condition indicating vertical illuminance isolines

9.2.2.1.3 Glare

Figure 356 and Figure 366 illustrate the luminances anticipated to be observed from the identified receptor sites for this lighting condition. Note that the scale associated with each receptor site view approximately matches the scale used for the associated site's existing conditions HDR falsecolor images. Receptor Sites 1A, 5B, 5C, 7 and 7A have been excluded since the gondola variant is not included in this model. Table 65 summarizes the anticipated glare significance at the receptor sites. Additionally, as noted in Section 4.5.3, the modeled retail lighting is included for pre-curfew times to capture the impact of interior lighting emanating through windows as a conservative contribution to spill light assessment; the modeled luminance, therefore, is an interior luminance and not subject to glare limitations directly.

Receptor Site	Facades		Signage	
	Maximum, [cd/m^2]	Significant	Maximum, [cd/m^2]	Significant
Receptor Site 1 - Water Street at Clay (Facing Ballpark)	39.0	Yes	3,500	Yes
Receptor Site 2 - Inner Harbor Turning Basin @ 190'	15.9	No	n/a	n/a
Receptor Site 2A - Turning Basin Line-of-Sight	15.9	No	n/a	n/a
Receptor Site 2B - Inner Harbor Turning Basin @ 64'	15.9	No	n/a	n/a
Receptor Site 2C - Inner Harbor Turning Basin @ 25'	15.9	No	n/a	n/a
Receptor Site 3 - Alameda Dock	39.0	Yes	3,500	Yes
Receptor Site 4 - MLK at Embarcadero	15.9	No	3,500	Yes
Receptor Site 5 - I880 Westbound	39.0	Yes	n/a	n/a
Receptor Site 5A - 2nd at Washington (Facing Ballpark)	39.0	Yes	3,500	Yes
Receptor Site 6 - I980 Ramp to Eastbound I880	39.0	Yes	3,500	Yes
Receptor Site 6A - 7th at Brush	39.0	Yes	3,500	Yes

Table 65: Summary of anticipated glare significance at receptor sites for the MRA project, Reduced ballpark height, "Full Buildout" scenario Game Night lighting conditions. [Note: Threshold of significance is 25 cd/m^2 for façade lighting and 1,000 cd/m^2 for digital signage]

Figure 356 shows the anticipated luminances viewed from Receptor Site 1, which is one of the closest receptor sites. As seen, from this perspective, there is a direct view of the field lighting and scoreboard/ribbon boards. Additionally, with the sports field lights shifted from the "halo" configuration to the pole-mounted configuration, increased luminance on the adjacent building facades is expected due to reflection from the roof. Therefore, façade luminances from this view **are** anticipated to exceed threshold and sign luminances from this view **are** anticipated to exceed threshold.

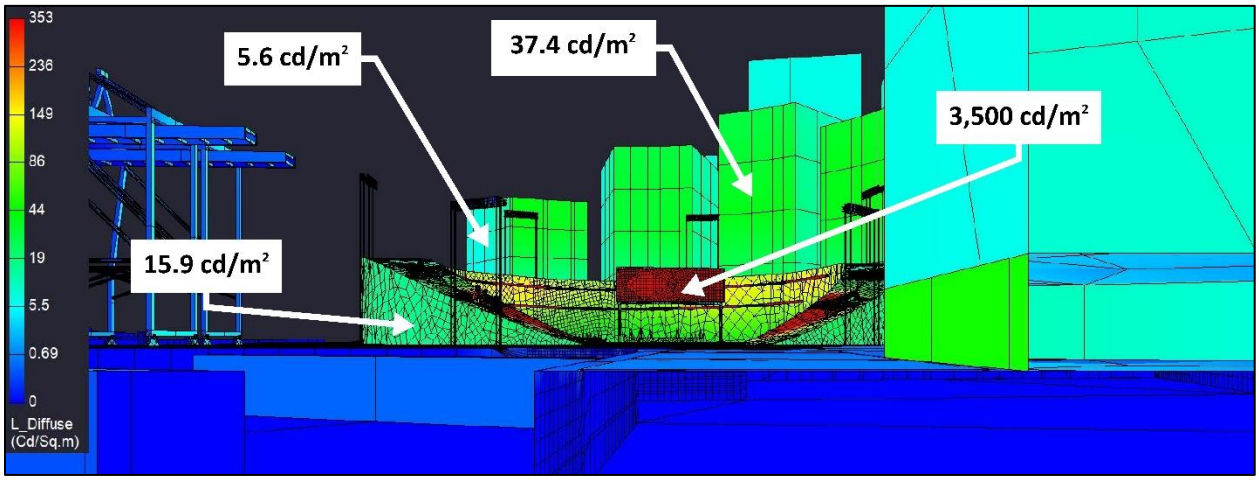


Figure 356: View from Receptor Site 1 for MRA project, Reduced ballpark height, "Full Buildout" scenario Game Night lighting condition

Figure 357 provides the anticipated luminances viewed from Receptor Site 2, which is centered in the turning basin and located 190' above the water line. As shown, based on the ballpark geometry, there is not anticipated to be a direct view of the field luminaires, significantly reducing the observed brightnesses in the field of view. Refer to further discussion on this topic in section 6.2.1 above. The façade luminances from this view **are not** anticipated to exceed threshold.

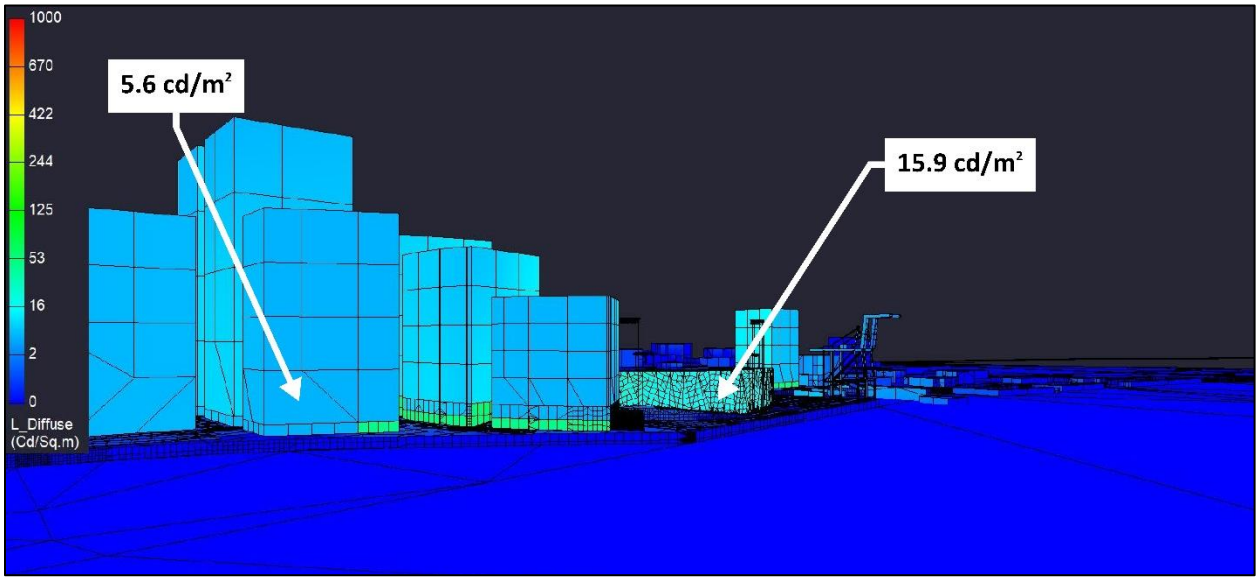


Figure 357: View from Receptor Site 2 for MRA project, Reduced ballpark height, "Full Buildout" scenario Game Night lighting condition

Figure 358 provides the anticipated luminances viewed from Receptor Site 2A, which is on Alameda with a direct line of site through the center of the turning basin. Luminances from this view **are not** anticipated to exceed threshold.

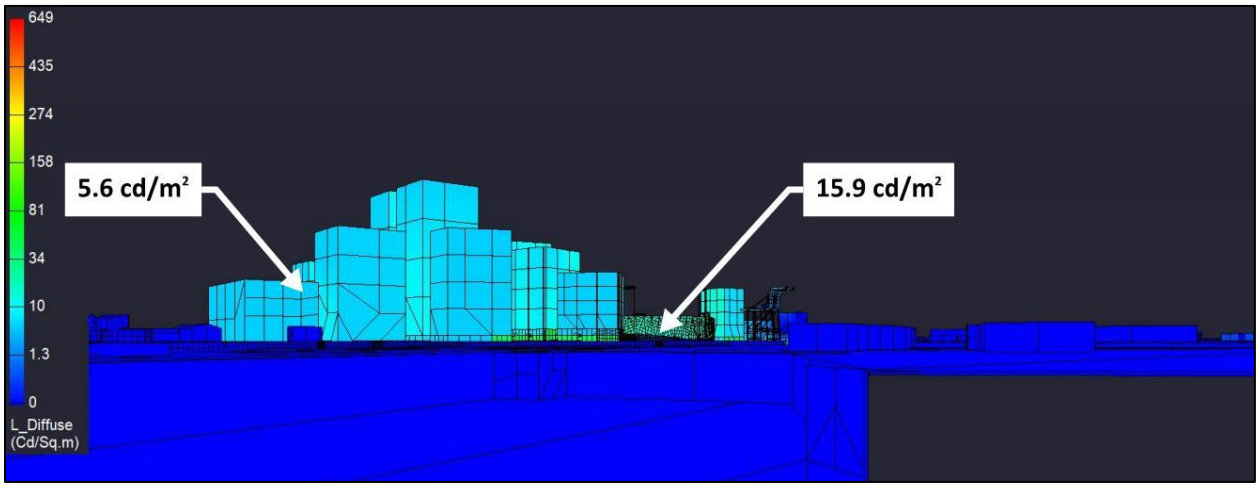


Figure 358: View from Receptor Site 2A for MRA project, Reduced ballpark height, "Full Buildout" scenario Game Night lighting condition

Figure 359 provides the anticipated luminances viewed from Receptor Site 2B, which is centered in the turning basin and located 64' above the water line. As shown, based on the ballpark geometry, there is not anticipated to be a direct view of the sports lighting, scoreboard or ribbon boards. The façade luminances from this view **are not** anticipated to exceed threshold.

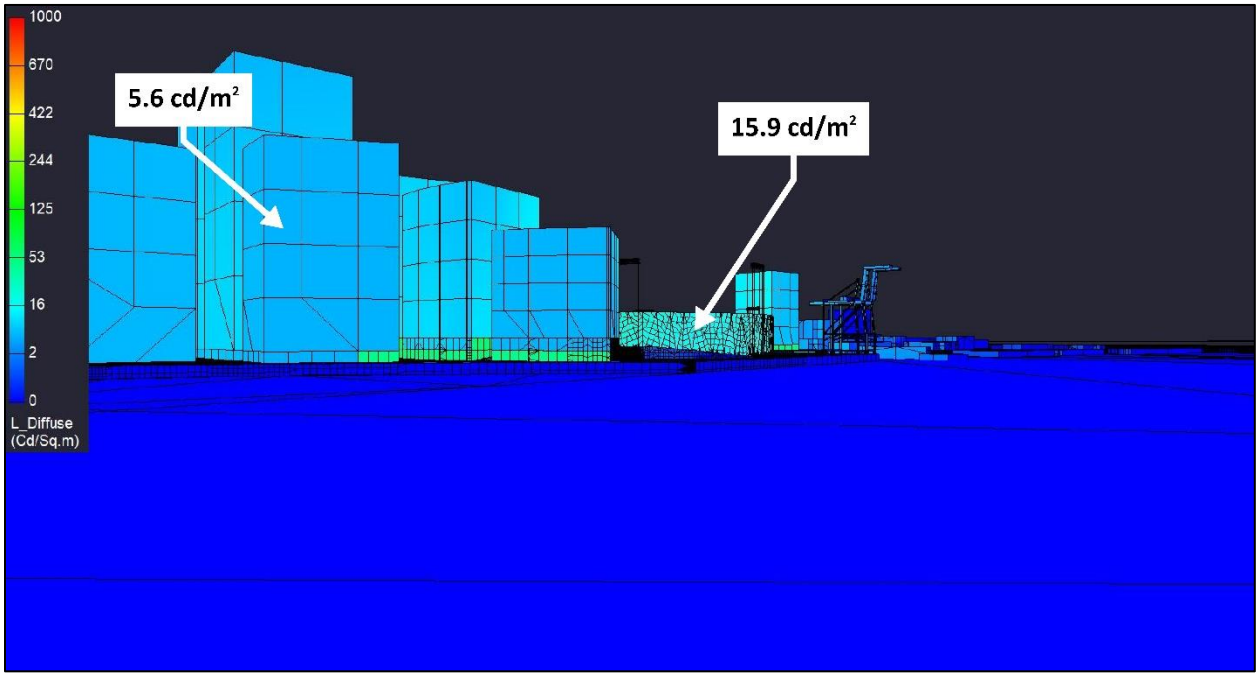


Figure 359: View from Receptor Site 2B for MRA project, Reduced ballpark height, "Full Buildout" scenario Game Night lighting condition

Figure 360 provides the anticipated luminances viewed from Receptor Site 2C, which is centered in the turning basin and located 25' above the water line. As shown, based on the ballpark geometry, there is not anticipated to be a direct view of the sports lighting, scoreboard or ribbon boards. The façade luminances from this view **are not** anticipated to exceed threshold.

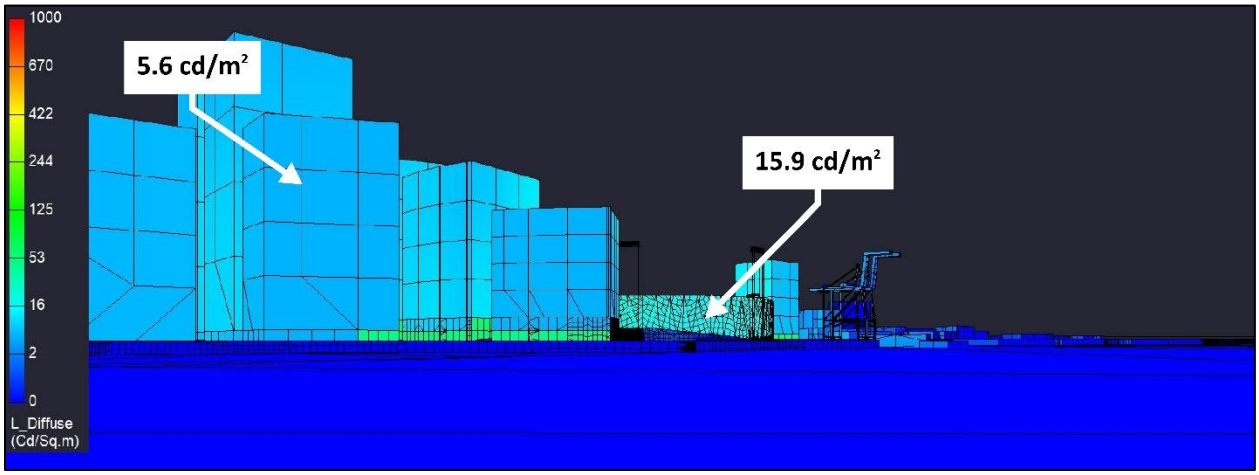


Figure 360: View from Receptor Site 2C for MRA project, Reduced ballpark height, "Full Buildout" scenario Game Night lighting condition

Figure 361 provides the anticipated luminances viewed from Receptor Site 3, which is located on Alameda and facing northwest toward the property. From this position, there is a direct line of site to the scoreboard and ribbon boards. Additionally, with the sports field lights shifted from the "halo" configuration to the pole-mounted configuration, increased luminance on the adjacent building facades is expected due to reflection from the roof. Therefore, façade luminances from this view **are** anticipated to exceed threshold and sign luminances from this view **are** anticipated to exceed threshold.

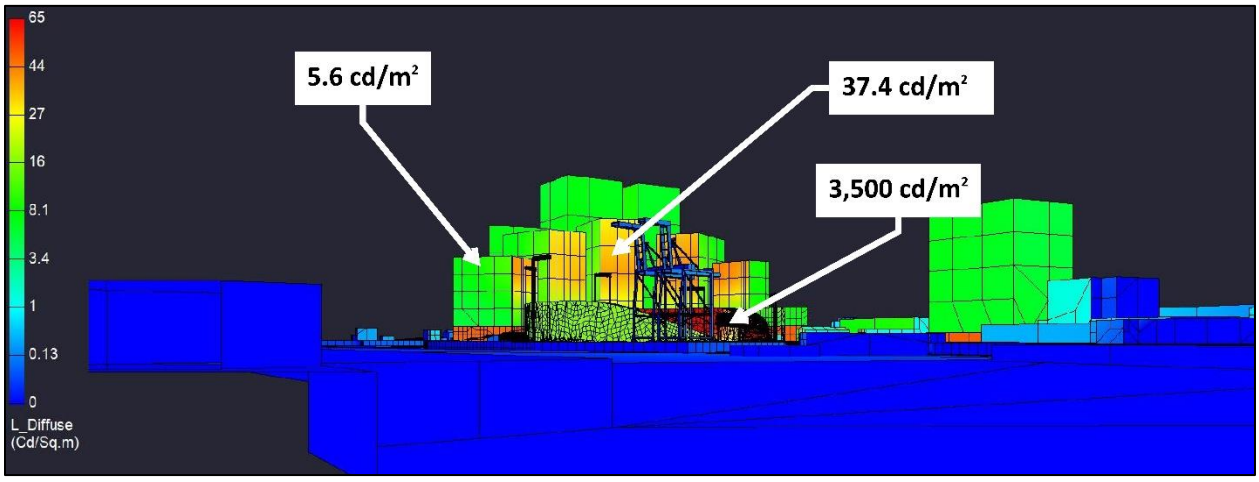


Figure 361: View from Receptor Site 3 for MRA project, Reduced ballpark height, "Full Buildout" scenario Game Night lighting condition

Figure 362 provides the view from Receptor Site 4, which is located at the intersection of MLK and Embarcadero. As shown, a small corner of the scoreboard is anticipated to be viewed from this location, which exceed threshold. Façade luminances from this view **are not** anticipated to exceed threshold and sign luminances from this view **are** anticipated to exceed threshold.

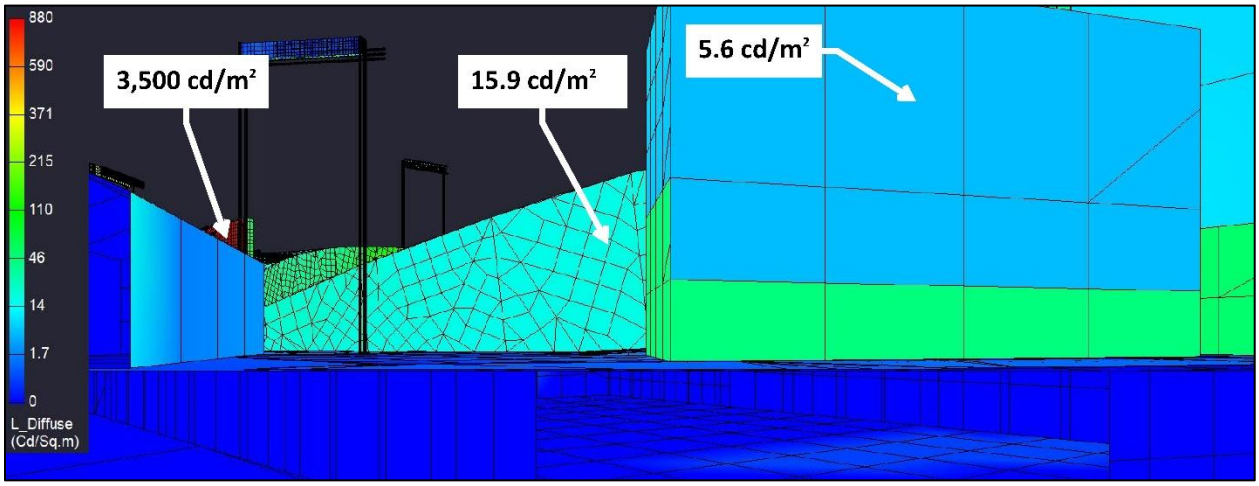


Figure 362: View from Receptor Site 4 for MRA project, Reduced ballpark height, "Full Buildout" scenario Game Night lighting condition

Figure 363 provides the anticipated luminances viewed from Receptor Site 5, which is located on Westbound I880. From this view, the infield poles for field lighting are within a direct view. The façade lighting of the adjacent mixed-use development is anticipated to be visible. With the sports field lights shifted from the "halo" configuration to the pole-mounted configuration, increased luminance on the adjacent building facades is expected due to reflection from the roof. Therefore, façade luminances from this view **are** anticipated to exceed threshold and sign luminances from this view **are not** anticipated to exceed threshold.

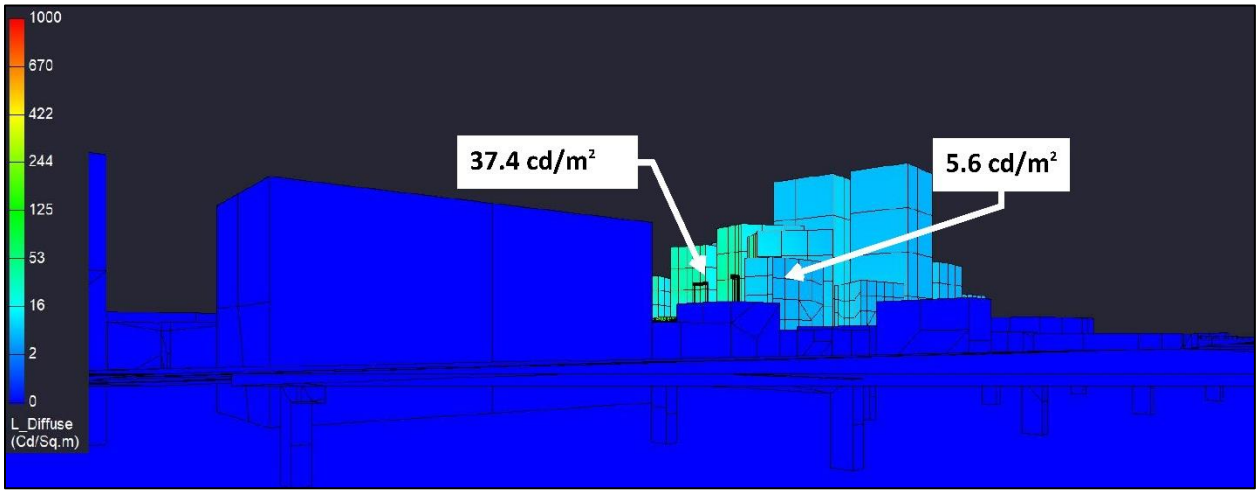


Figure 363: View from Receptor Site 5 for MRA project, Reduced ballpark height, "Full Buildout" scenario Game Night lighting condition

Figure 364 provides the anticipated luminances viewed from Receptor Site 5A, which is located on the southwest corner of the roof of the parking garage located at 2nd and Washington. From this elevated position, there is a direct view down into the ballpark, including a direct view of the ribbon boards. With the sports field lights shifted from the "halo" configuration to the pole-mounted configuration, increased luminance on the adjacent building facades is expected due to reflection from the roof. Therefore, façade luminances from this view **are** anticipated to exceed threshold and sign luminances from this view **are** anticipated to exceed threshold.

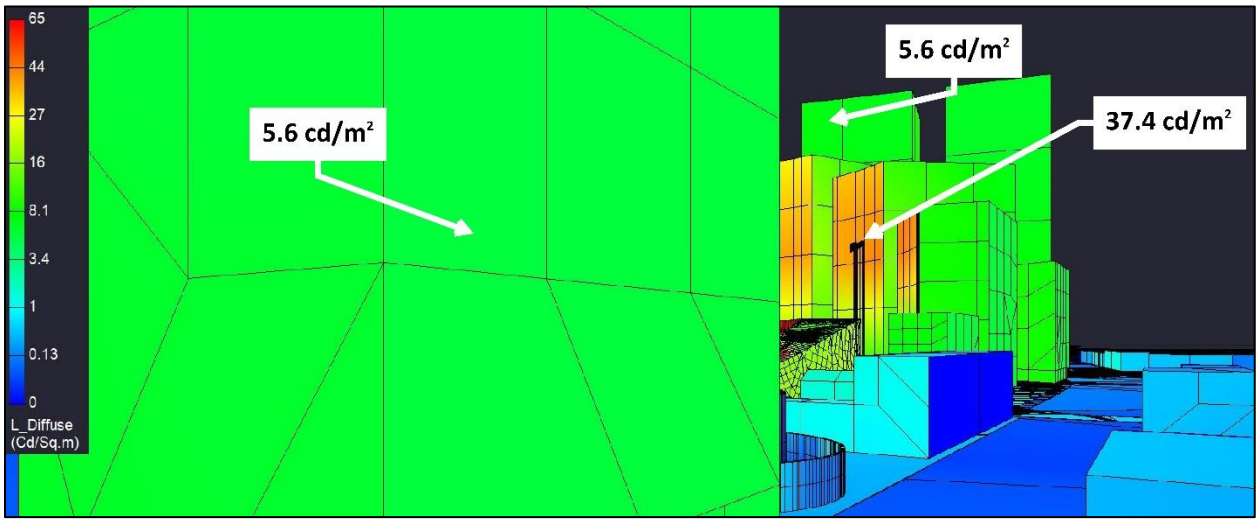


Figure 364: View from Receptor Site 5A for MRA project, Reduced ballpark height, "Full Buildout" scenario Game Night lighting condition

Figure 365 provides the anticipated luminances viewed from Receptor Site 6, which is located on the ramp from I980 to eastbound I880. From this perspective, a direct view of the scoreboard, ribbon boards, and infield light poles is anticipated. With the sports field lights shifted from the "halo" configuration to the pole-mounted configuration, increased luminance on the adjacent building facades is expected due to reflection from the roof. Therefore, façade luminances from this view **are** anticipated to exceed threshold and sign luminances from this view **are** anticipated to exceed threshold.

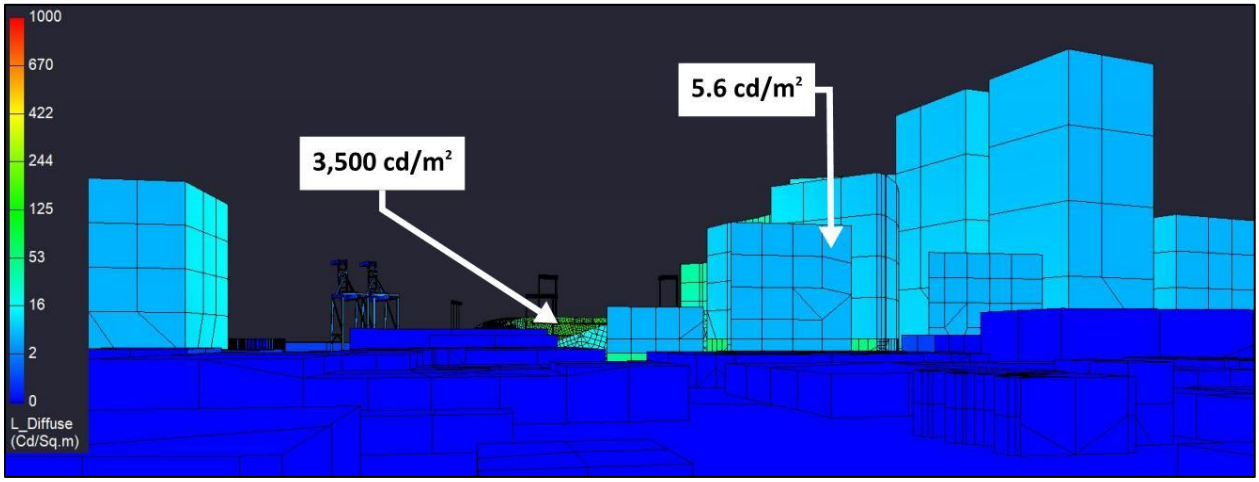


Figure 365: View from Receptor Site 6 for MRA project, Reduced ballpark height, "Full Buildout" scenario Game Night lighting condition

Figure 366 provides the anticipated luminances viewed from Receptor Site 6A, which is located at 7th and Brush. From this perspective, there is anticipated to be a minimal view of the scoreboard. With the sports field lights shifted from the "halo" configuration to the pole-mounted configuration, increased luminance on the adjacent building facades is expected due to reflection from the roof. Therefore, façade luminances from this view **are** anticipated to exceed threshold and sign luminances from this view **are** anticipated to exceed threshold.

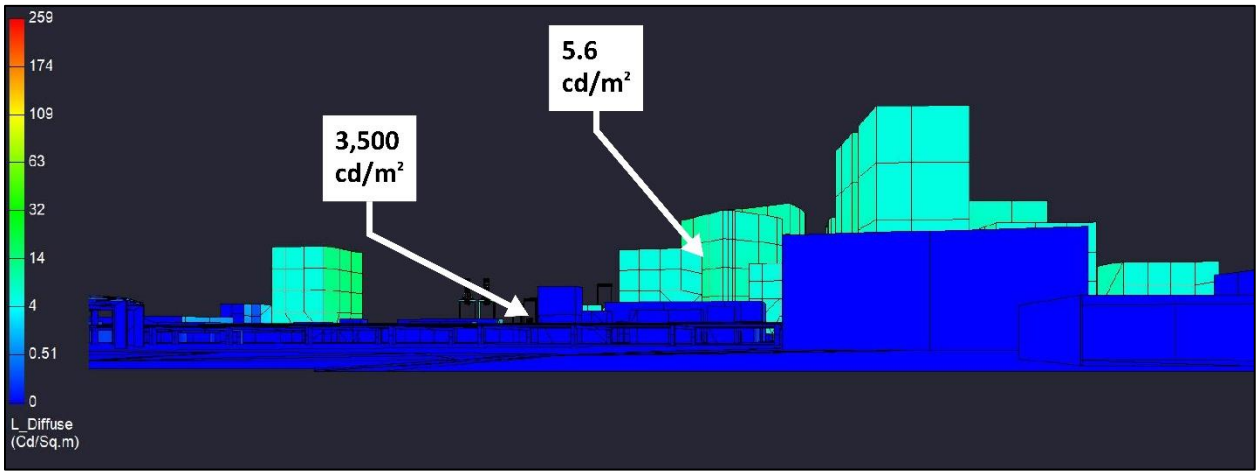


Figure 366: View from Receptor Site 6A for MRA project, Reduced ballpark height, "Full Buildout" scenario Game Night lighting condition

9.3 Project Design Option – Rotated Ballpark

The second set of analysis includes the project design option of the rotated ballpark within the MRA project and does not include the gondola variant.

9.3.1 "Phase 1" Scenario

Per the project description included in section 3.1, the "Phase 1" scenario includes the ballpark, site development immediately adjacent, and a select number of accessory buildings. The bulk of the remaining site is anticipated to be temporary surface parking.

9.3.1.1 Game Nights

As described in section 4.5.8, the Game Night lighting condition is anticipated to include all lighting "on", including sports and house lighting, and included identified signage locations.

9.3.1.1.1 Spill Light

Table 66 provides the calculation results for the spill light assessment at the receptor sites for this condition. As shown, the proposed lighting **is** anticipated to exceed the spill light threshold at Receptor Site 1 which has a direct view of the scoreboard, ribbon boards, and pole-mounted infield sports lights. All other receptor site spill light **is not** anticipated to exceed threshold.

Receptor Site	Spill Light, [lux]	Significant
Receptor Site 1 - Water Street at Clay (Facing Ballpark)	**42.00**	Yes
Receptor Site 2 - Inner Harbor Turning Basin @ 190'	0.20	No
Receptor Site 2A - Turning Basin Line-of-Sight	0.90	No
Receptor Site 2B - Inner Harbor Turning Basin @ 64'	0.30	No
Receptor Site 2C - Inner Harbor Turning Basin @ 25'	0.90	No
Receptor Site 3 - Alameda Dock	0.80	No
Receptor Site 4 - MLK at Embarcadero	3.10	No
Receptor Site 5 - I880 Westbound	8.20	No
Receptor Site 5A - 2nd at Washington (Facing Ballpark)	0.20	No
Receptor Site 6 - I980 Ramp to Eastbound I880	7.20	No
Receptor Site 6A - 7th at Brush	0.30	No

Table 66: Spill light at receptor sites for MRA project, Rotated Ballpark design option, "Phase 1" scenario Game Night lighting condition. [Note: Threshold of significance is 25 lux]

9.3.1.1.2 Spill Light Map

Figure 367 provides a spill light map for this lighting condition. To generate the spill light map, vertical calculation points were arrayed around the project site at 5'-6" AFG and oriented toward the pitcher's mound for reference. The isoline curves show the extent to which vertical light levels are calculated and are reported in lux. As shown, less than 1 vertical lux is expected in the turning basin. The adjacent estuary is anticipated to experience less than 1 vertical lux generally, with light levels increasing closer to shore. For reference, one 60W incandescent light bulb will generate 1 lux at a distance of approximately 8 meters (26 ft).

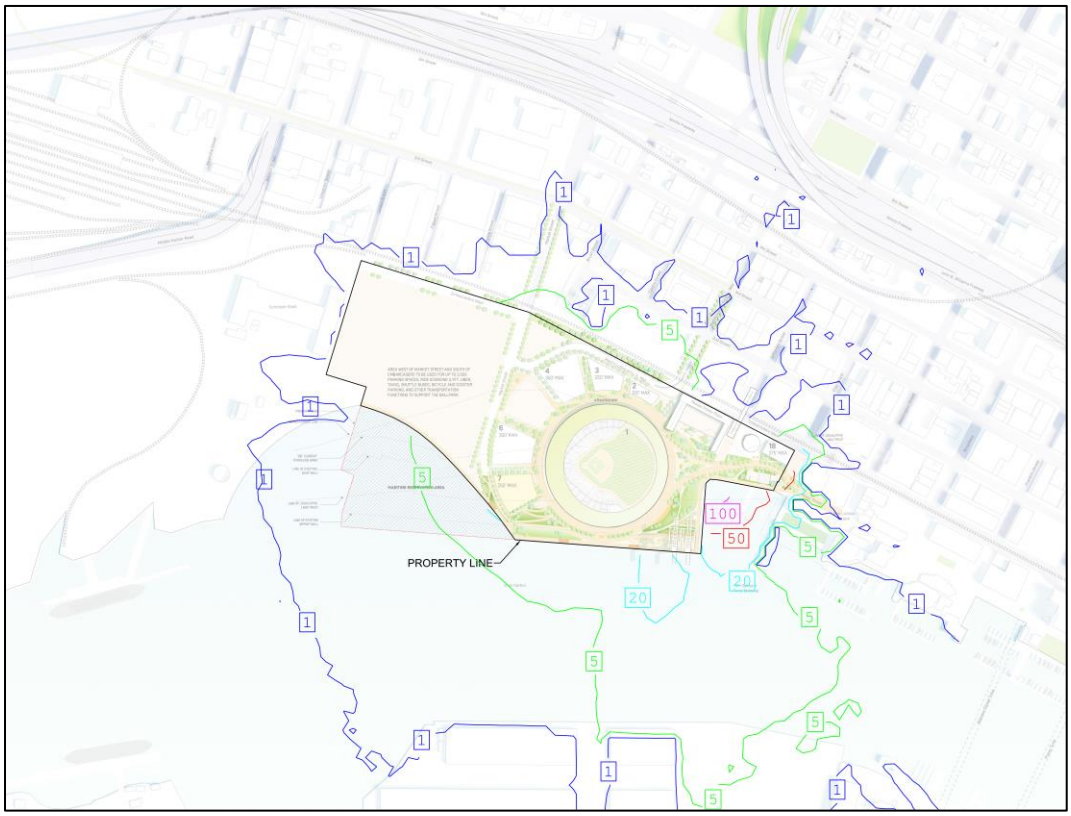


Figure 367: Spill light map for MRA project, Rotated Ballpark design option, "Phase 1" scenario Game Night lighting condition indicating vertical illuminance isolines

9.3.1.1.3 Glare

Figure 368 through Figure 378 illustrate the luminances anticipated to be observed from the identified receptor sites for this lighting condition. Note that the scale associated with each receptor site view approximately matches the scale used for the associated site's existing conditions HDR falsecolor images. Receptor Sites 1A, 5B, 5C, 7 and 7A have been excluded since the gondola variant is not included in this model. Table 67 summarizes the anticipated glare significance at the receptor sites. Additionally, as noted in Section 4.5.3, the modeled retail lighting is included for pre-curfew times to capture the impact of interior lighting emanating through windows as a conservative contribution to spill light assessment; the modeled luminance, therefore, is an interior luminance and not subject to glare limitations directly.

Receptor Site	Facades		Signage	
	Maximum, [cd/m^2]	Significant	Maximum, [cd/m^2]	Significant
Receptor Site 1 - Water Street at Clay (Facing Ballpark)	31.8	Yes	3,500	Yes
Receptor Site 2 - Inner Harbor Turning Basin @ 190'	15.9	No	n/a	n/a
Receptor Site 2A - Turning Basin Line-of-Sight	15.9	No	n/a	n/a
Receptor Site 2B - Inner Harbor Turning Basin @ 64'	15.9	No	n/a	n/a
Receptor Site 2C - Inner Harbor Turning Basin @ 25'	15.9	No	n/a	n/a
Receptor Site 3 - Alameda Dock	31.8	Yes	3,500	Yes
Receptor Site 4 - MLK at Embarcadero	15.9	No	n/a	n/a
Receptor Site 5 - I880 Westbound	31.8	Yes	n/a	n/a
Receptor Site 5A - 2nd at Washington (Facing Ballpark)	31.8	Yes	n/a	n/a
Receptor Site 6 - I980 Ramp to Eastbound I880	15.9	No	n/a	n/a
Receptor Site 6A - 7th at Brush	15.9	No	n/a	n/a

Table 67: Summary of anticipated glare significance at receptor sites for the MRA project, Rotated Ballpark design option, "Phase 1" scenario Game Night lighting conditions. [Note: Threshold of significance is 25 cd/m^2 for façade lighting and 1,000 cd/m^2 for digital signage]

Figure 368 shows the anticipated luminances viewed from Receptor Site 1, which is one of the closest receptor sites. As seen, from this perspective, there is a direct view of the digital display. Additionally, with the sports field lights shifted from the "halo" configuration to the pole-mounted configuration, increased luminance on the adjacent building facades is expected due to reflection from the roof. Therefore, façade luminances from this view **are** anticipated to exceed threshold and sign luminances from this view **are** anticipated to exceed threshold.

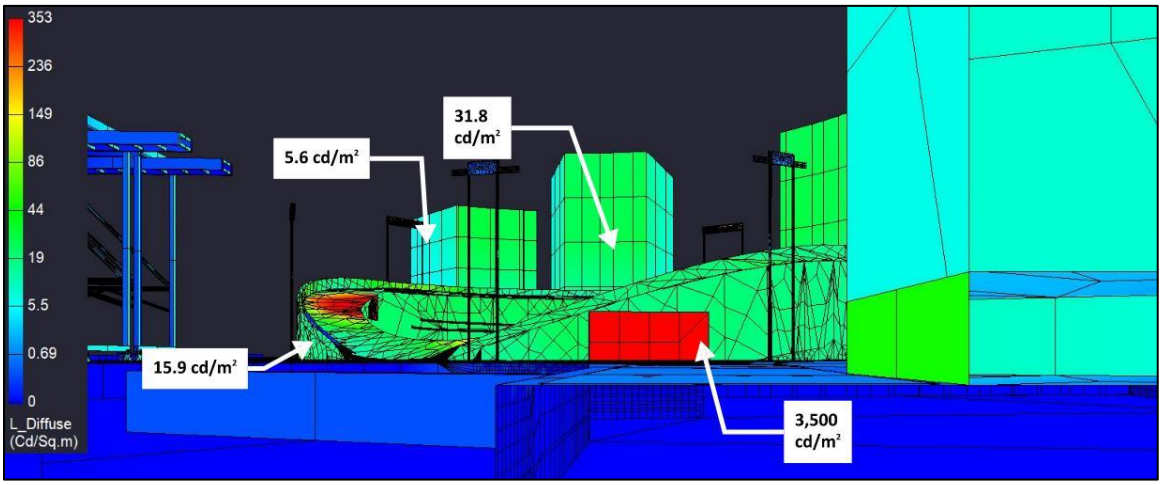


Figure 368: View from Receptor Site 1 for MRA project, Rotated Ballpark design option, "Phase 1" scenario Game Night lighting condition

Figure 369 provides the anticipated luminances viewed from Receptor Site 2, which is centered in the turning basin and located 190' above the water line. As shown, based on the ballpark geometry, there is not anticipated to be a direct view of the digital display. Luminances from this view **are not** anticipated to exceed threshold.

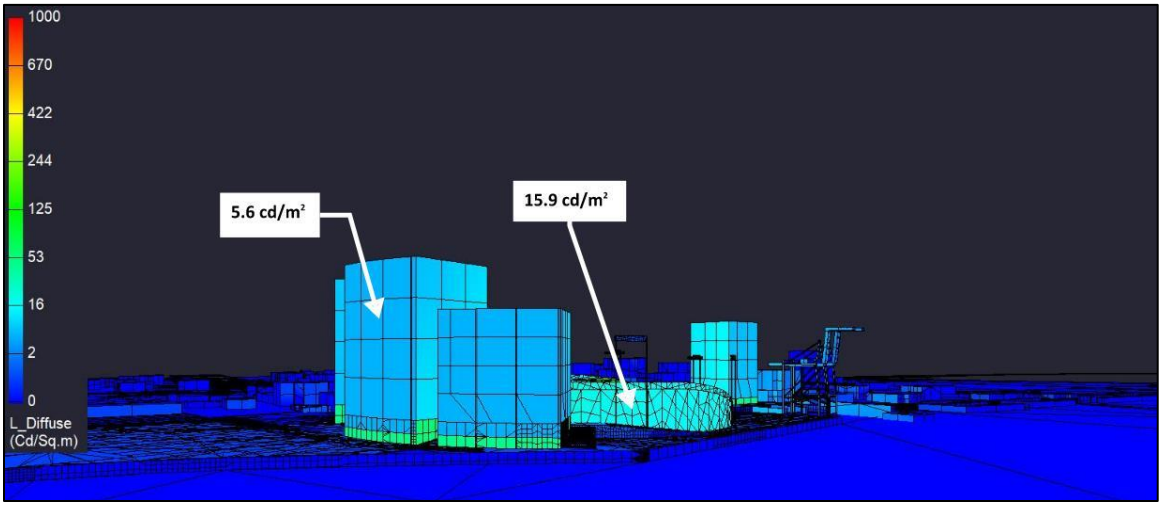


Figure 369: View from Receptor Site 2 for MRA project, Rotated Ballpark design option, "Phase 1" scenario Game Night lighting condition

Figure 370 provides the anticipated luminances viewed from Receptor Site 2A, which is on Alameda with a direct line of site through the center of the turning basin. Luminances from this view **are not** anticipated to exceed threshold.

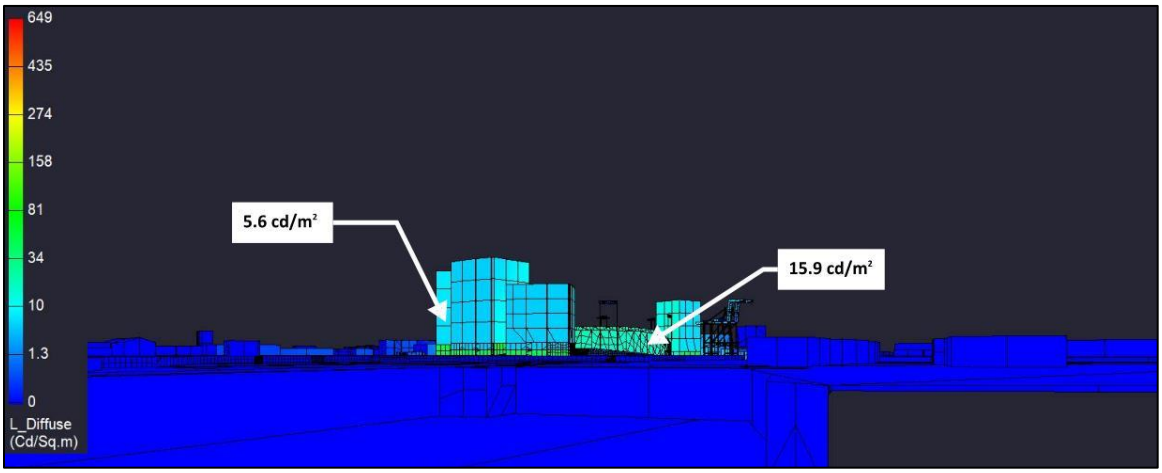


Figure 370: View from Receptor Site 2A for MRA project, Rotated Ballpark design option, "Phase 1" scenario Game Night lighting condition

Figure 371 provides the anticipated luminances viewed from Receptor Site 2B, which is centered in the turning basin and located 64' above the water line. As shown, based on the ballpark geometry, there is not anticipated to be a direct view of the digital display. Luminances from this view **are not** anticipated to exceed threshold.

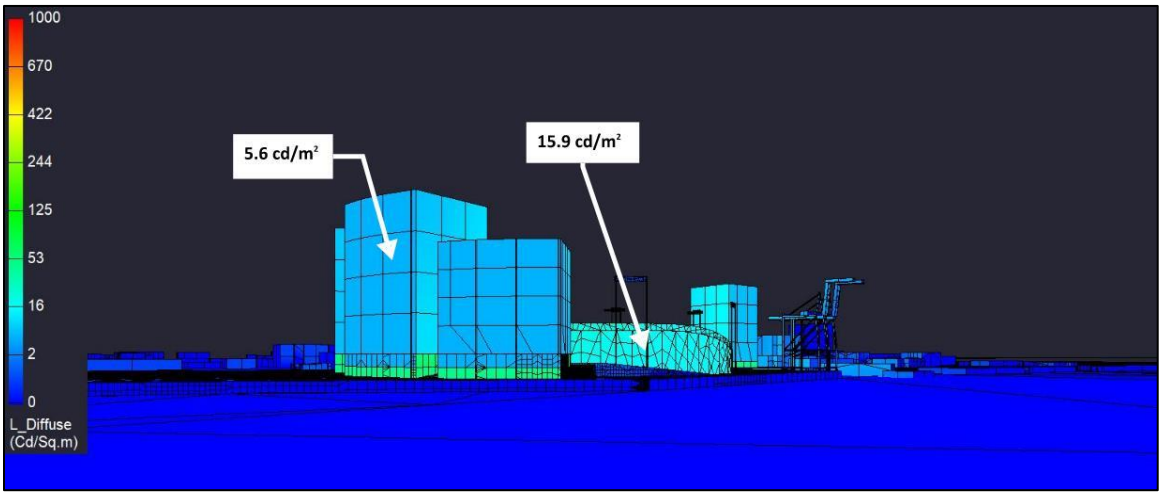


Figure 371: View from Receptor Site 2B for MRA project, Rotated Ballpark design option, "Phase 1" scenario Game Night lighting condition

Figure 372 provides the anticipated luminances viewed from Receptor Site 2C, which is centered in the turning basin and located 25’ above the water line. As shown, based on the ballpark geometry, there is not anticipated to be a direct view of the digital display. Luminances from this view **<u>are not</u>** anticipated to exceed threshold.

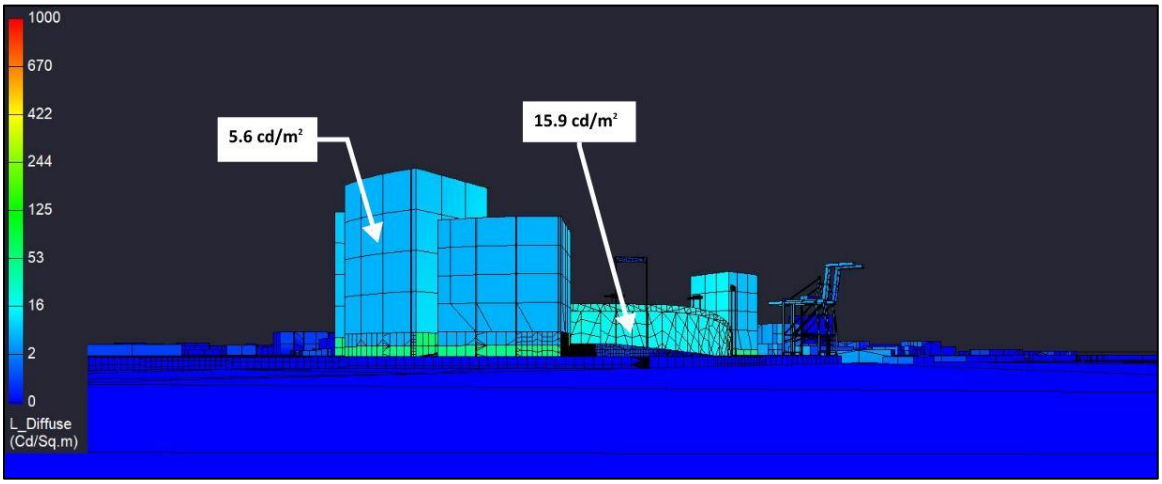


Figure 372: View from Receptor Site 2C for MRA project, Rotated Ballpark design option, “Phase 1” scenario Game Night lighting condition

Figure 373 provides the anticipated luminances viewed from Receptor Site 3, which is located on Alameda and facing northwest toward the property. From this position, there is a direct line of site to the digital displays. Additionally, with the sports field lights shifted from the “halo” configuration to the pole-mounted configuration, increased luminance on the adjacent building facades is expected due to reflection from the roof. Therefore, façade luminances from this view **<u>are</u>** anticipated to exceed threshold and sign luminances from this view **<u>are</u>** anticipated to exceed threshold.

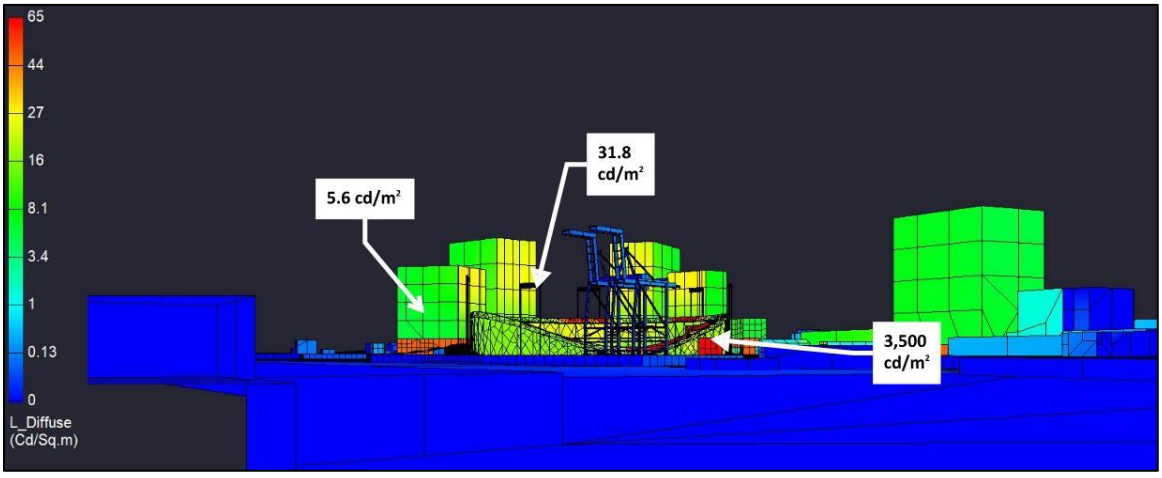


Figure 373: View from Receptor Site 3 for MRA project, Rotated Ballpark design option, “Phase 1” scenario Game Night lighting condition

Figure 374 provides the view from Receptor Site 4, which is located at the intersection of MLK and Embarcadero. Luminances from this view **are not** anticipated to exceed threshold.

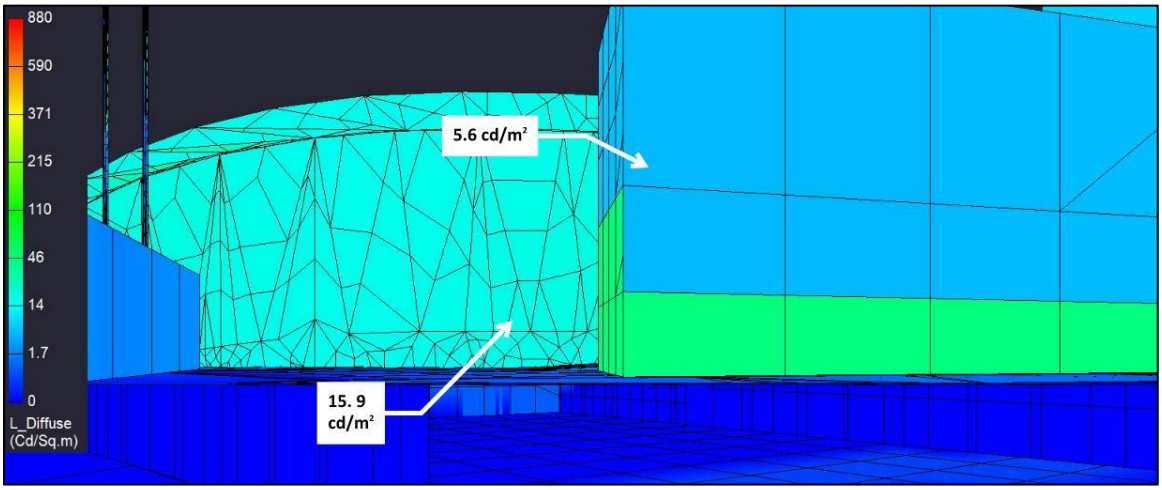


Figure 374: View from Receptor Site 4 for MRA project, Rotated Ballpark design option, "Phase 1" scenario Game Night lighting condition

Figure 375 provides the anticipated luminances viewed from Receptor Site 5, which is located on Westbound I880. With the sports field lights shifted from the "halo" configuration to the pole-mounted configuration, increased luminance on the adjacent building facades is expected due to reflection from the roof. Therefore, façade luminances from this view **are** anticipated to exceed threshold and sign luminances from this view **are not** anticipated to exceed threshold.

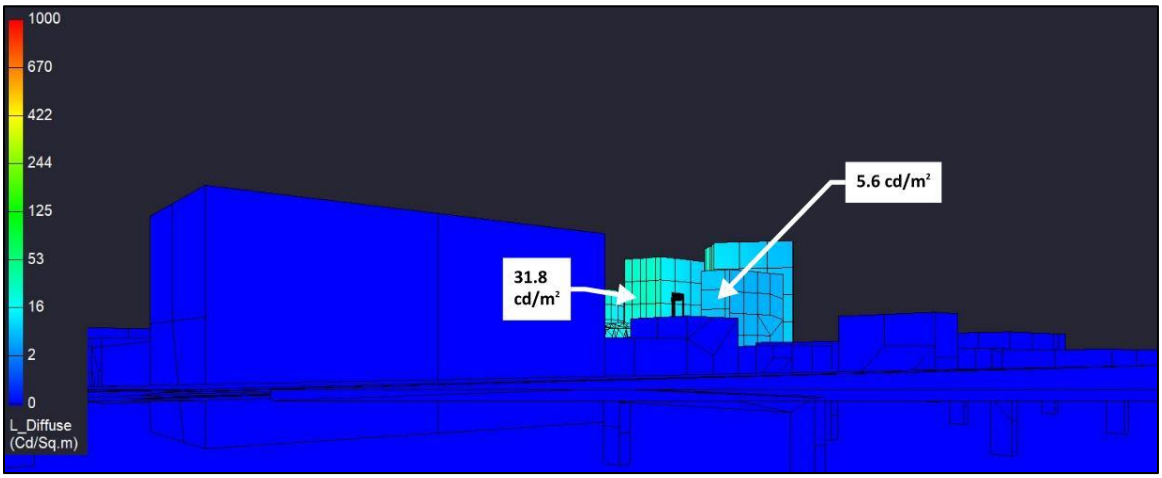


Figure 375: View from Receptor Site 5 for MRA project, Rotated Ballpark design option, "Phase 1" scenario Game Night lighting condition

Figure 376 provides the anticipated luminances viewed from Receptor Site 5A, which is located on the southwest corner of the roof of the parking garage located at 2nd and Washington. With the sports field lights shifted from the "halo" configuration to the pole-mounted configuration, increased luminance on the adjacent building facades is expected due to reflection from the roof. Therefore, façade luminances from this view **are** anticipated to exceed threshold and sign luminances from this view **are not** anticipated to exceed threshold.

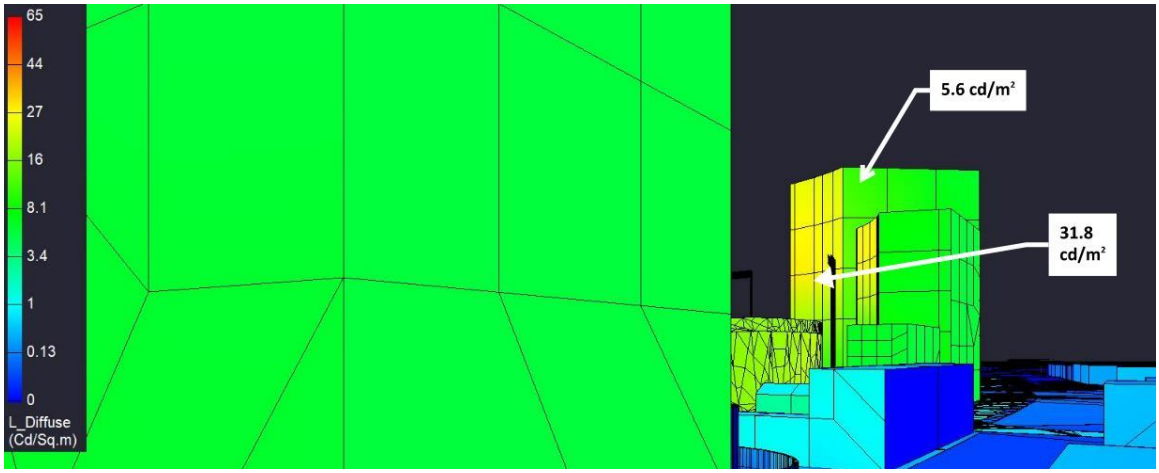


Figure 376: View from Receptor Site 5A for MRA project, Rotated Ballpark design option "Phase 1" scenario Game Night lighting condition

Figure 377 provides the anticipated luminances viewed from Receptor Site 6, which is located on the ramp from I980 to eastbound I880. Luminances from this view **are not** anticipated to exceed threshold.

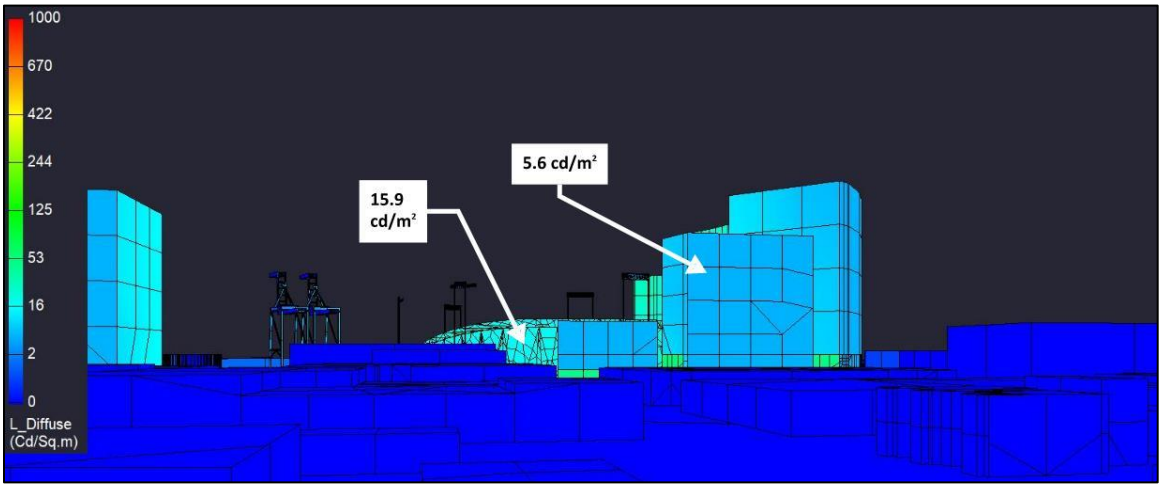


Figure 377: View from Receptor Site 6 for MRA project, Rotated Ballpark design option, "Phase 1" scenario Game Night lighting condition

Figure 378 provides the anticipated luminances viewed from Receptor Site 6A, which is located at 7th and Brush. Luminances from this view **are not** anticipated to exceed threshold.

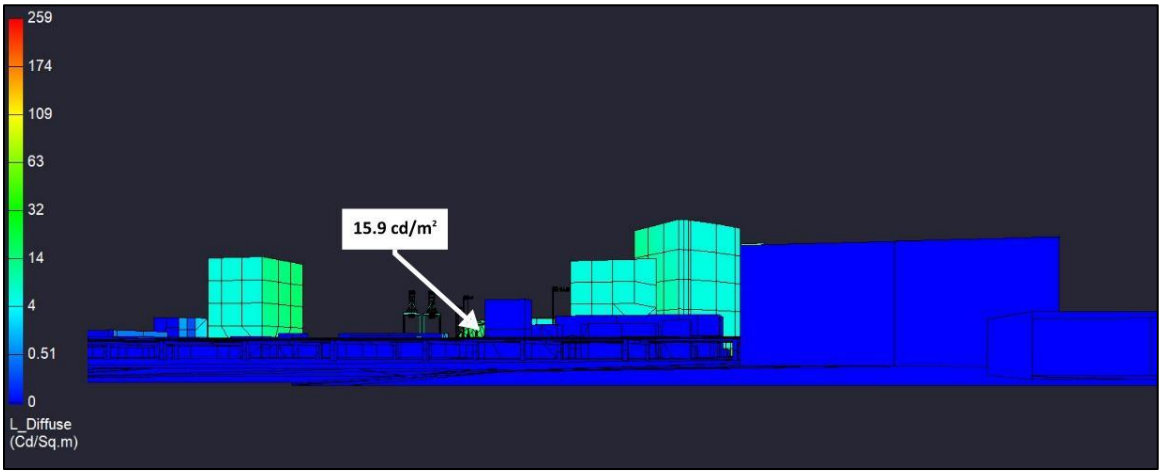


Figure 378: View from Receptor Site 6A for MRA project, Rotated Ballpark design option, “Phase 1” scenario Game Night lighting condition

9.3.2 "Full Buildout" Scenario

9.3.2.1 Game Nights

As described in section 4.5.8, the Game Night lighting condition is anticipated to include all lighting "on", including sports and house lighting, and included identified signage locations.

9.3.2.1.1 Spill Light

Table 68 provides the calculation results for the spill light assessment at the receptor sites for this condition. As shown, the proposed lighting **is** anticipated to exceed the spill light threshold at Receptor Site 1, which has a direct view of the scoreboard, ribbon boards, and pole-mounted infield sports lights. All other receptor site spill light **is not** anticipated to exceed threshold.

Receptor Site	Spill Light, [lux]	Significant
Receptor Site 1 - Water Street at Clay (Facing Ballpark)	**42.60**	**Yes**
Receptor Site 2 - Inner Harbor Turning Basin @ 190'	0.20	No
Receptor Site 2A - Turning Basin Line-of-Sight	1.60	No
Receptor Site 2B - Inner Harbor Turning Basin @ 64'	0.50	No
Receptor Site 2C - Inner Harbor Turning Basin @ 25'	1.60	No
Receptor Site 3 - Alameda Dock	1.50	No
Receptor Site 4 - MLK at Embarcadero	3.30	No
Receptor Site 5 - I880 Westbound	8.60	No
Receptor Site 5A - 2nd at Washington (Facing Ballpark)	0.50	No
Receptor Site 6 - I980 Ramp to Eastbound I880	7.60	No
Receptor Site 6A - 7th at Brush	0.30	No

Table 68: Spill light at receptor sites for MRA project, Rotated Ballpark design option, "Full Buildout" scenario Game Night lighting condition. [Note: Threshold of significance is 25 lux]

9.3.2.1.2 Spill Light Map

Figure 379 provides a spill light map for this lighting condition. To generate the spill light map, vertical calculation points were arrayed around the project site at 5'-6" AFG and oriented toward the pitcher's mound for reference. The isoline curves show the extent to which vertical light levels are calculated and are reported in lux. As shown, one vertical lux is expected in the turning basin. The adjacent estuary is anticipated to experience less than 1 vertical lux generally, with light levels increasing closer to shore.

Figure 379: Spill light map for MRA project, Rotated Ballpark design option, "Full Buildout" scenario Game Night lighting condition indicating vertical illuminance isolines

9.3.2.1.3 Glare

Figure 380 and Figure 390 illustrate the luminances anticipated to be observed from the identified receptor sites for this lighting condition. Note that the scale associated with each receptor site view approximately matches the scale used for the associated site's existing conditions HDR falsecolor images. Receptor Sites 1A, 5B, 5C, 7 and 7A have been excluded since the gondola variant is not included in this model. Table 69 summarizes the anticipated glare significance at the receptor sites. Additionally, as noted in Section 4.5.3, the modeled retail lighting is included for pre-curfew times to capture the impact of interior lighting emanating through windows as a conservative contribution to spill light assessment; the modeled luminance, therefore, is an interior luminance and not subject to glare limitations directly.

Receptor Site	Facades		Signage	
	Maximum, [cd/m^2]	Significant	Maximum, [cd/m^2]	Significant
Receptor Site 1 - Water Street at Clay (Facing Ballpark)	33.0	Yes	3,500	Yes
Receptor Site 2 - Inner Harbor Turning Basin @ 190'	15.9	No	n/a	n/a
Receptor Site 2A - Turning Basin Line-of-Sight	15.9	No	n/a	n/a
Receptor Site 2B - Inner Harbor Turning Basin @ 64'	15.9	No	n/a	n/a
Receptor Site 2C - Inner Harbor Turning Basin @ 25'	15.9	No	n/a	n/a
Receptor Site 3 - Alameda Dock	33.0	Yes	3,500	Yes
Receptor Site 4 - MLK at Embarcadero	15.9	No	n/a	n/a
Receptor Site 5 - I880 Westbound	33.0	Yes	n/a	n/a
Receptor Site 5A - 2nd at Washington (Facing Ballpark)	33.0	Yes	n/a	n/a
Receptor Site 6 - I980 Ramp to Eastbound I880	15.9	No	n/a	n/a
Receptor Site 6A - 7th at Brush	15.9	No	n/a	n/a

Table 69: Summary of anticipated glare significance at receptor sites for the MRA project, Rotated Ballpark design option, "Full Buildout" scenario Game Night lighting conditions. [Note: Threshold of significance is 25 cd/m^2 for façade lighting and 1,000 cd/m^2 for digital signage]

Figure 380 shows the anticipated luminances viewed from Receptor Site 1, which is one of the closest receptor sites. As seen, from this perspective, there is a direct view of the digital display. Additionally, with the sports field lights shifted from the "halo" configuration to the pole-mounted configuration, increased luminance on the adjacent building facades is expected due to reflection from the roof. Therefore, façade luminances from this view **are** anticipated to exceed threshold and sign luminances from this view **are** anticipated to exceed threshold.

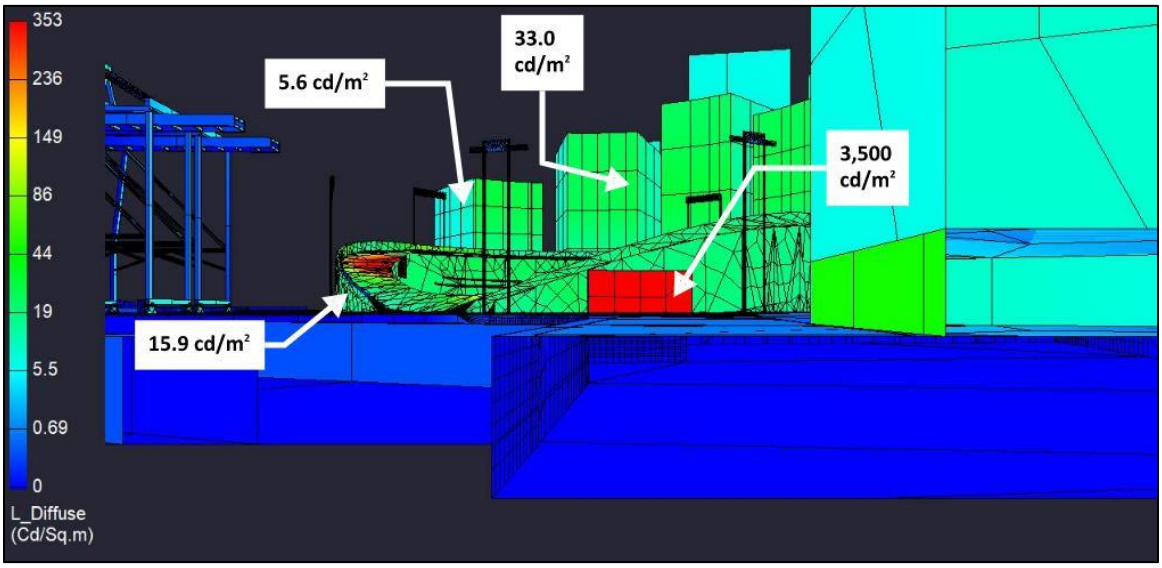


Figure 380: View from Receptor Site 1 for MRA project, Rotated Ballpark design option, "Full Buildout" scenario Game Night lighting condition

Figure 381 provides the anticipated luminances viewed from Receptor Site 2, which is centered in the turning basin and located 190' above the water line. Luminances from this view **are not** anticipated to exceed threshold.

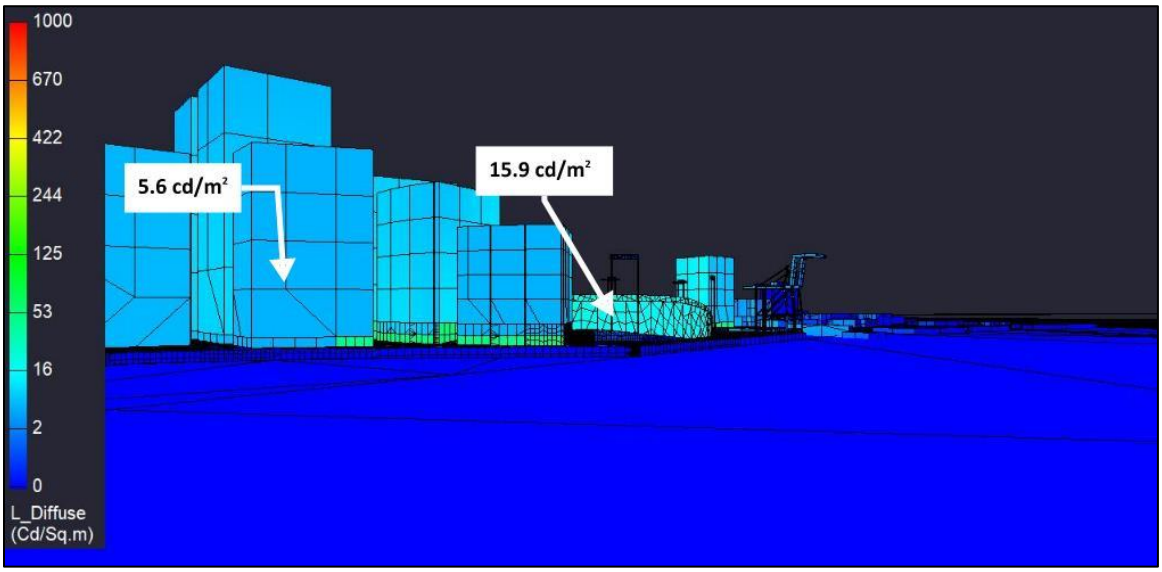


Figure 381: View from Receptor Site 2 for MRA project, Rotated Ballpark design option, "Full Buildout" scenario Game Night lighting condition

Figure 382 provides the anticipated luminances viewed from Receptor Site 2A, which is on Alameda with a direct line of site through the center of the turning basin. Luminances from this view **are not** anticipated to exceed threshold.

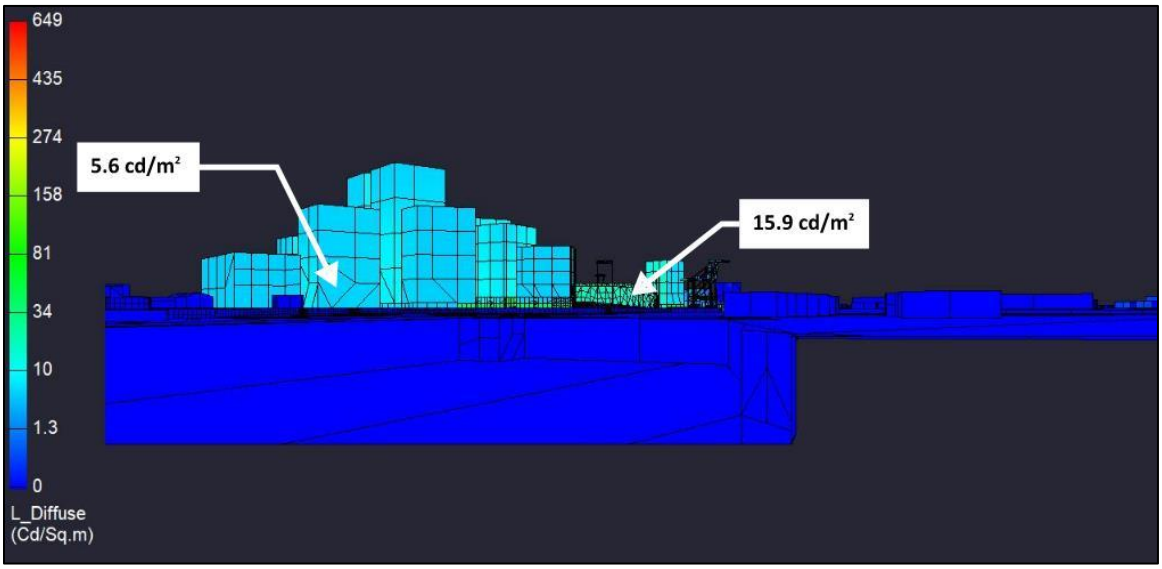


Figure 382: View from Receptor Site 2A for MRA project, Rotated Ballpark design option, "Full Buildout" scenario Game Night lighting condition

Figure 383 provides the anticipated luminances viewed from Receptor Site 2B, which is centered in the turning basin and located 64' above the water line. Luminances from this view **are not** anticipated to exceed threshold.

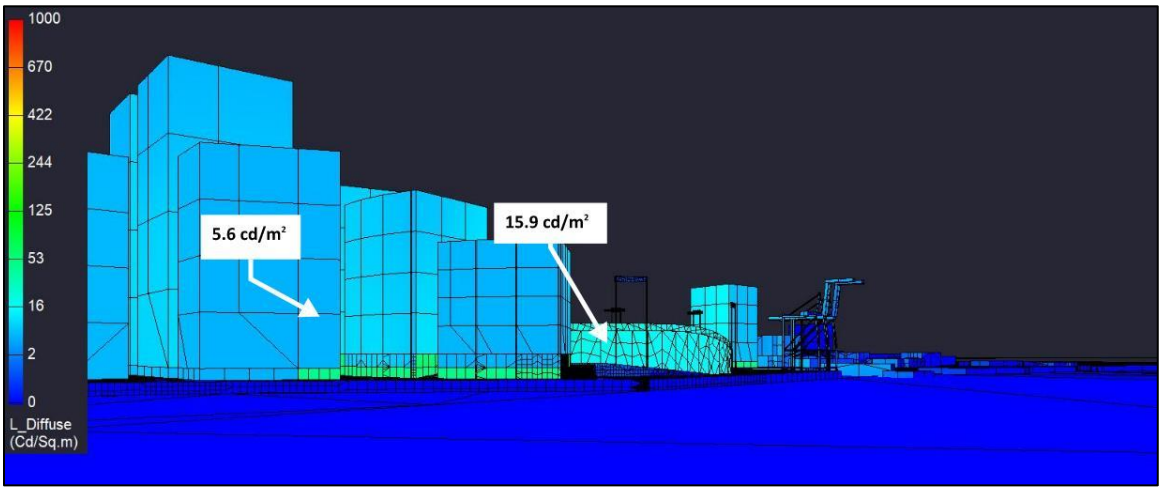


Figure 383: View from Receptor Site 2B for MRA project, Rotated Ballpark design option, "Full Buildout" scenario Game Night lighting condition

Figure 384 provides the anticipated luminances viewed from Receptor Site 2C, which is centered in the turning basin and located 25' above the water line. Luminances from this view **are not** anticipated to exceed threshold.

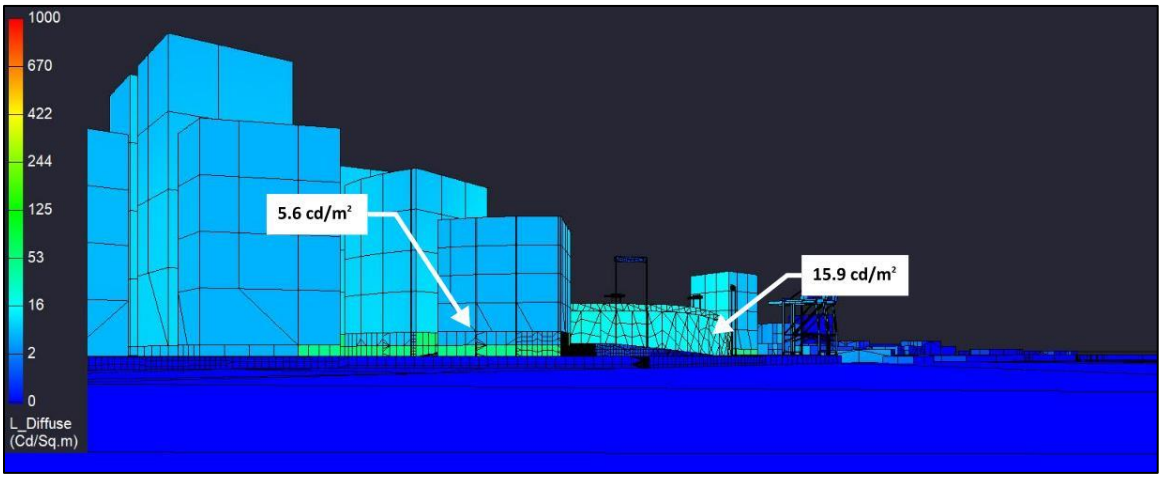


Figure 384: View from Receptor Site 2C for MRA project, Rotated Ballpark design option, "Full Buildout" scenario Game Night lighting condition

Figure 385 provides the anticipated luminances viewed from Receptor Site 3, which is located on Alameda and facing northwest toward the property. From this position, there is a direct line of site to the digital signage. Additionally, with the sports field lights shifted from the "halo" configuration to the pole-mounted configuration, increased luminance on the adjacent building facades is expected due to reflection from the roof. Therefore, façade luminances from this view **are** anticipated to exceed threshold and sign luminances from this view **are** anticipated to exceed threshold.

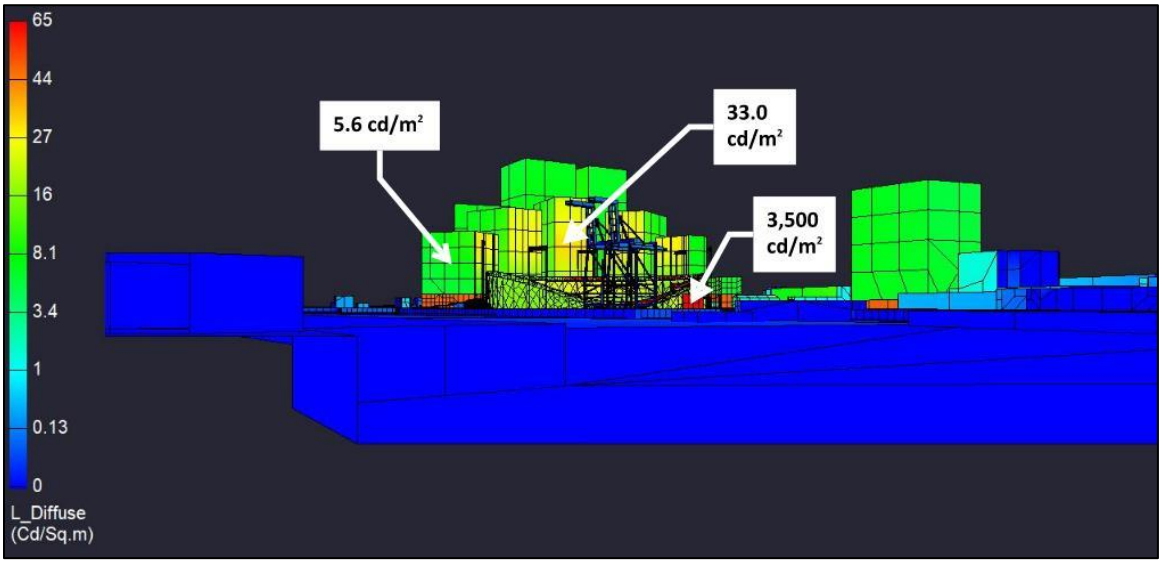


Figure 385: View from Receptor Site 3 for MRA project, Rotated Ballpark design option, "Full Buildout" scenario Game Night lighting condition

Figure 386 provides the view from Receptor Site 4, which is located at the intersection of MLK and Embarcadero. Façade luminances and sign luminances from this view **are not** anticipated to exceed threshold.

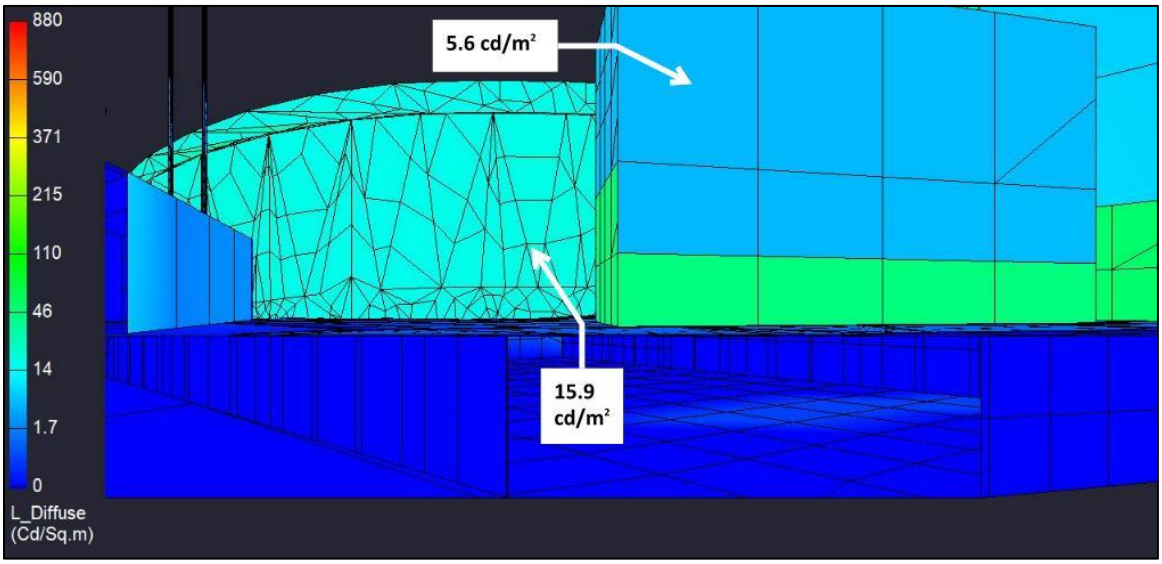


Figure 386: View from Receptor Site 4 for MRA project, Rotated Ballpark design option, "Full Buildout" scenario Game Night lighting condition

Figure 387 provides the anticipated luminances viewed from Receptor Site 5, which is located on Westbound I880. From this view, the infield poles for field lighting are within a direct view. The façade lighting of the adjacent mixed-use development is anticipated to be visible. With the sports field lights shifted from the "halo" configuration to the pole-mounted configuration, increased luminance on the adjacent building facades is expected due to reflection from the roof. Therefore, façade luminances from this view **are** anticipated to exceed threshold and sign luminances from this view **are not** anticipated to exceed threshold.

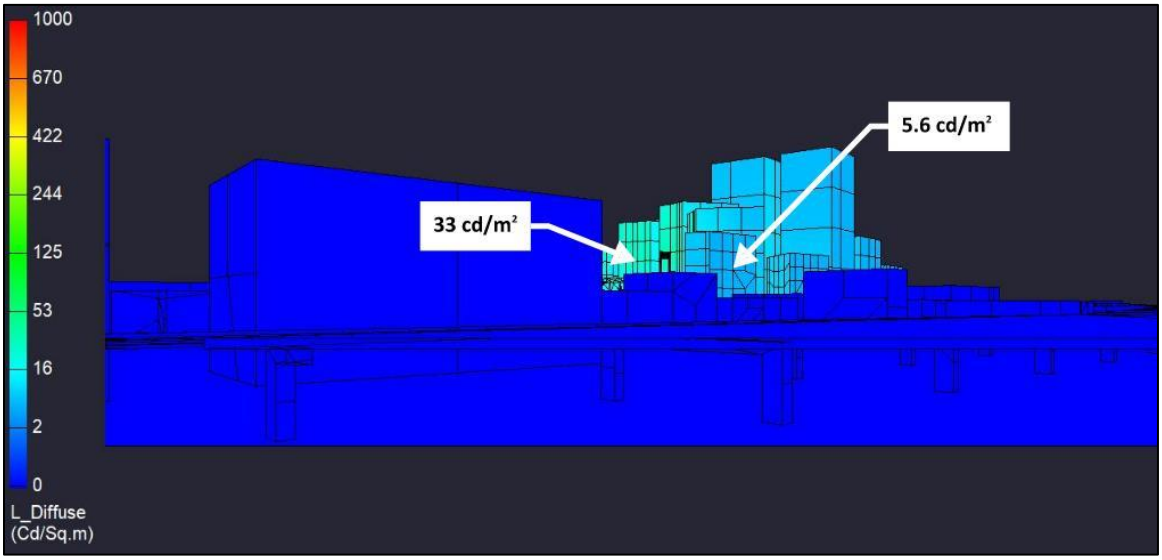


Figure 387: View from Receptor Site 5 for MRA project, Rotated Ballpark design option, "Full Buildout" scenario Game Night lighting condition

Figure 388 provides the anticipated luminances viewed from Receptor Site 5A, which is located on the southwest corner of the roof of the parking garage located at 2nd and Washington. With the sports field lights shifted from the "halo" configuration to the pole-mounted configuration, increased luminance on the adjacent building facades is expected due to reflection from the roof. Therefore, façade luminances from this view **are** anticipated to exceed threshold and sign luminances from this view **are not** anticipated to exceed threshold.

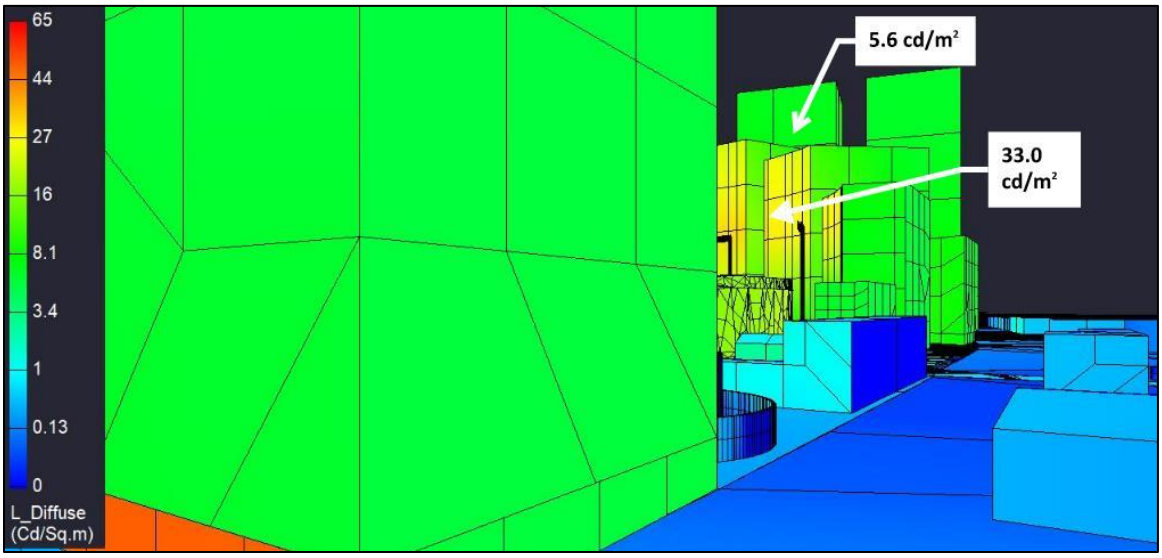


Figure 388: View from Receptor Site 5A for MRA project, Rotated Ballpark design option, "Full Buildout" scenario Game Night lighting condition

Figure 389 provides the anticipated luminances viewed from Receptor Site 6, which is located on the ramp from I980 to eastbound I880. Luminances from this view **are not** anticipated to exceed threshold.

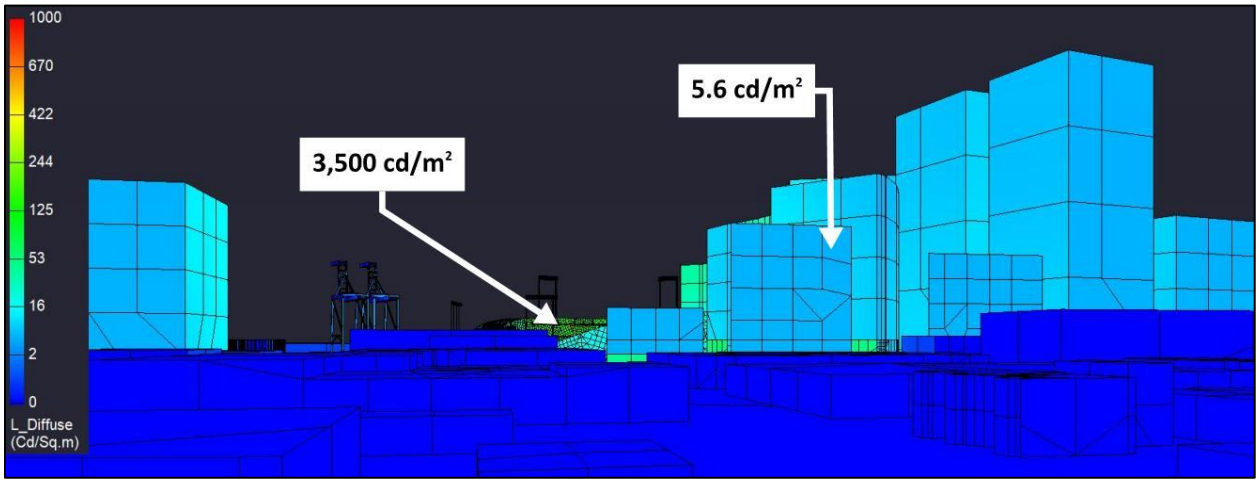


Figure 389: View from Receptor Site 6 for MRA project, Rotated Ballpark design option, "Full Buildout" scenario Game Night lighting condition

Figure 390 provides the anticipated luminances viewed from Receptor Site 6A, which is located at 7th and Brush. Luminances from this view **are not** anticipated to exceed threshold.

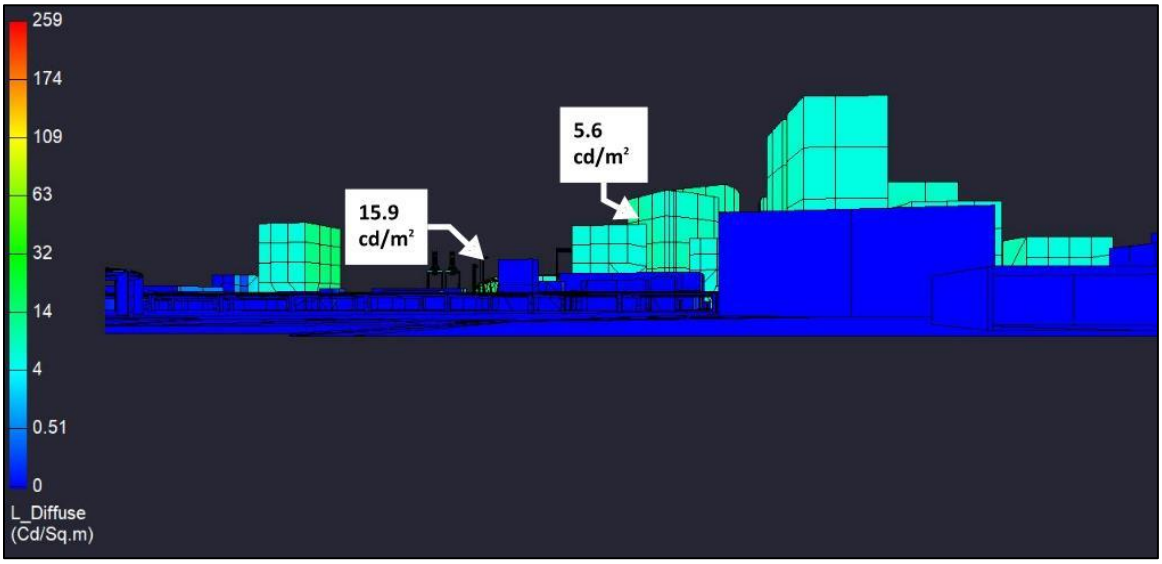


Figure 390: View from Receptor Site 6A for MRA project, Rotated Ballpark design option, "Full Buildout" scenario Game Night lighting condition

9.4 Impact of Cloud Cover

To assess the potential impact of cloud cover, a series of parametric analyses were conducted to determine the likely impact on spill light at the receptor site locations.

Figure 391 through Figure 396 show the anticipated receptor site spill light vertical illuminance values as a function of could ceiling height. As shown, low cloud ceilings increase spill light anticipated at the receptor sites until the ceiling height reaches approximately 3,000 ft, at which time the cloud ceiling has minimal further impact.

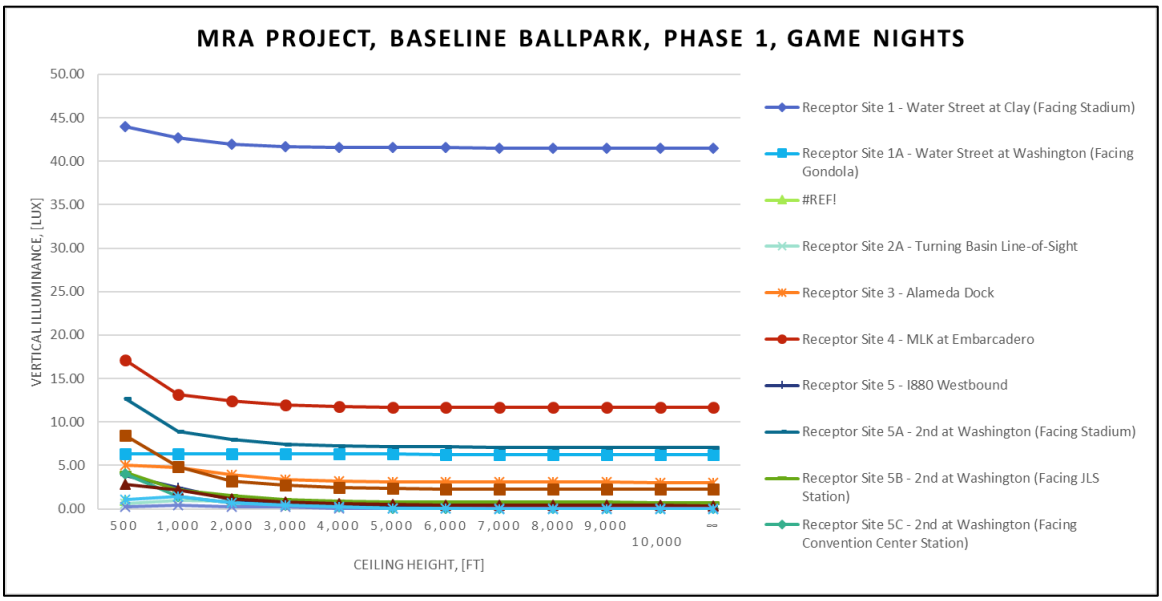


Figure 391: Impact of cloud ceiling height on spill light calculations at receptor sites for the MRA project, Baseline ballpark height, “Phase 1” scenario Game Night lighting condition

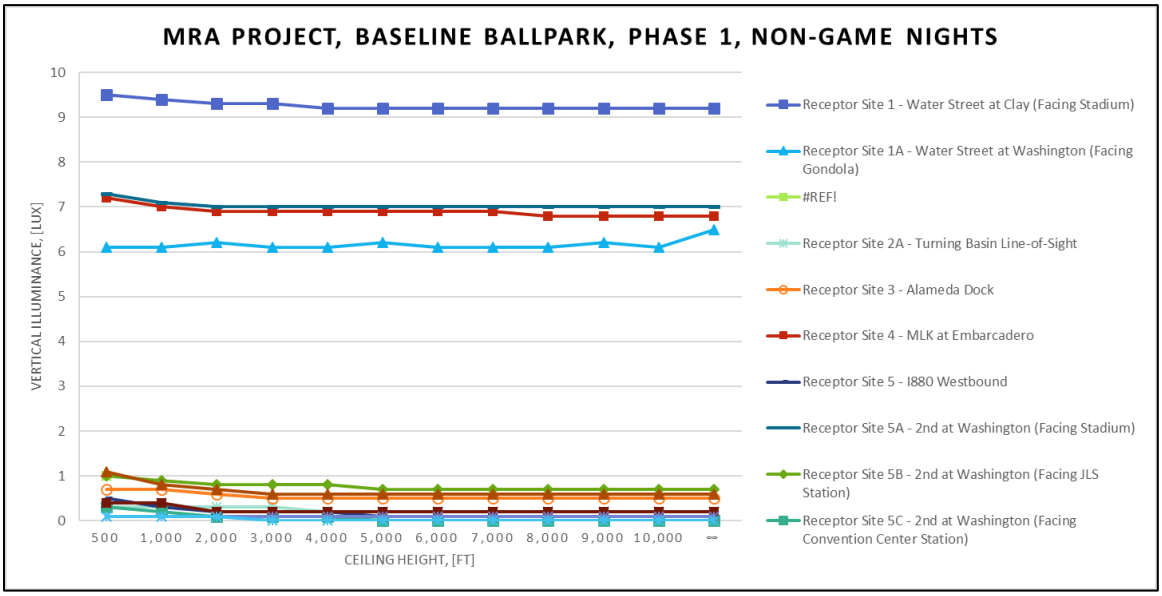


Figure 392: Impact of cloud ceiling height on spill light calculations at receptor sites for the MRA project, Baseline ballpark height, “Phase 1” scenario Non-Game Night Pre-Curfew lighting condition

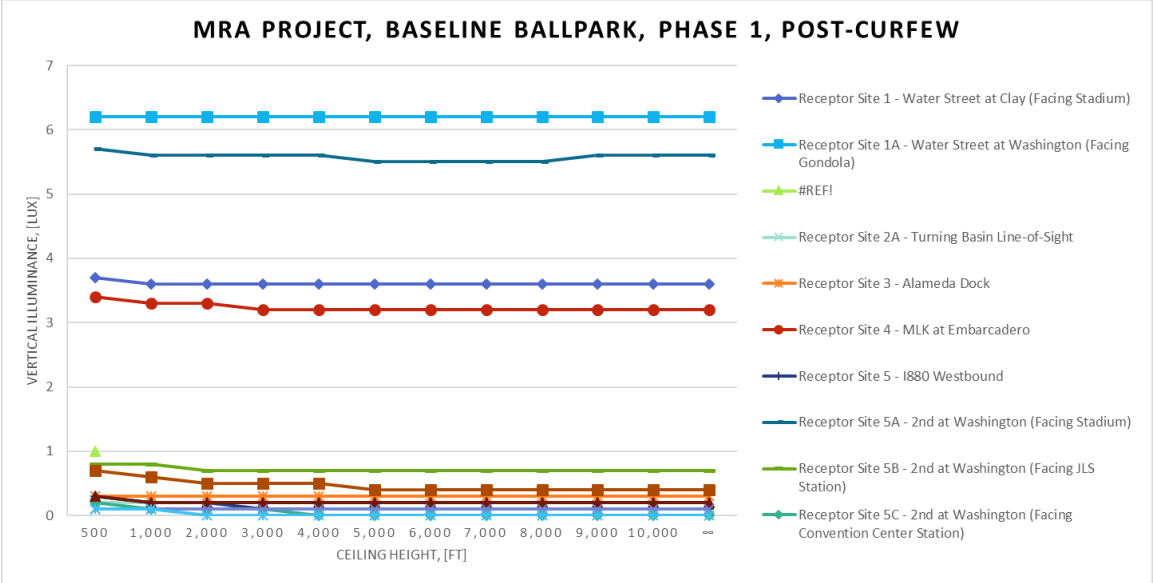


Figure 393: Impact of cloud ceiling height on spill light calculations at receptor sites for the MRA project, Baseline ballpark height, "Phase 1" scenario Post-Curfew lighting condition

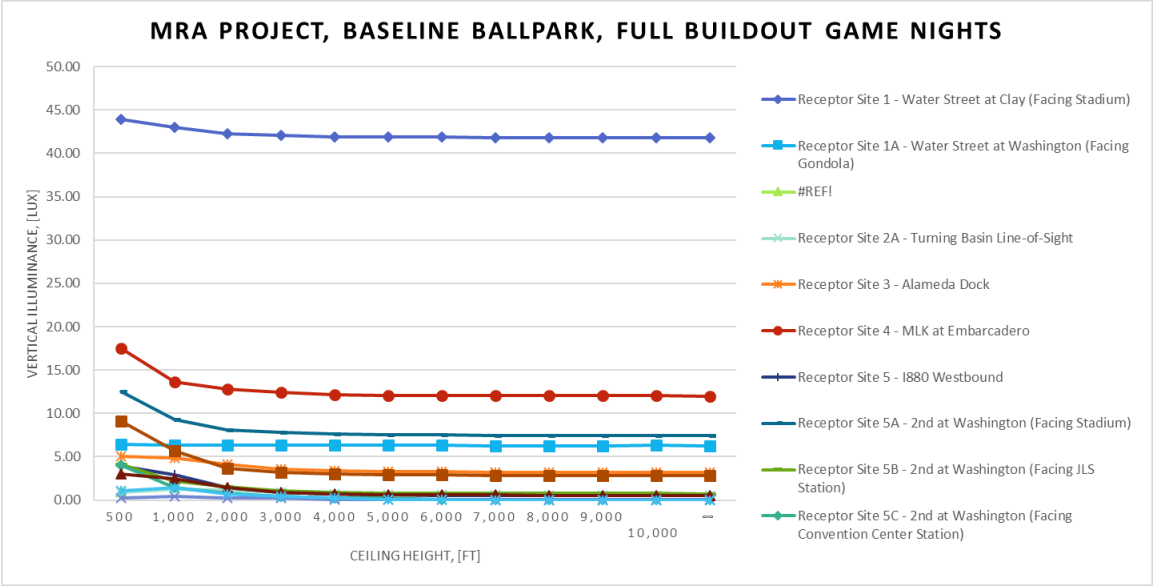


Figure 394: Impact of cloud ceiling height on spill light calculations at receptor sites for the MRA project, Baseline ballpark height, "Full Buildout" scenario Game Night lighting condition

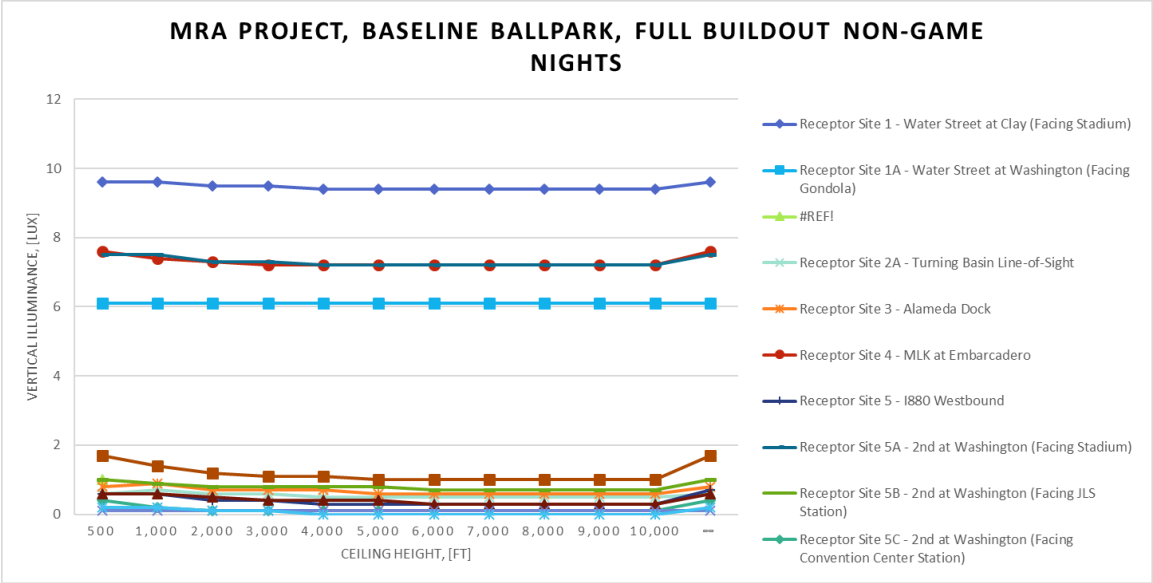


Figure 395: Impact of cloud ceiling height on spill light calculations at receptor sites for the MRA project, Baseline ballpark height, “Full Buildout” scenario Non-Game Night Pre-Curfew lighting condition

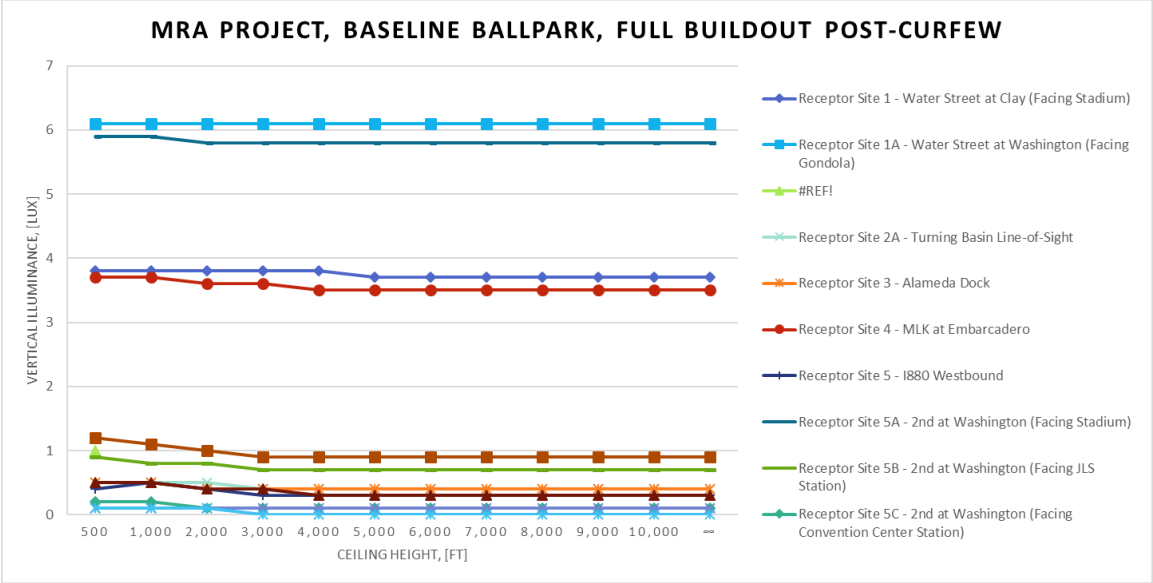


Figure 396: Impact of cloud ceiling height on spill light calculations at receptor sites for the MRA project, Baseline ballpark height, “Full Buildout” scenario Post-Curfew lighting condition

10 APPENDIX A – SPORTS LIGHTING PHOTOMETRIC REPORT

IES FLOOD REPORT
PHOTOMETRIC FILENAME : [redacted]

DESCRIPTIVE INFORMATION (From Photometric File)

IESNA:LM-63-2002
[TEST] [redacted]
[TESTLAB] [redacted]
[ISSUEDATE]01/03/17
[MANUFAC] [redacted]
[LUMCAT] [redacted]
[LUMINAIRE] [redacted]
[MORE] [redacted]
[MORE] [redacted]
[MORE] [redacted]
[LAMP]Cree XM-LM Light Emitting Diode (LED); [redacted]
[MORE] [redacted] (ave. 5700K); 75 Typical CRI
[BALLASTCAT] [redacted]
[BALLAST] [redacted] 1500 watt, 2 amp driver. (Operated at 480 VAC input)
[_MOUNTING]25 degrees below horizon
[_VOLTAGE]435.14
[_AMPERAGE]2.001
[_WATTAGE]870.7
[_WAVEFORM]DC
[_EFFICACY]107.1 lpw (does not include driver losses)
[_Ta]24.7 C
[_ABSOLUTE]Data shown is absolute for the sample provided. Report made
[MORE]in accordance with IESNA LM-79:2008 (minus Section 12 for
[MORE]color). Corrections were made for stray light/dark current.
[MORE]Spectral mismatch correction factor was not performed.
[MORE] [redacted]
[MORE] [redacted]
[MORE] [redacted]
[_EQUIPMENT] [redacted]
[MORE]PL0040, [redacted]
[MORE] [redacted]
[MORE] [redacted]
[MORE] [redacted]
[MORE] [redacted]
[_STABILIZATION]Units were operated for stabilization approximately 3-1/2 hours
[MORE]before testing. Total on-time was approximately 5 hours.
[_ACCREDITED] [redacted]
[MORE]Program [redacted]
[MORE] [redacted]
[MORE] [redacted]
[MORE] [redacted]
[_ABSOLUTELUMENS]93133
[_CONVERT] Luminaire test position and photometric web converted from original test data

Photometric Toolbox Professional Edition - Copyright 2002-2015 by Lighting Analysts, Inc.
Calculations based on published IES Methods and recommendations, values rounded for display purposes.
Results derived from content of manufacturers photometric file.

Page 1

IES FLOOD REPORT
PHOTOMETRIC FILENAME : [redacted]

CHARACTERISTICS

NEMA Type	3 H x 3 V
Maximum Candela	848996
Maximum Candela Angle	0H 0V
Horizontal Beam Angle (50%)	14.7
Vertical Beam Angle (50%)	14.7
Horizontal Field Angle (10%)	33.9
Vertical Field Angle (10%)	31.7
Lumens Per Lamp	N.A. (absolute)
Total Lamp Lumens	N.A. (absolute)
Beam Lumens	30325
Beam Efficiency	N.A.
Field Lumens	74851
Field Efficiency	N.A.
Spill Lumens	18776
Luminaire Lumens	93627
Total Efficiency	N.A.
Total Luminaire Watts	870.7
Ballast Factor	1.00

Photometric Toolbox Professional Edition - Copyright 2002-2015 by Lighting Analysts, Inc.
Calculations based on published IES Methods and recommendations, values rounded for display purposes.
Results derived from content of manufacturers photometric file.

IES FLOOD REPORT
PHOTOMETRIC FILENAME : [redacted]

AXIAL CANDELA

DEG.	HOR.	DEG.	VERT.
90	0	90	1
85	0	85	9
75	0	75	68
65	0	65	277
55	54	55	765
47.5	500	47.5	1208
42.5	1213	42.5	1331
37.5	2625	37.5	1274
33	5059	33	1124
29	8454	29	929
25.5	13294	25.5	729
22.5	23250	22.5	569
19.5	49980	20	537
17	84264	19	724
15	119746	18	2413
13	170575	17	6566
11	243636	16	17122
9	335743	15	32154
7	444658	14	58675
5	582000	13	88643
3	730154	12	125174
1	835740	11	165606
0	848996	10	212946
-1	835740	9	269089
-3	730154	8	326272
-5	582000	7	388943
-7	444658	6	465042
-9	335743	5	544791
-11	243636	4	644974
-13	170575	3	734919
-15	119746	2	805851
-17	84264	1	844608
-19.5	49980	0	848996
-22.5	23250	-1	832177
-25.5	13294	-2	787570
-29	8454	-3	725413
-33	5059	-4	663255
-37.5	2625	-5	602560
-42.5	1213	-6	540403
-47.5	500	-7	481902
-55	54	-8	431665
-65	0	-9	379824
-75	0	-10	329404
-85	0	-11	282686
-90	0	-12	243169
		-13	209448
		-14	180483
		-15	155639
		-16	133582
		-17	112770
		-18	93999
		-19	78031
		-20	67581
		-22.5	44245

Photometric Toolbox Professional Edition - Copyright 2002-2015 by Lighting Analysts, Inc.
Calculations based on published IES Methods and recommendations, values rounded for display purposes.
Results derived from content of manufacturers photometric file.

IES FLOOD REPORT
PHOTOMETRIC FILENAME : [redacted]

AXIAL CANDELA - (Cont.)

DEG. HOR.	DEG. VERT.
-25.5	25685
-29	15773
-33	9064
-37.5	4054
-42.5	1559
-47.5	640
-55	244
-65	136
-75	40
-85	0
-90	0

Photometric Toolbox Professional Edition - Copyright 2002-2015 by Lighting Analysts, Inc.
Calculations based on published IES Methods and recommendations, values rounded for display purposes.
Results derived from content of manufacturers photometric file.

IES FLOOD REPORT
PHOTOMETRIC FILENAME : [redacted]

CANDELA TABULATION
Maximum Candela = 848996
Beam Edge = 424498 Cd (50% of Max.)
Field Edge = 84899.6 Cd (10% of Max.)
* Indicates Values Inside Field Edge

Vert. Angles	Horizontal Angles									
	-90.0	-85.0	-75.0	-65.0	-55.0	-47.5	-42.5	-37.5	-33.0	-29.0
90.0	0	0	4	5	4	3	2	2	2	1
85.0	0	0	17	25	19	16	14	12	12	10
75.0	0	0	7	21	26	30	34	42	48	51
65.0	0	0	0	17	55	89	114	151	177	188
55.0	0	0	0	18	111	211	279	383	462	498
47.5	0	0	0	11	165	342	460	604	738	828
42.5	0	0	0	5	188	400	557	722	872	987
37.5	0	0	0	1	185	421	601	786	939	1056
33.0	0	0	0	0	162	417	607	798	942	1039
29.0	0	0	0	0	130	396	591	774	894	960
25.5	0	0	0	0	96	370	567	731	826	871
22.5	0	0	0	0	66	340	541	690	765	799
20.0	0	0	0	0	46	310	515	657	715	741
19.0	0	0	0	0	39	296	504	643	698	716
18.0	0	0	0	0	33	280	490	632	684	694
17.0	0	0	0	0	28	264	476	622	671	673
16.0	0	0	0	0	25	250	461	612	663	658
15.0	0	0	0	0	22	240	444	604	660	654
14.0	0	0	0	0	19	233	427	599	667	666
13.0	0	0	0	0	18	229	416	599	687	696
12.0	0	0	0	0	15	227	414	604	719	758
11.0	0	0	0	0	13	227	420	620	771	853
10.0	0	0	0	0	11	226	435	655	853	997
9.0	0	0	0	0	10	226	456	710	970	1205
8.0	0	0	0	0	10	229	484	792	1131	1487
7.0	0	0	0	0	12	235	520	898	1352	1868
6.0	0	0	0	0	16	249	567	1031	1633	2357
5.0	0	0	0	0	20	271	631	1189	1940	3005
4.0	0	0	0	0	24	301	711	1388	2388	3773
3.0	0	0	0	0	29	335	813	1642	2892	4705
2.0	0	0	0	0	34	379	920	1924	3511	5800
1.0	0	0	0	0	41	434	1067	2239	4238	7054
0.0	0	0	0	0	54	500	1213	2625	5059	8454
-1.0	0	0	0	0	71	572	1349	3030	5970	9889
-2.0	0	0	0	0	94	651	1535	3473	6895	11426
-3.0	0	0	0	0	119	736	1715	3945	7932	12894
-4.0	0	0	0	0	144	823	1913	4409	8745	14169
-5.0	0	0	0	0	171	902	2091	4914	9636	15312
-6.0	0	0	0	0	197	1005	2271	5372	10420	16304
-7.0	0	0	0	0	224	1077	2452	5830	11102	17124
-8.0	0	0	0	0	251	1173	2661	6301	11644	17690
-9.0	0	0	0	0	279	1256	2869	6707	12020	17968
-10.0	0	0	0	0	308	1341	3074	7027	12236	18002
-11.0	0	0	0	0	338	1421	3257	7275	12283	17820
-12.0	0	0	0	0	369	1495	3419	7437	12285	17476
-13.0	0	0	0	0	395	1560	3542	7534	12132	17045
-14.0	0	0	0	0	417	1614	3655	7565	11920	16540
-15.0	0	0	0	0	442	1685	3784	7523	11668	15958
-16.0	0	0	0	0	463	1755	3873	7409	11351	15336

Photometric Toolbox Professional Edition - Copyright 2002-2015 by Lighting Analysts, Inc.
Calculations based on published IES Methods and recommendations, values rounded for display purposes.
Results derived from content of manufacturers photometric file.

IES FLOOD REPORT
PHOTOMETRIC FILENAME : [redacted]

CANDELA TABULATION - (Cont.)

-17.0	0	0	0	0	491	1813	3923	7252	10982	14687
-18.0	0	0	0	0	505	1859	3941	7071	10582	14012
-19.0	0	0	0	0	522	1892	3927	6840	10158	13447
-20.0	0	0	0	1	533	1892	3846	6610	9716	12778
-22.5	0	0	0	3	550	1824	3510	5945	8422	10917
-25.5	0	0	0	4	533	1583	2876	4888	6446	8460
-29.0	0	0	0	2	449	1206	2162	3405	4278	6117
-33.0	0	0	0	0	302	781	1393	1833	2857	4139
-37.5	0	0	0	0	148	453	724	937	1614	2089
-42.5	0	0	0	0	12	185	247	457	708	899
-47.5	0	0	0	0	4	41	73	162	290	423
-55.0	0	0	0	0	0	0	3	20	97	164
-65.0	0	0	0	0	0	0	0	0	16	50
-75.0	0	0	0	0	0	0	0	0	0	0
-85.0	0	0	0	0	0	0	0	0	0	0
-90.0	0	0	0	0	0	0	0	0	0	0

Vert. Angles	**Horizontal Angles**									
	-25.5	**-22.5**	**-19.5**	**-17.0**	**-15.0**	**-13.0**	**-11.0**	**-9.0**	**-7.0**	**-5.0**
90.0	1	1	1	1	1	1	1	1	1	1
85.0	11	10	10	11	11	10	10	9	9	9
75.0	55	61	67	71	73	76	77	77	77	75
65.0	206	235	267	292	309	320	320	316	310	296
55.0	542	587	664	738	793	822	820	804	790	769
47.5	903	969	1033	1093	1142	1179	1201	1204	1192	1191
42.5	1073	1140	1198	1238	1266	1292	1316	1324	1325	1327
37.5	1137	1189	1224	1244	1255	1265	1287	1295	1288	1275
33.0	1097	1125	1140	1138	1134	1132	1133	1129	1126	1126
29.0	997	1012	1015	1005	988	973	962	948	936	935
25.5	896	904	892	870	841	815	790	767	748	741
22.5	811	801	770	737	706	672	641	610	592	581
20.0	738	710	661	625	588	549	514	486	473	470
19.0	706	673	622	581	542	508	473	450	465	634
18.0	677	641	588	541	503	474	454	512	761	1484
17.0	649	611	556	511	487	489	576	1036	2039	4413
16.0	627	589	537	509	545	679	1207	2890	5462	11503
15.0	621	582	545	584	816	1409	3208	6886	13184	22638
14.0	635	600	604	846	1608	3363	7716	14704	25104	38401
13.0	675	653	749	1416	3440	7715	16346	27565	44767	64131
12.0	754	768	1108	2736	7116	15348	28523	45731	69802	94317 *
11.0	889	983	1722	5096	12391	25543	43088	67960	98642 *	129903 *
10.0	1101	1348	2809	8875	19942	37845	62457	94680 *	133599 *	165322 *
9.0	1407	1911	4501	13819	28963	50906	82868	121836 *	168368 *	209410 *
8.0	1857	2715	7044	19901	39775	66840	102601 *	148840 *	207364 *	259966 *
7.0	2501	3851	10385	27806	52011	81609	121953 *	178382 *	249426 *	311821 *
6.0	3341	5300	14680	36315	63113	95307 *	140620 *	209391 *	287351 *	360860 *
5.0	4416	7400	20161	45563	73537	108737 *	161211 *	236620 *	318598 *	408444 *
4.0	5725	9828	26401	54342	83235	122384 *	181081 *	259388 *	347873 *	452666 *
3.0	7332	12859	32750	62623	92958 *	136096 *	199247 *	280237 *	378691 *	492510 *
2.0	9177	16226	38752	70313	102517 *	149160 *	216130 *	301028 *	406306 *	529392 *
1.0	11111	19909	44716	77649	111633 *	161100 *	231328 *	320373 *	427461 *	561034 *
0.0	13294	23250	49980	84264	119746 *	170575 *	243636 *	335743 *	444658 *	582000 *
-1.0	15645	26902	53991	89444 *	126525 *	178323 *	252681 *	346993 *	455654 *	590457 *
-2.0	17951	30319	57964	93443 *	131369 *	183046 *	257782 *	352952 *	460364 *	586750 *
-3.0	19842	33344	60680	96276 *	133992 *	185214 *	258273 *	352878 *	456312 *	570156 *

Photometric Toolbox Professional Edition - Copyright 2002-2015 by Lighting Analysts, Inc.
Calculations based on published IES Methods and recommendations, values rounded for display purposes.
Results derived from content of manufacturers photometric file.

IES FLOOD REPORT
PHOTOMETRIC FILENAME : [redacted]

CANDELA TABULATION - (Cont.)

-4.0	21588	35754	62239	97482 *	136189 *	184089 *	253354 *	346221 *	443302 *	538289 *
-5.0	23163	37777	62610	97672 *	136395 *	181012 *	244180 *	332203 *	423194 *	499294 *
-6.0	24634	38835	62490	96800 *	134934 *	176934 *	233126 *	313115 *	396573 *	461019 *
-7.0	25598	39433	62035	95023 *	131982 *	172137 *	222314 *	292403 *	364107 *	421095 *
-8.0	26062	39227	60790	92283 *	127553 *	166192 *	212227 *	269660 *	328154 *	380884 *
-9.0	26113	38446	58725	88748 *	121404 *	158472 *	199733 *	246154 *	291124 *	335552 *
-10.0	25784	37131	56046	83891	113508 *	147868 *	185602 *	223045 *	256806 *	291959 *
-11.0	25132	35508	52821	78079	104558 *	135816 *	169900 *	201083 *	227638 *	253048 *
-12.0	24339	33723	49303	71714	95437 *	123709 *	153603 *	180297 *	201826 *	220277 *
-13.0	23421	31848	45756	65286	86365 *	110773 *	137076 *	160400 *	178446 *	192502 *
-14.0	22391	30011	42355	59421	77078	98114 *	120380 *	140577 *	156523 *	168350 *
-15.0	21347	28171	39154	53816	68445	86350 *	105172 *	123006 *	135532 *	146286 *
-16.0	20272	26434	36271	48941	61533	75903	90978 *	105827 *	116015 *	125405 *
-17.0	19185	24954	33984	45294	56055	66874	78390	90720 *	98424 *	105858 *
-18.0	18283	23509	31774	41750	50984	59502	67663	77445	83356	88827 *
-19.0	17407	22048	29569	38267	45925	53170	59679	66555	70898	74963
-20.0	16433	20636	27289	34848	41386	47659	53485	59047	62897	65793
-22.5	13954	17144	21574	26193	30393	34947	39285	42476	44897	45023
-25.5	11131	13344	15474	17323	19765	23224	26217	28242	28869	27198
-29.0	8409	9700	10576	11554	12758	14695	16508	17336	16692	15807
-33.0	5349	5763	6324	7070	7825	9399	10795	10582	9285	8987
-37.5	2277	2295	2929	3785	4396	5551	6612	5827	4790	4477
-42.5	928	984	1296	1833	2240	2823	3101	2411	2002	1691
-47.5	435	495	653	903	1099	1227	1222	1013	858	705
-55.0	195	243	291	330	370	375	346	350	321	305
-65.0	91	123	146	160	168	174	176	178	181	183
-75.0	1	5	12	17	25	32	37	41	43	43
-85.0	0	0	0	0	0	0	0	0	0	0
-90.0	0	0	0	0	0	0	0	0	0	0

Vert. Angles	**Horizontal Angles**									
	-3.0	**-1.0**	**0.0**	**1.0**	**3.0**	**5.0**	**7.0**	**9.0**	**11.0**	**13.0**
90.0	1	1	1	1	1	1	1	1	1	1
85.0	9	9	9	9	9	9	9	9	10	10
75.0	70	69	68	69	70	75	77	77	77	76
65.0	282	275	277	275	282	296	310	316	320	320
55.0	765	768	765	768	765	769	790	804	820	822
47.5	1199	1209	1208	1209	1199	1191	1192	1204	1201	1179
42.5	1330	1330	1331	1330	1330	1327	1325	1324	1316	1292
37.5	1274	1273	1274	1273	1274	1275	1288	1295	1287	1265
33.0	1124	1124	1124	1124	1124	1126	1126	1129	1133	1132
29.0	928	928	929	928	928	935	936	948	962	973
25.5	731	729	729	729	731	741	748	767	790	815
22.5	575	569	569	569	575	581	592	610	641	672
20.0	496	535	537	535	496	470	473	486	514	549
19.0	677	795	724	795	677	634	465	450	473	508
18.0	1918	2690	2413	2690	1918	1484	761	512	454	474
17.0	5273	6393	6566	6393	5273	4413	2039	1036	576	489
16.0	14545	16851	17122	16851	14545	11503	5462	2890	1207	679
15.0	26932	31514	32154	31514	26932	22638	13184	6886	3208	1409
14.0	51181	56360	58675	56360	51181	38401	25104	14704	7716	3363
13.0	78723	85540 *	88643 *	85540 *	78723	64131	44767	27565	16346	7715
12.0	113465 *	121569 *	125174 *	121569 *	113465 *	94317 *	69802	45731	28523	15348
11.0	151763 *	161266 *	165606 *	161266 *	151763 *	129903 *	98642 *	67960	43088	25543
10.0	195930 *	208077 *	212946 *	208077 *	195930 *	165322 *	133599 *	94680 *	62457	37845

Photometric Toolbox Professional Edition - Copyright 2002-2015 by Lighting Analysts, Inc.
Calculations based on published IES Methods and recommendations, values rounded for display purposes.
Results derived from content of manufacturers photometric file.

IES FLOOD REPORT
PHOTOMETRIC FILENAME : [redacted]

CANDELA TABULATION - (Cont.)

9.0	249102 *	263757 *	269089 *	263757 *	249102 *	209410 *	168368 *	121836 *	82868	50906
8.0	305611 *	320747 *	326272 *	320747 *	305611 *	259966 *	207364 *	148840 *	102601 *	66840
7.0	362617 *	382249 *	388943 *	382249 *	362617 *	311821 *	249426 *	178382 *	121953 *	81609
6.0	424844 *	455737 *	465042 *	455737 *	424844 *	360860 *	287351 *	209391 *	140620 *	95307 *
5.0	488690 *	532435 *	544791 *	532435 *	488690 *	408444 *	318598 *	236620 *	161211 *	108737 *
4.0	556199 *	626524 *	644974 *	626524 *	556199 *	452666 *	347873 *	259388 *	181081 *	122384 *
3.0	625165 *	716642 *	734919 *	716642 *	625165 *	492510 *	378691 *	280237 *	199247 *	136096 *
2.0	674383 *	784160 *	805851 *	784160 *	674383 *	529392 *	406306 *	301028 *	216130 *	149160 *
1.0	712602 *	827862 *	844608 *	827862 *	712602 *	561034 *	427461 *	320373 *	231328 *	161100 *
0.0	730154 *	835740 *	848996 *	835740 *	730154 *	582000 *	444658 *	335743 *	243636 *	170575 *
-1.0	727686 *	815408 *	832177 *	815408 *	727686 *	590457 *	455654 *	346993 *	252681 *	178323 *
-2.0	705056 *	768077 *	787570 *	768077 *	705056 *	586750 *	460364 *	352952 *	257782 *	183046 *
-3.0	665327 *	707596 *	725413 *	707596 *	665327 *	570156 *	456312 *	352878 *	258273 *	185214 *
-4.0	616388 *	653394 *	663255 *	653394 *	616388 *	538289 *	443302 *	346221 *	253354 *	184089 *
-5.0	561337 *	599227 *	602560 *	599227 *	561337 *	499294 *	423194 *	332203 *	244180 *	181012 *
-6.0	507912 *	538430 *	540403 *	538430 *	507912 *	461019 *	396573 *	313115 *	233126 *	176934 *
-7.0	459838 *	481472 *	481902 *	481472 *	459838 *	421095 *	364107 *	292403 *	222314 *	172137 *
-8.0	410437 *	431776 *	431665 *	431776 *	410437 *	380884 *	328154 *	269660 *	212227 *	166192 *
-9.0	361661 *	380096 *	379824 *	380096 *	361661 *	335552 *	291124 *	246154 *	199733 *	158472 *
-10.0	317766 *	330107 *	329404 *	330107 *	317766 *	291959 *	256806 *	223045 *	185602 *	147868 *
-11.0	273859 *	283492 *	282686 *	283492 *	273859 *	253048 *	227638 *	201083 *	169900 *	135816 *
-12.0	235954 *	243653 *	243169 *	243653 *	235954 *	220277 *	201826 *	180297 *	153603 *	123709 *
-13.0	203936 *	209914 *	209448 *	209914 *	203936 *	192502 *	178446 *	160400 *	137076 *	110773 *
-14.0	176999 *	181102 *	180483 *	181102 *	176999 *	168350 *	156523 *	140577 *	120380 *	98114 *
-15.0	153663 *	156325 *	155639 *	156325 *	153663 *	146286 *	135532 *	123006 *	105172 *	86350 *
-16.0	132237 *	134185 *	133582 *	134185 *	132237 *	125405 *	116015 *	105827 *	90978 *	75903
-17.0	111817 *	113431 *	112770 *	113431 *	111817 *	105858 *	98424 *	90720 *	78390	66874
-18.0	93442 *	94577 *	93999 *	94577 *	93442 *	88827 *	83356	77445	67663	59502
-19.0	78003	78531	78031	78531	78003	74963	70898	66555	59679	53170
-20.0	67002	67106	67581	67106	67002	65793	62897	59047	53485	47659
-22.5	43541	43197	44245	43197	43541	45023	44897	42476	39285	34947
-25.5	26091	26168	25685	26168	26091	27198	28869	28242	26217	23224
-29.0	15482	15669	15773	15669	15482	15807	16692	17336	16508	14695
-33.0	8948	9051	9064	9051	8948	8987	9285	10582	10795	9399
-37.5	4162	4050	4054	4050	4162	4477	4790	5827	6612	5551
-42.5	1590	1564	1559	1564	1590	1691	2002	2411	3101	2823
-47.5	646	639	640	639	646	705	858	1013	1222	1227
-55.0	272	252	244	252	272	305	321	350	346	375
-65.0	186	185	136	185	186	183	181	178	176	174
-75.0	41	41	40	41	41	43	43	41	37	32
-85.0	0	0	0	0	0	0	0	0	0	0
-90.0	0	0	0	0	0	0	0	0	0	0

Vert. Angles	**Horizontal Angles**									
	15.0	**17.0**	**19.5**	**22.5**	**25.5**	**29.0**	**33.0**	**37.5**	**42.5**	**47.5**
90.0	1	1	1	1	1	1	2	2	2	3
85.0	11	11	10	10	11	10	12	12	14	16
75.0	73	71	67	61	55	51	48	42	34	30
65.0	309	292	267	235	206	188	177	151	114	89
55.0	793	738	664	587	542	498	462	383	279	211
47.5	1142	1093	1033	969	903	828	738	604	460	342
42.5	1266	1238	1198	1140	1073	987	872	722	557	400
37.5	1255	1244	1224	1189	1137	1056	939	786	601	421
33.0	1134	1138	1140	1124	1097	1039	942	798	607	417
29.0	988	1005	1015	1012	997	960	894	774	591	396

Photometric Toolbox Professional Edition - Copyright 2002-2015 by Lighting Analysts, Inc.
Calculations based on published IES Methods and recommendations, values rounded for display purposes.
Results derived from content of manufacturers photometric file.

IES FLOOD REPORT
PHOTOMETRIC FILENAME : [redacted]

CANDELA TABULATION - (Cont.)

25.5	841	870	892	904	896	871	826	731	567	370
22.5	706	737	770	801	811	799	765	690	541	340
20.0	588	625	661	710	738	741	715	657	515	310
19.0	542	581	622	673	706	716	698	643	504	296
18.0	503	541	588	641	677	694	684	632	490	280
17.0	487	511	556	611	649	673	671	622	476	264
16.0	545	509	537	589	627	658	663	612	461	250
15.0	816	584	545	582	621	654	660	604	444	240
14.0	1608	846	604	600	635	666	667	599	427	233
13.0	3440	1416	749	653	675	696	687	599	416	229
12.0	7116	2736	1108	768	754	758	719	604	414	227
11.0	12391	5096	1722	983	889	853	771	620	420	227
10.0	19942	8875	2809	1348	1101	997	853	655	435	226
9.0	28963	13819	4501	1911	1407	1205	970	710	456	226
8.0	39775	19901	7044	2715	1857	1487	1131	792	484	229
7.0	52011	27806	10385	3851	2501	1868	1352	898	520	235
6.0	63113	36315	14680	5300	3341	2357	1633	1031	567	249
5.0	73537	45563	20161	7400	4416	3005	1940	1189	631	271
4.0	83235	54342	26401	9828	5725	3773	2388	1388	711	301
3.0	92958 *	62623	32750	12859	7332	4705	2892	1642	813	335
2.0	102517 *	70313	38752	16226	9177	5800	3511	1924	920	379
1.0	111633 *	77649	44716	19909	11111	7054	4238	2239	1067	434
0.0	119746 *	84264	49980	23250	13294	8454	5059	2625	1213	500
-1.0	126525 *	89444 *	53991	26902	15645	9889	5970	3030	1349	572
-2.0	131369 *	93443 *	57964	30319	17951	11426	6895	3473	1535	651
-3.0	133992 *	96276 *	60680	33344	19842	12894	7932	3945	1715	736
-4.0	136189 *	97482 *	62239	35754	21588	14169	8745	4409	1913	823
-5.0	136395 *	97672 *	62610	37777	23163	15312	9636	4914	2091	902
-6.0	134934 *	96800 *	62490	38835	24634	16304	10420	5372	2271	1005
-7.0	131982 *	95023 *	62035	39433	25598	17124	11102	5830	2452	1077
-8.0	127553 *	92283 *	60790	39227	26062	17690	11644	6301	2661	1173
-9.0	121404 *	88748 *	58725	38446	26113	17968	12020	6707	2869	1256
-10.0	113508 *	83891	56046	37131	25784	18002	12236	7027	3074	1341
-11.0	104558 *	78079	52821	35508	25132	17820	12283	7275	3257	1421
-12.0	95437 *	71714	49303	33723	24339	17476	12285	7437	3419	1495
-13.0	86365 *	65286	45756	31848	23421	17045	12132	7534	3542	1560
-14.0	77078	59421	42355	30011	22391	16540	11920	7565	3655	1614
-15.0	68445	53816	39154	28171	21347	15958	11668	7523	3784	1685
-16.0	61533	48941	36271	26434	20272	15336	11351	7409	3873	1755
-17.0	56055	45294	33984	24954	19185	14687	10982	7252	3923	1813
-18.0	50984	41750	31774	23509	18283	14012	10582	7071	3941	1859
-19.0	45925	38267	29569	22048	17407	13447	10158	6840	3927	1892
-20.0	41386	34848	27289	20636	16433	12778	9716	6610	3846	1892
-22.5	30393	26193	21574	17144	13954	10917	8422	5945	3510	1824
-25.5	19765	17323	15474	13344	11131	8460	6446	4888	2876	1583
-29.0	12758	11554	10576	9700	8409	6117	4278	3405	2162	1206
-33.0	7825	7070	6324	5763	5349	4139	2857	1833	1393	781
-37.5	4396	3785	2929	2295	2277	2089	1614	937	724	453
-42.5	2240	1833	1296	984	928	899	708	457	247	185
-47.5	1099	903	653	495	435	423	290	162	73	41
-55.0	370	330	291	243	195	164	97	20	3	0
-65.0	168	160	146	123	91	50	16	0	0	0
-75.0	25	17	12	5	1	0	0	0	0	0
-85.0	0	0	0	0	0	0	0	0	0	0
-90.0	0	0	0	0	0	0	0	0	0	0

Photometric Toolbox Professional Edition - Copyright 2002-2015 by Lighting Analysts, Inc.
Calculations based on published IES Methods and recommendations, values rounded for display purposes.
Results derived from content of manufacturers photometric file.

IES FLOOD REPORT
PHOTOMETRIC FILENAME : [redacted]

CANDELA TABULATION - (Cont.)

Vert. Angles	Horizontal Angles				
	55.0	65.0	75.0	85.0	90.0
90.0	4	5	4	0	0
85.0	19	25	17	0	0
75.0	26	21	7	0	0
65.0	55	17	0	0	0
55.0	111	18	0	0	0
47.5	165	11	0	0	0
42.5	188	5	0	0	0
37.5	185	1	0	0	0
33.0	162	0	0	0	0
29.0	130	0	0	0	0
25.5	96	0	0	0	0
22.5	66	0	0	0	0
20.0	46	0	0	0	0
19.0	39	0	0	0	0
18.0	33	0	0	0	0
17.0	28	0	0	0	0
16.0	25	0	0	0	0
15.0	22	0	0	0	0
14.0	19	0	0	0	0
13.0	18	0	0	0	0
12.0	15	0	0	0	0
11.0	13	0	0	0	0
10.0	11	0	0	0	0
9.0	10	0	0	0	0
8.0	10	0	0	0	0
7.0	12	0	0	0	0
6.0	16	0	0	0	0
5.0	20	0	0	0	0
4.0	24	0	0	0	0
3.0	29	0	0	0	0
2.0	34	0	0	0	0
1.0	41	0	0	0	0
0.0	54	0	0	0	0
-1.0	71	0	0	0	0
-2.0	94	0	0	0	0
-3.0	119	0	0	0	0
-4.0	144	0	0	0	0
-5.0	171	0	0	0	0
-6.0	197	0	0	0	0
-7.0	224	0	0	0	0
-8.0	251	0	0	0	0
-9.0	279	0	0	0	0
-10.0	308	0	0	0	0
-11.0	338	0	0	0	0
-12.0	369	0	0	0	0
-13.0	395	0	0	0	0
-14.0	417	0	0	0	0
-15.0	442	0	0	0	0
-16.0	463	0	0	0	0
-17.0	491	0	0	0	0
-18.0	505	0	0	0	0
-19.0	522	0	0	0	0
-20.0	533	1	0	0	0

Photometric Toolbox Professional Edition - Copyright 2002-2015 by Lighting Analysts, Inc.
Calculations based on published IES Methods and recommendations, values rounded for display purposes.
Results derived from content of manufacturers photometric file.

IES FLOOD REPORT
PHOTOMETRIC FILENAME : [redacted]

CANDELA TABULATION - (Cont.)

-22.5	550	3	0	0	0
-25.5	533	4	0	0	0
-29.0	449	2	0	0	0
-33.0	302	0	0	0	0
-37.5	148	0	0	0	0
-42.5	12	0	0	0	0
-47.5	4	0	0	0	0
-55.0	0	0	0	0	0
-65.0	0	0	0	0	0
-75.0	0	0	0	0	0
-85.0	0	0	0	0	0
-90.0	0	0	0	0	0

Photometric Toolbox Professional Edition - Copyright 2002-2015 by Lighting Analysts, Inc.
Calculations based on published IES Methods and recommendations, values rounded for display purposes.
Results derived from content of manufacturers photometric file.

IES FLOOD REPORT
PHOTOMETRIC FILENAME : [redacted]

LUMEN TABULATION
Average Of Right And Left Sides
Total Luminaire Lumens (one side of beam only) = 46813.33
Total Field Lumens (one side of beam only) = 37425.38
* Indicates Values Inside Field Edge

Vert. Angles	Horizontal Angles									
	0	1	3	5	7	9	11	13	15	17
90	0.01	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
85	0.12	0.24	0.25	0.26	0.26	0.26	0.26	0.25	0.24	0.29
75	0.52	1.06	1.10	1.15	1.18	1.18	1.18	1.15	1.09	1.26
65	1.59	3.18	3.21	3.28	3.35	3.39	3.40	3.32	3.12	3.55
55	2.26	4.50	4.47	4.48	4.51	4.53	4.49	4.36	4.14	4.78
47.5	1.93	3.86	3.83	3.81	3.80	3.78	3.72	3.61	3.47	4.12
42.5	1.98	3.96	3.95	3.95	3.95	3.92	3.84	3.75	3.66	4.43
37.5	1.64	3.28	3.28	3.28	3.28	3.27	3.23	3.18	3.14	3.86
33	1.25	2.50	2.50	2.50	2.50	2.50	2.50	2.50	2.50	3.11
29	0.88	1.77	1.77	1.78	1.79	1.82	1.85	1.87	1.90	2.39
25.5	0.59	1.19	1.20	1.21	1.23	1.26	1.30	1.35	1.39	1.77
22.5	0.42	0.83	0.81	0.80	0.81	0.84	0.88	0.93	0.97	1.26
20	0.20	0.38	0.35	0.31	0.28	0.29	0.30	0.32	0.34	0.45
19	0.50	0.93	0.72	0.51	0.33	0.28	0.28	0.30	0.32	0.42
18	1.38	2.48	1.99	1.32	0.66	0.39	0.30	0.29	0.30	0.40
17	3.57	6.55	5.43	3.55	1.72	0.86	0.44	0.33	0.30	0.38
16	7.44	13.67	11.49	8.00	4.29	2.13	0.97	0.51	0.36	0.39
15	13.61	25.26	21.14	15.04	9.03	4.88	2.34	1.06	0.56	0.47
14	22.02	41.37	35.31	26.11	16.91	9.95	5.23	2.38	1.07	0.65
13	32.05 *	60.78 *	53.27 *	41.35	28.33	17.72	10.12	4.97	2.15	1.09
12	43.68 *	83.42 *	74.36 *	59.48 *	42.55	27.79	16.76	8.93	4.00	1.93
11	56.95 *	109.14 *	97.68 *	79.89 *	59.56 *	40.22	25.17	14.15	6.78	3.35
10	72.64 *	139.55 *	124.55 *	102.50 *	78.20 *	54.27 *	34.87	20.34	10.48	5.42
9	89.85 *	173.40 *	155.59 *	128.01 *	97.49 *	68.42 *	45.17	27.56	15.00	8.18

Photometric Toolbox Professional Edition - Copyright 2002-2015 by Lighting Analysts, Inc.
Calculations based on published IES Methods and recommendations, values rounded for display purposes.
Results derived from content of manufacturers photometric file.

IES FLOOD REPORT
PHOTOMETRIC FILENAME : [redacted]

LUMENS TABULATION - (Cont.)

8	108.00 *	208.71 *	188.40 *	155.80 *	118.24 *	82.76 *	55.57 *	35.50	20.42	11.78
7	128.84 *	247.41 *	221.84 *	183.19 *	139.44 *	97.54 *	65.47 *	43.16	26.24	16.12
6	152.15 *	289.46 *	255.67 *	208.30 *	158.66 *	112.17 *	75.36 *	50.35 *	31.99	21.10
5	178.86 *	335.44 *	289.58 *	231.38 *	175.32 *	125.73 *	85.42 *	57.32 *	37.58	26.48
4	207.36 *	384.25 *	323.09 *	253.21 *	190.97 *	137.98 *	95.17 *	64.23 *	42.92	31.84
3	231.62 *	426.24 *	352.70 *	273.68 *	206.06 *	149.48 *	104.38 *	71.04 *	48.08	36.96
2	248.44 *	456.47 *	376.39 *	291.45 *	219.47 *	160.32 *	112.88 *	77.50 *	53.01 *	41.84
1	255.65 *	472.81 *	392.86 *	305.23 *	230.49 *	169.65 *	120.17 *	83.21 *	57.58 *	46.39
0	253.76 *	473.21 *	399.62 *	313.96 *	238.75 *	176.84 *	125.91 *	87.95 *	61.49 *	50.20
-1	243.93 *	459.09 *	396.53 *	317.05 *	243.72 *	181.55 *	129.88 *	91.51 *	64.53 *	53.31
-2	227.59 *	433.19 *	383.97 *	314.08 *	244.70 *	183.27 *	131.74 *	93.63 *	66.62 *	55.75
-3	209.39 *	402.24 *	363.14 *	304.15 *	241.12 *	181.59 *	131.23 *	94.50 *	67.92 *	57.25
-4	191.78 *	369.92 *	336.57 *	288.40 *	233.00 *	176.38 *	128.51 *	94.24 *	68.48 *	57.85
-5	173.67 *	335.91 *	308.35 *	269.62 *	220.96 *	168.38 *	124.43 *	92.99 *	68.19 *	57.78
-6	155.52 *	302.54 *	281.05 *	248.83 *	206.05 *	159.13 *	119.85 *	91.03 *	67.16 *	57.19
-7	139.11 *	271.47 *	254.07 *	226.33 *	189.18 *	149.48 *	115.14 *	88.35 *	65.42 *	56.07
-8	123.62 *	241.09 *	226.15 *	202.32 *	171.19 *	139.15 *	109.74 *	84.77 *	62.95 *	54.34
-9	108.09 *	211.51 *	198.56 *	178.04 *	153.40 *	128.17 *	103.04 *	79.98 *	59.67 *	51.96
-10	93.34 *	183.44 *	172.69 *	155.93 *	137.03 *	116.93 *	95.22 *	74.15 *	55.64 *	48.97
-11	80.19 *	157.83 *	149.37 *	136.74 *	122.29 *	105.72 *	86.86 *	67.91 *	51.21 *	45.55
-12	69.01 *	135.99 *	129.55 *	120.12 *	108.74 *	94.70 *	78.23 *	61.52 *	46.67	41.96
-13	59.47 *	117.50 *	112.70 *	105.39 *	95.91 *	83.76 *	69.47 *	55.02 *	42.19	38.48
-14	51.29 *	101.69 *	98.04 *	91.89 *	83.80 *	73.36 *	61.08 *	48.76	37.88	35.21
-15	44.15 *	87.73 *	84.71 *	79.25 *	72.45 *	63.74 *	53.39 *	43.19	34.07	32.21
-16	37.62 *	74.84 *	72.21 *	67.51 *	61.98 *	54.88 *	46.50	38.48	31.01	29.74
-17	31.59 *	62.90 *	60.76 *	57.02 *	52.78 *	47.13	40.58	34.49	28.41	27.63
-18	26.28 *	52.44 *	50.93	48.17	44.98	40.70	35.76	30.97	25.90	25.56
-19	22.18	44.24	43.42	41.59	39.12	35.81	31.88	27.80	23.49	23.50

Photometric Toolbox Professional Edition - Copyright 2002-2015 by Lighting Analysts, Inc.
Calculations based on published IES Methods and recommendations, values rounded for display purposes.
Results derived from content of manufacturers photometric file.

IES FLOOD REPORT
PHOTOMETRIC FILENAME : [redacted]

LUMENS TABULATION - (Cont.)

-20	42.29	84.04	84.08	82.78	78.92	72.85	65.32	57.04	48.61	49.68
-22.5	31.82	63.47	64.66	66.34	65.37	61.29	55.27	48.03	41.14	43.70
-25.5	22.20	44.43	44.97	46.95	48.11	46.36	42.05	36.43	31.46	34.76
-29	15.10	29.92	29.91	30.76	32.51	33.13	30.63	26.41	22.96	25.69
-33	8.98	17.95	18.17	18.77	20.69	22.82	21.69	18.07	15.20	16.36
-37.5	4.27	8.65	9.06	9.82	11.33	13.46	13.47	11.09	8.97	8.90
-42.5	1.68	3.38	3.52	3.98	4.74	5.81	6.24	5.46	4.45	4.24
-47.5	1.01	2.07	2.20	2.49	2.88	3.30	3.54	3.40	2.97	2.95
-55	0.62	1.36	1.44	1.50	1.55	1.57	1.60	1.61	1.51	1.68
-65	0.31	0.69	0.69	0.68	0.67	0.65	0.62	0.59	0.54	0.61
-75	0.06	0.12	0.13	0.13	0.13	0.12	0.10	0.08	0.06	0.05
-85	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
-90										
Total	4337.91	8278.99	7389.99	6225.41	5032.74	3911.65	2942.02	2179.17	1591.9	1375.6

Vert. Angles	**Horizontal Angles**									
	19.5	**22.5**	**25.5**	**29**	**33**	**37.5**	**42.5**	**47.5**	**55**	**65**
90	0.02	0.02	0.03	0.03	0.04	0.04	0.05	0.08	0.10	0.07
85	0.32	0.29	0.30	0.32	0.32	0.30	0.25	0.33	0.35	0.18
75	1.34	1.16	1.18	1.21	1.17	0.99	0.72	0.71	0.45	0.12
65	3.74	3.28	3.40	3.46	3.28	2.70	1.87	1.66	0.76	0.09
55	5.20	4.70	4.92	4.95	4.59	3.77	2.61	2.22	0.87	0.06
47.5	4.63	4.26	4.49	4.47	4.11	3.42	2.37	1.96	0.70	0.02
42.5	5.07	4.74	5.04	5.03	4.64	3.89	2.66	2.13	0.72	0.01
37.5	4.49	4.27	4.62	4.67	4.36	3.66	2.48	1.91	0.60	0.00
33	3.66	3.53	3.88	4.00	3.81	3.23	2.17	1.58	0.44	0.00
29	2.85	2.78	3.09	3.24	3.16	2.72	1.81	1.24	0.30	0.00
25.5	2.15	2.14	2.40	2.55	2.53	2.21	1.47	0.93	0.18	0.00
22.5	1.57	1.60	1.83	1.97	1.98	1.75	1.15	0.68	0.11	0.00
20	0.57	0.59	0.69	0.75	0.76	0.68	0.44	0.25	0.03	0.00

Photometric Toolbox Professional Edition - Copyright 2002-2015 by Lighting Analysts, Inc.
Calculations based on published IES Methods and recommendations, values rounded for display purposes.
Results derived from content of manufacturers photometric file.

IES FLOOD REPORT
PHOTOMETRIC FILENAME : [redacted]

LUMENS TABULATION - (Cont.)

19	0.54	0.56	0.66	0.73	0.74	0.66	0.42	0.23	0.03	0.00
18	0.51	0.54	0.64	0.71	0.73	0.65	0.41	0.22	0.02	0.00
17	0.49	0.52	0.62	0.70	0.72	0.63	0.39	0.20	0.02	0.00
16	0.48	0.50	0.61	0.69	0.71	0.62	0.38	0.19	0.02	0.00
15	0.50	0.51	0.61	0.69	0.71	0.60	0.36	0.18	0.02	0.00
14	0.56	0.53	0.63	0.71	0.71	0.60	0.35	0.18	0.01	0.00
13	0.70	0.59	0.68	0.75	0.73	0.59	0.35	0.17	0.01	0.00
12	0.98	0.71	0.77	0.81	0.76	0.60	0.35	0.17	0.01	0.00
11	1.46	0.90	0.91	0.91	0.81	0.62	0.35	0.17	0.01	0.00
10	2.25	1.20	1.12	1.05	0.89	0.66	0.36	0.17	0.01	0.00
9	3.45	1.65	1.41	1.25	1.01	0.71	0.38	0.17	0.01	0.00
8	5.12	2.28	1.83	1.52	1.17	0.79	0.40	0.17	0.01	0.00
7	7.30	3.13	2.39	1.88	1.37	0.88	0.42	0.18	0.01	0.00
6	10.14	4.27	3.11	2.33	1.62	1.00	0.46	0.20	0.01	0.00
5	13.60	5.71	4.01	2.90	1.93	1.14	0.52	0.22	0.02	0.00
4	17.45	7.46	5.10	3.59	2.33	1.33	0.58	0.25	0.02	0.00
3	21.45	9.51	6.40	4.41	2.79	1.55	0.66	0.28	0.02	0.00
2	25.51	11.77	7.85	5.38	3.33	1.79	0.75	0.32	0.03	0.00
1	29.40	14.10	9.46	6.48	3.96	2.08	0.87	0.37	0.04	0.00
0	32.87	16.51	11.20	7.67	4.67	2.40	0.98	0.43	0.05	0.00
-1	36.08	18.95	13.01	8.92	5.42	2.74	1.11	0.50	0.06	0.00
-2	38.88	21.17	14.72	10.22	6.22	3.11	1.25	0.57	0.08	0.00
-3	40.95	23.07	16.23	11.42	7.00	3.49	1.40	0.65	0.10	0.00
-4	42.31	24.68	17.59	12.49	7.75	3.89	1.54	0.73	0.12	0.00
-5	43.02	25.96	18.81	13.49	8.49	4.27	1.69	0.81	0.14	0.00
-6	43.25	26.82	19.82	14.34	9.16	4.64	1.83	0.89	0.16	0.00
-7	42.97	27.20	20.49	15.03	9.76	5.03	1.98	0.97	0.18	0.00
-8	42.05	27.10	20.81	15.49	10.26	5.41	2.14	1.06	0.20	0.00

Photometric Toolbox Professional Edition - Copyright 2002-2015 by Lighting Analysts, Inc.
Calculations based on published IES Methods and recommendations, values rounded for display purposes.
Results derived from content of manufacturers photometric file.

IES FLOOD REPORT
PHOTOMETRIC FILENAME : [redacted]

LUMENS TABULATION - (Cont.)

-9	40.59	26.60	20.82	15.72	10.63	5.74	2.30	1.14	0.22	0.00
-10	38.71	25.78	20.55	15.75	10.86	6.02	2.45	1.22	0.25	0.00
-11	36.54	24.77	20.08	15.63	10.99	6.24	2.58	1.29	0.27	0.00
-12	34.26	23.65	19.49	15.39	11.02	6.40	2.70	1.36	0.29	0.00
-13	31.98	22.47	18.81	15.05	10.95	6.50	2.79	1.42	0.31	0.00
-14	29.79	21.27	18.06	14.64	10.82	6.57	2.89	1.49	0.33	0.00
-15	27.73	20.08	17.27	14.18	10.62	6.59	2.99	1.55	0.34	0.00
-16	25.94	18.96	16.46	13.67	10.35	6.55	3.06	1.62	0.36	0.00
-17	24.36	17.93	15.68	13.12	10.04	6.47	3.11	1.67	0.38	0.00
-18	22.80	16.96	14.96	12.58	9.69	6.35	3.13	1.71	0.39	0.00
-19	21.23	15.97	14.23	12.03	9.32	6.19	3.11	1.73	0.40	0.00
-20	46.19	35.56	32.03	27.30	21.47	14.51	7.45	4.29	1.03	0.00
-22.5	43.21	34.79	31.60	26.82	21.57	15.06	7.91	4.81	1.24	0.01
-25.5	36.64	31.10	28.29	23.12	18.62	13.61	7.37	4.72	1.32	0.01
-29	27.61	24.39	22.76	18.16	13.85	10.26	5.97	3.91	1.15	0.00
-33	16.61	14.73	14.77	12.57	9.12	6.41	4.06	2.71	0.77	0.00
-37.5	8.00	6.77	7.34	6.93	5.20	3.45	2.17	1.43	0.30	0.00
-42.5	3.66	2.97	3.18	3.03	2.26	1.37	0.73	0.43	0.03	0.00
-47.5	2.69	2.14	2.16	1.91	1.19	0.56	0.24	0.12	0.01	0.00
-55	1.71	1.36	1.18	0.85	0.37	0.07	0.01	0.00	0.00	0.00
-65	0.61	0.46	0.34	0.17	0.04	0.00	0.00	0.00	0.00	0.00
-75	0.04	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
-85	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
-90										
Total	1060.78	699.99	577.42	461.84	339.51	216.74	109.69	64.94	16.43	0.56

Vert. Angles	**Horizontal Angles**		
75	**85**	**90**	**Total**
90	0.01	0.00	0.65
85	0.03	0.00	5.39

Photometric Toolbox Professional Edition - Copyright 2002-2015 by Lighting Analysts, Inc.
Calculations based on published IES Methods and recommendations, values rounded for display purposes.
Results derived from content of manufacturers photometric file.

IES FLOOD REPORT
PHOTOMETRIC FILENAME : [redacted]

LUMENS TABULATION - (Cont.)

75			
	0.01	0.00	19.95
65			
	0.00	0.00	55.62
55			
	0.00	0.00	76.41
47.5			
	0.00	0.00	66.36
42.5			
	0.00	0.00	71.33
37.5			
	0.00	0.00	62.51
33			
	0.00	0.00	50.66
29			
	0.00	0.00	39.02
25.5			
	0.00	0.00	29.06
22.5			
	0.00	0.00	21.19
20			
	0.00	0.00	7.97
19			
	0.00	0.00	9.17
18			
	0.00	0.00	13.90
17			
	0.00	0.00	27.41
16			
	0.00	0.00	53.43
15			
	0.00	0.00	97.58
14			
	0.00	0.00	165.31
13			
	0.00	0.00	256.42
12			
	0.00	0.00	368.05
11			
	0.00	0.00	499.02
10			
	0.00	0.00	650.54
9			
	0.00	0.00	818.69
8			
	0.00	0.00	998.45
7			
	0.00	0.00	1186.82
6			
	0.00	0.00	1378.35
5			
	0.00	0.00	1573.17
4			
	0.00	0.00	1769.13
3			
	0.00	0.00	1947.31

Photometric Toolbox Professional Edition - Copyright 2002-2015 by Lighting Analysts, Inc.
Calculations based on published IES Methods and recommendations, values rounded for display purposes.
Results derived from content of manufacturers photometric file.

IES FLOOD REPORT
PHOTOMETRIC FILENAME : [redacted]

LUMENS TABULATION - (Cont.)

2	0.00	0.00	2094.51
1	0.00	0.00	2200.78
0	0.00	0.00	2258.46
-1	0.00	0.00	2267.88
-2	0.00	0.00	2230.77
-3	0.00	0.00	2156.85
-4	0.00	0.00	2056.23
-5	0.00	0.00	1936.97
-6	0.00	0.00	1809.26
-7	0.00	0.00	1678.2
-8	0.00	0.00	1539.84
-9	0.00	0.00	1396.19
-10	0.00	0.00	1254.92
-11	0.00	0.00	1122.06
-12	0.00	0.00	1001.03
-13	0.00	0.00	890.18
-14	0.00	0.00	788.87
-15	0.00	0.00	696.26
-16	0.00	0.00	611.74
-17	0.00	0.00	536.05
-18	0.00	0.00	470.27
-19	0.00	0.00	417.24
-20	0.00	0.00	855.45
-22.5	0.00	0.00	728.11
-25.5	0.00	0.00	562.52
-29	0.00	0.00	405.07
-33	0.00	0.00	260.46
-37.5	0.00	0.00	140.60

Photometric Toolbox Professional Edition - Copyright 2002-2015 by Lighting Analysts, Inc.
Calculations based on published IES Methods and recommendations, values rounded for display purposes.
Results derived from content of manufacturers photometric file.

IES FLOOD REPORT
PHOTOMETRIC FILENAME : [redacted]

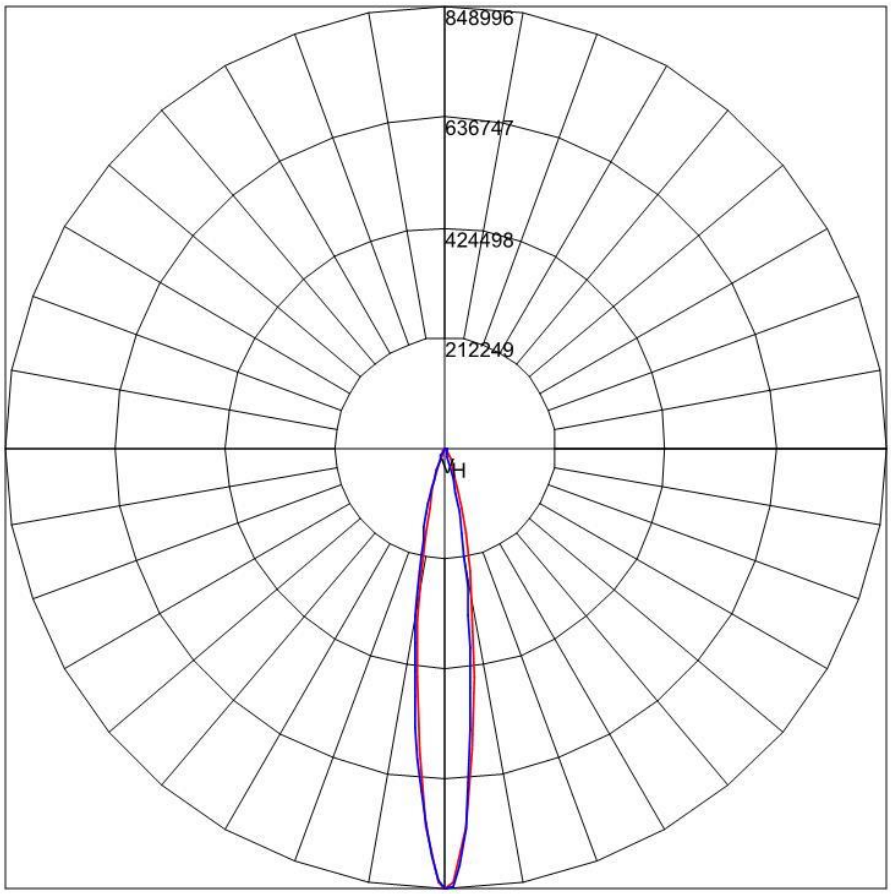
LUMENS TABULATION - (Cont.)

-42.5	0.00	0.00	61.14
-47.5	0.00	0.00	37.83
-55	0.00	0.00	19.99
-65	0.00	0.00	7.67
-75	0.00	0.00	1.04
-85	0.00	0.00	0.00
-90			
Total	0.05	0.00	46813.31

Photometric Toolbox Professional Edition - Copyright 2002-2015 by Lighting Analysts, Inc.
Calculations based on published IES Methods and recommendations, values rounded for display purposes.
Results derived from content of manufacturers photometric file.

IES FLOOD REPORT
PHOTOMETRIC FILENAME : [redacted]

AXIAL CANDELA DISPLAY

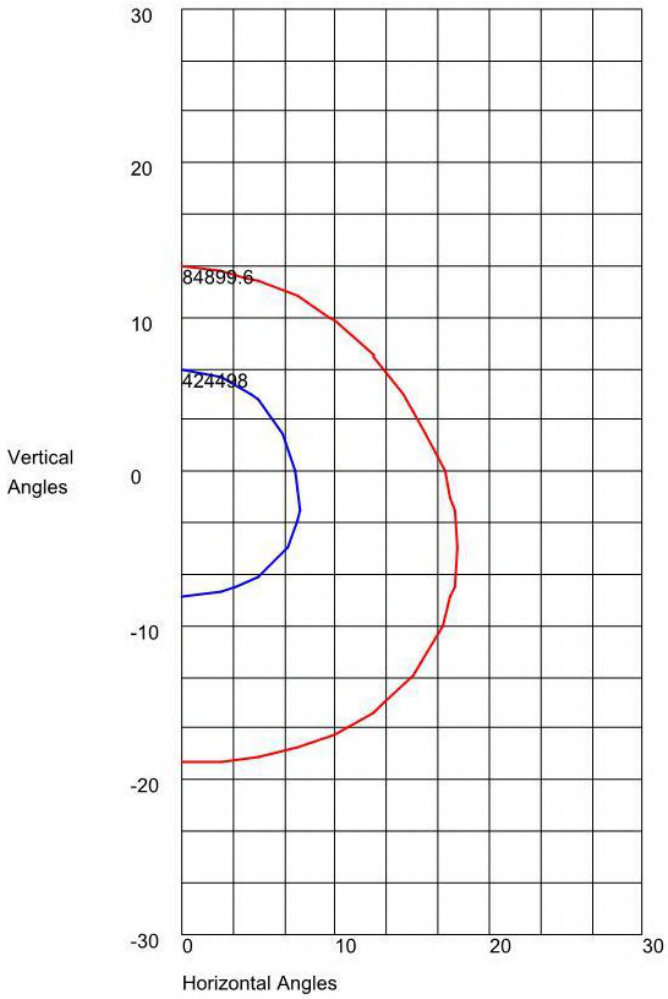


Maximum Candela = 848996 Located At Horizontal Angle = 0, Vertical Angle = 0
H - Horizontal Axial Candela
V - Vertical Axial Candela

Photometric Toolbox Professional Edition - Copyright 2002-2015 by Lighting Analysts, Inc.
Calculations based on published IES Methods and recommendations, values rounded for display purposes.
Results derived from content of manufacturers photometric file.

IES FLOOD REPORT
PHOTOMETRIC FILENAME : [redacted]

ISOCANDELA CURVES



Maximum Candela = 848996 Located At Horizontal Angle = 0, Vertical Angle = 0
50% Maximum Candela = 424498
10% Maximum Candela = 84899.6

Photometric Toolbox Professional Edition - Copyright 2002-2015 by Lighting Analysts, Inc.
Calculations based on published IES Methods and recommendations, values rounded for display purposes.
Results derived from content of manufacturers photometric file.

IES FLOOD REPORT
PHOTOMETRIC FILENAME : [redacted]

DESCRIPTIVE INFORMATION (From Photometric File)

IESNA:LM-63-2002
[TEST][redacted]
[TESTLAB][redacted]
[ISSUEDATE]11/28/16
[MANUFAC][redacted]
[LUMCAT][redacted]
[LUMINAIRE][redacted]
[MORE][redacted]
[MORE][redacted]
[MORE][redacted]
[MORE][redacted]
[LAMP]Cree XM-LM Light Emitting Diode (LED);[redacted]
[MORE][redacted](ave. 5700K); 75 Typical CRI
[BALLASTCAT][redacted]
[BALLAST][redacted]1500 watt, 2 amp driver. (Operated at 480 VAC input)
[_MOUNTING]25 degrees below horizon
[_VOLTAGE]713.13
[_AMPERAGE]1.796
[_WATTAGE]1280.6
[_WAVEFORM]DC
[_EFFICACY]90.3 lpw (does not include driver losses)
[_Ta]24.8 C
[_ABSOLUTE]Data shown is absolute for the sample provided. Report made
[MORE]in accordance with IESNA LM-79:2008 (minus Section 12 for
[MORE]color). Corrections were made for stray light/dark current.
[MORE]Spectral mismatch correction factor was not performed.
[MORE][redacted]
[MORE][redacted]
[MORE][redacted]
[_EQUIPMENT][redacted]
[MORE][redacted]
[MORE][redacted]
[MORE][redacted]
[MORE][redacted]
[MORE][redacted]
[_STABILIZATION]Units were operated for stabilization approximately 3 hours
[MORE]before testing. Total on-time was approximately 4 hours.
[_ACCREDITED][redacted]
[MORE][redacted]
[MORE][redacted]
[MORE][redacted]
[MORE][redacted]
[_ABSOLUTELUMENS]115467
[_CONVERT] Luminaire test position and photometric web converted from original test data

Photometric Toolbox Professional Edition - Copyright 2002-2015 by Lighting Analysts, Inc.
Calculations based on published IES Methods and recommendations, values rounded for display purposes.
Results derived from content of manufacturers photometric file.

IES FLOOD REPORT
PHOTOMETRIC FILENAME : [redacted]

CHARACTERISTICS

NEMA Type	3 H x 3 V
Maximum Candela	750275
Maximum Candela Angle	0H 0V
Horizontal Beam Angle (50%)	19.6
Vertical Beam Angle (50%)	20.6
Horizontal Field Angle (10%)	35.9
Vertical Field Angle (10%)	37.7
Lumens Per Lamp	N.A. (absolute)
Total Lamp Lumens	N.A. (absolute)
Beam Lumens	52805
Beam Efficiency	N.A.
Field Lumens	97029
Field Efficiency	N.A.
Spill Lumens	19126
Luminaire Lumens	116156
Total Efficiency	N.A.
Total Luminaire Watts	1280.6
Ballast Factor	1.00

Photometric Toolbox Professional Edition - Copyright 2002-2015 by Lighting Analysts, Inc.
Calculations based on published IES Methods and recommendations, values rounded for display purposes.
Results derived from content of manufacturers photometric file.

IES FLOOD REPORT
PHOTOMETRIC FILENAME : [redacted]

AXIAL CANDELA

DEG.	HOR.	DEG.	VERT.
90	0	90	0
85	0	85	1
75	0	75	6
65	0	65	21
55	21	55	76
47.5	749	47.5	181
42.5	1871	42.5	302
37.5	4535	37.5	476
33	9008	33	686
29	13988	29	986
25.5	21253	25.5	1542
22.5	33617	22.5	2704
19.5	55700	20	5180
17	86598	19	7641
15	129931	18	11602
13	207926	17	17457
11	306124	16	25379
9	420267	15	35352
7	546867	14	48101
5	656477	13	66542
3	720973	12	88679
1	746953	11	133502
0	750275	10	194958
-1	746953	9	265854
-3	720973	8	337768
-5	656477	7	409177
-7	546867	6	479708
-9	420267	5	554297
-11	306124	4	621573
-13	207926	3	677880
-15	129931	2	719562
-17	86598	1	742232
-19.5	55700	0	750275
-22.5	33617	-1	744425
-25.5	21253	-2	728338
-29	13988	-3	701281
-33	9008	-4	667643
-37.5	4535	-5	628155
-42.5	1871	-6	587204
-47.5	749	-7	549910
-55	21	-8	517003
-65	0	-9	489215
-75	0	-10	473077
-85	0	-11	446572
-90	0	-12	416070
		-13	379729
		-14	340066
		-15	304998
		-16	281054
		-17	263981
		-18	243315
		-19	213209
		-20	181713
		-22.5	115468

Photometric Toolbox Professional Edition - Copyright 2002-2015 by Lighting Analysts, Inc.
Calculations based on published IES Methods and recommendations, values rounded for display purposes.
Results derived from content of manufacturers photometric file.

IES FLOOD REPORT
PHOTOMETRIC FILENAME : [redacted]

AXIAL CANDELA - (Cont.)

DEG. HOR.	DEG. VERT.
-25.5	68127
-29	40226
-33	23928
-37.5	12582
-42.5	3960
-47.5	1757
-55	344
-65	64
-75	21
-85	0
-90	0

Photometric Toolbox Professional Edition - Copyright 2002-2015 by Lighting Analysts, Inc.
Calculations based on published IES Methods and recommendations, values rounded for display purposes.
Results derived from content of manufacturers photometric file.

IES FLOOD REPORT
PHOTOMETRIC FILENAME : [redacted]

CANDELA TABULATION
Maximum Candela = 750275
Beam Edge = 375137.5 Cd (50% of Max.)
Field Edge = 75027.5 Cd (10% of Max.)
* Indicates Values Inside Field Edge

Vert. Angles	Horizontal Angles									
	-90.0	-85.0	-75.0	-65.0	-55.0	-47.5	-42.5	-37.5	-33.0	-29.0
90.0	0	0	1	4	3	3	2	2	2	1
85.0	0	0	6	18	16	13	12	10	8	7
75.0	0	0	1	12	14	12	11	9	9	9
65.0	0	0	0	5	11	12	13	13	15	15
55.0	0	0	0	0	5	13	20	28	35	41
47.5	0	0	0	0	0	10	30	51	71	87
42.5	0	0	0	0	0	5	31	65	99	130
37.5	0	0	0	0	0	1	22	69	120	170
33.0	0	0	0	0	0	0	10	63	129	193
29.0	0	0	0	0	0	0	1	54	130	213
25.5	0	0	0	0	0	0	0	56	155	271
22.5	0	0	0	0	0	0	1	84	226	402
20.0	0	0	0	0	0	0	5	130	325	582
19.0	0	0	0	0	0	0	9	153	400	720
18.0	0	0	0	0	0	0	18	194	502	916
17.0	0	0	0	0	0	0	34	240	638	1199
16.0	0	0	0	0	0	0	55	305	815	1567
15.0	0	0	0	0	0	0	96	391	1024	1992
14.0	0	0	0	0	0	1	126	502	1253	2447
13.0	0	0	0	0	0	9	179	640	1500	2929
12.0	0	0	0	0	0	35	250	792	1773	3428
11.0	0	0	0	0	0	74	333	955	2078	4059
10.0	0	0	0	0	0	127	437	1125	2440	4690
9.0	0	0	0	0	0	187	555	1312	2884	5510
8.0	0	0	0	0	0	256	688	1524	3432	6408
7.0	0	0	0	0	0	327	829	1769	4093	7369
6.0	0	0	0	0	0	395	970	2064	4797	8393
5.0	0	0	0	0	0	456	1106	2402	5535	9448
4.0	0	0	0	0	0	512	1236	2783	6258	10489
3.0	0	0	0	0	0	564	1369	3170	6956	11484
2.0	0	0	0	0	0	620	1507	3598	7645	12426
1.0	0	0	0	0	12	683	1675	4062	8350	13237
0.0	0	0	0	0	21	749	1871	4535	9008	13988
-1.0	0	0	0	0	37	819	2066	4921	9621	14749
-2.0	0	0	0	0	45	890	2229	5195	10150	15394
-3.0	0	0	0	0	58	957	2340	5425	10538	15977
-4.0	0	0	0	0	77	1020	2418	5755	10855	16495
-5.0	0	0	0	0	106	1080	2489	6134	11097	16905
-6.0	0	0	0	0	133	1139	2553	6479	11195	17360
-7.0	0	0	0	0	157	1191	2614	6726	11374	17863
-8.0	0	0	0	0	178	1233	2748	6945	11590	18330
-9.0	0	0	0	0	193	1270	2937	7118	11808	18736
-10.0	0	0	0	0	208	1296	3159	7180	11994	19048
-11.0	0	0	0	0	225	1310	3349	7211	12115	19235
-12.0	0	0	0	0	236	1311	3489	7216	12191	19266
-13.0	0	0	0	0	249	1295	3545	7185	12158	19095
-14.0	0	0	0	0	260	1254	3537	7088	12061	18698
-15.0	0	0	0	0	265	1225	3499	6979	11881	18095
-16.0	0	0	0	0	267	1198	3407	6839	11606	17304

Photometric Toolbox Professional Edition - Copyright 2002-2015 by Lighting Analysts, Inc.
Calculations based on published IES Methods and recommendations, values rounded for display purposes.
Results derived from content of manufacturers photometric file.

IES FLOOD REPORT
PHOTOMETRIC FILENAME : [redacted]

CANDELA TABULATION - (Cont.)

-17.0	0	0	0	0	266	1166	3283	6696	11246	16431
-18.0	0	0	0	0	258	1130	3134	6533	10827	15652
-19.0	0	0	0	0	244	1091	2953	6341	10419	15109
-20.0	0	0	0	0	222	1041	2747	6081	10170	14383
-22.5	0	0	0	0	173	895	2201	5364	9311	12612
-25.5	0	0	0	0	126	696	1614	4457	7854	10658
-29.0	0	0	0	0	72	488	1177	3474	6172	8577
-33.0	0	0	0	0	12	247	653	2082	4104	6068
-37.5	0	0	0	0	0	86	300	845	1590	3121
-42.5	0	0	0	0	0	0	68	245	558	1002
-47.5	0	0	0	0	0	0	0	36	128	339
-55.0	0	0	0	0	0	0	0	0	0	0
-65.0	0	0	0	0	0	0	0	0	0	0
-75.0	0	0	0	0	0	0	0	0	0	0
-85.0	0	0	0	0	0	0	0	0	0	0
-90.0	0	0	0	0	0	0	0	0	0	0

Vert. Angles	**Horizontal Angles**									
	-25.5	**-22.5**	**-19.5**	**-17.0**	**-15.0**	**-13.0**	**-11.0**	**-9.0**	**-7.0**	**-5.0**
90.0	1	1	1	1	1	1	1	1	0	0
85.0	6	5	5	4	4	4	3	3	2	2
75.0	8	8	8	8	7	7	7	6	6	6
65.0	16	17	17	18	19	19	19	19	19	20
55.0	46	50	55	59	61	64	67	69	71	74
47.5	102	114	127	138	147	155	163	169	173	177
42.5	157	180	203	226	242	257	273	283	291	294
37.5	213	252	292	328	356	387	414	435	453	460
33.0	256	316	380	437	487	530	565	598	634	658
29.0	304	388	479	563	633	683	738	795	859	925
25.5	396	509	629	734	826	912	1024	1139	1263	1411
22.5	574	748	910	1063	1207	1361	1593	1831	2100	2432
20.0	846	1137	1373	1641	1906	2202	2674	3178	3776	4562
19.0	1051	1450	1728	2091	2468	2906	3636	4429	5380	6351
18.0	1381	1831	2223	2731	3291	3978	5152	6422	7944	9513
17.0	1789	2383	2926	3653	4411	5630	7488	9435	11754	14141
16.0	2348	3124	3900	4970	6162	8105	10868	13589	16981	19655
15.0	3009	4046	5206	6823	8556	11539	15412	19101	23677	27397
14.0	3731	5114	6885	9326	11877	15996	21178	26097	32020	37132
13.0	4513	6302	8925	12500	16037	21413	28295	34773	42907	51021
12.0	5356	7600	11233	16218	20960	27858	37260	46055	60887	73642
11.0	6291	9036	13750	19968	26464	35694	47816	63763	89047 *	109395 *
10.0	7367	10671	16463	24059	32708	44679	63935	89484 *	128287 *	158636 *
9.0	8562	12509	19400	28492	39770	57513	86410 *	123707 *	174909 *	216398 *
8.0	9851	14333	22591	33217	47771	73423	114389 *	164021 *	225023 *	274987 *
7.0	11215	16448	25980	38524	55850	90916 *	142483 *	205426 *	272771 *	333871 *
6.0	12643	18765	29881	44872	66207	109664 *	170578 *	243573 *	319528 *	396974 *
5.0	14123	21214	34185	51246	77387 *	128188 *	196526 *	279030 *	371099 *	459454 *
4.0	15615	23750	38546	58472	89310 *	146465 *	221711 *	314477 *	422551 *	521544 *
3.0	17088	26324	43109	66269	101320 *	164753 *	247365 *	349322 *	468065 *	575246 *
2.0	18530	28863	47702	73788	112635 *	181899 *	271336 *	380327 *	505073 *	617053 *
1.0	19922	31327	52143	80766 *	122414 *	196482 *	291285 *	404785 *	530557 *	643202 *
0.0	21253	33617	55700	86598 *	129931 *	207926 *	306124 *	420267 *	546867 *	656477 *
-1.0	22492	35561	59095	92089 *	137063 *	216946 *	316827 *	431421 *	554162 *	657910 *
-2.0	23596	37443	62045	96794 *	143601 *	223847 *	324208 *	437507 *	552660 *	647800 *
-3.0	24595	39014	64443	100636 *	149859 *	229209 *	326742 *	437358 *	542978 *	626987 *

Photometric Toolbox Professional Edition - Copyright 2002-2015 by Lighting Analysts, Inc.
Calculations based on published IES Methods and recommendations, values rounded for display purposes.
Results derived from content of manufacturers photometric file.

IES FLOOD REPORT
PHOTOMETRIC FILENAME : [redacted]

CANDELA TABULATION - (Cont.)

-4.0	25360	40031	66228	103425 *	155783 *	230792 *	325207 *	430778 *	526950 *	602507 *
-5.0	26042	41343	67313	106166 *	159007 *	230217 *	319035 *	418355 *	504611 *	569586 *
-6.0	27057	42821	68527	108144 *	159372 *	226816 *	308935 *	400552 *	479571 *	535911 *
-7.0	27911	43517	69370	108478 *	157018 *	220057 *	296277 *	379492 *	451777 *	501553 *
-8.0	28570	43969	69423	107073 *	152154 *	210381 *	280903 *	355864 *	420306 *	469459 *
-9.0	29027	44114	68683	104144 *	145359 *	198858 *	264961 *	334939 *	389779 *	436742 *
-10.0	29301	43890	67248	99975 *	137308 *	186192 *	247446 *	311959 *	363670 *	406046 *
-11.0	29348	43171	65148	95049 *	129052 *	172785 *	228631 *	288209 *	338308 *	378792 *
-12.0	29040	42044	62467	89869 *	119980 *	158775 *	208750 *	263226 *	313705 *	354857 *
-13.0	28425	40426	59390	84057 *	110660 *	144711 *	188855 *	237989 *	288921 *	332735 *
-14.0	27406	38343	55895	78172 *	101519 *	130989 *	169603 *	214906 *	263672 *	310662 *
-15.0	26026	35893	52183	72074	92706 *	118672 *	151636 *	192078 *	238792 *	287931 *
-16.0	24428	33521	48122	65575	84654 *	107779 *	135133 *	171067 *	214164 *	263261 *
-17.0	22907	31491	44608	59778	76627 *	96987 *	120384 *	152401 *	190134 *	233326 *
-18.0	21799	29352	40658	53755	68683	86770 *	107748 *	136031 *	167874 *	200933 *
-19.0	20671	27161	36543	47895	61011	77366 *	96933 *	121595 *	147797 *	169982 *
-20.0	19397	25013	32965	42772	54523	69657	87911 *	109619 *	131349 *	144292 *
-22.5	16396	20085	25226	31898	40540	52369	67026	81522 *	92637 *	91963 *
-25.5	13282	15579	19118	23742	29515	37241	46894	54341	57060	57396
-29.0	10254	12008	14621	17857	21335	25551	30103	33255	34437	35989
-33.0	7525	8785	10491	12376	14305	16373	18430	19736	20630	21774
-37.5	4479	5580	6508	7378	8211	9127	9851	10644	11244	11800
-42.5	1513	2090	2567	2957	3183	3372	3371	3605	3769	3849
-47.5	529	689	859	1015	1108	1225	1312	1382	1512	1616
-55.0	6	41	75	108	136	163	195	235	256	295
-65.0	0	3	14	23	30	37	47	57	67	78
-75.0	0	0	0	0	0	2	5	10	13	15
-85.0	0	0	0	0	0	0	0	0	0	0
-90.0	0	0	0	0	0	0	0	0	0	0

Vert. Angles	**Horizontal Angles**									
	-3.0	**-1.0**	**0.0**	**1.0**	**3.0**	**5.0**	**7.0**	**9.0**	**11.0**	**13.0**
90.0	0	0	0	0	0	0	0	1	1	1
85.0	1	1	1	1	1	2	2	3	3	4
75.0	6	6	6	6	6	6	6	6	7	7
65.0	21	20	21	20	21	20	19	19	19	19
55.0	75	76	76	76	75	74	71	69	67	64
47.5	178	180	181	180	178	177	173	169	163	155
42.5	297	297	302	297	297	294	291	283	273	257
37.5	470	471	476	471	470	460	453	435	414	387
33.0	682	690	686	690	682	658	634	597	565	530
29.0	967	998	986	998	967	925	859	795	738	683
25.5	1478	1564	1542	1564	1478	1411	1263	1139	1024	912
22.5	2524	2759	2704	2759	2524	2432	2100	1831	1593	1361
20.0	4741	5100	5180	5100	4741	4562	3776	3178	2674	2202
19.0	6935	7134	7641	7134	6935	6351	5380	4429	3636	2906
18.0	10482	10813	11602	10813	10482	9513	7944	6422	5152	3978
17.0	15749	16334	17457	16334	15749	14141	11754	9435	7488	5630
16.0	22897	23891	25379	23891	22897	19655	16981	13589	10868	8105
15.0	31899	33470	35352	33470	31899	27397	23677	19101	15412	11539
14.0	43437	46683	48101	46683	43437	37132	32020	26097	21178	15996
13.0	59749	64277	66542	64277	59749	51021	42907	34773	28295	21413
12.0	87199 *	94222 *	88679 *	94222 *	87199 *	73642	60887	46055	37260	27858
11.0	130092 *	141472 *	133502 *	141472 *	130092 *	109395 *	89047 *	63763	47816	35694
10.0	187642 *	204297 *	194958 *	204297 *	187642 *	158636 *	128287 *	89484 *	63935	44679

Photometric Toolbox Professional Edition - Copyright 2002-2015 by Lighting Analysts, Inc.
Calculations based on published IES Methods and recommendations, values rounded for display purposes.
Results derived from content of manufacturers photometric file.

IES FLOOD REPORT
PHOTOMETRIC FILENAME : [redacted]

CANDELA TABULATION - (Cont.)

9.0	253392 *	275096 *	265854 *	275096 *	253392 *	216398 *	174909 *	123707 *	86410 *	57513
8.0	319982 *	346026 *	337768 *	346026 *	319982 *	274987 *	225023 *	164021 *	114389 *	73423
7.0	380286 *	417275 *	409177 *	417275 *	380286 *	333871 *	272771 *	205426 *	142483 *	90916 *
6.0	451853 *	487464 *	479708 *	487464 *	451853 *	396974 *	319528 *	243573 *	170578 *	109664 *
5.0	521784 *	552336 *	554297 *	552336 *	521784 *	459454 *	371099 *	279030 *	196526 *	128188 *
4.0	589198 *	619903 *	621573 *	619903 *	589198 *	521544 *	422551 *	314477 *	221711 *	146465 *
3.0	645406 *	670145 *	677880 *	670145 *	645406 *	575246 *	468065 *	349322 *	247365 *	164753 *
2.0	683956 *	712447 *	719562 *	712447 *	683956 *	617053 *	505073 *	380327 *	271336 *	181899 *
1.0	709679 *	736999 *	742232 *	736999 *	709679 *	643202 *	530557 *	404785 *	291285 *	196482 *
0.0	720973 *	746953 *	750275 *	746953 *	720973 *	656477 *	546867 *	420267 *	306124 *	207926 *
-1.0	719313 *	743097 *	744425 *	743097 *	719313 *	657910 *	554162 *	431421 *	316827 *	216946 *
-2.0	704942 *	727471 *	728338 *	727471 *	704942 *	647800 *	552660 *	437507 *	324208 *	223847 *
-3.0	678888 *	701058 *	701281 *	701058 *	678888 *	626987 *	542978 *	437358 *	326742 *	229209 *
-4.0	646216 *	667767 *	667643 *	667767 *	646216 *	602507 *	526950 *	430778 *	325207 *	230792 *
-5.0	609685 *	628000 *	628155 *	628000 *	609685 *	569586 *	504611 *	418355 *	319035 *	230217 *
-6.0	570770 *	588042 *	587204 *	588042 *	570770 *	535911 *	479571 *	400552 *	308935 *	226816 *
-7.0	534033 *	549717 *	549910 *	549717 *	534033 *	501553 *	451777 *	379492 *	296277 *	220057 *
-8.0	500330 *	516297 *	517003 *	516297 *	500330 *	469459 *	420306 *	355864 *	280903 *	210381 *
-9.0	471247 *	488529 *	489215 *	488529 *	471247 *	436742 *	389779 *	334939 *	264961 *	198858 *
-10.0	443755 *	465286 *	473077 *	465286 *	443755 *	406046 *	363670 *	311959 *	247446 *	186192 *
-11.0	416304 *	438158 *	446572 *	438158 *	416304 *	378792 *	338308 *	288209 *	228631 *	172785 *
-12.0	389237 *	407204 *	416070 *	407204 *	389237 *	354857 *	313705 *	263226 *	208750 *	158775 *
-13.0	362463 *	371419 *	379729 *	371419 *	362463 *	332735 *	288921 *	237989 *	188855 *	144711 *
-14.0	337873 *	334573 *	340066 *	334573 *	337873 *	310662 *	263672 *	214906 *	169603 *	130989 *
-15.0	315268 *	303975 *	304998 *	303975 *	315268 *	287931 *	238792 *	192078 *	151636 *	118672 *
-16.0	290409 *	282347 *	281054 *	282347 *	290409 *	263261 *	214164 *	171067 *	135133 *	107779 *
-17.0	258498 *	262911 *	263981 *	262911 *	258498 *	233326 *	190134 *	152401 *	120384 *	96987 *
-18.0	218948 *	235535 *	243315 *	235535 *	218948 *	200933 *	167874 *	136031 *	107748 *	86770 *
-19.0	177459 *	204773 *	213209 *	204773 *	177459 *	169982 *	147797 *	121595 *	96933 *	77366 *
-20.0	149705 *	175650 *	181713 *	175650 *	149705 *	144292 *	131349 *	109619 *	87911 *	69657
-22.5	94603 *	113592 *	115468 *	113592 *	94603 *	91963 *	92637 *	81522 *	67026	52369
-25.5	60516	67693	68127	67693	60516	57396	57060	54341	46894	37241
-29.0	38416	40266	40226	40266	38416	35989	34437	33255	30103	25551
-33.0	23102	23897	23928	23897	23102	21774	20630	19736	18430	16373
-37.5	12030	12360	12582	12360	12030	11800	11244	10644	9851	9127
-42.5	3943	3960	3960	3960	3943	3849	3769	3605	3371	3372
-47.5	1703	1772	1757	1772	1703	1616	1512	1382	1312	1225
-55.0	317	332	344	332	317	295	256	235	195	163
-65.0	88	96	64	96	88	78	67	57	47	37
-75.0	18	21	21	21	18	15	13	10	5	2
-85.0	0	0	0	0	0	0	0	0	0	0
-90.0	0	0	0	0	0	0	0	0	0	0

Vert. Angles	**Horizontal Angles**									
	15.0	**17.0**	**19.5**	**22.5**	**25.5**	**29.0**	**33.0**	**37.5**	**42.5**	**47.5**
90.0	1	1	1	1	1	1	2	2	2	3
85.0	4	4	5	5	6	7	8	10	12	13
75.0	7	8	8	8	8	9	9	9	11	12
65.0	19	18	17	17	16	15	15	13	13	12
55.0	61	59	55	50	46	41	35	28	20	13
47.5	147	138	127	114	102	87	71	51	30	10
42.5	242	226	203	180	157	130	99	65	31	5
37.5	356	328	292	252	213	170	120	69	22	1
33.0	487	437	380	316	256	193	129	63	10	0
29.0	633	563	479	388	304	213	130	54	1	0

Photometric Toolbox Professional Edition - Copyright 2002-2015 by Lighting Analysts, Inc.
Calculations based on published IES Methods and recommendations, values rounded for display purposes.
Results derived from content of manufacturers photometric file.

IES FLOOD REPORT
PHOTOMETRIC FILENAME : [redacted]

CANDELA TABULATION - (Cont.)

25.5	826	734	629	509	396	271	155	56	0	0
22.5	1207	1063	910	748	574	402	226	84	1	0
20.0	1906	1641	1373	1137	846	582	325	130	5	0
19.0	2468	2091	1728	1450	1051	720	400	153	9	0
18.0	3291	2731	2223	1831	1381	916	502	194	18	0
17.0	4411	3653	2926	2383	1789	1199	638	240	34	0
16.0	6162	4970	3900	3124	2348	1567	815	305	55	0
15.0	8556	6823	5206	4046	3009	1992	1024	391	96	0
14.0	11877	9326	6885	5114	3731	2447	1253	502	126	1
13.0	16037	12500	8925	6302	4513	2929	1500	640	179	9
12.0	20960	16218	11233	7600	5356	3428	1773	792	250	35
11.0	26464	19968	13750	9036	6291	4059	2078	955	333	74
10.0	32708	24059	16463	10671	7367	4690	2440	1125	437	127
9.0	39770	28492	19400	12509	8562	5510	2884	1312	555	187
8.0	47771	33217	22591	14333	9851	6408	3432	1524	688	256
7.0	55850	38524	25980	16448	11215	7369	4093	1769	829	327
6.0	66207	44872	29881	18765	12643	8393	4797	2064	970	395
5.0	77387 *	51246	34185	21214	14123	9448	5535	2402	1106	456
4.0	89310 *	58472	38546	23750	15615	10489	6258	2783	1236	512
3.0	101320 *	66269	43109	26324	17088	11484	6956	3170	1369	564
2.0	112635 *	73788	47702	28863	18530	12426	7645	3598	1507	620
1.0	122414 *	80766 *	52143	31327	19922	13237	8350	4062	1675	683
0.0	129931 *	86598 *	55700	33617	21253	13988	9008	4535	1871	749
-1.0	137063 *	92089 *	59095	35561	22492	14749	9621	4921	2066	819
-2.0	143601 *	96794 *	62045	37443	23596	15394	10150	5195	2229	890
-3.0	149859 *	100636 *	64443	39014	24595	15977	10538	5425	2340	957
-4.0	155783 *	103425 *	66228	40031	25360	16495	10855	5755	2418	1020
-5.0	159007 *	106166 *	67313	41343	26042	16905	11097	6134	2489	1080
-6.0	159372 *	108144 *	68527	42821	27057	17360	11195	6479	2553	1139
-7.0	157018 *	108478 *	69370	43517	27911	17863	11374	6726	2614	1191
-8.0	152154 *	107073 *	69423	43969	28570	18330	11590	6945	2748	1233
-9.0	145359 *	104144 *	68683	44114	29027	18736	11808	7118	2937	1270
-10.0	137308 *	99975 *	67248	43890	29301	19048	11994	7180	3159	1296
-11.0	129052 *	95049 *	65148	43171	29348	19235	12115	7211	3349	1310
-12.0	119980 *	89869 *	62467	42044	29040	19266	12191	7216	3489	1311
-13.0	110660 *	84057 *	59390	40426	28425	19095	12158	7185	3545	1295
-14.0	101519 *	78172 *	55895	38343	27406	18698	12061	7088	3537	1254
-15.0	92706 *	72074	52183	35893	26026	18095	11881	6979	3499	1225
-16.0	84654 *	65575	48122	33521	24428	17304	11606	6839	3407	1198
-17.0	76627 *	59778	44608	31491	22907	16431	11246	6696	3283	1166
-18.0	68683	53755	40658	29352	21799	15652	10827	6533	3134	1130
-19.0	61011	47895	36543	27161	20671	15109	10419	6341	2953	1091
-20.0	54523	42772	32965	25013	19397	14383	10170	6081	2747	1041
-22.5	40540	31898	25226	20085	16396	12612	9311	5364	2201	895
-25.5	29515	23742	19118	15579	13282	10658	7854	4457	1614	696
-29.0	21335	17857	14621	12008	10254	8577	6172	3474	1177	488
-33.0	14305	12376	10491	8785	7525	6068	4104	2082	653	247
-37.5	8211	7378	6508	5580	4479	3121	1590	845	300	86
-42.5	3183	2957	2567	2090	1513	1002	558	245	68	0
-47.5	1108	1015	859	689	529	339	128	36	0	0
-55.0	136	108	75	41	6	0	0	0	0	0
-65.0	30	23	14	3	0	0	0	0	0	0
-75.0	0	0	0	0	0	0	0	0	0	0
-85.0	0	0	0	0	0	0	0	0	0	0
-90.0	0	0	0	0	0	0	0	0	0	0

Photometric Toolbox Professional Edition - Copyright 2002-2015 by Lighting Analysts, Inc.
Calculations based on published IES Methods and recommendations, values rounded for display purposes.
Results derived from content of manufacturers photometric file.

IES FLOOD REPORT
PHOTOMETRIC FILENAME : [redacted]

CANDELA TABULATION - (Cont.)

Vert. Angles	Horizontal Angles				
	55.0	65.0	75.0	85.0	90.0
90.0	3	4	1	0	0
85.0	16	18	6	0	0
75.0	14	12	1	0	0
65.0	11	5	0	0	0
55.0	5	0	0	0	0
47.5	0	0	0	0	0
42.5	0	0	0	0	0
37.5	0	0	0	0	0
33.0	0	0	0	0	0
29.0	0	0	0	0	0
25.5	0	0	0	0	0
22.5	0	0	0	0	0
20.0	0	0	0	0	0
19.0	0	0	0	0	0
18.0	0	0	0	0	0
17.0	0	0	0	0	0
16.0	0	0	0	0	0
15.0	0	0	0	0	0
14.0	0	0	0	0	0
13.0	0	0	0	0	0
12.0	0	0	0	0	0
11.0	0	0	0	0	0
10.0	0	0	0	0	0
9.0	0	0	0	0	0
8.0	0	0	0	0	0
7.0	0	0	0	0	0
6.0	0	0	0	0	0
5.0	0	0	0	0	0
4.0	0	0	0	0	0
3.0	0	0	0	0	0
2.0	0	0	0	0	0
1.0	12	0	0	0	0
0.0	21	0	0	0	0
-1.0	37	0	0	0	0
-2.0	45	0	0	0	0
-3.0	58	0	0	0	0
-4.0	77	0	0	0	0
-5.0	106	0	0	0	0
-6.0	133	0	0	0	0
-7.0	157	0	0	0	0
-8.0	178	0	0	0	0
-9.0	193	0	0	0	0
-10.0	208	0	0	0	0
-11.0	225	0	0	0	0
-12.0	236	0	0	0	0
-13.0	249	0	0	0	0
-14.0	260	0	0	0	0
-15.0	265	0	0	0	0
-16.0	267	0	0	0	0
-17.0	266	0	0	0	0
-18.0	258	0	0	0	0
-19.0	244	0	0	0	0
-20.0	222	0	0	0	0

Photometric Toolbox Professional Edition - Copyright 2002-2015 by Lighting Analysts, Inc.
Calculations based on published IES Methods and recommendations, values rounded for display purposes.
Results derived from content of manufacturers photometric file.

IES FLOOD REPORT
PHOTOMETRIC FILENAME : [redacted]

CANDELA TABULATION - (Cont.)

-22.5	173	0	0	0	0
-25.5	126	0	0	0	0
-29.0	72	0	0	0	0
-33.0	12	0	0	0	0
-37.5	0	0	0	0	0
-42.5	0	0	0	0	0
-47.5	0	0	0	0	0
-55.0	0	0	0	0	0
-65.0	0	0	0	0	0
-75.0	0	0	0	0	0
-85.0	0	0	0	0	0
-90.0	0	0	0	0	0

Photometric Toolbox Professional Edition - Copyright 2002-2015 by Lighting Analysts, Inc.
Calculations based on published IES Methods and recommendations, values rounded for display purposes.
Results derived from content of manufacturers photometric file.

IES FLOOD REPORT
PHOTOMETRIC FILENAME : [redacted]

LUMEN TABULATION
Average Of Right And Left Sides
Total Luminaire Lumens (one side of beam only) = 58077.85
Total Field Lumens (one side of beam only) = 48514.71
* Indicates Values Inside Field Edge

Vert. Angles	Horizontal Angles									
	0	1	3	5	7	9	11	13	15	17
90	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.01	0.01
85	0.01	0.02	0.02	0.02	0.03	0.03	0.03	0.03	0.03	0.05
75	0.04	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.09
65	0.15	0.29	0.29	0.28	0.27	0.26	0.25	0.24	0.23	0.27
55	0.29	0.58	0.57	0.56	0.55	0.53	0.50	0.47	0.44	0.51
47.5	0.37	0.72	0.72	0.71	0.69	0.67	0.63	0.59	0.55	0.63
42.5	0.59	1.17	1.16	1.13	1.10	1.05	0.99	0.92	0.84	0.95
37.5	0.80	1.58	1.55	1.50	1.44	1.36	1.27	1.17	1.06	1.17
33	1.02	2.03	1.96	1.86	1.74	1.62	1.50	1.38	1.24	1.34
29	1.36	2.67	2.54	2.36	2.14	1.94	1.75	1.58	1.41	1.52
25.5	1.96	3.80	3.58	3.27	2.87	2.51	2.19	1.91	1.68	1.81
22.5	3.00	5.75	5.42	4.87	4.10	3.48	2.92	2.47	2.13	2.25
20	1.91	3.64	3.43	3.04	2.53	2.09	1.70	1.40	1.19	1.24
19	2.83	5.38	5.06	4.42	3.65	2.95	2.33	1.87	1.55	1.59
18	4.28	8.12	7.58	6.57	5.36	4.27	3.31	2.56	2.06	2.09
17	6.33	12.00	11.01	9.47	7.81	6.21	4.78	3.59	2.81	2.79
16	8.99	17.07	15.47	13.29	11.06	8.84	6.84	5.08	3.88	3.78
15	12.46	23.67	21.25	18.21	15.22	12.27	9.55	7.09	5.36	5.11
14	17.18	32.59	29.07	24.70	20.48	16.55	12.94	9.65	7.28	6.80
13	23.89 *	46.49 *	41.27	34.60	27.84	21.96	17.11	12.75	9.62	8.84
12	34.87 *	68.95 *	60.82 *	50.43 *	39.18	29.23	22.14	16.40	12.24	11.06
11	51.34 *	100.99 *	89.00 *	73.52 *	55.89 *	39.75	28.62	20.62	15.11	13.42
10	71.60 *	140.10 *	123.99 *	102.73 *	77.88 *	54.53 *	37.62	25.81	18.30	15.98
9	93.26 *	181.81 *	161.77 *	135.00 *	103.71 *	73.27 *	49.42 *	32.29	21.85	18.75

Photometric Toolbox Professional Edition - Copyright 2002-2015 by Lighting Analysts, Inc.
Calculations based on published IES Methods and recommendations, values rounded for display purposes.
Results derived from content of manufacturers photometric file.

IES FLOOD REPORT
PHOTOMETRIC FILENAME : [redacted]

LUMENS TABULATION - (Cont.)

8	115.01 *	222.77 *	198.90 *	167.62 *	130.80 *	93.94 *	62.75 *	39.60	25.67	21.75
7	136.59 *	264.37 *	237.46 *	200.41 *	157.05 *	114.30 *	76.52 *	47.68 *	30.08	25.18
6	157.92 *	306.46 *	278.04 *	234.33 *	182.98 *	133.44 *	90.12 *	56.37 *	35.09	28.96
5	178.81 *	347.52 *	317.83 *	268.80 *	209.21 *	151.75 *	103.22 *	65.22 *	40.47	32.99
4	197.19 *	384.27 *	354.21 *	301.03 *	234.44 *	169.92 *	116.24 *	74.16 *	46.17 *	37.32
3	211.70 *	412.78 *	383.12 *	327.99 *	256.81 *	187.24 *	128.91 *	82.84 *	51.83 *	41.74
2	221.69 *	432.74 *	403.21 *	347.75 *	274.60 *	202.14 *	140.18 *	90.65 *	57.04 *	45.99
1	226.66 *	443.63 *	414.82 *	360.05 *	286.93 *	213.35 *	149.24 *	97.05 *	61.45 *	49.76
0	227.29 *	446.02 *	418.52 *	365.86 *	294.51 *	221.18 *	156.10 *	102.24 *	65.25 *	53.06
-1	224.14 *	440.62 *	414.76 *	365.42 *	297.98 *	226.48 *	161.16 *	106.61 *	68.74 *	56.05 *
-2	217.65 *	428.06 *	403.92 *	359.04 *	297.19 *	228.85 *	164.47 *	110.32 *	71.87 *	58.56 *
-3	208.48 *	410.04 *	388.12 *	348.29 *	292.30 *	227.99 *	165.65 *	113.14 *	74.62 *	60.52 *
-4	197.35 *	388.38 *	368.89 *	333.78 *	283.64 *	223.99 *	164.65 *	114.65 *	76.77 *	62.04 *
-5	185.15 *	364.77 *	347.30 *	316.52 *	271.94 *	217.01 *	161.64 *	114.59 *	77.99 *	63.31 *
-6	173.23 *	341.34 *	325.47 *	298.21 *	258.11 *	207.77 *	156.73 *	112.79 *	78.03 *	64.10 *
-7	162.42 *	319.69 *	304.68 *	279.17 *	242.43 *	196.86 *	150.11 *	109.30 *	76.82 *	64.06 *
-8	153.14 *	300.82 *	285.29 *	259.96 *	226.36 *	185.48 *	142.28 *	104.44 *	74.48 *	63.16 *
-9	145.91 *	284.45 *	267.06 *	241.78 *	211.20 *	173.88 *	133.70 *	98.67 *	71.27 *	61.48 *
-10	138.83 *	268.42 *	249.91 *	225.20 *	196.39 *	161.42 *	124.40 *	92.41 *	67.55 *	59.20 *
-11	130.07 *	251.28 *	233.85 *	209.88 *	181.50 *	148.31 *	114.55 *	85.80 *	63.53 *	56.50 *
-12	119.89 *	232.93 *	218.67 *	195.43 *	166.48 *	134.81 *	104.44 *	78.93 *	59.23 *	53.48
-13	108.57 *	214.05 *	204.15 *	181.15 *	151.65 *	121.69 *	94.47 *	72.10 *	54.81 *	50.17
-14	97.75 *	196.61 *	190.18 *	166.77 *	137.16 *	109.22 *	85.05 *	65.60 *	50.43 *	46.70
-15	89.28 *	181.43 *	175.76 *	152.09 *	123.08 *	97.48 *	76.46 *	59.67 *	46.12 *	43.02
-16	83.03 *	166.54 *	158.84 *	136.45 *	109.76 *	86.84 *	68.57 *	54.09 *	41.96	39.43
-17	76.59 *	148.54 *	138.52 *	120.00 *	97.50 *	77.48 *	61.36 *	48.63 *	37.89	35.94
-18	68.29 *	127.35 *	116.58 *	103.99 *	86.46 *	69.34 *	54.94 *	43.42	33.87	32.34
-19	59.04 *	107.70 *	97.45 *	89.88 *	76.97 *	62.40 *	49.44 *	38.80	30.19	28.96

Photometric Toolbox Professional Edition - Copyright 2002-2015 by Lighting Analysts, Inc.
Calculations based on published IES Methods and recommendations, values rounded for display purposes.
Results derived from content of manufacturers photometric file.

IES FLOOD REPORT
PHOTOMETRIC FILENAME : [redacted]

LUMENS TABULATION - (Cont.)

-20	111.64 *	203.03 *	182.53 *	174.28 *	156.52 *	129.77 *	103.15	80.20	62.12	60.05
-22.5	83.36 *	153.61 *	138.78 *	135.89	129.20	112.39	90.96	70.78	55.21	54.23
-25.5	57.65	110.22	102.27	98.01	94.54	86.40	72.89	58.78	47.37	47.67
-29	39.09	76.52	72.49	68.36	65.19	60.91	53.90	45.85	38.58	40.02
-33	24.94	48.90	46.97	44.61	42.25	39.59	36.05	31.93	27.85	29.90
-37.5	12.51	24.58	24.02	23.22	22.07	20.60	19.16	17.65	15.91	17.55
-42.5	4.36	8.66	8.44	8.14	7.74	7.25	6.91	6.57	6.05	6.69
-47.5	2.40	4.71	4.48	4.18	3.83	3.51	3.23	2.92	2.60	2.79
-55	0.64	1.27	1.18	1.05	0.93	0.80	0.66	0.54	0.43	0.40
-65	0.15	0.34	0.30	0.26	0.22	0.18	0.14	0.10	0.08	0.07
-75	0.03	0.06	0.05	0.04	0.03	0.02	0.01	0.00	0.00	0.00
-85	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
-90										
Total	4986.96	9725.01	9064.62	8007.55	6643.56	5191.45	3852.92	2745.06	1936.36	1697.16

Vert. Angles	**Horizontal Angles**									
	19.5	**22.5**	**25.5**	**29**	**33**	**37.5**	**42.5**	**47.5**	**55**	**65**
90	0.01	0.01	0.02	0.02	0.03	0.04	0.04	0.06	0.08	0.04
85	0.06	0.06	0.07	0.09	0.10	0.12	0.13	0.20	0.23	0.10
75	0.11	0.10	0.11	0.13	0.13	0.13	0.13	0.18	0.16	0.05
65	0.30	0.27	0.28	0.28	0.25	0.22	0.16	0.15	0.08	0.01
55	0.55	0.49	0.49	0.46	0.39	0.28	0.15	0.08	0.01	0.00
47.5	0.67	0.58	0.56	0.51	0.40	0.26	0.10	0.03	0.00	0.00
42.5	0.99	0.84	0.79	0.68	0.49	0.27	0.08	0.01	0.00	0.00
37.5	1.19	0.97	0.89	0.72	0.48	0.22	0.04	0.00	0.00	0.00
33	1.33	1.06	0.92	0.69	0.42	0.15	0.01	0.00	0.00	0.00
29	1.50	1.17	0.98	0.70	0.39	0.11	0.00	0.00	0.00	0.00
25.5	1.79	1.39	1.17	0.83	0.44	0.12	0.00	0.00	0.00	0.00
22.5	2.22	1.72	1.42	1.00	0.54	0.16	0.00	0.00	0.00	0.00
20	1.21	0.94	0.76	0.53	0.28	0.09	0.00	0.00	0.00	0.00

Photometric Toolbox Professional Edition - Copyright 2002-2015 by Lighting Analysts, Inc.
Calculations based on published IES Methods and recommendations, values rounded for display purposes.
Results derived from content of manufacturers photometric file.

IES FLOOD REPORT
PHOTOMETRIC FILENAME : [redacted]

LUMENS TABULATION - (Cont.)

19	1.54	1.19	0.96	0.66	0.35	0.11	0.01	0.00	0.00	0.00
18	2.00	1.54	1.25	0.85	0.44	0.14	0.01	0.00	0.00	0.00
17	2.63	2.01	1.64	1.10	0.56	0.18	0.02	0.00	0.00	0.00
16	3.47	2.61	2.11	1.41	0.71	0.25	0.04	0.00	0.00	0.00
15	4.53	3.32	2.65	1.75	0.89	0.33	0.06	0.00	0.00	0.00
14	5.81	4.10	3.23	2.12	1.09	0.42	0.08	0.00	0.00	0.00
13	7.26	4.96	3.84	2.51	1.32	0.54	0.13	0.02	0.00	0.00
12	8.88	5.90	4.53	2.96	1.57	0.68	0.19	0.04	0.00	0.00
11	10.65	6.96	5.31	3.46	1.85	0.83	0.26	0.07	0.00	0.00
10	12.59	8.16	6.19	4.05	2.17	1.00	0.35	0.11	0.00	0.00
9	14.68	9.44	7.19	4.76	2.56	1.19	0.45	0.16	0.00	0.00
8	16.92	10.82	8.26	5.56	3.03	1.40	0.57	0.21	0.00	0.00
7	19.42	12.33	9.39	6.44	3.56	1.64	0.68	0.26	0.00	0.00
6	22.19	13.93	10.57	7.35	4.14	1.91	0.79	0.30	0.00	0.00
5	25.10	15.59	11.77	8.28	4.75	2.19	0.89	0.35	0.00	0.00
4	28.09	17.27	12.95	9.19	5.36	2.50	0.99	0.38	0.00	0.00
3	31.14	18.95	14.10	10.05	5.98	2.81	1.09	0.42	0.00	0.00
2	34.13	20.59	15.19	10.88	6.62	3.16	1.21	0.47	0.00	0.00
1	36.85	22.15	16.21	11.64	7.26	3.54	1.34	0.52	0.01	0.00
0	39.23	23.57	17.17	12.37	7.86	3.91	1.48	0.58	0.02	0.00
-1	41.40	24.85	18.06	13.03	8.36	4.20	1.62	0.64	0.03	0.00
-2	43.28	26.01	18.85	13.59	8.76	4.43	1.73	0.70	0.04	0.00
-3	44.72	26.92	19.53	14.06	9.11	4.65	1.81	0.75	0.05	0.00
-4	45.83	27.71	20.09	14.45	9.47	4.90	1.89	0.82	0.07	0.00
-5	46.92	28.65	20.70	14.76	9.77	5.15	1.95	0.88	0.09	0.00
-6	47.82	29.49	21.37	15.09	10.01	5.36	2.02	0.94	0.11	0.00
-7	48.26	30.04	21.96	15.44	10.25	5.55	2.10	0.99	0.13	0.00
-8	48.24	30.40	22.43	15.78	10.48	5.76	2.20	1.03	0.14	0.00

Photometric Toolbox Professional Edition - Copyright 2002-2015 by Lighting Analysts, Inc.
Calculations based on published IES Methods and recommendations, values rounded for display purposes.
Results derived from content of manufacturers photometric file.

IES FLOOD REPORT
PHOTOMETRIC FILENAME : [redacted]

LUMENS TABULATION - (Cont.)

-9	47.76	30.54	22.77	16.08	10.66	5.95	2.33	1.06	0.15	0.00
-10	46.80	30.41	22.97	16.29	10.77	6.09	2.45	1.09	0.16	0.00
-11	45.39	29.97	22.96	16.40	10.84	6.20	2.55	1.10	0.18	0.00
-12	43.58	29.20	22.70	16.37	10.84	6.25	2.59	1.10	0.18	0.00
-13	41.38	28.09	22.18	16.19	10.77	6.23	2.59	1.09	0.19	0.00
-14	38.88	26.64	21.38	15.86	10.63	6.15	2.56	1.07	0.20	0.00
-15	36.20	25.01	20.34	15.37	10.44	6.04	2.51	1.06	0.20	0.00
-16	33.64	23.45	19.21	14.77	10.18	5.90	2.44	1.03	0.20	0.00
-17	31.16	22.03	18.19	14.14	9.88	5.73	2.35	1.01	0.20	0.00
-18	28.52	20.66	17.35	13.58	9.55	5.53	2.24	0.97	0.19	0.00
-19	25.95	19.25	16.48	13.07	9.24	5.28	2.11	0.93	0.18	0.00
-20	55.07	42.20	37.19	30.33	21.63	11.95	4.63	2.08	0.38	0.00
-22.5	51.19	40.91	37.63	31.67	22.65	11.93	4.37	2.03	0.34	0.00
-25.5	45.78	37.34	35.47	30.39	21.50	10.94	3.74	1.73	0.26	0.00
-29	39.16	32.20	30.73	26.02	17.72	8.61	2.76	1.17	0.13	0.00
-33	30.10	24.76	22.59	17.48	10.85	5.09	1.56	0.55	0.02	0.00
-37.5	17.86	14.26	11.98	8.19	4.53	2.13	0.61	0.15	0.00	0.00
-42.5	6.62	5.03	4.01	2.65	1.35	0.51	0.09	0.00	0.00	0.00
-47.5	2.66	1.98	1.55	0.91	0.34	0.08	0.00	0.00	0.00	0.00
-55	0.28	0.10	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00
-65	0.04	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
-75	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
-85	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
-90										
Total	1373.51	923.10	733.65	545.99	356.98	187.49	71.28	30.56	4.43	0.19

Vert. Angles	**Horizontal Angles**		
75	**85**	**90**	**Total**
90	0.00	0.00	0.41
85	0.01	0.00	1.43

Photometric Toolbox Professional Edition - Copyright 2002-2015 by Lighting Analysts, Inc.
Calculations based on published IES Methods and recommendations, values rounded for display purposes.
Results derived from content of manufacturers photometric file.

IES FLOOD REPORT
PHOTOMETRIC FILENAME : [redacted]

LUMENS TABULATION - (Cont.)

75	0.00	0.00	1.98
65	0.00	0.00	4.52
55	0.00	0.00	7.91
47.5	0.00	0.00	9.37
42.5	0.00	0.00	14.06
37.5	0.00	0.00	17.41
33	0.00	0.00	20.29
29	0.00	0.00	24.12
25.5	0.00	0.00	31.31
22.5	0.00	0.00	43.46
20	0.00	0.00	25.97
19	0.00	0.00	36.45
18	0.00	0.00	52.44
17	0.00	0.00	74.94
16	0.00	0.00	104.91
15	0.00	0.00	143.70
14	0.00	0.00	194.12
13	0.00	0.00	264.95
12	0.00	0.00	370.06
11	0.00	0.00	517.65
10	0.00	0.00	703.17
9	0.00	0.00	911.57
8	0.00	0.00	1125.56
7	0.00	0.00	1343.34
6	0.00	0.00	1564.9
5	0.00	0.00	1784.75
4	0.00	0.00	1991.68
3	0.00	0.00	2169.51

Photometric Toolbox Professional Edition - Copyright 2002-2015 by Lighting Analysts, Inc.
Calculations based on published IES Methods and recommendations, values rounded for display purposes.
Results derived from content of manufacturers photometric file.

IES FLOOD REPORT
PHOTOMETRIC FILENAME : [redacted]

LUMENS TABULATION - (Cont.)

2	0.00	0.00	2308.24
1	0.00	0.00	2402.45
0	0.00	0.00	2456.2
-1	0.00	0.00	2474.16
-2	0.00	0.00	2457.32
-3	0.00	0.00	2410.76
-4	0.00	0.00	2339.36
-5	0.00	0.00	2249.07
-6	0.00	0.00	2147.98
-7	0.00	0.00	2040.26
-8	0.00	0.00	1931.89
-9	0.00	0.00	1826.69
-10	0.00	0.00	1720.76
-11	0.00	0.00	1610.84
-12	0.00	0.00	1497.12
-13	0.00	0.00	1381.55
-14	0.00	0.00	1268.85
-15	0.00	0.00	1161.57
-16	0.00	0.00	1056.34
-17	0.00	0.00	947.12
-18	0.00	0.00	835.17
-19	0.00	0.00	733.33
-20	0.00	0.00	1468.76
-22.5	0.00	0.00	1227.12
-25.5	0.00	0.00	962.95
-29	0.00	0.00	719.40
-33	0.00	0.00	486.01
-37.5	0.00	0.00	256.96

Photometric Toolbox Professional Edition - Copyright 2002-2015 by Lighting Analysts, Inc.
Calculations based on published IES Methods and recommendations, values rounded for display purposes.
Results derived from content of manufacturers photometric file.

IES FLOOD REPORT
PHOTOMETRIC FILENAME : [redacted]

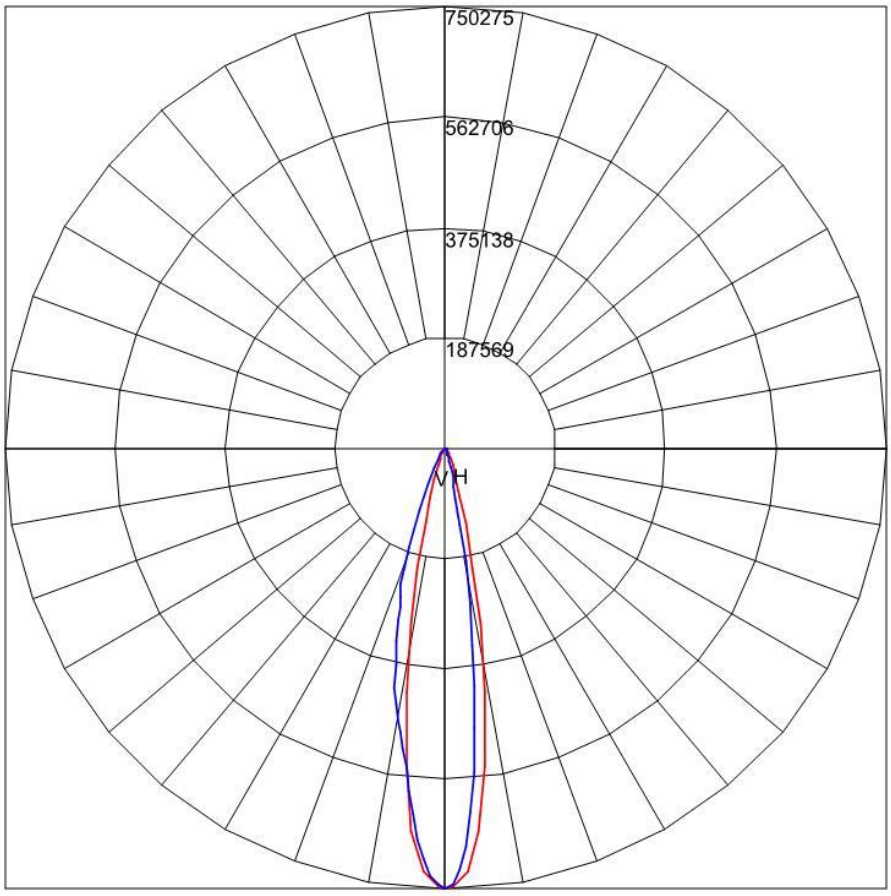
LUMENS TABULATION - (Cont.)

-42.5			
	0.00	0.00	91.06
-47.5			
	0.00	0.00	42.18
-55			
	0.00	0.00	8.30
-65			
	0.00	0.00	1.88
-75			
	0.00	0.00	0.25
-85			
	0.00	0.00	0.00
-90			
Total	0.02	0.00	58077.84

Photometric Toolbox Professional Edition - Copyright 2002-2015 by Lighting Analysts, Inc.
Calculations based on published IES Methods and recommendations, values rounded for display purposes.
Results derived from content of manufacturers photometric file.

IES FLOOD REPORT
PHOTOMETRIC FILENAME : [redacted]

AXIAL CANDELA DISPLAY

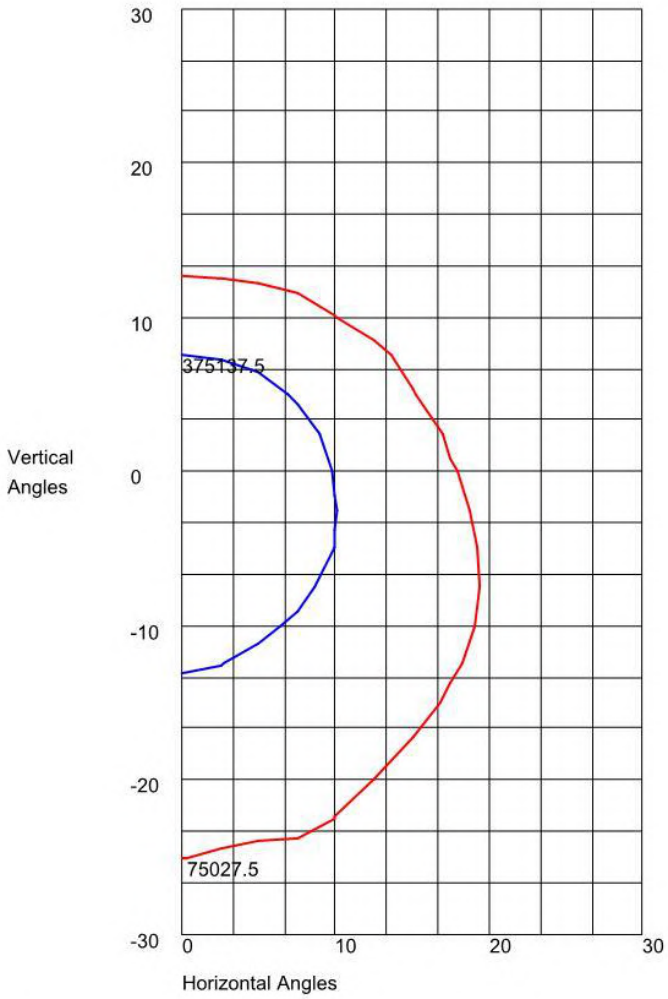


Maximum Candela = 750275 Located At Horizontal Angle = 0, Vertical Angle = 0
H - Horizontal Axial Candela
V - Vertical Axial Candela

Photometric Toolbox Professional Edition - Copyright 2002-2015 by Lighting Analysts, Inc.
Calculations based on published IES Methods and recommendations, values rounded for display purposes.
Results derived from content of manufacturers photometric file.

IES FLOOD REPORT
PHOTOMETRIC FILENAME : [redacted]

ISOCANDELA CURVES



Maximum Candela = 750275 Located At Horizontal Angle = 0, Vertical Angle = 0
50% Maximum Candela = 375137.5
10% Maximum Candela = 75027.5

Photometric Toolbox Professional Edition - Copyright 2002-2015 by Lighting Analysts, Inc.
Calculations based on published IES Methods and recommendations, values rounded for display purposes.
Results derived from content of manufacturers photometric file.

11 APPENDIX B – HOUSE LIGHTING PHOTOMETRIC REPORT

IES FLOOD REPORT
PHOTOMETRIC FILENAME : [redacted]

DESCRIPTIVE INFORMATION (From Photometric File)

IESNA:LM-63-2002
[TEST] [redacted]
[TESTLAB] [redacted]
[ISSUEDATE] 02/21/18
[MANUFAC] [redacted]
[LUMCAT] [redacted]
[LUMINAIRE] [redacted]
[LAMP] [redacted]
[_AGI32] File was generated from AGi32

Note: Candela values converted from Type-C to Type-B

CHARACTERISTICS

NEMA Type	7 H x 7 V
Maximum Candela	0
Maximum Candela Angle	0H 127.5V
Horizontal Beam Angle (50%)	180.0
Vertical Beam Angle (50%)	180.0
Horizontal Field Angle (10%)	180.0
Vertical Field Angle (10%)	180.0
Lumens Per Lamp	N.A. (absolute)
Total Lamp Lumens	N.A. (absolute)
Beam Lumens	0
Beam Efficiency	N.A.
Field Lumens	0
Field Efficiency	N.A.
Spill Lumens	0
Luminaire Lumens	0
Total Efficiency	N.A.
Total Luminaire Watts	309
Ballast Factor	1.00

Photometric Toolbox Professional Edition - Copyright 2002-2015 by Lighting Analysts, Inc.
Calculations based on published IES Methods and recommendations, values rounded for display purposes.
Results derived from content of manufacturers photometric file.

IES FLOOD REPORT
PHOTOMETRIC FILENAME : [redacted]

AXIAL CANDELA

DEG.	HOR.	DEG.	VERT.
90	0	90	0
85	0	85	0
75	0	75	0
65	0	65	0
55	0	55	0
47.5	0	47.5	0
42.5	0	42.5	0
37.5	0	37.5	0
33	0	33	0
29	0	29	0
25.5	0	25.5	0
22.5	0	22.5	0
19.5	0	19.5	0
17	0	17	0
15	0	15	0
13	0	13	0
11	0	11	0
9	0	9	0
7	0	7	0
5	0	5	0
3	0	3	0
1	0	1	0
0	0	0	0
-1	0	-1	0
-3	0	-3	0
-5	0	-5	0
-7	0	-7	0
-9	0	-9	0
-11	0	-11	0
-13	0	-13	0
-15	0	-15	0
-17	0	-17	0
-19.5	0	-19.5	0
-22.5	0	-22.5	0
-25.5	0	-25.5	0
-29	0	-29	0
-33	0	-33	0
-37.5	0	-37.5	0
-42.5	0	-42.5	0
-47.5	0	-47.5	0
-55	0	-55	0
-65	0	-65	0
-75	0	-75	0
-85	0	-85	0
-90	0	-90	0

Photometric Toolbox Professional Edition - Copyright 2002-2015 by Lighting Analysts, Inc.
Calculations based on published IES Methods and recommendations, values rounded for display purposes.
Results derived from content of manufacturers photometric file.

IES FLOOD REPORT
PHOTOMETRIC FILENAME : [redacted]

CANDELA TABULATION
Maximum Candela = 0
Beam Edge = 0 Cd (50% of Max.)
Field Edge = 0 Cd (10% of Max.)
* Indicates Values Inside Field Edge

Vert. Angles	Horizontal Angles									
	-90.0	-85.0	-75.0	-65.0	-55.0	-47.5	-42.5	-37.5	-33.0	-29.0
90.0	0	0	0	0	0	0	0	0	0	0
85.0	0	0	0	0	0	0	0	0	0	0
75.0	0	0	0	0	0	0	0	0	0	0
65.0	0	0	0	0	0	0	0	0	0	0
55.0	0	0	0	0	0	0	0	0	0	0
47.5	0	0	0	0	0	0	0	0	0	0
42.5	0	0	0	0	0	0	0	0	0	0
37.5	0	0	0	0	0	0	0	0	0	0
33.0	0	0	0	0	0	0	0	0	0	0
29.0	0	0	0	0	0	0	0	0	0	0
25.5	0	0	0	0	0	0	0	0	0	0
22.5	0	0	0	0	0	0	0	0	0	0
19.5	0	0	0	0	0	0	0	0	0	0
17.0	0	0	0	0	0	0	0	0	0	0
15.0	0	0	0	0	0	0	0	0	0	0
13.0	0	0	0	0	0	0	0	0	0	0
11.0	0	0	0	0	0	0	0	0	0	0
9.0	0	0	0	0	0	0	0	0	0	0
7.0	0	0	0	0	0	0	0	0	0	0
5.0	0	0	0	0	0	0	0	0	0	0
3.0	0	0	0	0	0	0	0	0	0	0
1.0	0	0	0	0	0	0	0	0	0	0
0.0	0	0	0	0	0	0	0	0	0	0
-1.0	0	0	0	0	0	0	0	0	0	0
-3.0	0	0	0	0	0	0	0	0	0	0
-5.0	0	0	0	0	0	0	0	0	0	0
-7.0	0	0	0	0	0	0	0	0	0	0
-9.0	0	0	0	0	0	0	0	0	0	0
-11.0	0	0	0	0	0	0	0	0	0	0
-13.0	0	0	0	0	0	0	0	0	0	0
-15.0	0	0	0	0	0	0	0	0	0	0
-17.0	0	0	0	0	0	0	0	0	0	0
-19.5	0	0	0	0	0	0	0	0	0	0
-22.5	0	0	0	0	0	0	0	0	0	0
-25.5	0	0	0	0	0	0	0	0	0	0
-29.0	0	0	0	0	0	0	0	0	0	0
-33.0	0	0	0	0	0	0	0	0	0	0
-37.5	0	0	0	0	0	0	0	0	0	0
-42.5	0	0	0	0	0	0	0	0	0	0
-47.5	0	0	0	0	0	0	0	0	0	0
-55.0	0	0	0	0	0	0	0	0	0	0
-65.0	0	0	0	0	0	0	0	0	0	0
-75.0	0	0	0	0	0	0	0	0	0	0
-85.0	0	0	0	0	0	0	0	0	0	0
-90.0	0	0	0	0	0	0	0	0	0	0

Photometric Toolbox Professional Edition - Copyright 2002-2015 by Lighting Analysts, Inc.
Calculations based on published IES Methods and recommendations, values rounded for display purposes.
Results derived from content of manufacturers photometric file.

IES FLOOD REPORT
PHOTOMETRIC FILENAME : [redacted]

CANDELA TABULATION - (Cont.)

Vert. Angles	Horizontal Angles									
	-25.5	-22.5	-19.5	-17.0	-15.0	-13.0	-11.0	-9.0	-7.0	-5.0
90.0	0	0	0	0	0	0	0	0	0	0
85.0	0	0	0	0	0	0	0	0	0	0
75.0	0	0	0	0	0	0	0	0	0	0
65.0	0	0	0	0	0	0	0	0	0	0
55.0	0	0	0	0	0	0	0	0	0	0
47.5	0	0	0	0	0	0	0	0	0	0
42.5	0	0	0	0	0	0	0	0	0	0
37.5	0	0	0	0	0	0	0	0	0	0
33.0	0	0	0	0	0	0	0	0	0	0
29.0	0	0	0	0	0	0	0	0	0	0
25.5	0	0	0	0	0	0	0	0	0	0
22.5	0	0	0	0	0	0	0	0	0	0
19.5	0	0	0	0	0	0	0	0	0	0
17.0	0	0	0	0	0	0	0	0	0	0
15.0	0	0	0	0	0	0	0	0	0	0
13.0	0	0	0	0	0	0	0	0	0	0
11.0	0	0	0	0	0	0	0	0	0	0
9.0	0	0	0	0	0	0	0	0	0	0
7.0	0	0	0	0	0	0	0	0	0	0
5.0	0	0	0	0	0	0	0	0	0	0
3.0	0	0	0	0	0	0	0	0	0	0
1.0	0	0	0	0	0	0	0	0	0	0
0.0	0	0	0	0	0	0	0	0	0	0
-1.0	0	0	0	0	0	0	0	0	0	0
-3.0	0	0	0	0	0	0	0	0	0	0
-5.0	0	0	0	0	0	0	0	0	0	0
-7.0	0	0	0	0	0	0	0	0	0	0
-9.0	0	0	0	0	0	0	0	0	0	0
-11.0	0	0	0	0	0	0	0	0	0	0
-13.0	0	0	0	0	0	0	0	0	0	0
-15.0	0	0	0	0	0	0	0	0	0	0
-17.0	0	0	0	0	0	0	0	0	0	0
-19.5	0	0	0	0	0	0	0	0	0	0
-22.5	0	0	0	0	0	0	0	0	0	0
-25.5	0	0	0	0	0	0	0	0	0	0
-29.0	0	0	0	0	0	0	0	0	0	0
-33.0	0	0	0	0	0	0	0	0	0	0
-37.5	0	0	0	0	0	0	0	0	0	0
-42.5	0	0	0	0	0	0	0	0	0	0
-47.5	0	0	0	0	0	0	0	0	0	0
-55.0	0	0	0	0	0	0	0	0	0	0
-65.0	0	0	0	0	0	0	0	0	0	0
-75.0	0	0	0	0	0	0	0	0	0	0
-85.0	0	0	0	0	0	0	0	0	0	0
-90.0	0	0	0	0	0	0	0	0	0	0

Vert. Angles	Horizontal Angles									
	-3.0	-1.0	0.0	1.0	3.0	5.0	7.0	9.0	11.0	13.0
90.0	0	0	0	0	0	0	0	0	0	0
85.0	0	0	0	0	0	0	0	0	0	0
75.0	0	0	0	0	0	0	0	0	0	0
65.0	0	0	0	0	0	0	0	0	0	0

Photometric Toolbox Professional Edition - Copyright 2002-2015 by Lighting Analysts, Inc.
Calculations based on published IES Methods and recommendations, values rounded for display purposes.
Results derived from content of manufacturers photometric file.

IES FLOOD REPORT
PHOTOMETRIC FILENAME : [redacted]

CANDELA TABULATION - (Cont.)

55.0	0	0	0	0	0	0	0	0	0	0
47.5	0	0	0	0	0	0	0	0	0	0
42.5	0	0	0	0	0	0	0	0	0	0
37.5	0	0	0	0	0	0	0	0	0	0
33.0	0	0	0	0	0	0	0	0	0	0
29.0	0	0	0	0	0	0	0	0	0	0
25.5	0	0	0	0	0	0	0	0	0	0
22.5	0	0	0	0	0	0	0	0	0	0
19.5	0	0	0	0	0	0	0	0	0	0
17.0	0	0	0	0	0	0	0	0	0	0
15.0	0	0	0	0	0	0	0	0	0	0
13.0	0	0	0	0	0	0	0	0	0	0
11.0	0	0	0	0	0	0	0	0	0	0
9.0	0	0	0	0	0	0	0	0	0	0
7.0	0	0	0	0	0	0	0	0	0	0
5.0	0	0	0	0	0	0	0	0	0	0
3.0	0	0	0	0	0	0	0	0	0	0
1.0	0	0	0	0	0	0	0	0	0	0
0.0	0	0	0	0	0	0	0	0	0	0
-1.0	0	0	0	0	0	0	0	0	0	0
-3.0	0	0	0	0	0	0	0	0	0	0
-5.0	0	0	0	0	0	0	0	0	0	0
-7.0	0	0	0	0	0	0	0	0	0	0
-9.0	0	0	0	0	0	0	0	0	0	0
-11.0	0	0	0	0	0	0	0	0	0	0
-13.0	0	0	0	0	0	0	0	0	0	0
-15.0	0	0	0	0	0	0	0	0	0	0
-17.0	0	0	0	0	0	0	0	0	0	0
-19.5	0	0	0	0	0	0	0	0	0	0
-22.5	0	0	0	0	0	0	0	0	0	0
-25.5	0	0	0	0	0	0	0	0	0	0
-29.0	0	0	0	0	0	0	0	0	0	0
-33.0	0	0	0	0	0	0	0	0	0	0
-37.5	0	0	0	0	0	0	0	0	0	0
-42.5	0	0	0	0	0	0	0	0	0	0
-47.5	0	0	0	0	0	0	0	0	0	0
-55.0	0	0	0	0	0	0	0	0	0	0
-65.0	0	0	0	0	0	0	0	0	0	0
-75.0	0	0	0	0	0	0	0	0	0	0
-85.0	0	0	0	0	0	0	0	0	0	0
-90.0	0	0	0	0	0	0	0	0	0	0

Vert. Angles	**Horizontal Angles**									
	15.0	**17.0**	**19.5**	**22.5**	**25.5**	**29.0**	**33.0**	**37.5**	**42.5**	**47.5**
90.0	0	0	0	0	0	0	0	0	0	0
85.0	0	0	0	0	0	0	0	0	0	0
75.0	0	0	0	0	0	0	0	0	0	0
65.0	0	0	0	0	0	0	0	0	0	0
55.0	0	0	0	0	0	0	0	0	0	0
47.5	0	0	0	0	0	0	0	0	0	0
42.5	0	0	0	0	0	0	0	0	0	0
37.5	0	0	0	0	0	0	0	0	0	0
33.0	0	0	0	0	0	0	0	0	0	0
29.0	0	0	0	0	0	0	0	0	0	0
25.5	0	0	0	0	0	0	0	0	0	0

Photometric Toolbox Professional Edition - Copyright 2002-2015 by Lighting Analysts, Inc.
Calculations based on published IES Methods and recommendations, values rounded for display purposes.
Results derived from content of manufacturers photometric file.

IES FLOOD REPORT
PHOTOMETRIC FILENAME : [redacted]

CANDELA TABULATION - (Cont.)

22.5	0	0	0	0	0	0	0	0	0	0
19.5	0	0	0	0	0	0	0	0	0	0
17.0	0	0	0	0	0	0	0	0	0	0
15.0	0	0	0	0	0	0	0	0	0	0
13.0	0	0	0	0	0	0	0	0	0	0
11.0	0	0	0	0	0	0	0	0	0	0
9.0	0	0	0	0	0	0	0	0	0	0
7.0	0	0	0	0	0	0	0	0	0	0
5.0	0	0	0	0	0	0	0	0	0	0
3.0	0	0	0	0	0	0	0	0	0	0
1.0	0	0	0	0	0	0	0	0	0	0
0.0	0	0	0	0	0	0	0	0	0	0
-1.0	0	0	0	0	0	0	0	0	0	0
-3.0	0	0	0	0	0	0	0	0	0	0
-5.0	0	0	0	0	0	0	0	0	0	0
-7.0	0	0	0	0	0	0	0	0	0	0
-9.0	0	0	0	0	0	0	0	0	0	0
-11.0	0	0	0	0	0	0	0	0	0	0
-13.0	0	0	0	0	0	0	0	0	0	0
-15.0	0	0	0	0	0	0	0	0	0	0
-17.0	0	0	0	0	0	0	0	0	0	0
-19.5	0	0	0	0	0	0	0	0	0	0
-22.5	0	0	0	0	0	0	0	0	0	0
-25.5	0	0	0	0	0	0	0	0	0	0
-29.0	0	0	0	0	0	0	0	0	0	0
-33.0	0	0	0	0	0	0	0	0	0	0
-37.5	0	0	0	0	0	0	0	0	0	0
-42.5	0	0	0	0	0	0	0	0	0	0
-47.5	0	0	0	0	0	0	0	0	0	0
-55.0	0	0	0	0	0	0	0	0	0	0
-65.0	0	0	0	0	0	0	0	0	0	0
-75.0	0	0	0	0	0	0	0	0	0	0
-85.0	0	0	0	0	0	0	0	0	0	0
-90.0	0	0	0	0	0	0	0	0	0	0

Vert. Angles	**Horizontal Angles**				
	55.0	**65.0**	**75.0**	**85.0**	**90.0**
90.0	0	0	0	0	0
85.0	0	0	0	0	0
75.0	0	0	0	0	0
65.0	0	0	0	0	0
55.0	0	0	0	0	0
47.5	0	0	0	0	0
42.5	0	0	0	0	0
37.5	0	0	0	0	0
33.0	0	0	0	0	0
29.0	0	0	0	0	0
25.5	0	0	0	0	0
22.5	0	0	0	0	0
19.5	0	0	0	0	0
17.0	0	0	0	0	0
15.0	0	0	0	0	0
13.0	0	0	0	0	0
11.0	0	0	0	0	0
9.0	0	0	0	0	0

Photometric Toolbox Professional Edition - Copyright 2002-2015 by Lighting Analysts, Inc.
Calculations based on published IES Methods and recommendations, values rounded for display purposes.
Results derived from content of manufacturers photometric file.

IES FLOOD REPORT
PHOTOMETRIC FILENAME : [redacted]

CANDELA TABULATION - (Cont.)

7.0	0	0	0	0	0
5.0	0	0	0	0	0
3.0	0	0	0	0	0
1.0	0	0	0	0	0
0.0	0	0	0	0	0
-1.0	0	0	0	0	0
-3.0	0	0	0	0	0
-5.0	0	0	0	0	0
-7.0	0	0	0	0	0
-9.0	0	0	0	0	0
-11.0	0	0	0	0	0
-13.0	0	0	0	0	0
-15.0	0	0	0	0	0
-17.0	0	0	0	0	0
-19.5	0	0	0	0	0
-22.5	0	0	0	0	0
-25.5	0	0	0	0	0
-29.0	0	0	0	0	0
-33.0	0	0	0	0	0
-37.5	0	0	0	0	0
-42.5	0	0	0	0	0
-47.5	0	0	0	0	0
-55.0	0	0	0	0	0
-65.0	0	0	0	0	0
-75.0	0	0	0	0	0
-85.0	0	0	0	0	0
-90.0	0	0	0	0	0

Photometric Toolbox Professional Edition - Copyright 2002-2015 by Lighting Analysts, Inc.
Calculations based on published IES Methods and recommendations, values rounded for display purposes.
Results derived from content of manufacturers photometric file.

IES FLOOD REPORT
PHOTOMETRIC FILENAME : [redacted]

LUMEN TABULATION
Average Of Right And Left Sides
Total Luminaire Lumens (one side of beam only) = 0.00
Total Field Lumens (one side of beam only) = 0.00
* Indicates Values Inside Field Edge

Vert. Angles	Horizontal Angles									
	0	1	3	5	7	9	11	13	15	17
90	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
85	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
75	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
65	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
47.5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
42.5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
37.5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
25.5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
22.5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
19.5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
-1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Photometric Toolbox Professional Edition - Copyright 2002-2015 by Lighting Analysts, Inc.
Calculations based on published IES Methods and recommendations, values rounded for display purposes.
Results derived from content of manufacturers photometric file.

IES FLOOD REPORT
PHOTOMETRIC FILENAME : [redacted]

LUMENS TABULATION - (Cont.)

-3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
-5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
-7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
-9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
-11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
-13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
-15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
-17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
-19.5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
-22.5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
-25.5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
-29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
-33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
-37.5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
-42.5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
-47.5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
-55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
-65	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
-75	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
-85	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
-90 **Total**	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Vert. Angles	**Horizontal Angles**									
	19.5	**22.5**	**25.5**	**29**	**33**	**37.5**	**42.5**	**47.5**	**55**	**65**
90	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
85	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
75	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
65	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Photometric Toolbox Professional Edition - Copyright 2002-2015 by Lighting Analysts, Inc.
Calculations based on published IES Methods and recommendations, values rounded for display purposes.
Results derived from content of manufacturers photometric file.

IES FLOOD REPORT
PHOTOMETRIC FILENAME : [redacted]

LUMENS TABULATION - (Cont.)

47.5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
42.5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
37.5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
25.5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
22.5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
19.5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
-1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
-3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
-5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
-7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
-9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
-11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
-13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
-15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
-17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
-19.5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Photometric Toolbox Professional Edition - Copyright 2002-2015 by Lighting Analysts, Inc.
Calculations based on published IES Methods and recommendations, values rounded for display purposes.
Results derived from content of manufacturers photometric file.

IES FLOOD REPORT
PHOTOMETRIC FILENAME : [redacted]

LUMENS TABULATION - (Cont.)

-22.5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
-25.5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
-29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
-33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
-37.5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
-42.5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
-47.5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
-55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
-65	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
-75	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
-85	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
-90										
Total	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Vert. Angles	**Horizontal Angles**			
	75	**85**	**90**	**Total**
90	0.00	0.00	0.00	
85	0.00	0.00	0.00	
75	0.00	0.00	0.00	
65	0.00	0.00	0.00	
55	0.00	0.00	0.00	
47.5	0.00	0.00	0.00	
42.5	0.00	0.00	0.00	
37.5	0.00	0.00	0.00	
33	0.00	0.00	0.00	
29	0.00	0.00	0.00	
25.5	0.00	0.00	0.00	
22.5	0.00	0.00	0.00	
19.5	0.00	0.00	0.00	
17	0.00	0.00	0.00	

Photometric Toolbox Professional Edition - Copyright 2002-2015 by Lighting Analysts, Inc.
Calculations based on published IES Methods and recommendations, values rounded for display purposes.
Results derived from content of manufacturers photometric file.

IES FLOOD REPORT
PHOTOMETRIC FILENAME : [redacted]

LUMENS TABULATION - (Cont.)

15	0.00	0.00	0.00
13	0.00	0.00	0.00
11	0.00	0.00	0.00
9	0.00	0.00	0.00
7	0.00	0.00	0.00
5	0.00	0.00	0.00
3	0.00	0.00	0.00
1	0.00	0.00	0.00
0	0.00	0.00	0.00
-1	0.00	0.00	0.00
-3	0.00	0.00	0.00
-5	0.00	0.00	0.00
-7	0.00	0.00	0.00
-9	0.00	0.00	0.00
-11	0.00	0.00	0.00
-13	0.00	0.00	0.00
-15	0.00	0.00	0.00
-17	0.00	0.00	0.00
-19.5	0.00	0.00	0.00
-22.5	0.00	0.00	0.00
-25.5	0.00	0.00	0.00
-29	0.00	0.00	0.00
-33	0.00	0.00	0.00
-37.5	0.00	0.00	0.00
-42.5	0.00	0.00	0.00
-47.5	0.00	0.00	0.00
-55	0.00	0.00	0.00
-65	0.00	0.00	0.00

Photometric Toolbox Professional Edition - Copyright 2002-2015 by Lighting Analysts, Inc.
Calculations based on published IES Methods and recommendations, values rounded for display purposes.
Results derived from content of manufacturers photometric file.

IES FLOOD REPORT
PHOTOMETRIC FILENAME : [redacted]

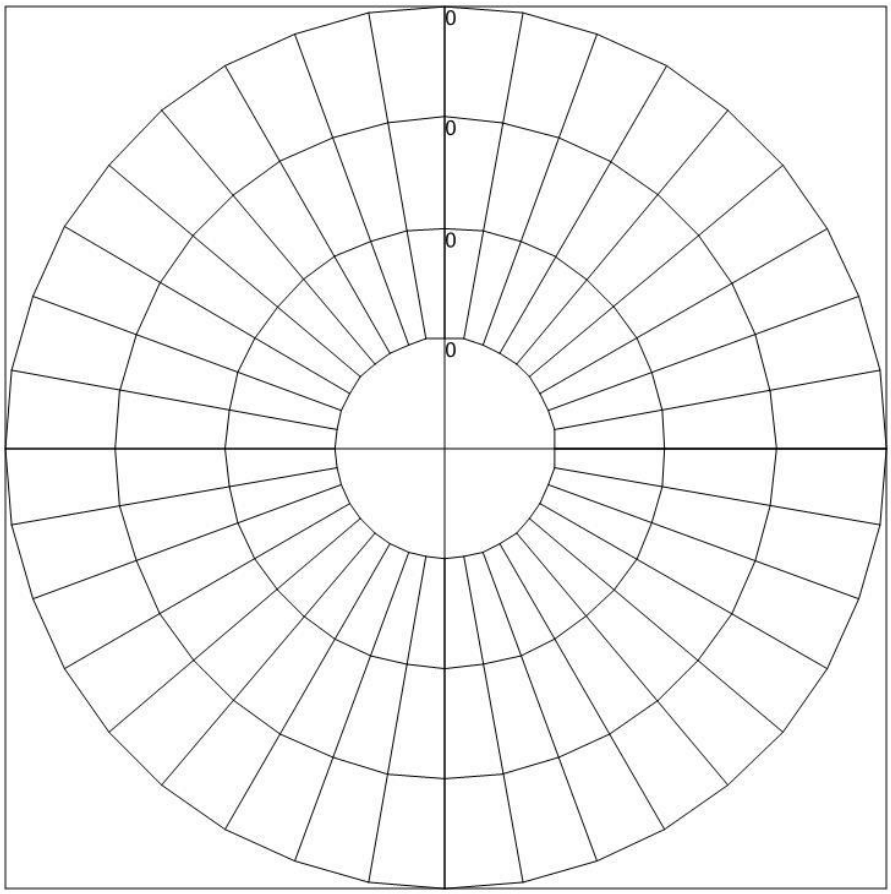
LUMENS TABULATION - (Cont.)

-75			
	0.00	0.00	0.00
-85			
	0.00	0.00	0.00
-90			
Total	0.00	0.00	0.00

Photometric Toolbox Professional Edition - Copyright 2002-2015 by Lighting Analysts, Inc.
Calculations based on published IES Methods and recommendations, values rounded for display purposes.
Results derived from content of manufacturers photometric file.

IES FLOOD REPORT
PHOTOMETRIC FILENAME : [redacted]

AXIAL CANDELA DISPLAY



12 APPENDIX C – EXISTING LIGHTING PHOTOMETRIC REPORT

IES INDOOR REPORT
PHOTOMETRIC FILENAME : HMSPCP1HP00S9.IES

DESCRIPTION INFORMATION (From Photometric File)

IESNA:LM-63-2002
[TEST] 51809
[TESTDATE] 1/31/2008
[ISSUEDATE] 1/31/2008
[TESTLAB] ACUITY BRANDS LIGHTING GRANVILLE LAB
[MANUFAC] Holophane
[LUMCAT] HMSPCP1HP00S9
[LUMINAIRE] HMSP
[LAMPCAT] C1000S52 - ED-37
[LAMP] 1000W CLEAR COMPACT HPS
[BALLAST]
[BALLASTCAT]
[DISTRIBUTION] TYPE VS, SEMICUTOFF
[_LAMPWATTAGE] 1000
[_LAMPLUMENS] 135000
[_MOUNTING]
[_PHYSICALDIMENSIONS] 0, -1.4, 0
[_FAMILY] HMSP
[_PRODUCTID] 4256cbfe-fb45-43e6-995f-5df2effb963e
[OTHER] METALLIZED GLASS REFLECTOR
[_TERCAT] Roadway - Type V
[_TER] 80

CHARACTERISTICS

Lumens Per Lamp	135000 (1 lamp)
Total Lamp Lumens	135000
Luminaire Lumens	95637
Total Luminaire Efficiency	71 %
Luminaire Efficacy Rating (LER)	89
Total Luminaire Watts	1080
Ballast Factor	1.00
CIE Type	Direct
Spacing Criterion (0-180)	4.34
Spacing Criterion (90-270)	4.30
Spacing Criterion (Diagonal)	4.22
Basic Luminous Shape	Circular
Luminous Length (0-180)	0.00 ft
Luminous Width (90-270)	1.40 ft (Diameter)
Luminous Height	0.00 ft

Photometric Toolbox Professional Edition - Copyright 2002-2015 by Lighting Analysts, Inc.
Calculations based on published IES Methods and recommendations, values rounded for display purposes.
Results derived from content of manufacturers photometric file.

IES INDOOR REPORT
PHOTOMETRIC FILENAME : HMSPCP1HP00S9.IES

LUMINANCE DATA (cd/sq.m)

Angle In Degrees	Average 0-Deg	Average 45-Deg	Average 90-Deg
45	155018	152321	151086
55	253393	291185	249361
65	388171	464142	378468
75	431885	605654	421736
85	227315	360049	239739

Photometric Toolbox Professional Edition - Copyright 2002-2015 by Lighting Analysts, Inc.
Calculations based on published IES Methods and recommendations, values rounded for display purposes.
Results derived from content of manufacturers photometric file.

IES INDOOR REPORT
PHOTOMETRIC FILENAME : HMSPCP1HP00S9.IES

CANDELA TABULATION

	0.0	5.0	15.0	25.0	35.0	45.0	55.0	60.0	62.5	65.0
0.0	3465	3465	3465	3465	3465	3465	3465	3465	3465	3465
2.5	3689	3702	3706	3719	3708	3691	3658	3652	3641	3637
5.0	3854	3854	3843	3812	3773	3744	3710	3691	3684	3678
7.5	4256	4256	4214	4115	4039	4001	3989	3978	3980	3976
10.0	4585	4580	4570	4453	4295	4165	4178	4233	4244	4254
12.5	5102	5089	5074	4949	4717	4521	4562	4631	4669	4693
15.0	5836	5815	5794	5676	5382	5108	5171	5264	5321	5348
17.5	5908	5877	5837	5726	5368	5064	5190	5335	5405	5430
20.0	6895	6871	6806	6635	6208	5819	5994	6189	6282	6332
22.5	7765	7746	7646	7435	6966	6513	6732	6932	7049	7126
25.0	8317	8295	8254	8071	7562	7125	7332	7556	7704	7788
27.5	9140	9130	9223	9027	8458	8159	8270	8547	8707	8786
30.0	9951	9953	10182	9976	9320	9093	9164	9464	9622	9718
32.5	11247	11310	11763	11553	10917	10566	10709	10974	11097	11201
35.0	11799	11888	12619	12378	11626	11230	11628	11703	11793	11888
37.5	13133	13219	14171	13888	13082	12477	13309	13245	13279	13292
40.0	13618	13696	14584	14352	13683	12856	14012	13759	13773	13659
42.5	14643	14812	15603	15557	15022	13978	15439	15008	15020	14890
45.0	15691	15909	16604	16934	16486	15418	16921	16477	16495	16239
47.5	17073	17398	18075	18919	18659	17524	19003	18603	18608	18139
50.0	18242	18729	19309	20856	20793	19738	21017	20702	20644	20045
52.5	19356	19923	20276	22508	22453	21865	22524	22409	22377	21718
55.0	20805	21272	21559	24034	24102	23908	24075	24040	24095	23465
57.5	21102	21431	21844	24170	24456	24286	24401	24284	24378	23832
60.0	22547	22855	23451	25815	26236	26177	26301	26146	26229	25666
62.5	23413	23674	24541	26926	27455	27391	27549	27297	27376	26808
65.0	23483	23701	24736	27373	28041	28079	28193	27846	27880	27250
67.5	21881	22099	23211	26225	27131	27346	27376	26919	26894	26180
70.0	20710	20966	22124	25560	26741	27044	27010	26391	26271	25494
72.5	19203	19414	20587	24325	25653	26082	25904	25172	25016	24200
75.0	16001	16139	17185	20692	21967	22439	22121	21416	21250	20505
77.5	13063	13203	14086	17171	18378	18905	18457	17830	17650	16991
80.0	9684	9809	10436	12843	13825	14338	13858	13327	13158	12648
82.5	6227	6327	6698	8340	9152	9579	9127	8727	8586	8235
85.0	2836	2878	3026	3769	4200	4492	4206	4030	3970	3824
87.5	1069	1073	1047	1075	1103	1145	1153	1169	1181	1187
90.0	212	208	199	193	197	204	214	220	226	228

Vert. Angles	**Horizontal Angles**									
	67.5	70.0	72.5	75.0	77.5	80.0	82.5	85.0	87.5	90.0
0.0	3465	3465	3465	3465	3465	3465	3465	3465	3465	3465
2.5	3633	3622	3618	3616	3602	3606	3593	3591	3587	3581
5.0	3665	3646	3648	3638	3623	3617	3602	3591	3576	3557
7.5	3970	3951	3953	3945	3936	3909	3896	3881	3867	3850
10.0	4278	4278	4297	4290	4280	4259	4244	4218	4201	4189
12.5	4723	4736	4764	4772	4781	4768	4751	4747	4734	4736
15.0	5405	5422	5464	5477	5513	5502	5498	5483	5467	5471
17.5	5469	5494	5548	5569	5604	5585	5558	5544	5525	5517
20.0	6385	6413	6489	6529	6567	6548	6523	6497	6480	6476
22.5	7196	7211	7290	7322	7369	7354	7328	7305	7303	7309
25.0	7870	7890	7925	7921	7962	7944	7921	7901	7886	7895
27.5	8903	8930	8928	8863	8831	8818	8780	8748	8711	8701
30.0	9859	9888	9892	9798	9685	9617	9548	9475	9464	9450

Photometric Toolbox Professional Edition - Copyright 2002-2015 by Lighting Analysts, Inc.
Calculations based on published IES Methods and recommendations, values rounded for display purposes.
Results derived from content of manufacturers photometric file.

IES INDOOR REPORT
PHOTOMETRIC FILENAME : HMSPCP1HP00S9.IES

CANDELA TABULATION - (Cont.)

32.5	11327	11392	11422	11353	11203	11071	10889	10813	10807	10763
35.0	12020	12060	12077	12014	11930	11677	11443	11309	11313	11271
37.5	13352	13498	13575	13549	13367	13135	12820	12663	12657	12621
40.0	13736	13930	14105	14010	13812	13641	13396	13208	13168	13137
42.5	14923	15064	15174	15086	14953	14831	14595	14338	14212	14210
45.0	16244	16217	16206	16180	16126	16067	15824	15525	15330	15293
47.5	17954	17746	17656	17696	17703	17679	17421	17116	16820	16716
50.0	19629	19239	19017	19042	19096	19052	18804	18528	18165	17954
52.5	21090	20545	20177	20125	20166	20168	19946	19718	19307	19038
55.0	22767	22119	21563	21441	21363	21355	21225	21071	20723	20474
57.5	23122	22534	21938	21766	21605	21522	21392	21301	21064	20792
60.0	24864	24259	23608	23361	23093	22938	22748	22670	22461	22151
62.5	26011	25377	24723	24422	24041	23764	23525	23457	23270	22959
65.0	26402	25696	25010	24603	24164	23764	23472	23369	23202	22896
67.5	25264	24498	23701	23177	22636	22166	21879	21733	21580	21357
70.0	24503	23666	22713	22117	21447	20945	20657	20473	20381	20180
72.5	23225	22326	21286	20597	19902	19368	19104	18938	18879	18705
75.0	19647	18807	17858	17228	16594	16121	15882	15797	15758	15625
77.5	16241	15513	14680	14159	13611	13229	13067	12972	12960	12863
80.0	12073	11554	10907	10535	10101	9842	9754	9660	9675	9618
82.5	7839	7486	7074	6837	6553	6399	6361	6280	6305	6249
85.0	3661	3485	3295	3178	3064	3026	3011	2984	2999	2991
87.5	1189	1173	1171	1159	1151	1153	1155	1157	1161	1177
90.0	232	234	236	236	240	240	242	242	246	246

Vert. Angles	**Horizontal Angles**									
	95.0	**105.0**	**115.0**	**125.0**	**135.0**	**145.0**	**155.0**	**165.0**	**175.0**	**180.0**
0.0	3465	3465	3465	3465	3465	3465	3465	3465	3465	3465
2.5	3579	3574	3543	3514	3468	3415	3365	3342	3323	3325
5.0	3517	3454	3411	3384	3333	3280	3233	3242	3259	3269
7.5	3825	3726	3694	3659	3595	3516	3467	3459	3448	3431
10.0	4153	4053	3937	3867	3780	3736	3744	3770	3791	3793
12.5	4695	4590	4489	4364	4211	4151	4224	4306	4334	4340
15.0	5429	5355	5270	5065	4848	4766	4850	5004	5051	5067
17.5	5480	5409	5343	5060	4795	4720	4873	5076	5078	5080
20.0	6459	6349	6282	5918	5588	5514	5709	5984	6009	6003
22.5	7301	7207	7137	6747	6308	6197	6451	6743	6747	6743
25.0	7899	7862	7835	7394	6910	6762	7055	7306	7271	7267
27.5	8697	8742	8833	8256	7803	7570	7944	8149	8064	8023
30.0	9464	9611	9783	9125	8688	8403	8816	8995	8751	8697
32.5	10817	11080	11262	10653	10100	9865	10180	10377	9972	9881
35.0	11319	11771	11837	11329	10410	10668	10806	11088	10425	10346
37.5	12608	13212	13251	12831	11518	12198	12230	12597	11780	11726
40.0	13121	13679	13728	13551	12163	12811	12815	13231	12493	12440
42.5	14227	14755	15079	15016	13561	14265	14115	14443	13705	13721
45.0	15383	15879	16678	16552	15335	15981	15645	15641	14994	14935
47.5	16873	17445	18775	18644	17583	18148	17793	17204	16633	16450
50.0	18228	18827	20715	20592	19821	20116	19846	18586	18163	17790
52.5	19464	19983	22403	22297	21899	21837	21671	19806	19537	19038
55.0	20846	21380	24032	24114	23879	23513	23414	21244	21040	20570
57.5	21047	21791	24204	24615	24240	23938	23733	21668	21342	21025
60.0	22419	23376	25974	26453	26098	25664	25413	23273	22777	22480
62.5	23189	24368	26970	27608	27249	26779	26340	24196	23556	23277
65.0	23100	24436	27358	28133	27861	27248	26505	24177	23365	23093
67.5	21549	22994	26273	27348	27288	26402	25387	22761	21894	21610

Photometric Toolbox Professional Edition - Copyright 2002-2015 by Lighting Analysts, Inc.
Calculations based on published IES Methods and recommendations, values rounded for display purposes.
Results derived from content of manufacturers photometric file.

IES INDOOR REPORT
PHOTOMETRIC FILENAME : HMSPCP1HP00S9.IES

CANDELA TABULATION - (Cont.)

70.0	20385	21934	25588	27012	27215	26083	24656	21750	20810	20522
72.5	18891	20377	24346	26025	26546	25122	23460	20364	19345	19110
75.0	15766	17028	20712	22352	23095	21601	20030	17181	16185	16058
77.5	12952	13945	17163	18707	19560	18079	16668	14084	13302	13261
80.0	9669	10348	12863	14132	14967	13704	12564	10460	9960	9921
82.5	6296	6710	8394	9326	10107	9150	8365	6842	6593	6553
85.0	3024	3170	3901	4327	4855	4402	4062	3314	3285	3270
87.5	1185	1173	1195	1153	1221	1231	1255	1193	1257	1278
90.0	250	248	228	210	218	228	236	242	259	261

Photometric Toolbox Professional Edition - Copyright 2002-2015 by Lighting Analysts, Inc.
Calculations based on published IES Methods and recommendations, values rounded for display purposes.
Results derived from content of manufacturers photometric file.

IES INDOOR REPORT
PHOTOMETRIC FILENAME : HMSPCP1HP00S9.IES

ZONAL LUMEN SUMMARY

Zone	Lumens	%Lamp	%Fixt
0-20	1825.89	1.40	1.90
0-30	5436.02	4.00	5.70
0-40	12794.4	9.50	13.40
0-60	45419.05	33.60	47.50
0-80	90497.51	67.00	94.60
0-90	95637.03	70.80	100.00
10-90	95277.18	70.60	99.60
20-40	10968.51	8.10	11.50
20-50	23626.7	17.50	24.70
40-70	57614.09	42.70	60.20
60-80	45078.46	33.40	47.10
70-80	20089.02	14.90	21.00
80-90	5139.53	3.80	5.40
90-110	0.00	0.00	0.00
90-120	0.00	0.00	0.00
90-130	0.00	0.00	0.00
90-150	0.00	0.00	0.00
90-180	0.00	0.00	0.00
110-180	0.00	0.00	0.00
0-180	95637.03	70.80	100.00

Total Luminaire Efficiency = 70.80%

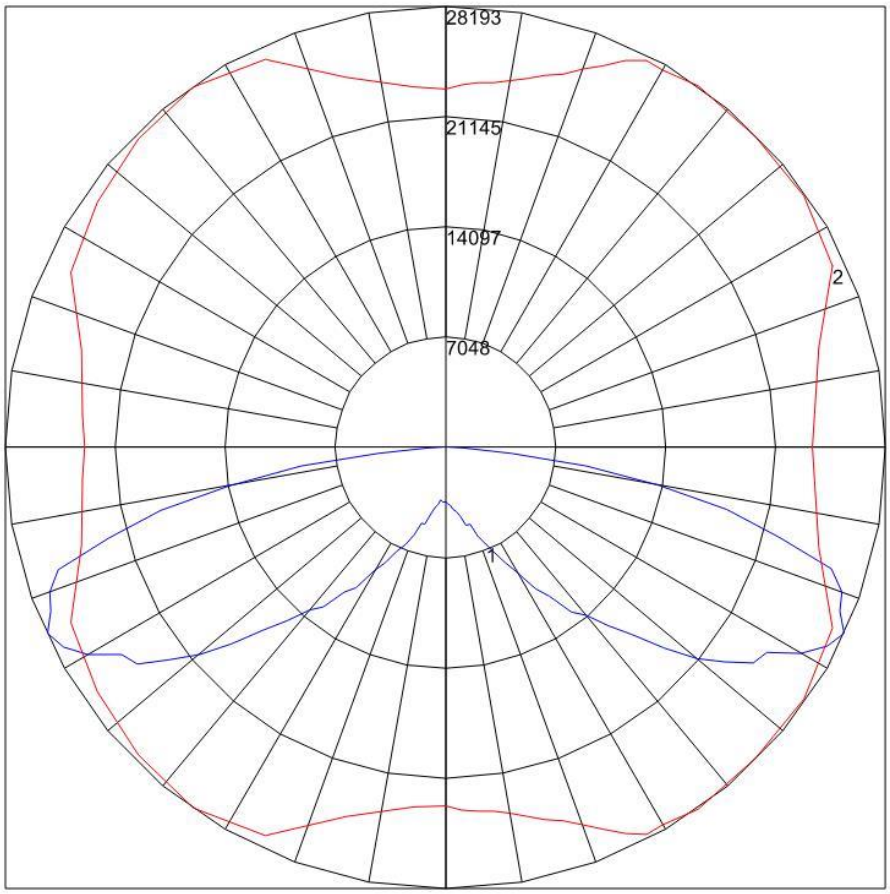
ZONAL LUMEN SUMMARY

Zone	Lumens
0-10	359.85
10-20	1466.04
20-30	3610.13
30-40	7358.38
40-50	12658.19
50-60	19966.45
60-70	24989.45
70-80	20089.01
80-90	5139.53
90-100	0.00
100-110	0.00
110-120	0.00
120-130	0.00
130-140	0.00
140-150	0.00
150-160	0.00
160-170	0.00
170-180	0.00

Photometric Toolbox Professional Edition - Copyright 2002-2015 by Lighting Analysts, Inc.
Calculations based on published IES Methods and recommendations, values rounded for display purposes.
Results derived from content of manufacturers photometric file.

IES INDOOR REPORT
PHOTOMETRIC FILENAME : HMSPCP1HP00S9.IES

POLAR GRAPH



Maximum Candela = 28193 Located At Horizontal Angle = 55, Vertical Angle = 65
1 - Vertical Plane Through Horizontal Angles (55 - 235) (Through Max. Cd.)
2 - Horizontal Cone Through Vertical Angle (65) (Through Max. Cd.)

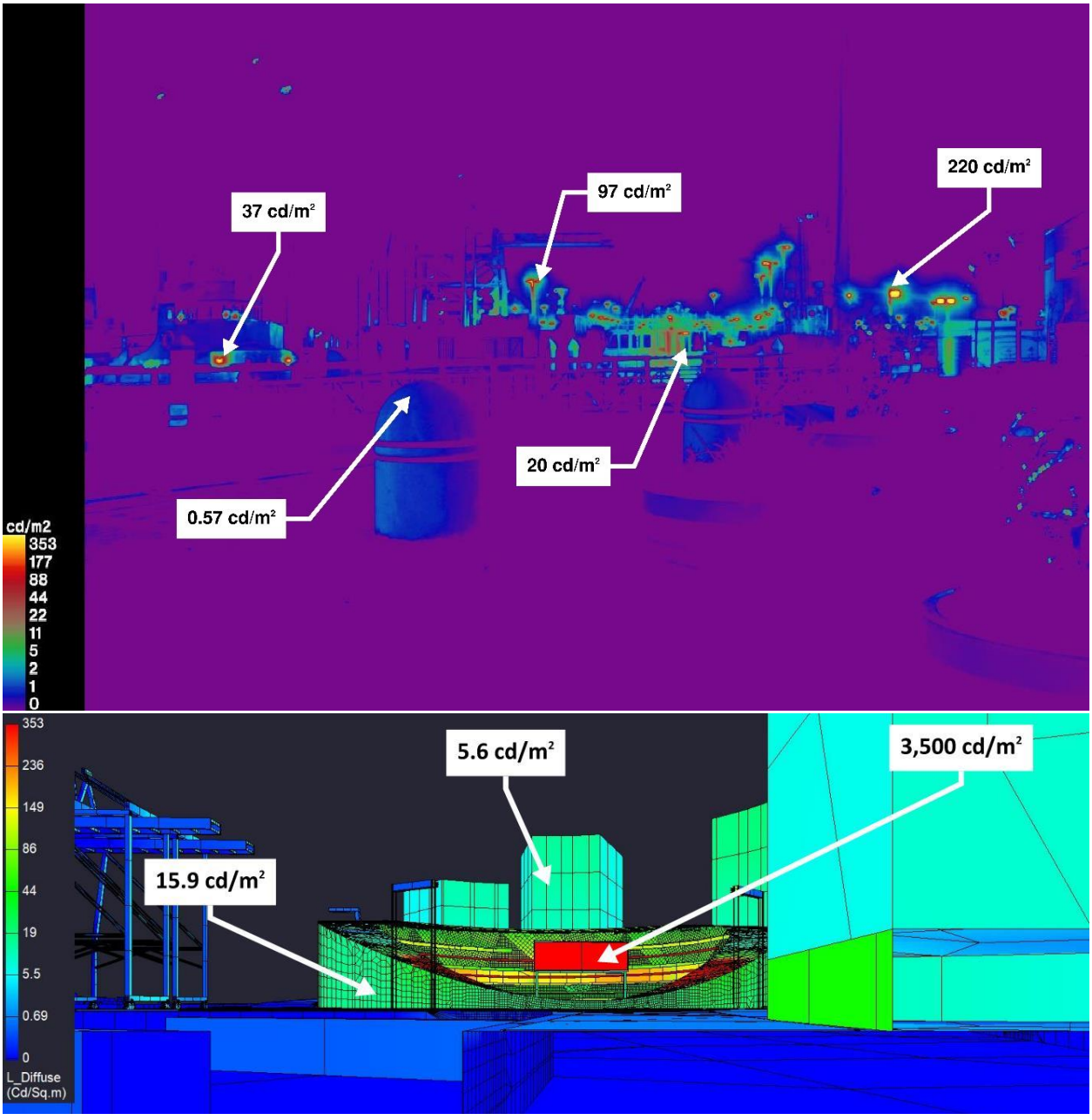
Photometric Toolbox Professional Edition - Copyright 2002-2015 by Lighting Analysts, Inc.
Calculations based on published IES Methods and recommendations, values rounded for display purposes.
Results derived from content of manufacturers photometric file.

13 APPENDIX D – RECEPTOR SITE BIRGHTNESS MEASUREMENTS VS CALCULATED BRIGHTNESSES – BASELINE PROJECT

The purpose of the paired images within this section is to allow direct “Before and After” comparison of the existing measured conditions at the receptor sites and the calculated brightness from the various simulations.

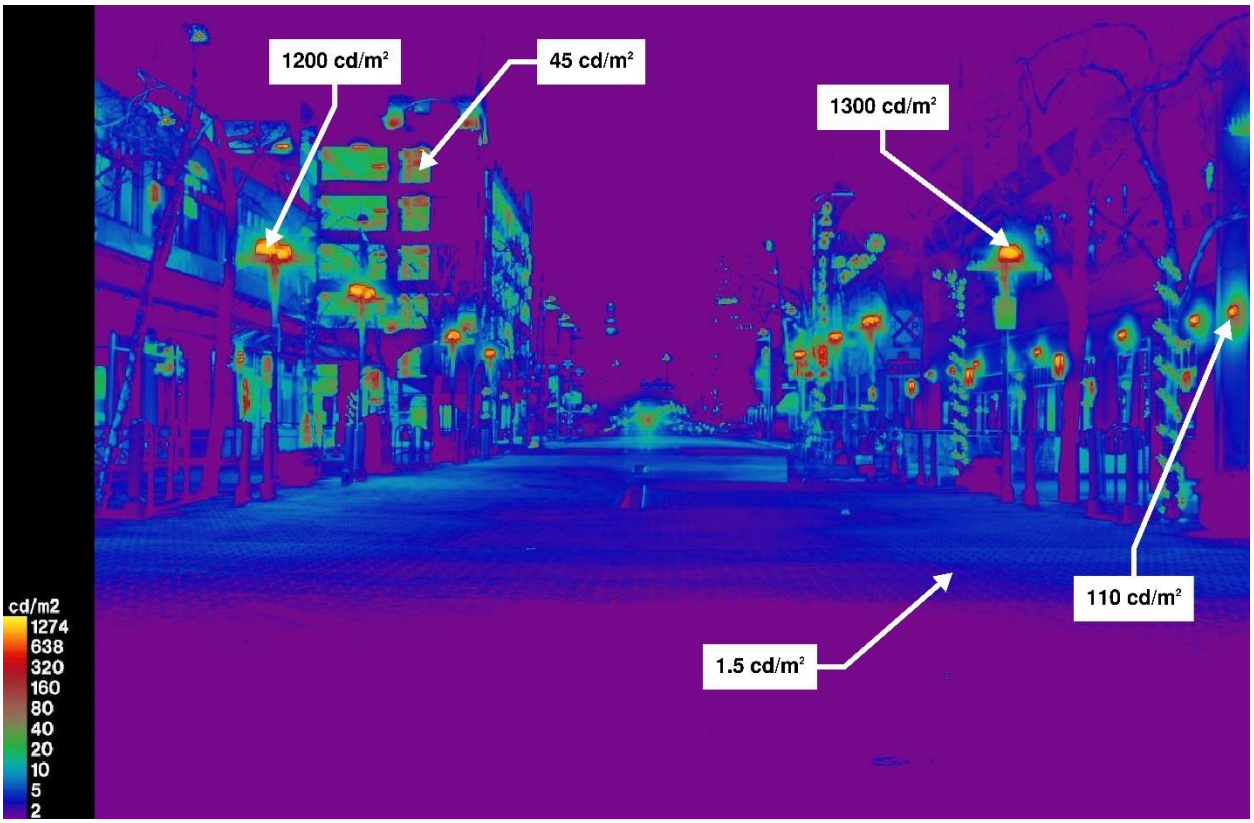
Baseline Ballpark “Phase 1” Scenario Game Nights

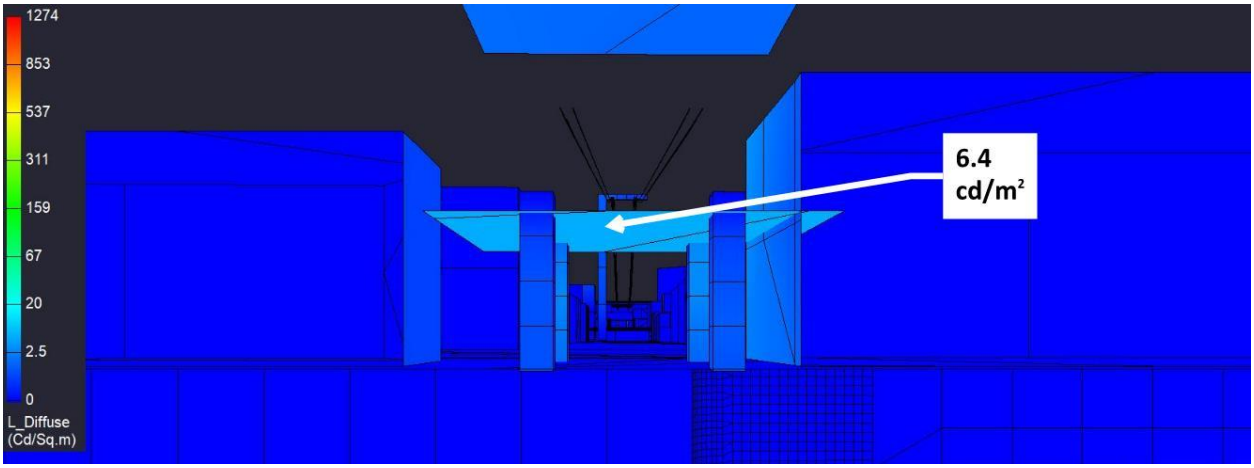
Receptor Site 1 - Water Street at Clay (Facing Ballpark)



Baseline Ballpark “Phase 1” Scenario Game Nights

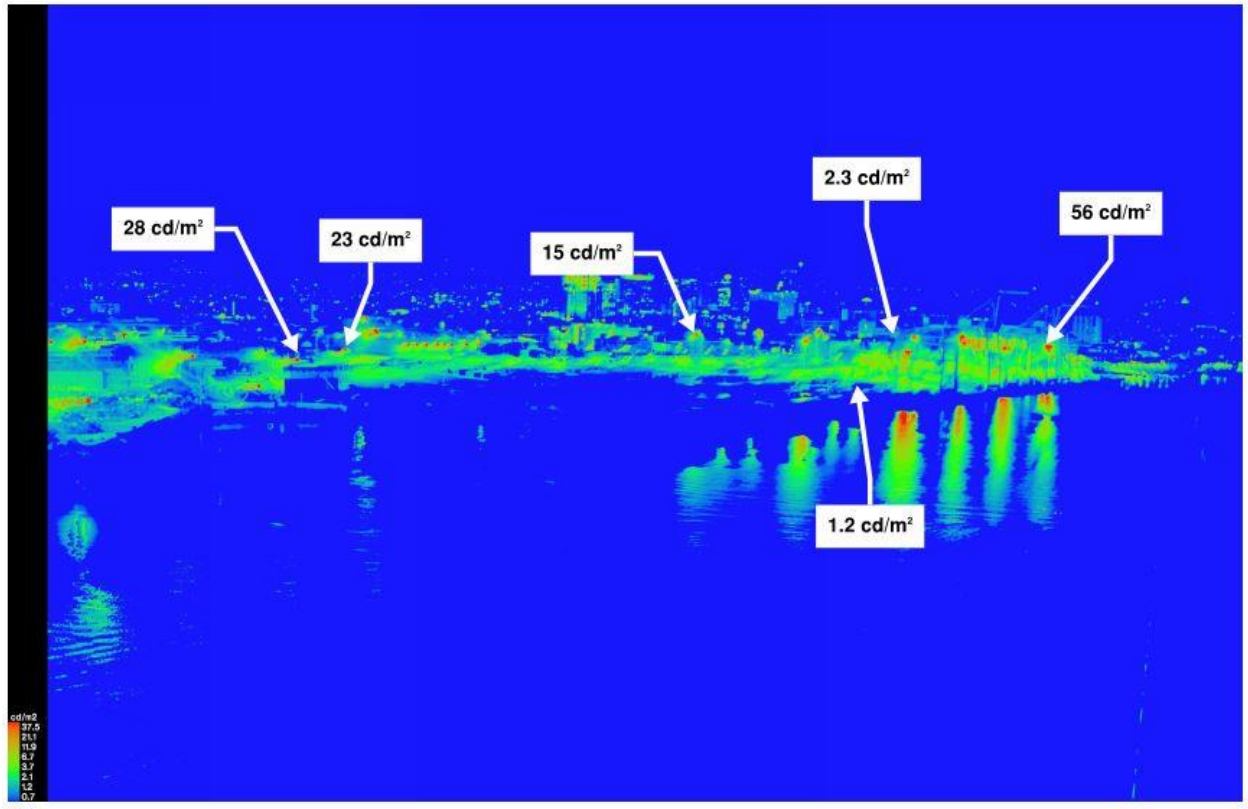
Receptor Site 1A - Water Street at Washington (Facing Gondola)

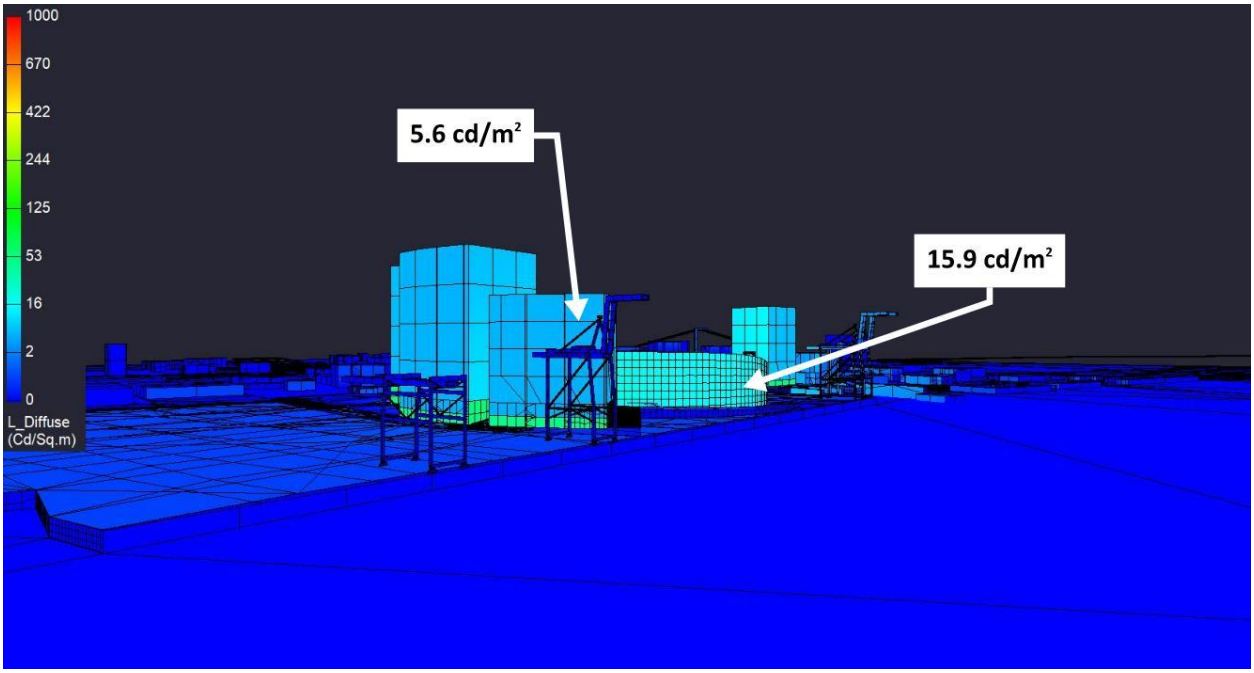




Baseline Ballpark “Phase 1” Scenario Game Nights

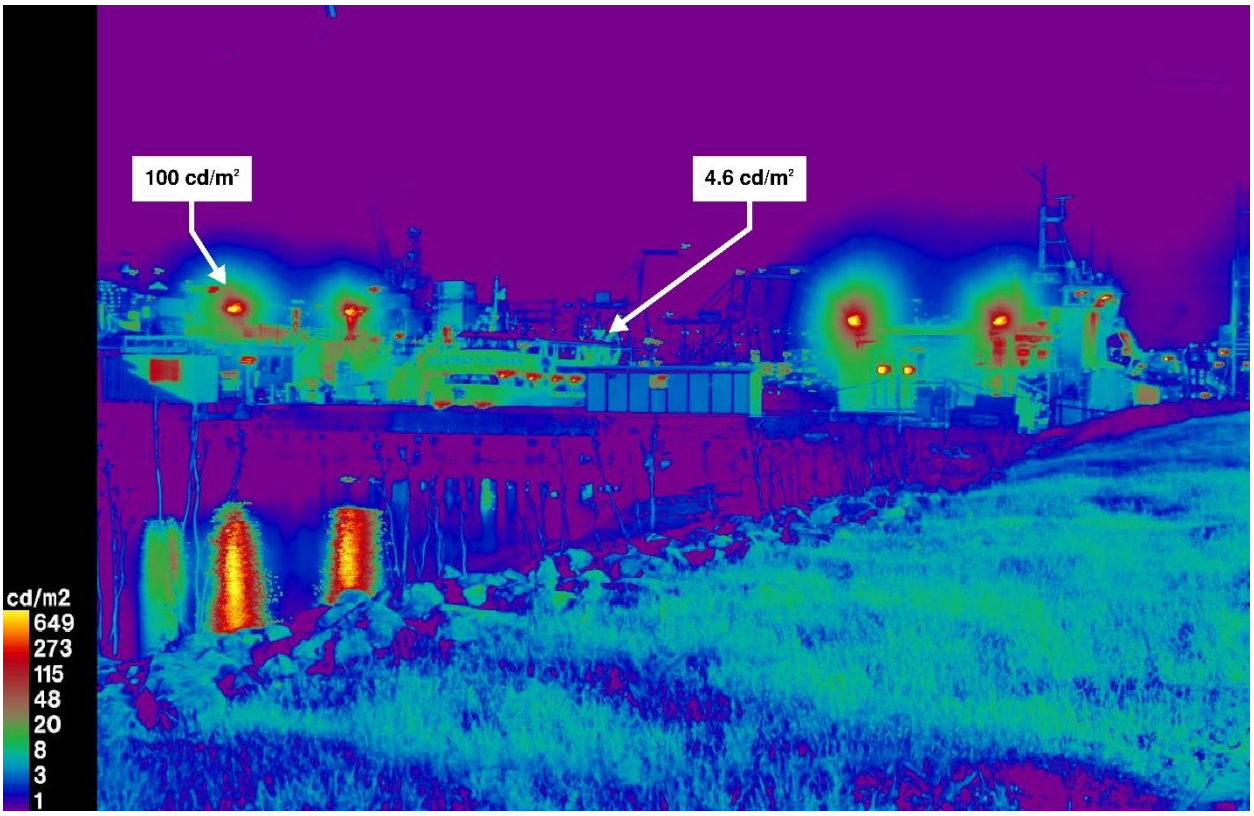
Receptor Site 2 - Inner Harbor Turning Basin @ 190'

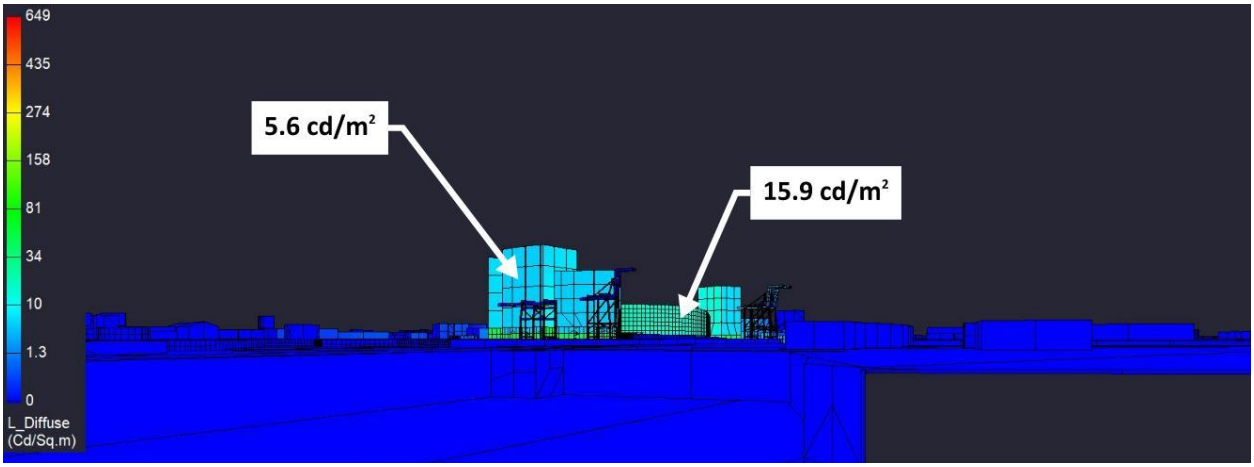




Baseline Ballpark “Phase 1” Scenario Game Nights

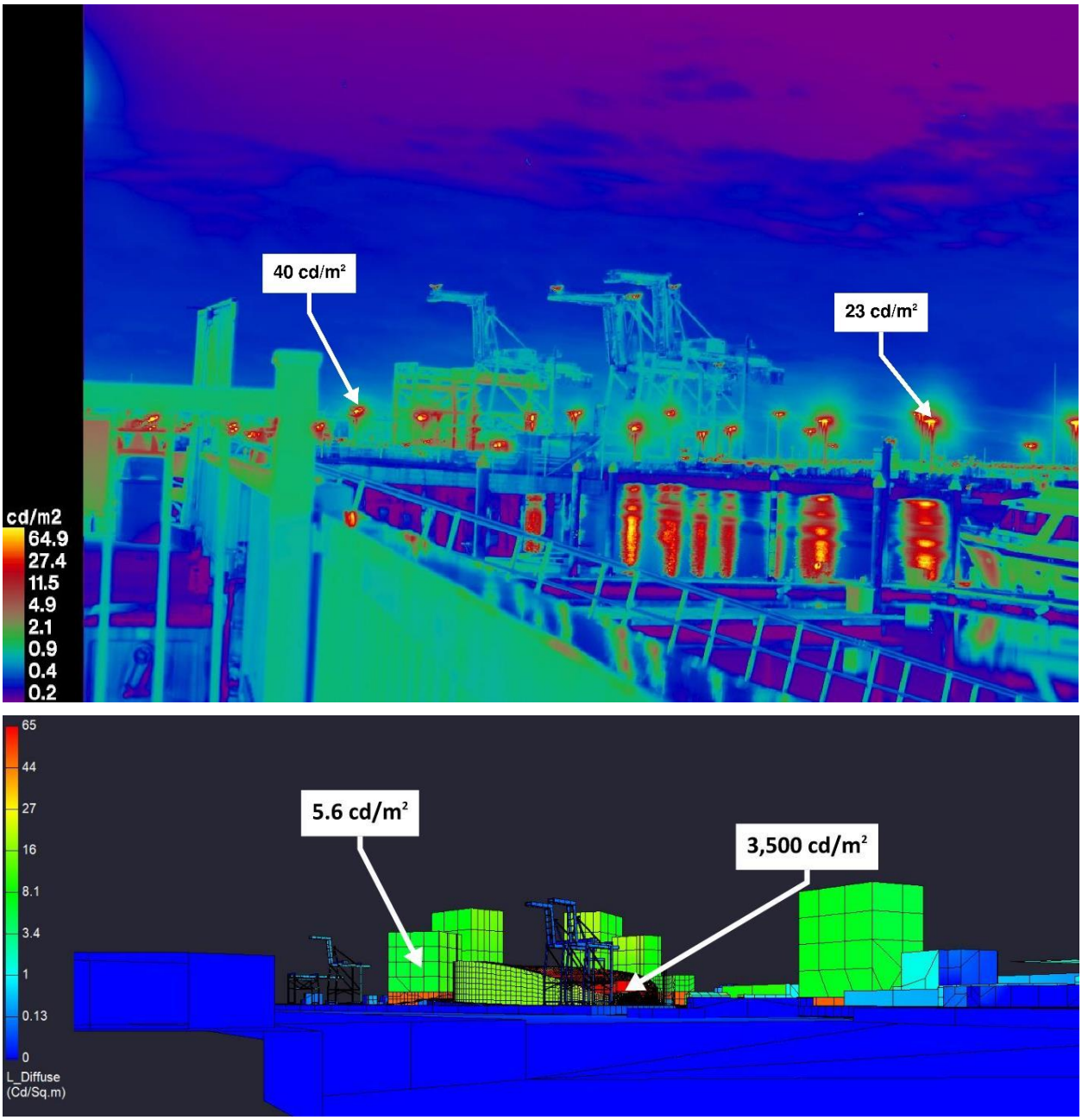
Receptor Site 2A - Turning Basin Line-of-Sight





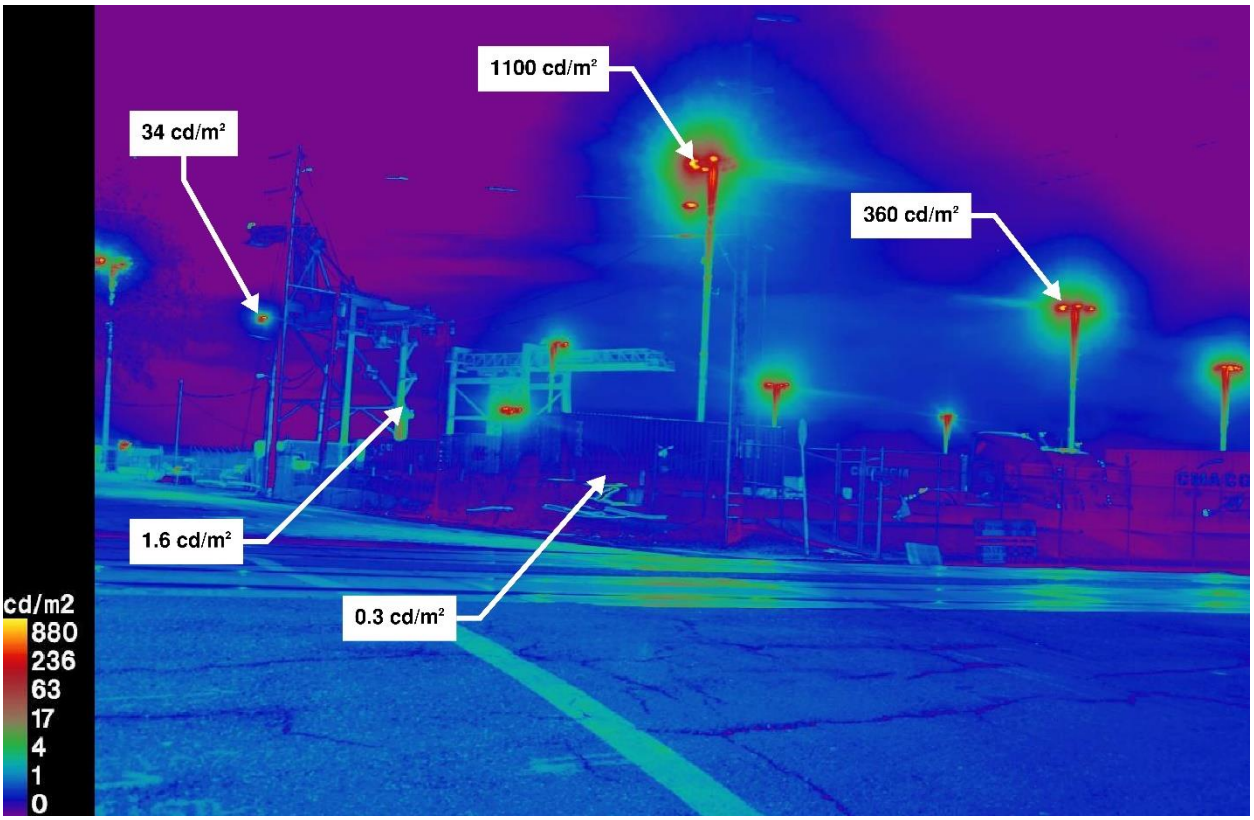
Baseline Ballpark “Phase 1” Scenario Game Nights

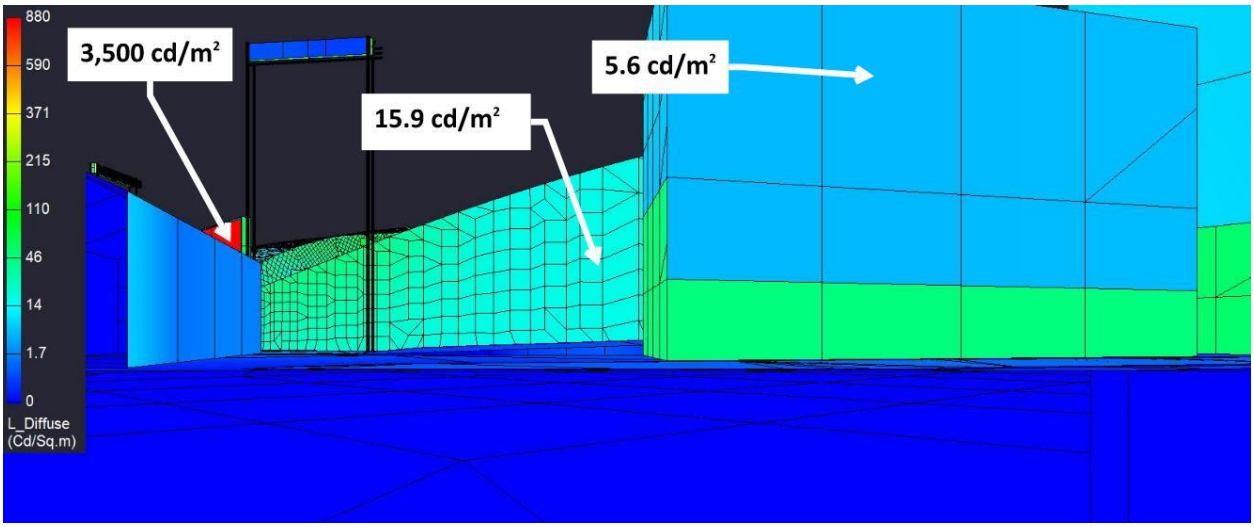
Receptor Site 3 - Alameda Dock



Baseline Ballpark “Phase 1” Scenario Game Nights

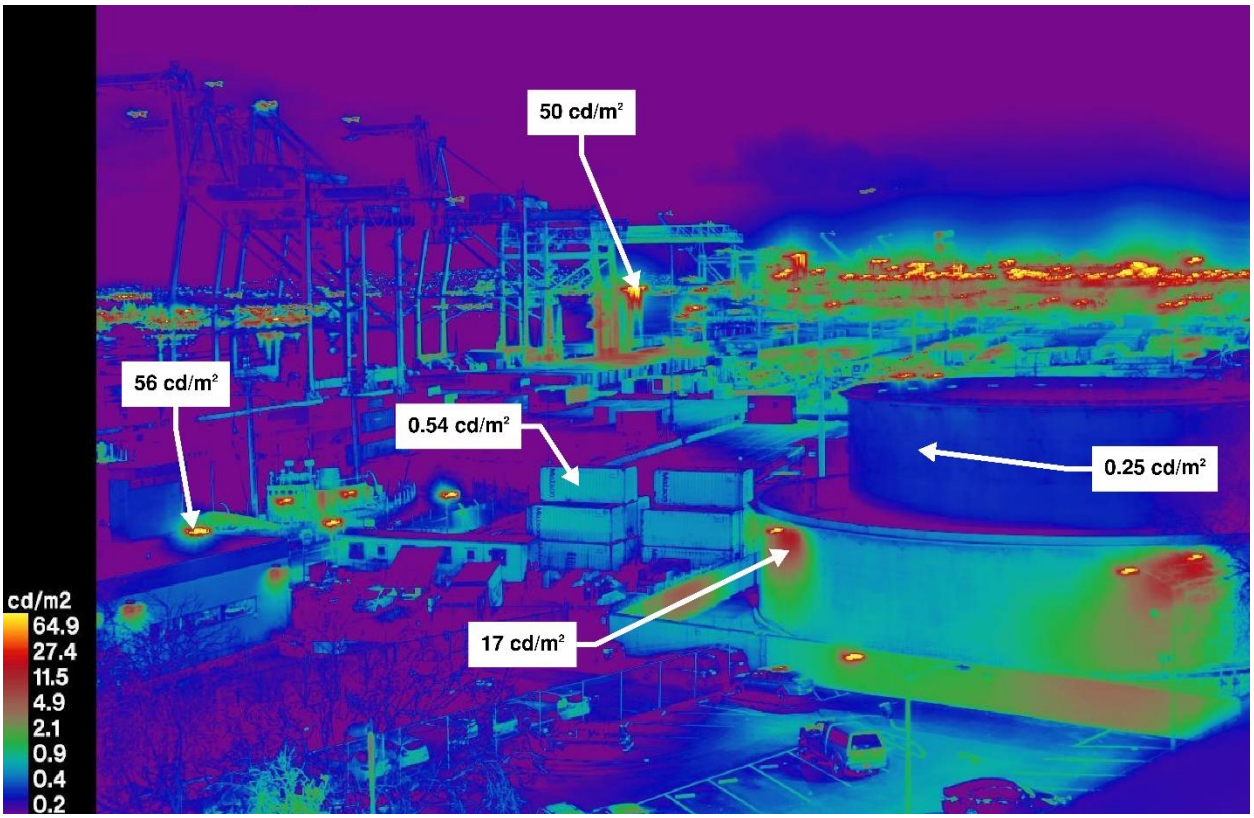
Receptor Site 4 - MLK at Embarcadero

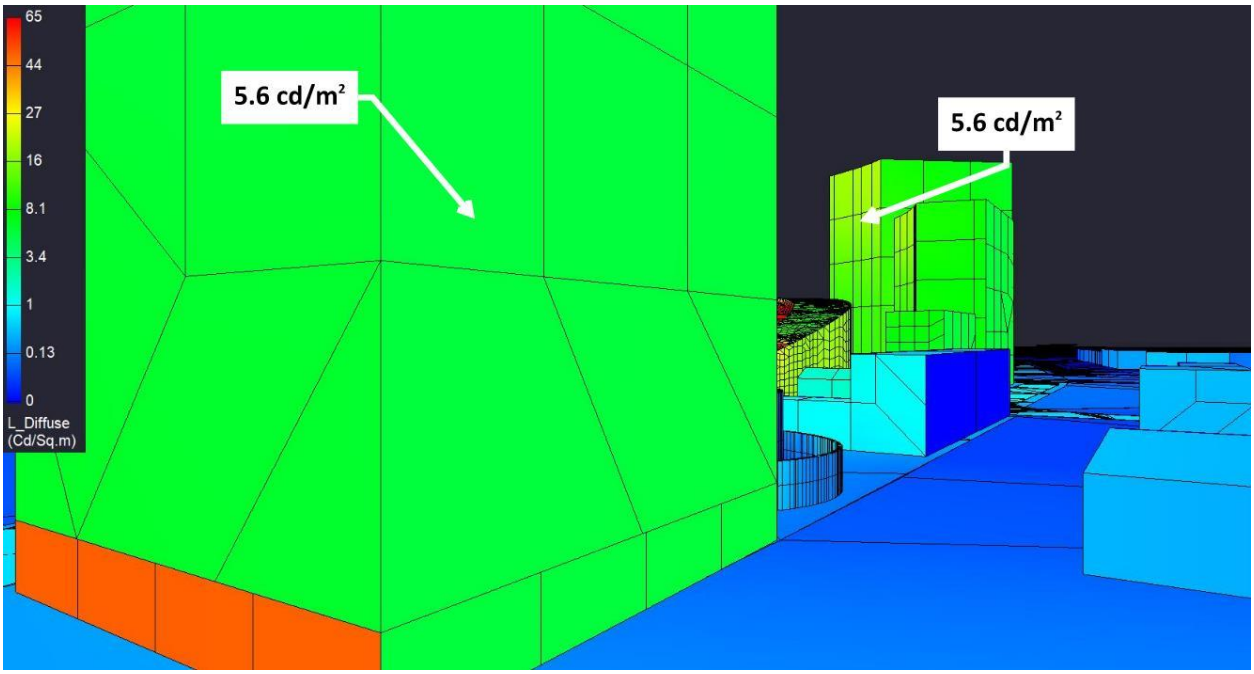




Baseline Ballpark “Phase 1” Scenario Game Nights

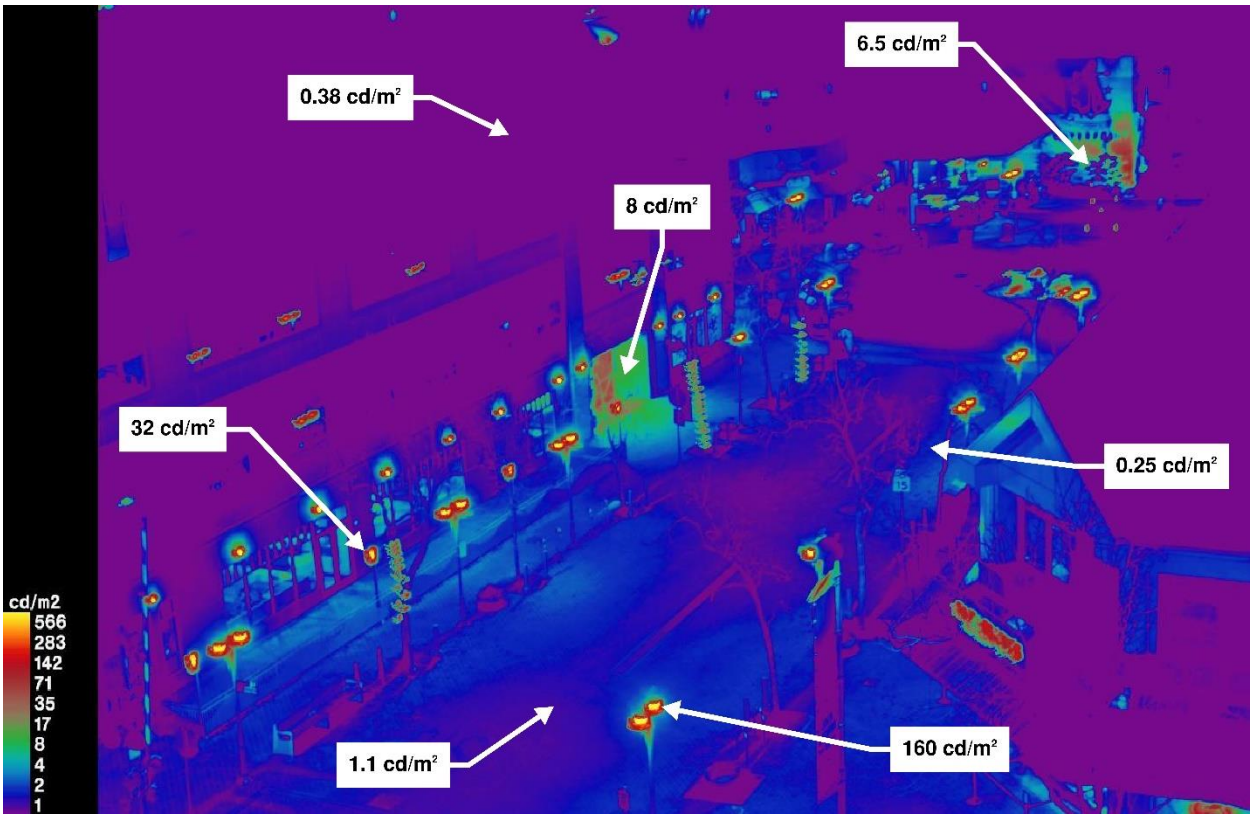
Receptor Site 5A - 2nd at Washington (Facing Stadium)

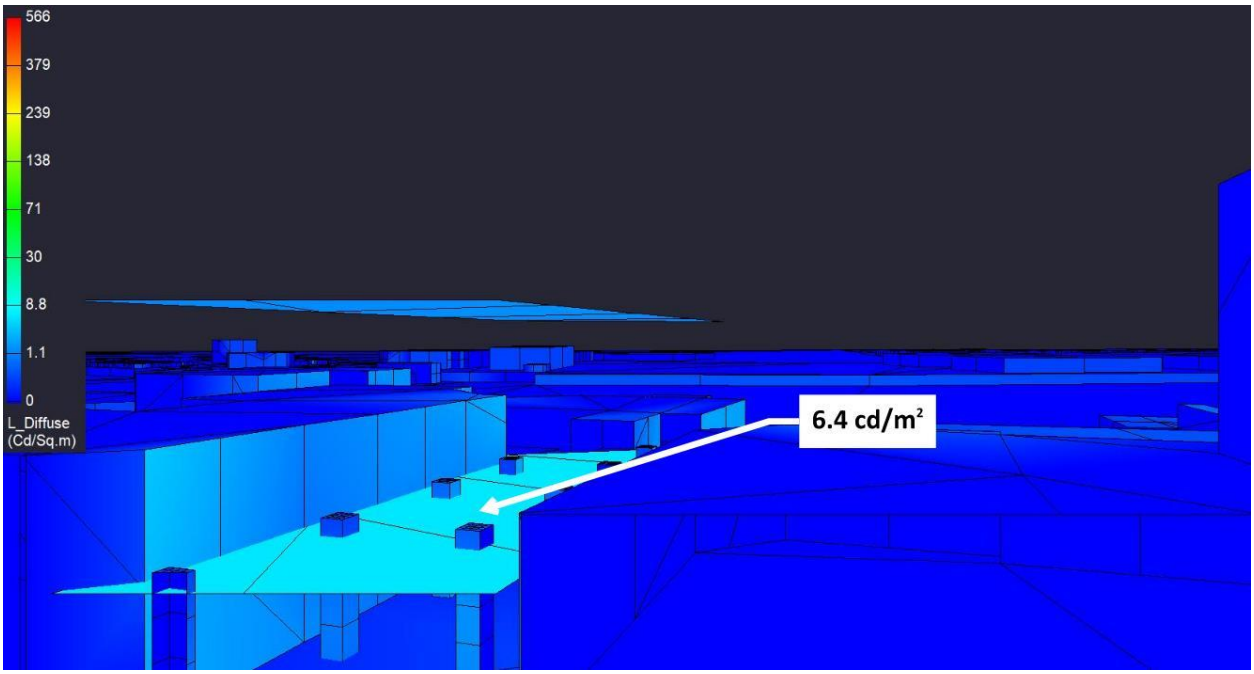




Baseline Ballpark “Phase 1” Scenario Game Nights

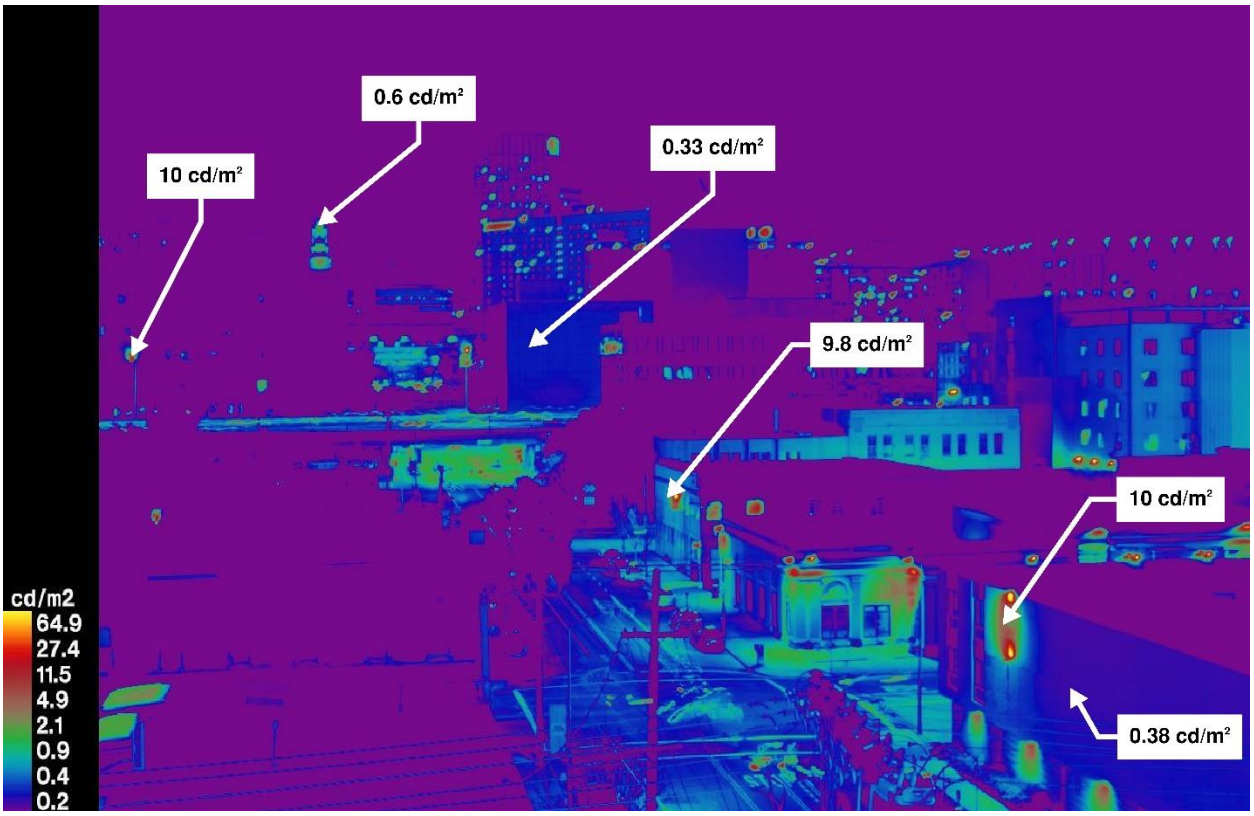
Receptor Site 5B - 2nd at Washington (Facing JLS Station)

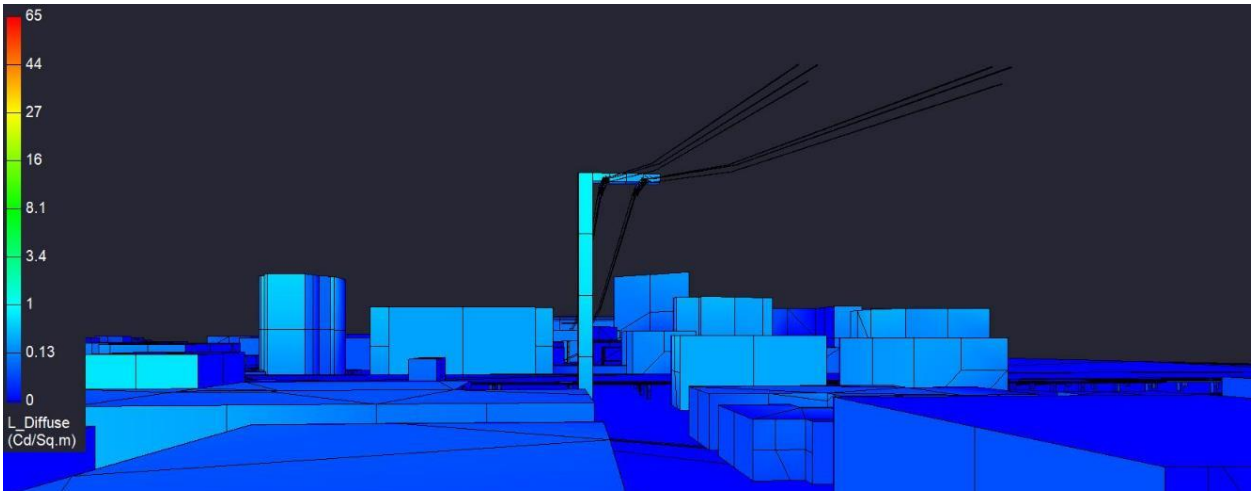




Baseline Ballpark “Phase 1” Scenario Game Nights

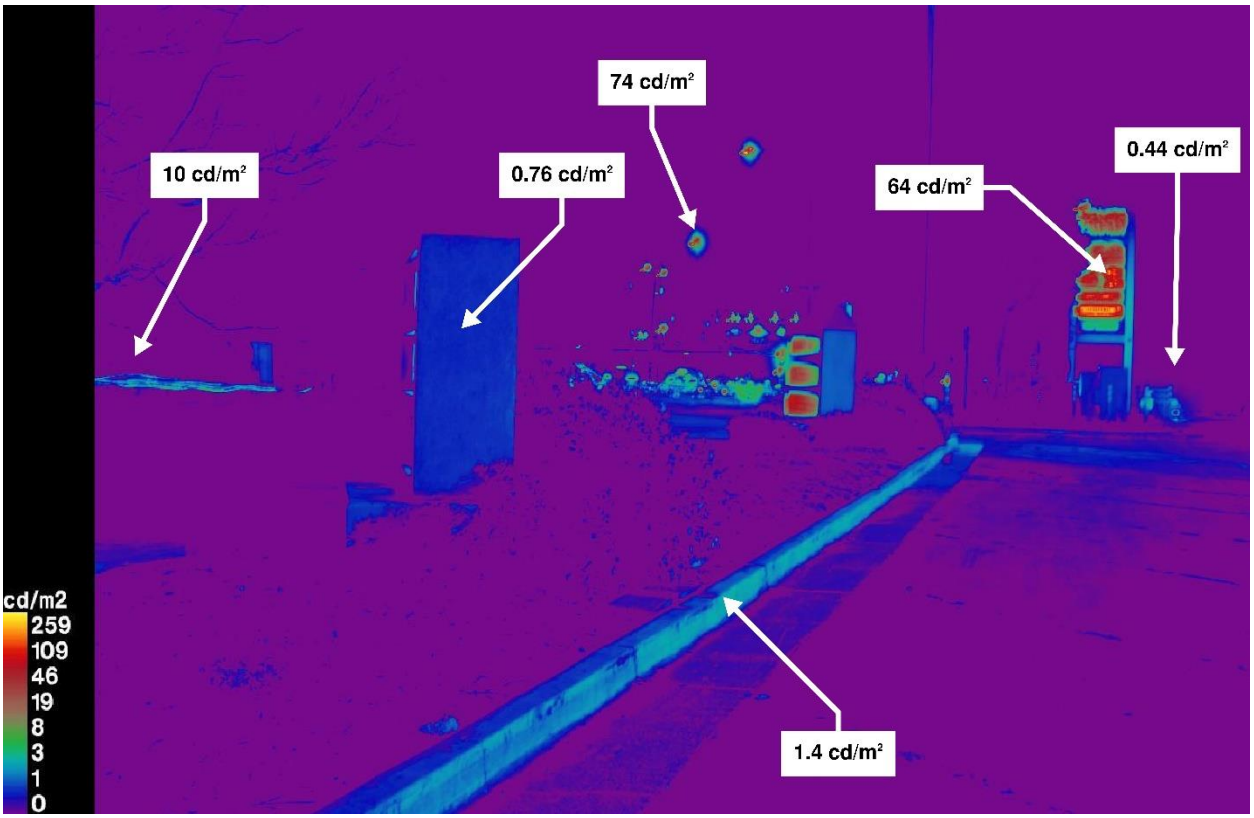
Receptor Site 5C - 2nd at Washington (Facing Convention Center Station)

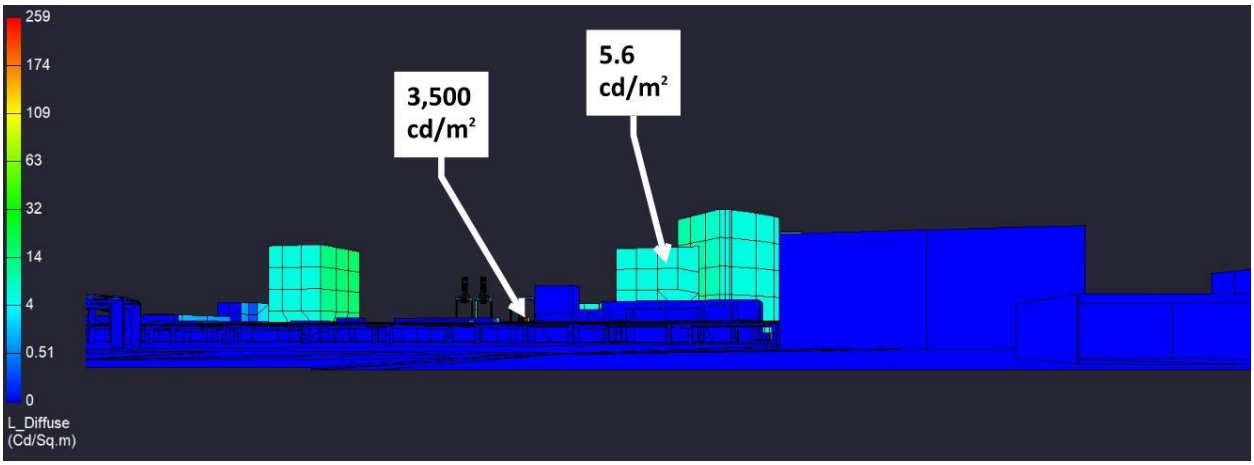




Baseline Ballpark “Phase 1” Scenario Game Nights

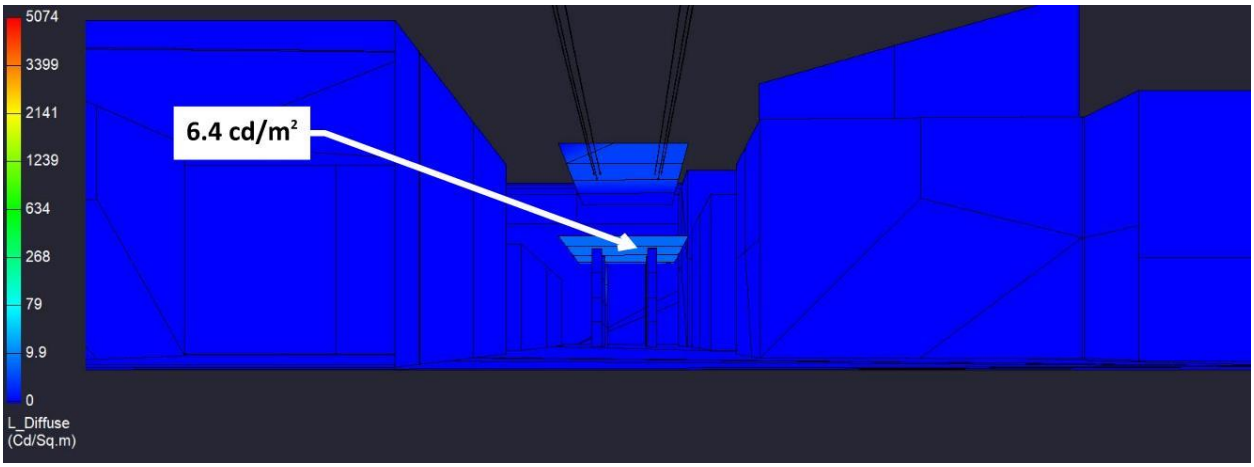
Receptor Site 6A - 7th at Brush





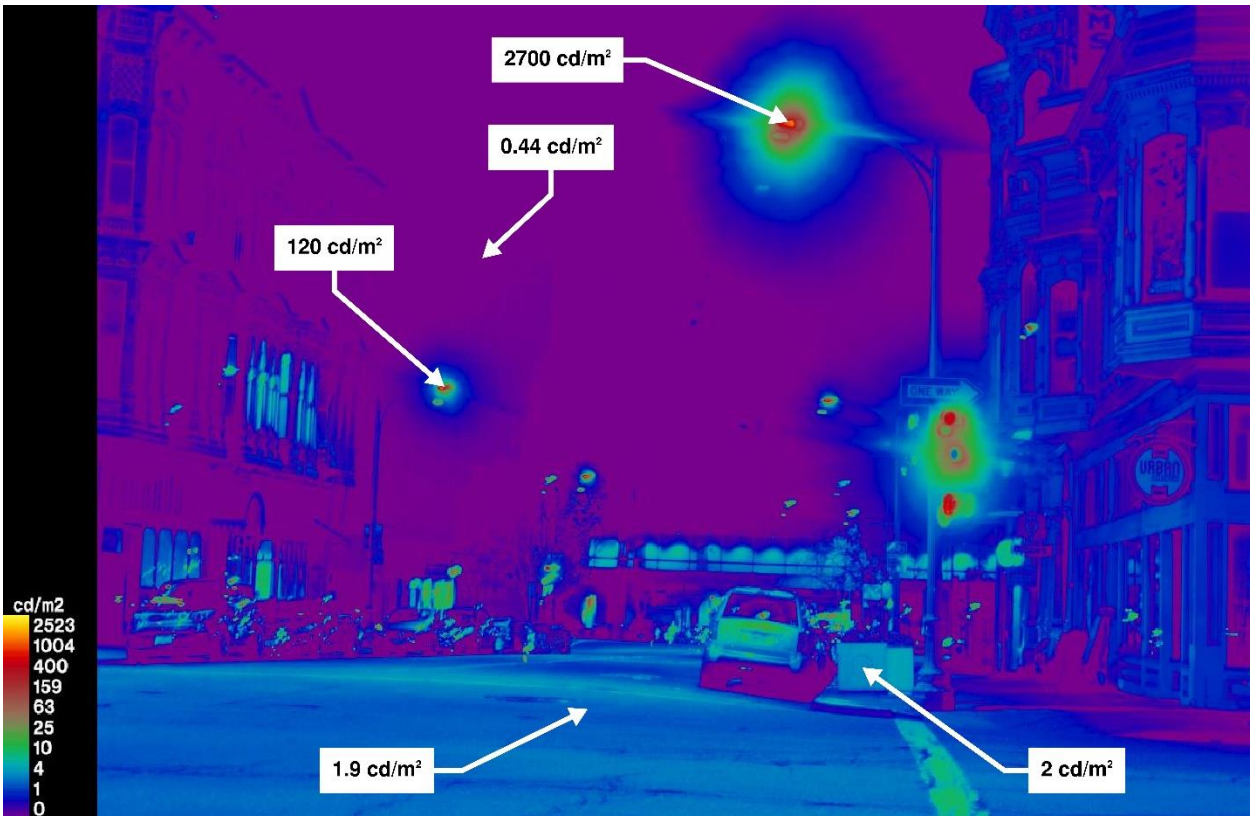
Baseline Ballpark “Phase 1” Scenario Game Nights

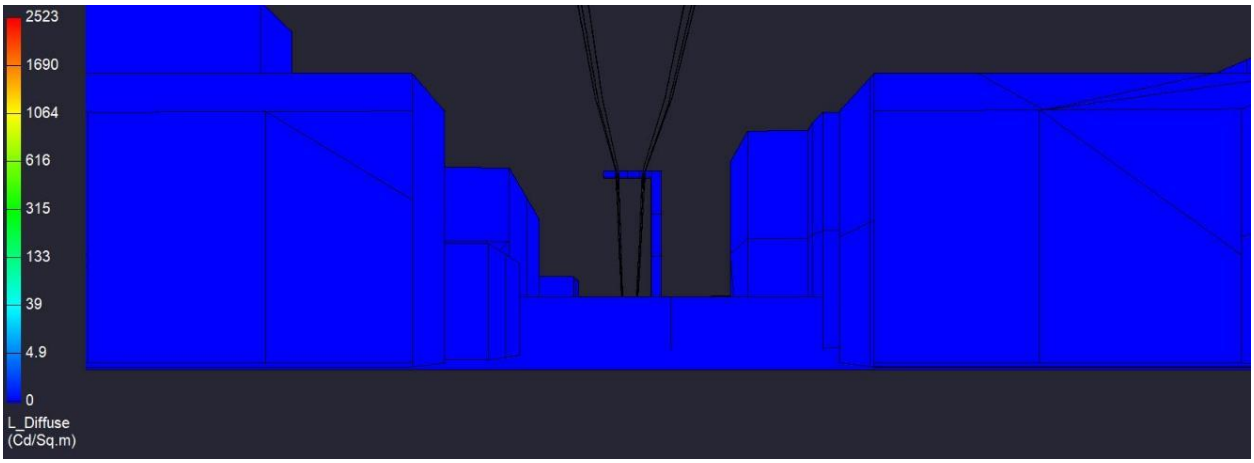
Receptor Site 7 - 8th at Washington (Facing Convention Center Station)



Baseline Ballpark “Phase 1” Scenario Game Nights

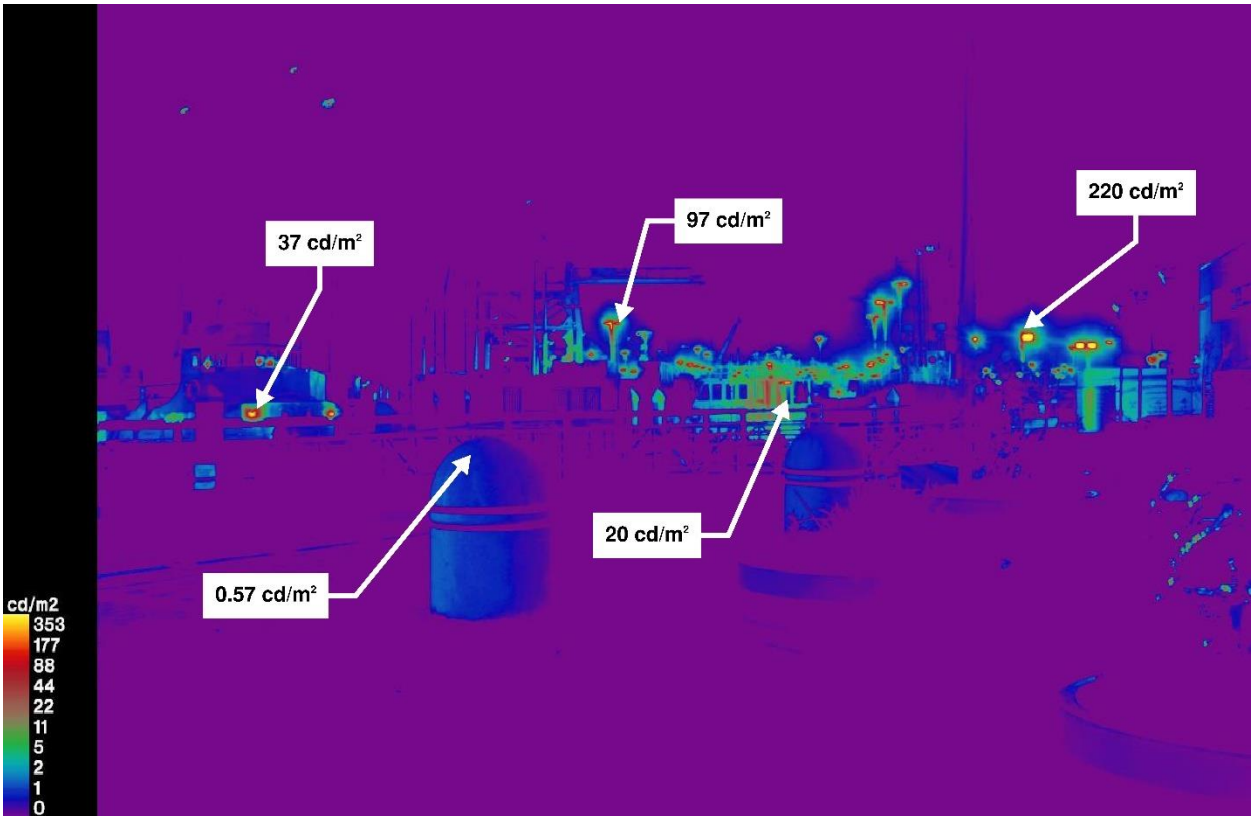
Receptor Site 7A - 8th at Washington (Facing Tower)

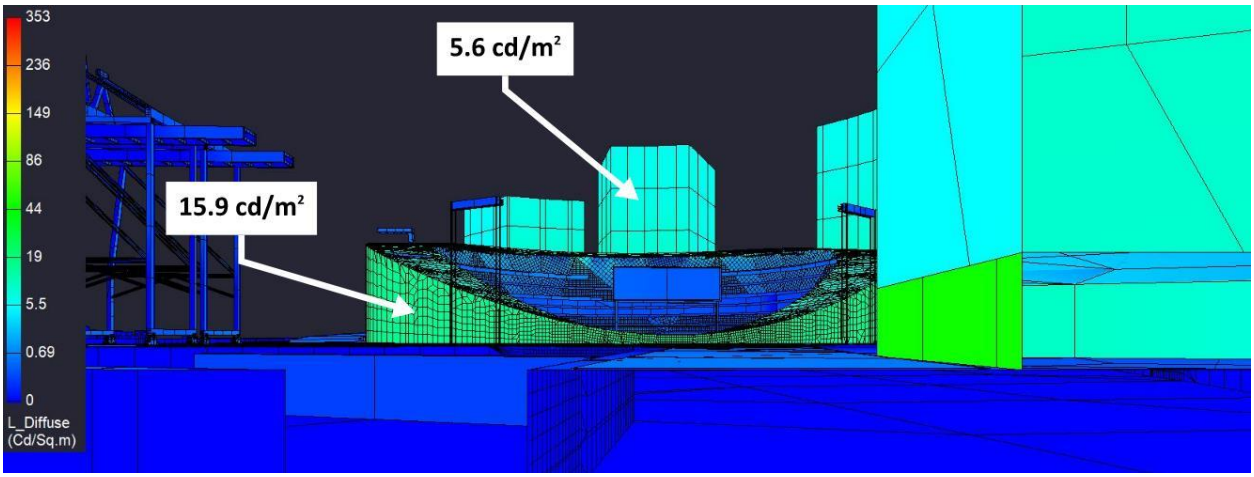




Baseline Project, Baseline Ballpark “Phase 1” Scenario Non-Game Nights Pre-Curfew

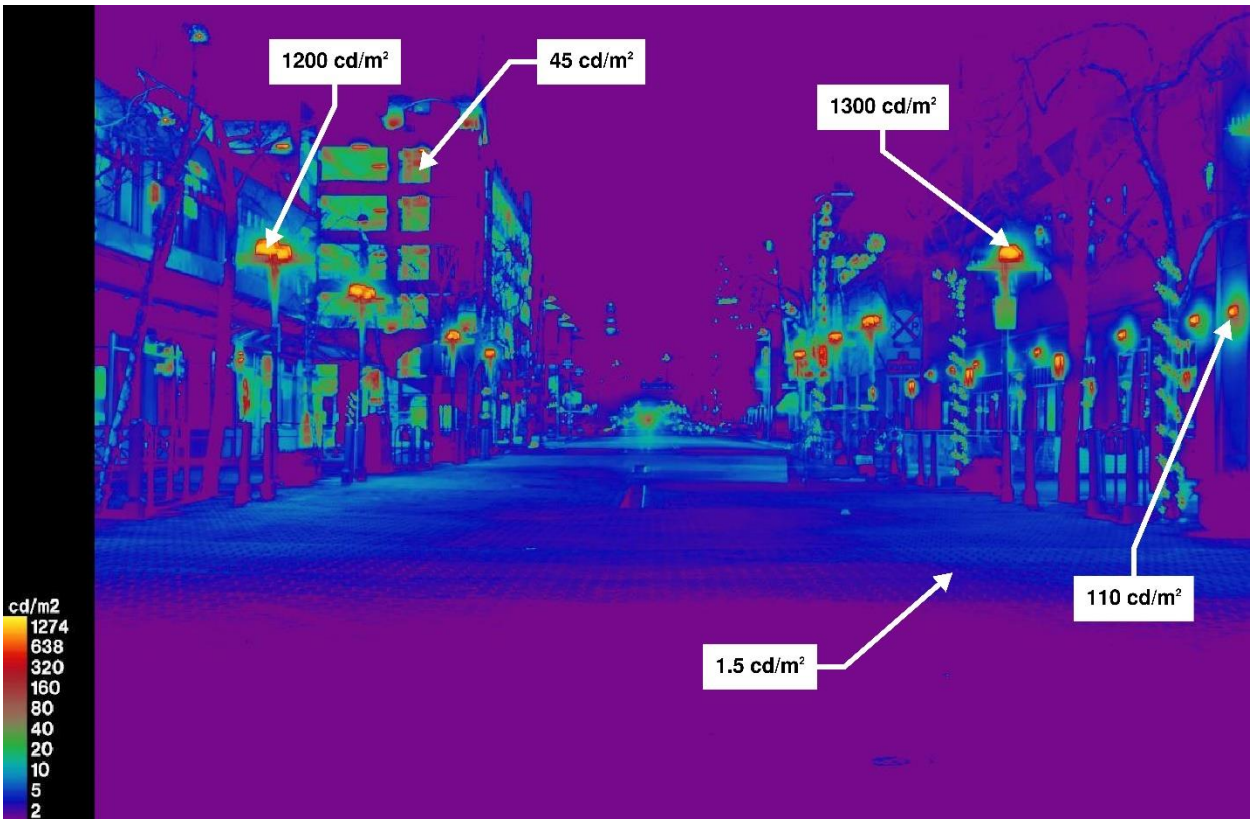
Receptor Site 1 - Water Street at Clay (Facing Ballpark)

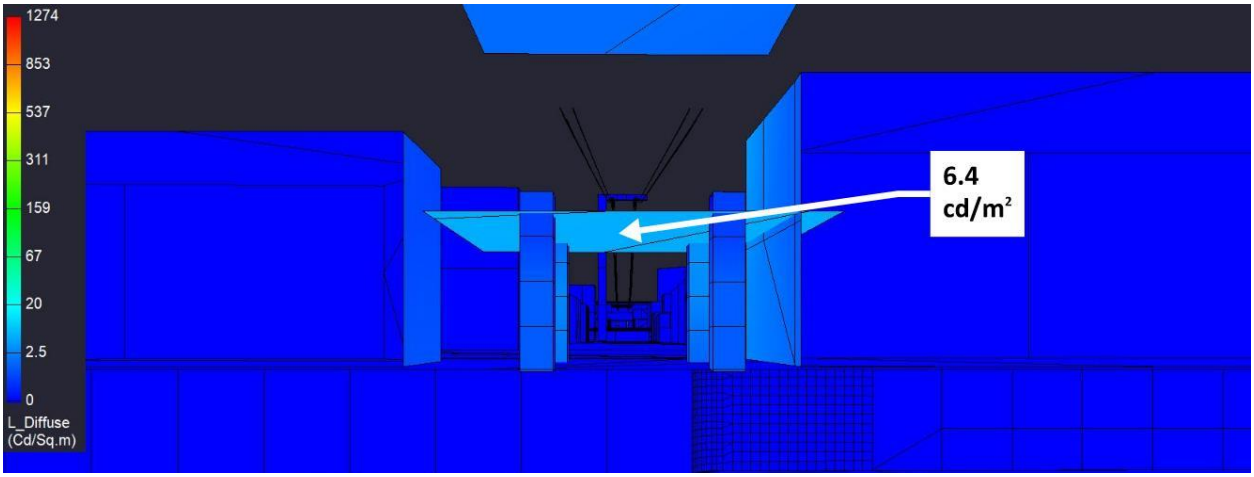




Baseline Project, Baseline Ballpark “Phase 1” Scenario Non-Game Nights Pre-Curfew

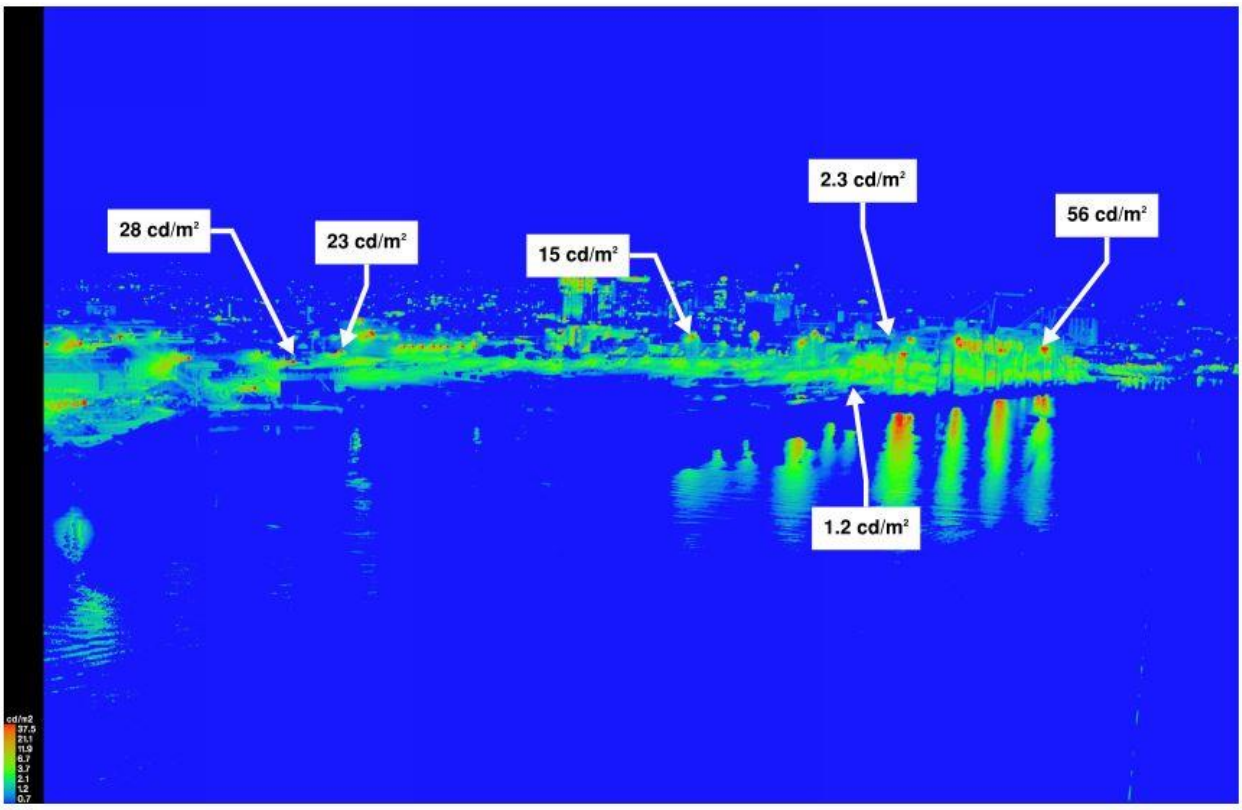
Receptor Site 1A - Water Street at Washington (Facing Gondola)

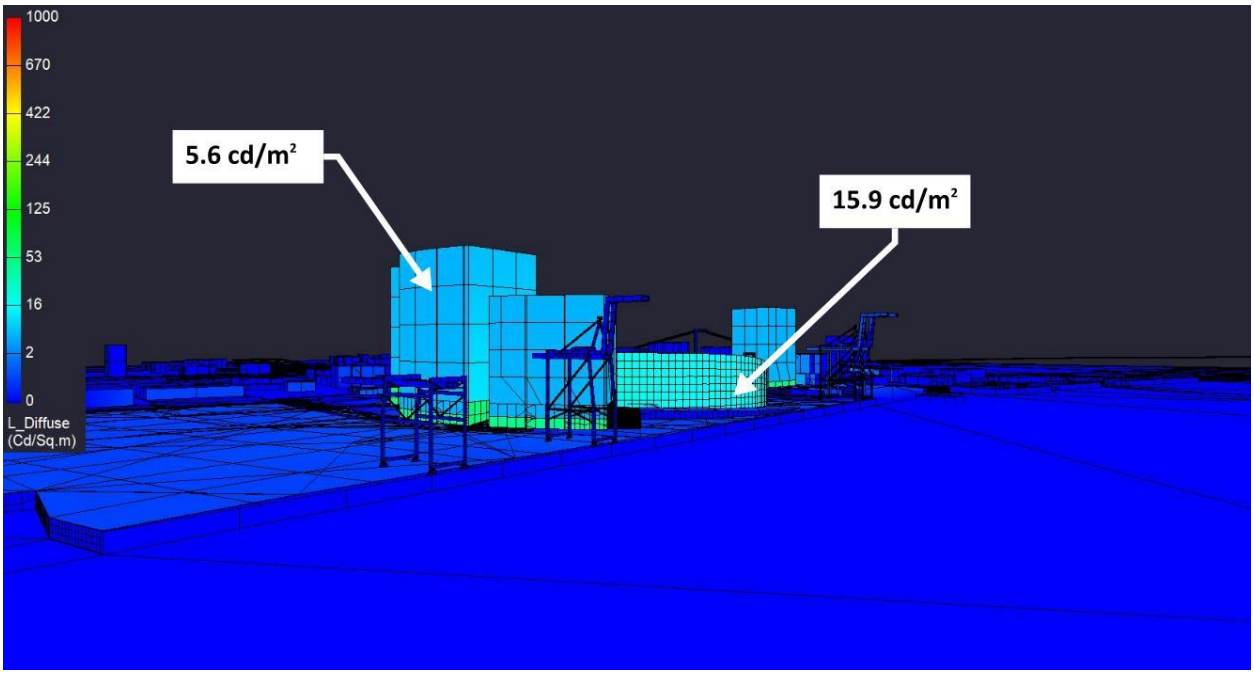




Baseline Project, Baseline Ballpark “Phase 1” Scenario Non-Game Nights Pre-Curfew

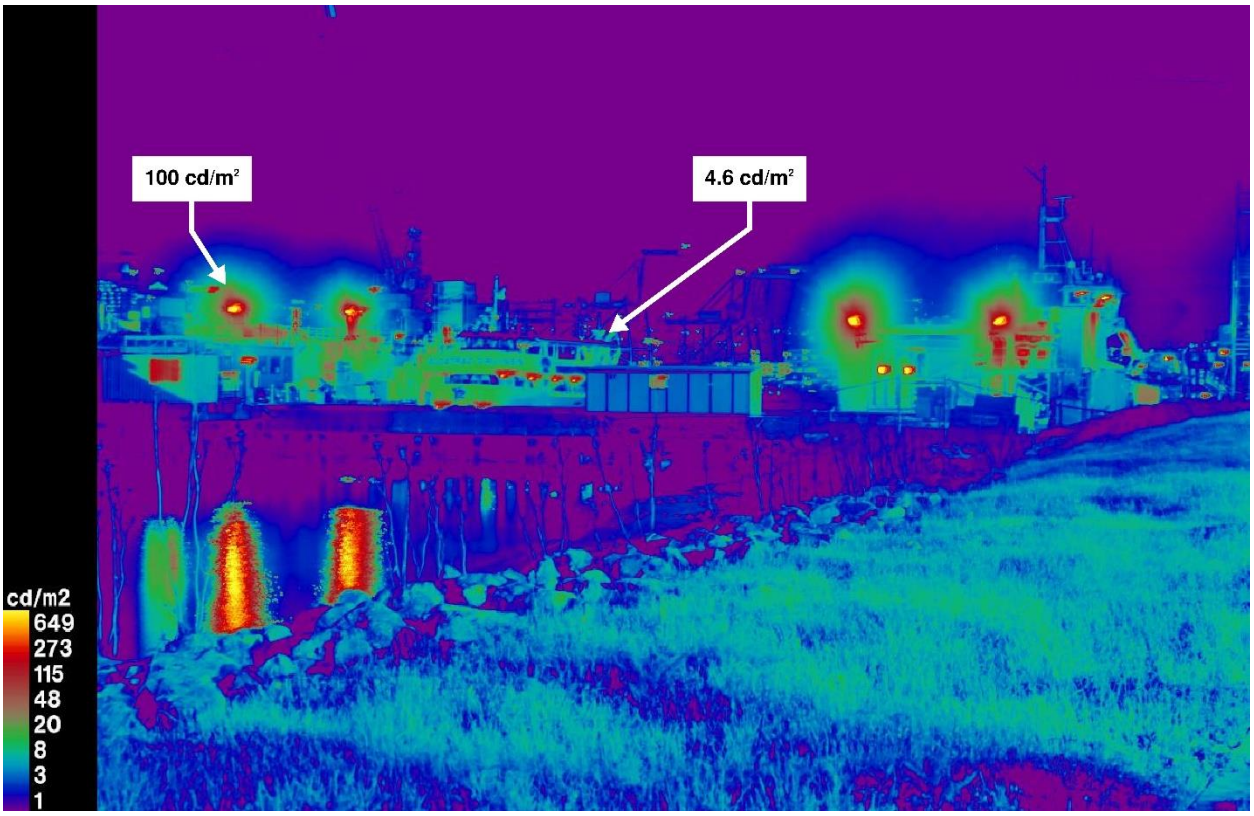
Receptor Site 2 - Inner Harbor Turning Basin @ 190'

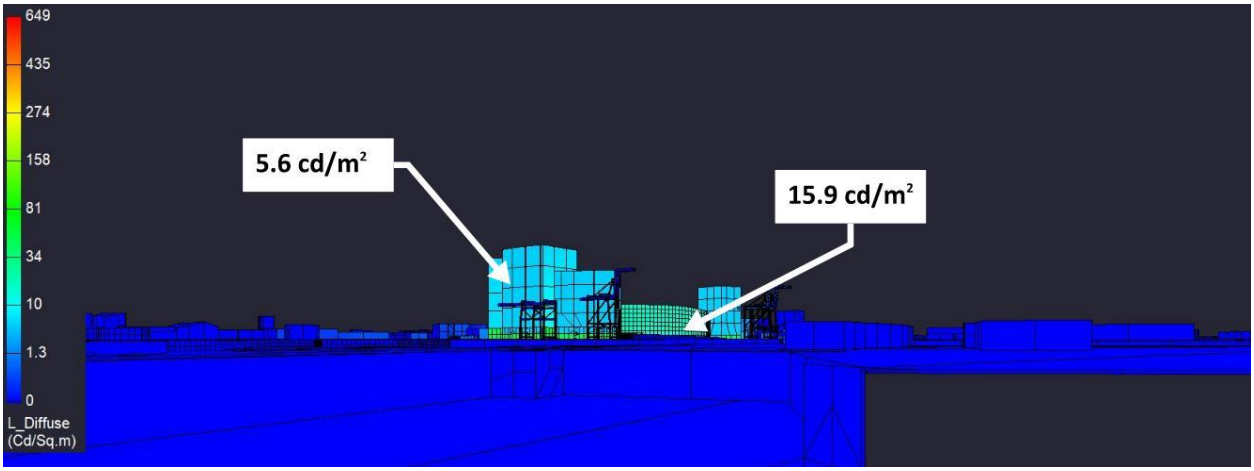




Baseline Project, Baseline Ballpark “Phase 1” Scenario Non-Game Nights Pre-Curfew

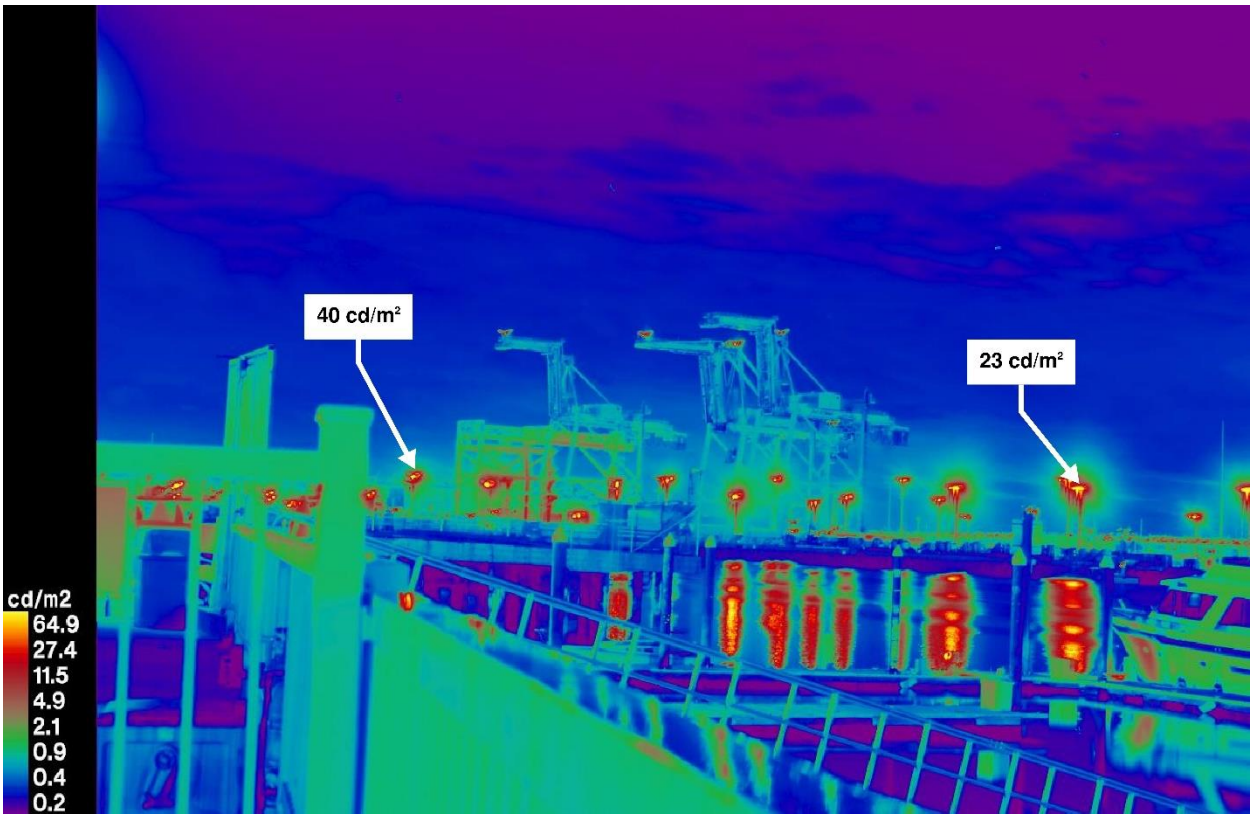
Receptor Site 2A - Turning Basin Line-of-Sight

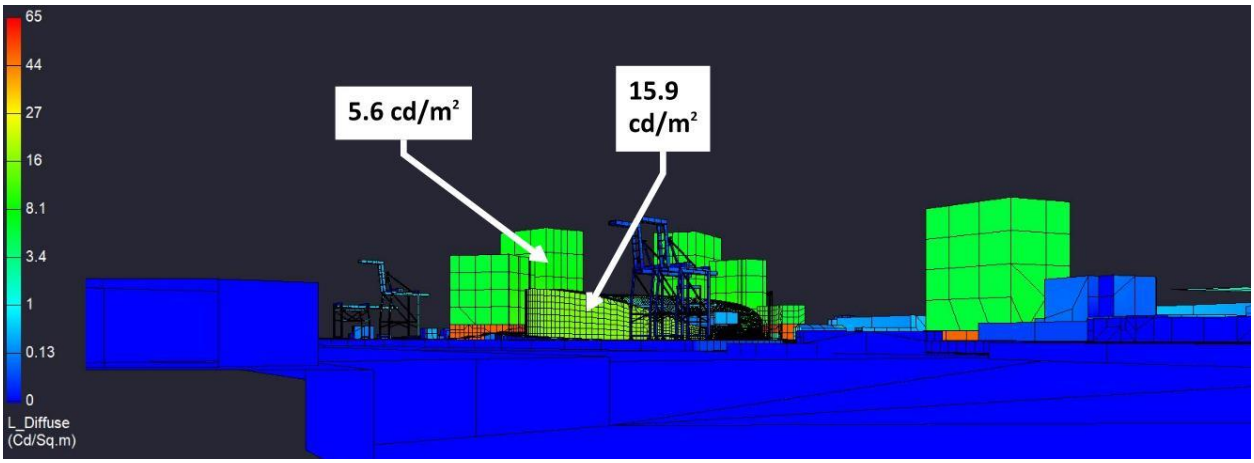




Baseline Project, Baseline Ballpark “Phase 1” Scenario Non-Game Nights Pre-Curfew

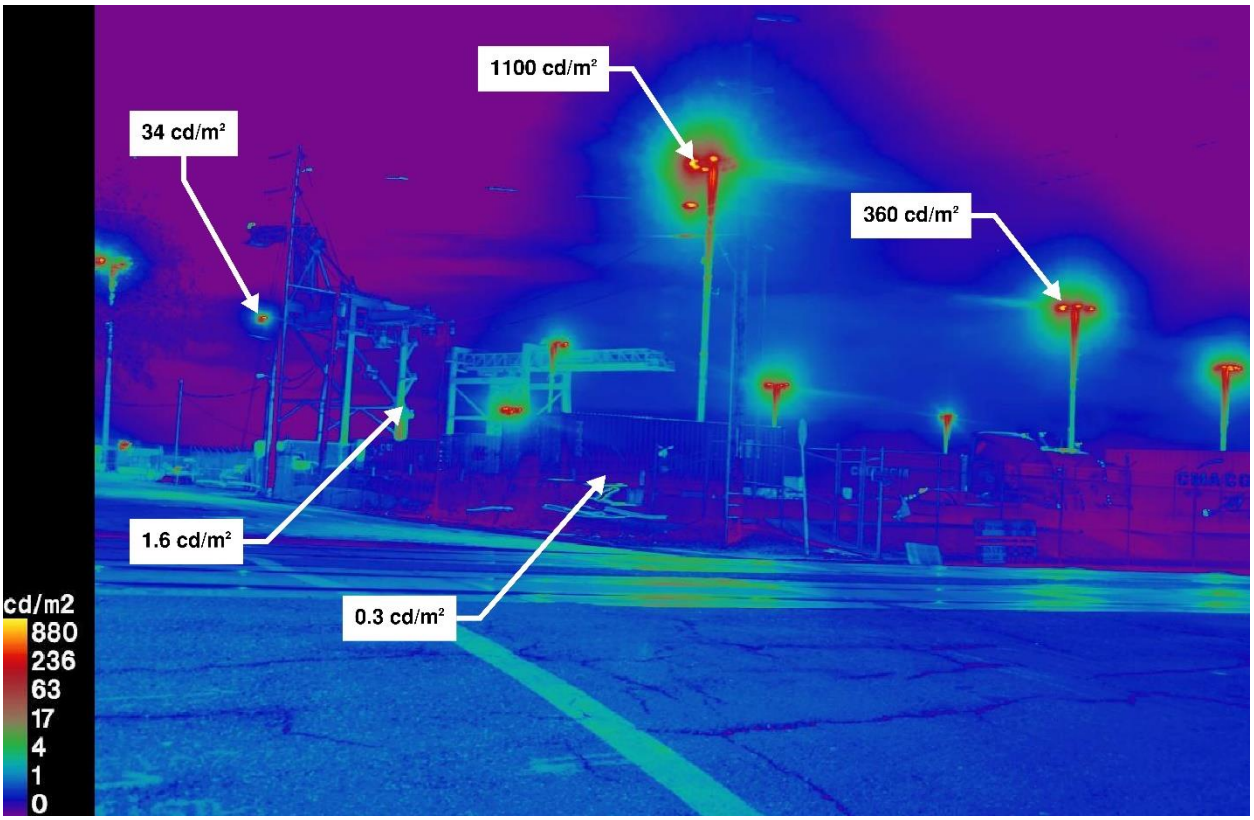
Receptor Site 3 - Alameda Dock

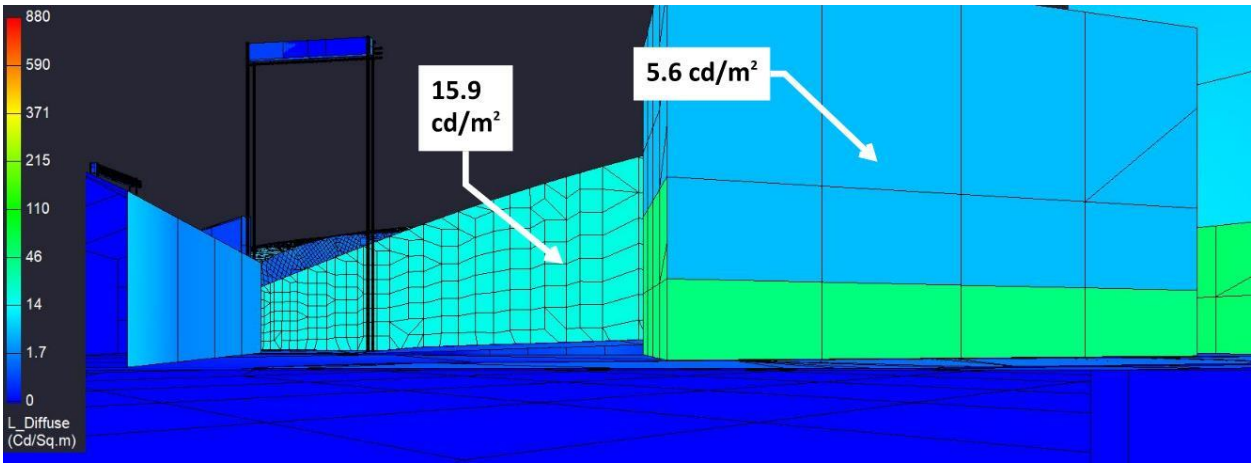




Baseline Project, Baseline Ballpark “Phase 1” Scenario Non-Game Nights Pre-Curfew

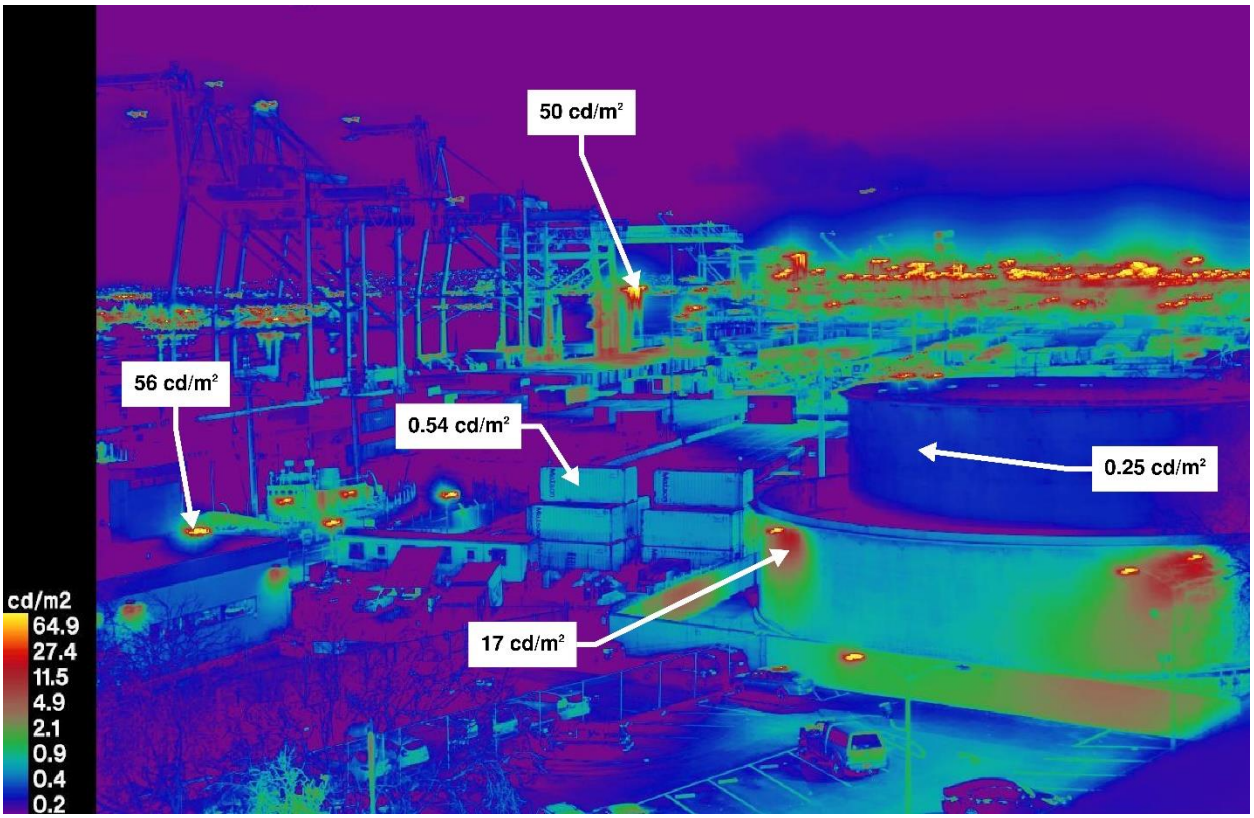
Receptor Site 4 - MLK at Embarcadero

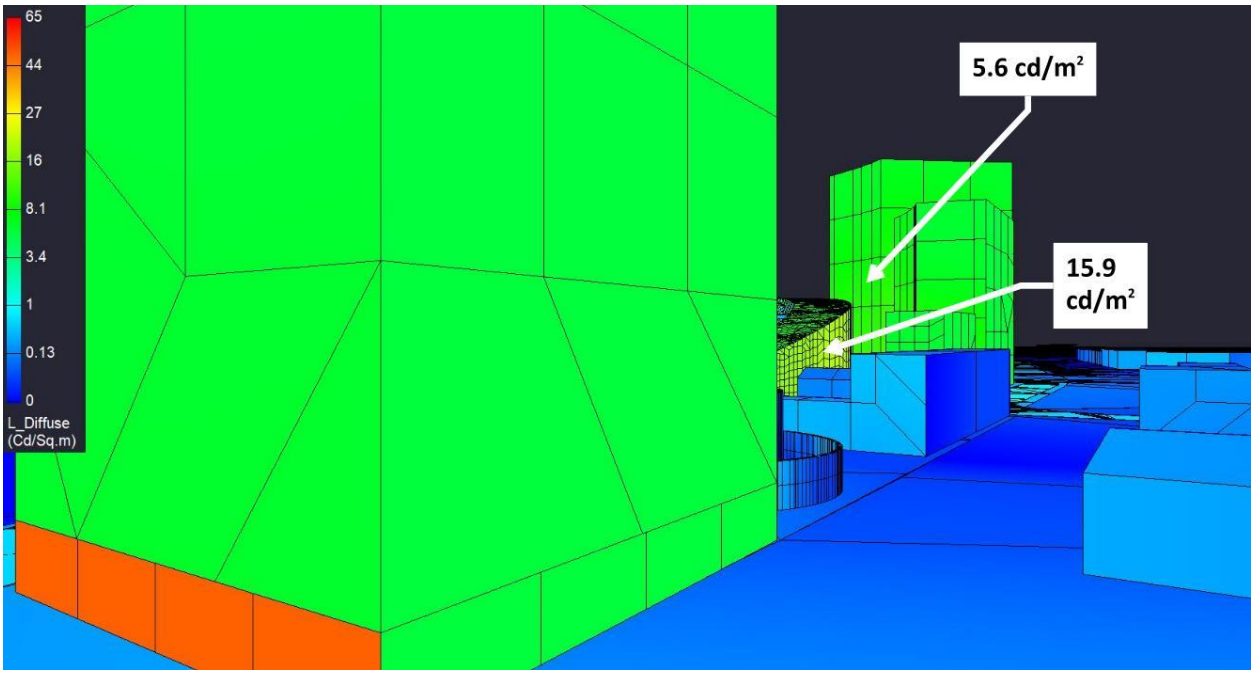




Baseline Project, Baseline Ballpark “Phase 1” Scenario Non-Game Nights Pre-Curfew

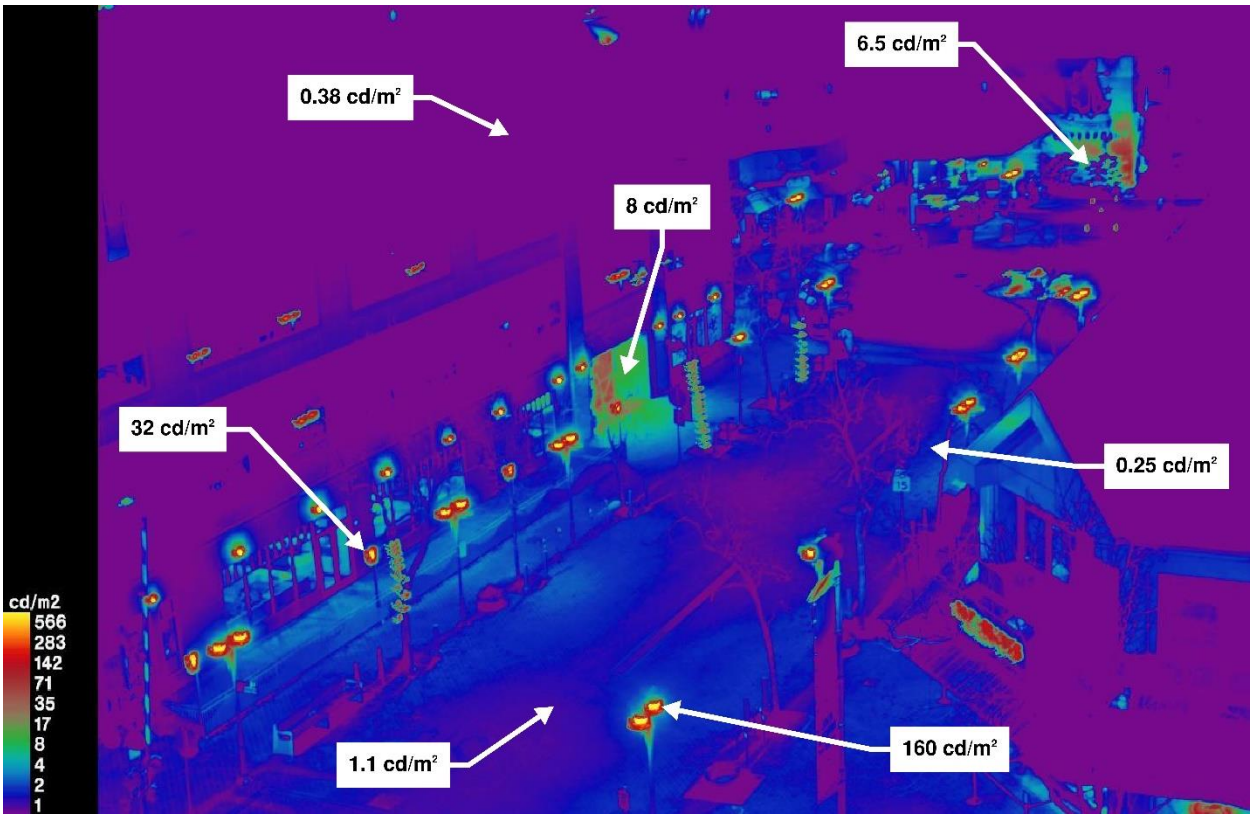
Receptor Site 5A - 2nd at Washington (Facing Stadium)

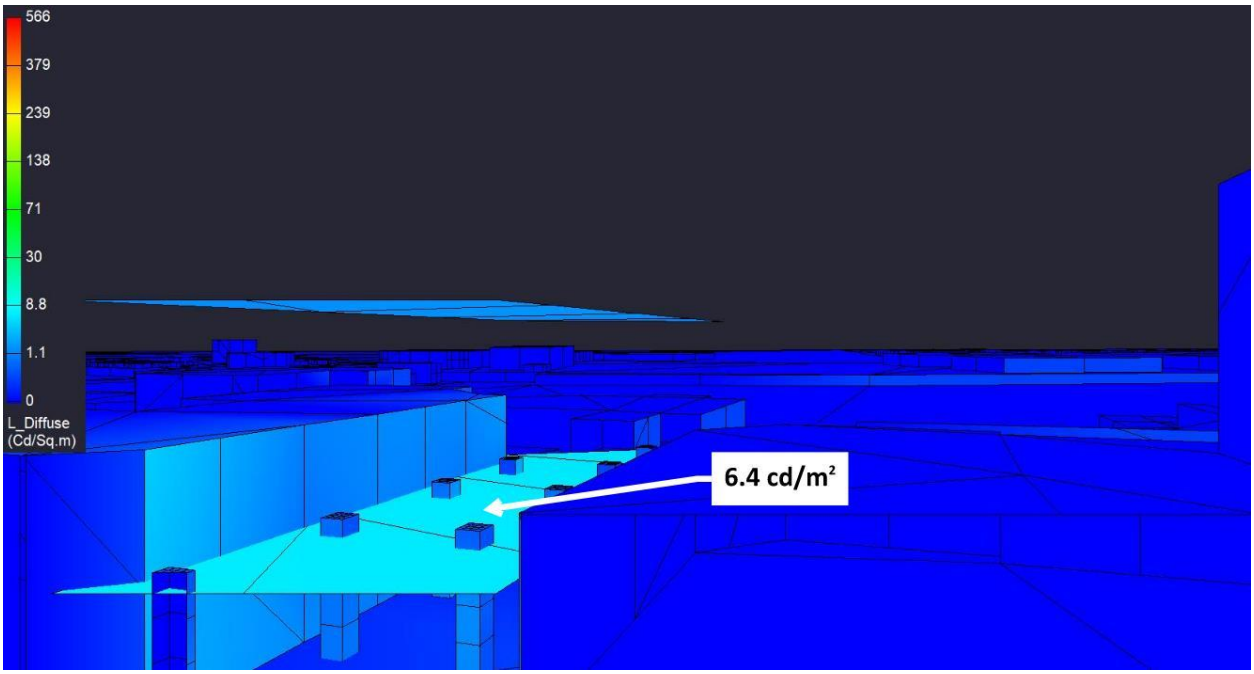




Baseline Project, Baseline Ballpark “Phase 1” Scenario Non-Game Nights Pre-Curfew

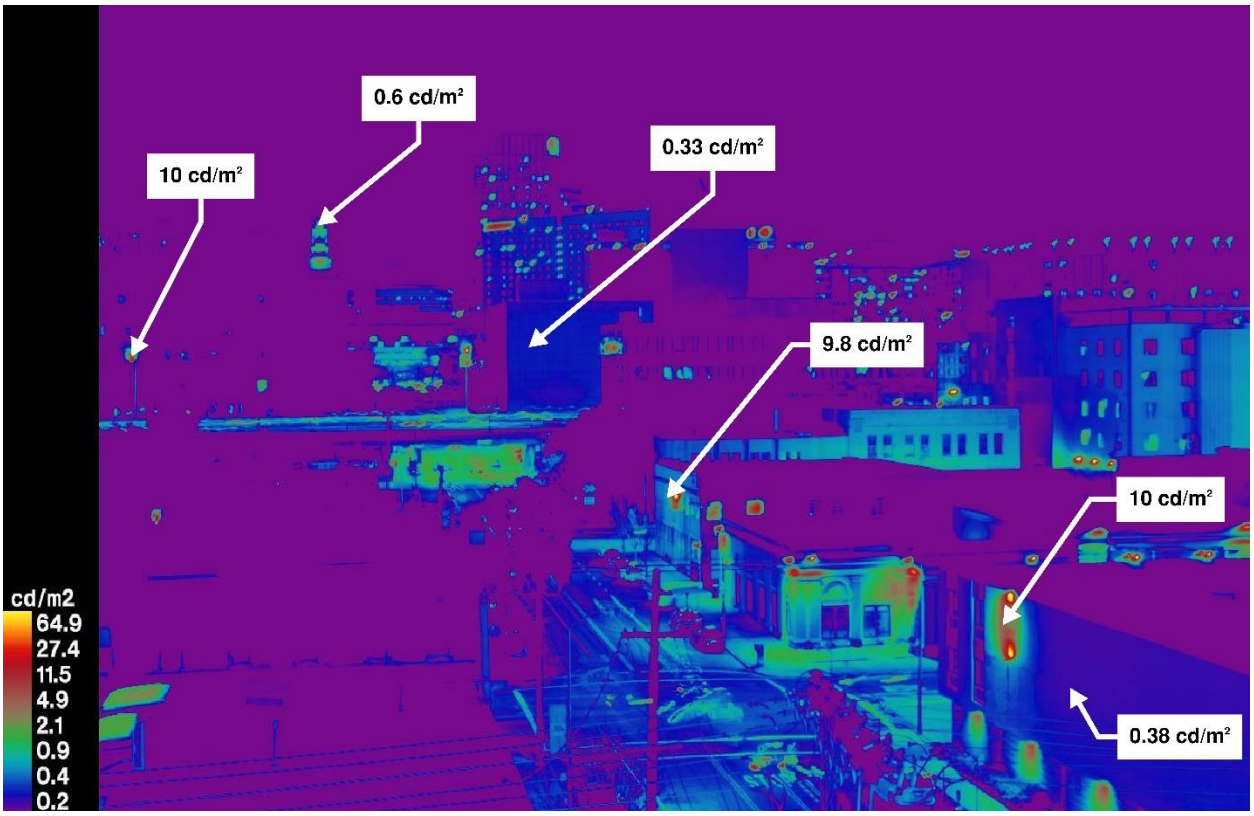
Receptor Site 5B - 2nd at Washington (Facing JLS Station)

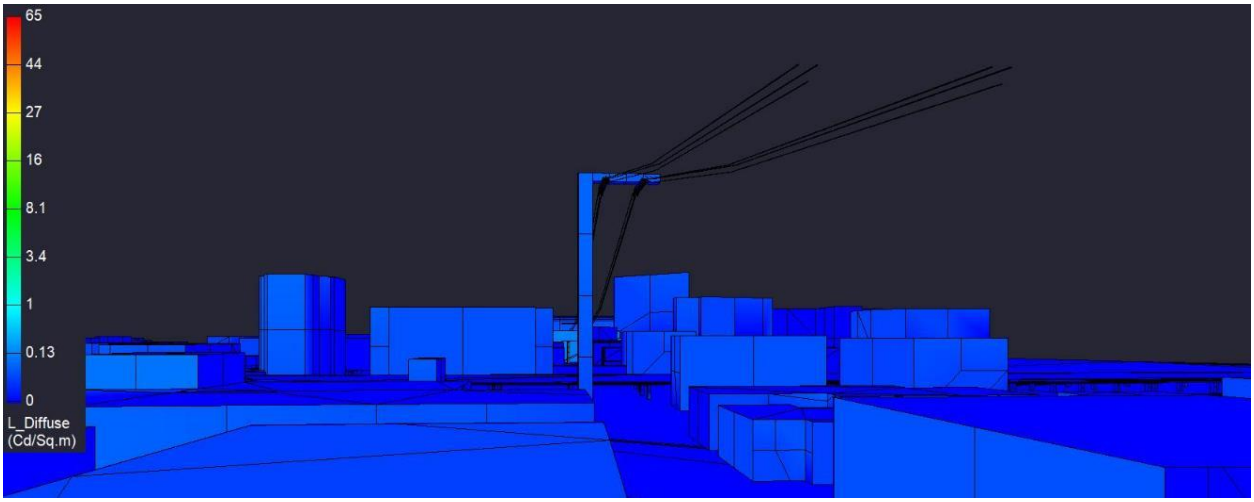




Baseline Project, Baseline Ballpark “Phase 1” Scenario Non-Game Nights Pre-Curfew

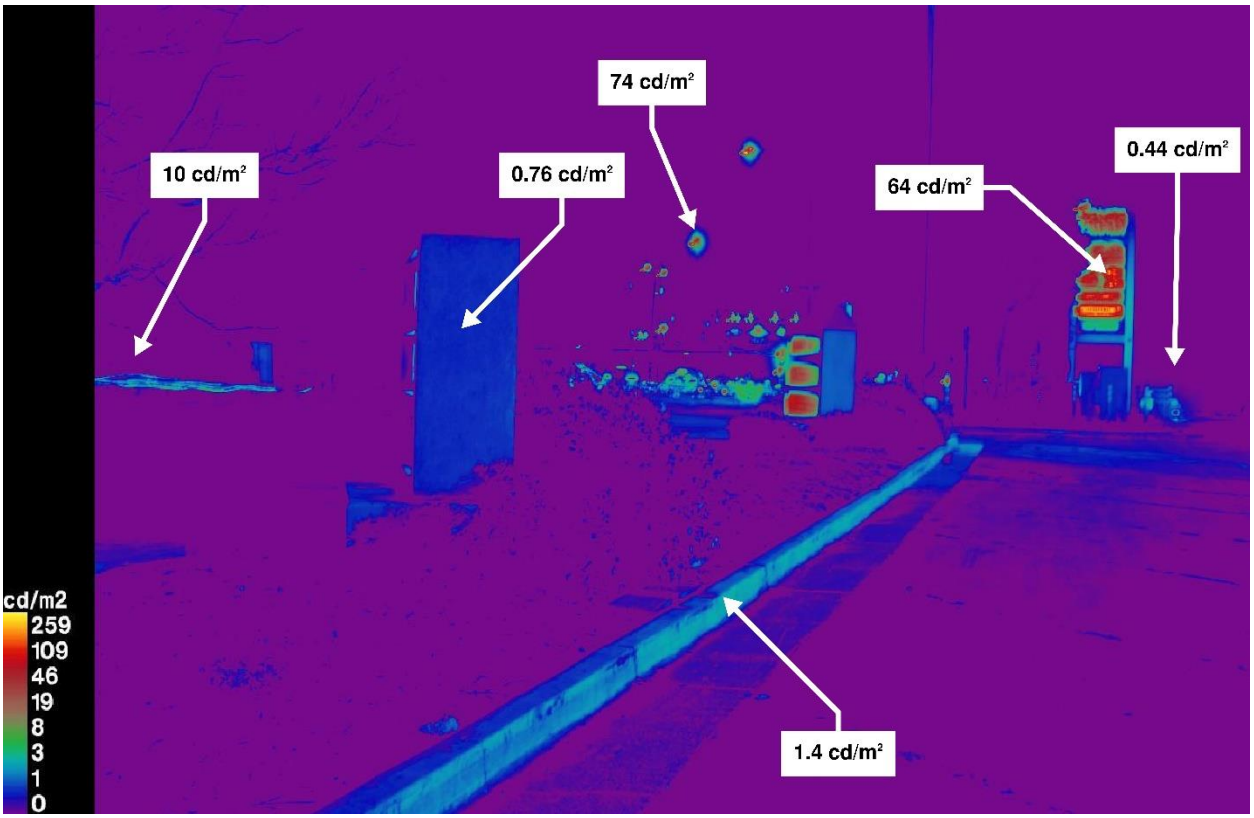
Receptor Site 5C - 2nd at Washington (Facing Convention Center Station)

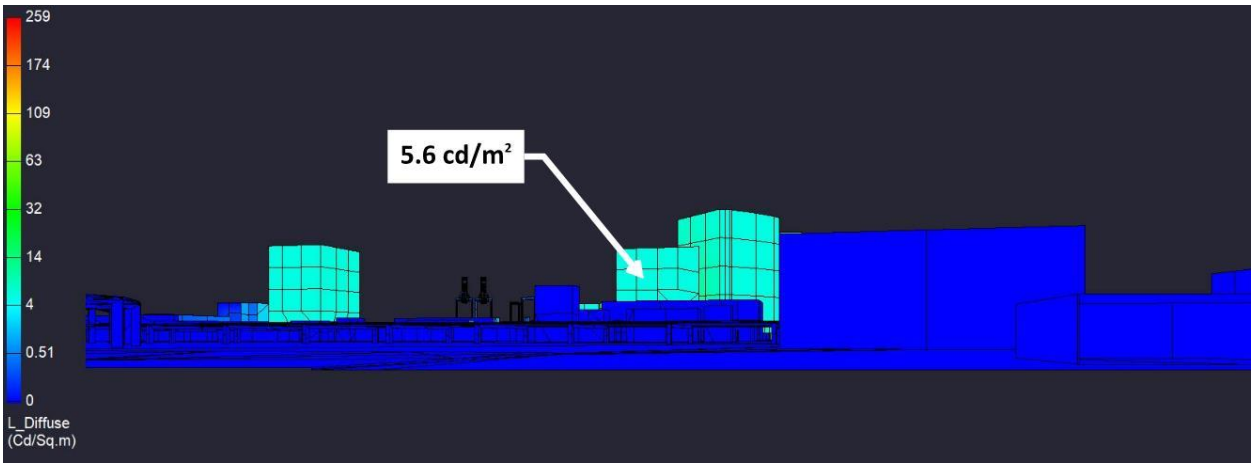




Baseline Project, Baseline Ballpark “Phase 1” Scenario Non-Game Nights Pre-Curfew

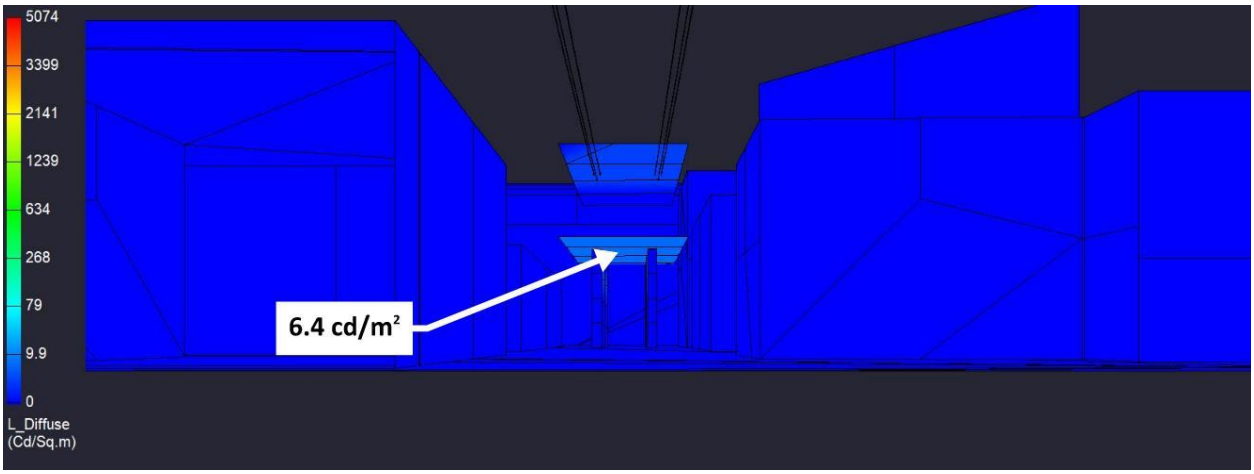
Receptor Site 6A - 7th at Brush





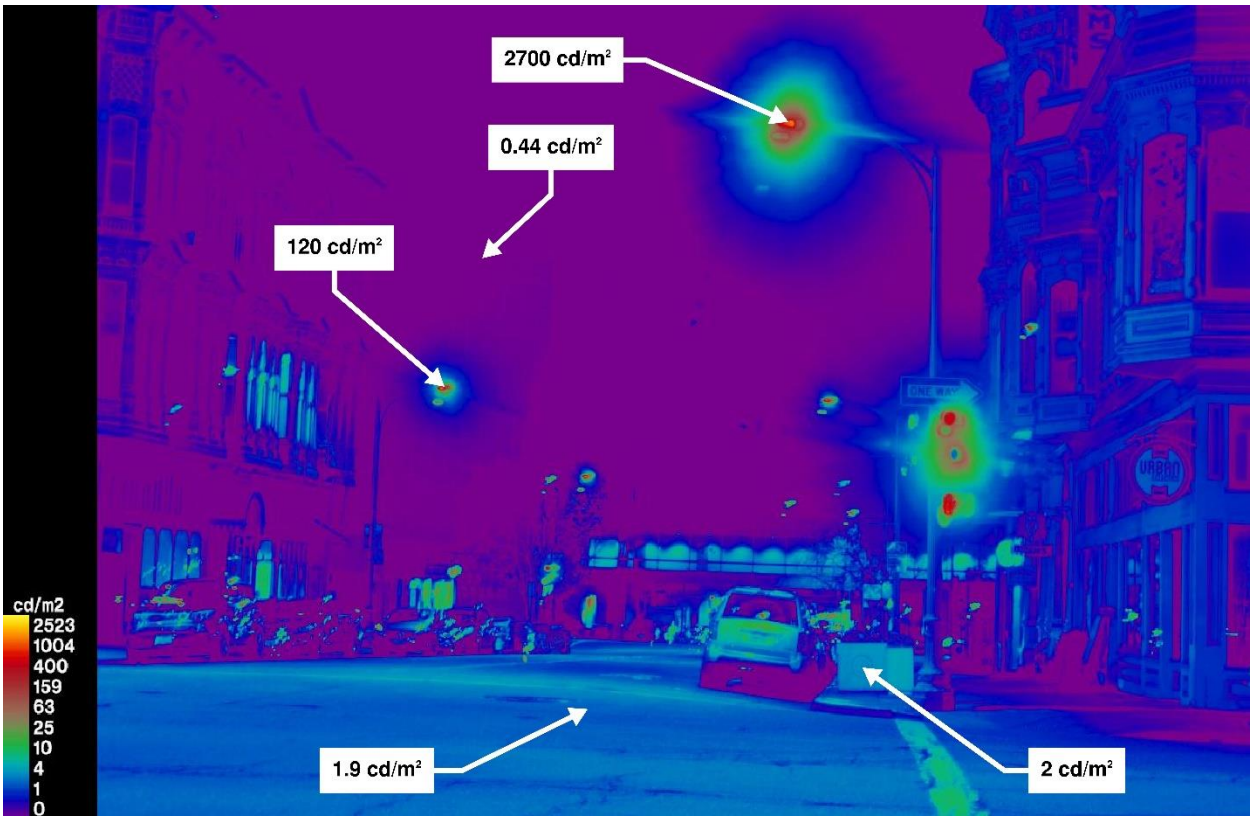
Baseline Project, Baseline Ballpark “Phase 1” Scenario Non-Game Nights Pre-Curfew

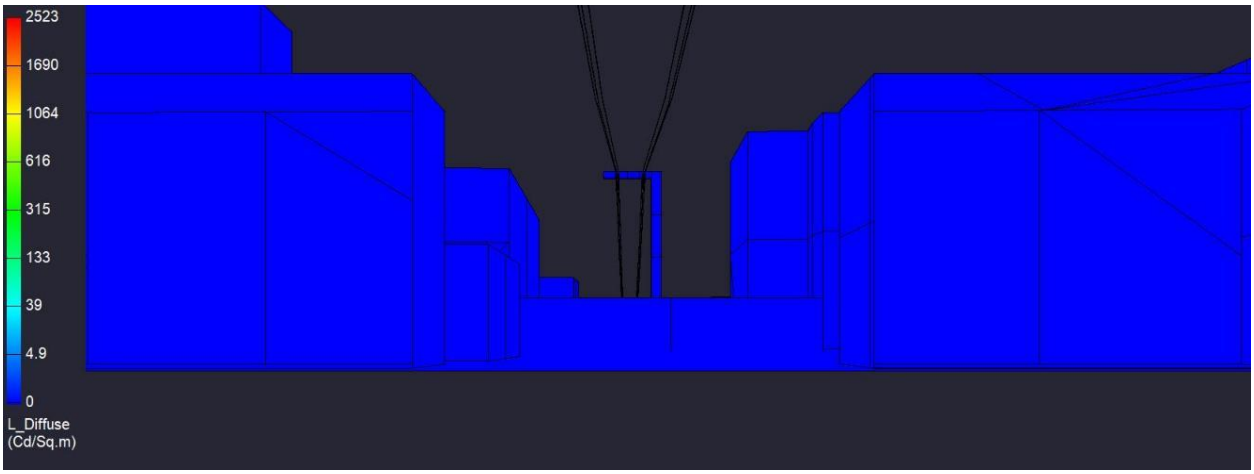
Receptor Site 7 - 8th at Washington (Facing Convention Center Station)



Baseline Project, Baseline Ballpark “Phase 1” Scenario Non-Game Nights Pre-Curfew

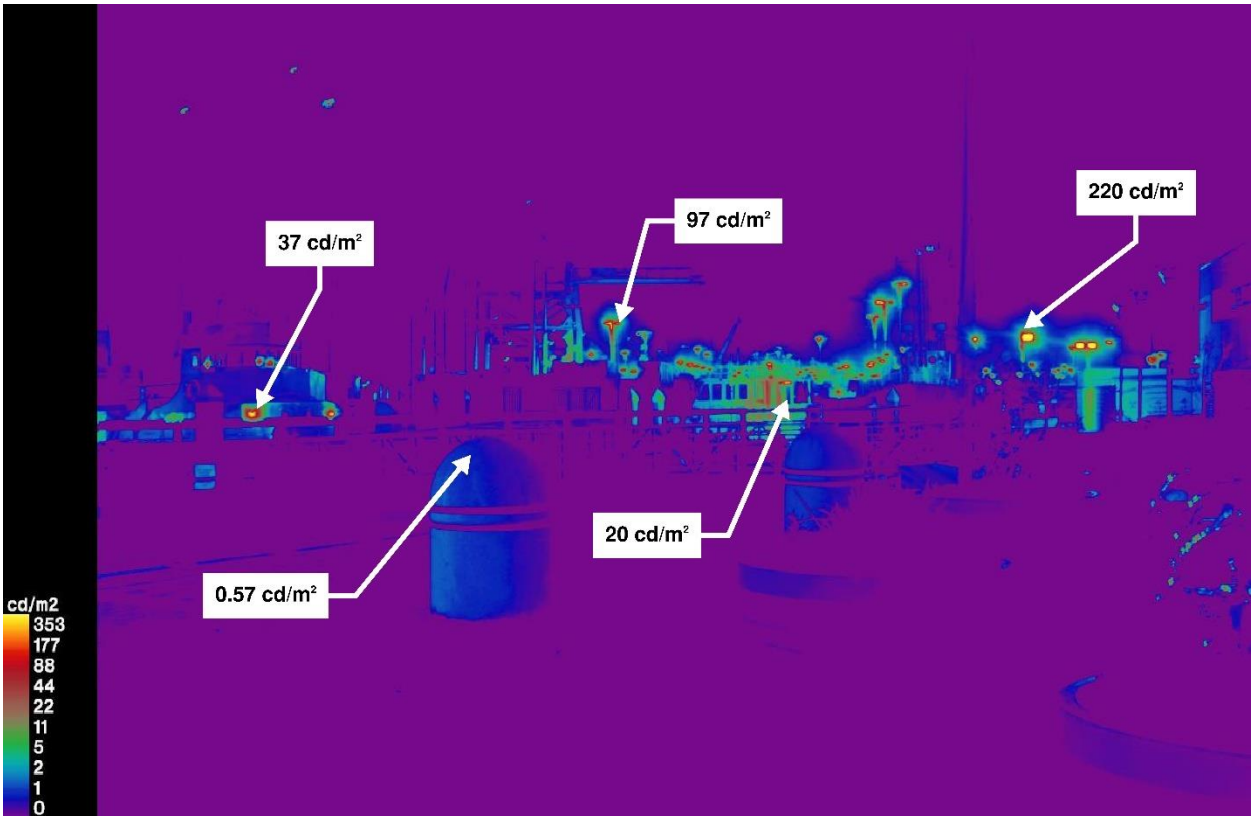
Receptor Site 7A - 8th at Washington (Facing Tower)

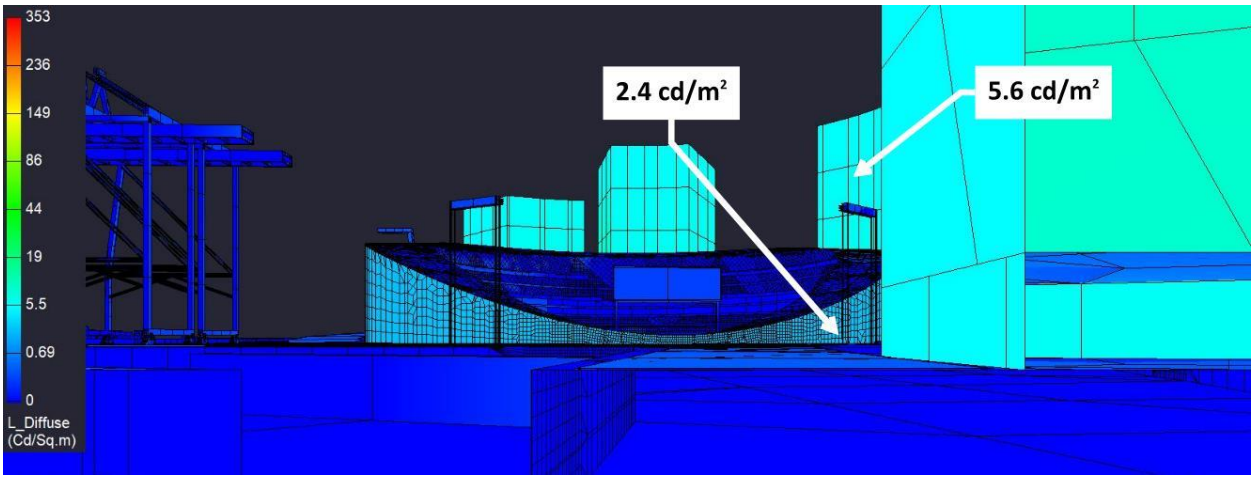




Baseline Project, Baseline Ballpark “Phase 1” Scenario Post-Curfew

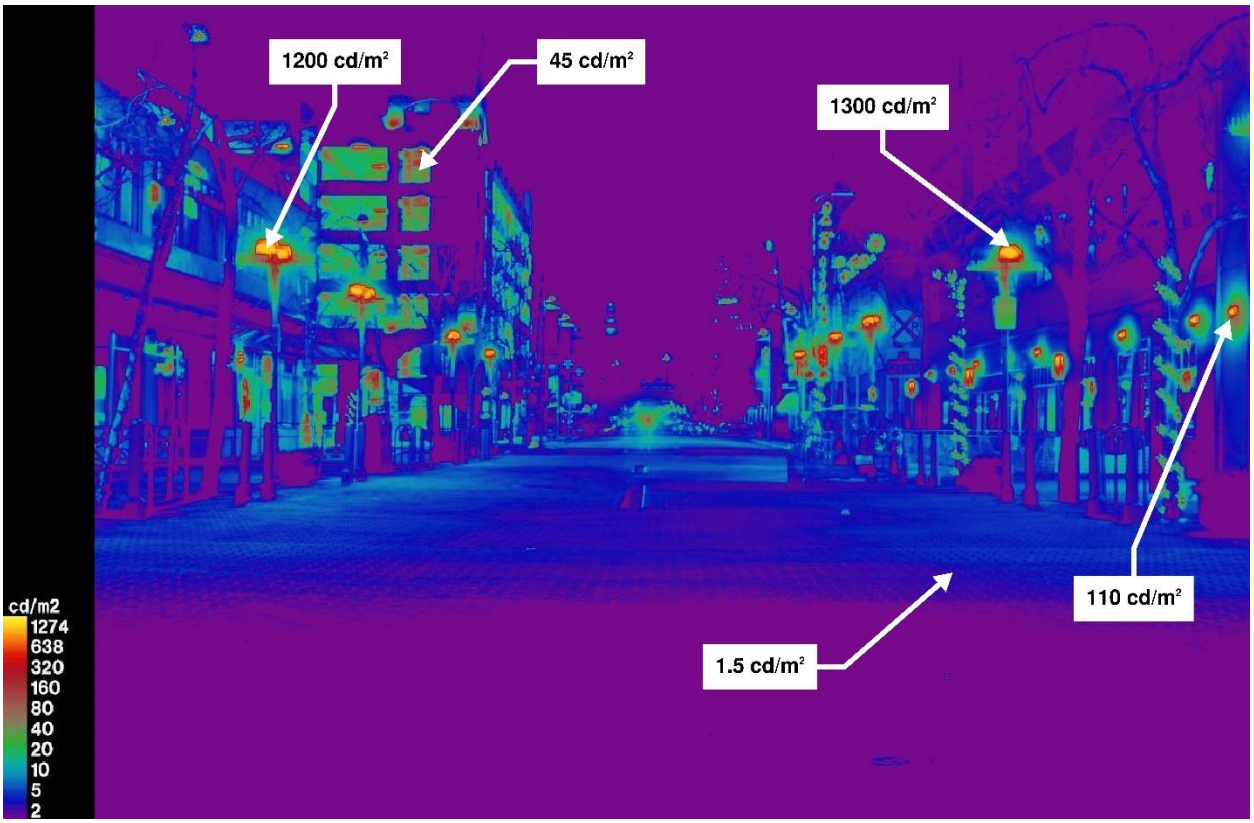
Receptor Site 1 - Water Street at Clay (Facing Ballpark)

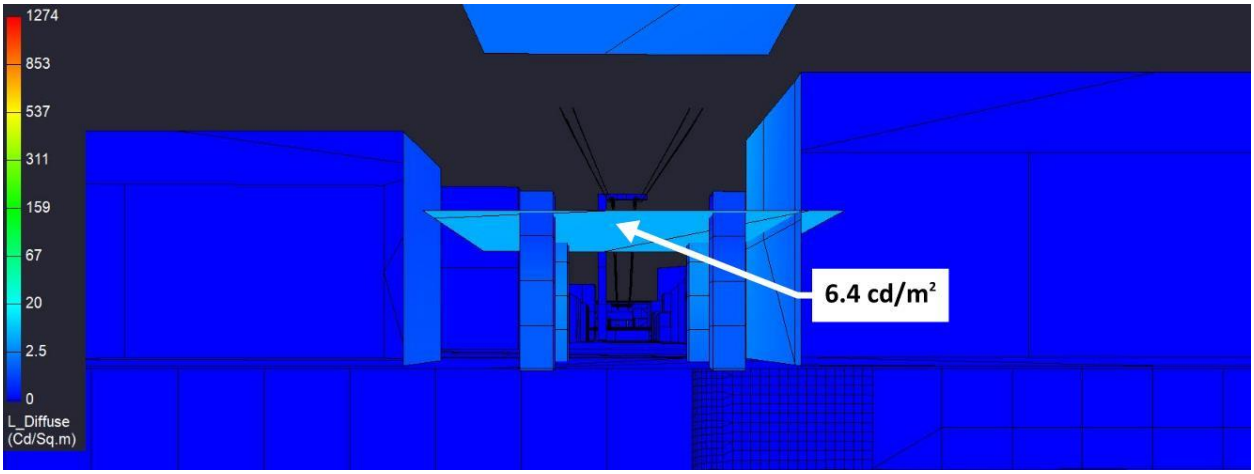




Baseline Project, Baseline Ballpark “Phase 1” Scenario Post-Curfew

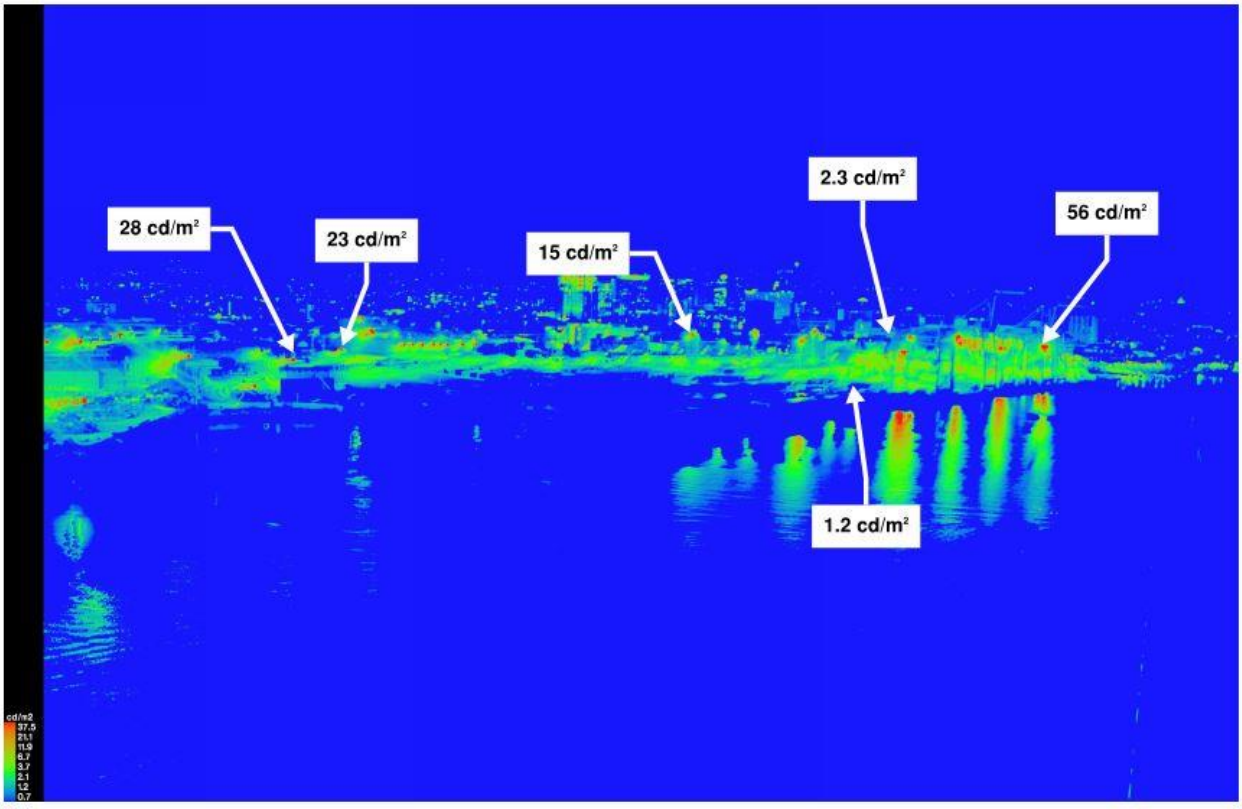
Receptor Site 1A - Water Street at Washington (Facing Gondola)

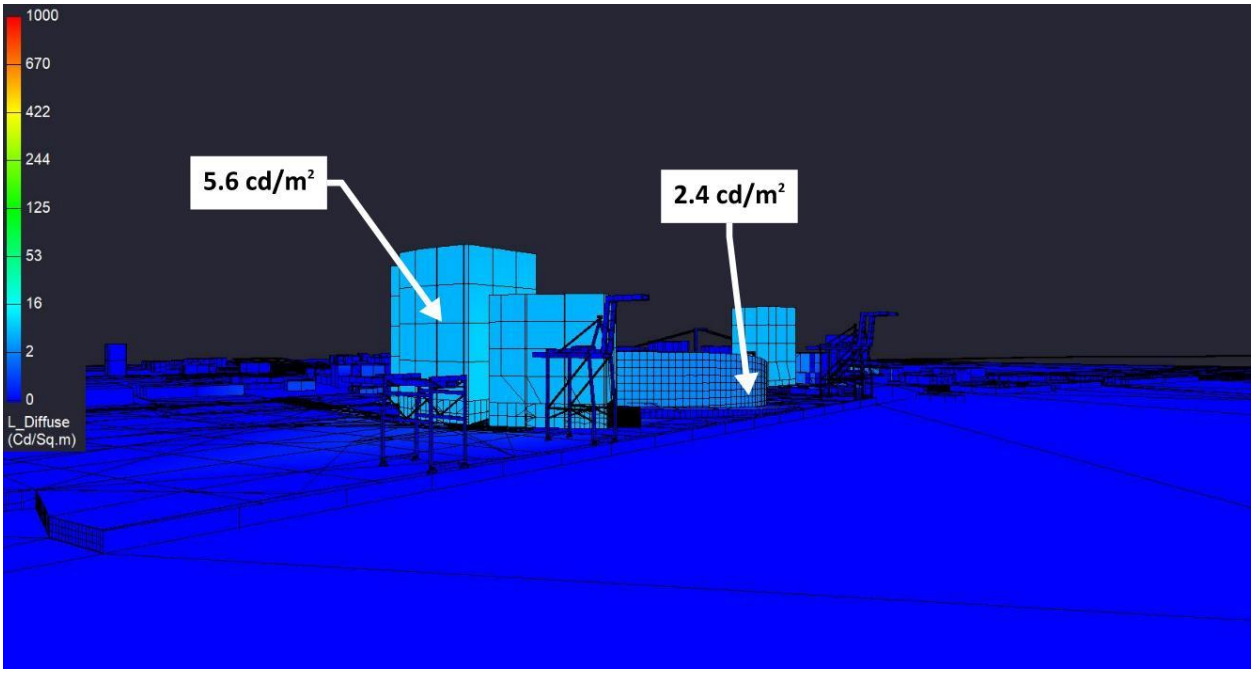




Baseline Project, Baseline Ballpark “Phase 1” Scenario Post-Curfew

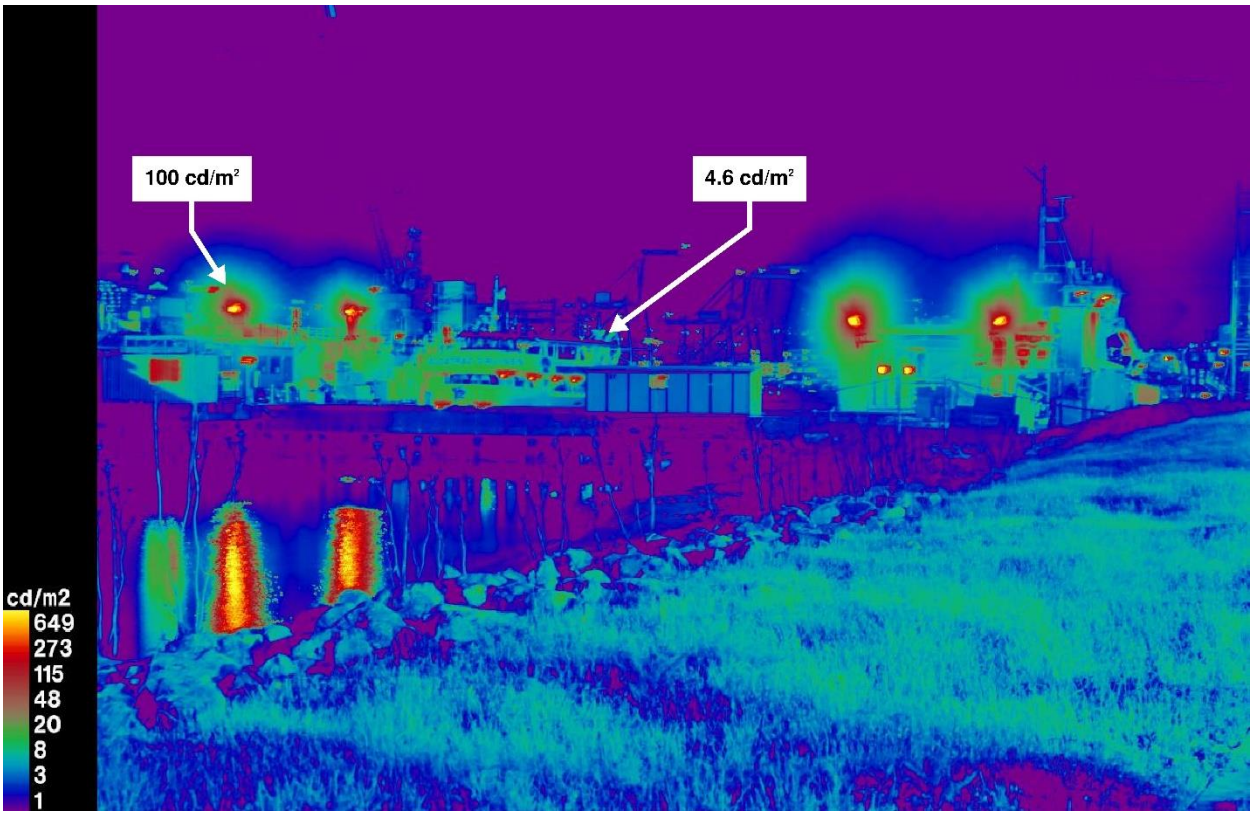
Receptor Site 2 - Inner Harbor Turning Basin @ 190'

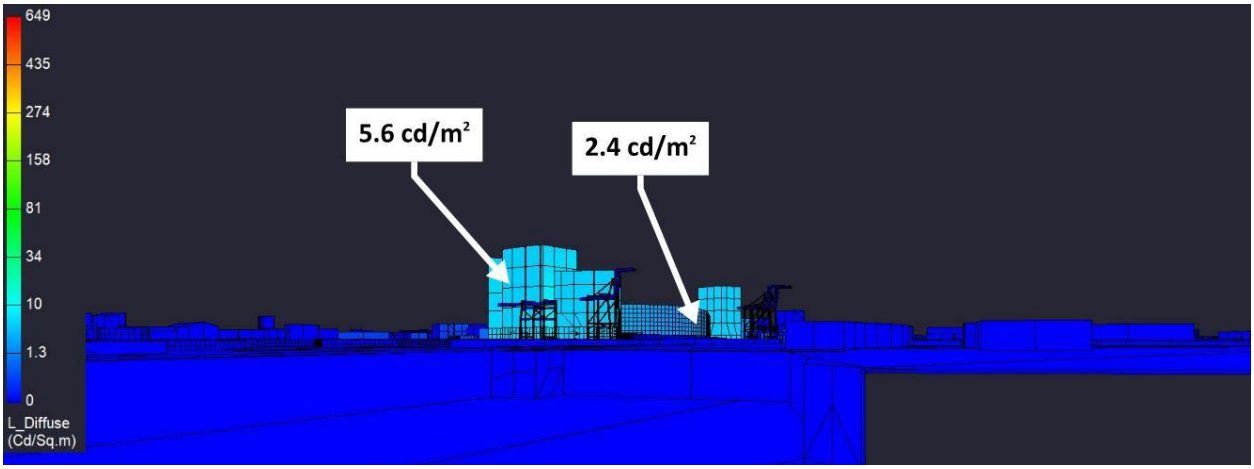




Baseline Project, Baseline Ballpark “Phase 1” Scenario Post-Curfew

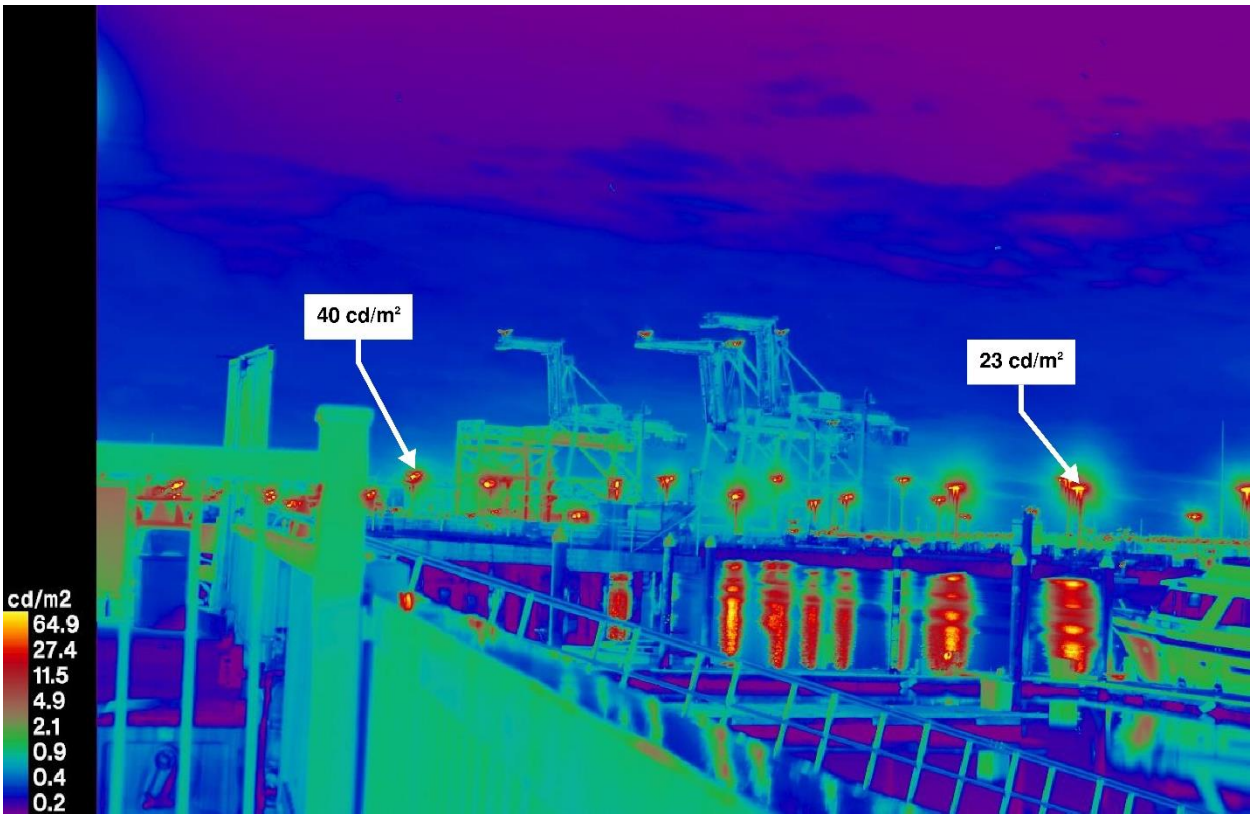
Receptor Site 2A - Turning Basin Line-of-Sight

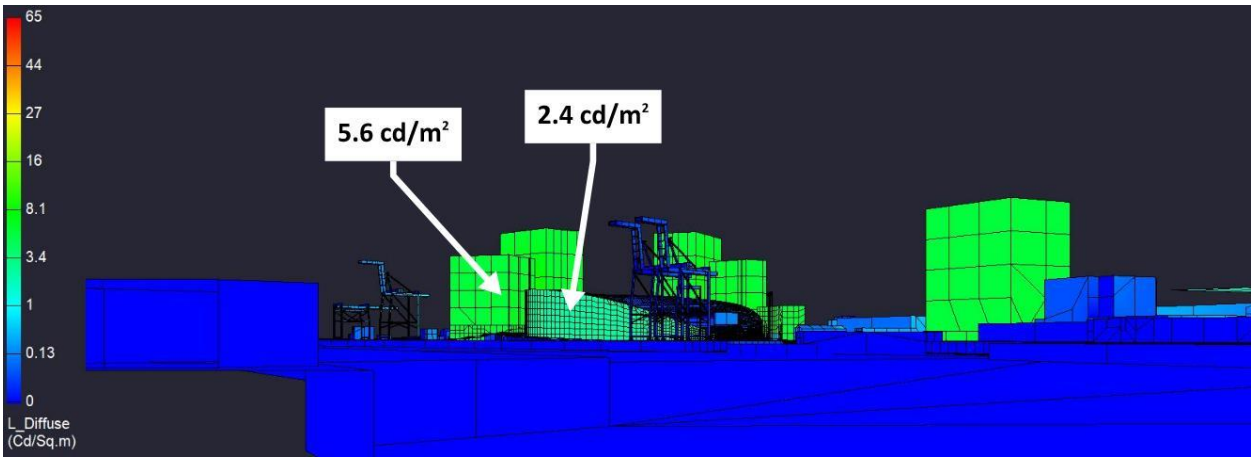




Baseline Project, Baseline Ballpark “Phase 1” Scenario Post-Curfew

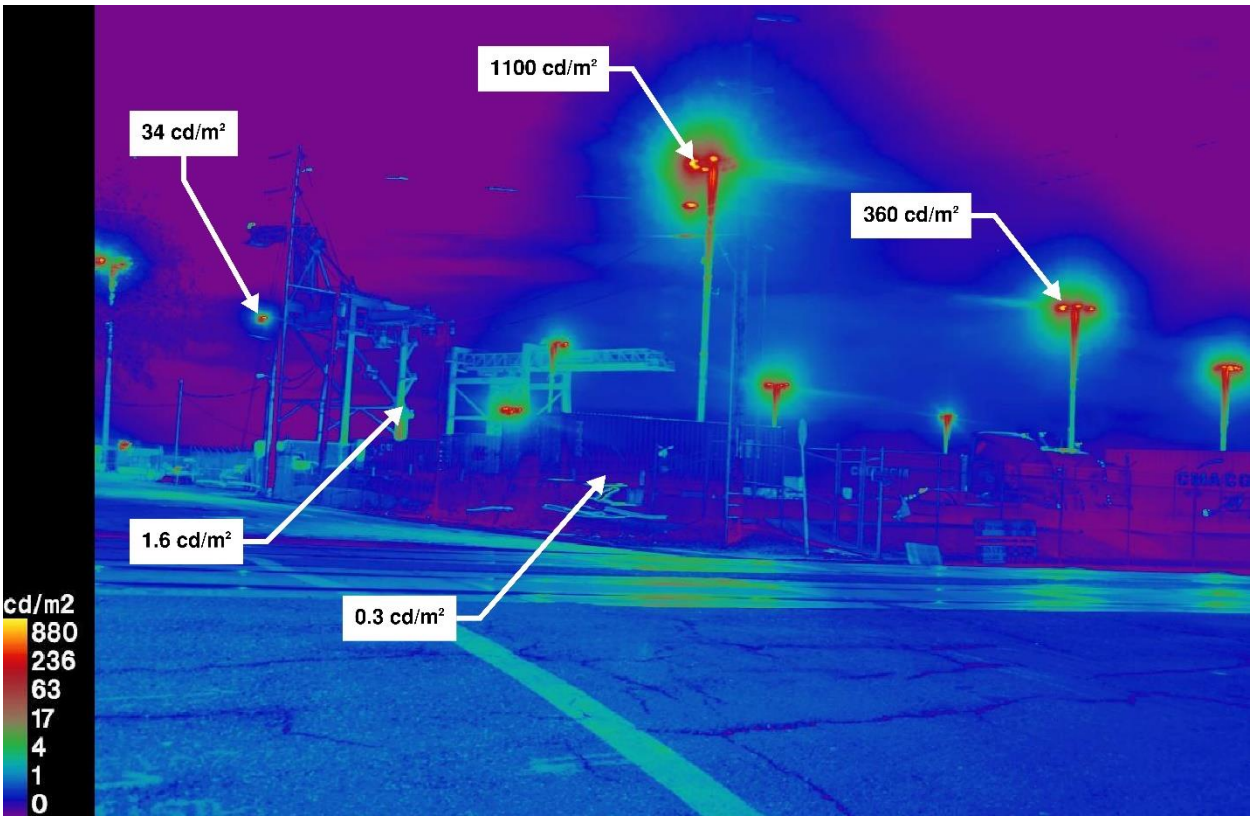
Receptor Site 3 - Alameda Dock

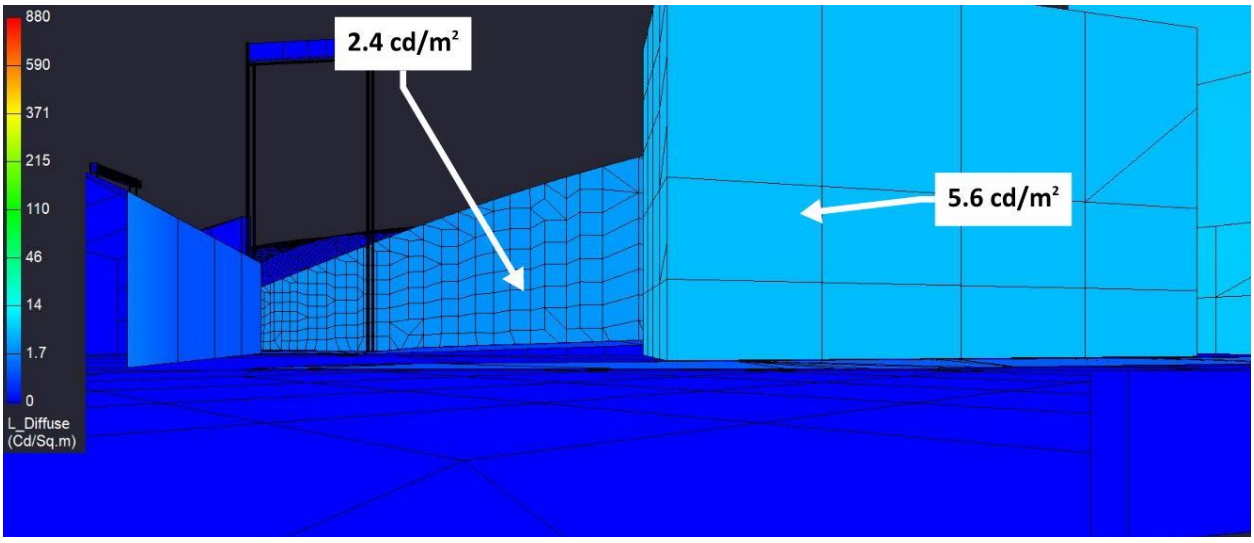




Baseline Project, Baseline Ballpark “Phase 1” Scenario Post-Curfew

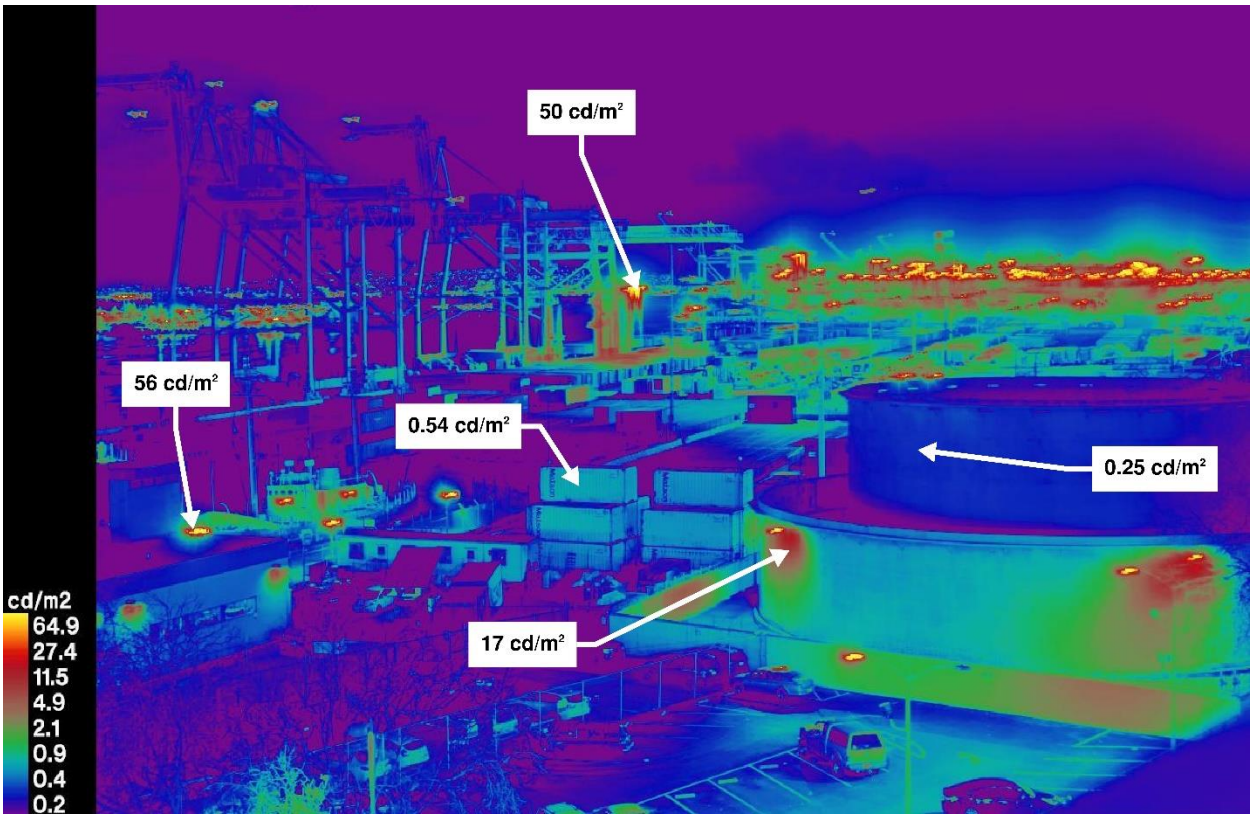
Receptor Site 4 - MLK at Embarcadero

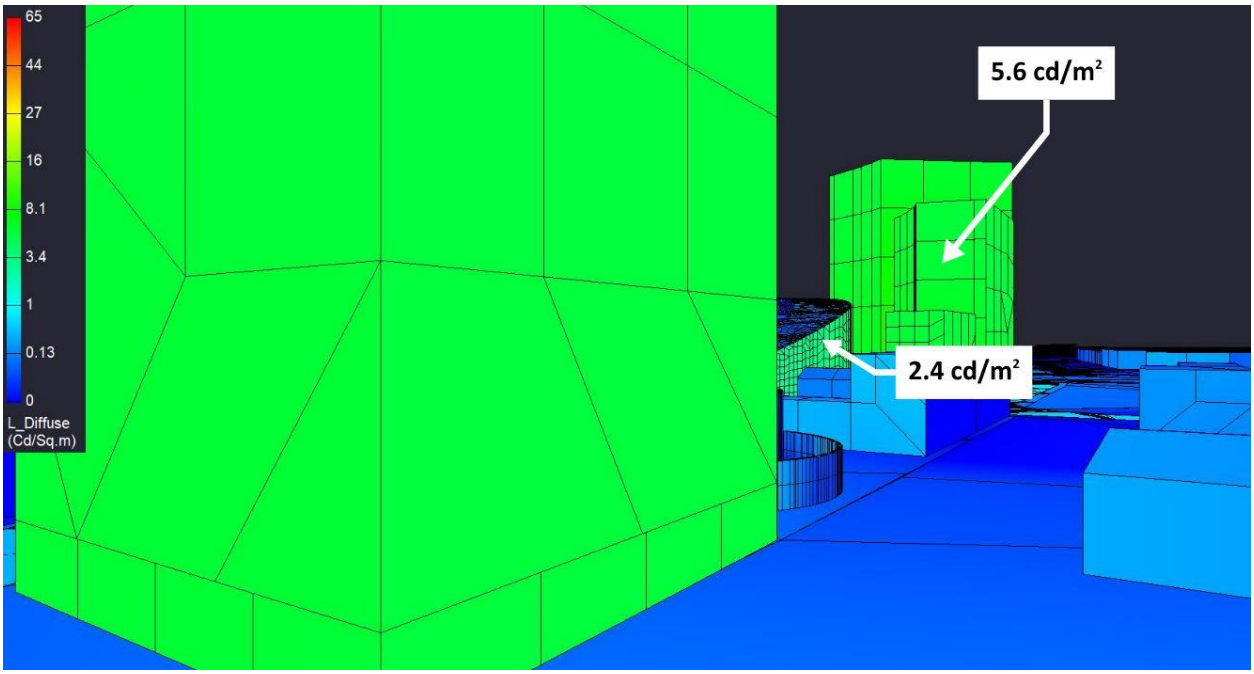




Baseline Project, Baseline Ballpark “Phase 1” Scenario Post-Curfew

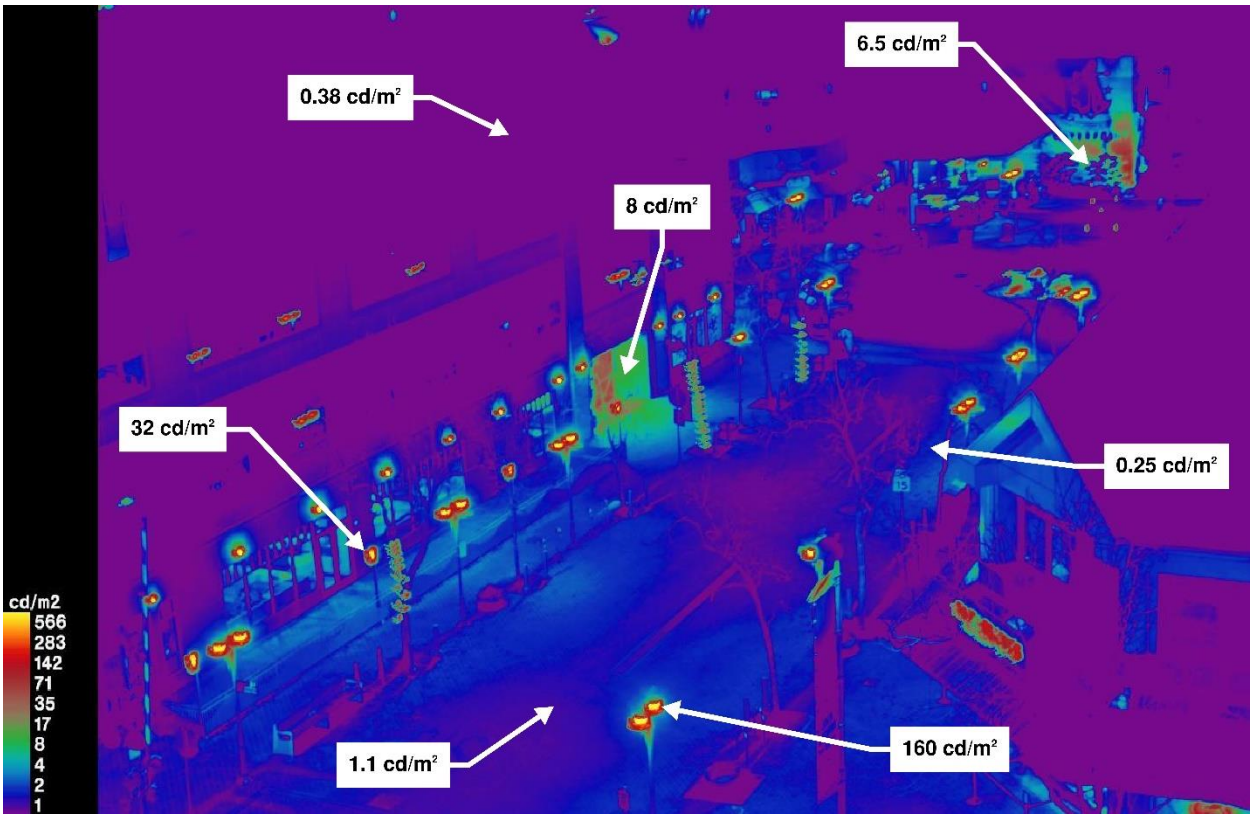
Receptor Site 5A - 2nd at Washington (Facing Stadium)

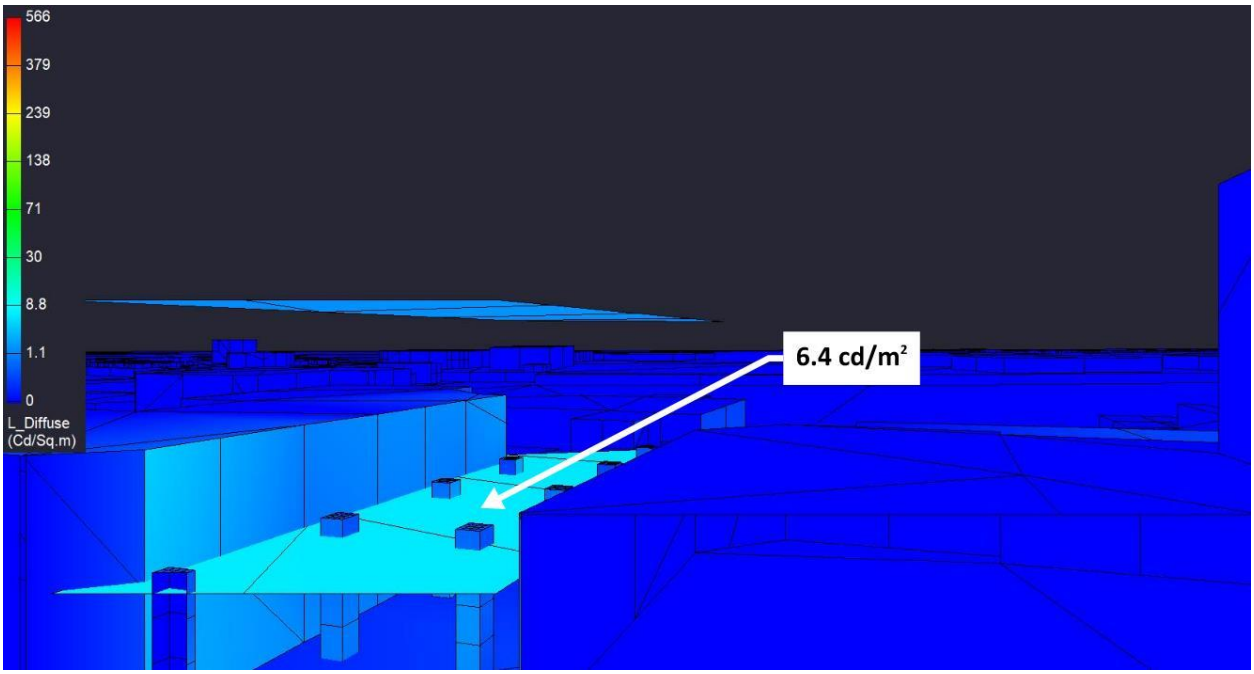




Baseline Project, Baseline Ballpark “Phase 1” Scenario Post-Curfew

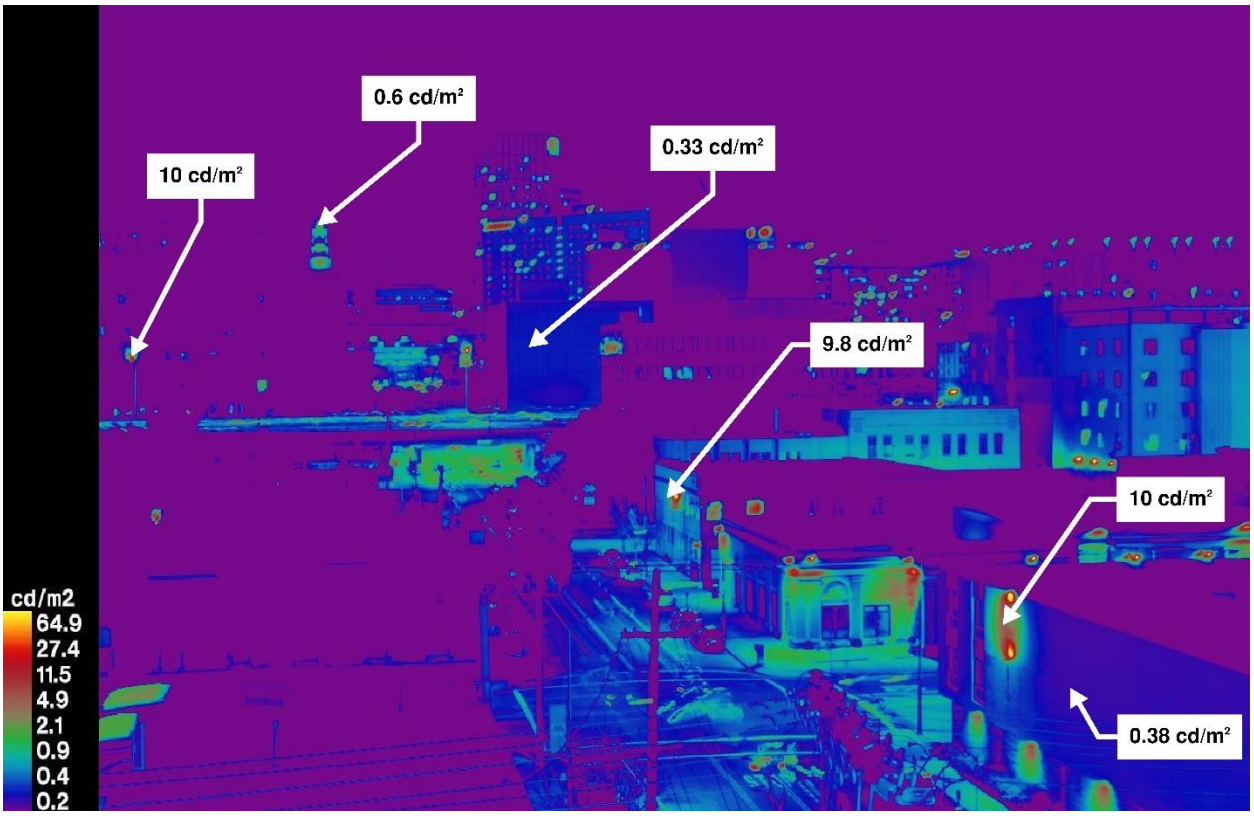
Receptor Site 5B - 2nd at Washington (Facing JLS Station)

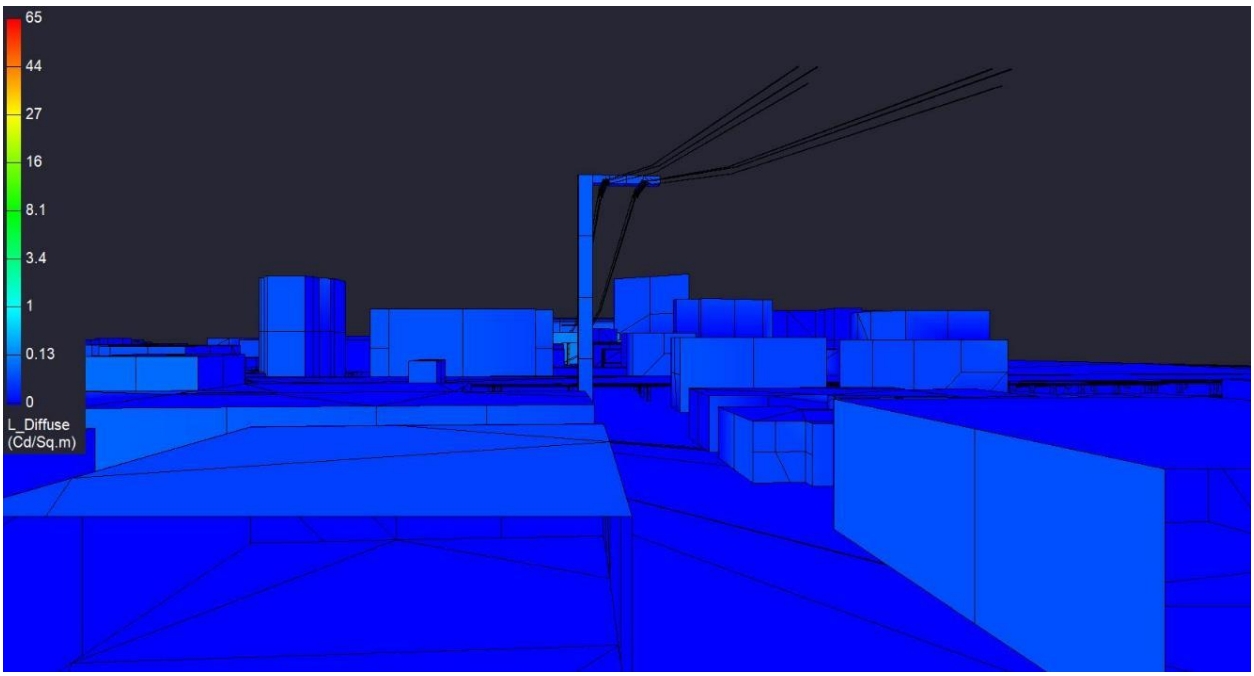




Baseline Project, Baseline Ballpark “Phase 1” Scenario Post-Curfew

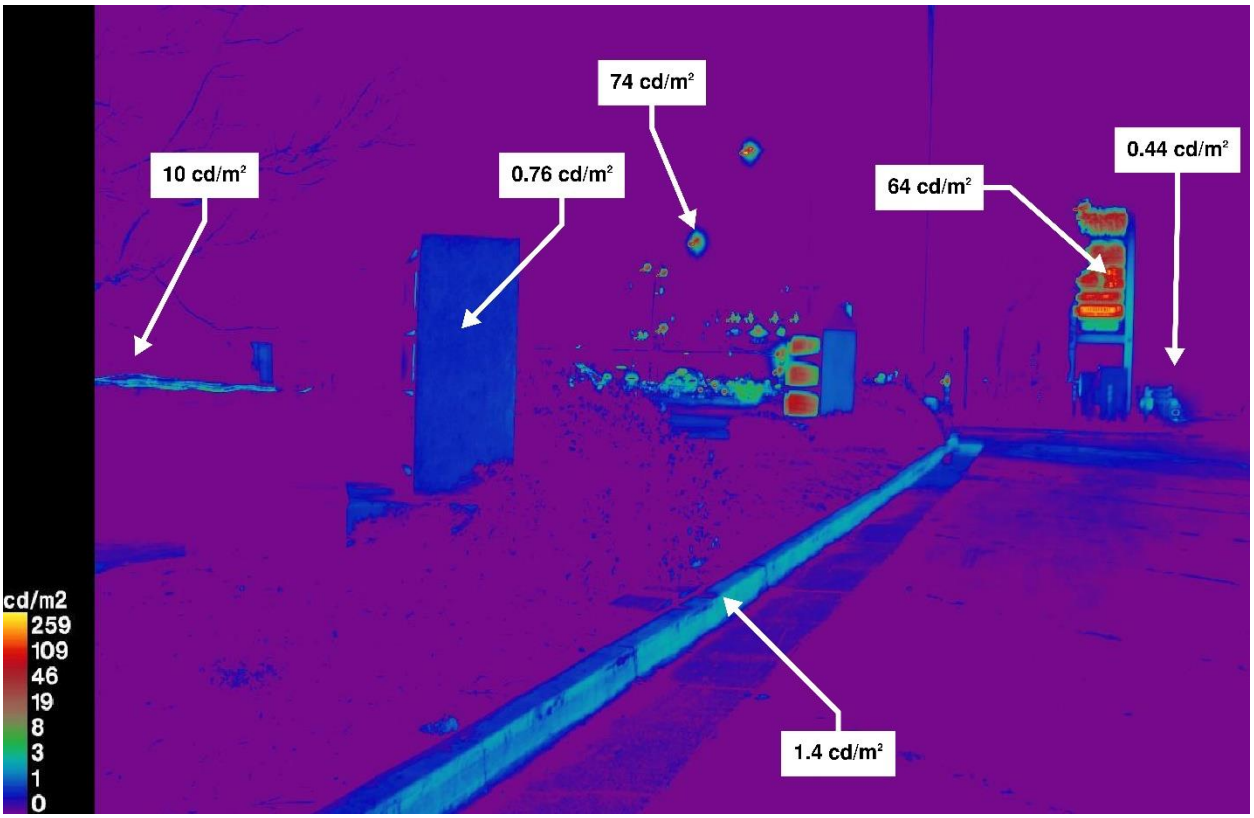
Receptor Site 5C - 2nd at Washington (Facing Convention Center Station)

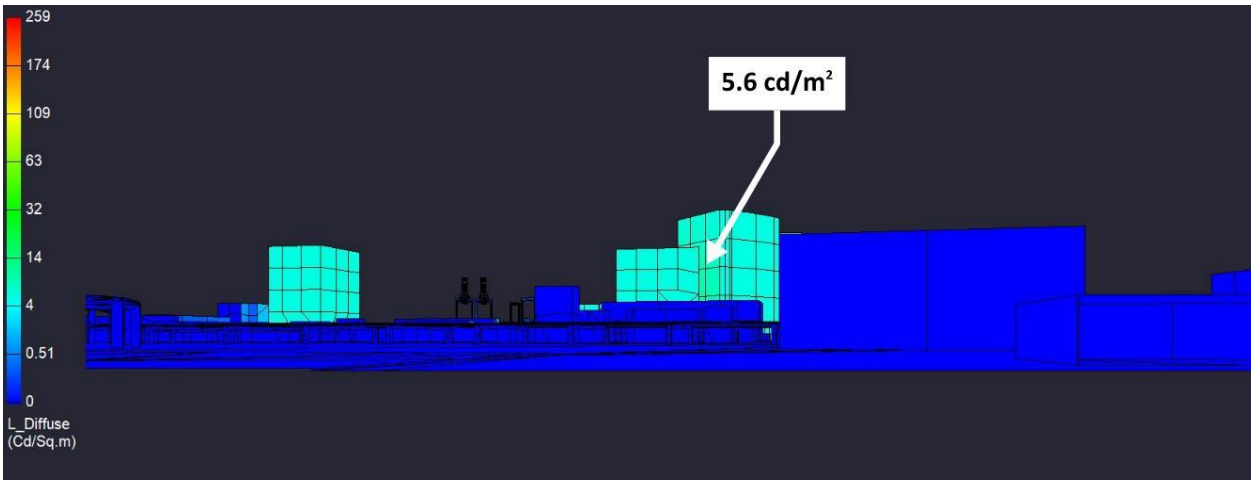




Baseline Project, Baseline Ballpark “Phase 1” Scenario Post-Curfew

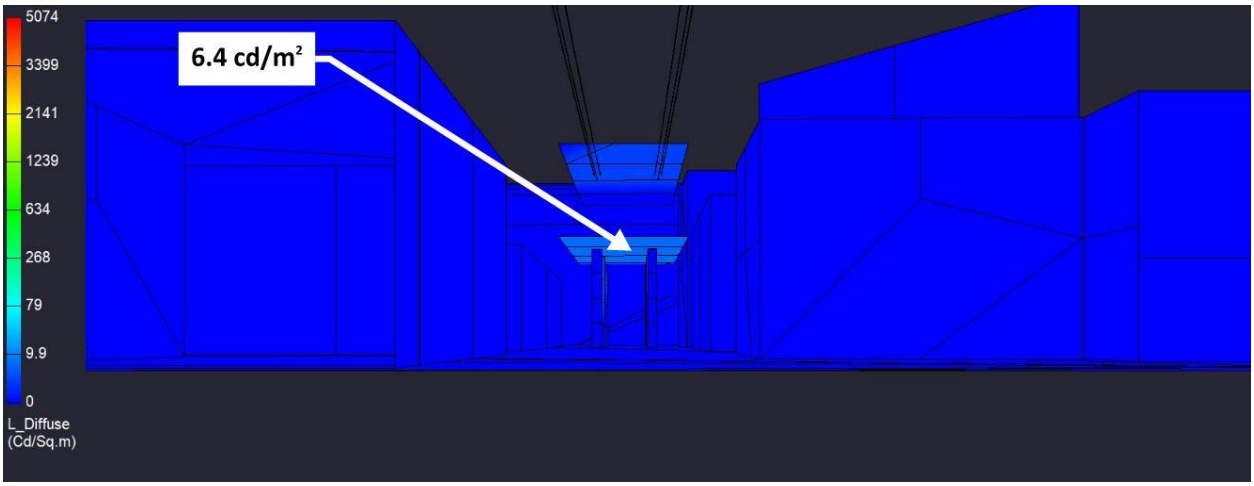
Receptor Site 6A - 7th at Brush





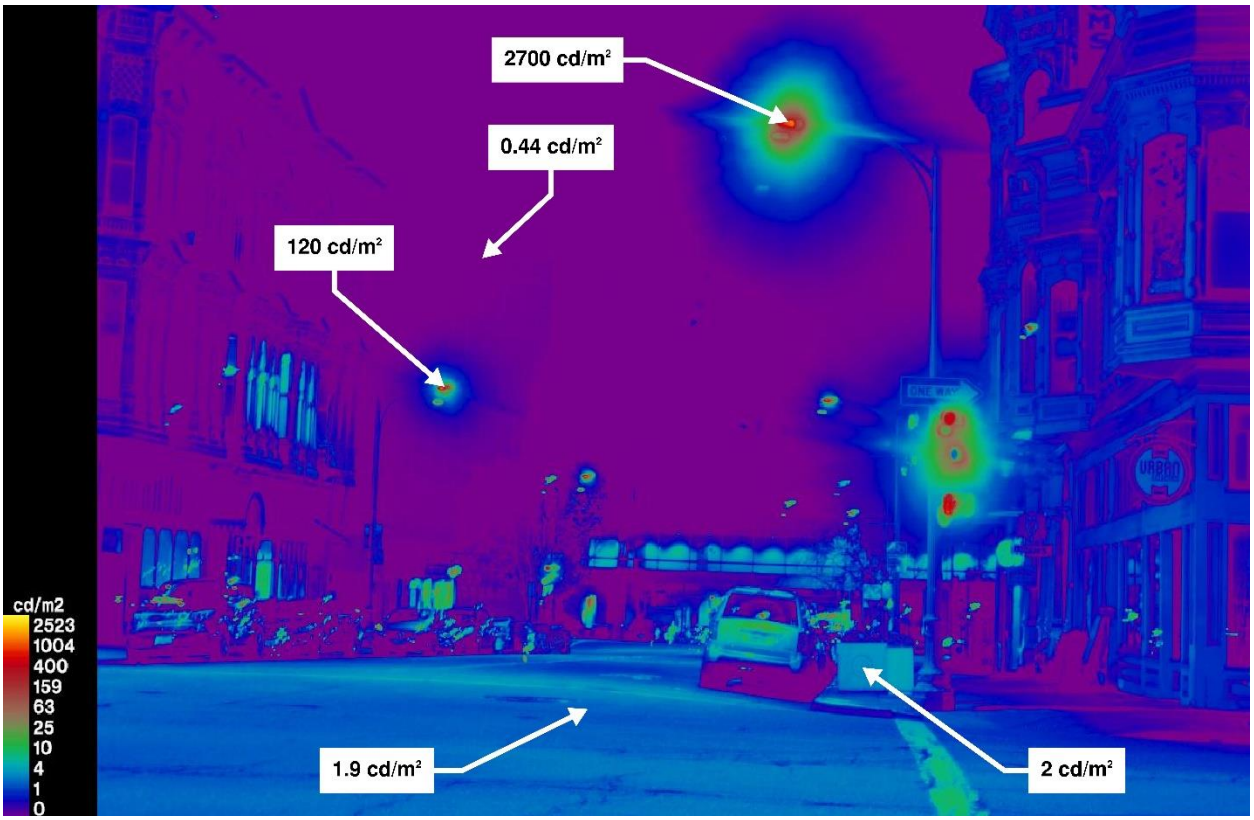
Baseline Project, Baseline Ballpark “Phase 1” Scenario Post-Curfew

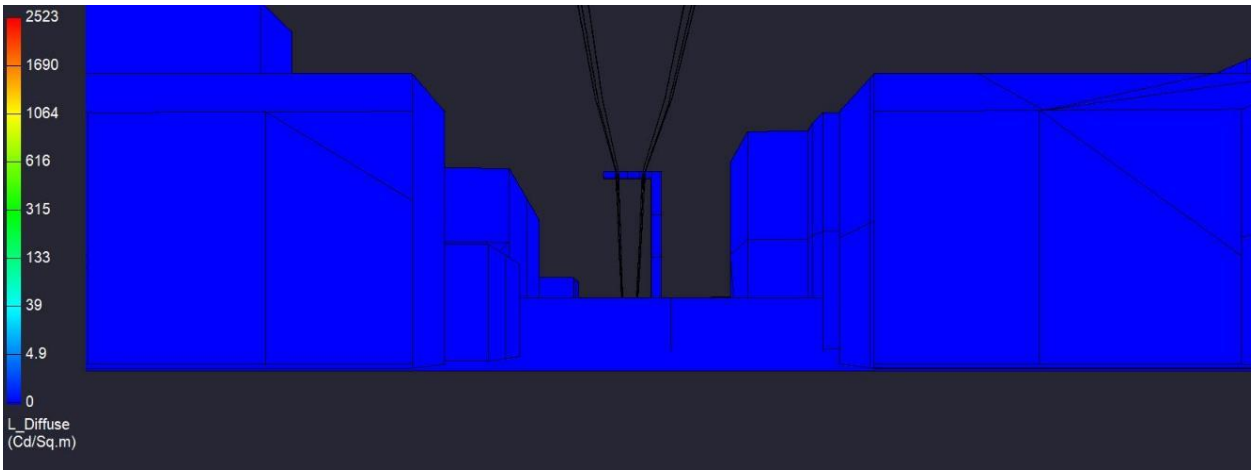
Receptor Site 7 - 8th at Washington (Facing Convention Center Station)



Baseline Project, Baseline Ballpark “Phase 1” Scenario Post-Curfew

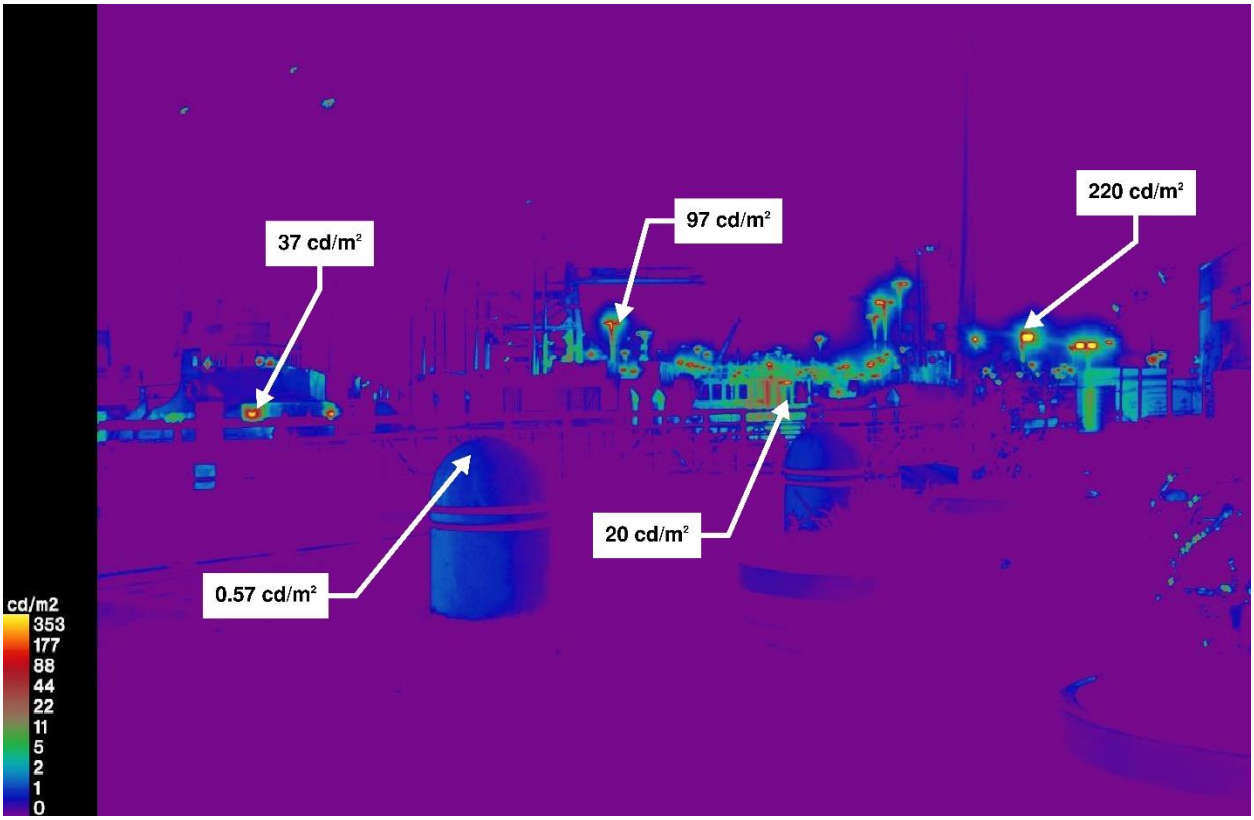
Receptor Site 7A - 8th at Washington (Facing Tower)

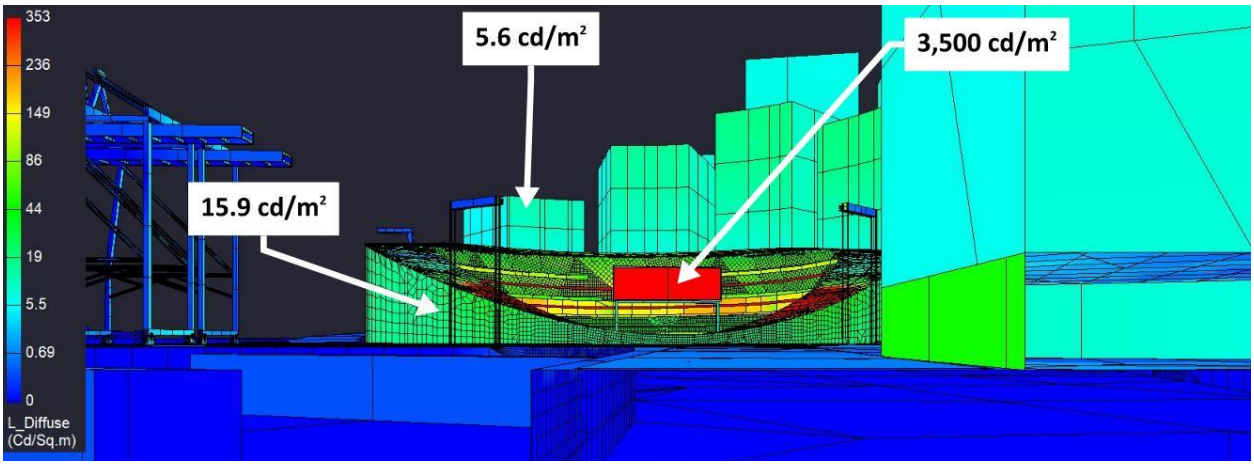




Baseline Project, Baseline Ballpark Height “Full Buildout” Scenario Game Nights

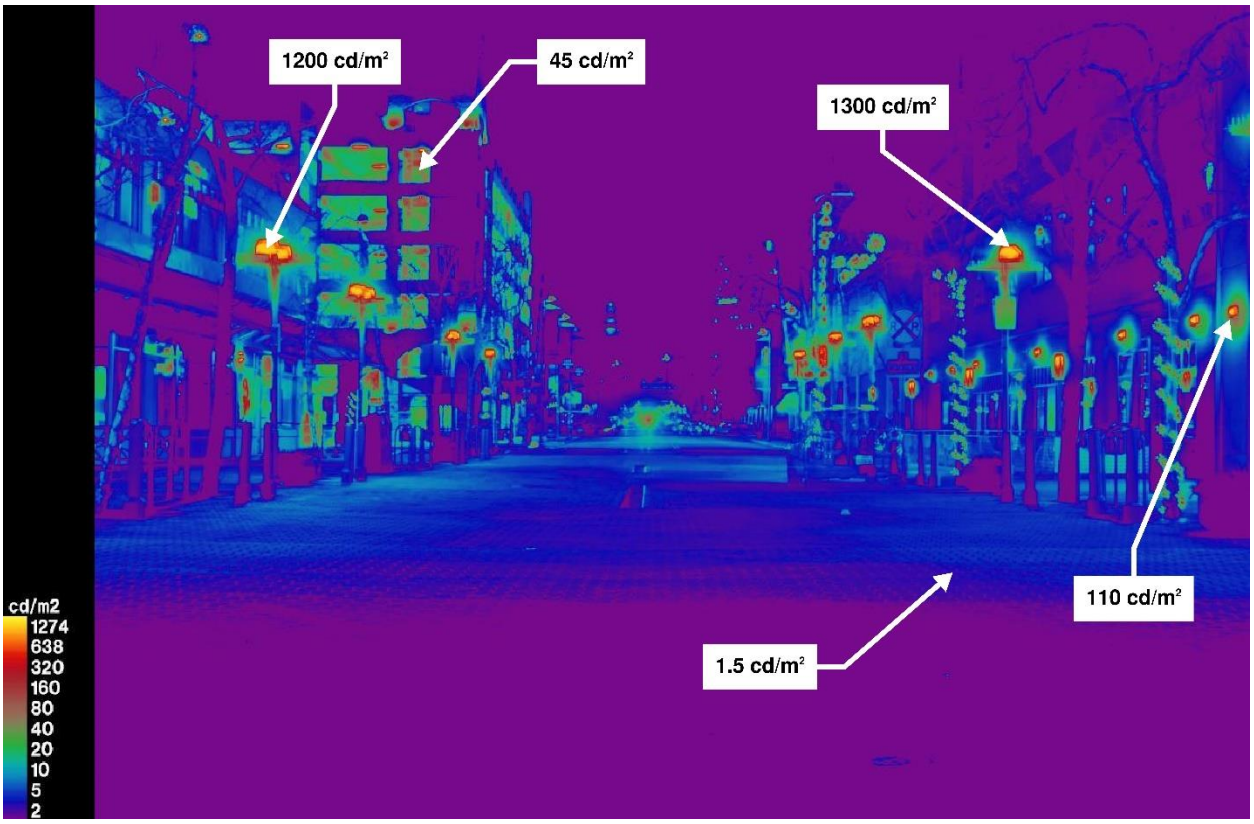
Receptor Site 1 - Water Street at Clay (Facing Ballpark)

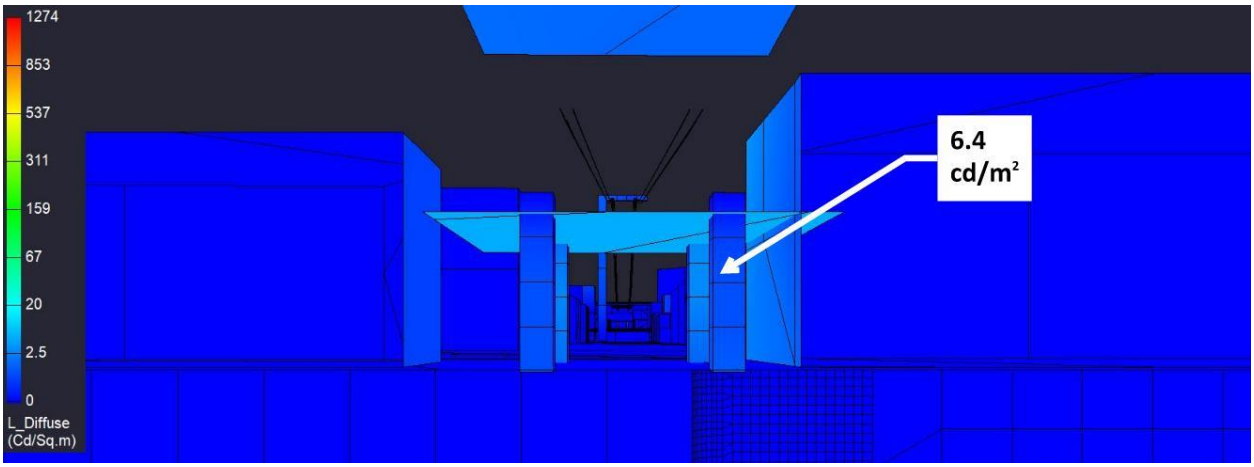




Baseline Project, Baseline Ballpark Height “Full Buildout” Scenario Game Nights

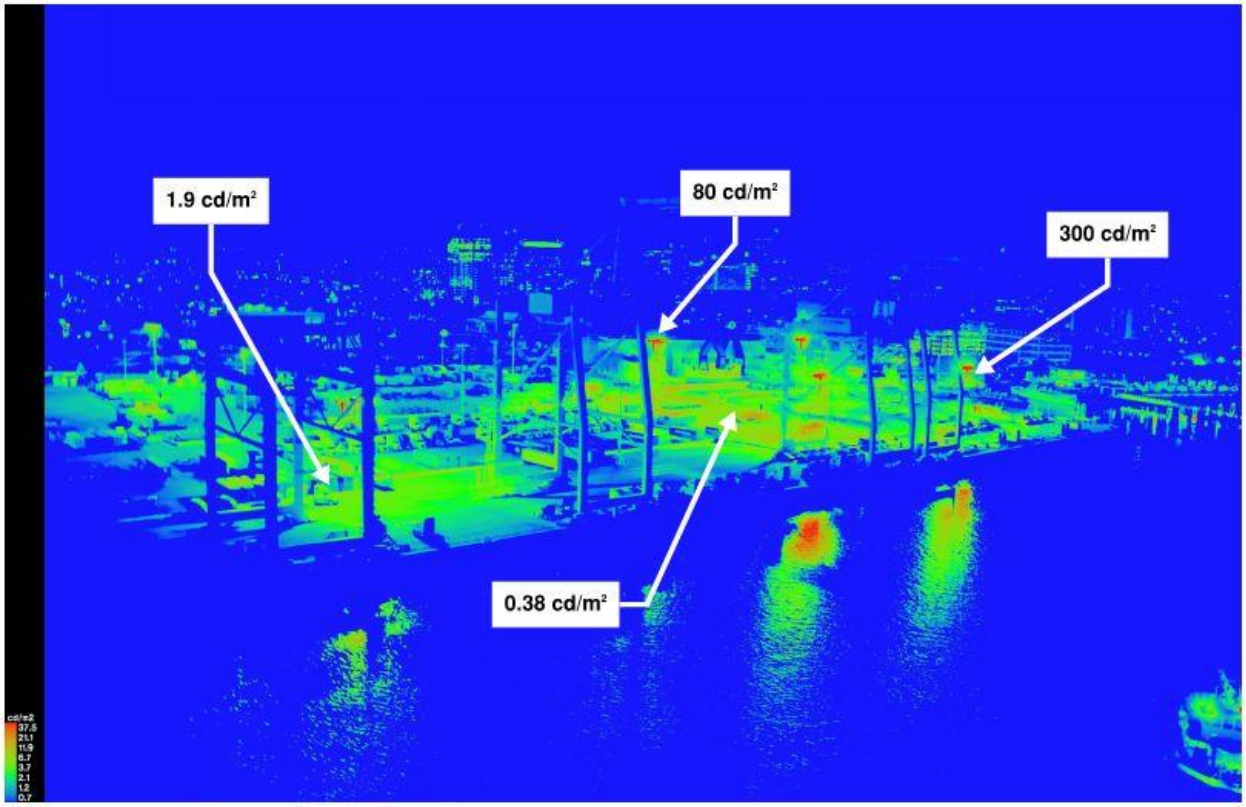
Receptor Site 1A - Water Street at Washington (Facing Gondola)

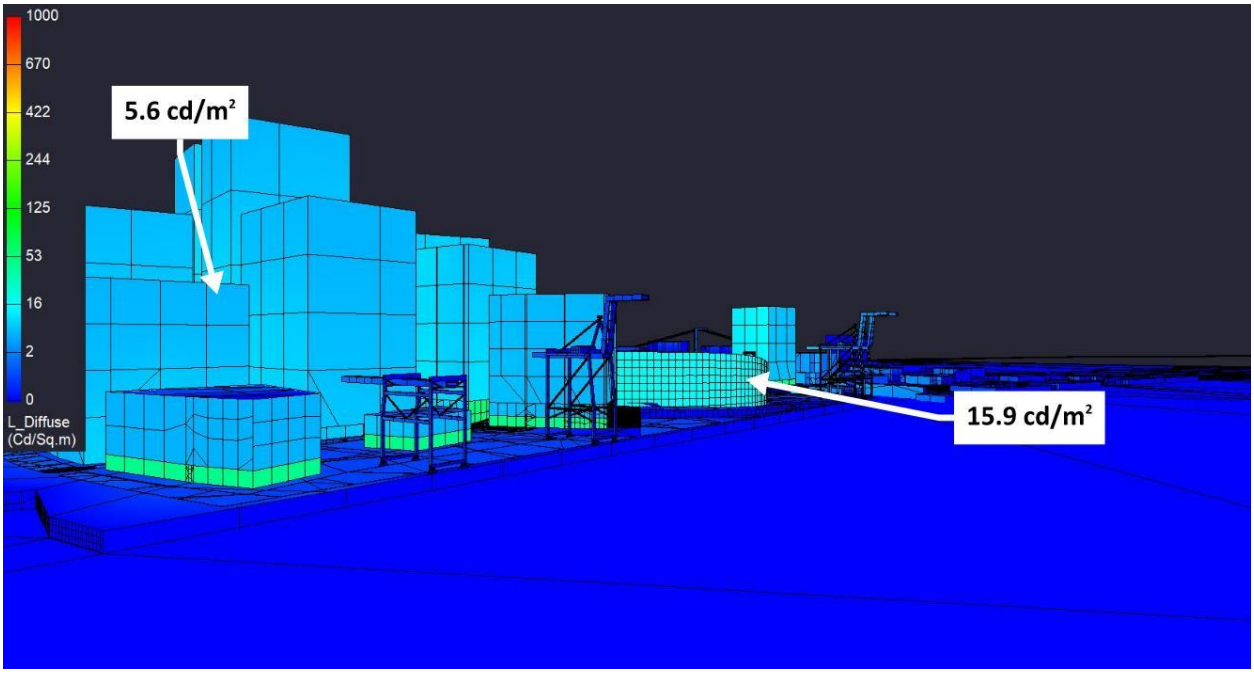




Baseline Project, Baseline Ballpark Height “Full Buildout” Scenario Game Nights

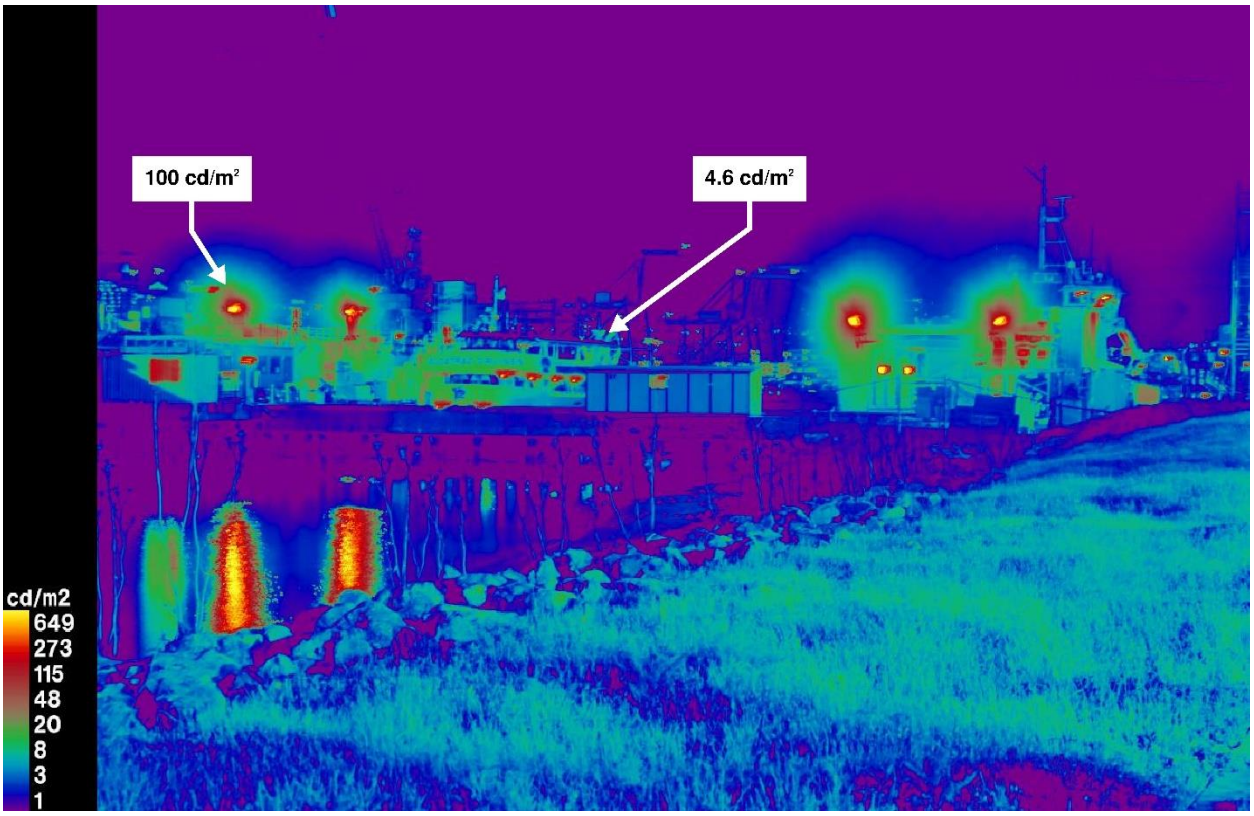
Receptor Site 2 - Inner Harbor Turning Basin @ 190'

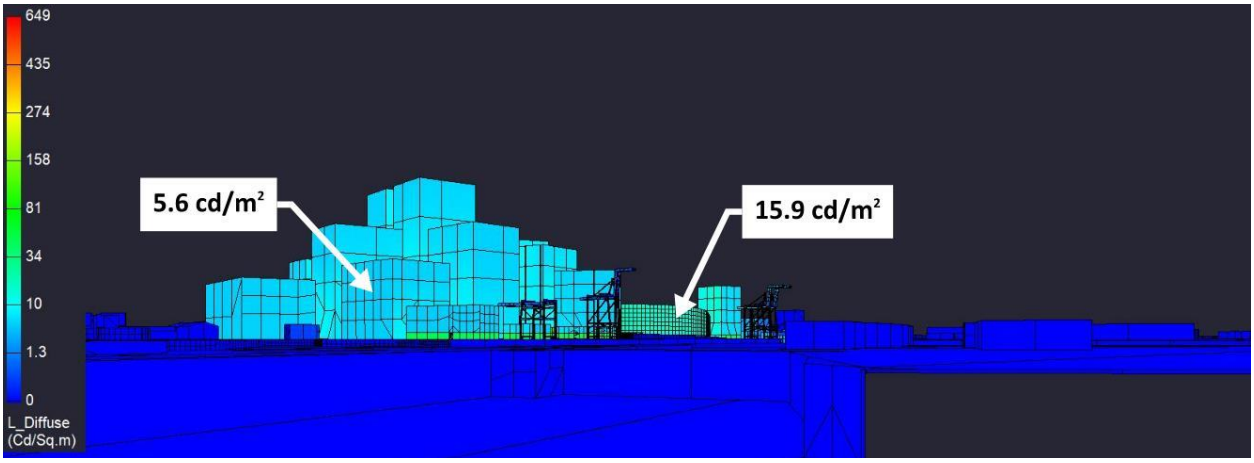




Baseline Project, Baseline Ballpark Height “Full Buildout” Scenario Game Nights

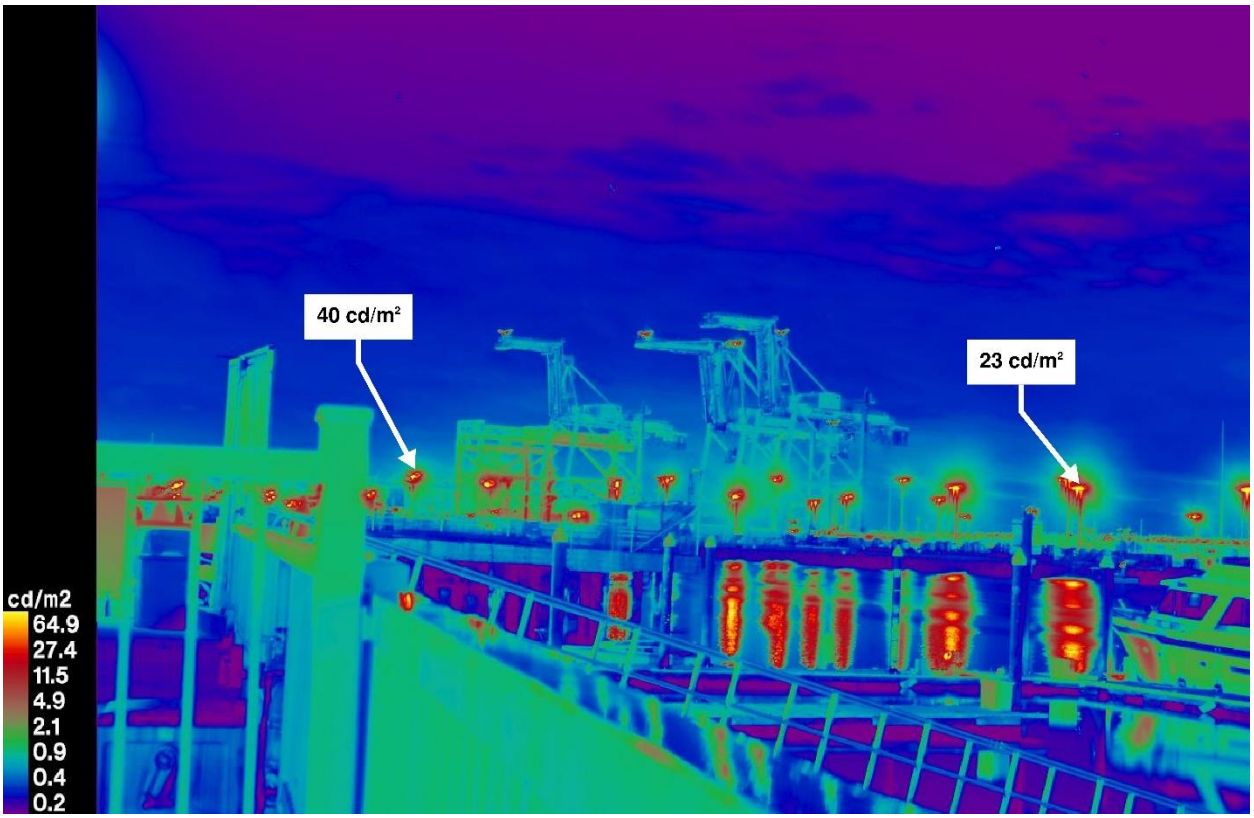
Receptor Site 2A - Turning Basin Line-of-Sight

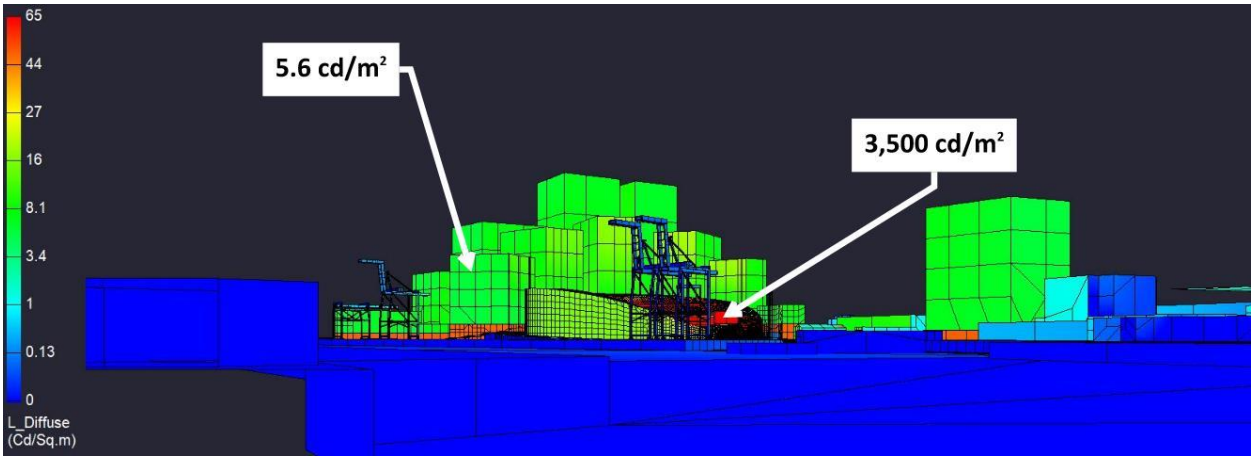




Baseline Project, Baseline Ballpark Height “Full Buildout” Scenario Game Nights

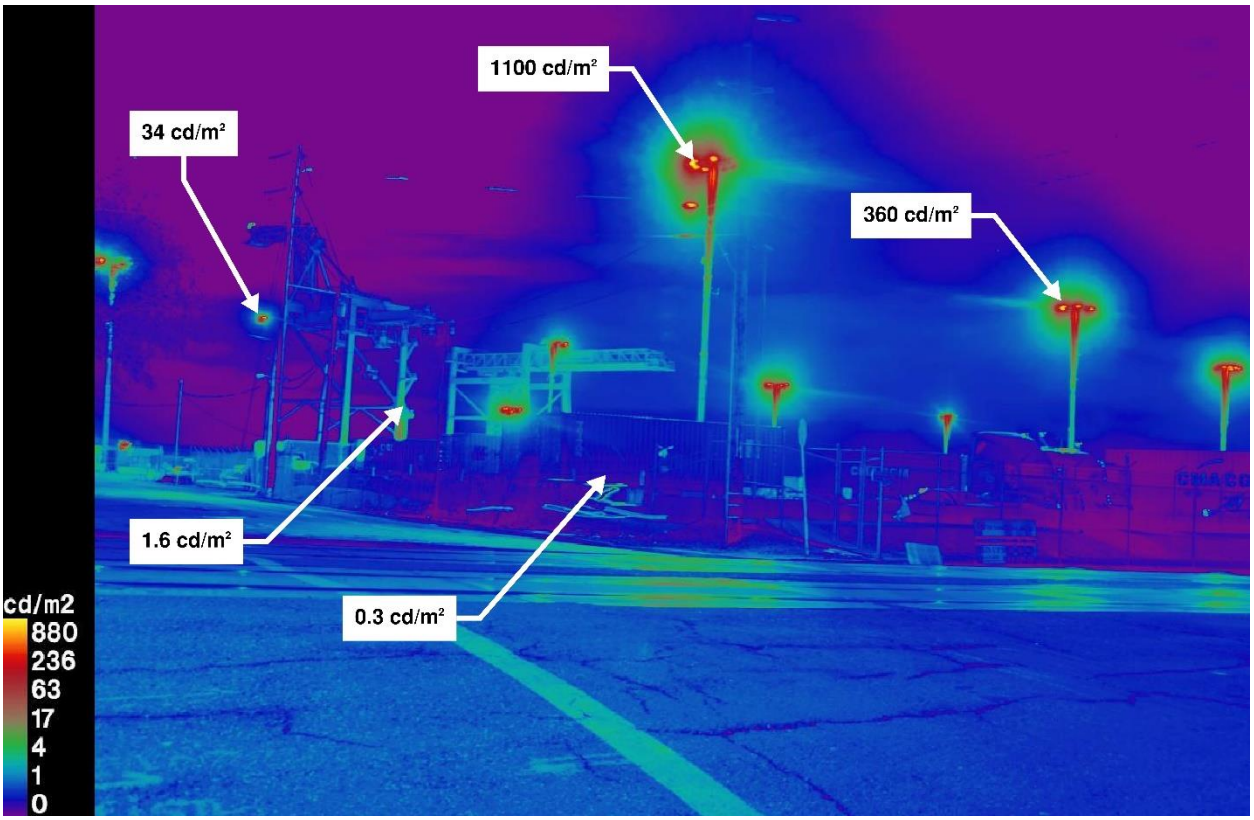
Receptor Site 3 - Alameda Dock

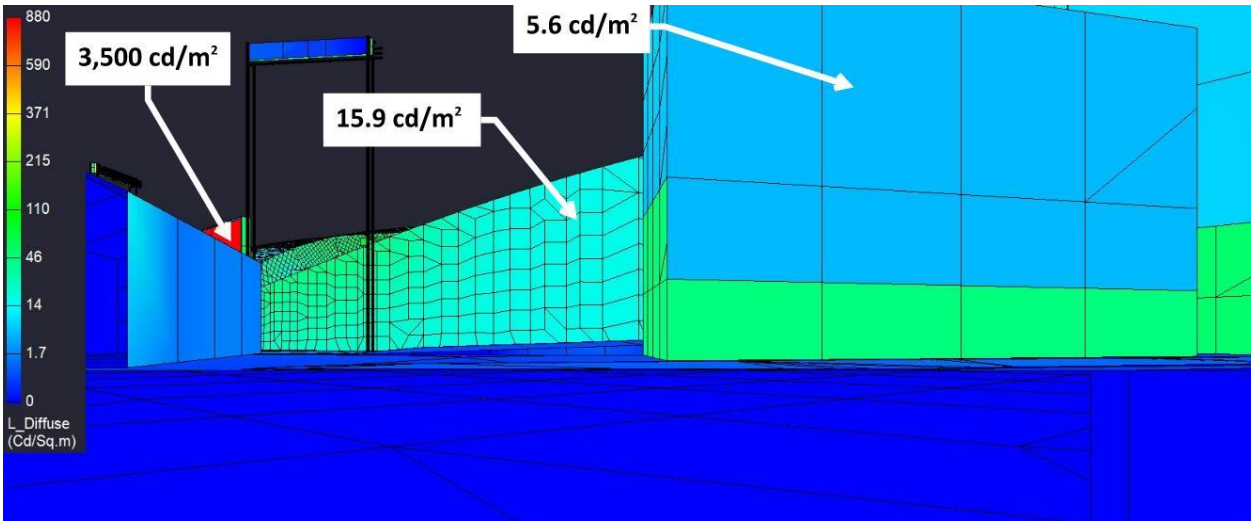




Baseline Project, Baseline Ballpark Height “Full Buildout” Scenario Game Nights

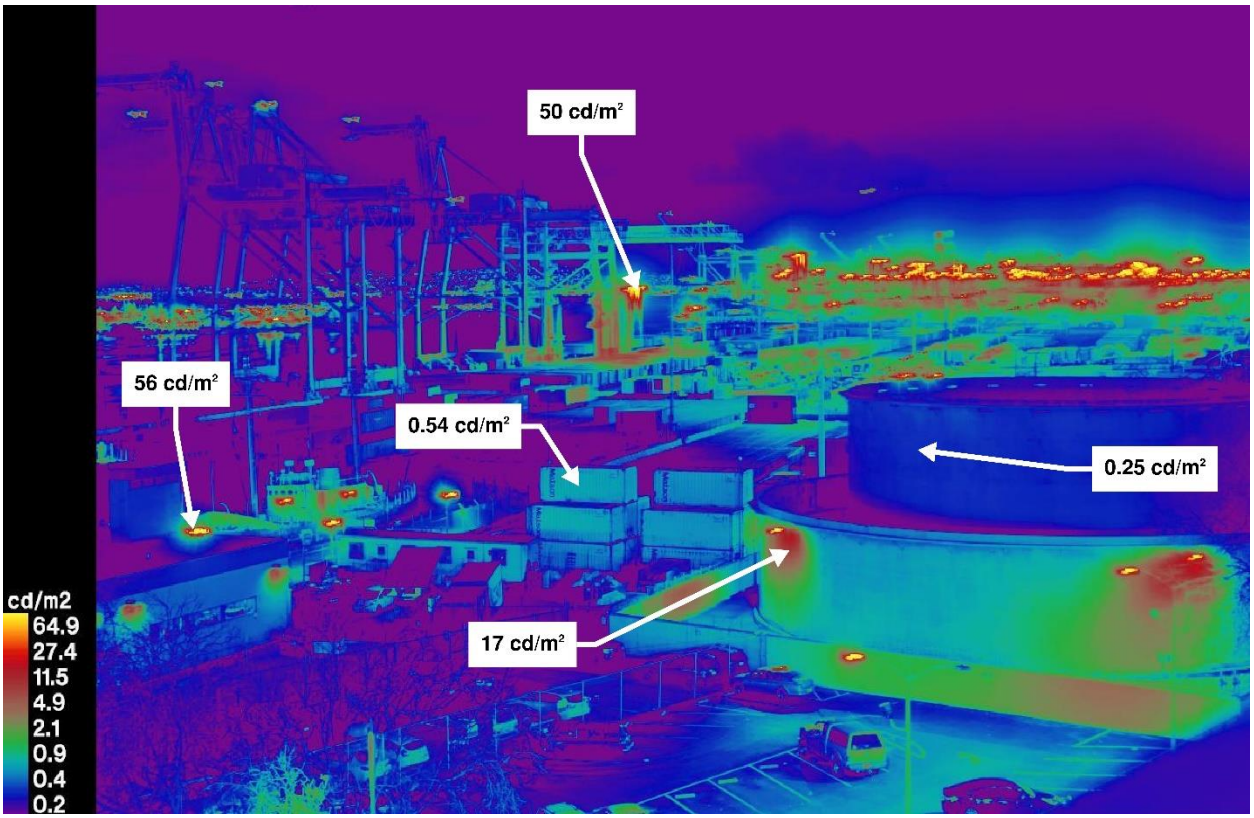
Receptor Site 4 - MLK at Embarcadero

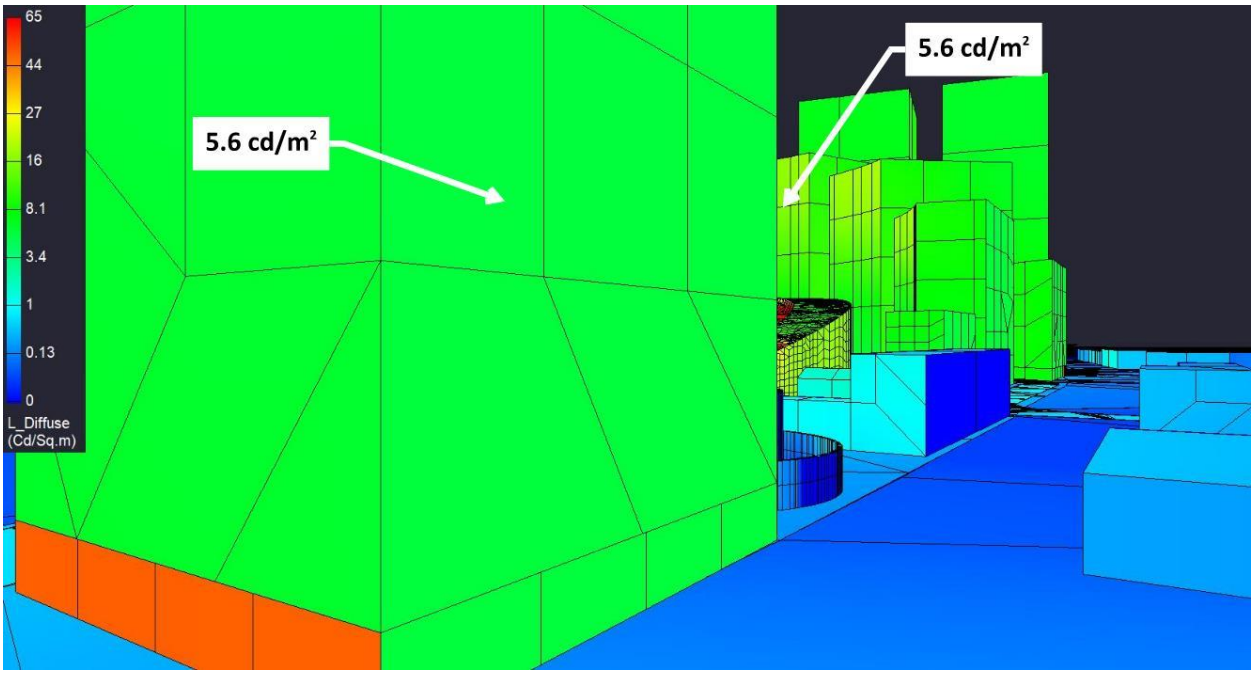




Baseline Project, Baseline Ballpark Height “Full Buildout” Scenario Game Nights

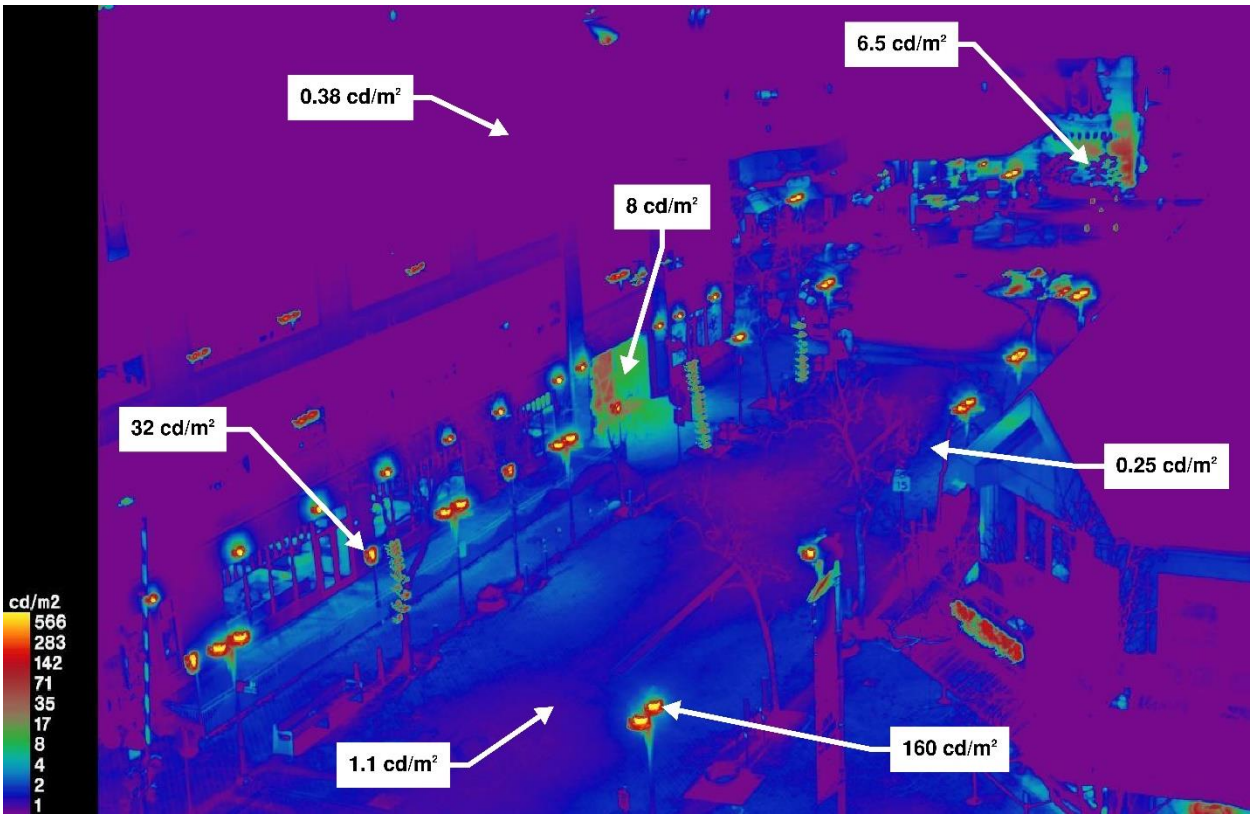
Receptor Site 5A - 2nd at Washington (Facing Stadium)

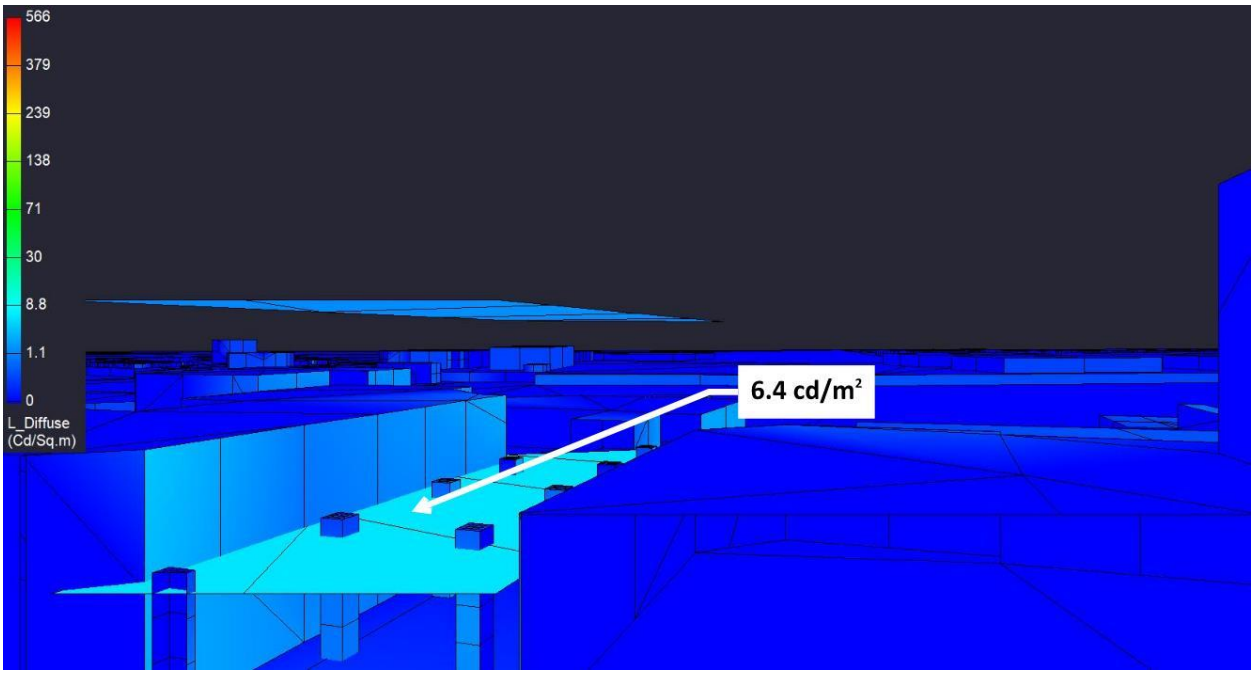




Baseline Project, Baseline Ballpark Height “Full Buildout” Scenario Game Nights

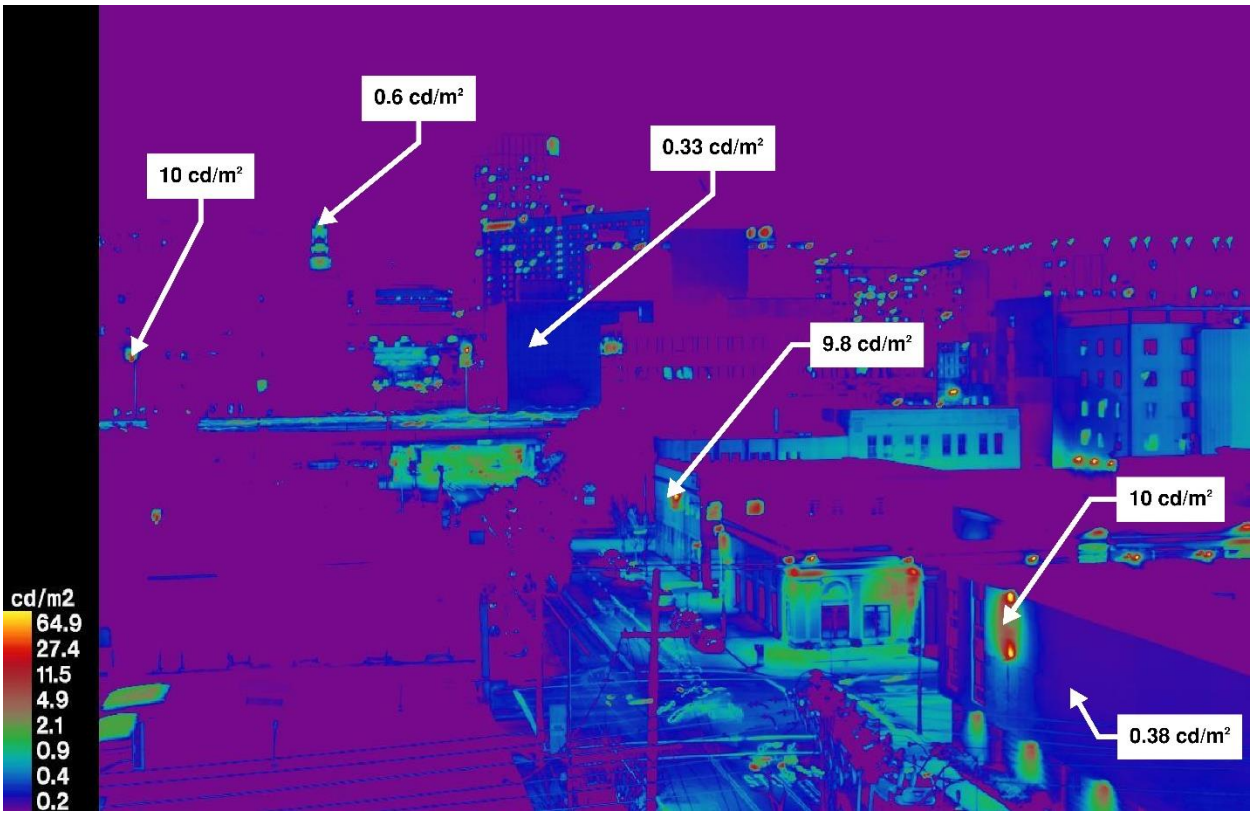
Receptor Site 5B - 2nd at Washington (Facing JLS Station)

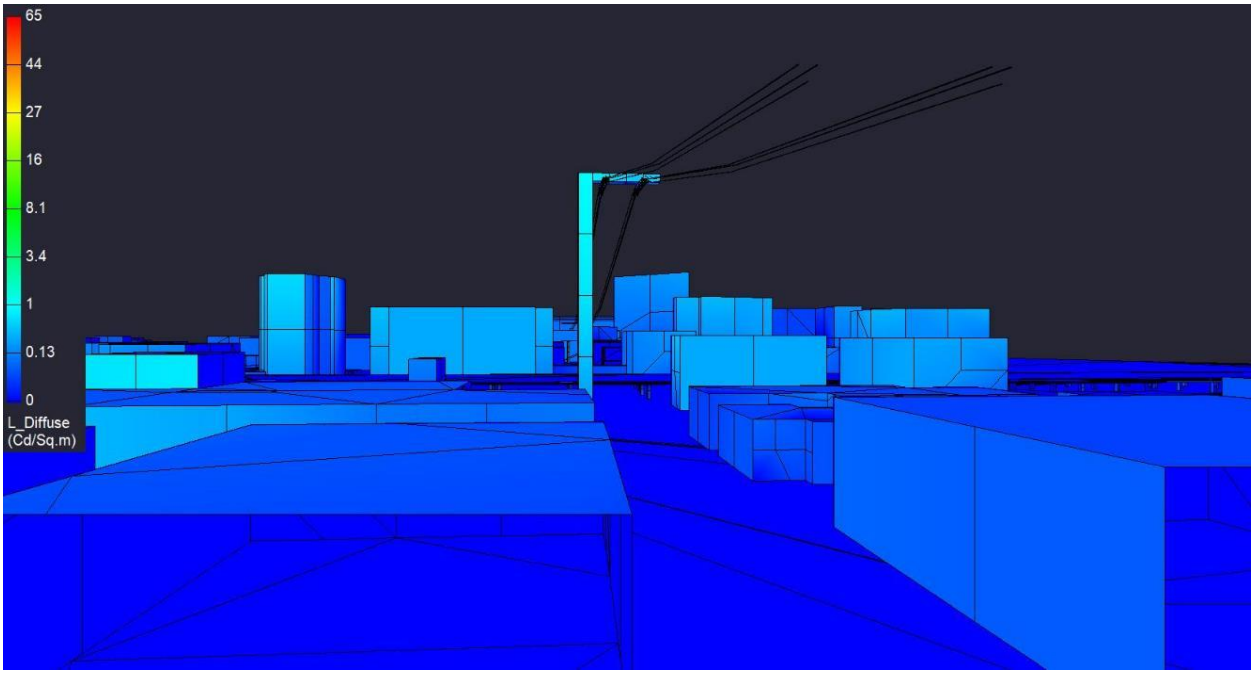




Baseline Project, Baseline Ballpark Height “Full Buildout” Scenario Game Nights

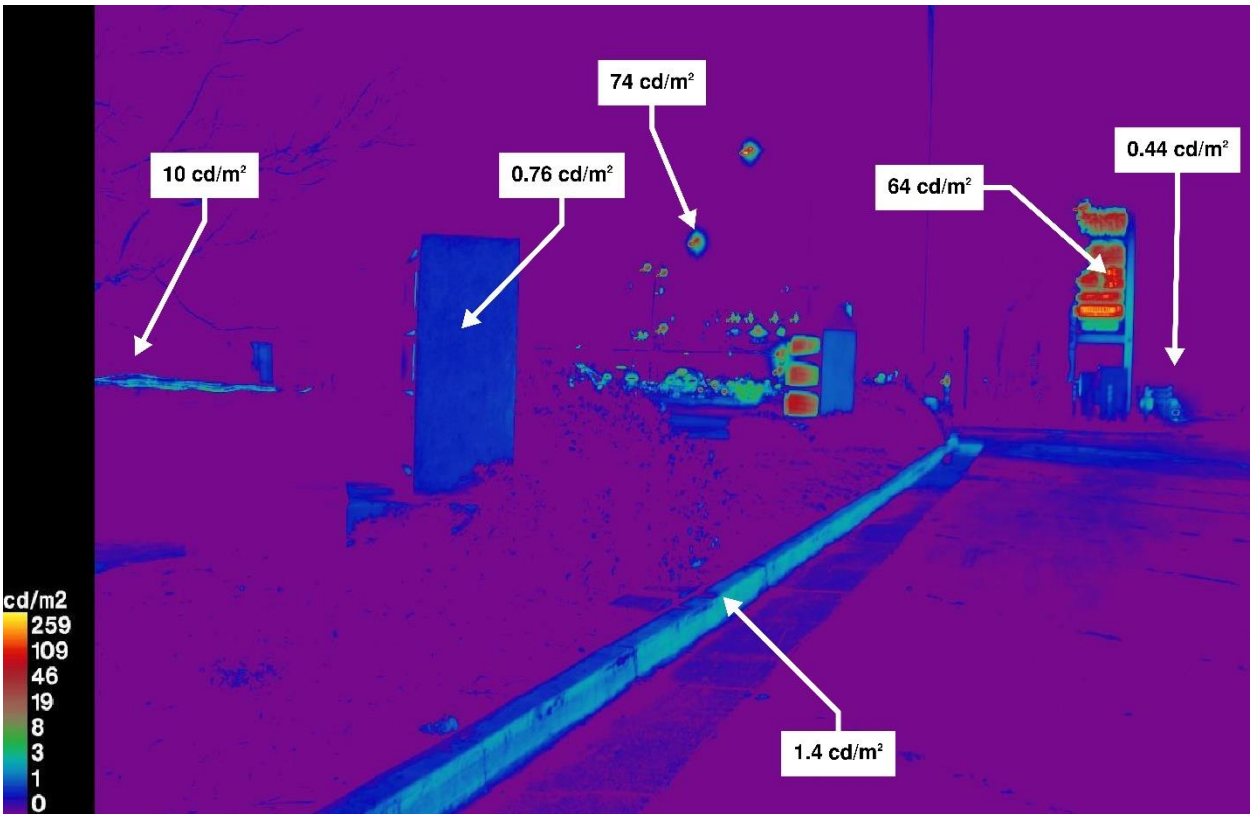
Receptor Site 5C - 2nd at Washington (Facing Convention Center Station)

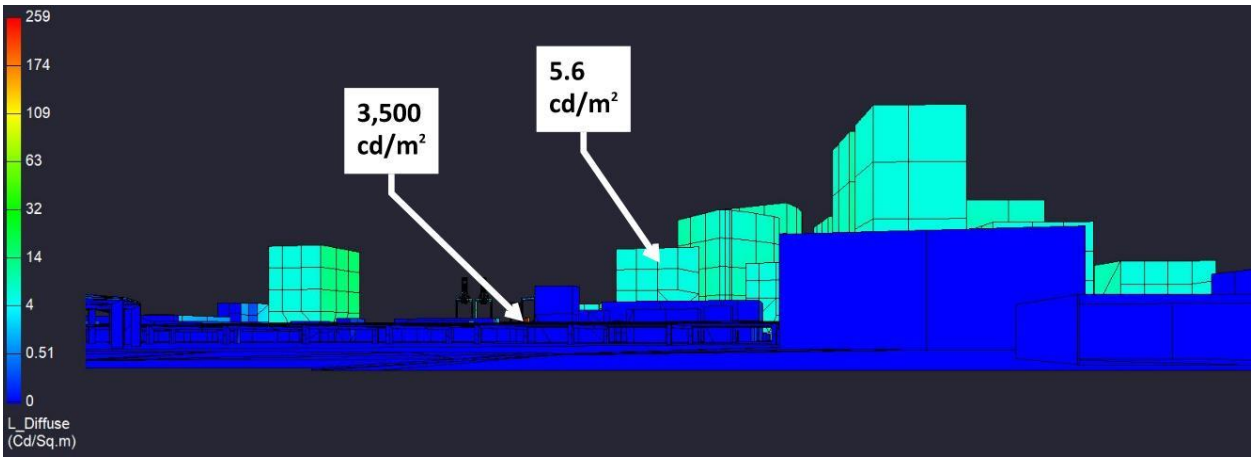




Baseline Project, Baseline Ballpark Height “Full Buildout” Scenario Game Nights

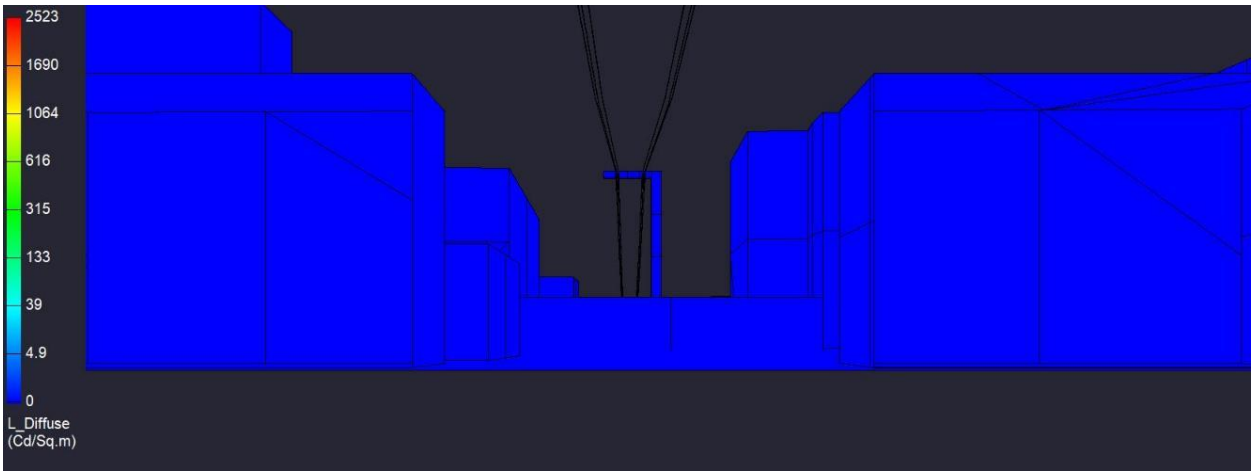
Receptor Site 6A - 7th at Brush





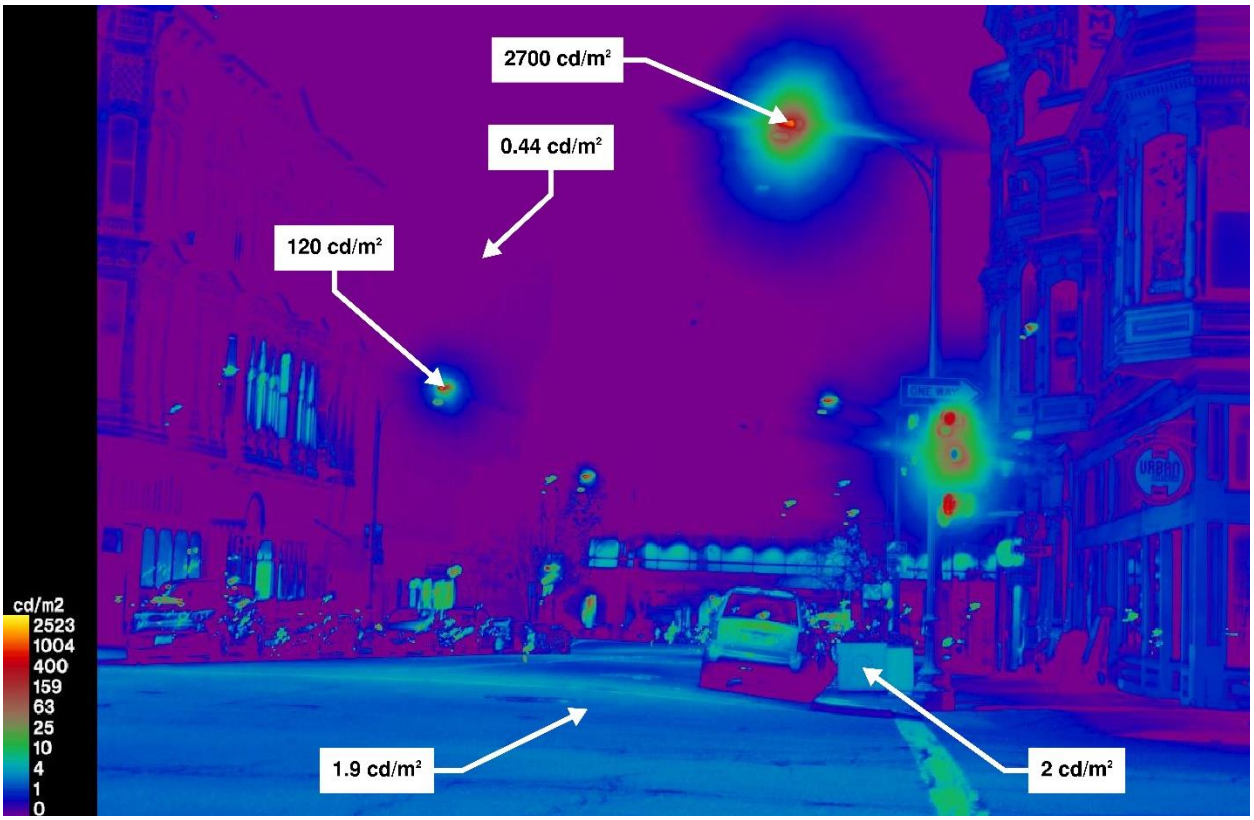
Baseline Project, Baseline Ballpark Height “Full Buildout” Scenario Game Nights

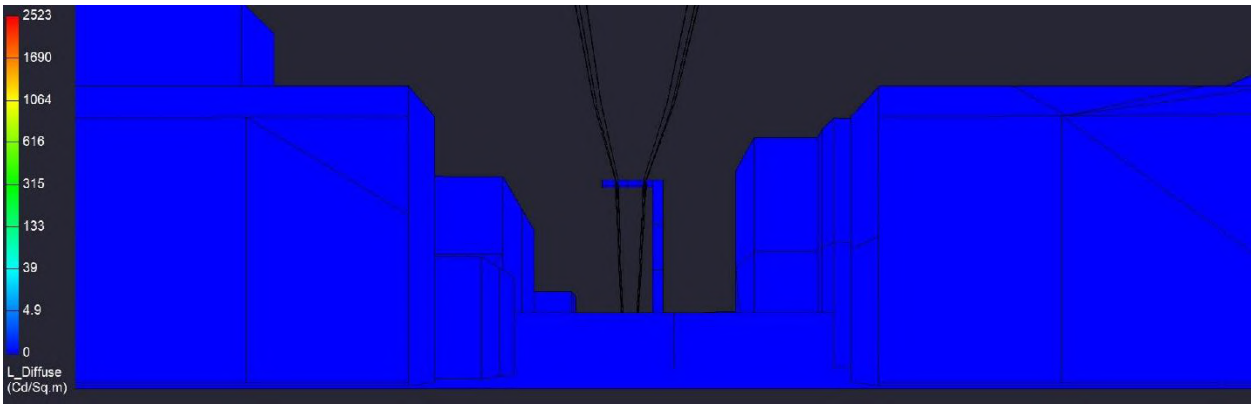
Receptor Site 7 - 8th at Washington (Facing Convention Center Station)



Baseline Project, Baseline Ballpark Height “Full Buildout” Scenario Game Nights

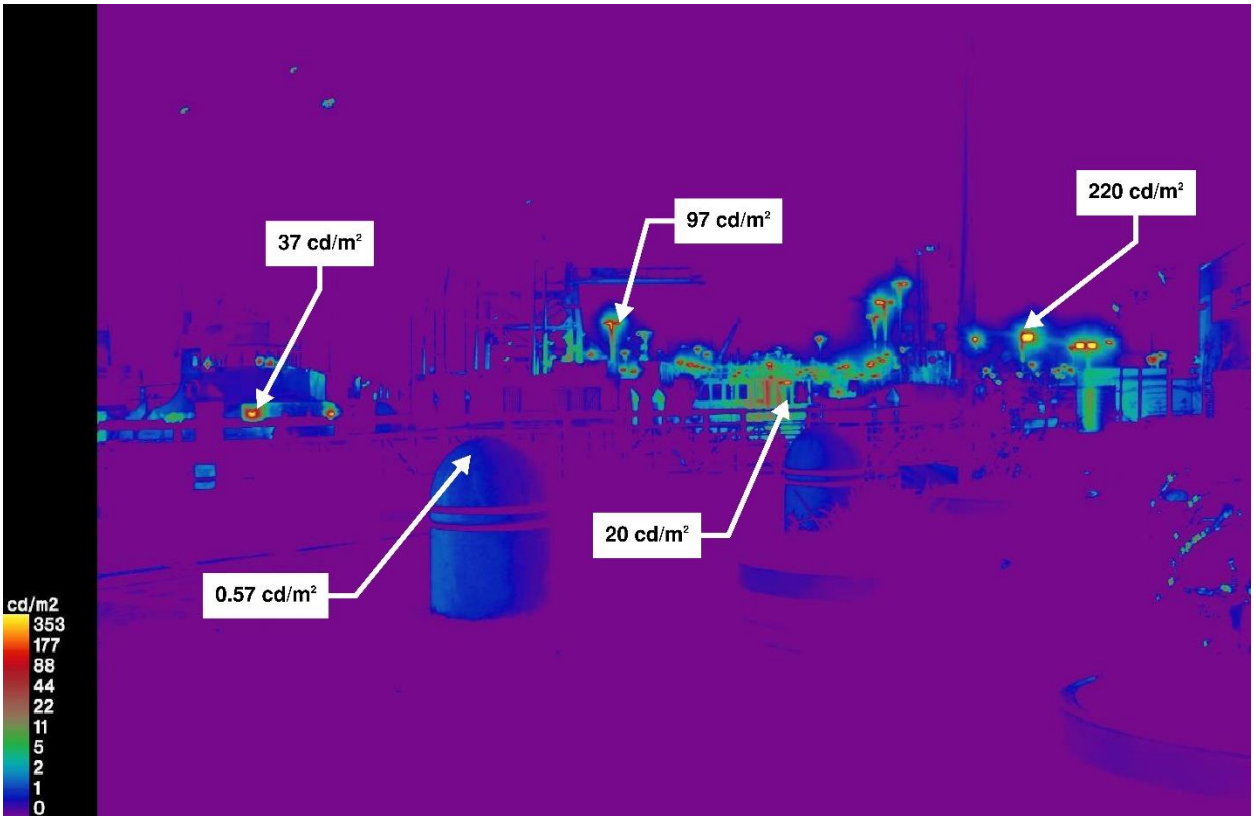
Receptor Site 7A - 8th at Washington (Facing Tower)

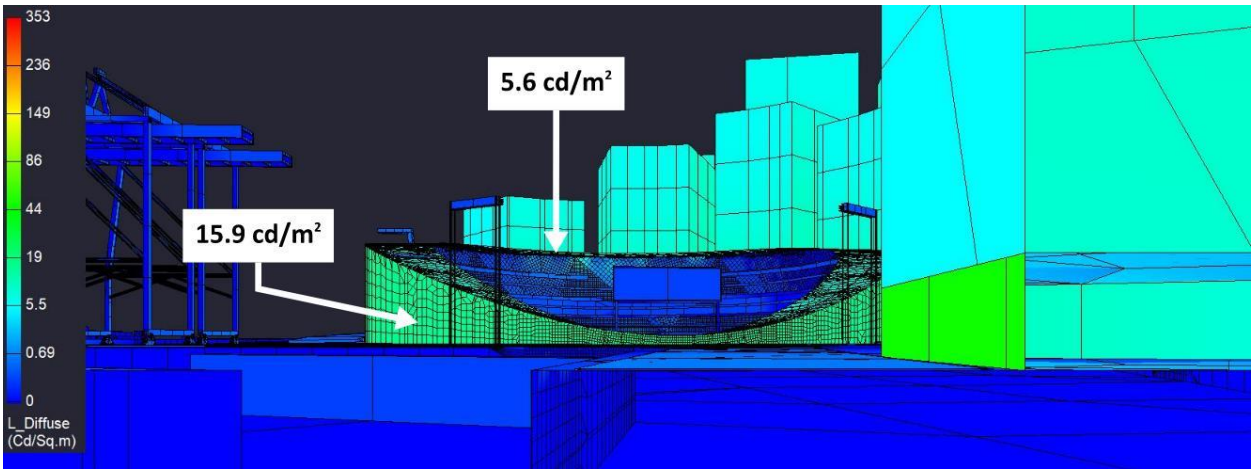




Baseline Project, Baseline Ballpark “Full Buildout” Scenario Non-Game Nights Pre-Curfew

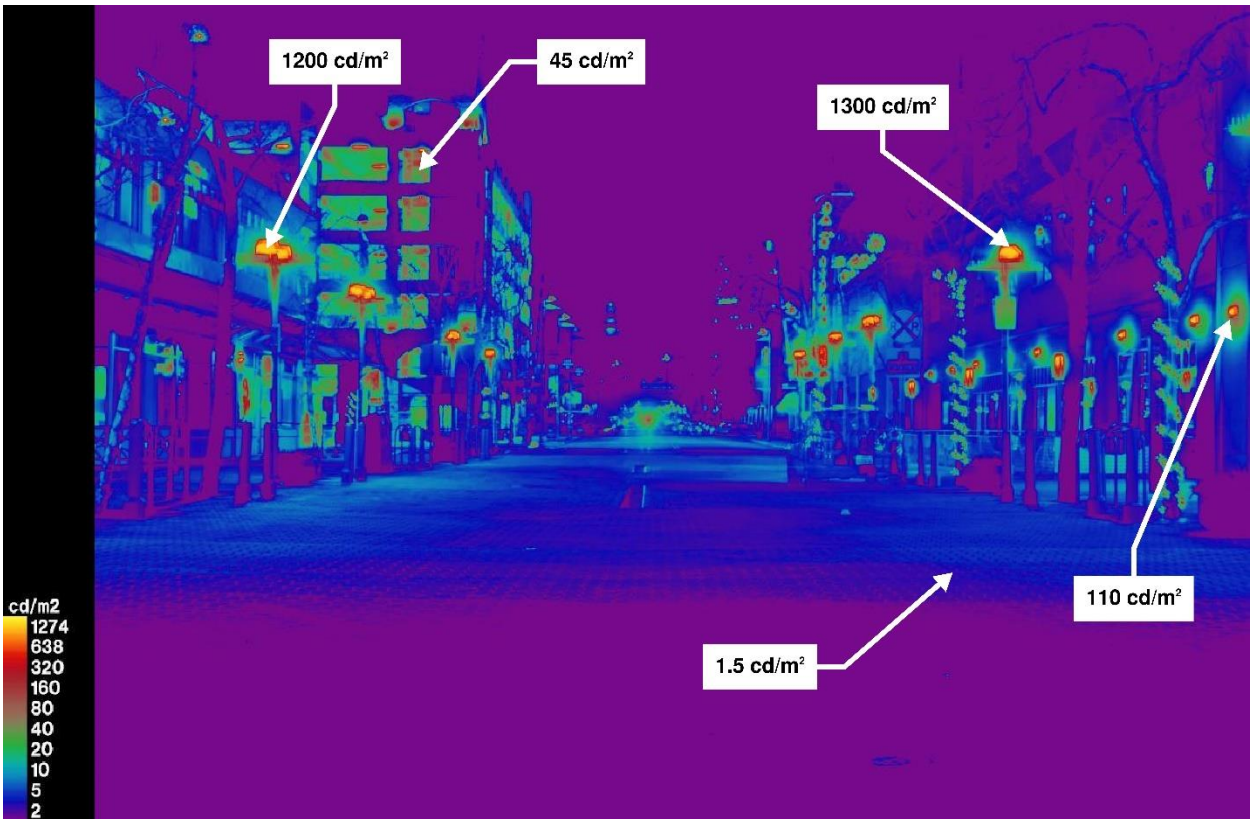
Receptor Site 1 - Water Street at Clay (Facing Ballpark)

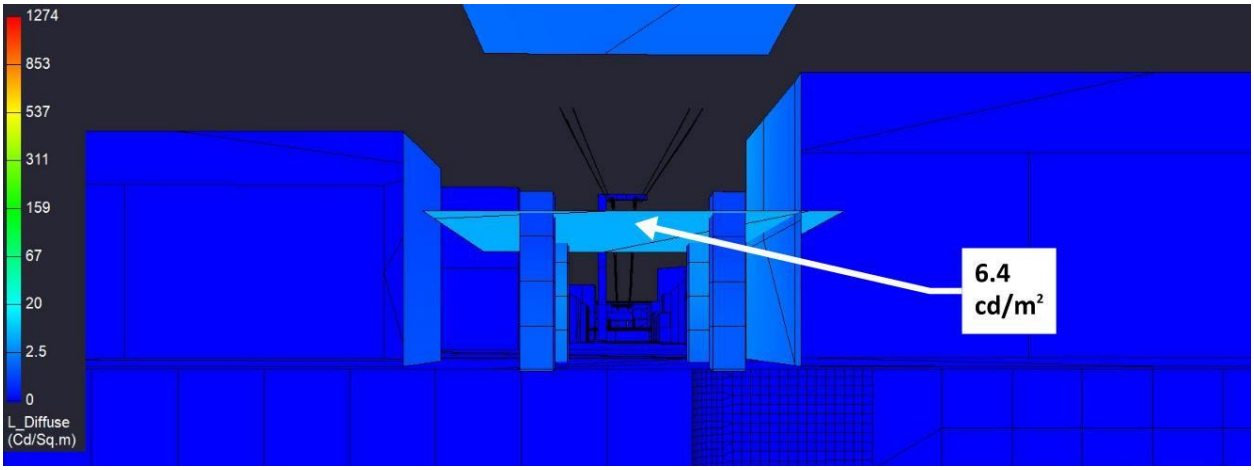




Baseline Project, Baseline Ballpark “Full Buildout” Scenario Non-Game Nights Pre-Curfew

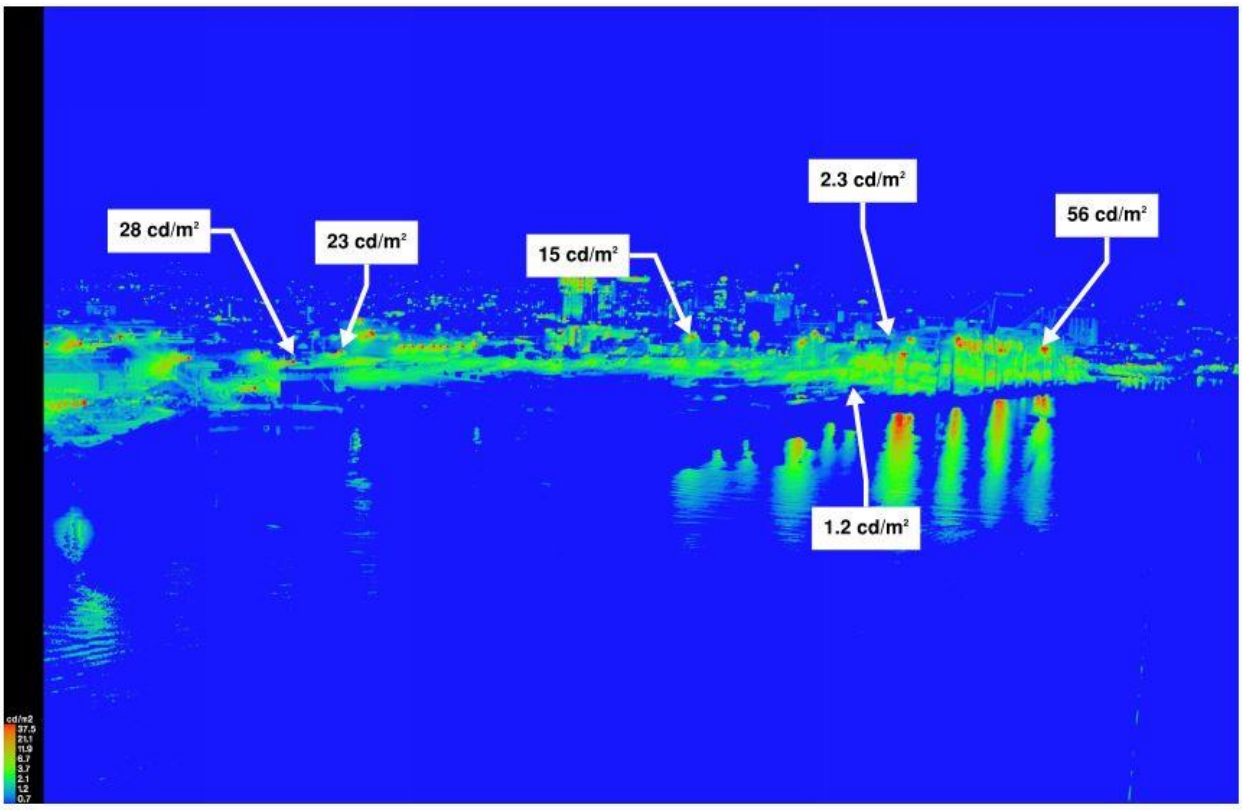
Receptor Site 1A - Water Street at Washington (Facing Gondola)

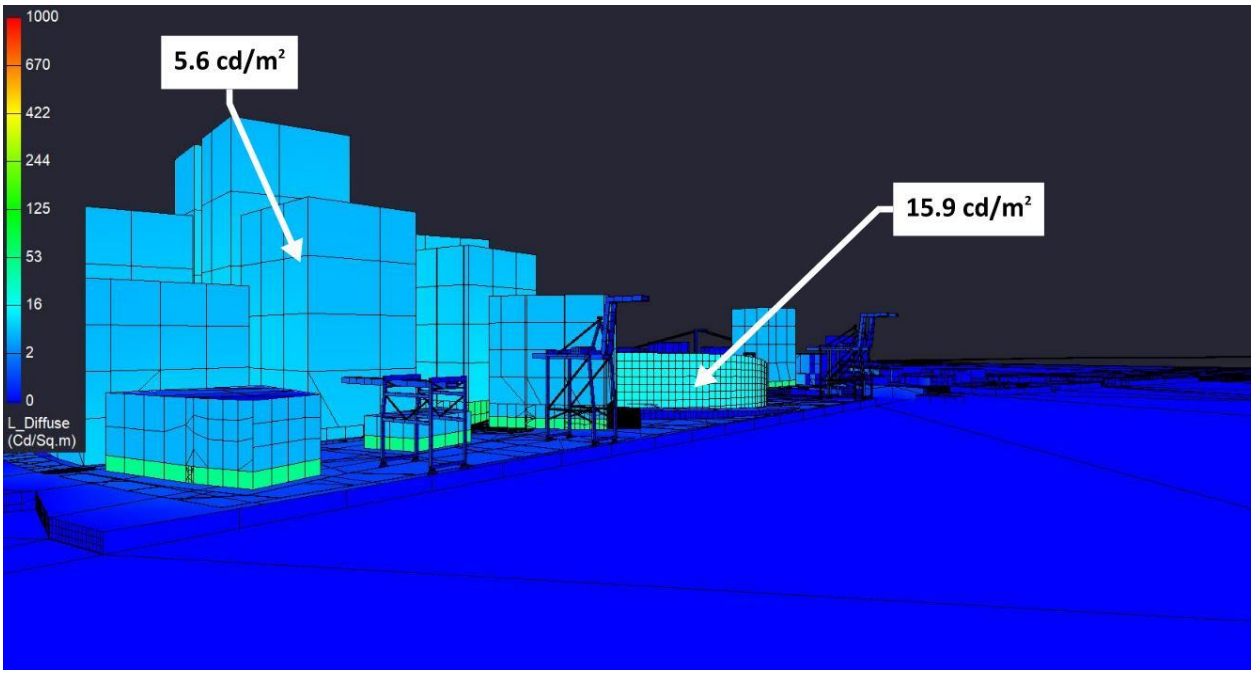




Baseline Project, Baseline Ballpark “Full Buildout” Scenario Non-Game Nights Pre-Curfew

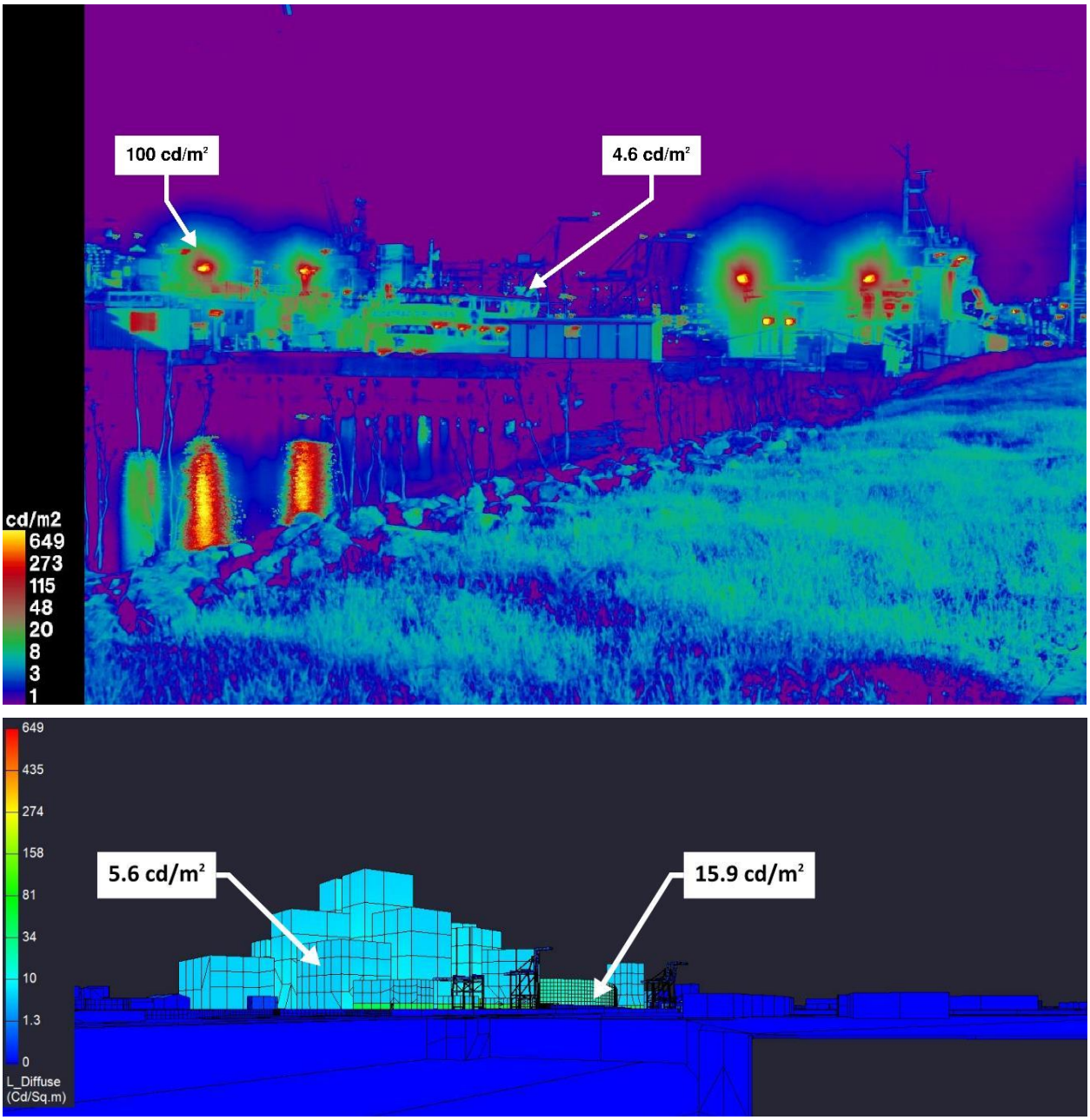
Receptor Site 2 - Inner Harbor Turning Basin @ 190'





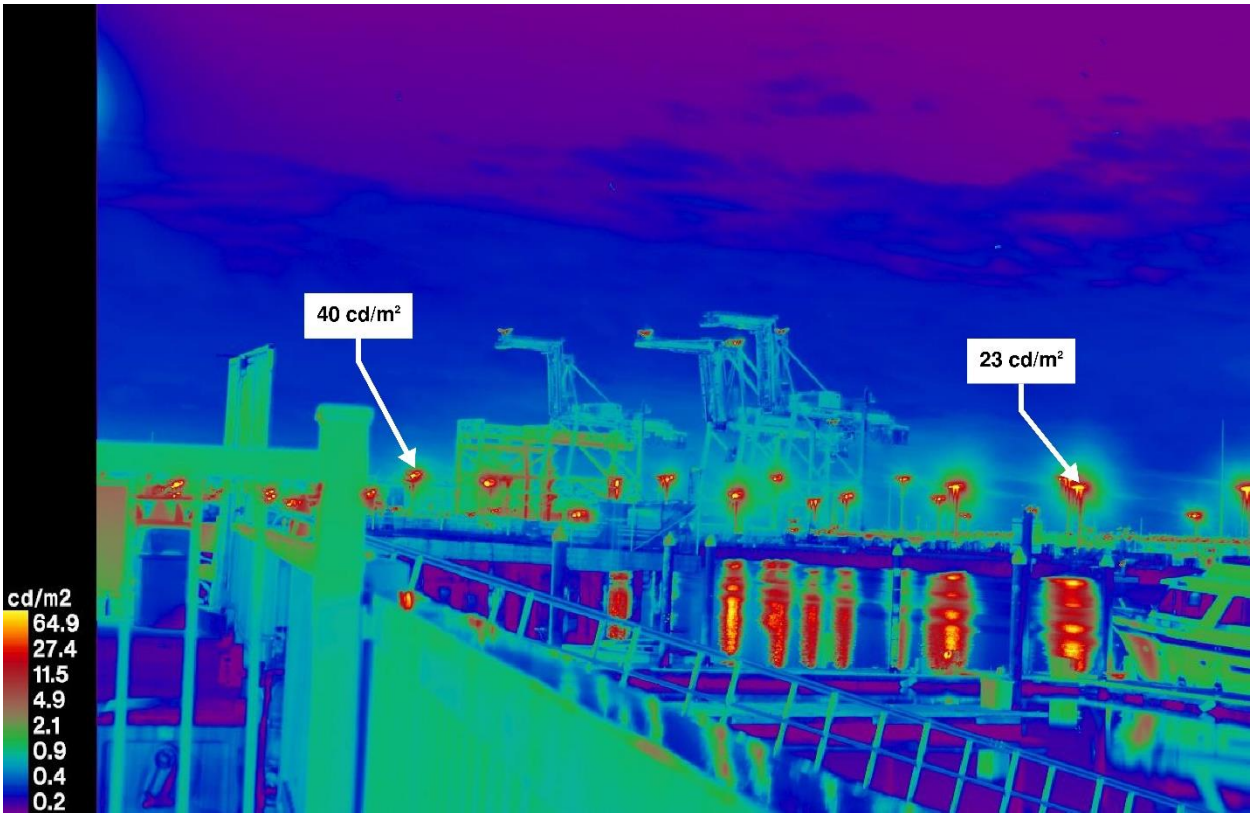
Baseline Project, Baseline Ballpark “Full Buildout” Scenario Non-Game Nights Pre-Curfew

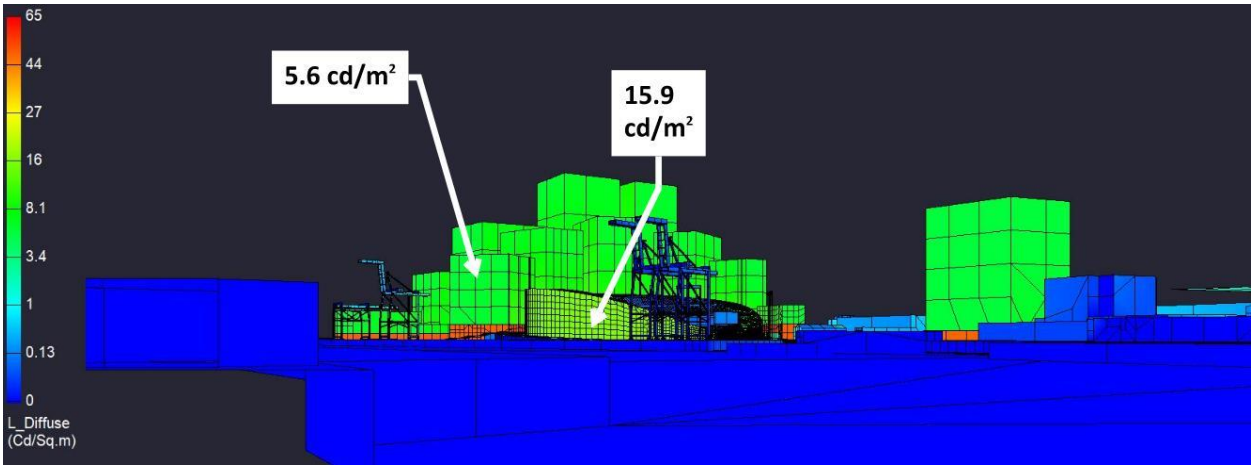
Receptor Site 2A - Turning Basin Line-of-Sight



Baseline Project, Baseline Ballpark “Full Buildout” Scenario Non-Game Nights Pre-Curfew

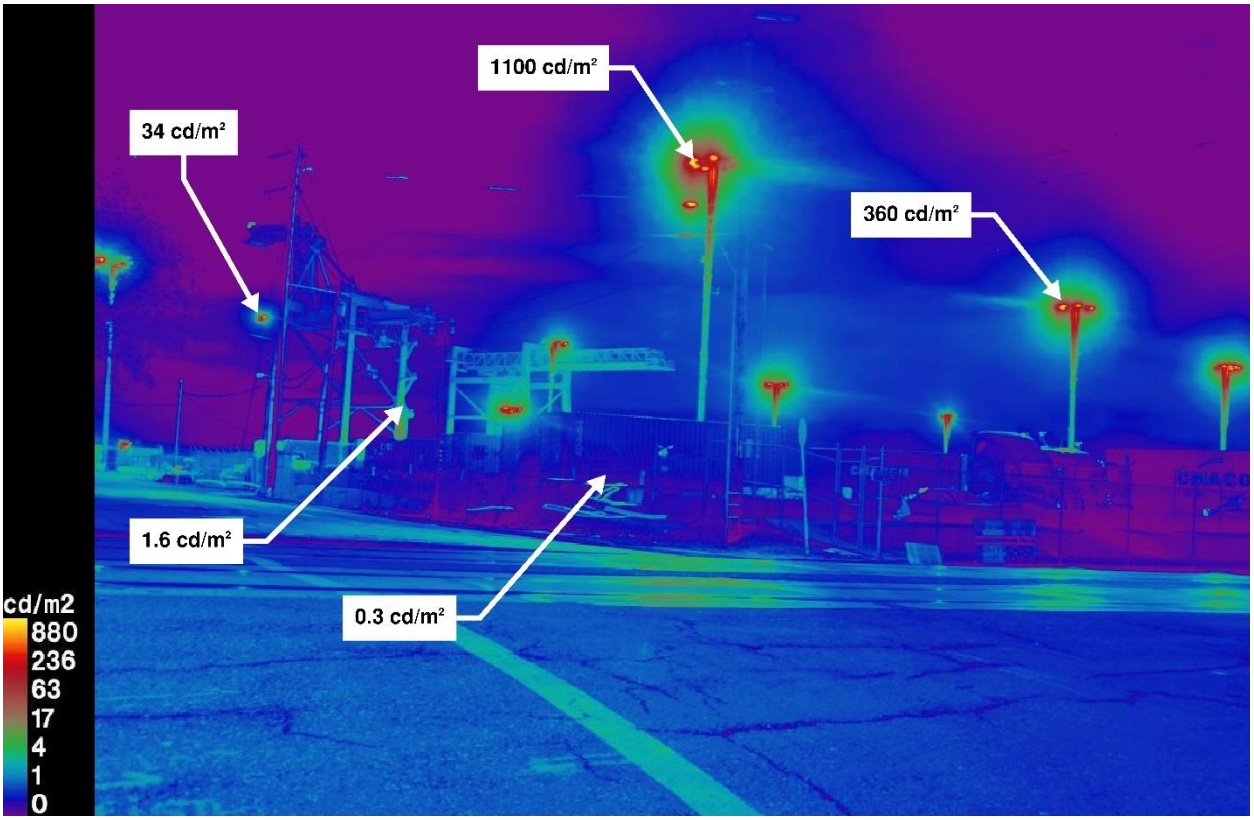
Receptor Site 3 - Alameda Dock

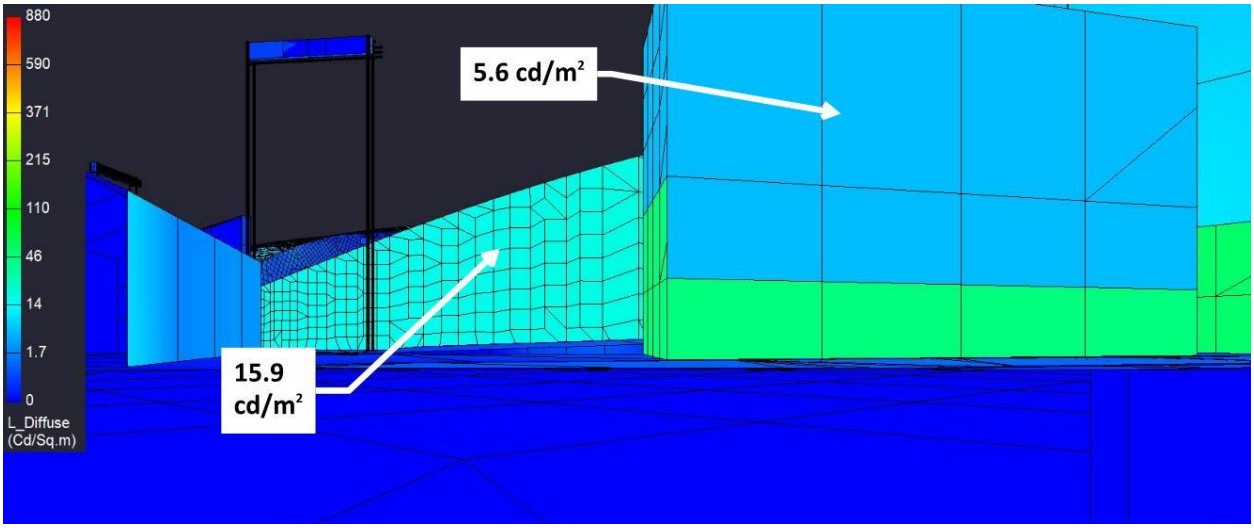




Baseline Project, Baseline Ballpark “Full Buildout” Scenario Non-Game Nights Pre-Curfew

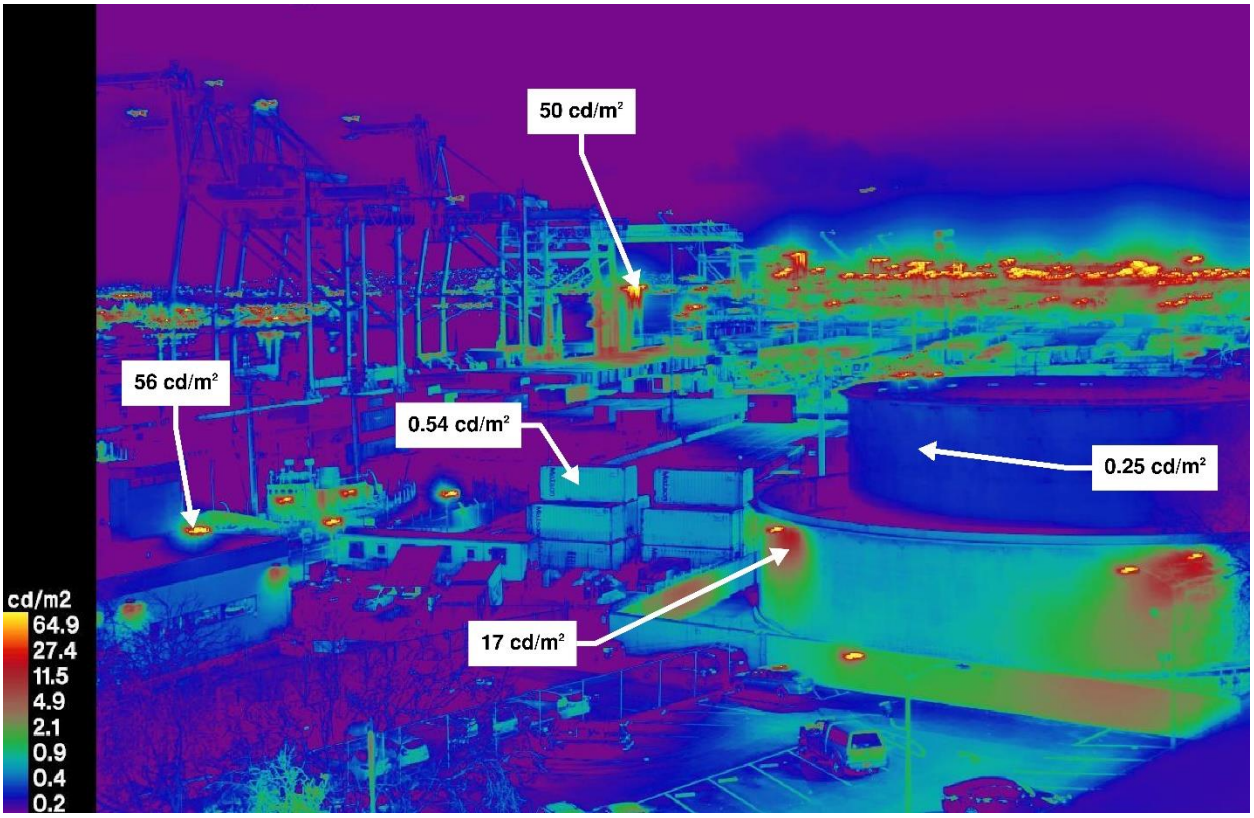
Receptor Site 4 - MLK at Embarcadero

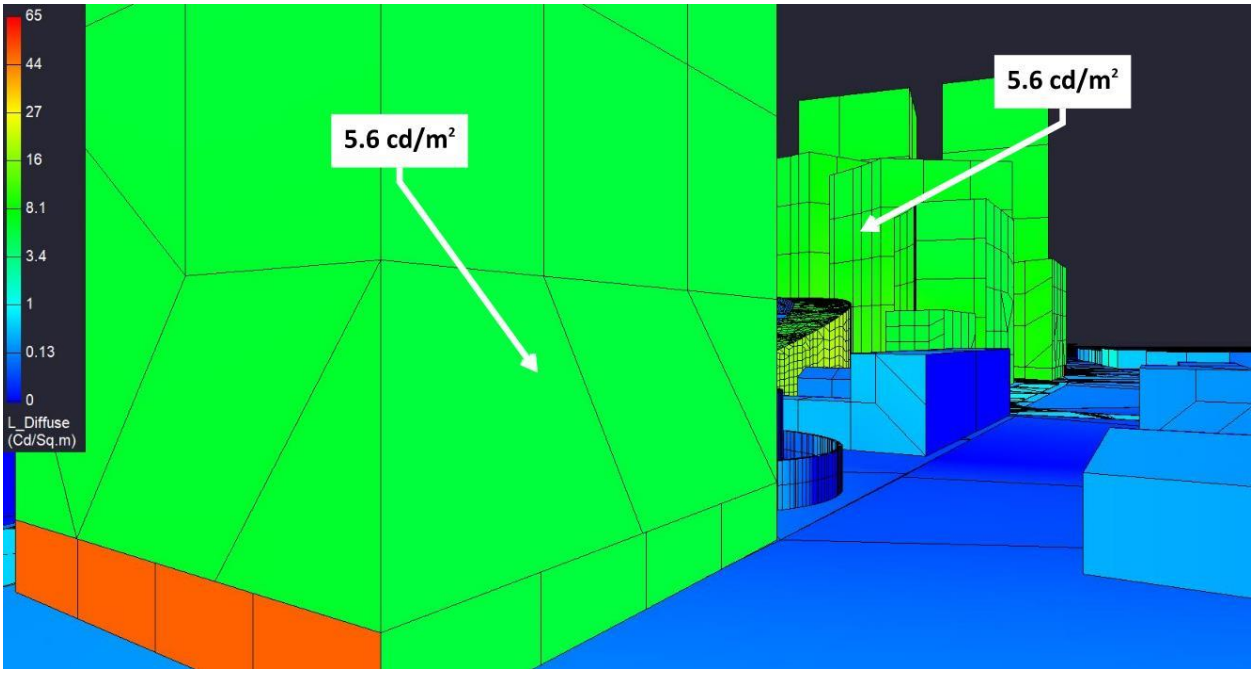




Baseline Project, Baseline Ballpark “Full Buildout” Scenario Non-Game Nights Pre-Curfew

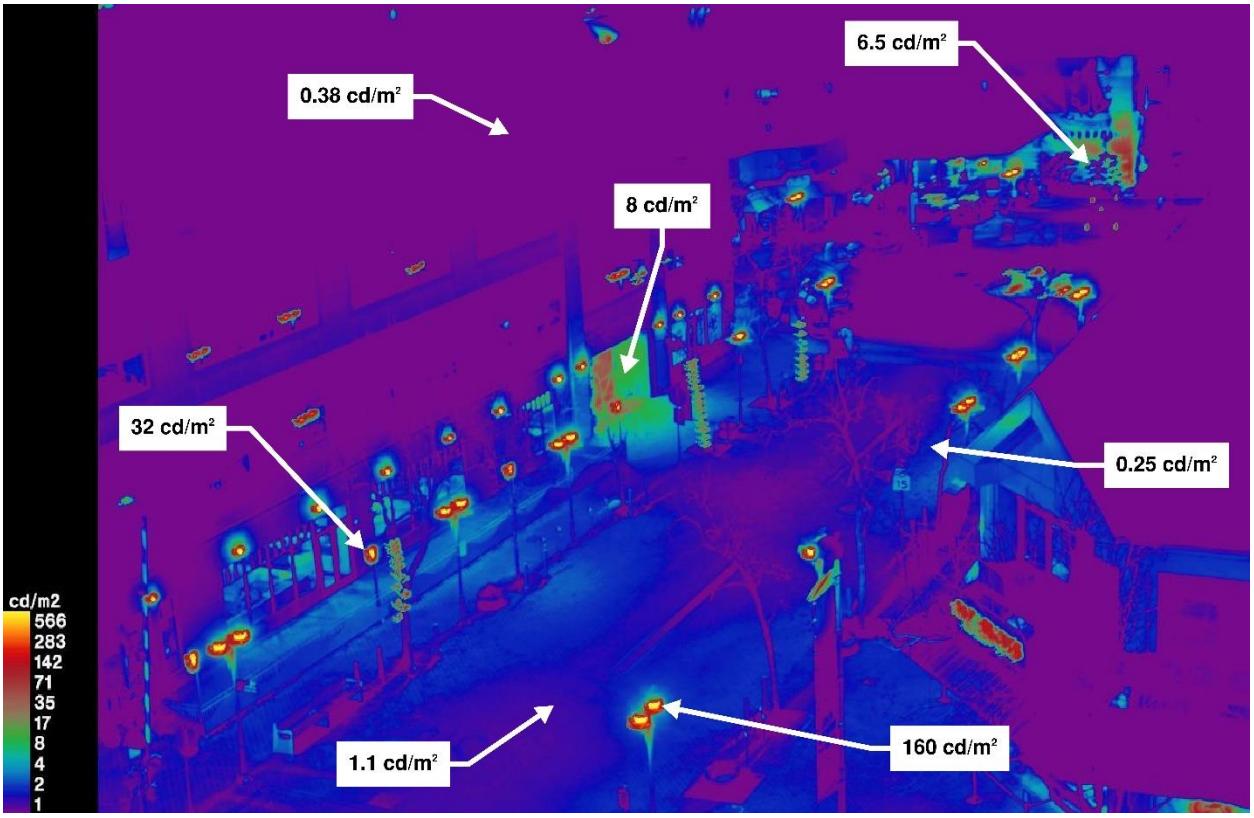
Receptor Site 5A - 2nd at Washington (Facing Stadium)

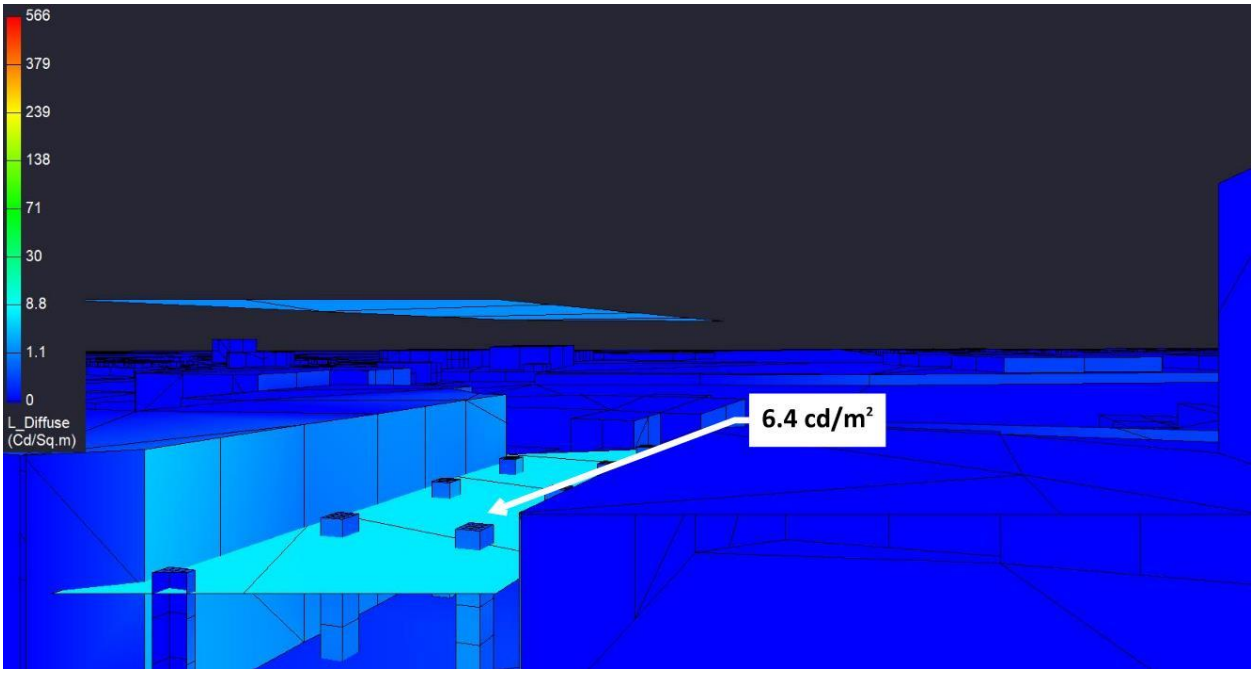




Baseline Project, Baseline Ballpark “Full Buildout” Scenario Non-Game Nights Pre-Curfew

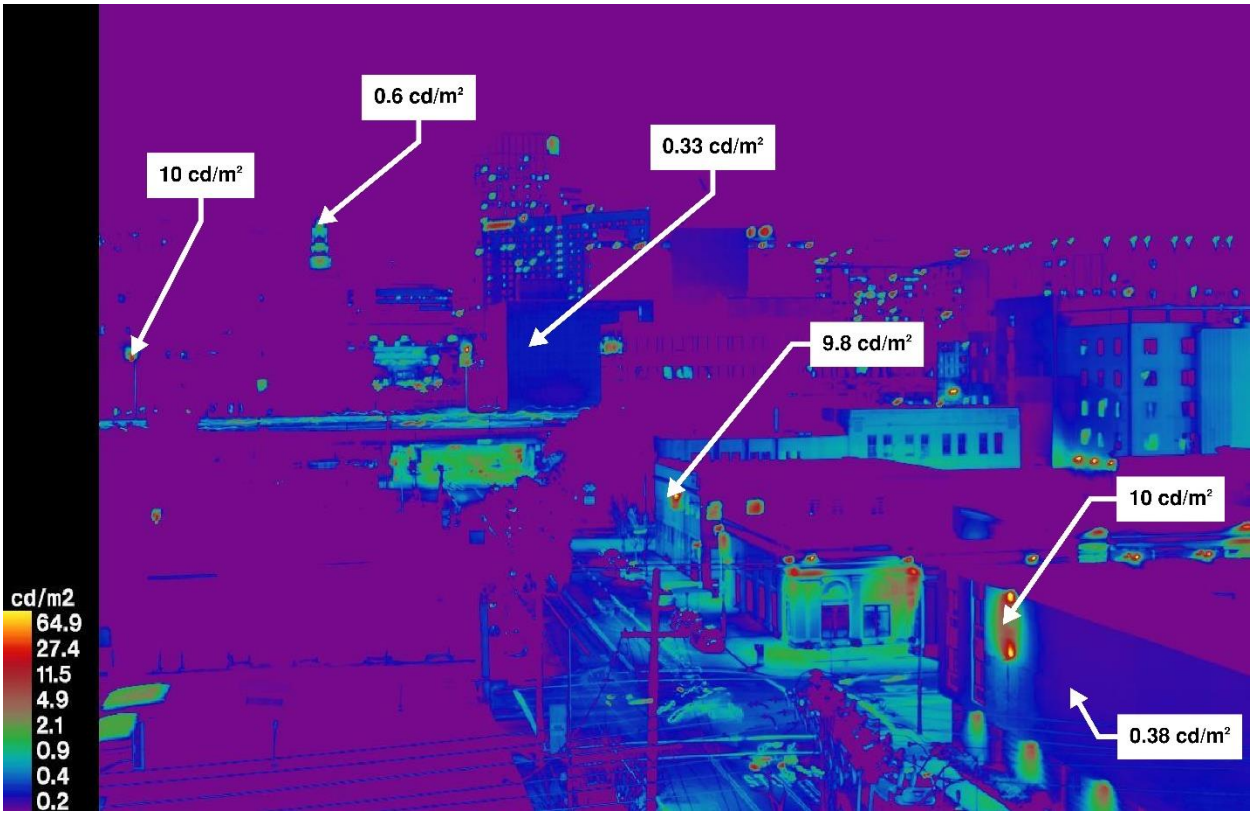
Receptor Site 5B - 2nd at Washington (Facing JLS Station)

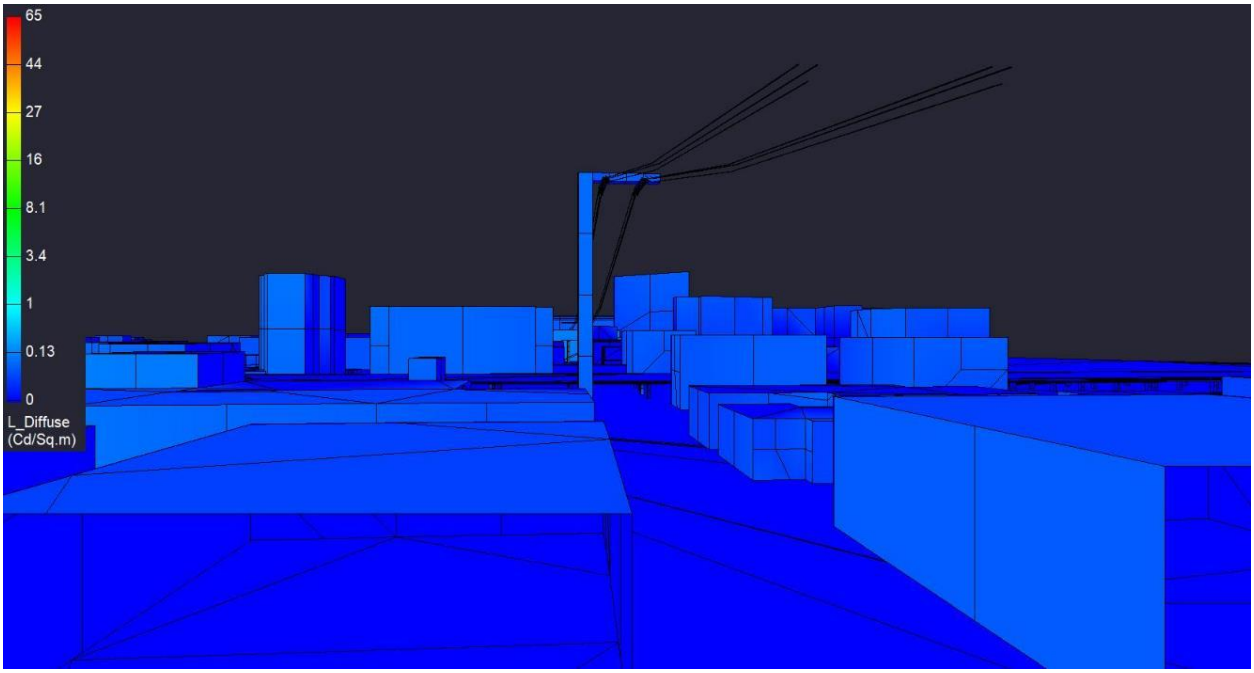




Baseline Project, Baseline Ballpark “Full Buildout” Scenario Non-Game Nights Pre-Curfew

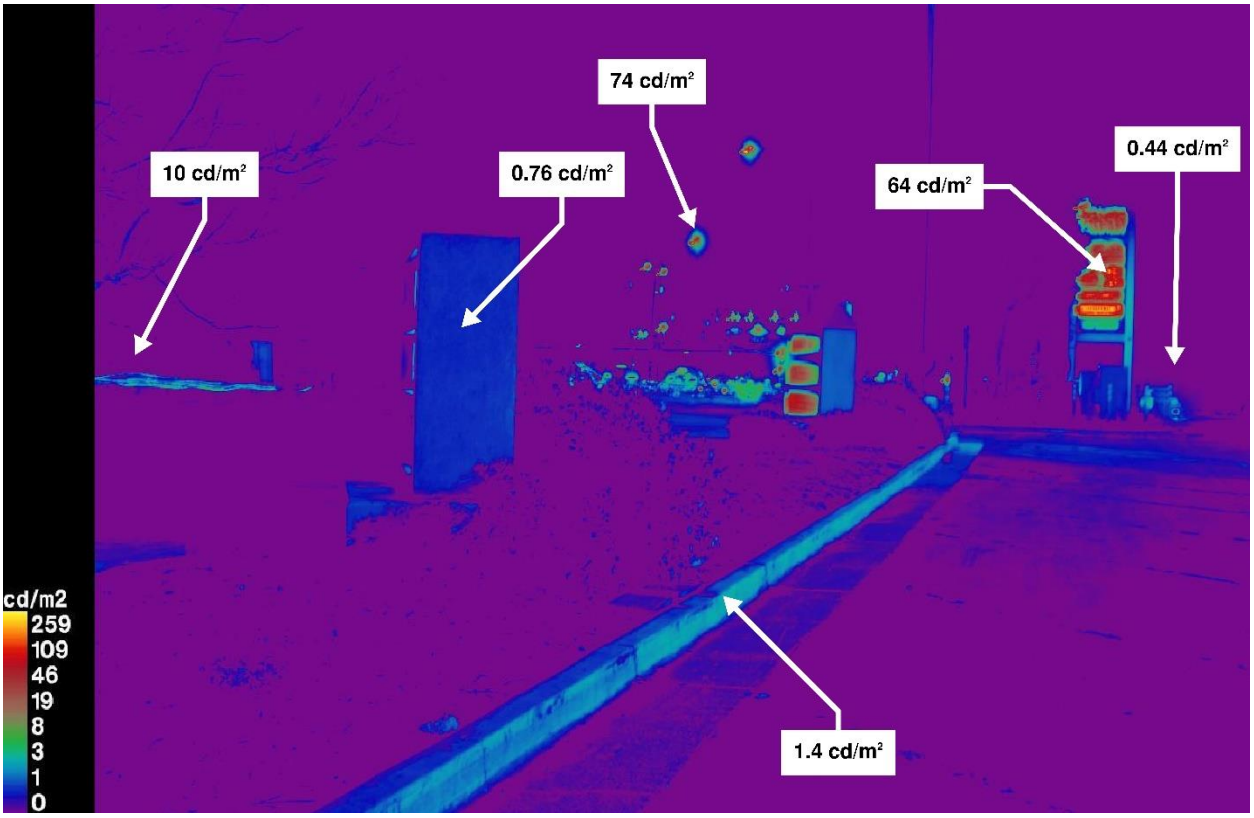
Receptor Site 5C - 2nd at Washington (Facing Convention Center Station)

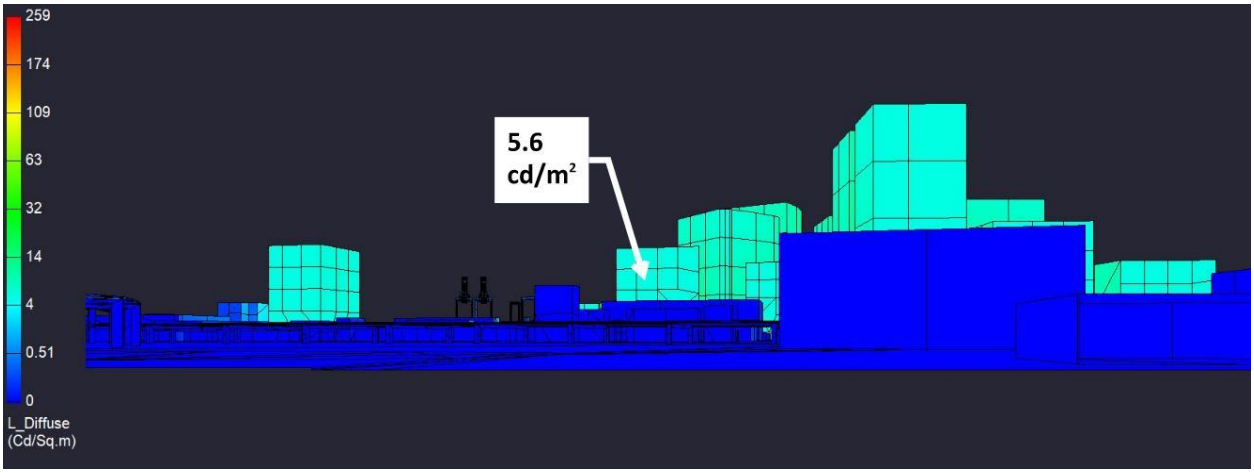




Baseline Project, Baseline Ballpark “Full Buildout” Scenario Non-Game Nights Pre-Curfew

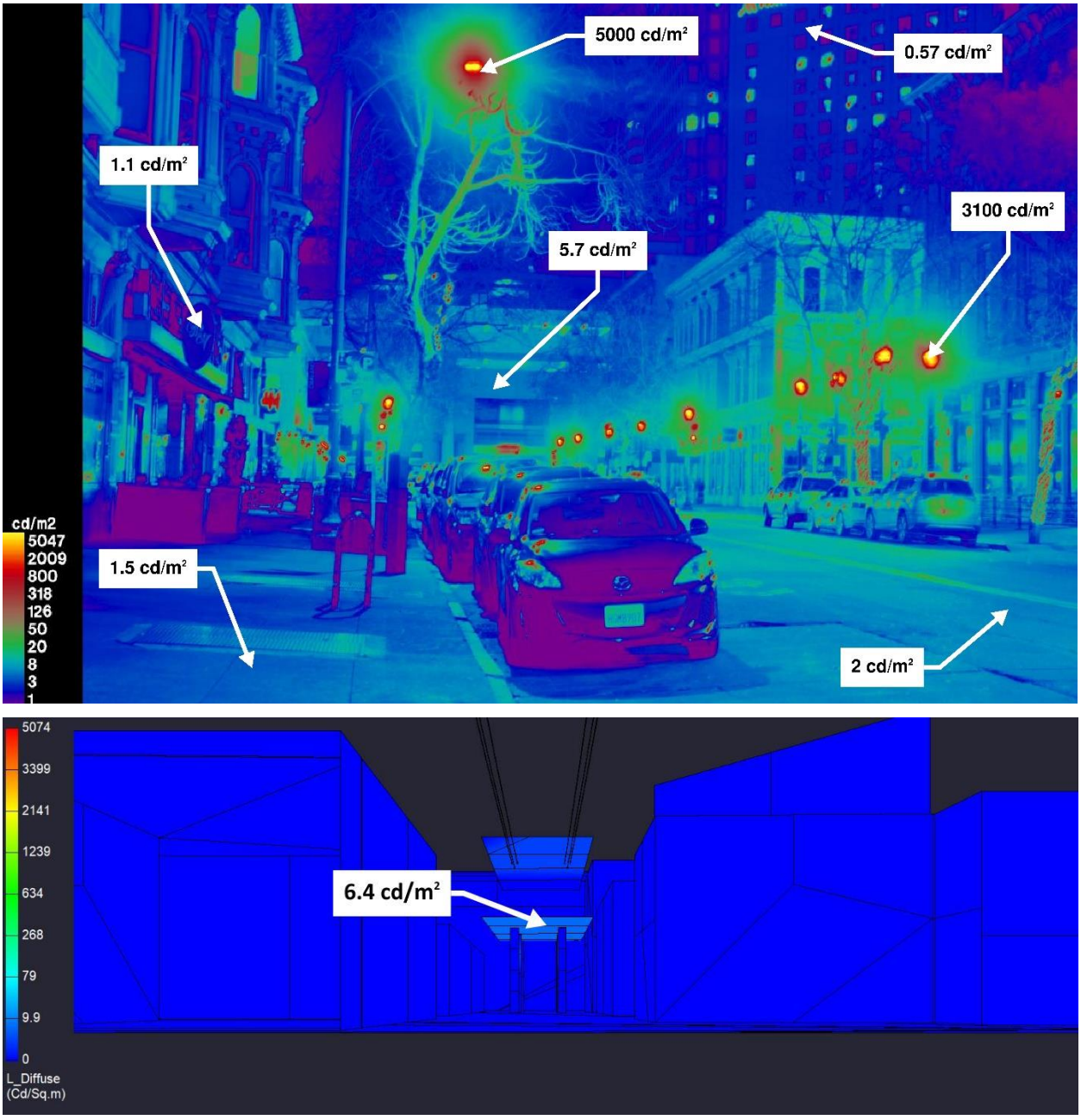
Receptor Site 6A - 7th at Brush





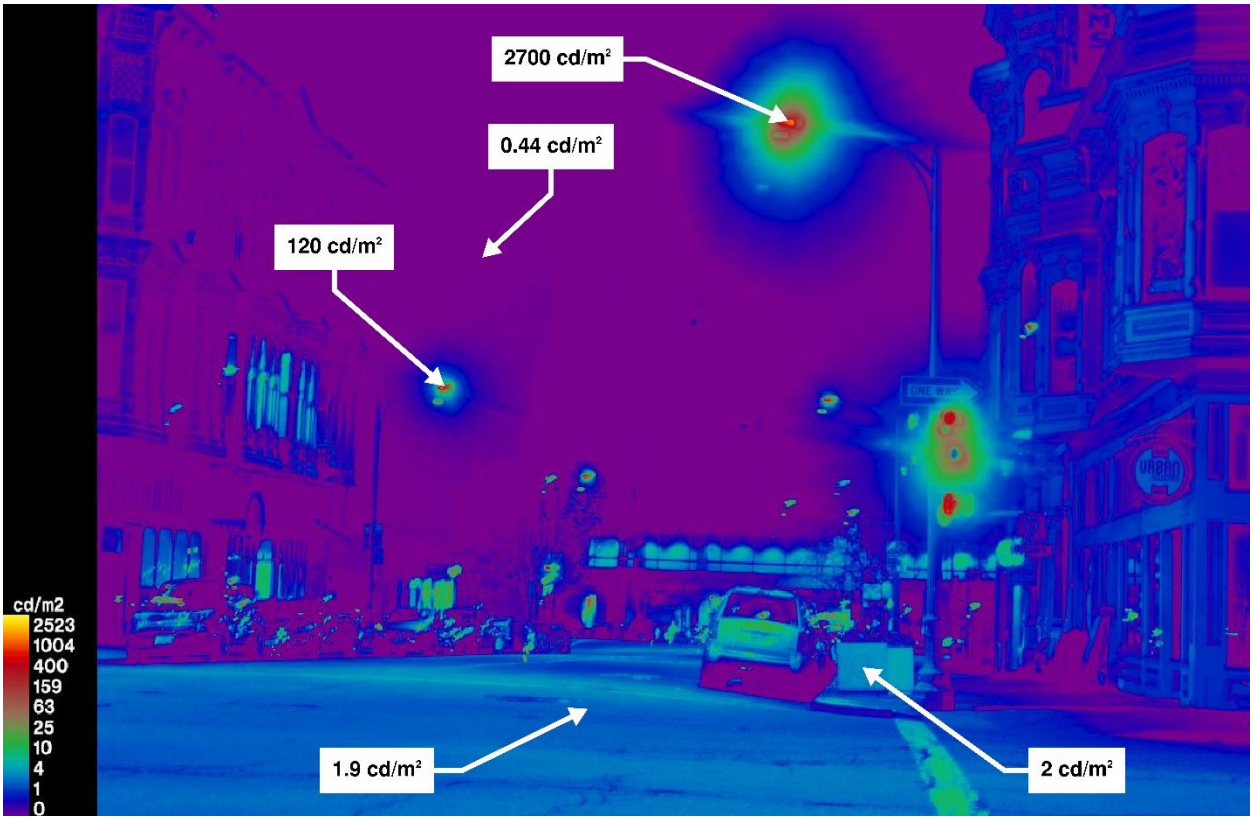
Baseline Project, Baseline Ballpark “Full Buildout” Scenario Non-Game Nights Pre-Curfew

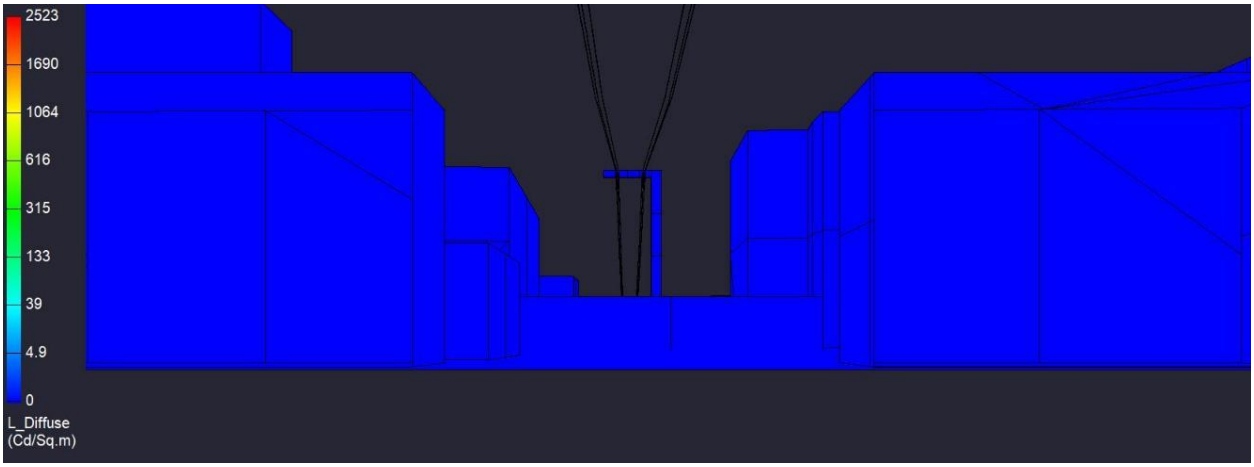
Receptor Site 7 - 8th at Washington (Facing Convention Center Station)



Baseline Project, Baseline Ballpark “Full Buildout” Scenario Non-Game Nights Pre-Curfew

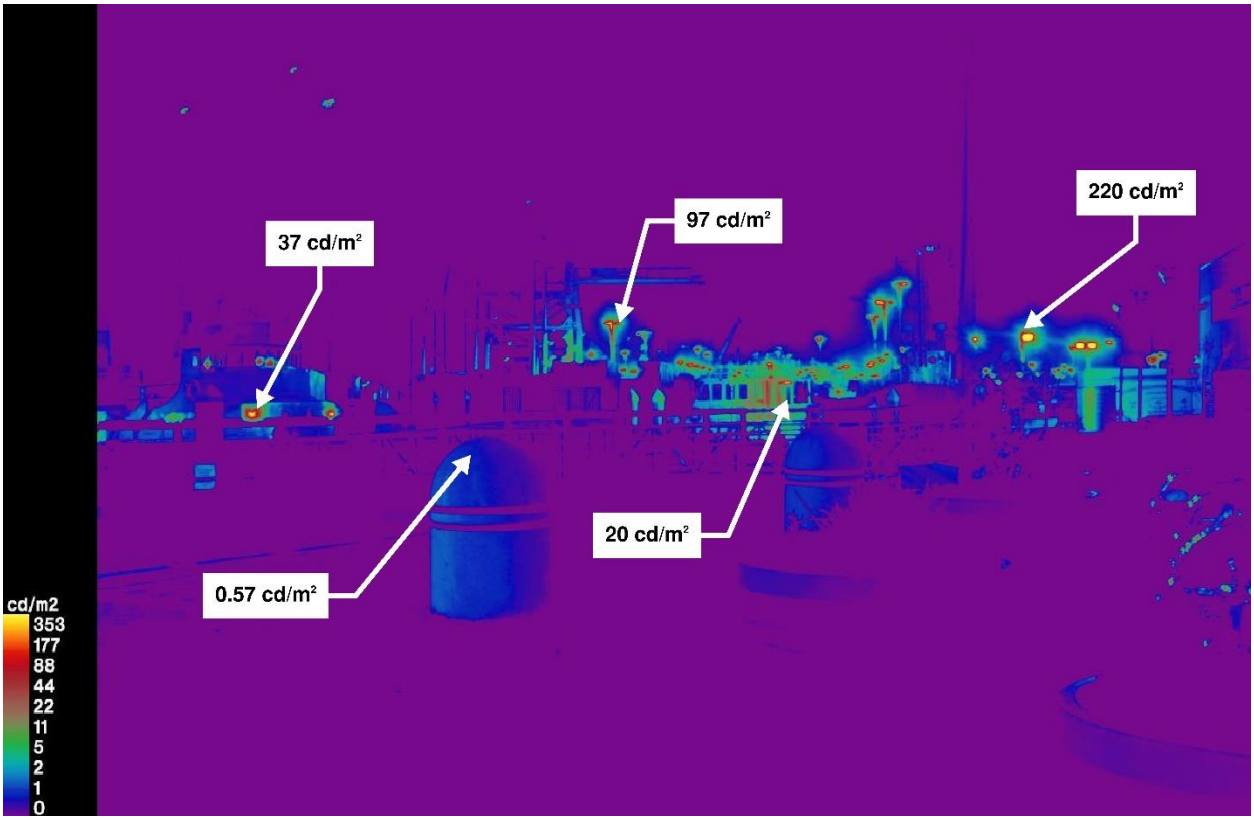
Receptor Site 7A - 8th at Washington (Facing Tower)

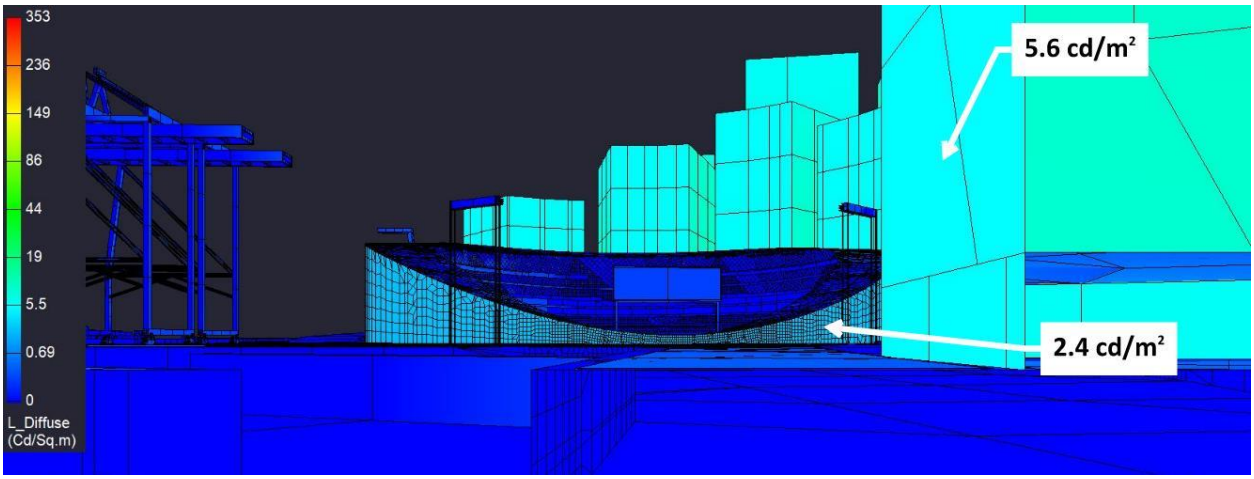




Baseline Project, Baseline Ballpark “Full Buildout” Scenario Post-Curfew

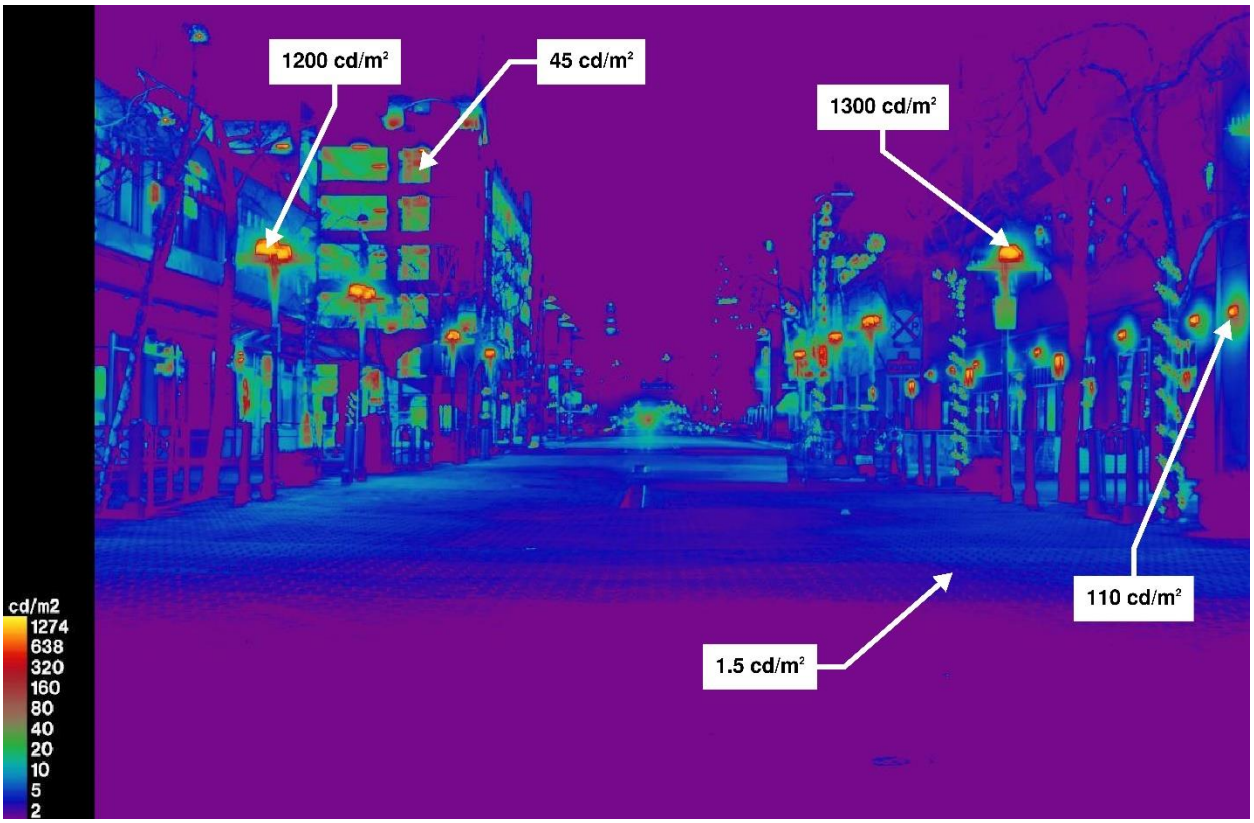
Receptor Site 1 - Water Street at Clay (Facing Ballpark)

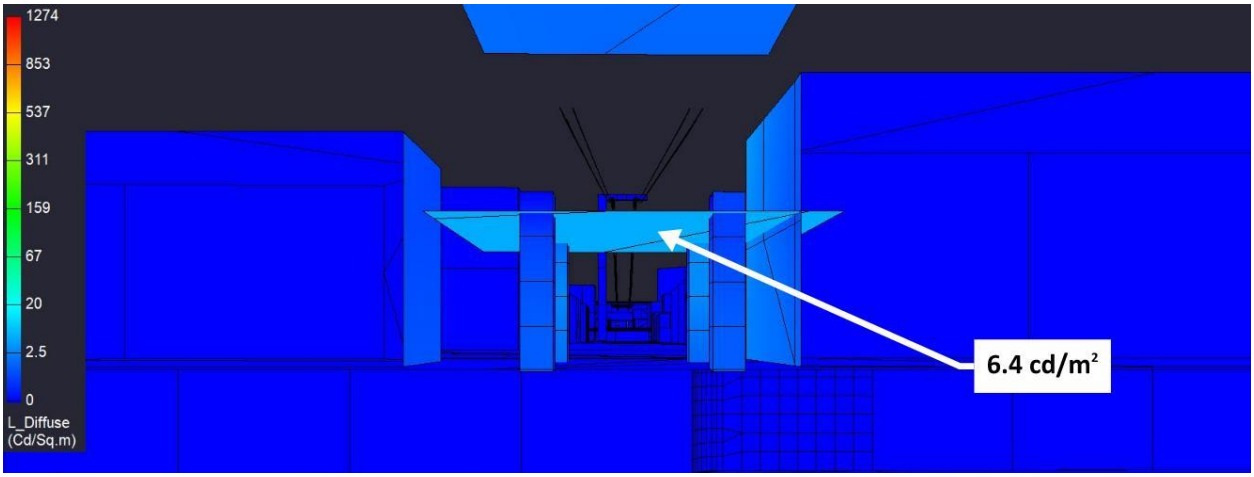




Baseline Project, Baseline Ballpark “Full Buildout” Scenario Post-Curfew

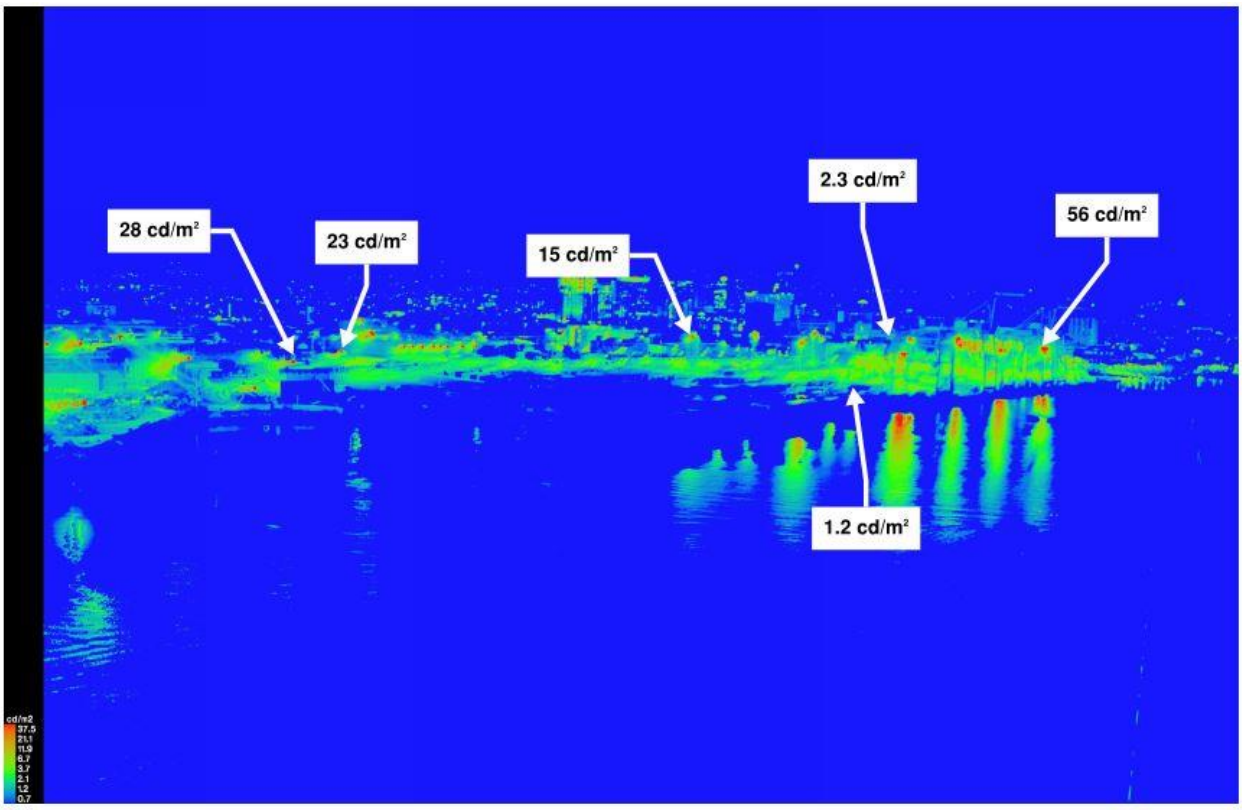
Receptor Site 1A - Water Street at Washington (Facing Gondola)

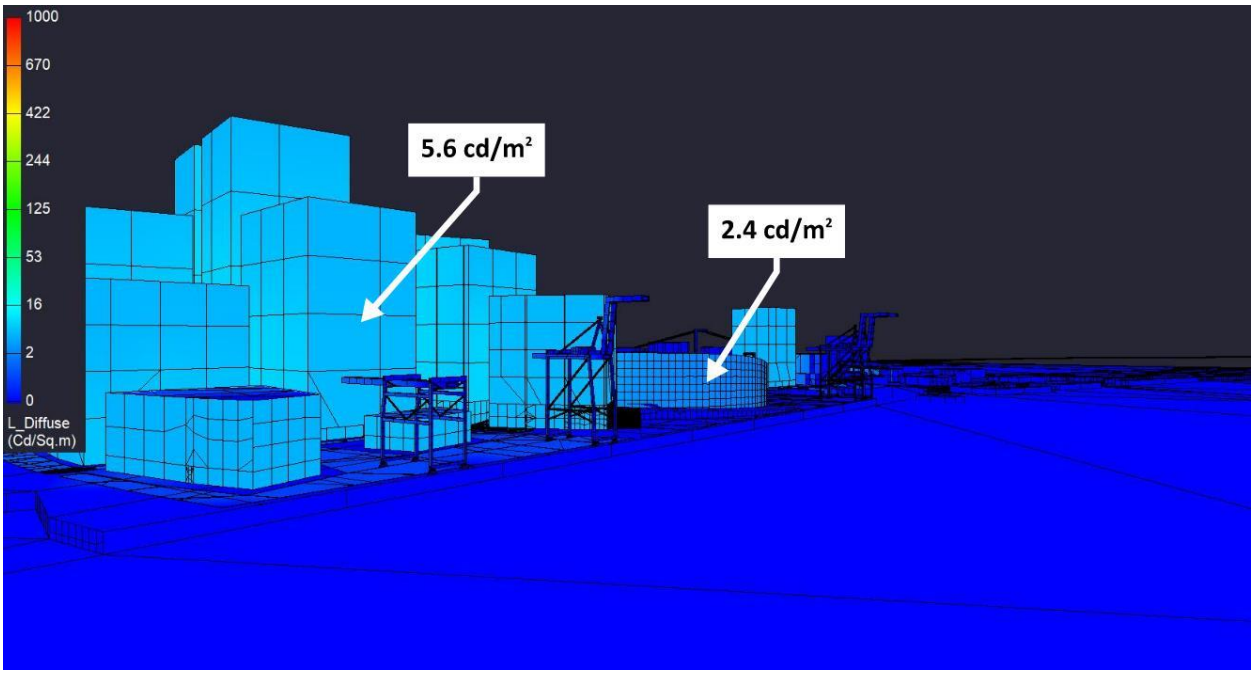




Baseline Project, Baseline Ballpark “Full Buildout” Scenario Post-Curfew

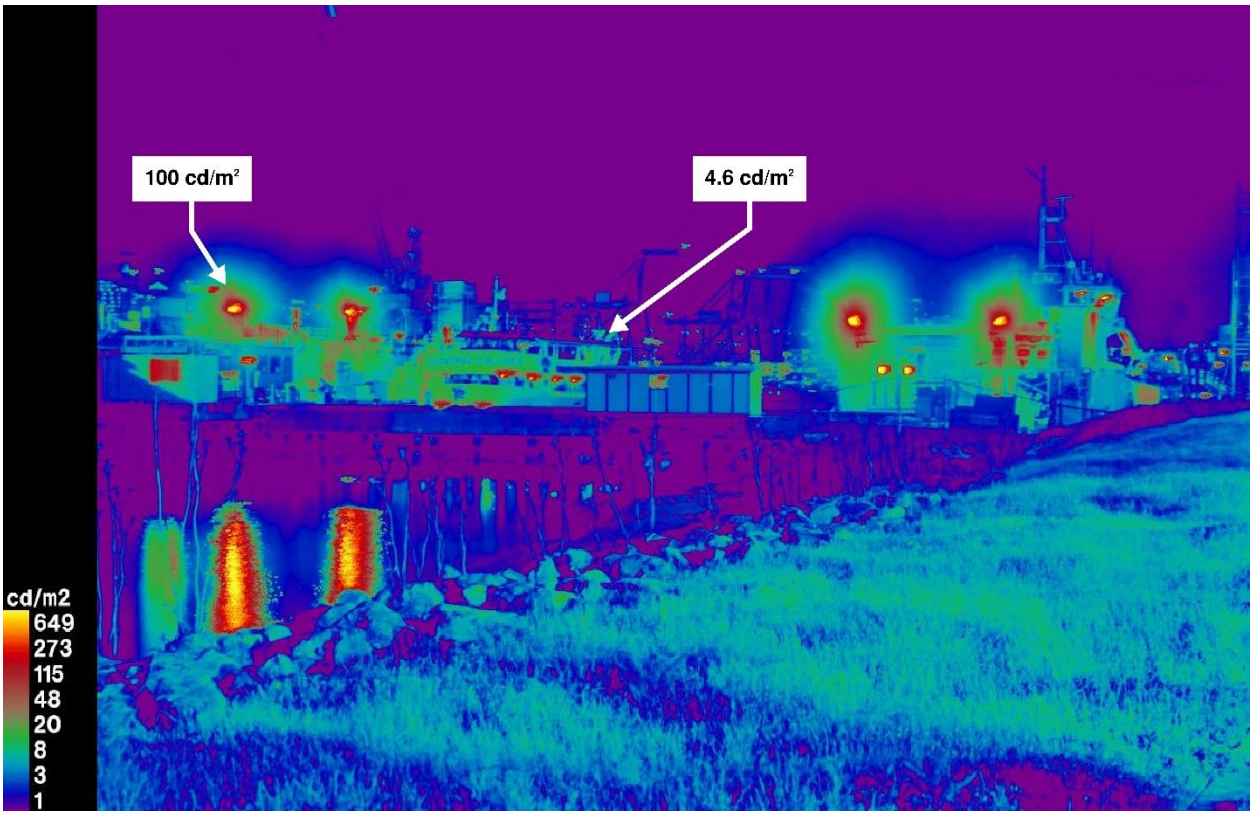
Receptor Site 2 - Inner Harbor Turning Basin @ 190'

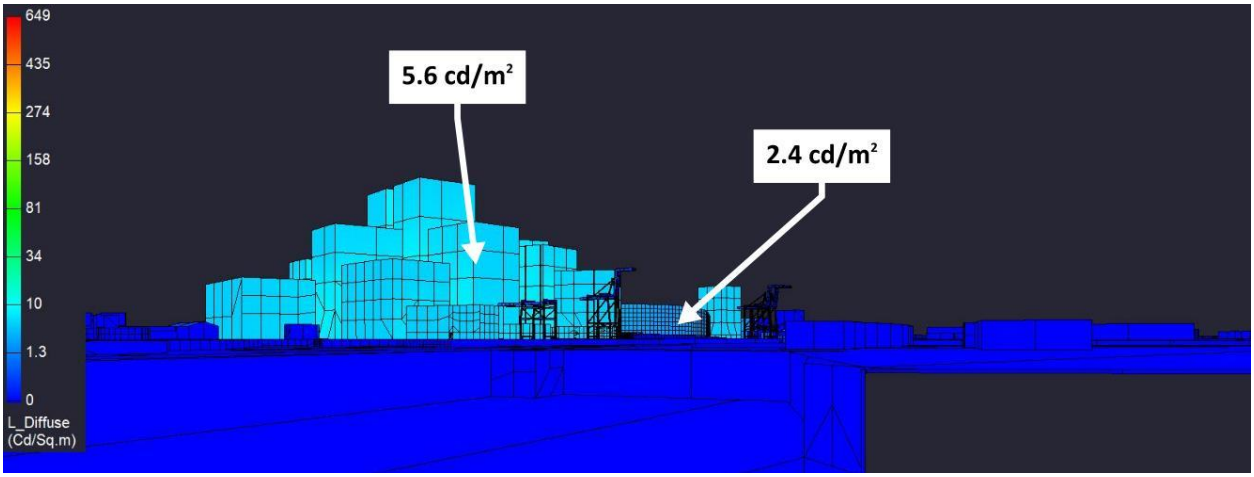




Baseline Project, Baseline Ballpark “Full Buildout” Scenario Post-Curfew

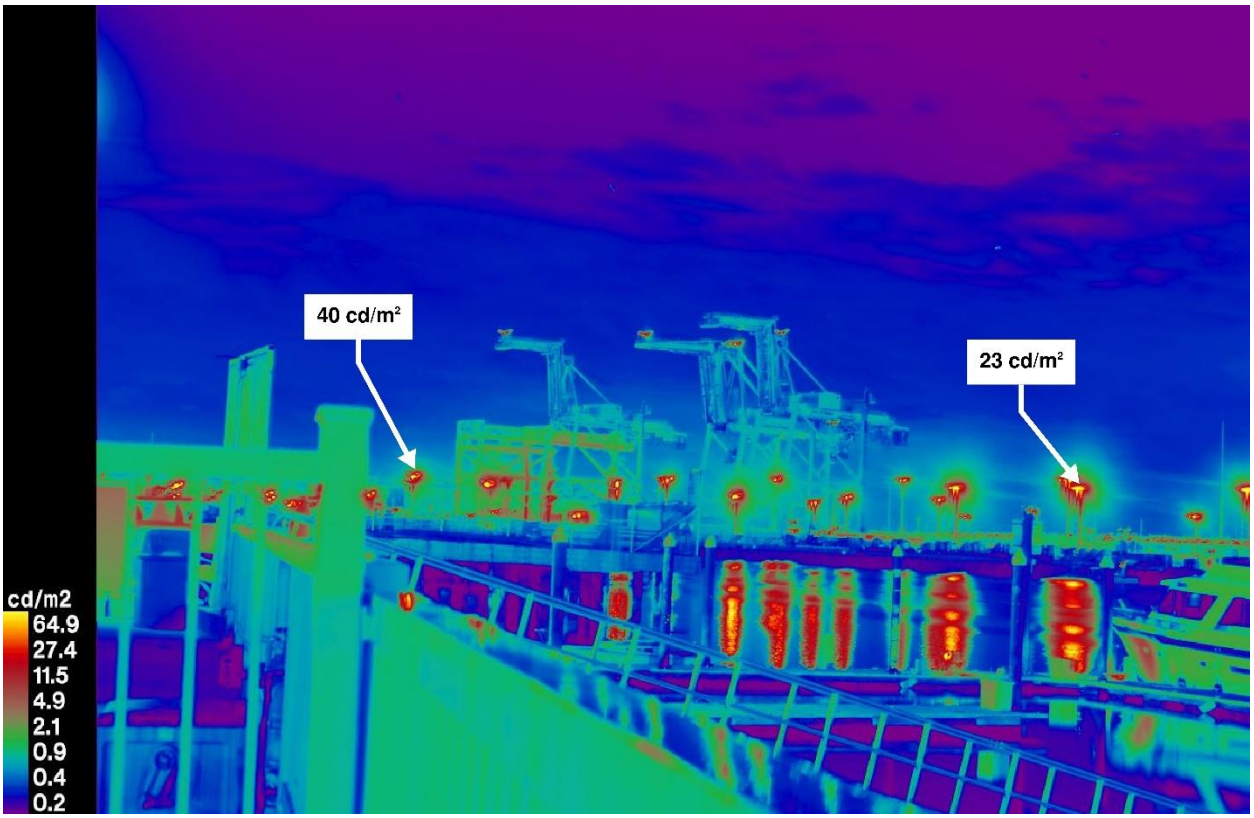
Receptor Site 2A - Turning Basin Line-of-Sight

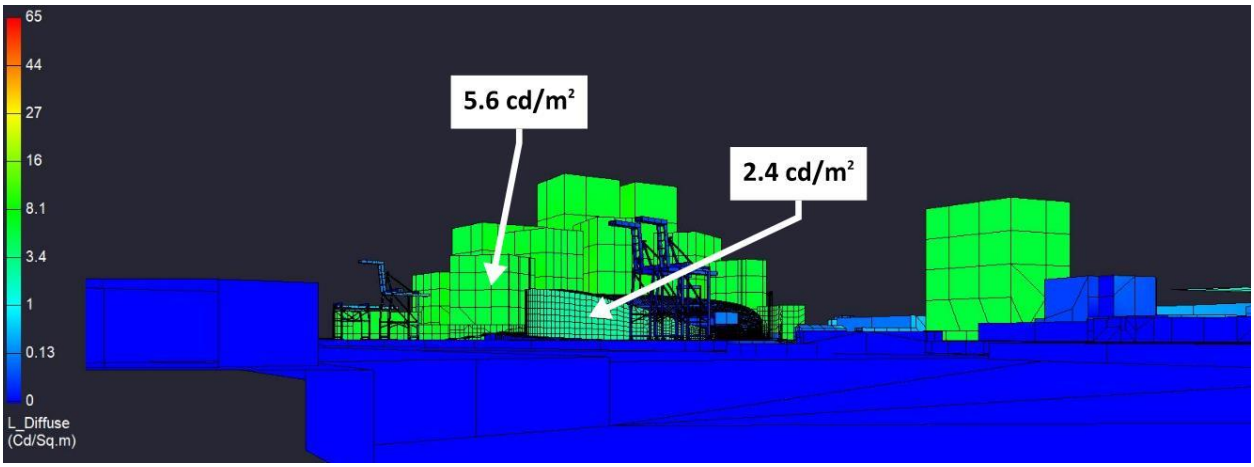




Baseline Project, Baseline Ballpark “Full Buildout” Scenario Post-Curfew

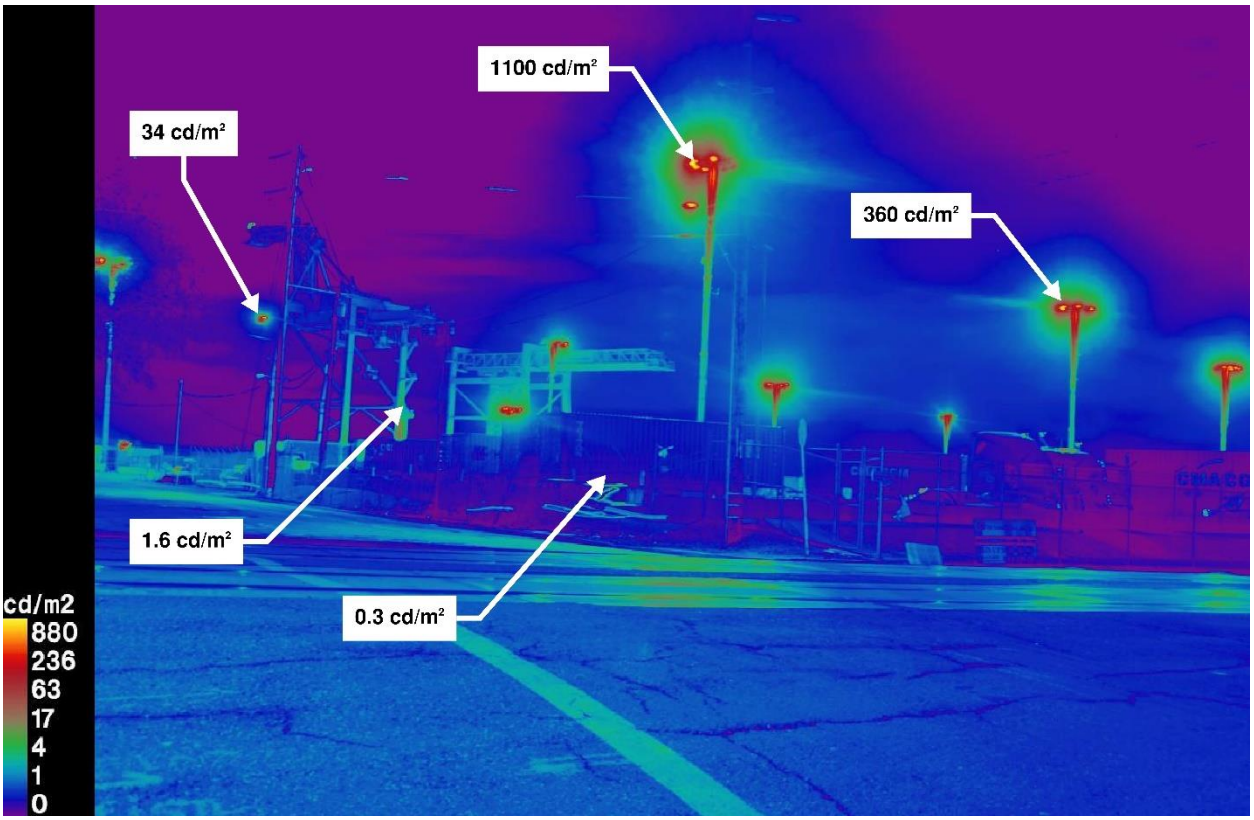
Receptor Site 3 - Alameda Dock

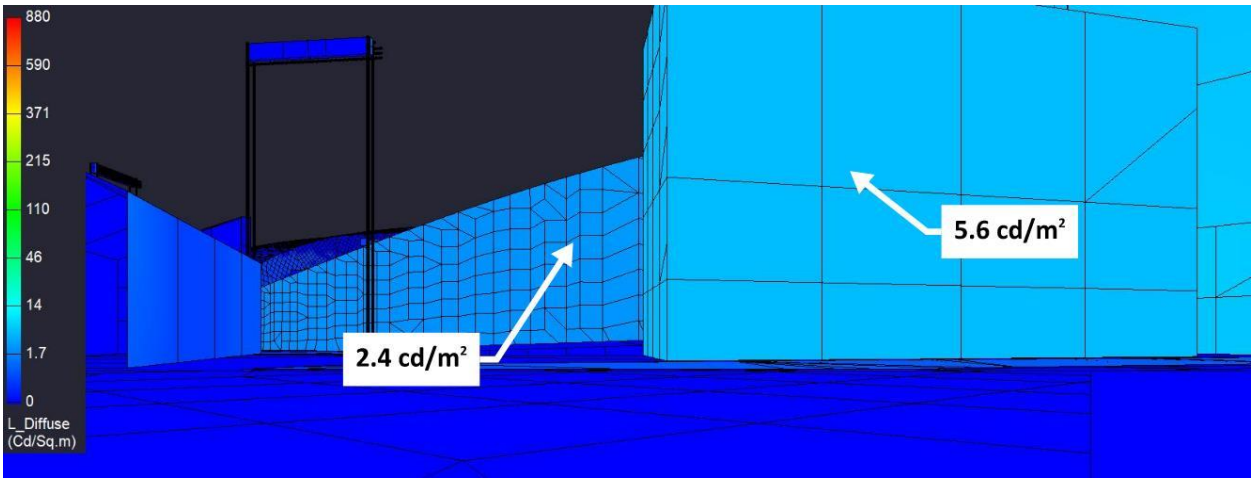




Baseline Project, Baseline Ballpark “Full Buildout” Scenario Post-Curfew

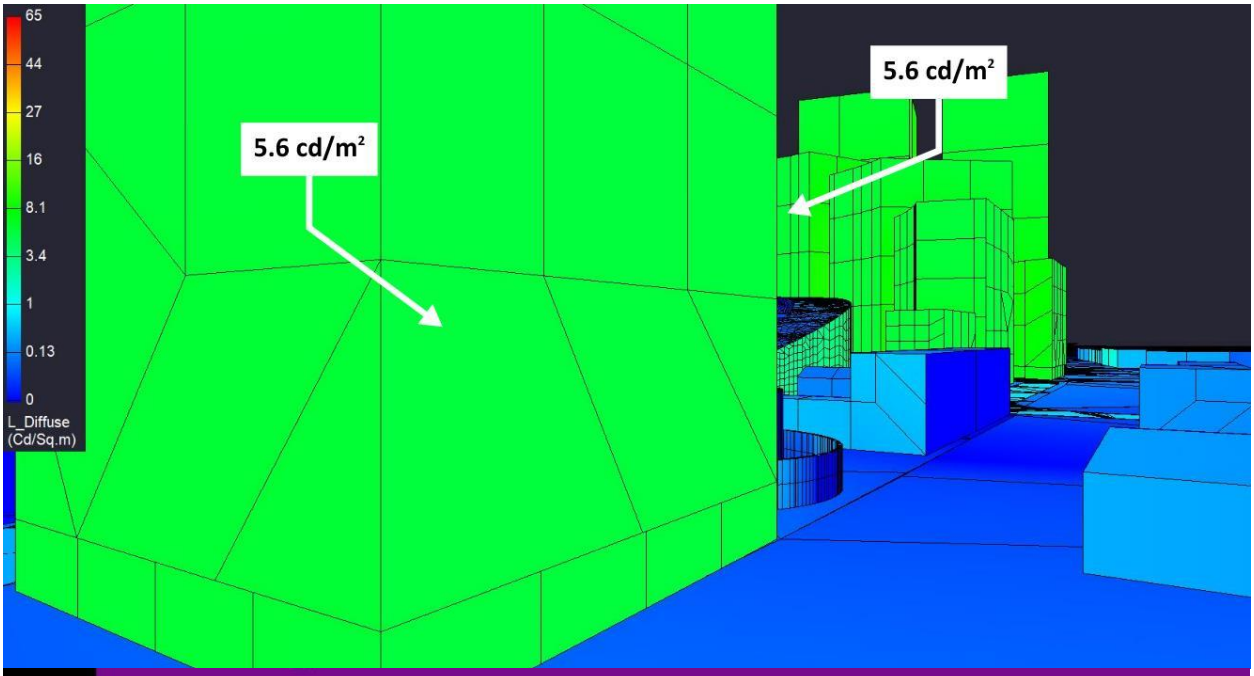
Receptor Site 4 - MLK at Embarcadero

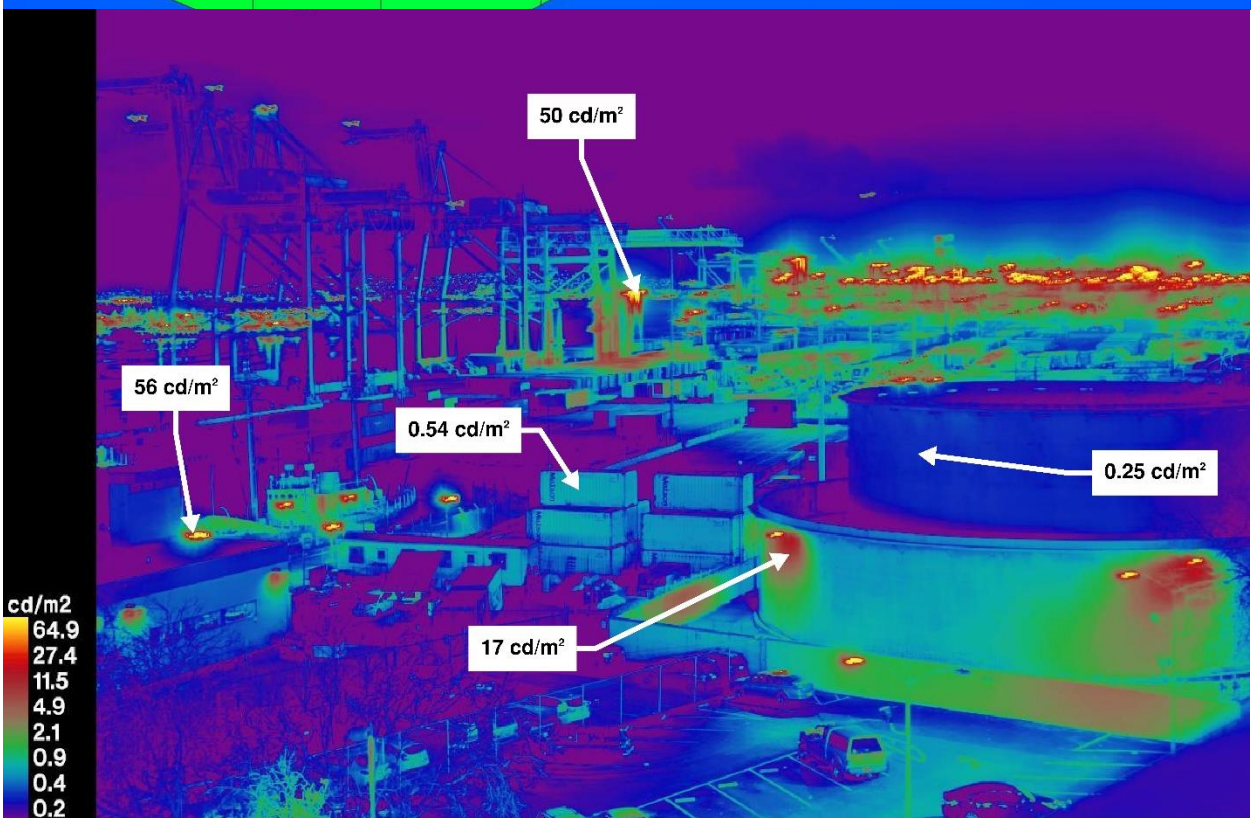




Baseline Project, Baseline Ballpark “Full Buildout” Scenario Post-Curfew

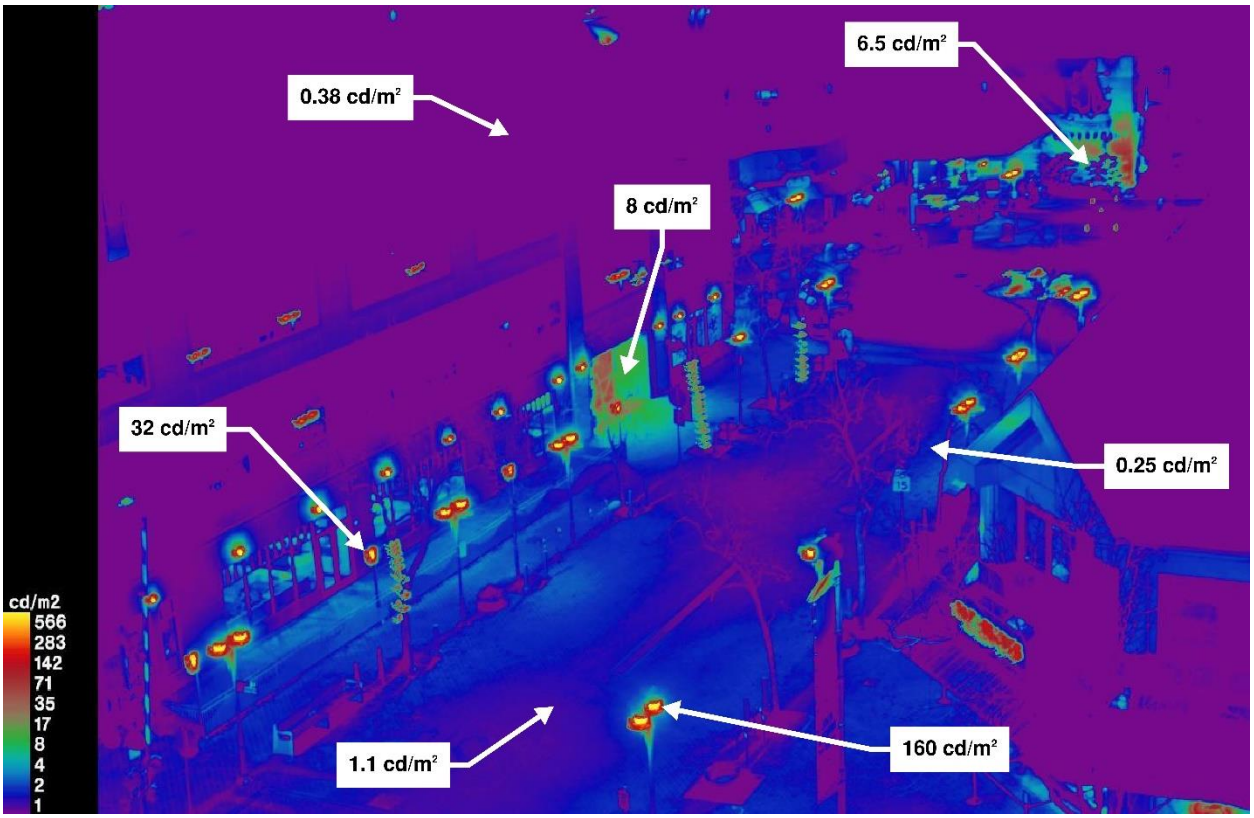
Receptor Site 5A - 2nd at Washington (Facing Stadium)

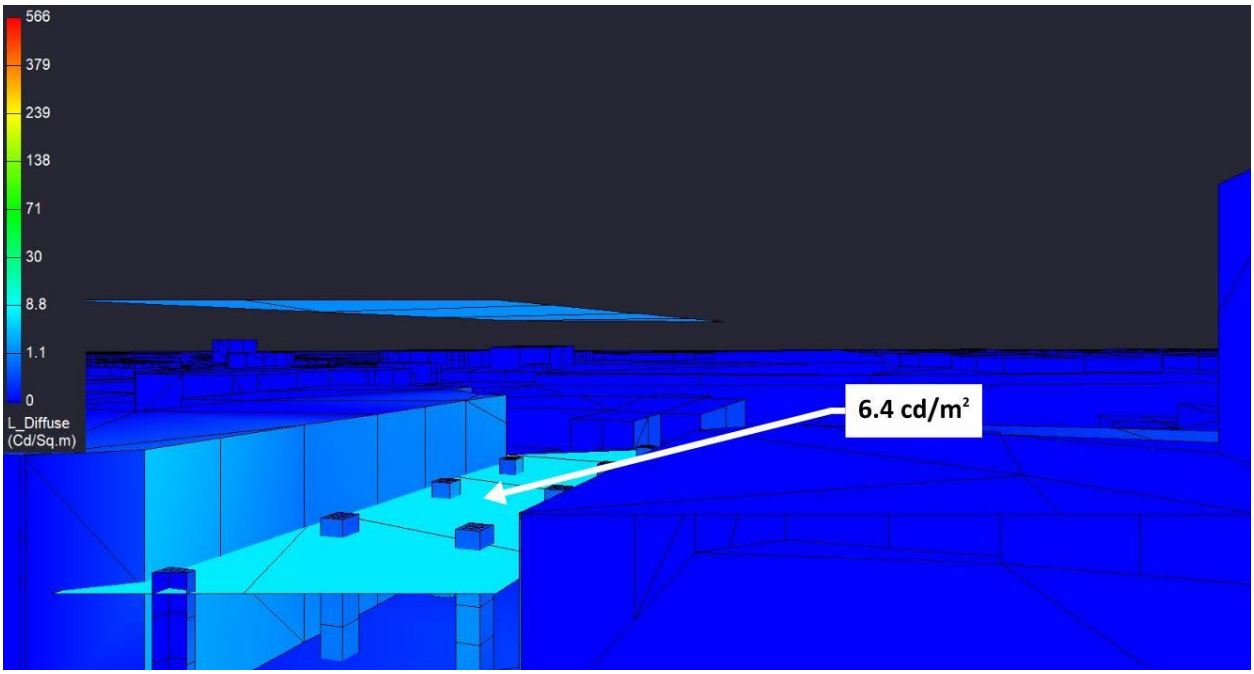




Baseline Project, Baseline Ballpark “Full Buildout” Scenario Post-Curfew

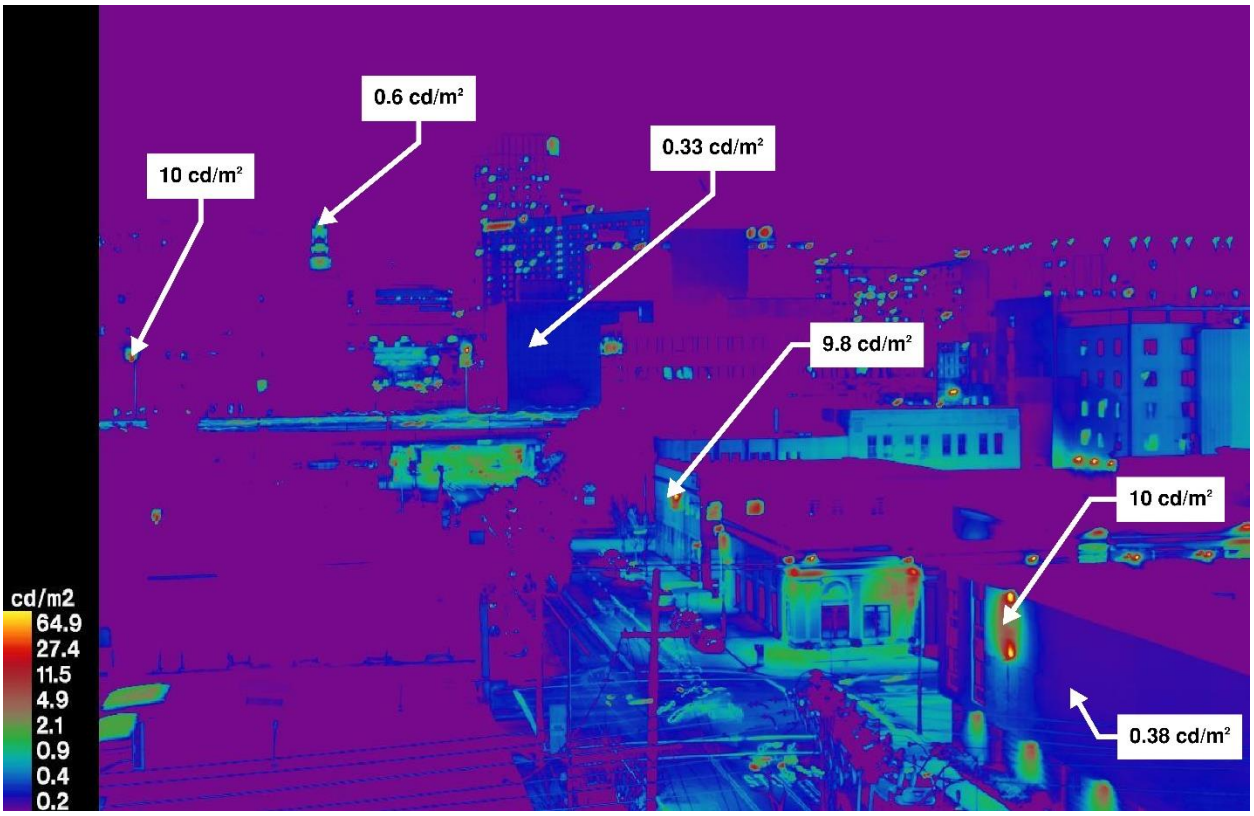
Receptor Site 5B - 2nd at Washington (Facing JLS Station)

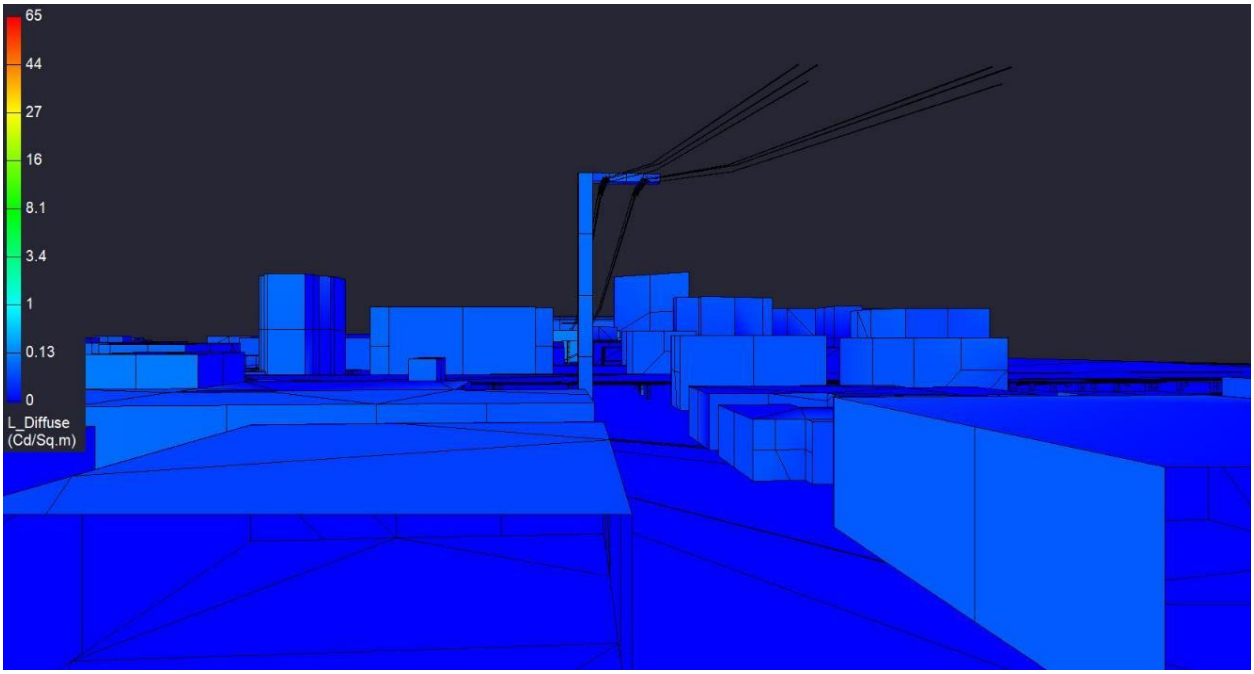




Baseline Project, Baseline Ballpark “Full Buildout” Scenario Post-Curfew

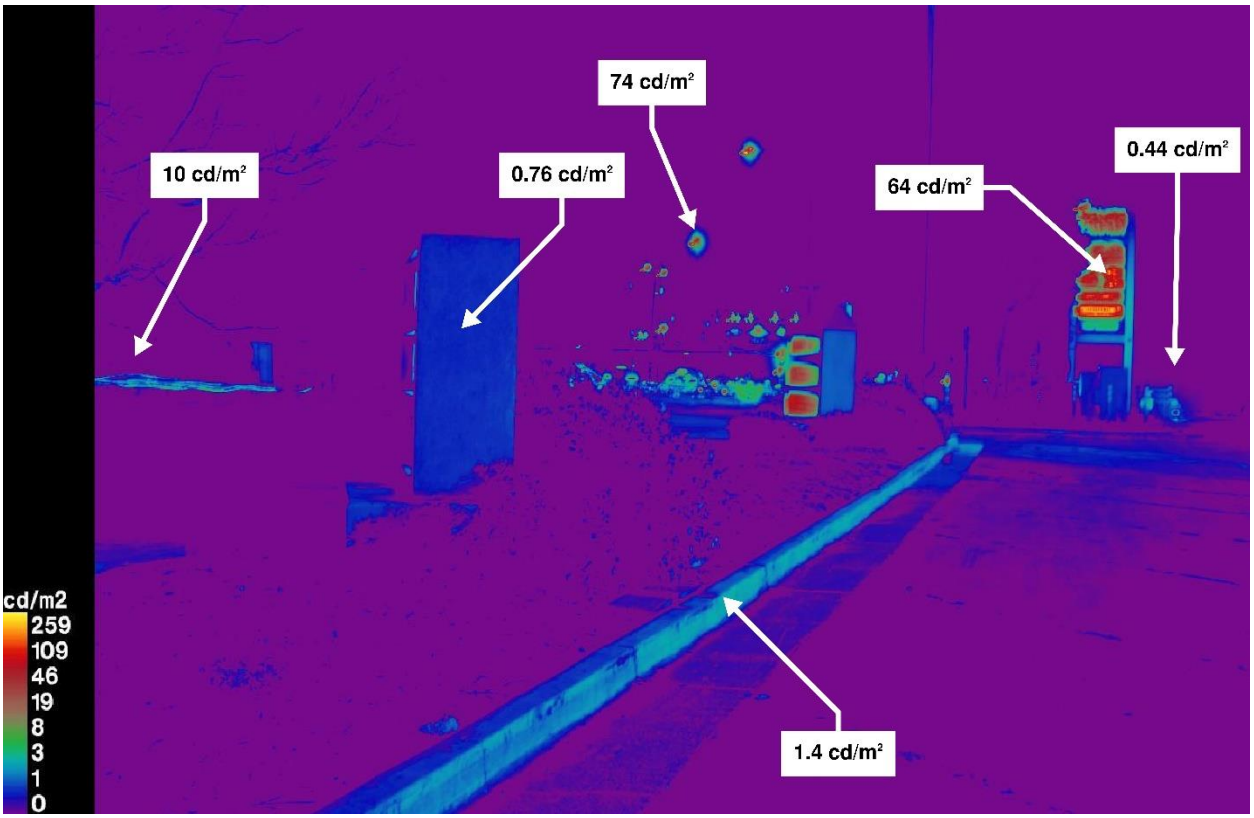
Receptor Site 5C - 2nd at Washington (Facing Convention Center Station)

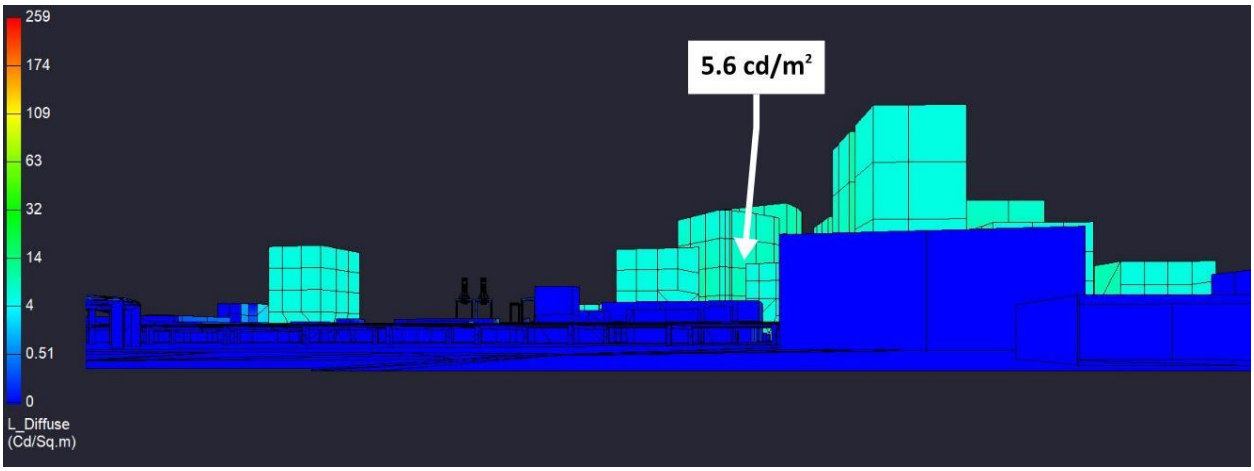




Baseline Project, Baseline Ballpark “Full Buildout” Scenario Post-Curfew

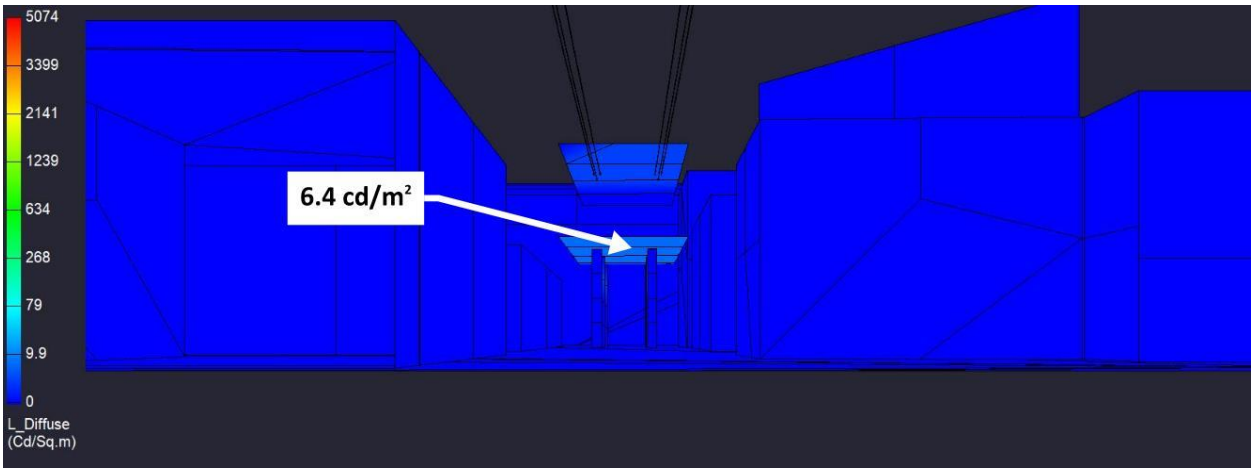
Receptor Site 6A - 7th at Brush





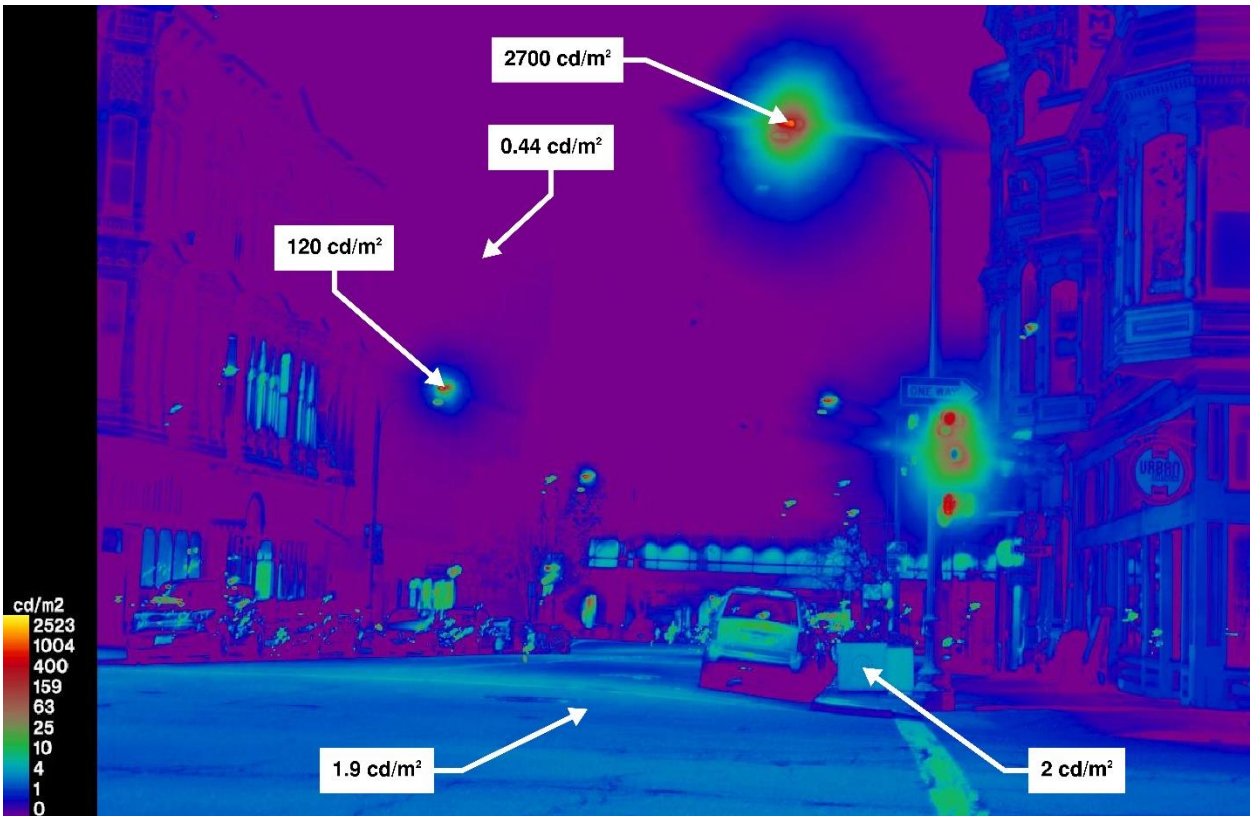
Baseline Project, Baseline Ballpark “Full Buildout” Scenario Post-Curfew

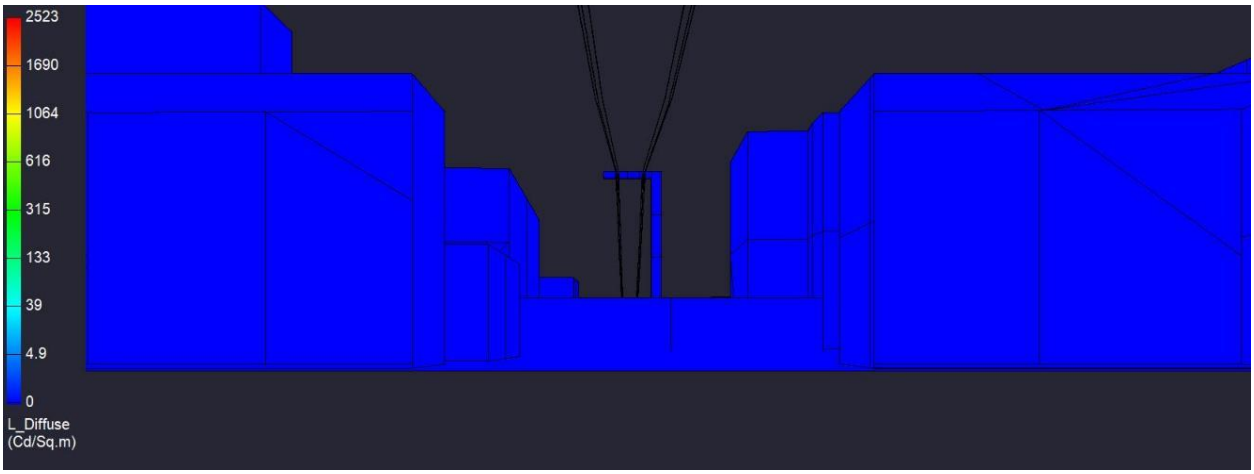
Receptor Site 7 - 8th at Washington (Facing Convention Center Station)



Baseline Project, Baseline Ballpark “Full Buildout” Scenario Post-Curfew

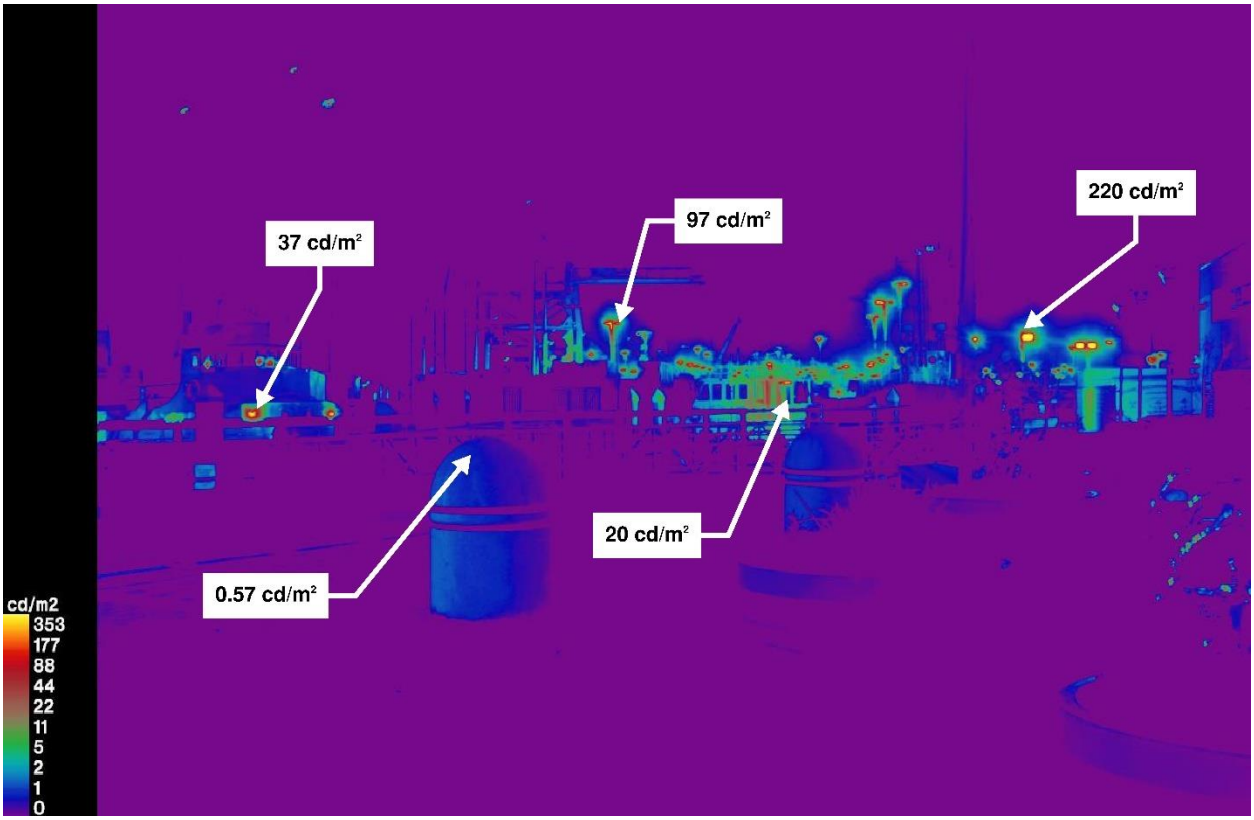
Receptor Site 7A - 8th at Washington (Facing Tower)

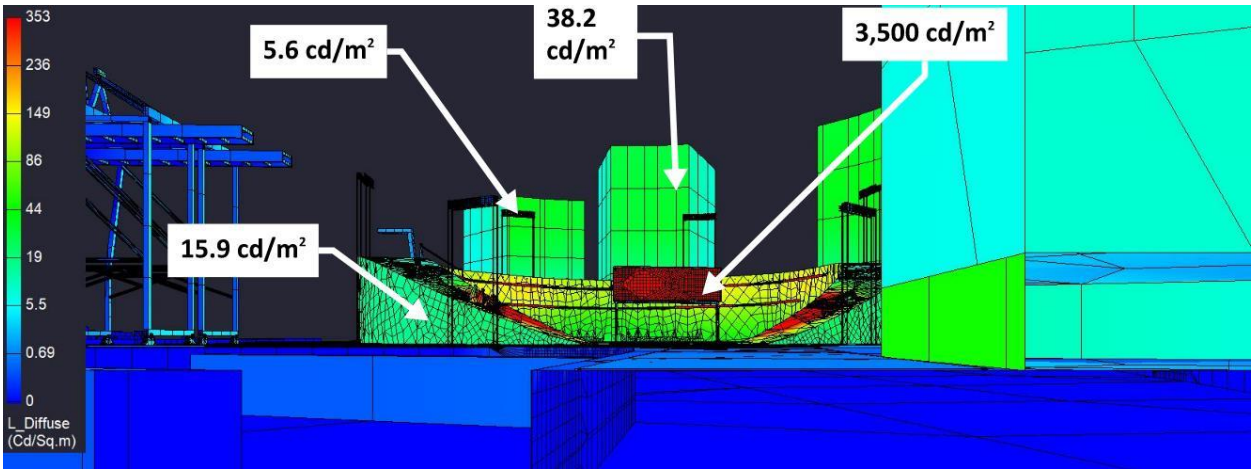




Baseline Project, Reduced Ballpark Height “Phase 1” Scenario Game Nights

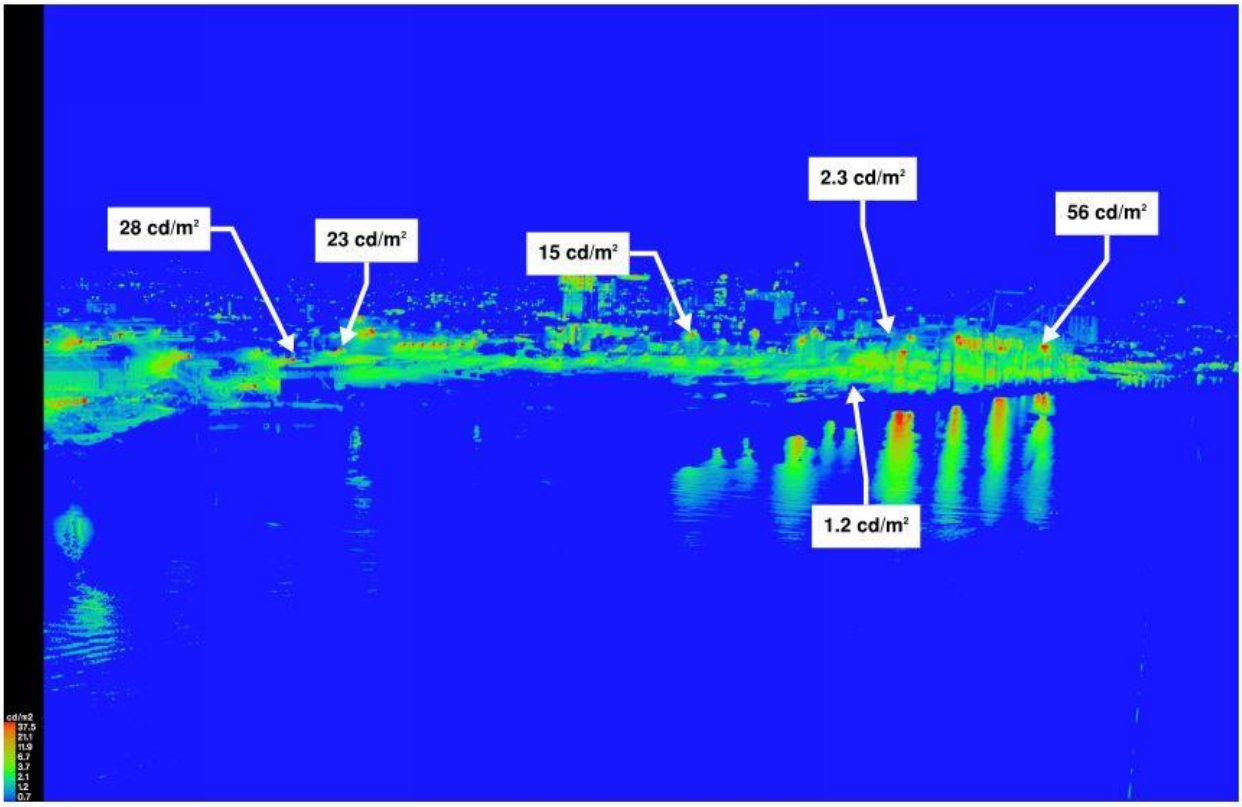
Receptor Site 1 - Water Street at Clay (Facing Ballpark)

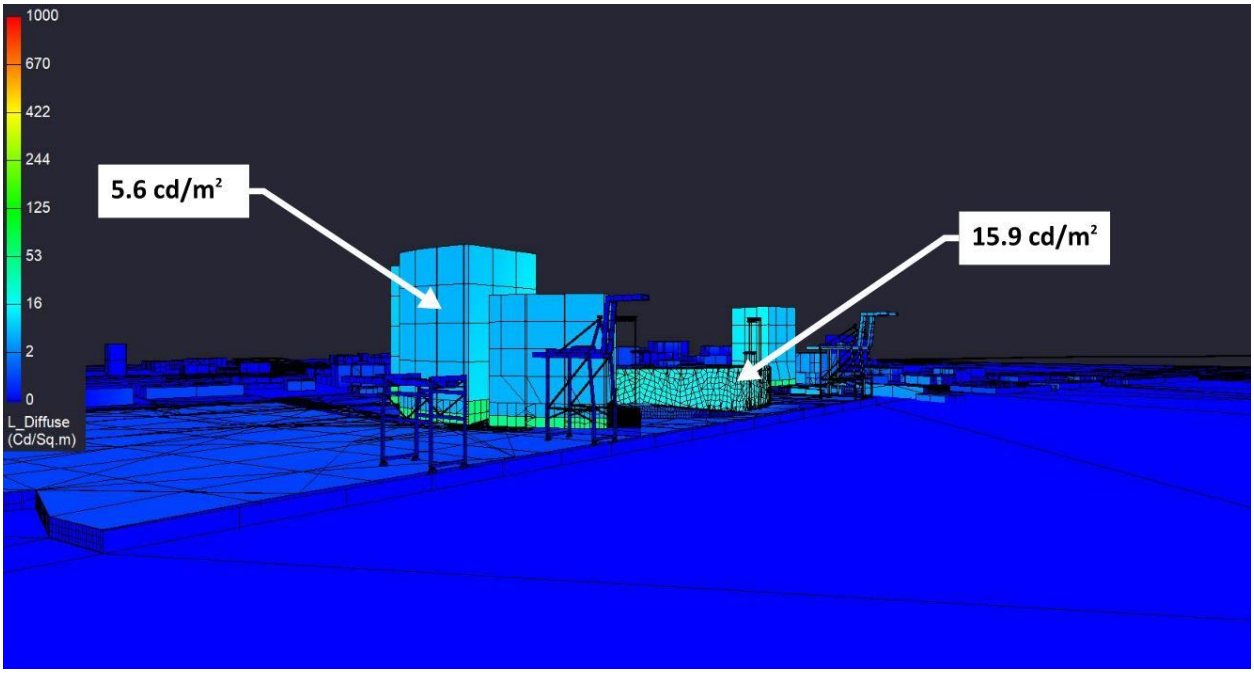




Baseline Project, Reduced Ballpark Height “Phase 1” Scenario Game Nights

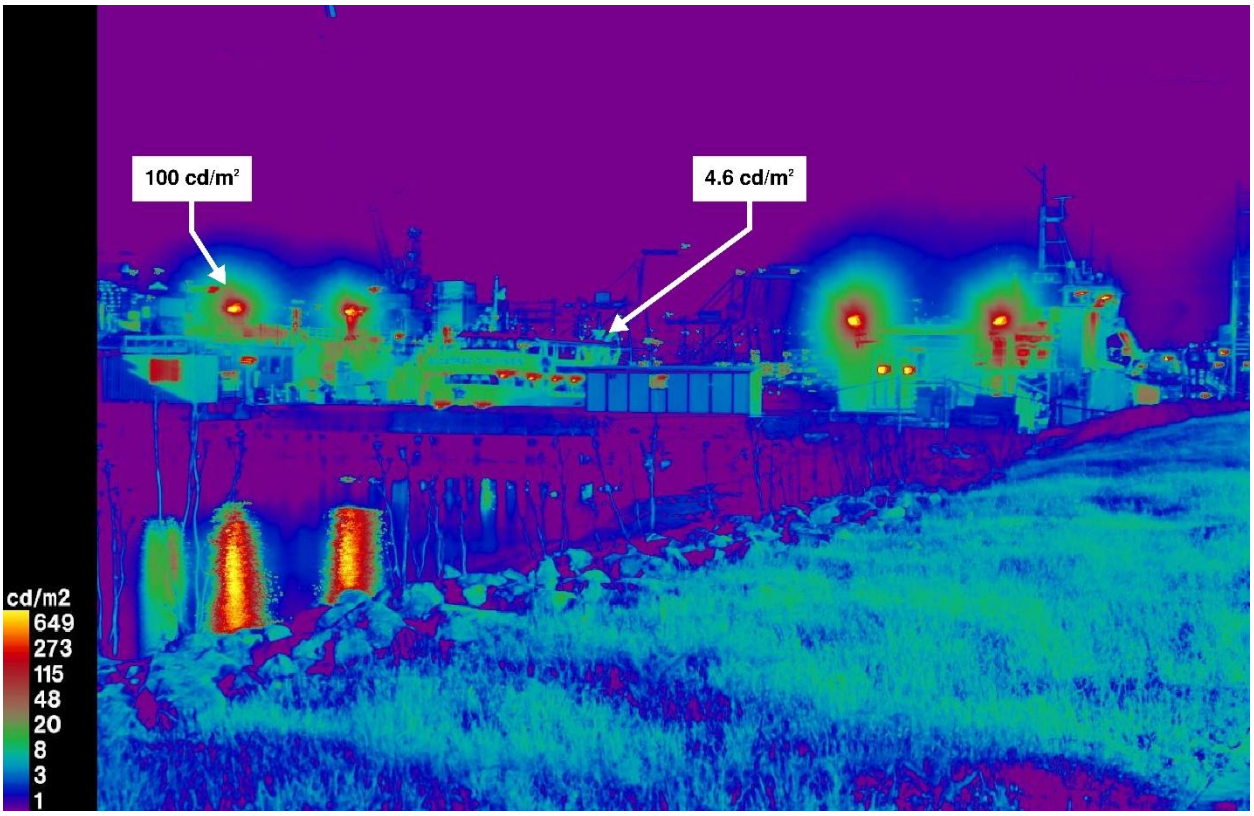
Receptor Site 2 - Inner Harbor Turning Basin @ 190'

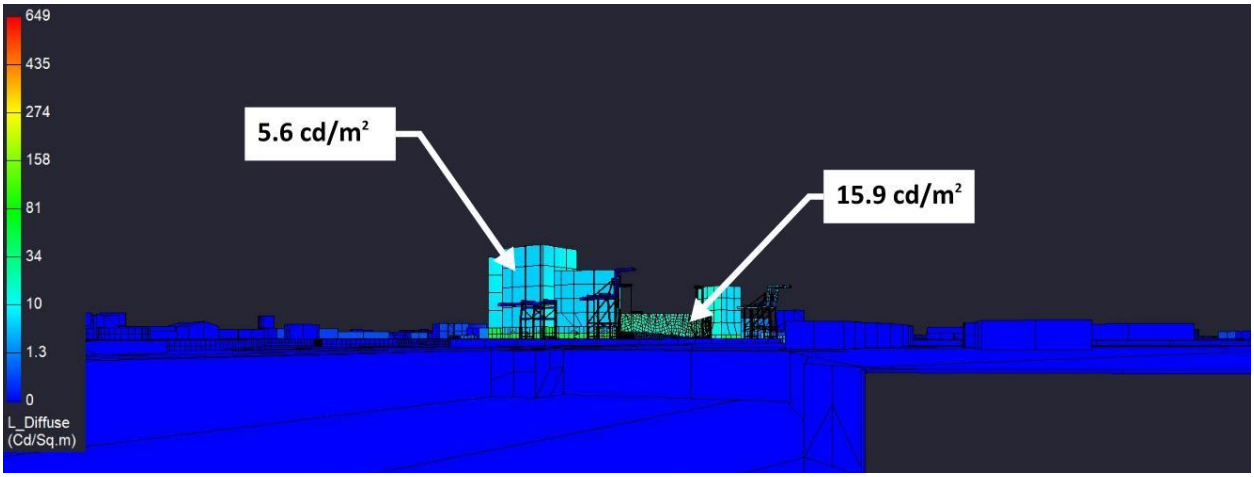




Baseline Project, Reduced Ballpark Height “Phase 1” Scenario Game Nights

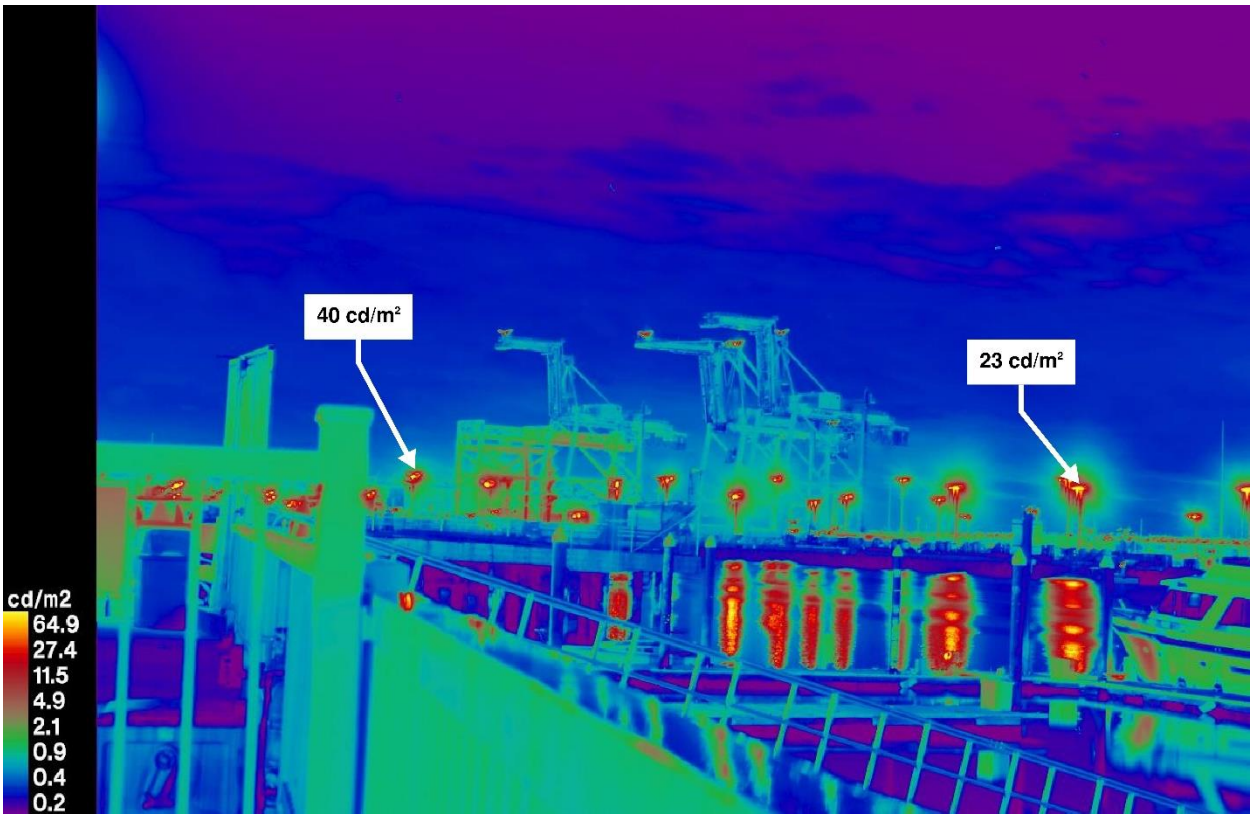
Receptor Site 2A - Turning Basin Line-of-Sight

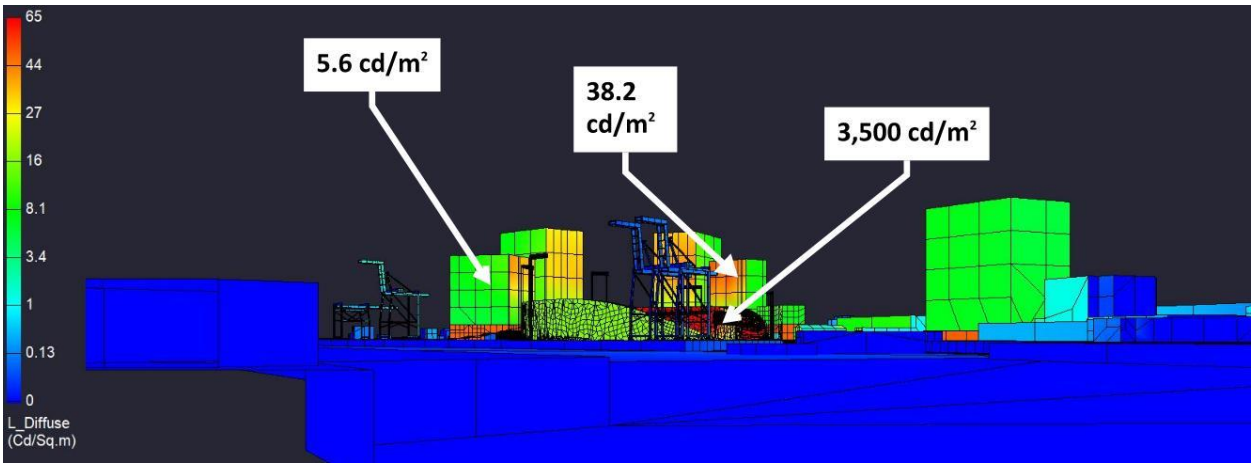




Baseline Project, Reduced Ballpark Height “Phase 1” Scenario Game Nights

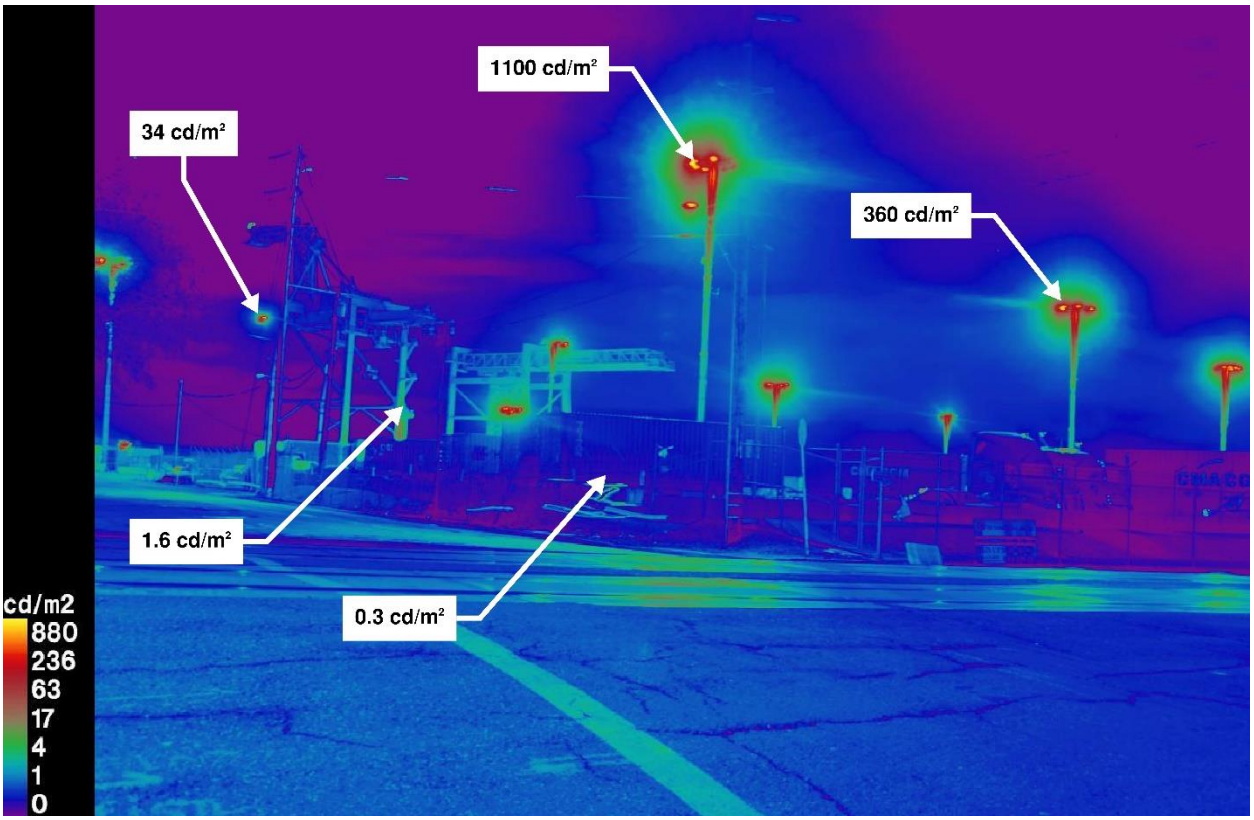
Receptor Site 3 - Alameda Dock

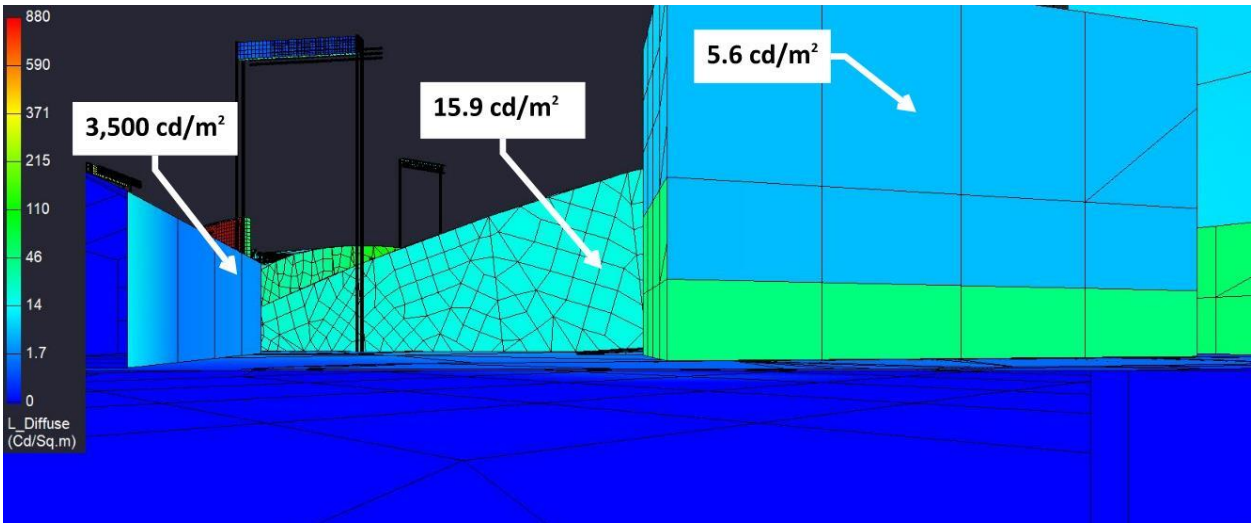




Baseline Project, Reduced Ballpark Height “Phase 1” Scenario Game Nights

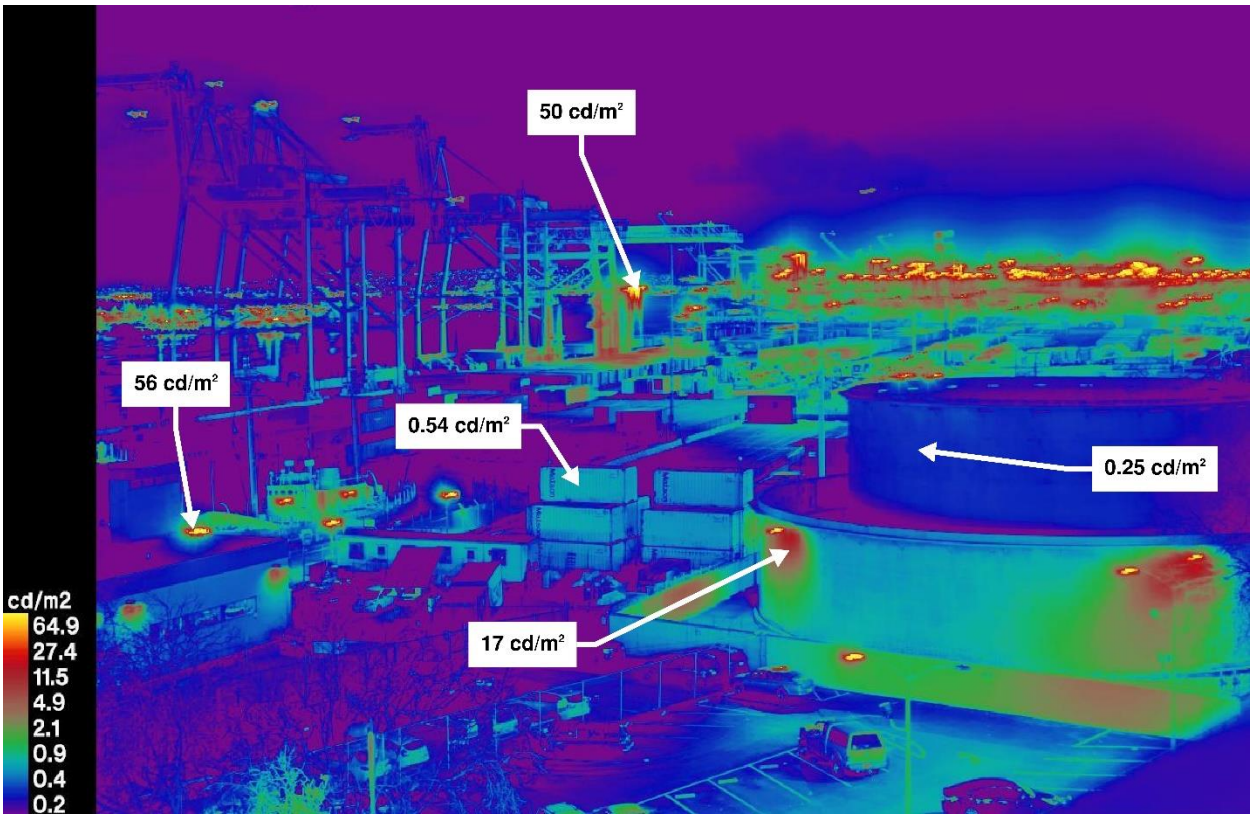
Receptor Site 4 - MLK at Embarcadero

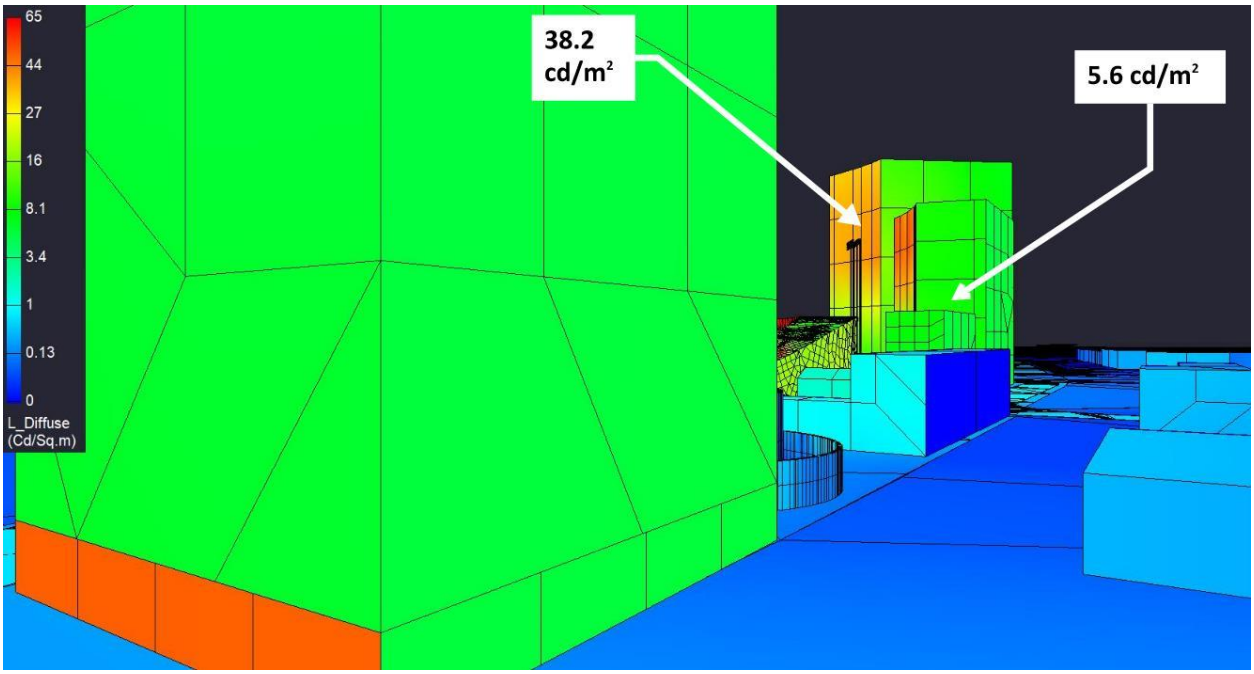




Baseline Project, Reduced Ballpark Height “Phase 1” Scenario Game Nights

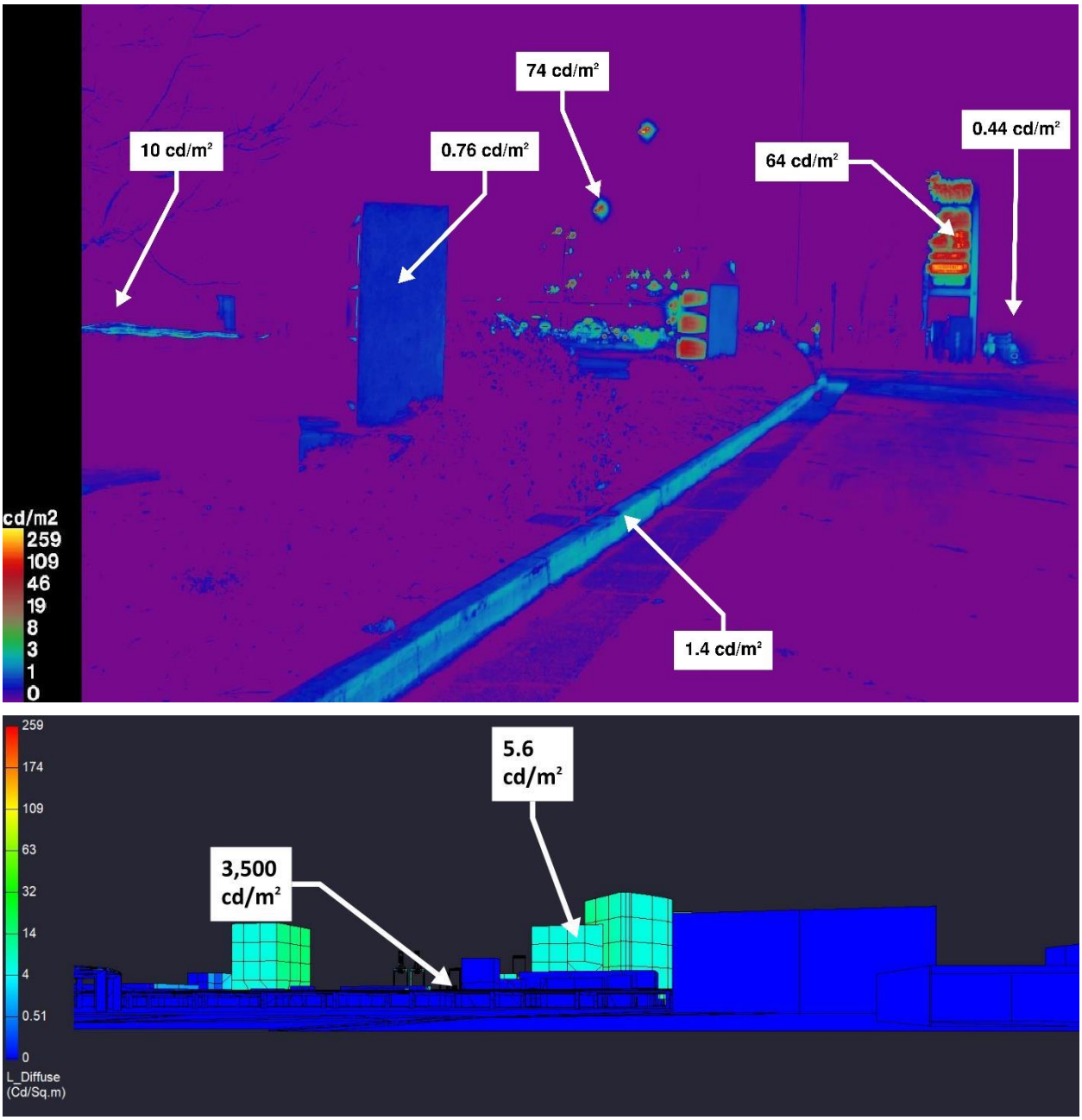
Receptor Site 5A - 2nd at Washington (Facing Stadium)





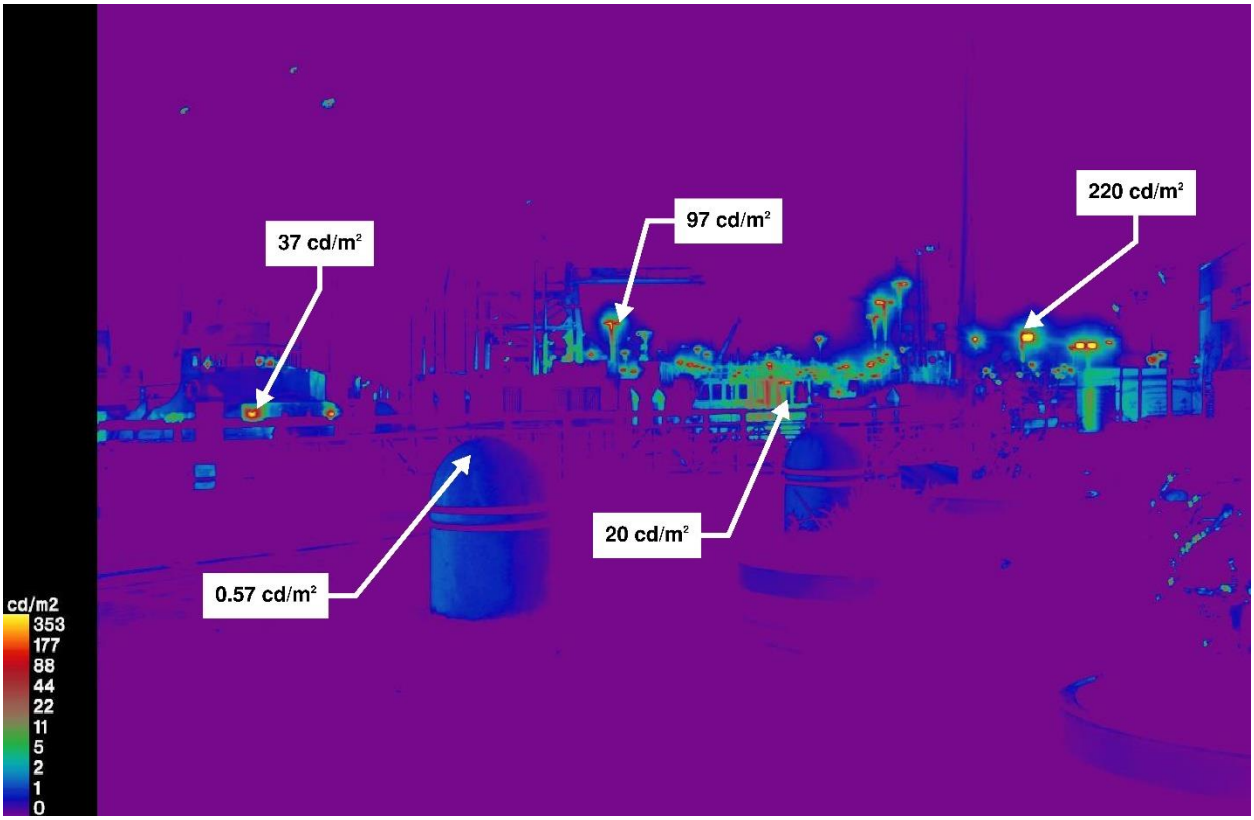
Baseline Project, Reduced Ballpark Height “Phase 1” Scenario Game Nights

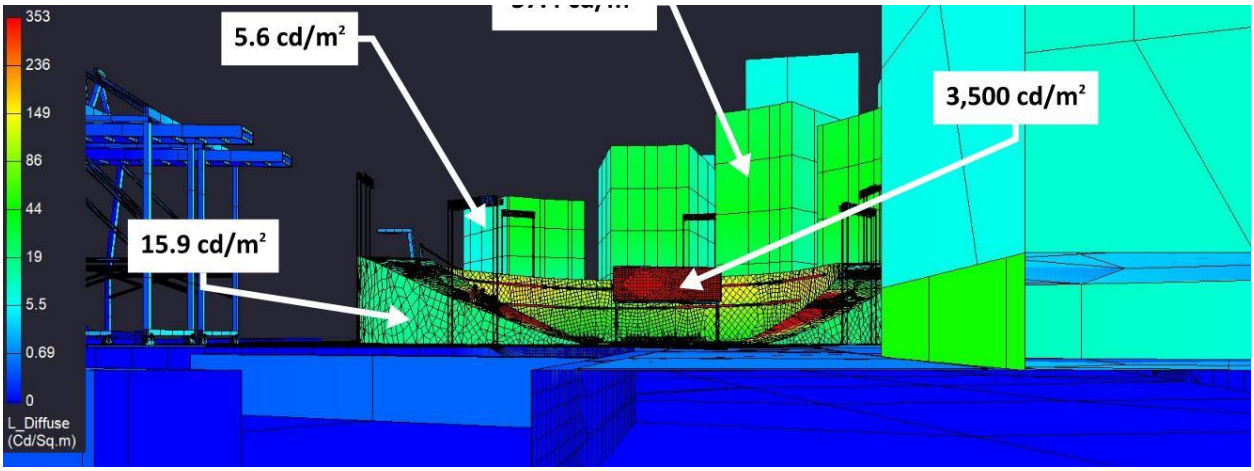
Receptor Site 6A - 7th at Brush



Baseline Project, Reduced Ballpark Height “Full Buildout” Scenario Game Nights

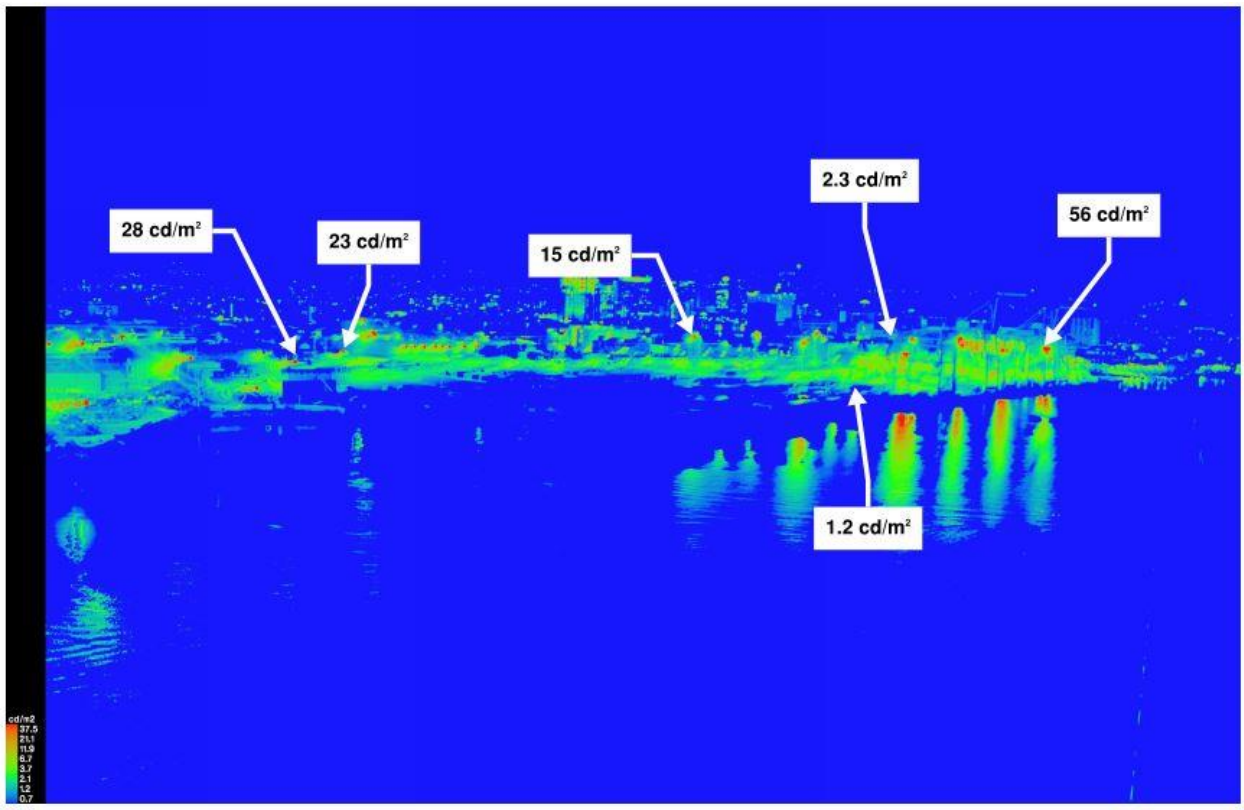
Receptor Site 1 - Water Street at Clay (Facing Ballpark)

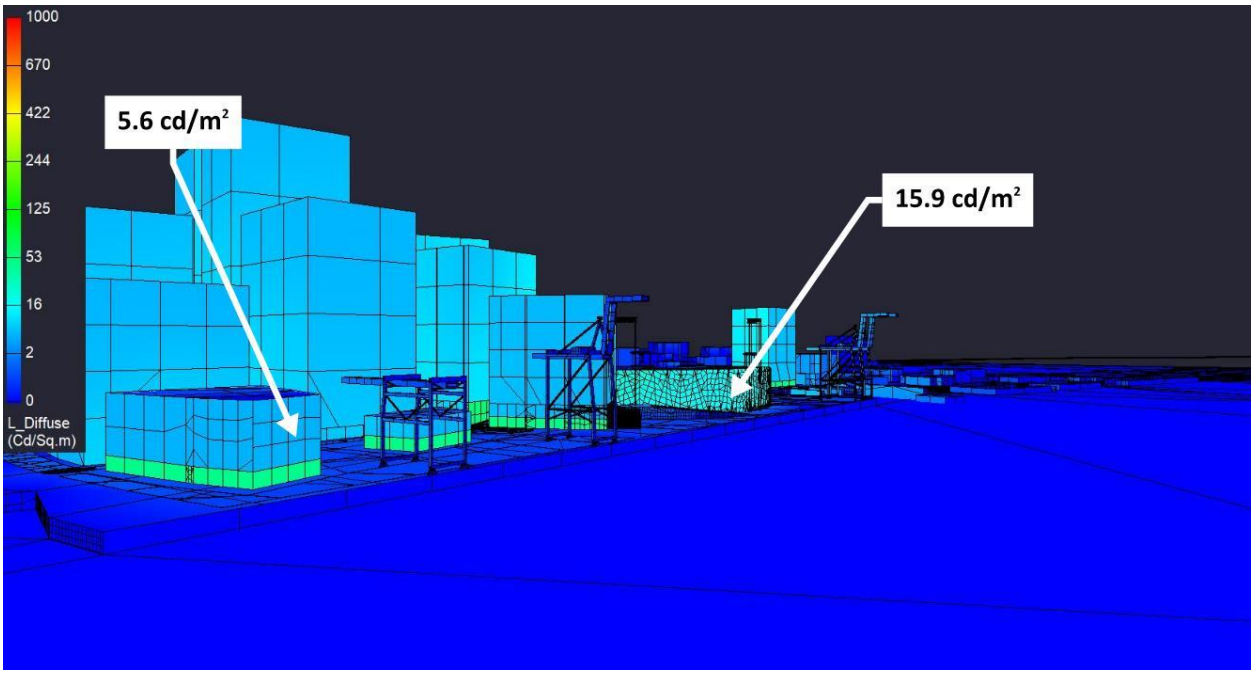




Baseline Project, Reduced Ballpark Height “Full Buildout” Scenario Game Nights

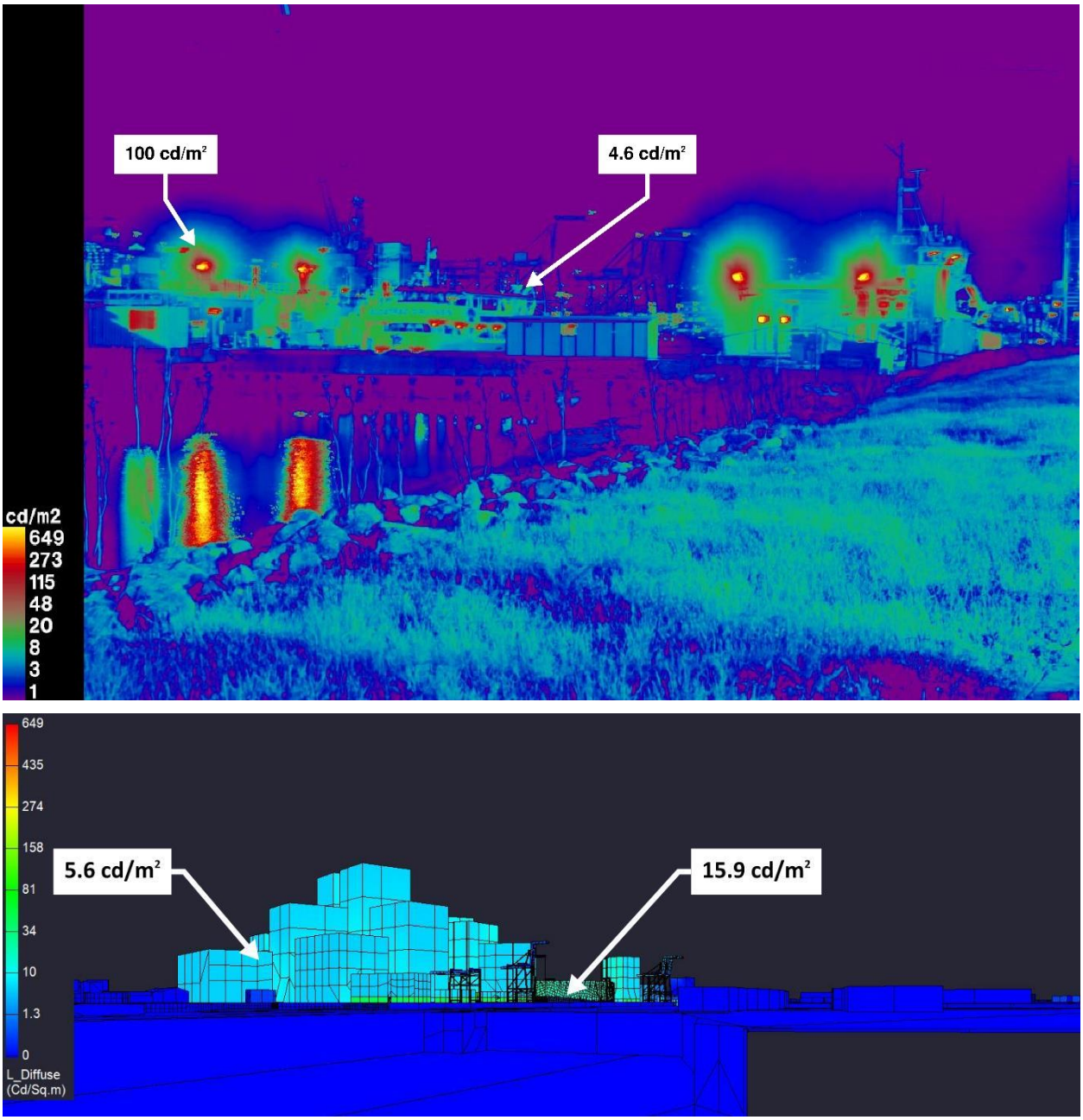
Receptor Site 2 - Inner Harbor Turning Basin @ 190'





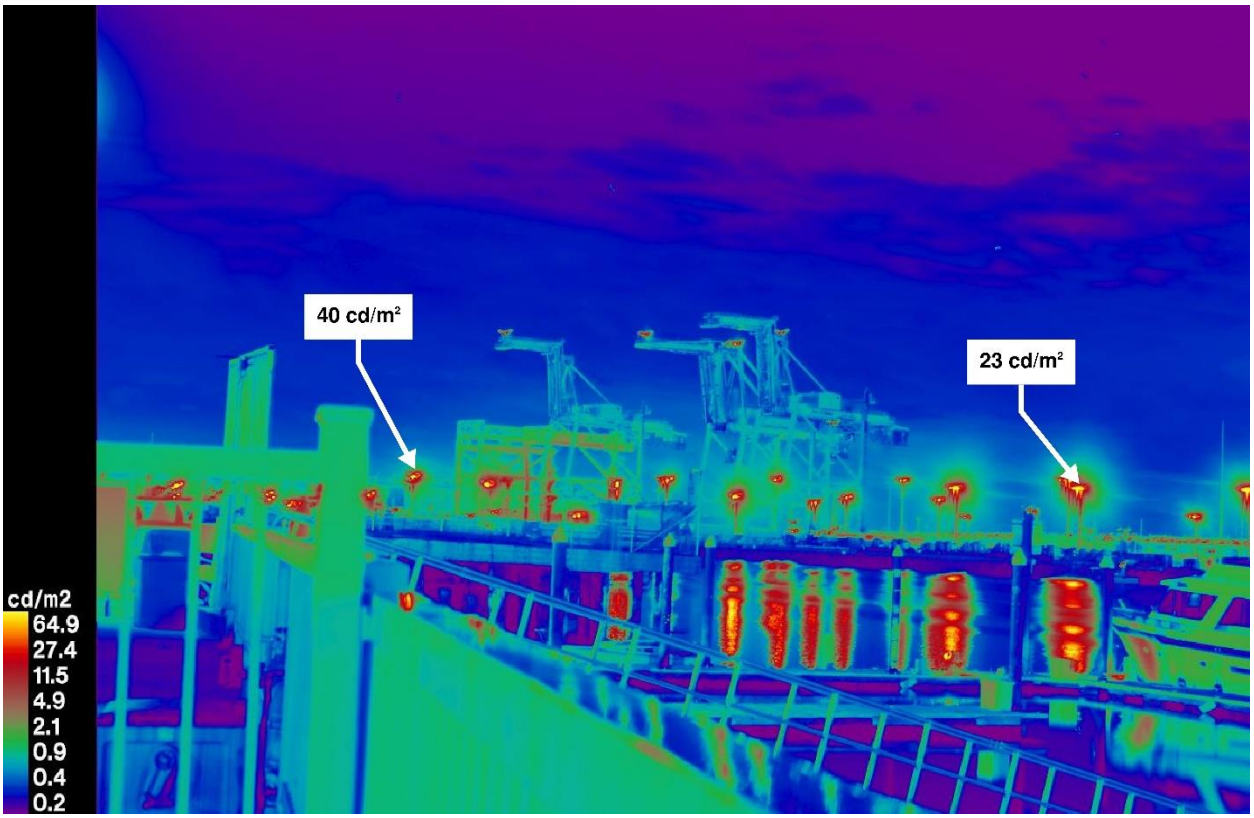
Baseline Project, Reduced Ballpark Height “Full Buildout” Scenario Game Nights

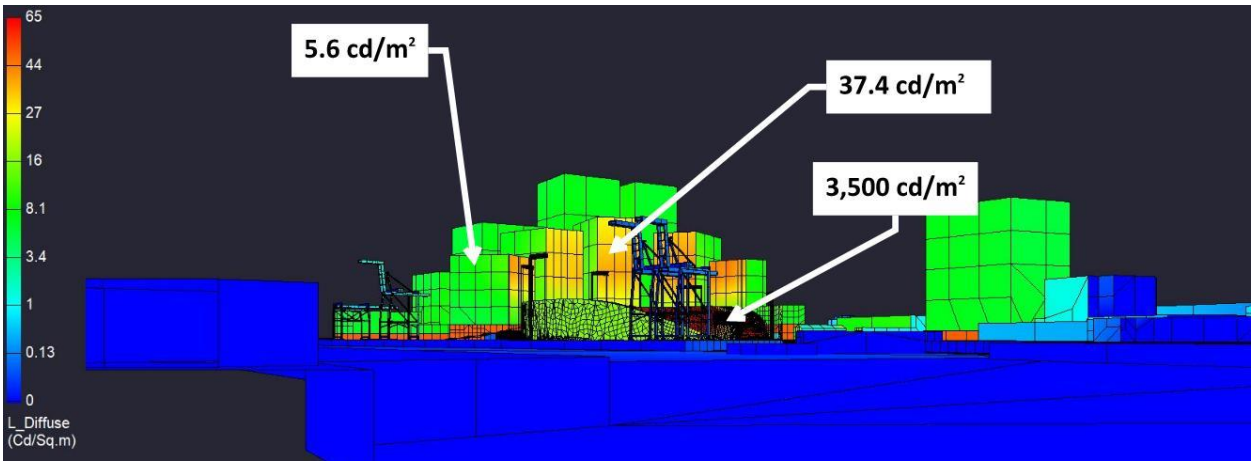
Receptor Site 2A - Turning Basin Line-of-Sight



Baseline Project, Reduced Ballpark Height “Full Buildout” Scenario Game Nights

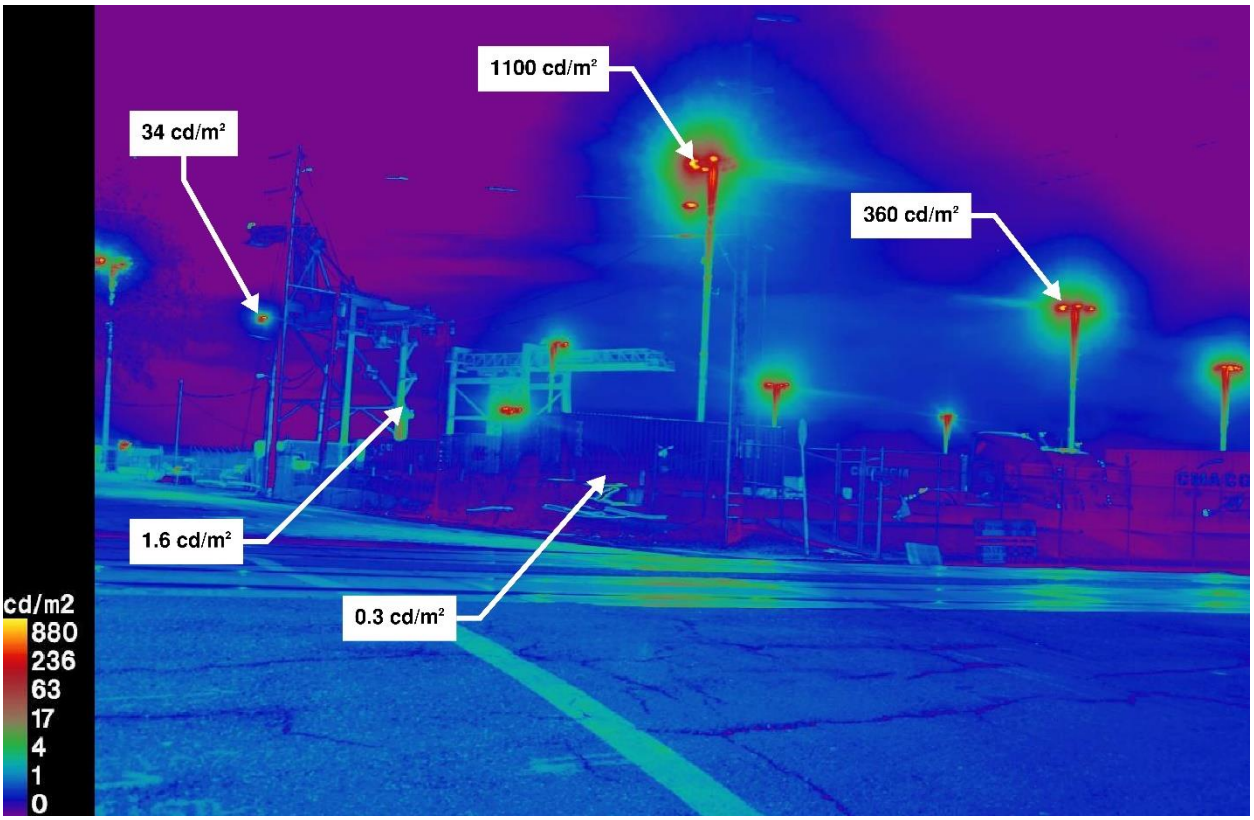
Receptor Site 3 - Alameda Dock

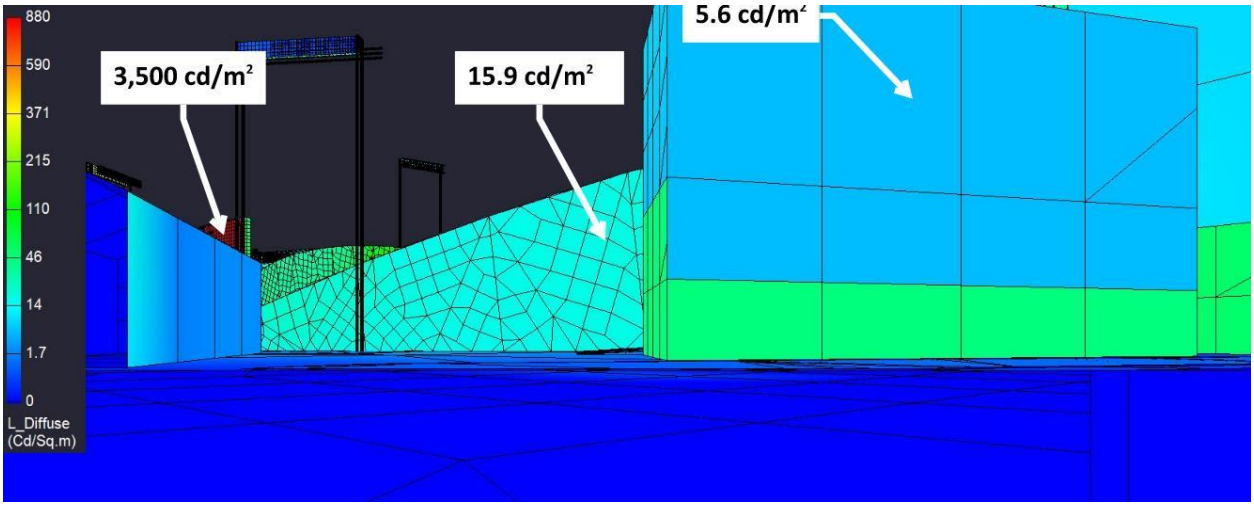




Baseline Project, Reduced Ballpark Height “Full Buildout” Scenario Game Nights

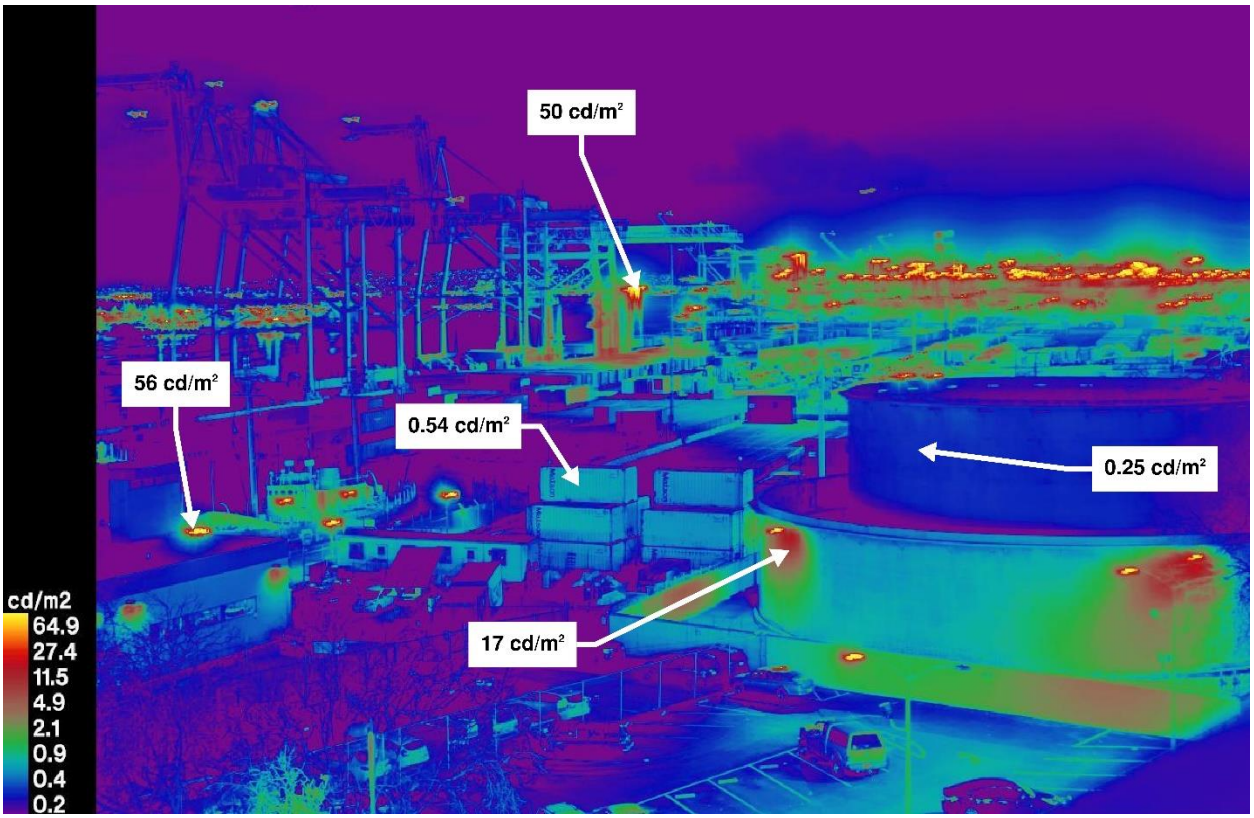
Receptor Site 4 - MLK at Embarcadero

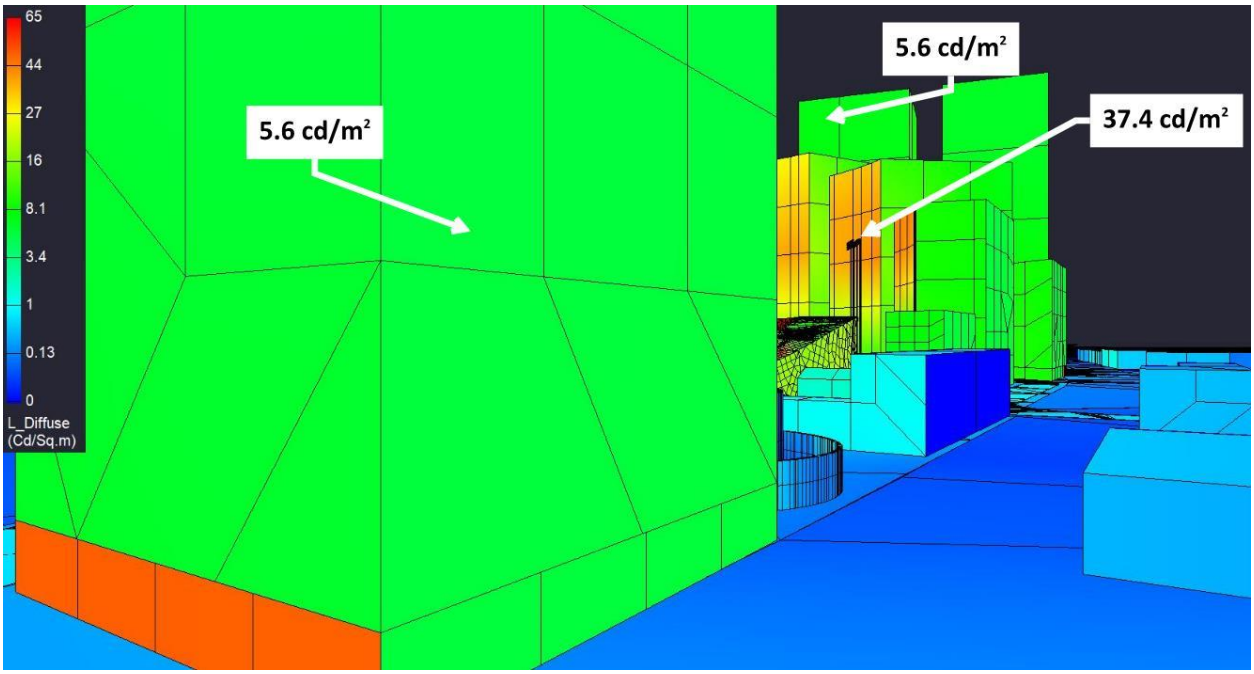




Baseline Project, Reduced Ballpark Height “Full Buildout” Scenario Game Nights

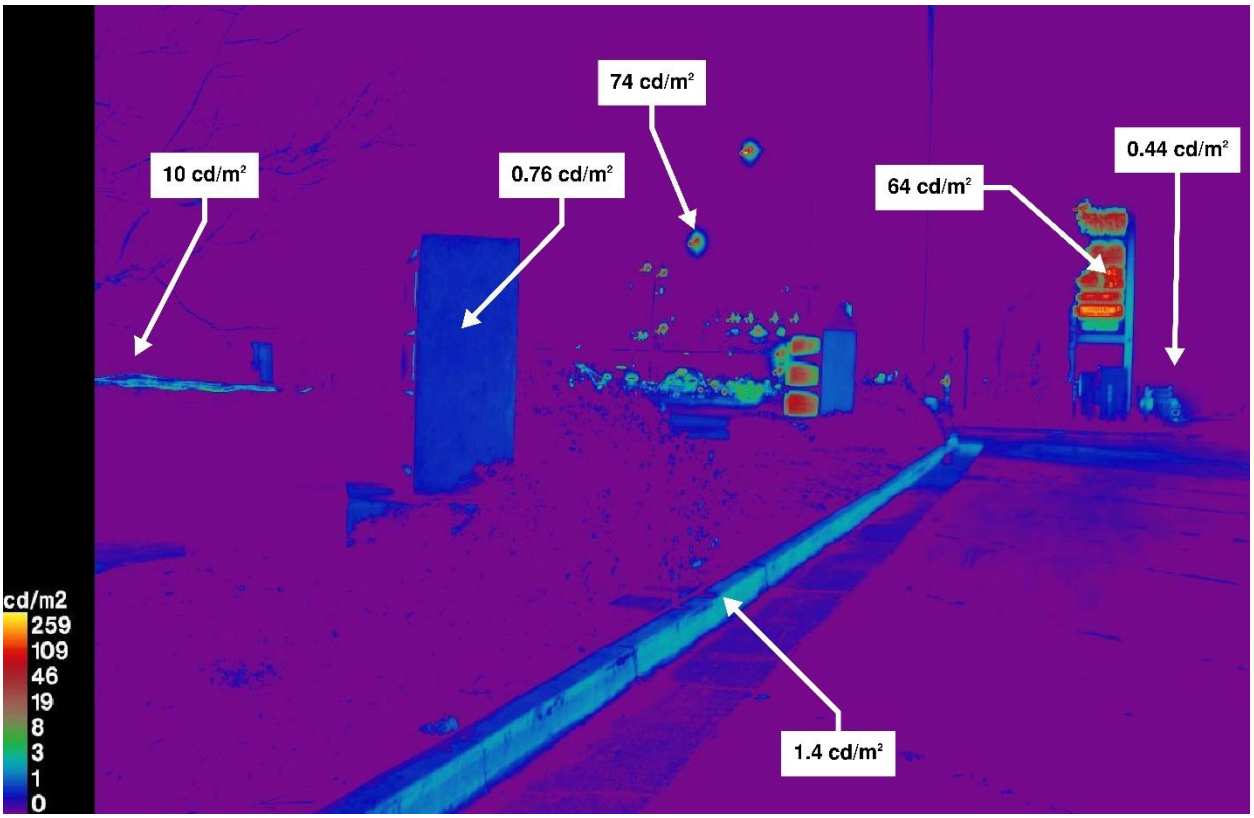
Receptor Site 5A - 2nd at Washington (Facing Stadium)

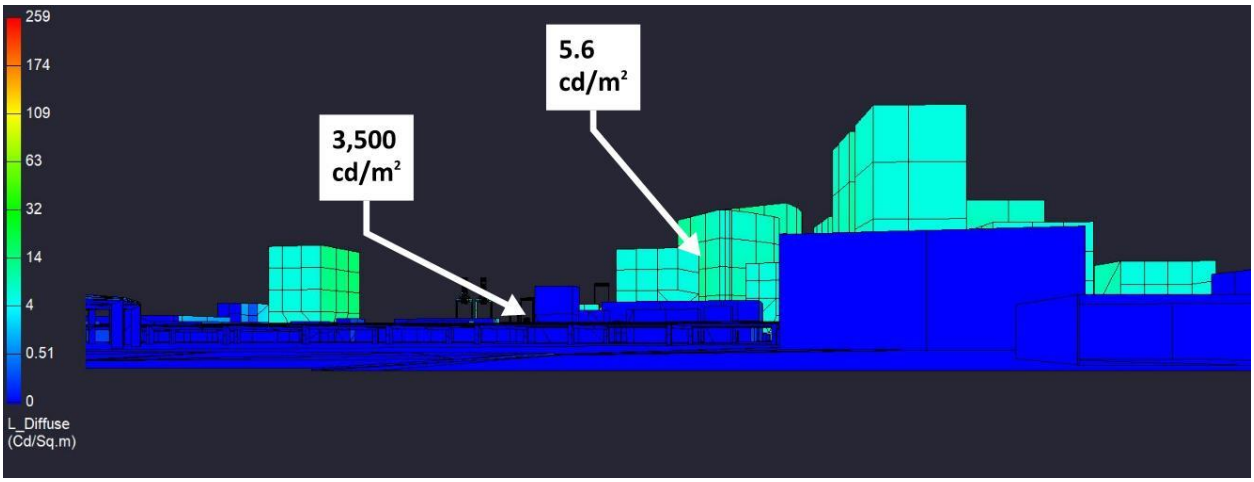




Baseline Project, Reduced Ballpark Height “Full Buildout” Scenario Game Nights

Receptor Site 6A - 7th at Brush



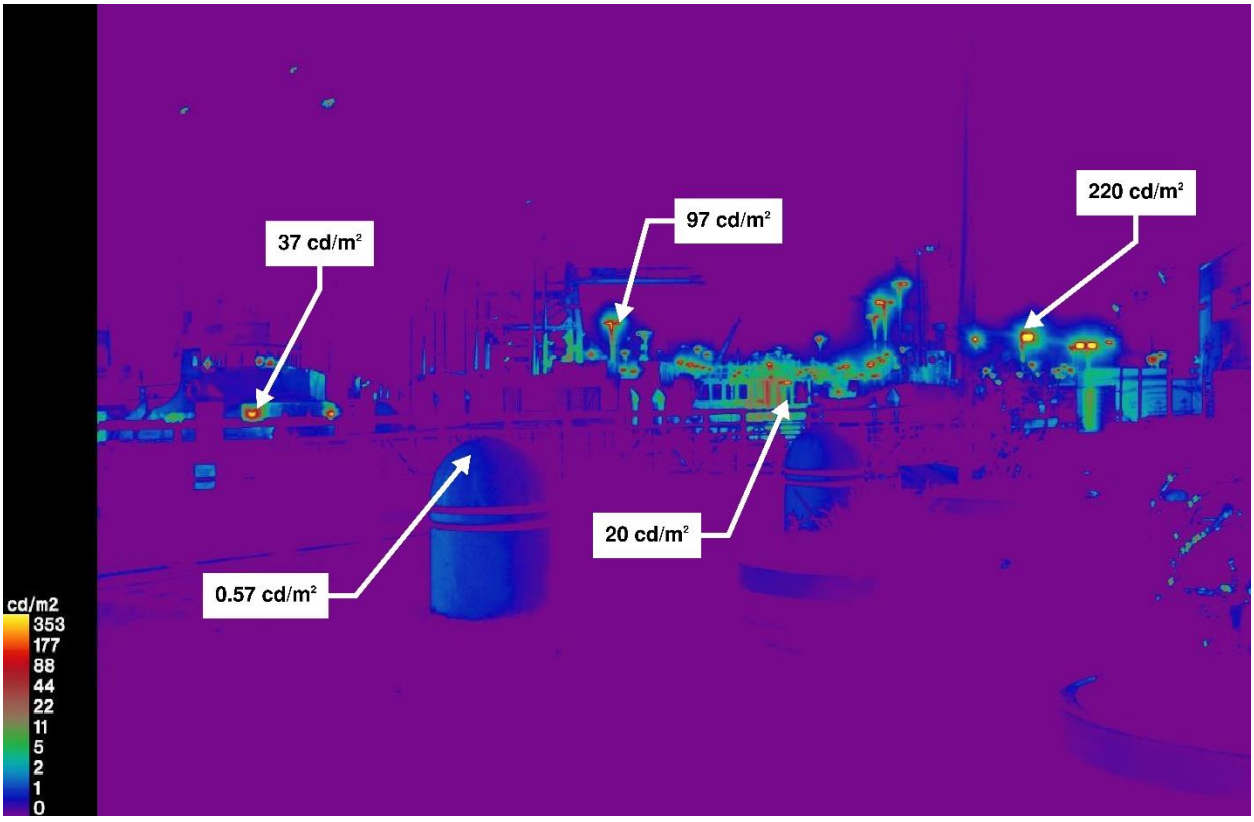


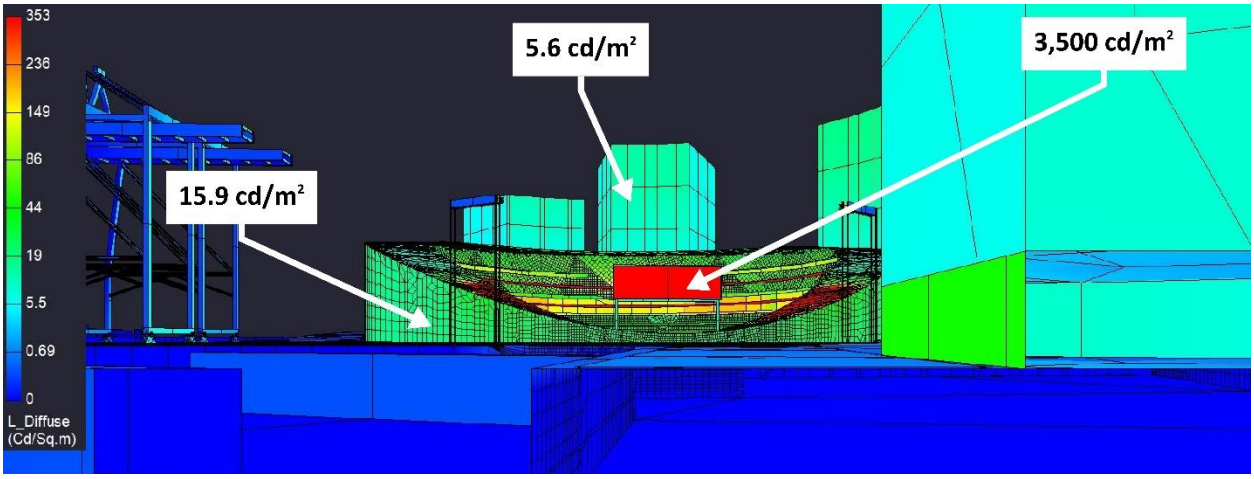
14 APPENDIX E – RECEPTOR SITE BIRGHTNESS MEASUREMENTS VS CALCULATED BRIGHTNESSES – MRA PROJECT

The purpose of the paired images within this section is to allow direct “Before and After” comparison of the existing measured conditions at the receptor sites and the calculated brightness from the various simulations.

Baseline Ballpark “Phase 1” Scenario Game Nights

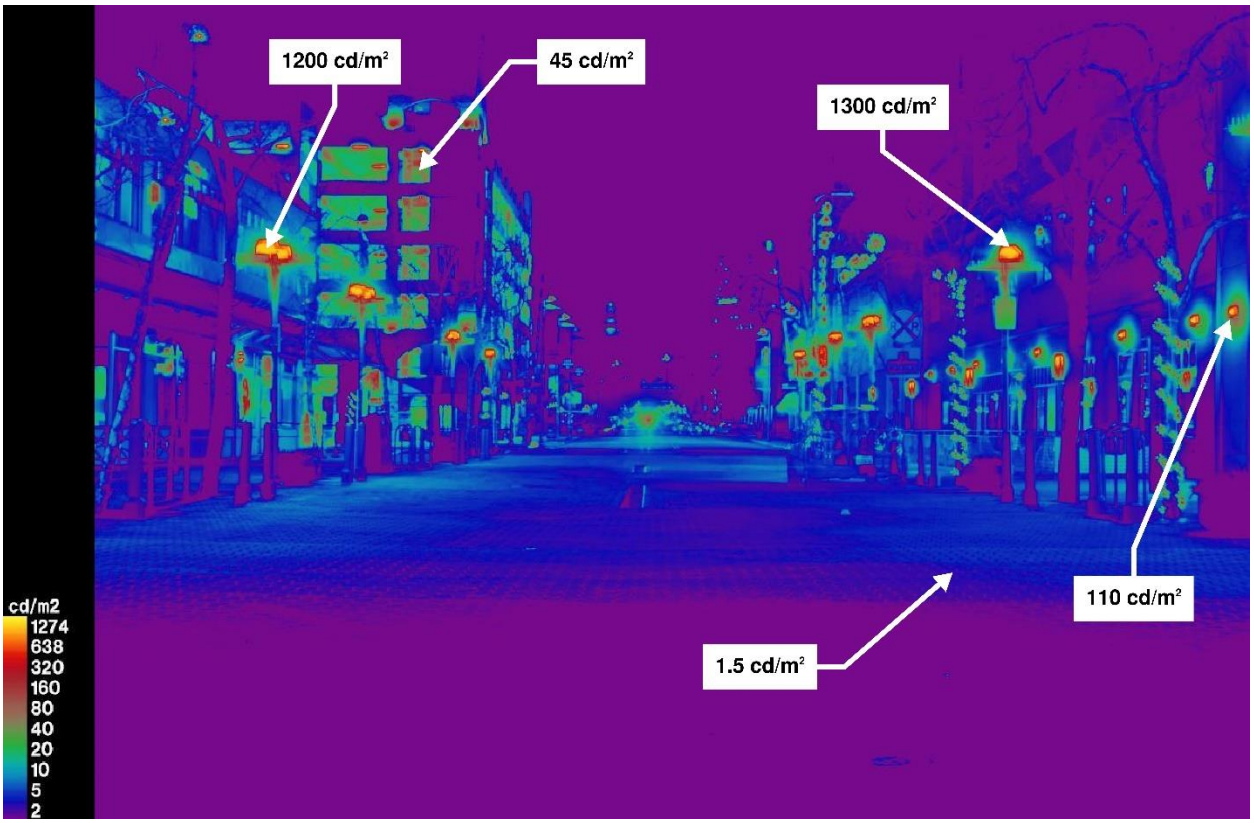
Receptor Site 1 - Water Street at Clay (Facing Ballpark)

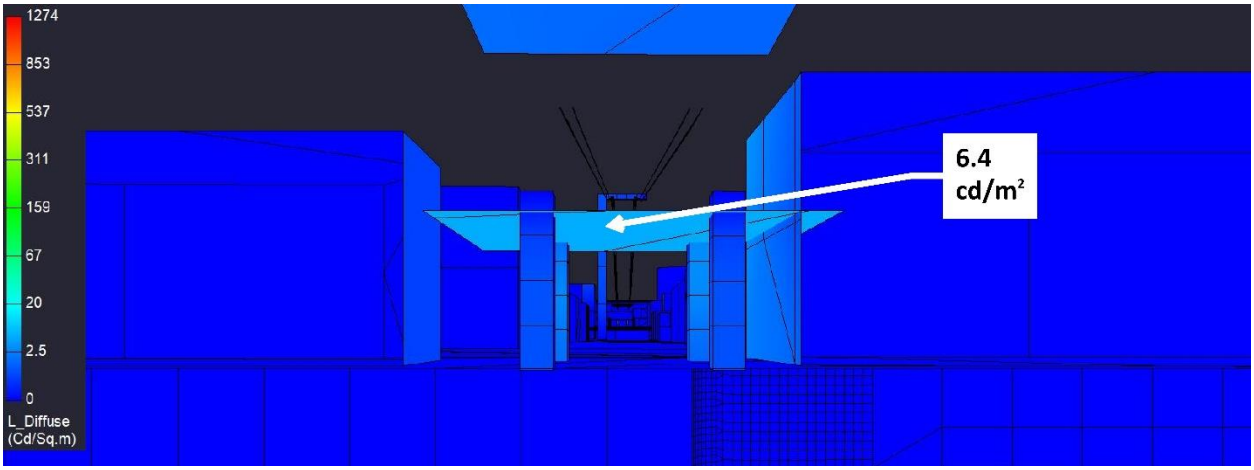




Baseline Geometry “Phase 1” Scenario Game Nights

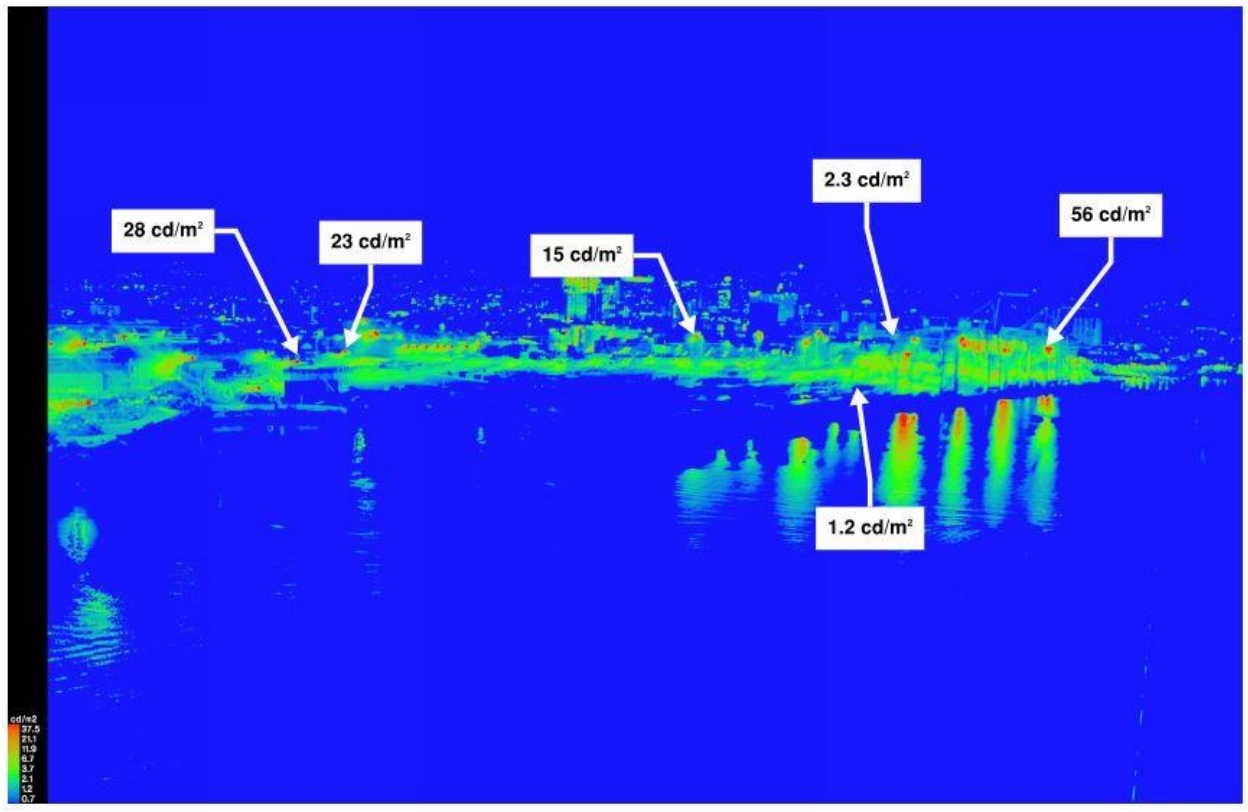
Receptor Site 1A - Water Street at Washington (Facing Gondola)

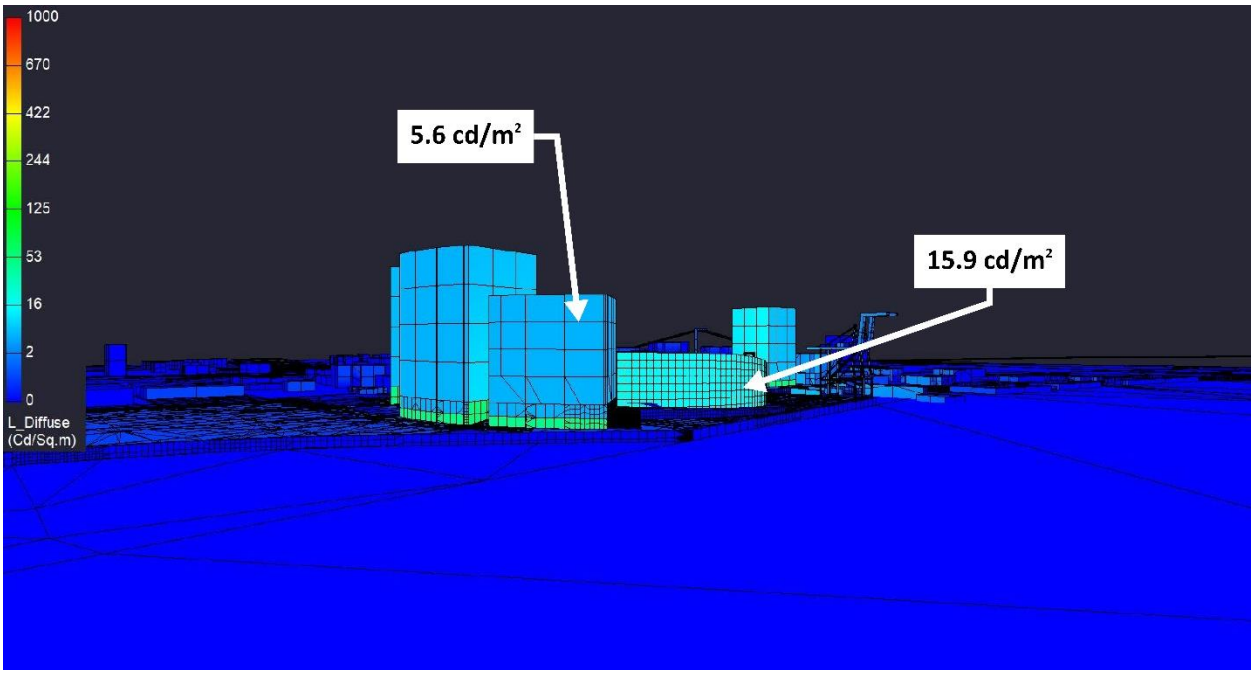




Baseline Geometry “Phase 1” Scenario Game Nights

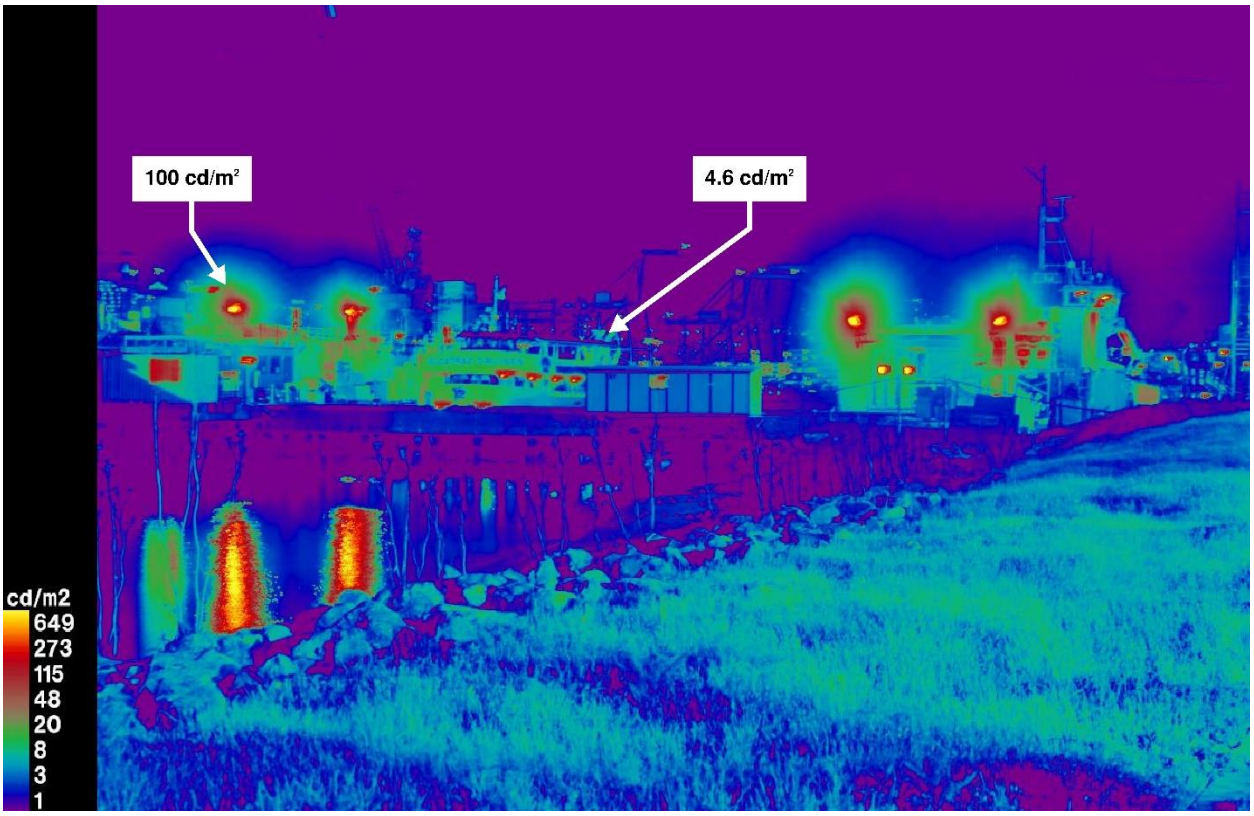
Receptor Site 2 - Inner Harbor Turning Basin @ 190'

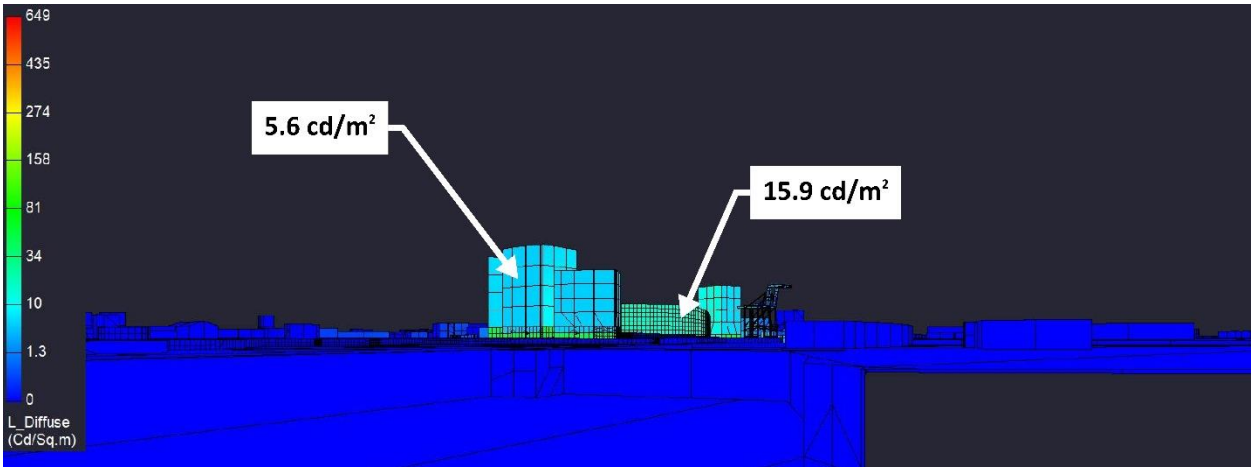




Baseline Geometry “Phase 1” Scenario Game Nights

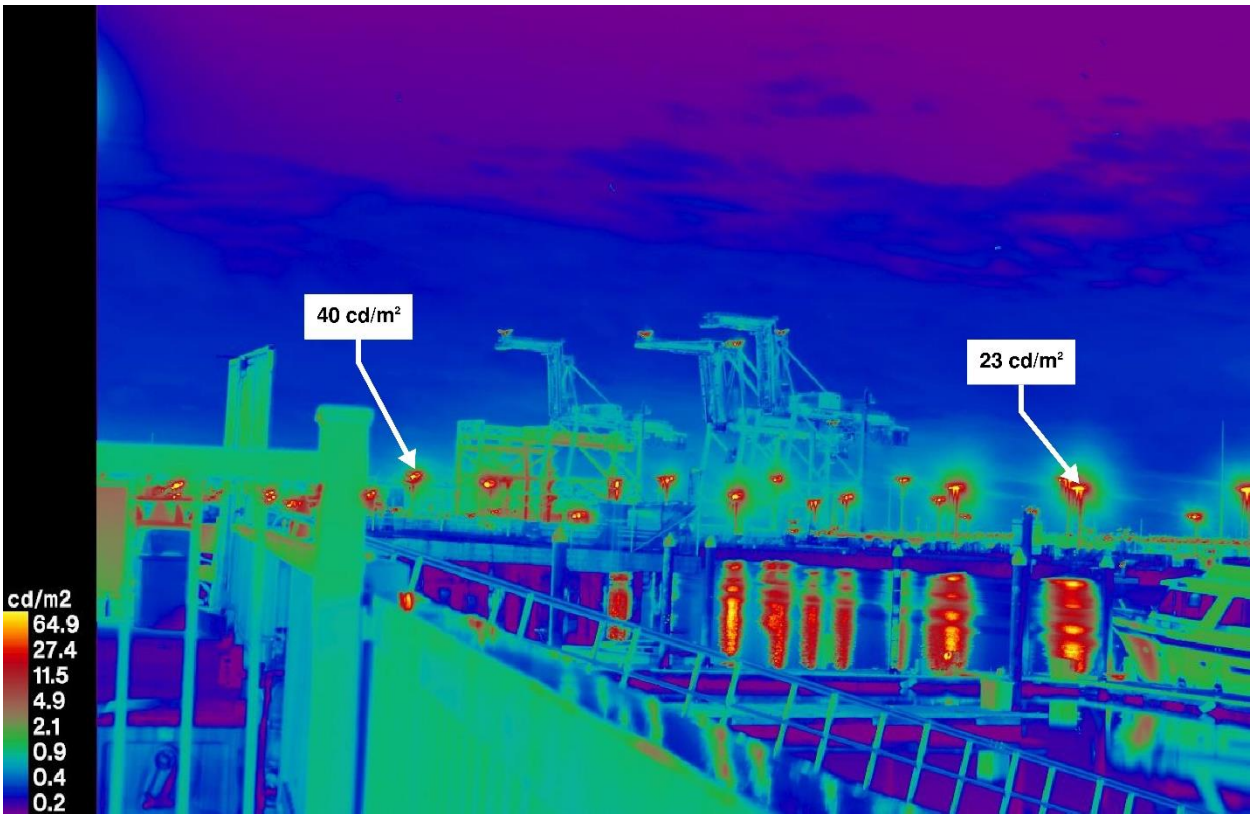
Receptor Site 2A - Turning Basin Line-of-Sight

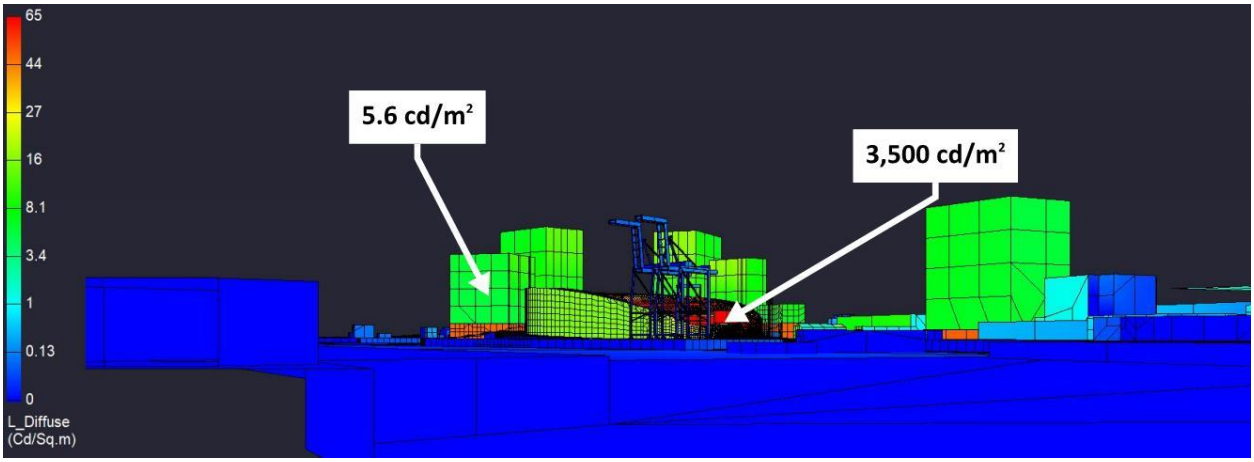




Baseline Geometry “Phase 1” Scenario Game Nights

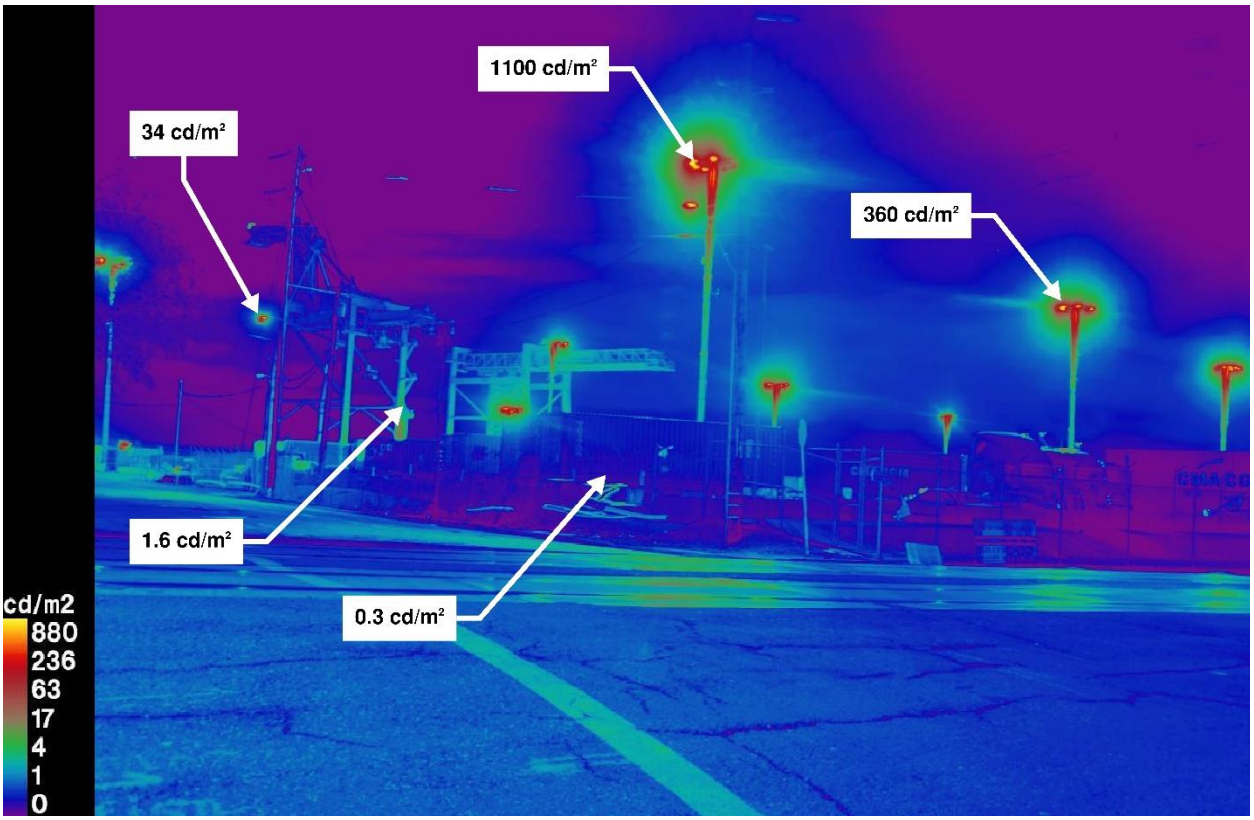
Receptor Site 3 - Alameda Dock

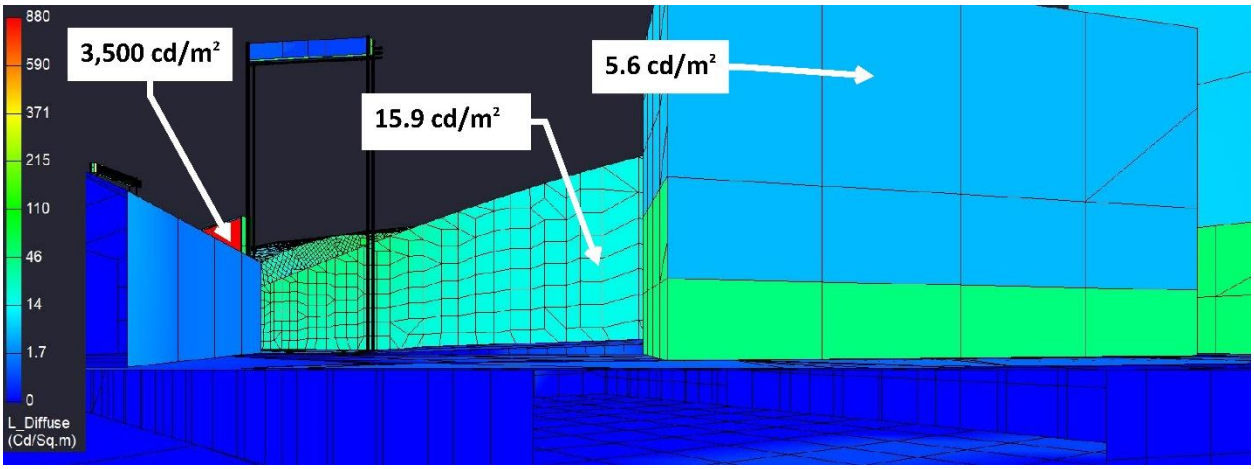




Baseline Geometry “Phase 1” Scenario Game Nights

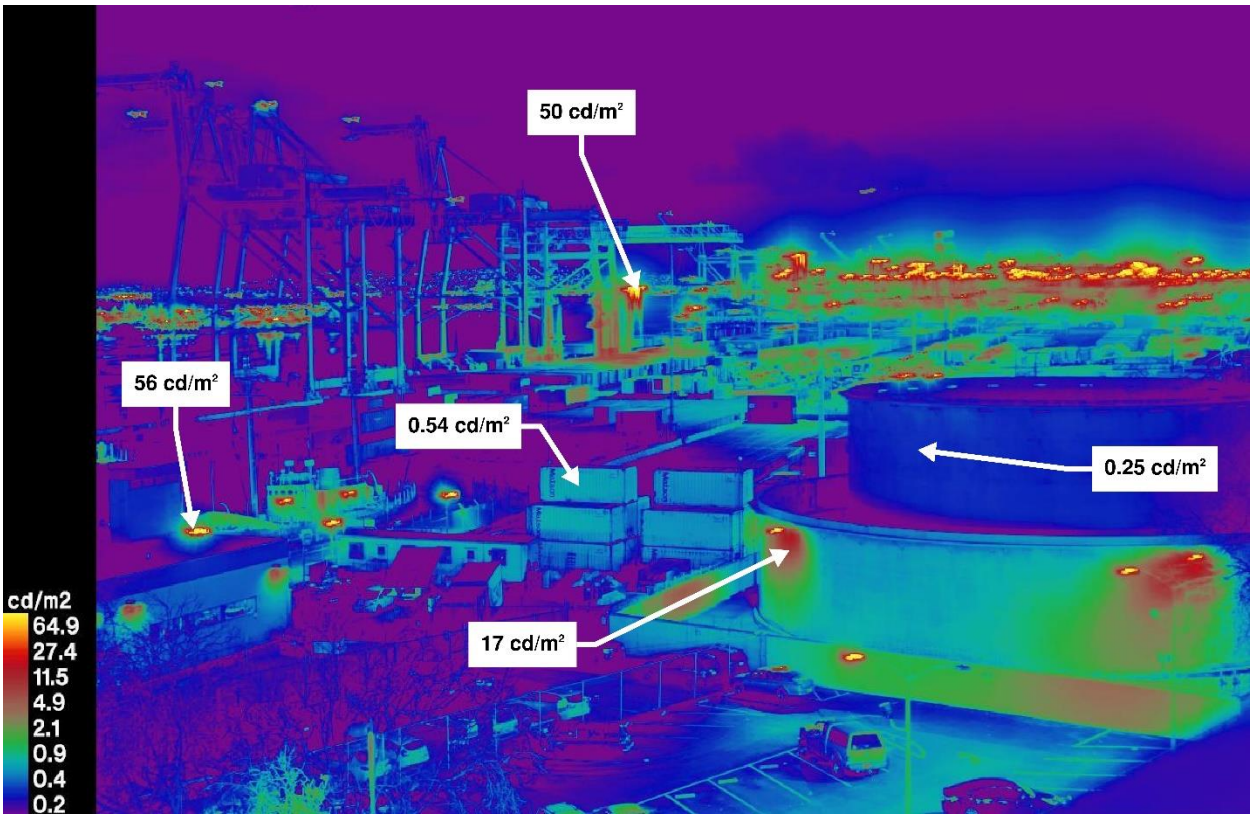
Receptor Site 4 - MLK at Embarcadero

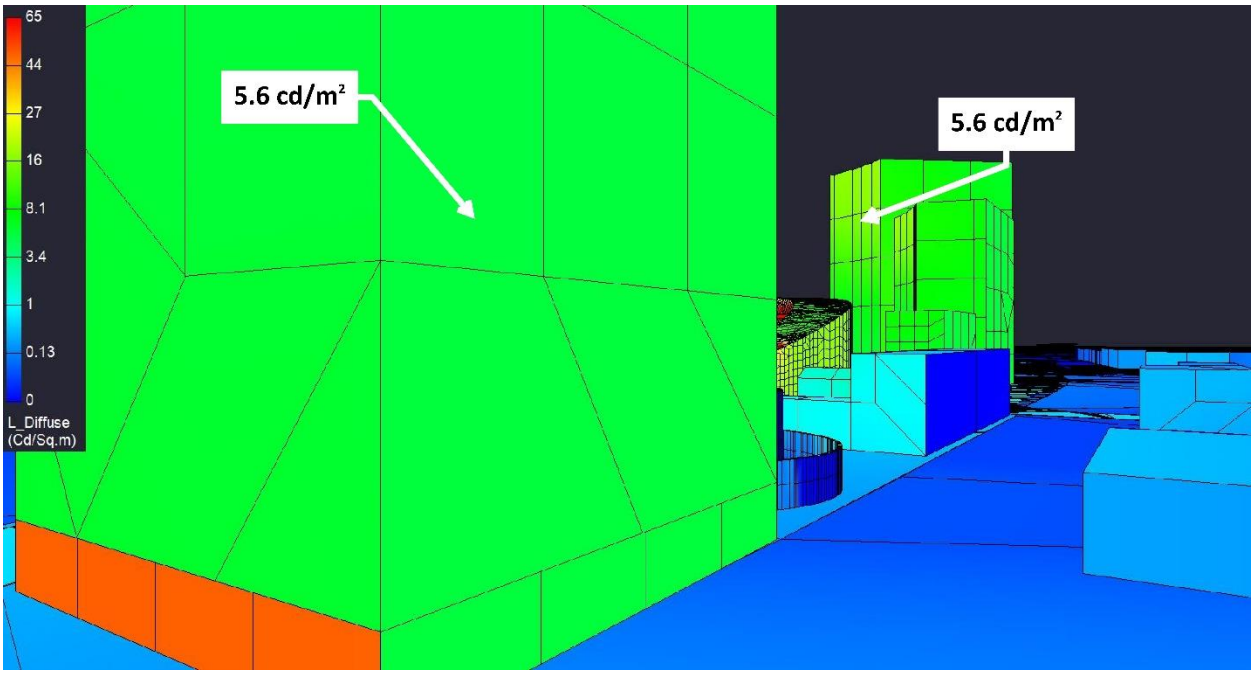




Baseline Geometry “Phase 1” Scenario Game Nights

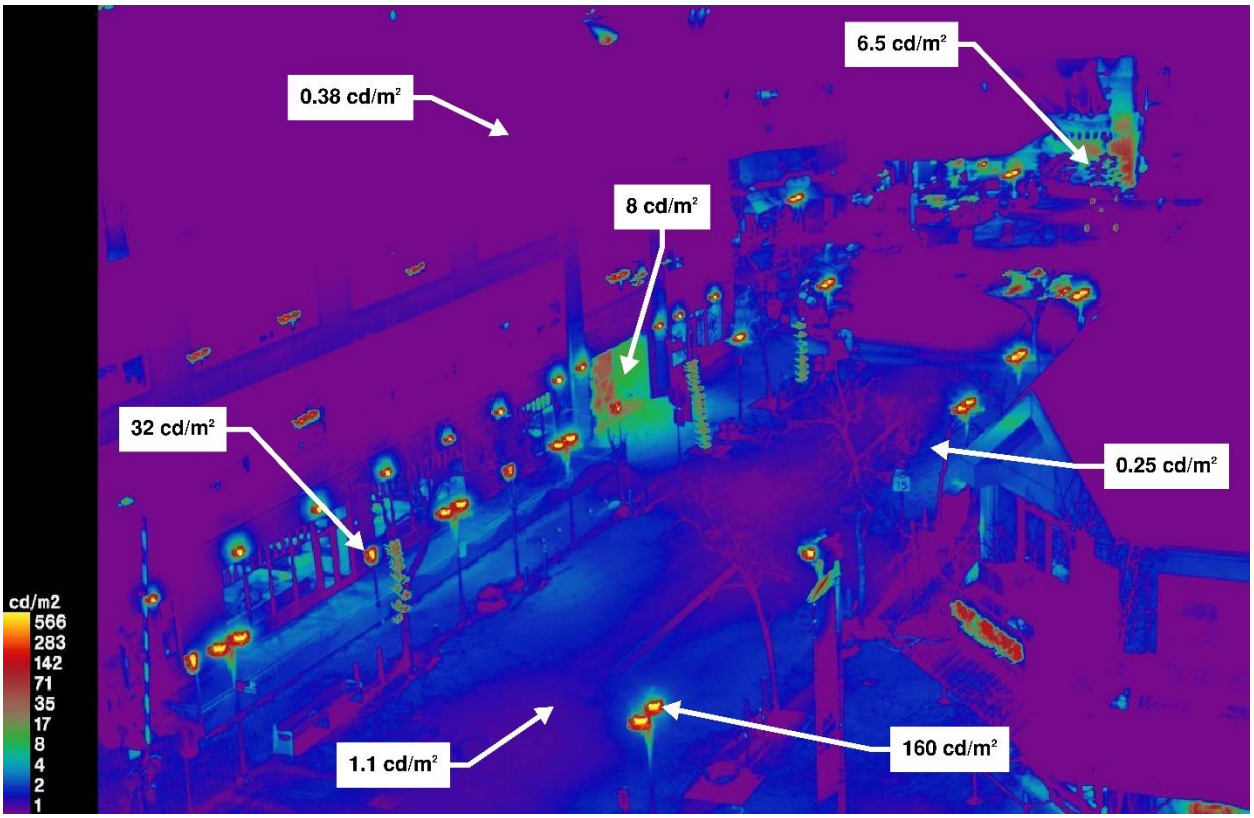
Receptor Site 5A - 2nd at Washington (Facing Stadium)

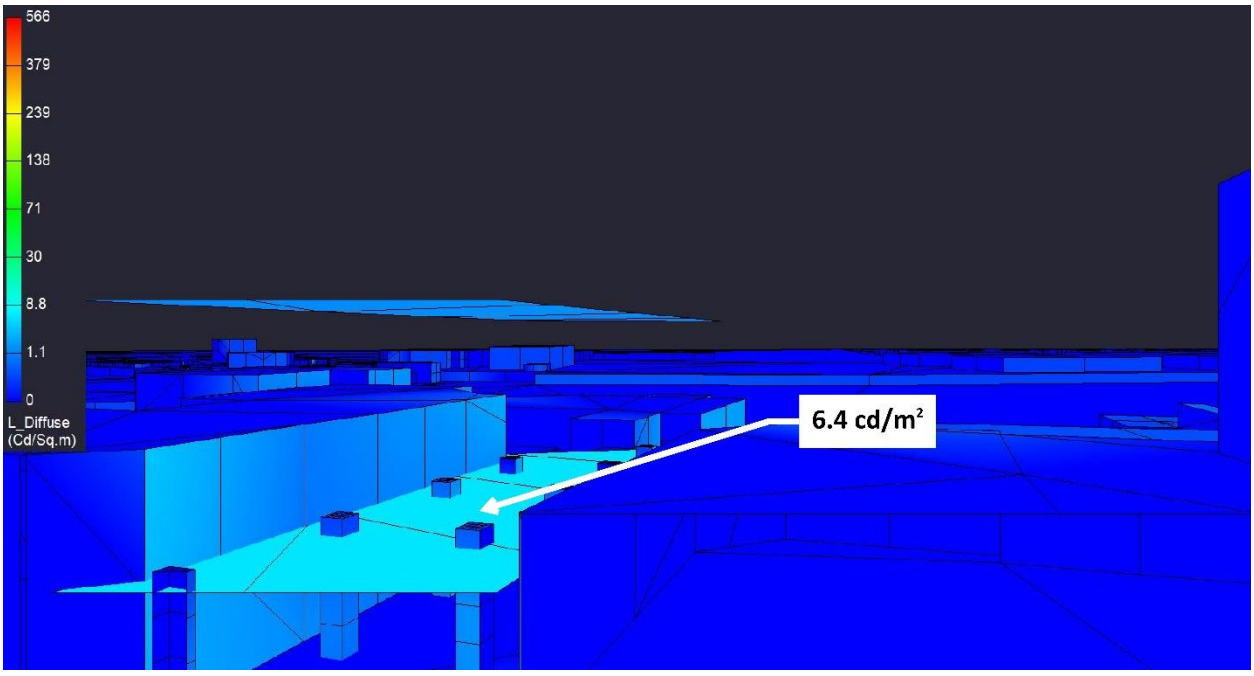




Baseline Geometry “Phase 1” Scenario Game Nights

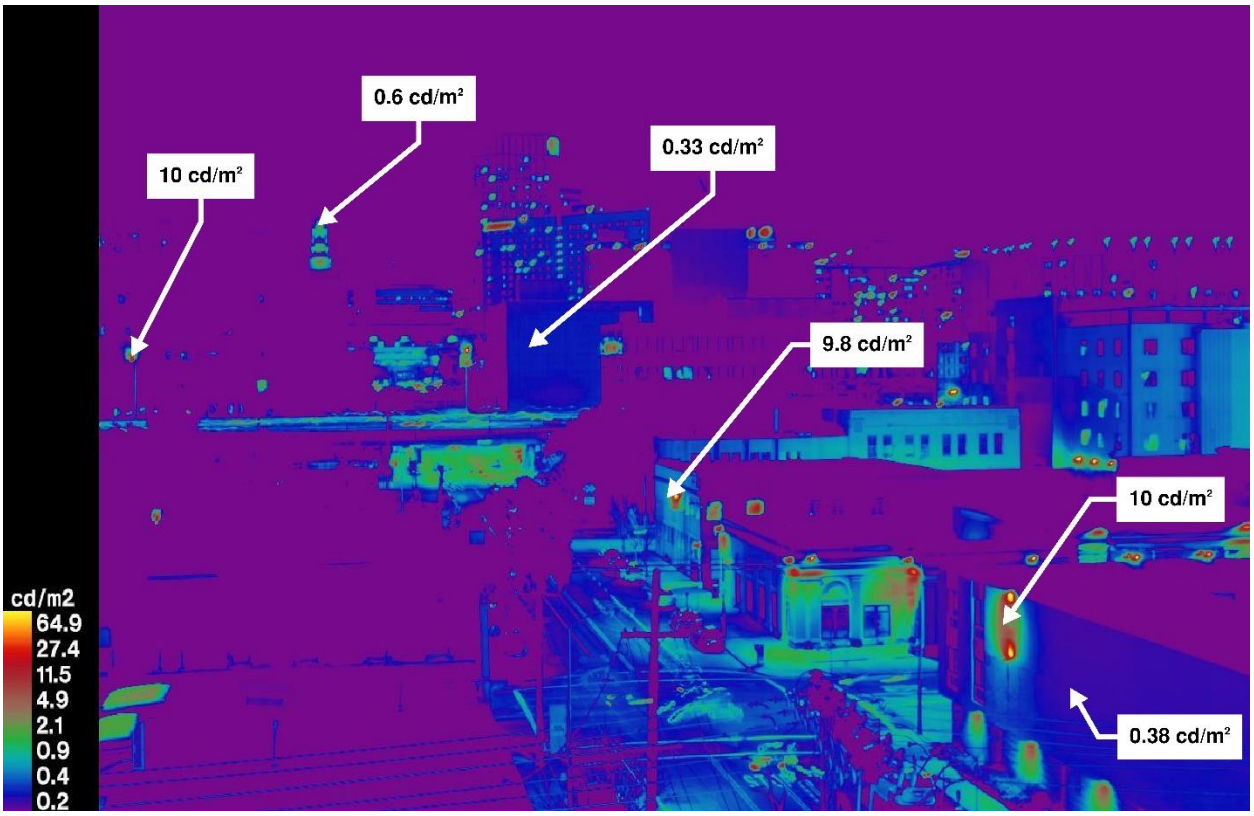
Receptor Site 5B - 2nd at Washington (Facing JLS Station)

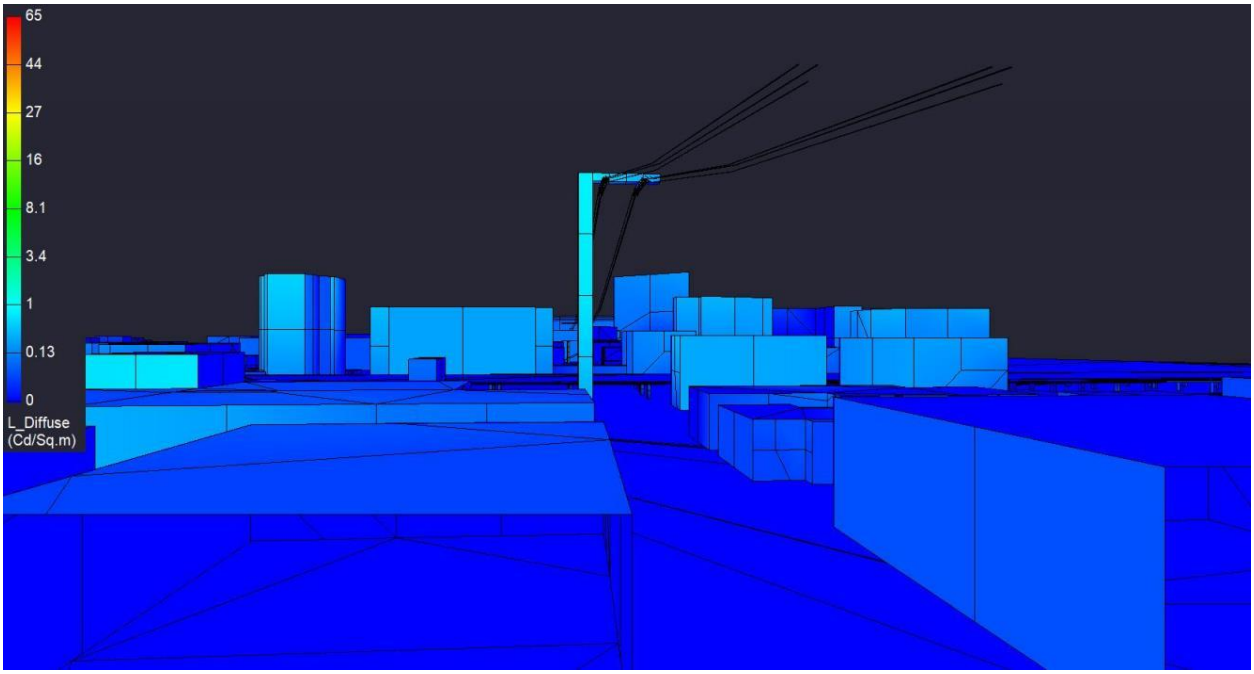




Baseline Geometry “Phase 1” Scenario Game Nights

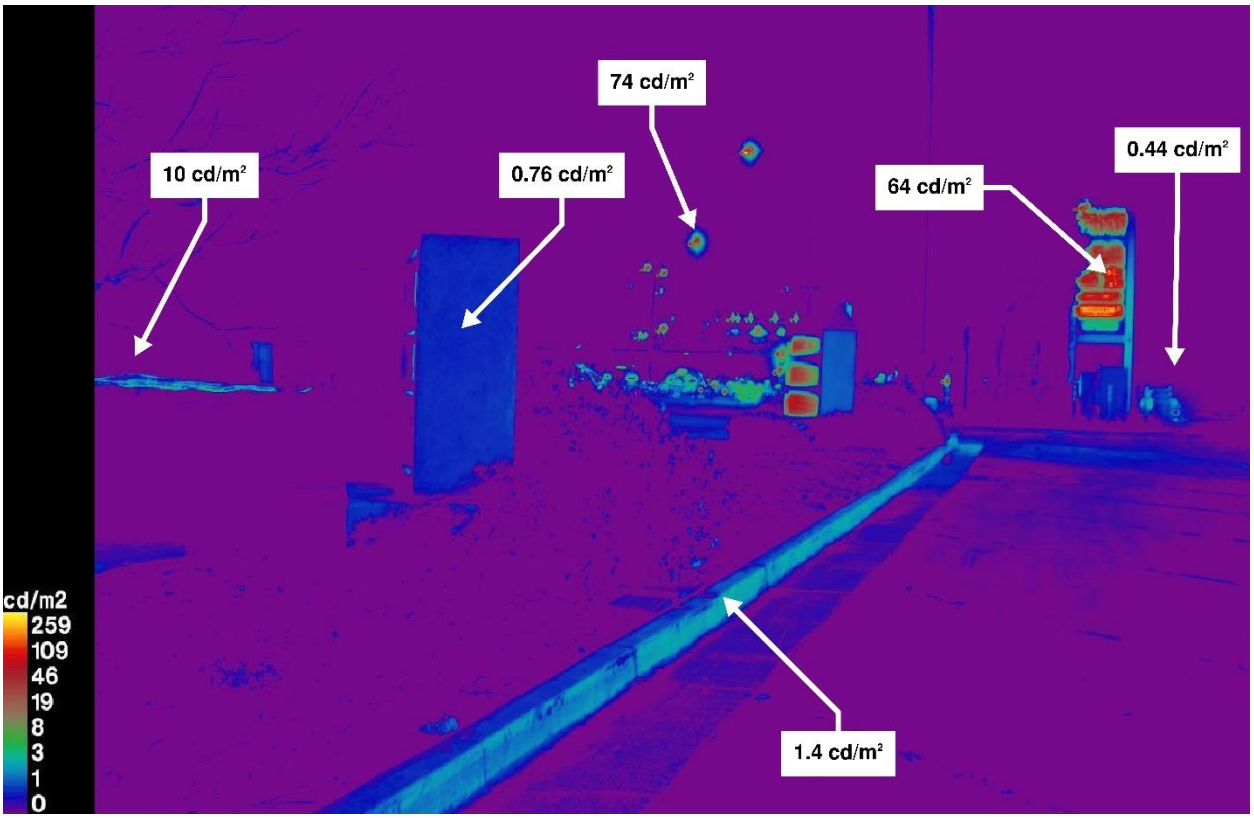
Receptor Site 5C - 2nd at Washington (Facing Convention Center Station)

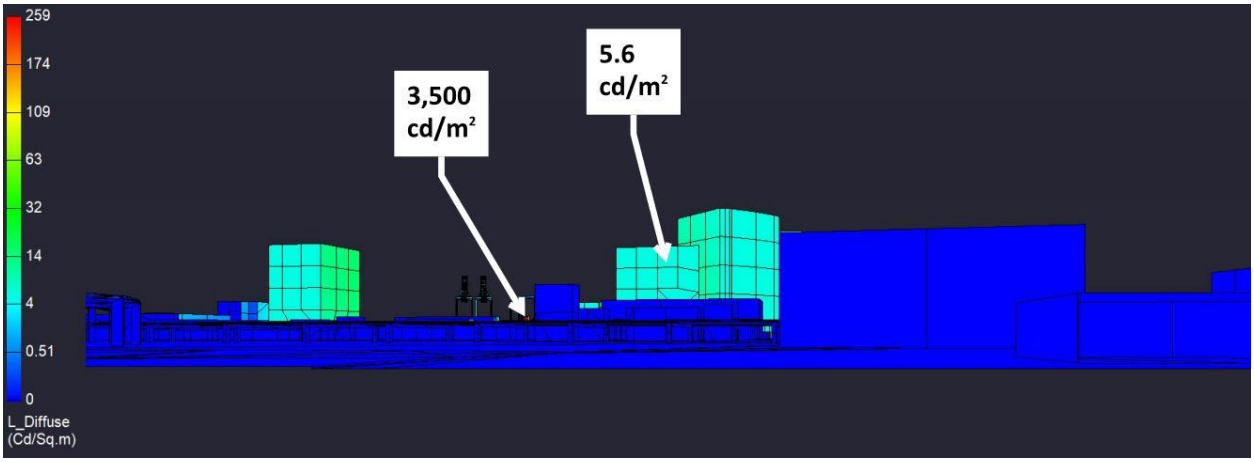




Baseline Geometry “Phase 1” Scenario Game Nights

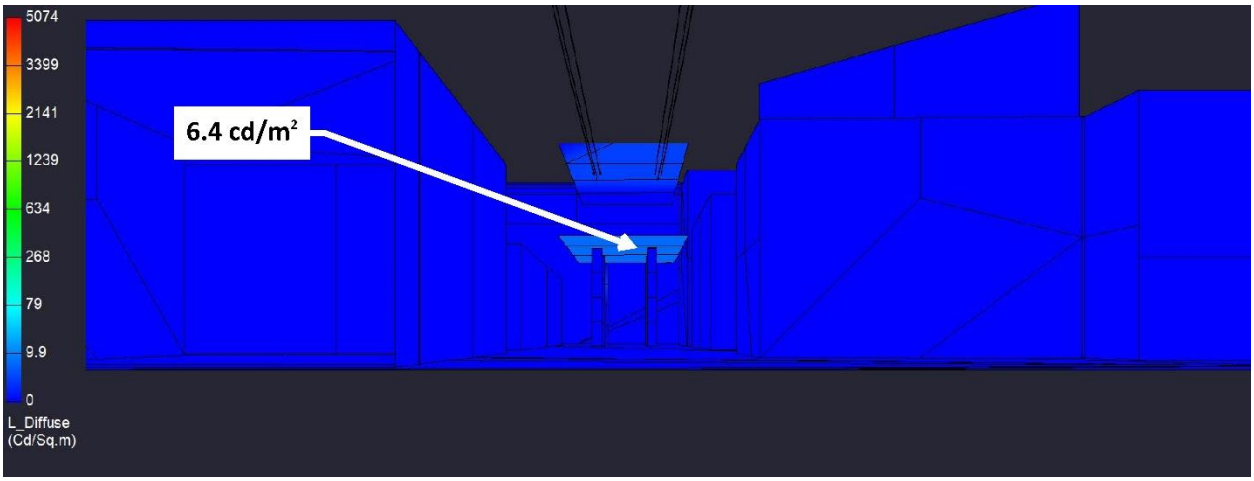
Receptor Site 6A - 7th at Brush





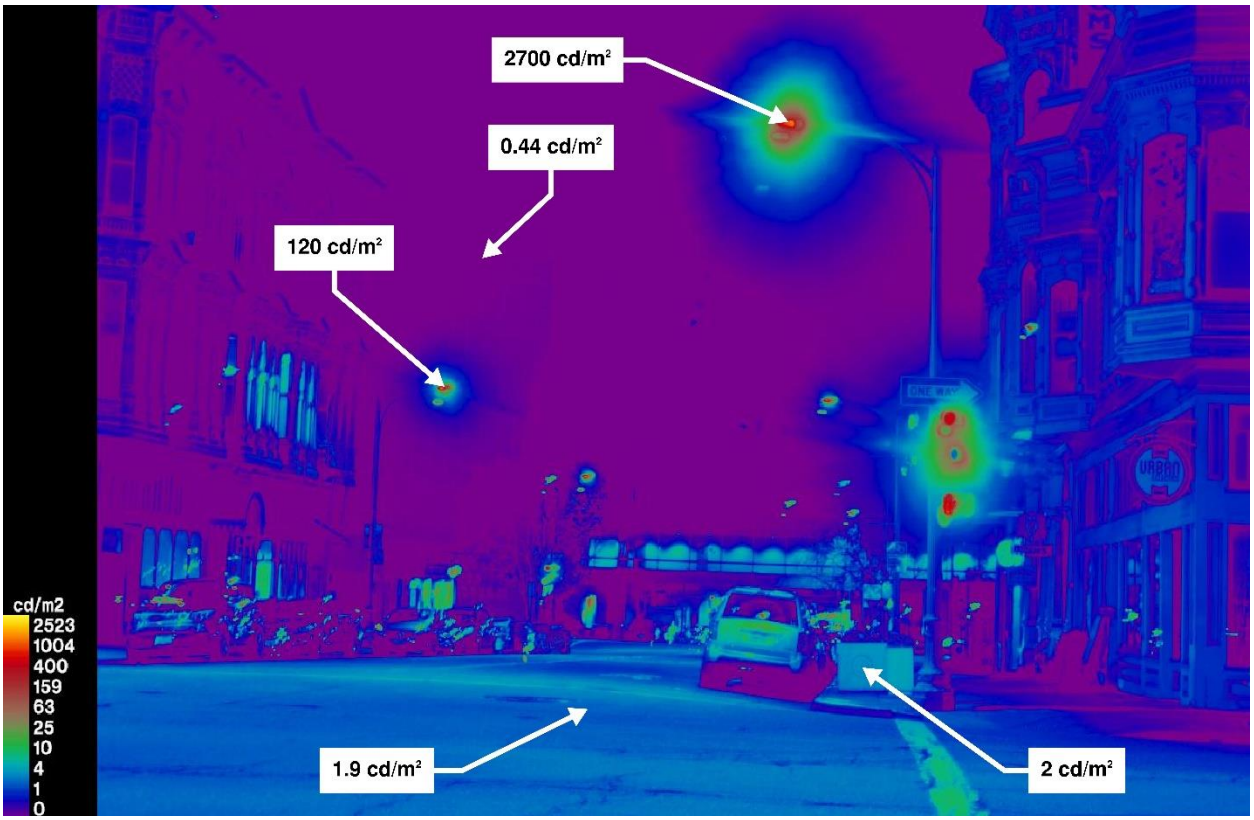
Baseline Geometry “Phase 1” Scenario Game Nights

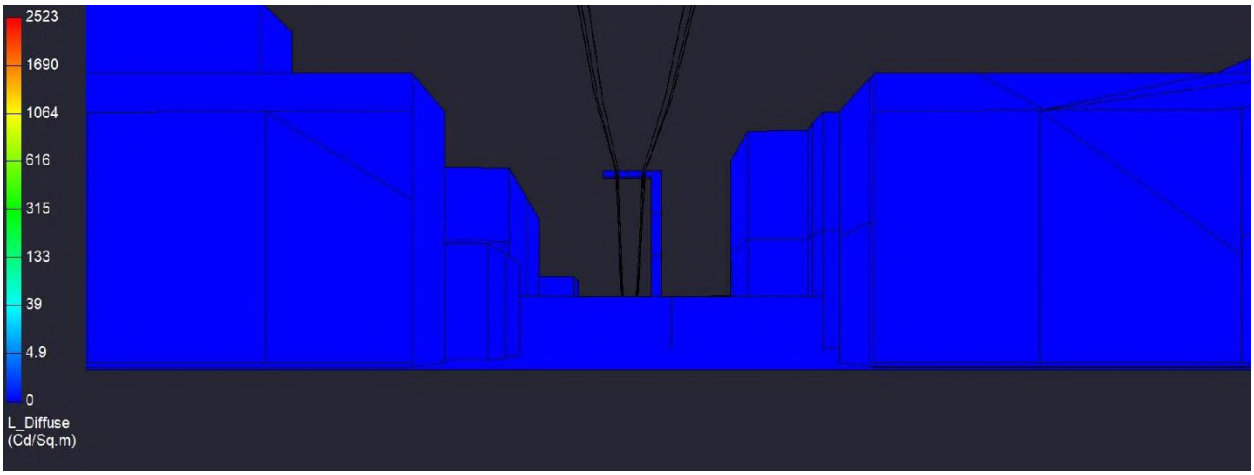
Receptor Site 7 - 8th at Washington (Facing Convention Center Station)



Baseline Geometry “Phase 1” Scenario Game Nights

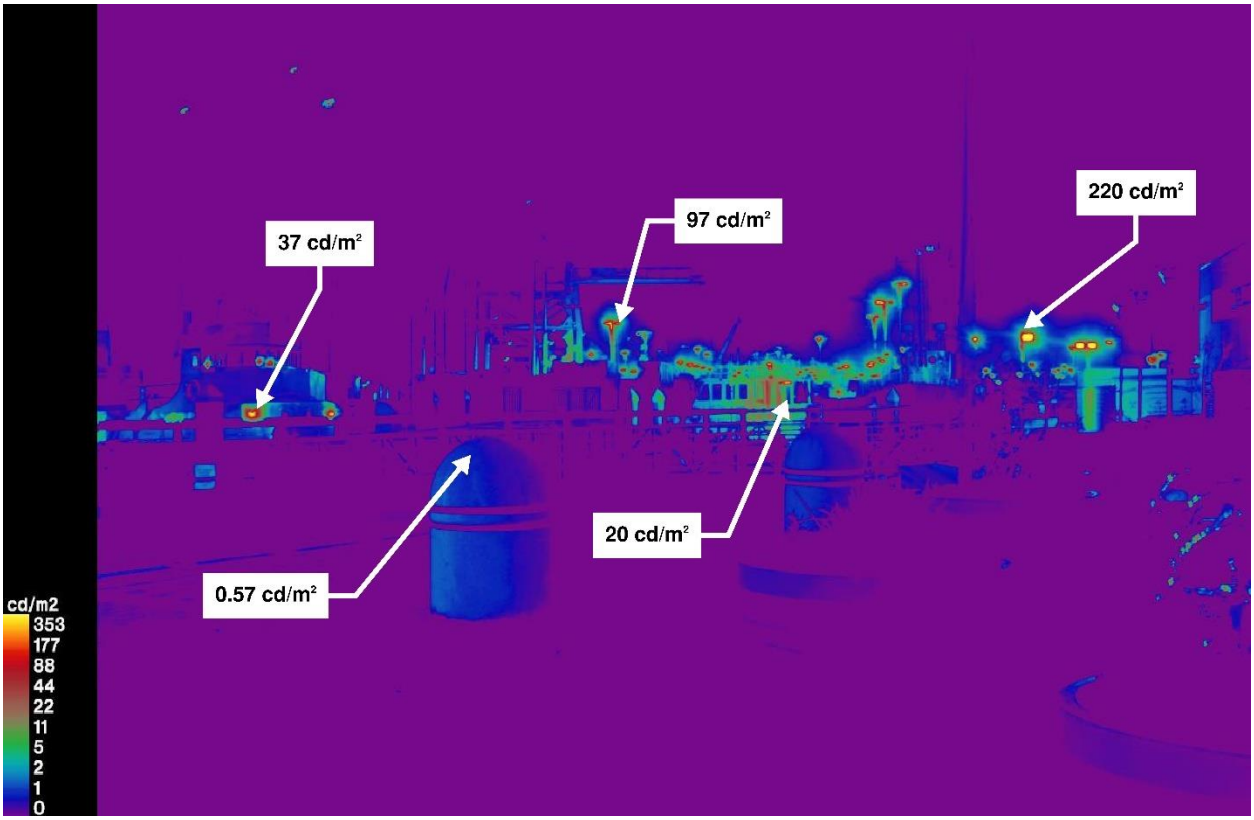
Receptor Site 7A - 8th at Washington (Facing Tower)

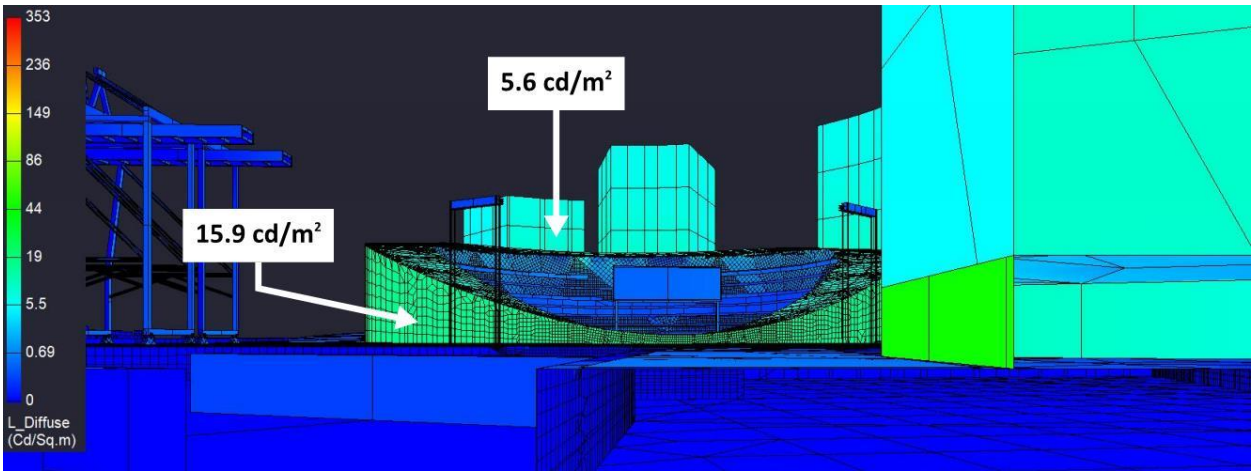




MRA Project, Baseline Ballpark “Phase 1” Scenario Non-Game Nights Pre-Curfew

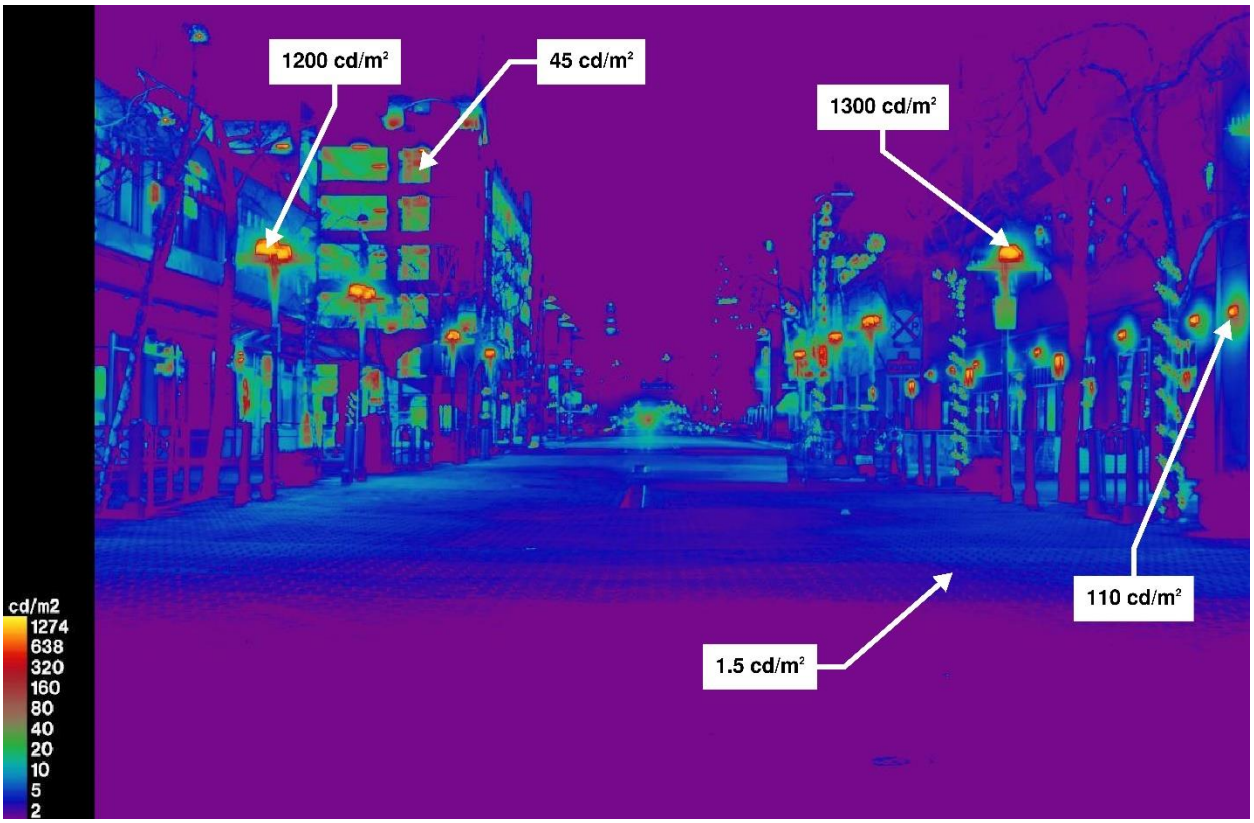
Receptor Site 1 - Water Street at Clay (Facing Ballpark)

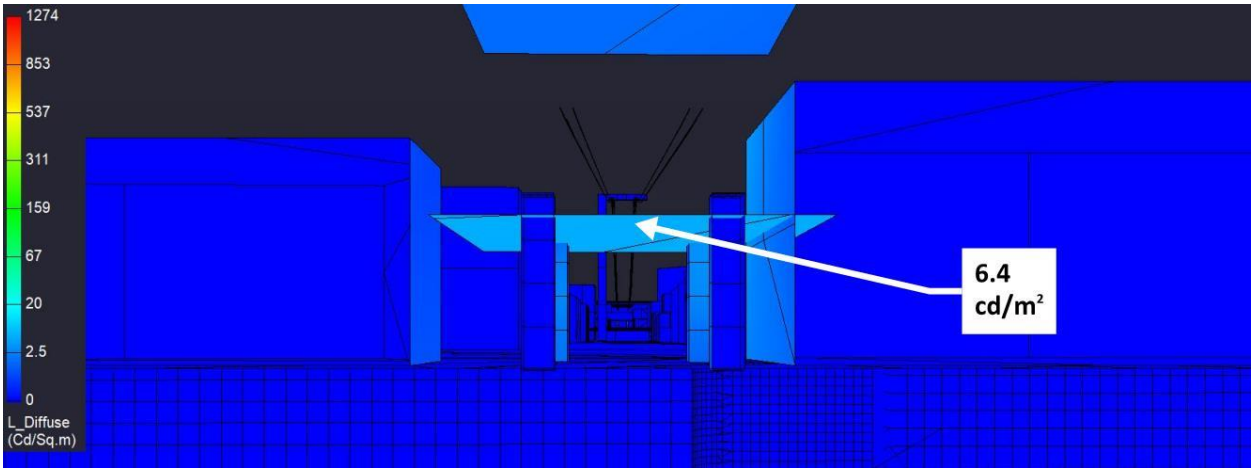




MRA Project, Baseline Ballpark “Phase 1” Scenario Non-Game Nights Pre-Curfew

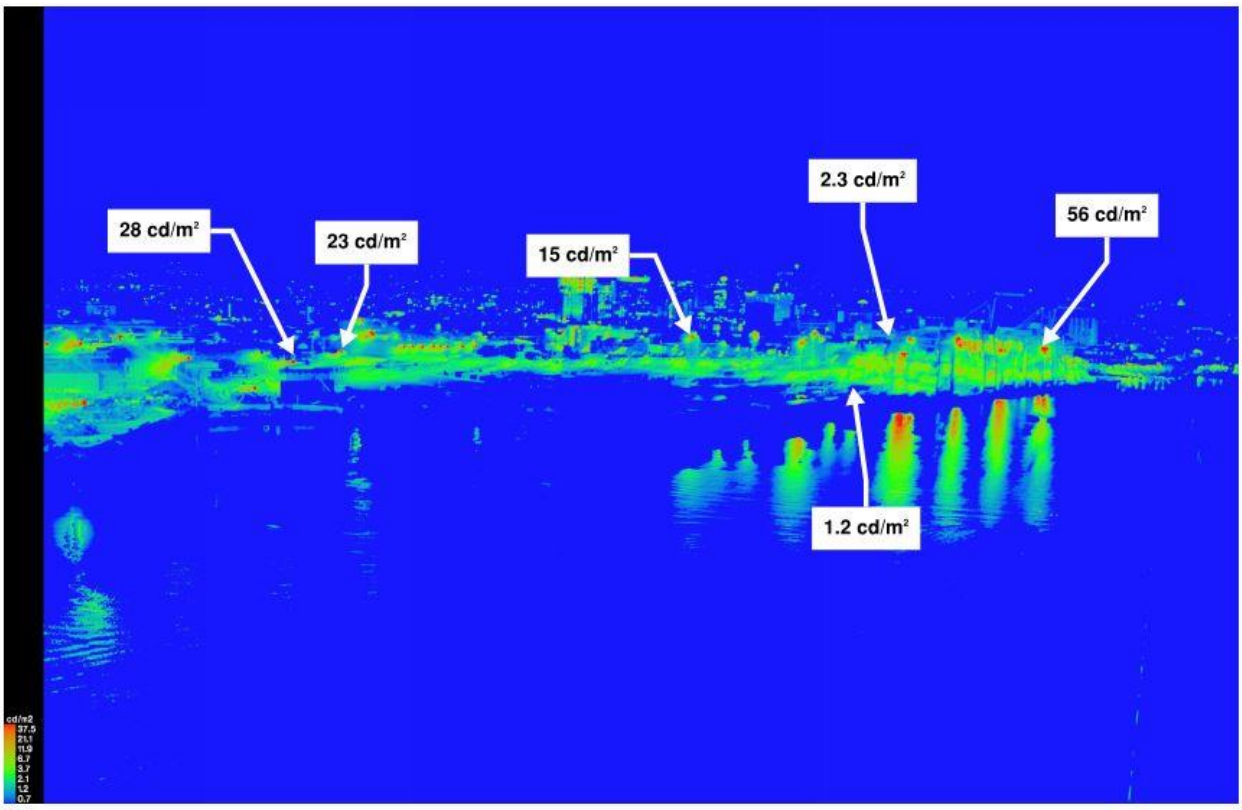
Receptor Site 1A - Water Street at Washington (Facing Gondola)

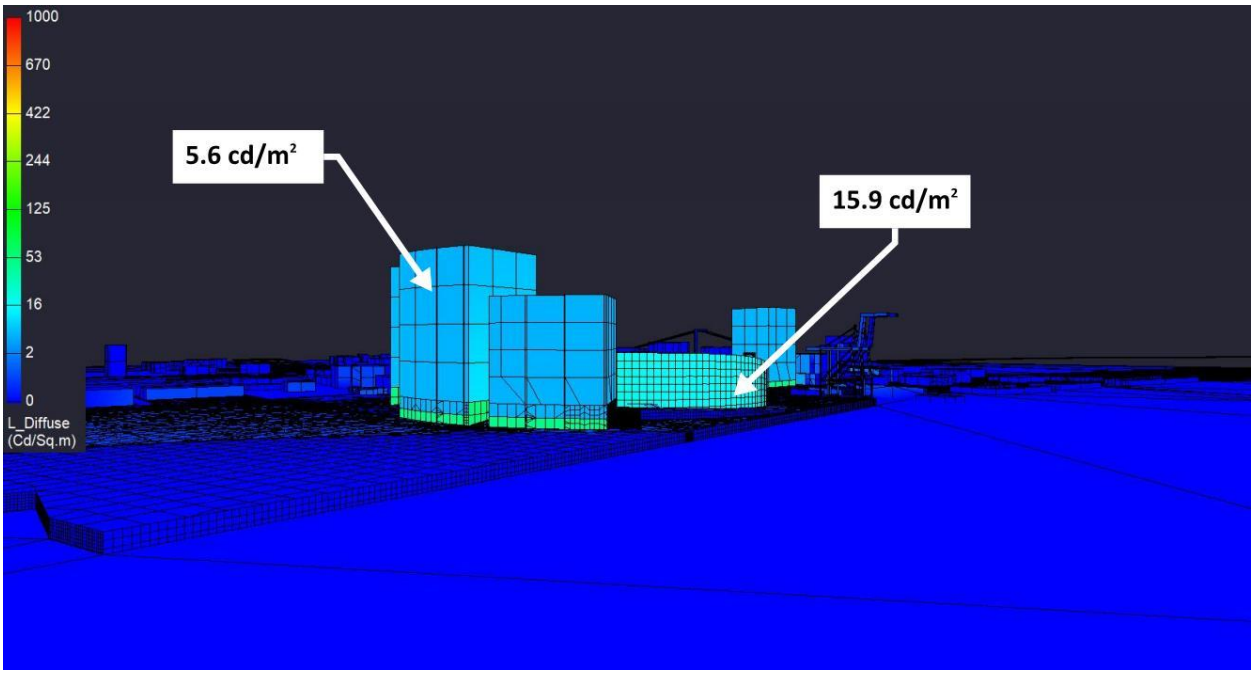




MRA Project, Baseline Ballpark “Phase 1” Scenario Non-Game Nights Pre-Curfew

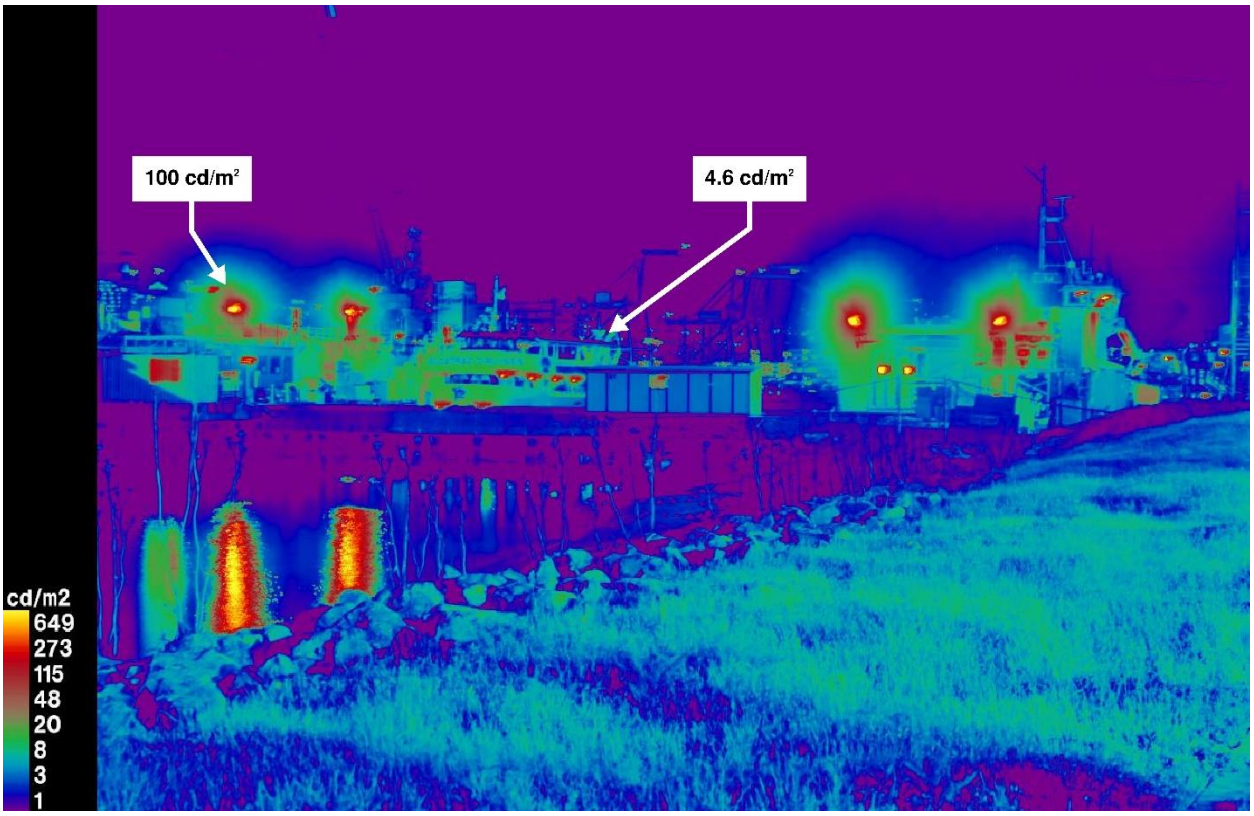
Receptor Site 2 - Inner Harbor Turning Basin @ 190'

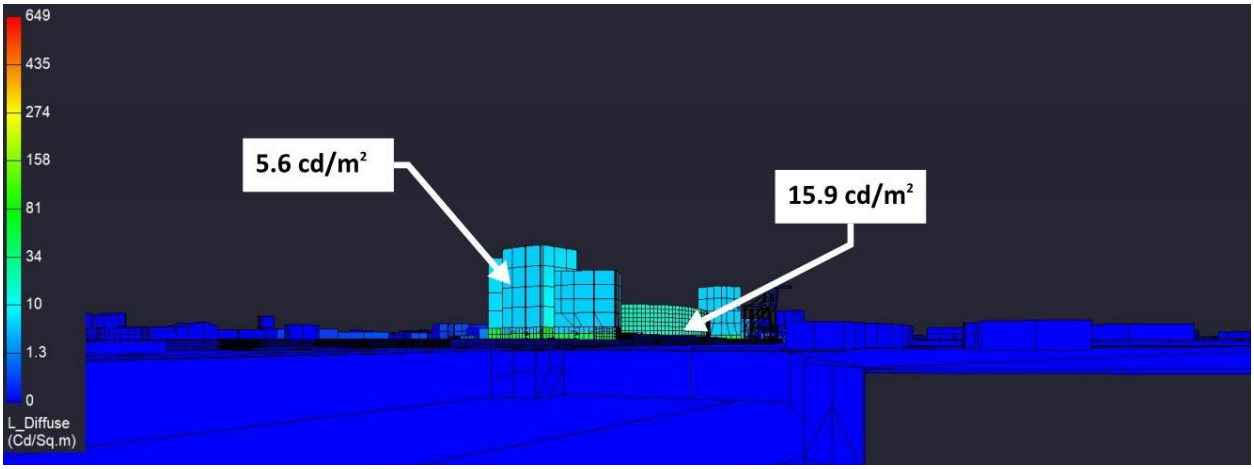




MRA Project, Baseline Ballpark “Phase 1” Scenario Non-Game Nights Pre-Curfew

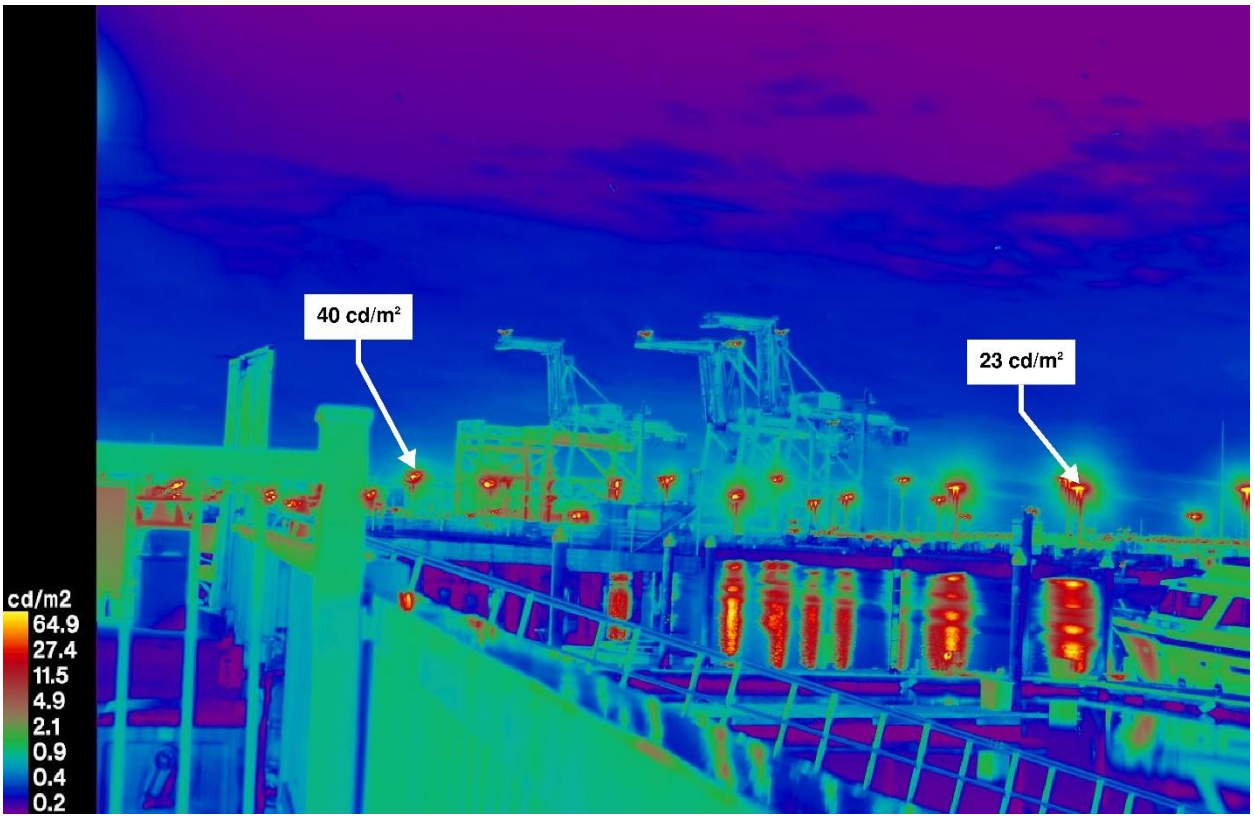
Receptor Site 2A - Turning Basin Line-of-Sight

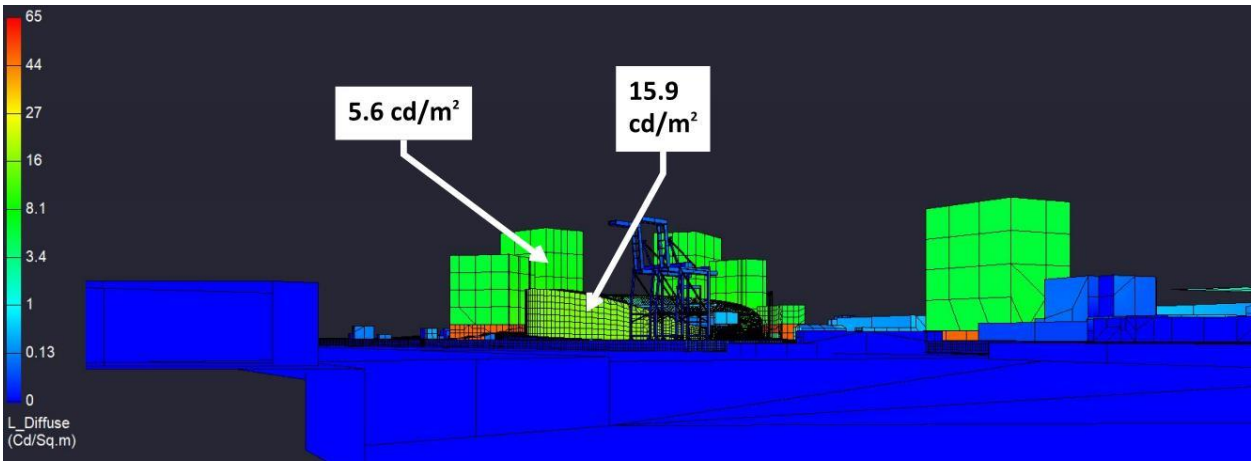




MRA Project, Baseline Ballpark “Phase 1” Scenario Non-Game Nights Pre-Curfew

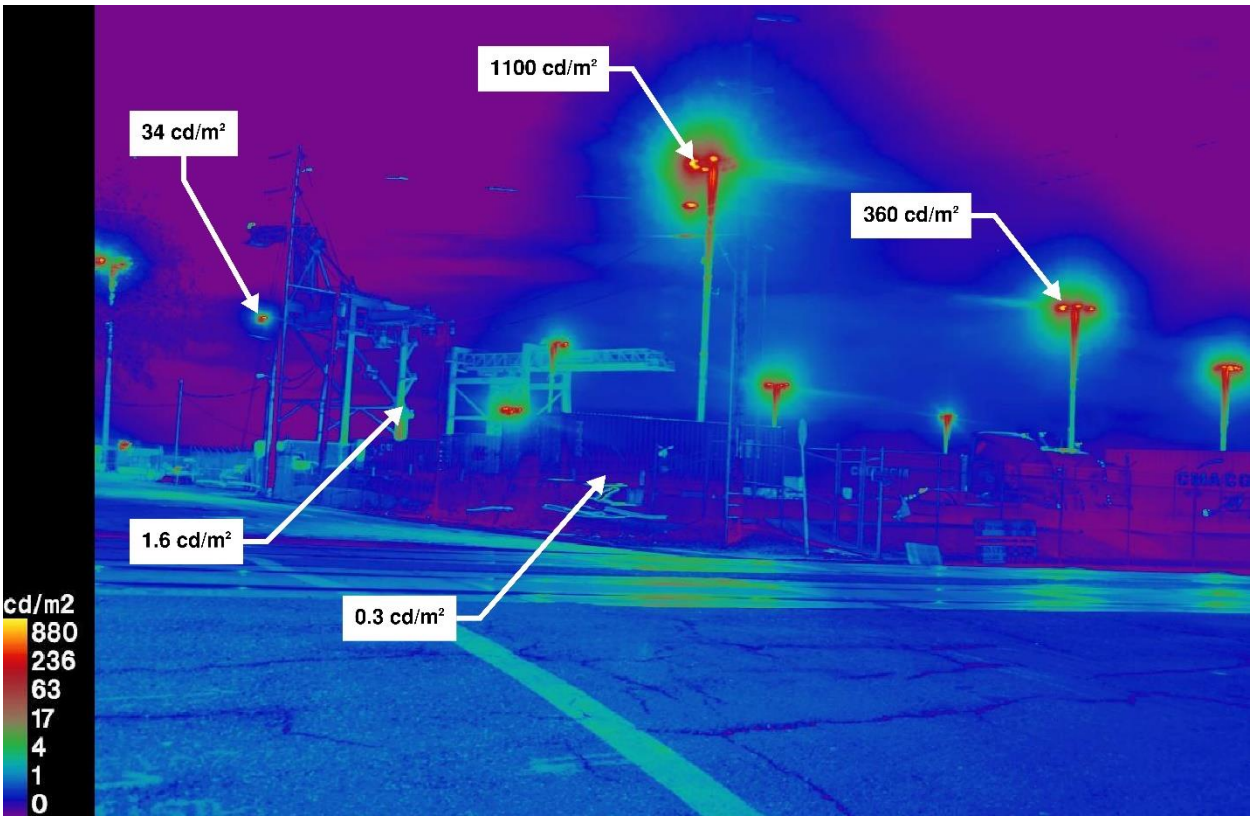
Receptor Site 3 - Alameda Dock

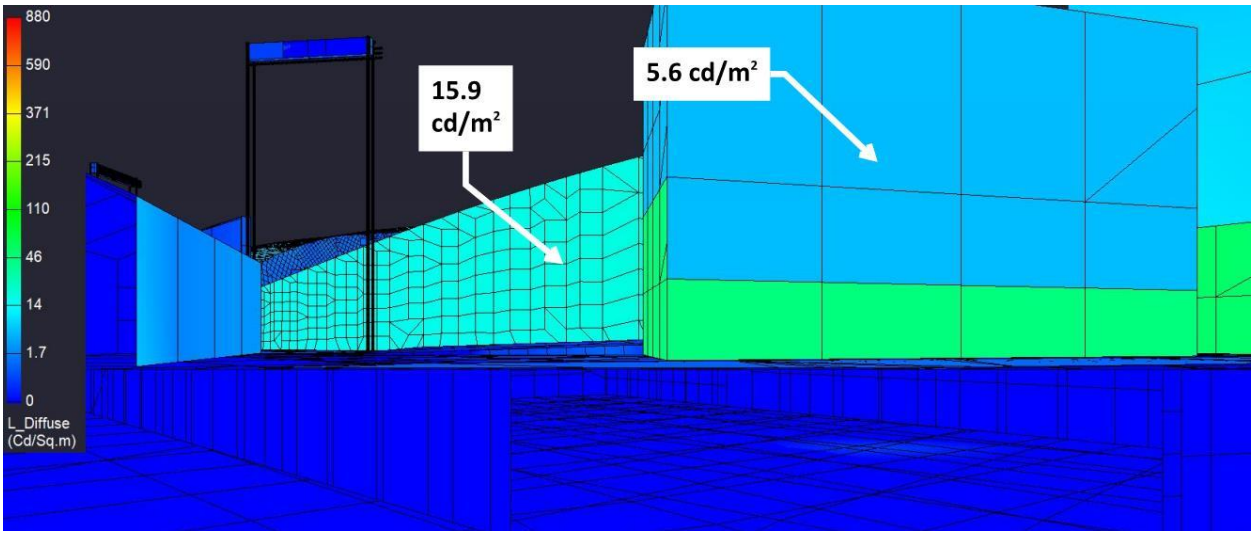




MRA Project, Baseline Ballpark “Phase 1” Scenario Non-Game Nights Pre-Curfew

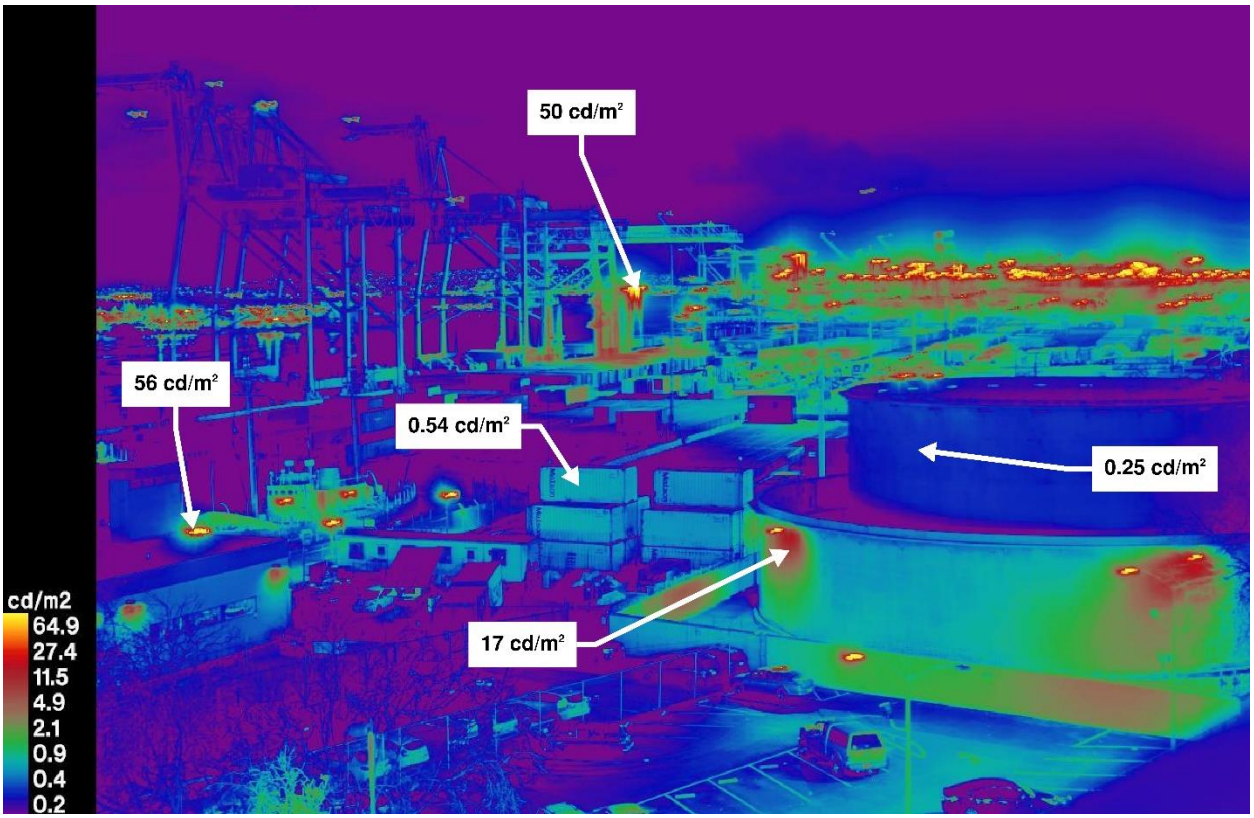
Receptor Site 4 - MLK at Embarcadero

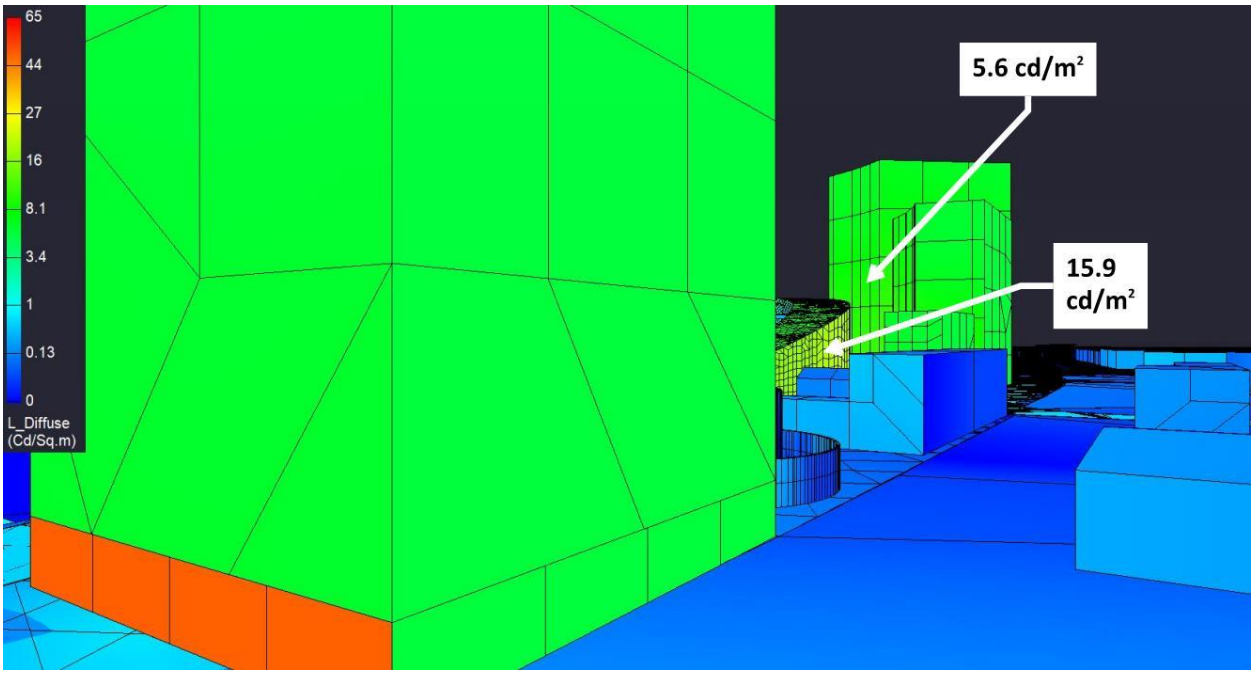




MRA Project, Baseline Ballpark “Phase 1” Scenario Non-Game Nights Pre-Curfew

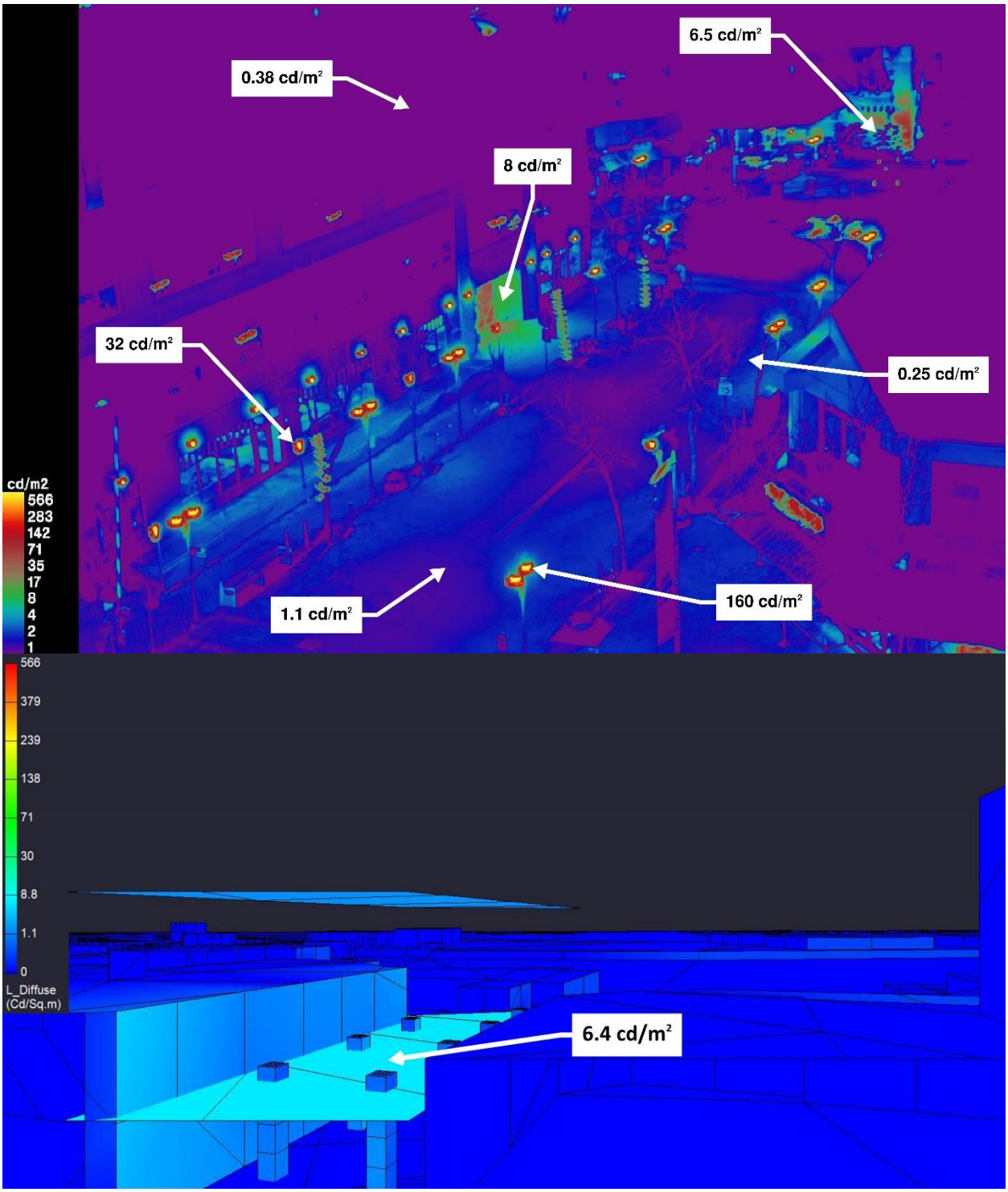
Receptor Site 5A - 2nd at Washington (Facing Stadium)



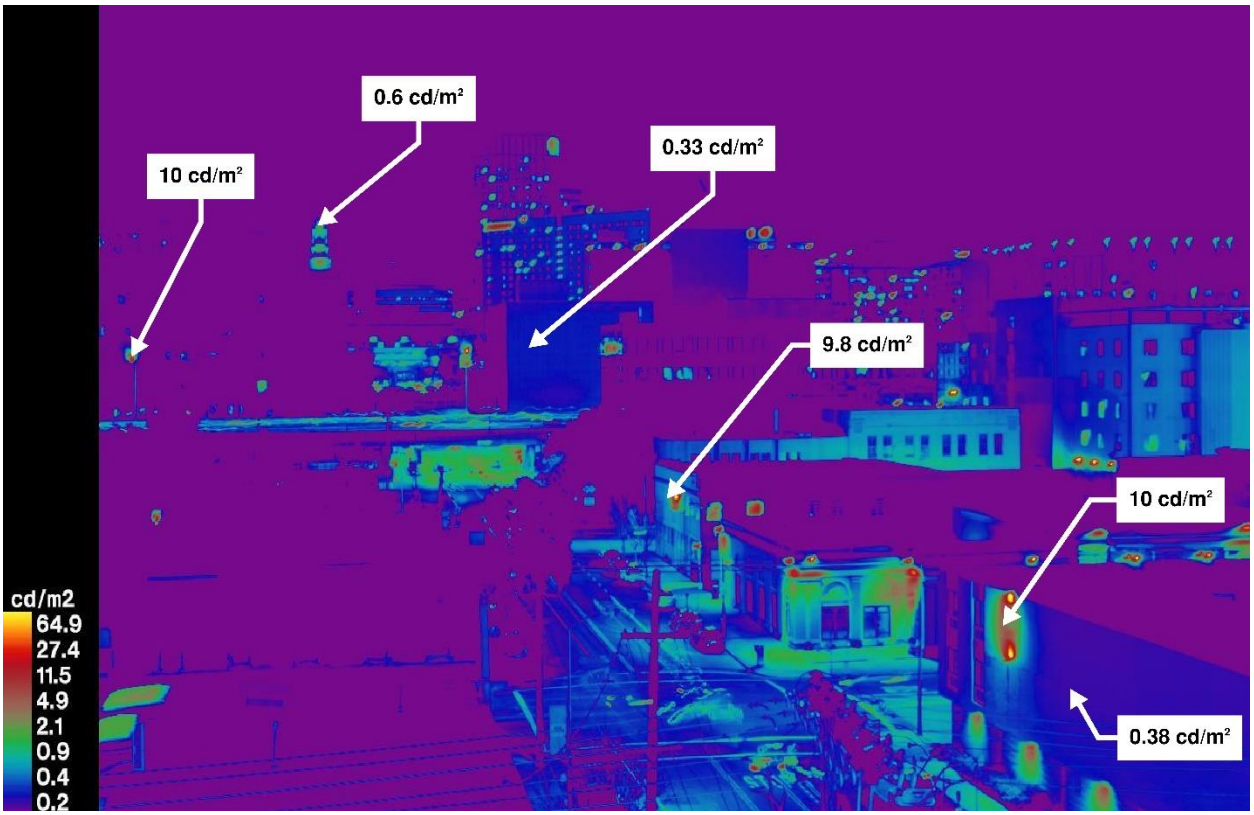


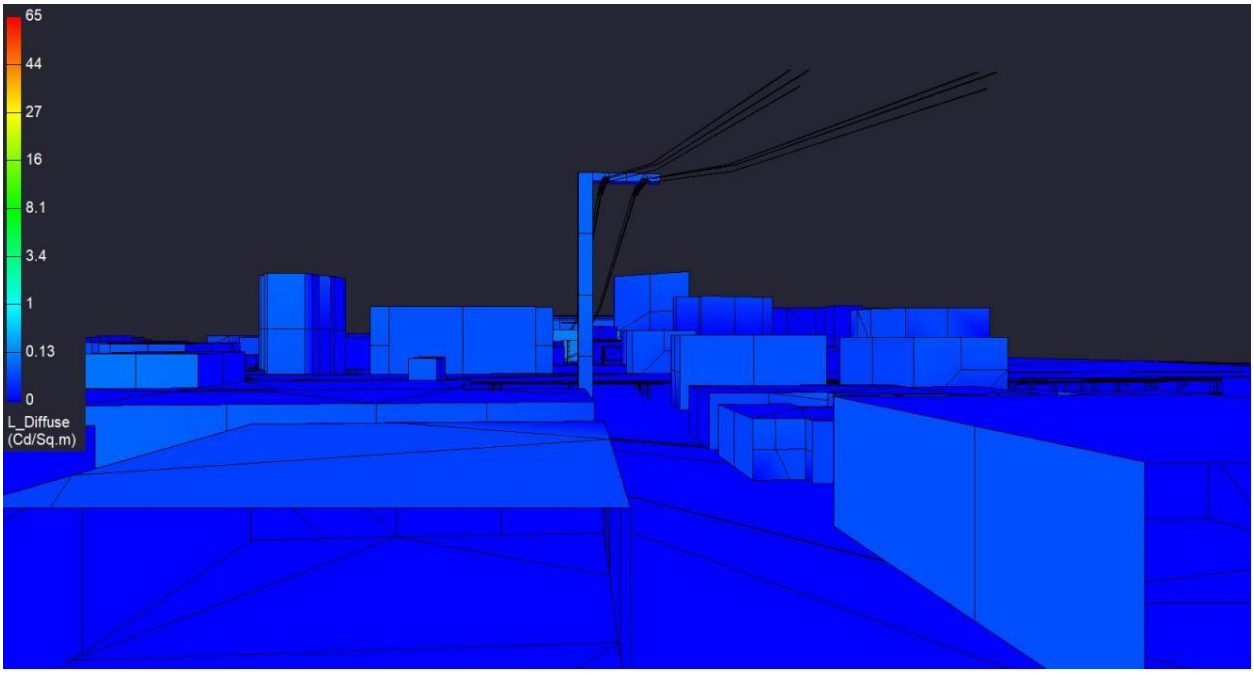
MRA Project, Baseline Ballpark “Phase 1” Scenario Non-Game Nights Pre-Curfew

Receptor Site 5B - 2nd at Washington (Facing JLS Station)



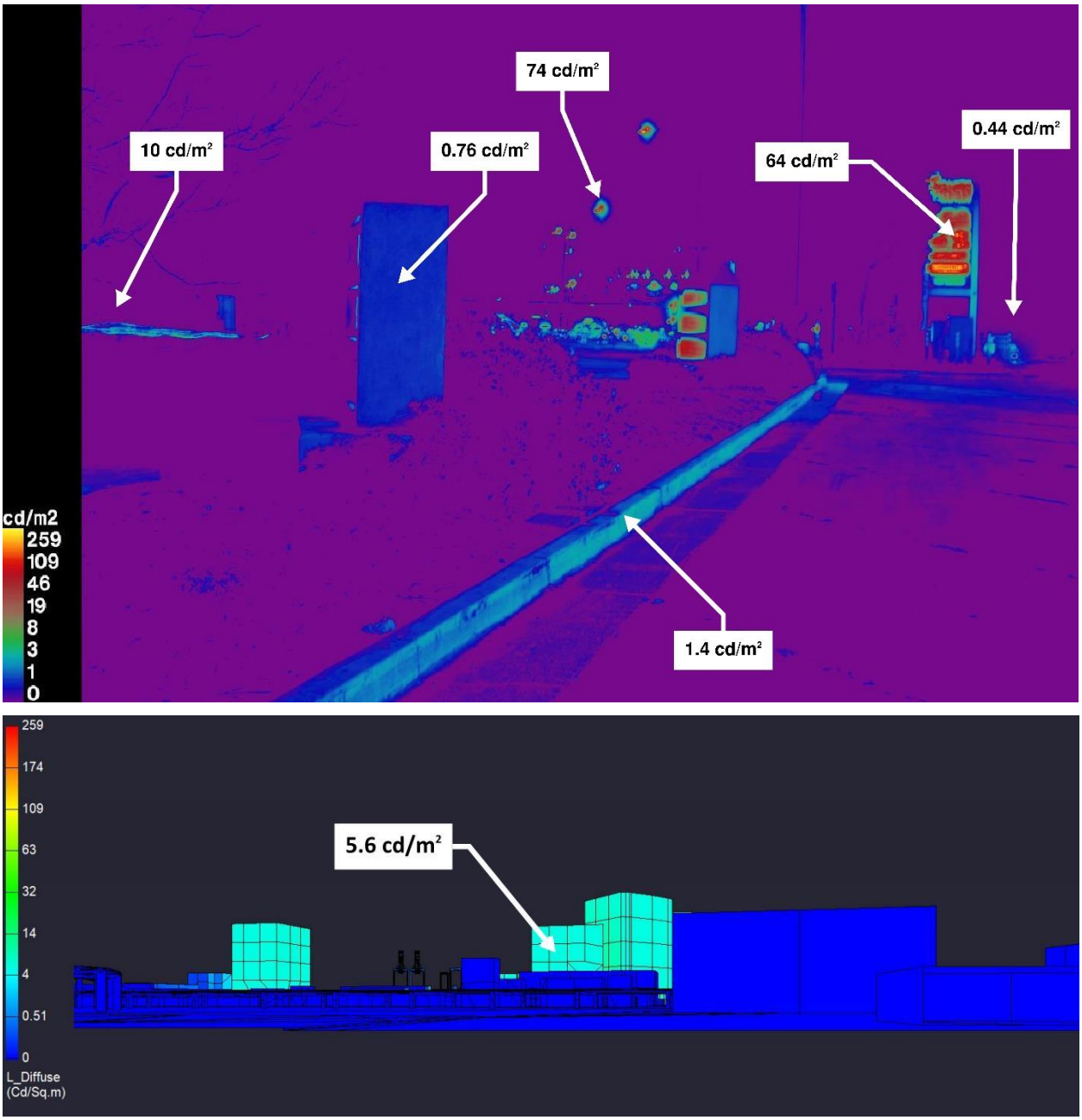
MRA Project, Baseline Ballpark “Phase 1” Scenario Non-Game Nights Pre-Curfew
Receptor Site 5C - 2nd at Washington (Facing Convention Center Station)





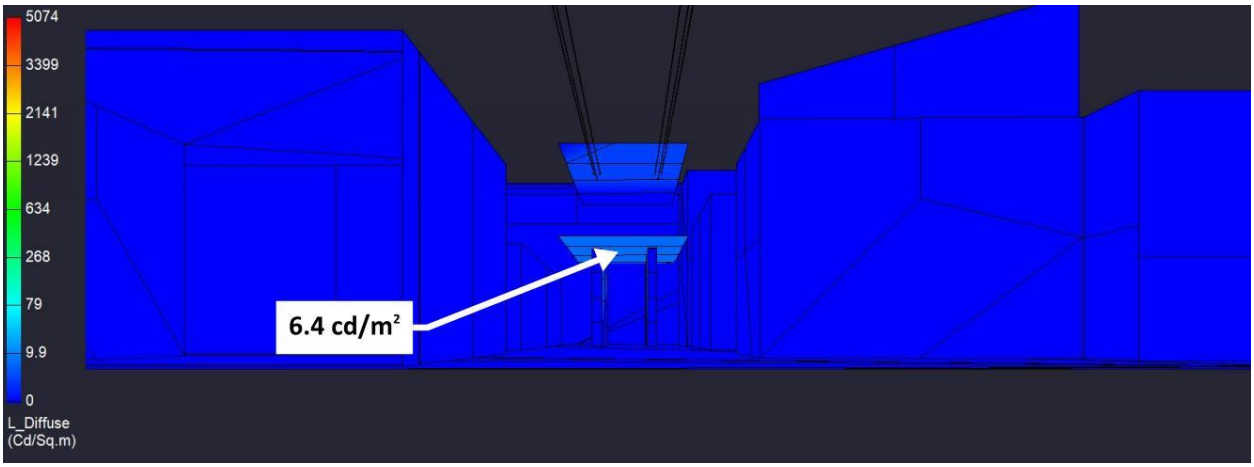
MRA Project, Baseline Ballpark “Phase 1” Scenario Non-Game Nights Pre-Curfew

Receptor Site 6A - 7th at Brush



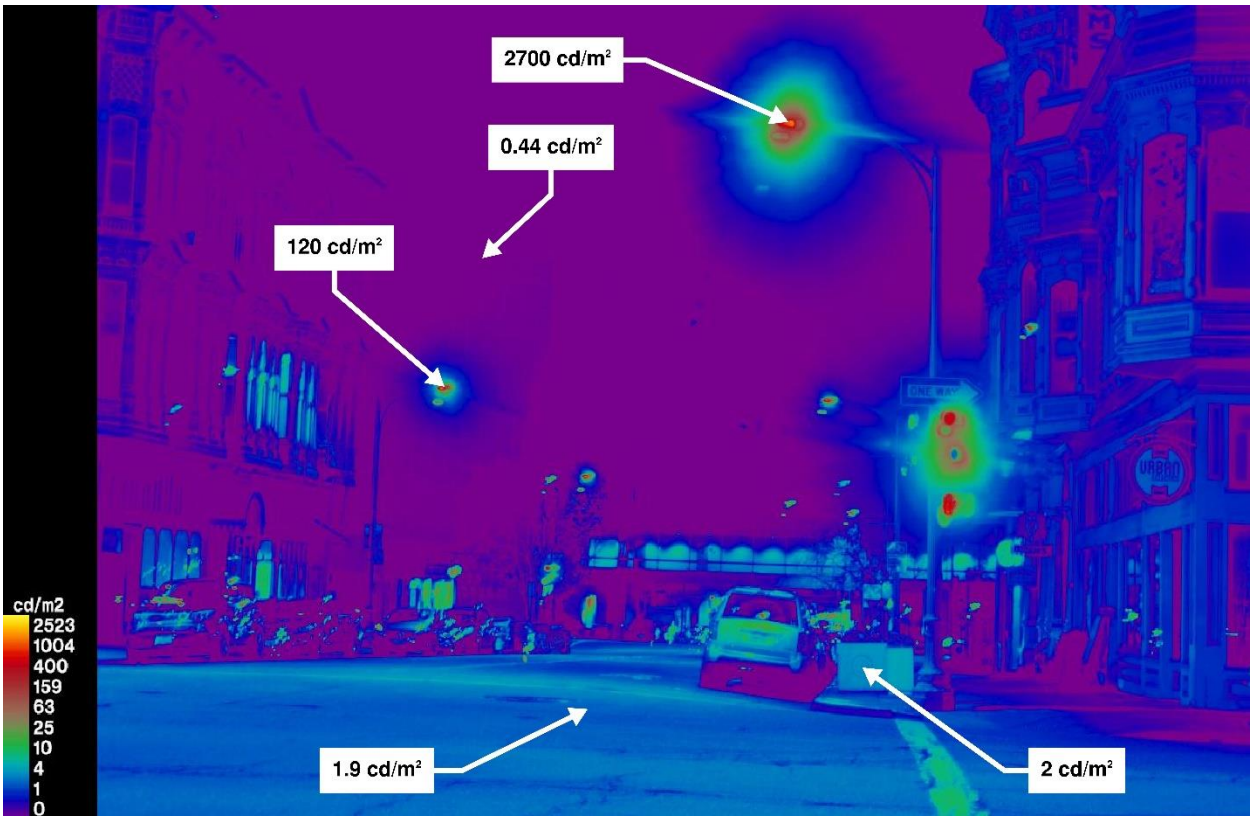
MRA Project, Baseline Ballpark “Phase 1” Scenario Non-Game Nights Pre-Curfew

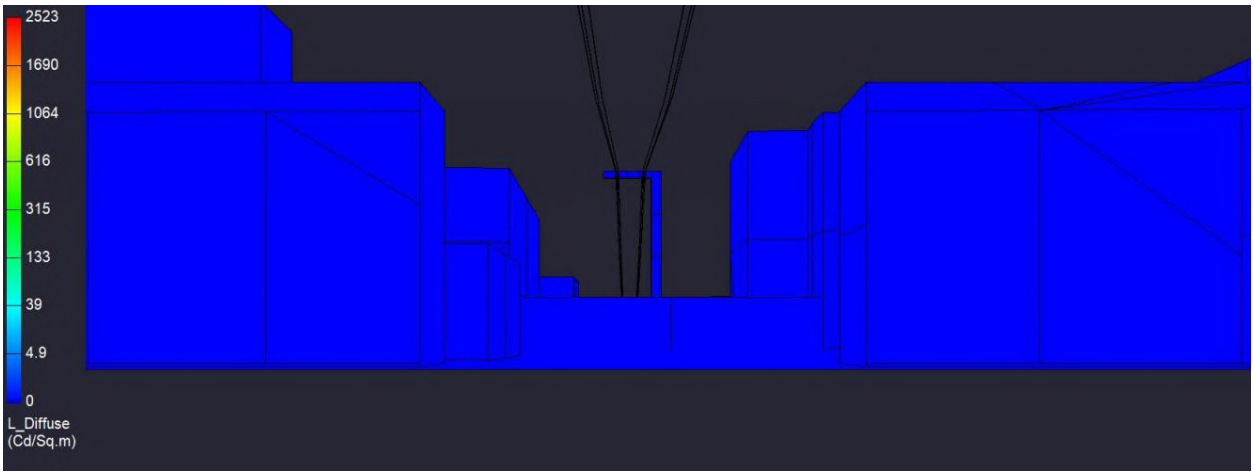
Receptor Site 7 - 8th at Washington (Facing Convention Center Station)



MRA Project, Baseline Ballpark “Phase 1” Scenario Non-Game Nights Pre-Curfew

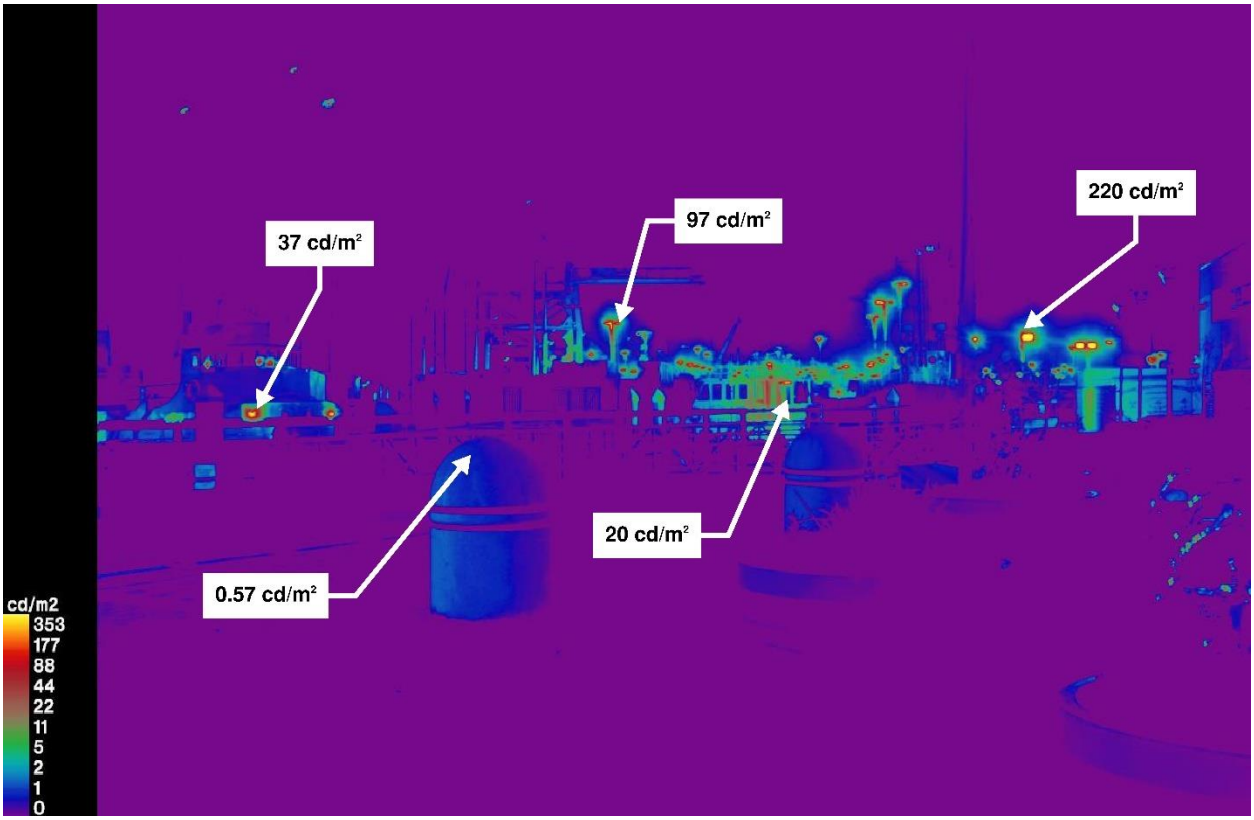
Receptor Site 7A - 8th at Washington (Facing Tower)

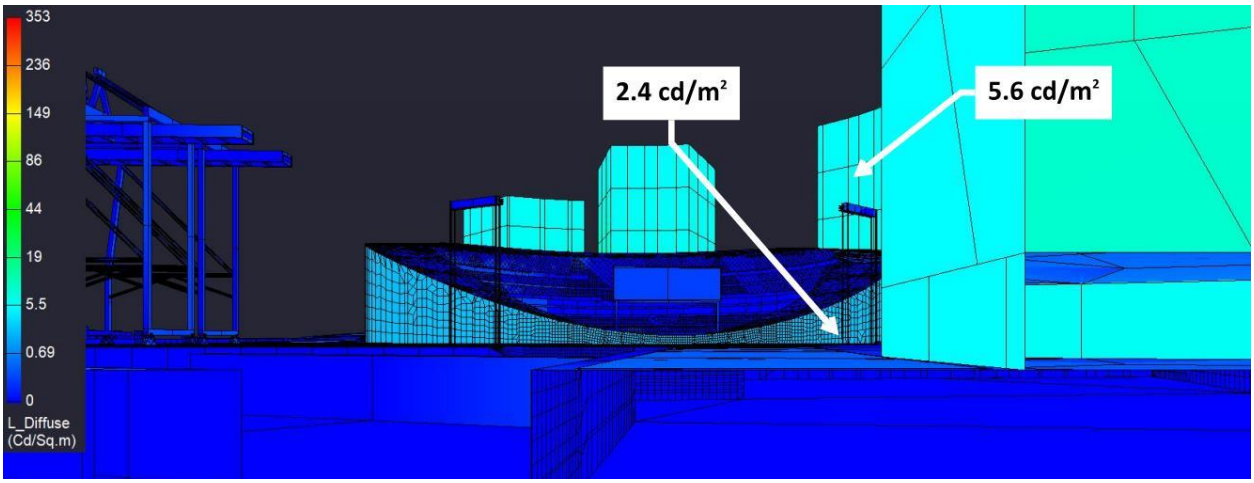




MRA Project, Baseline Ballpark “Phase 1” Scenario Post-Curfew

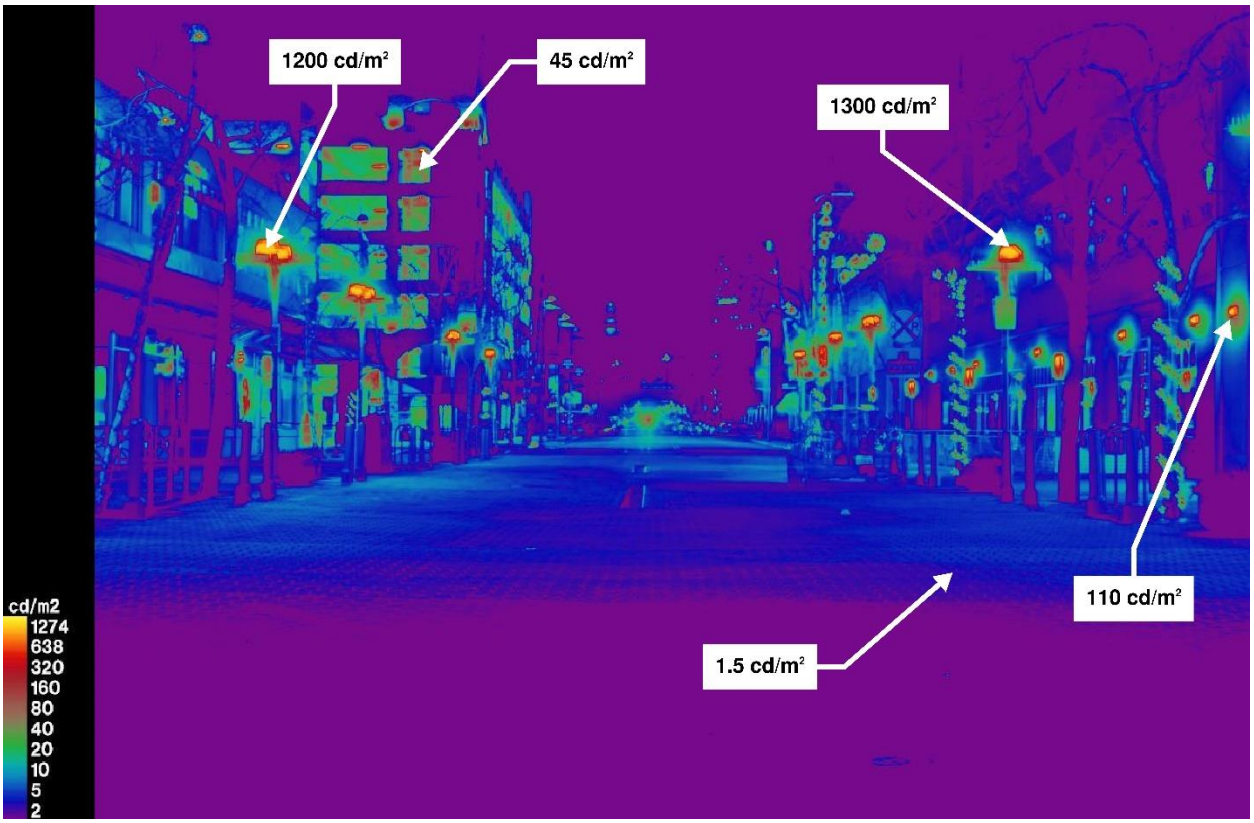
Receptor Site 1 - Water Street at Clay (Facing Ballpark)

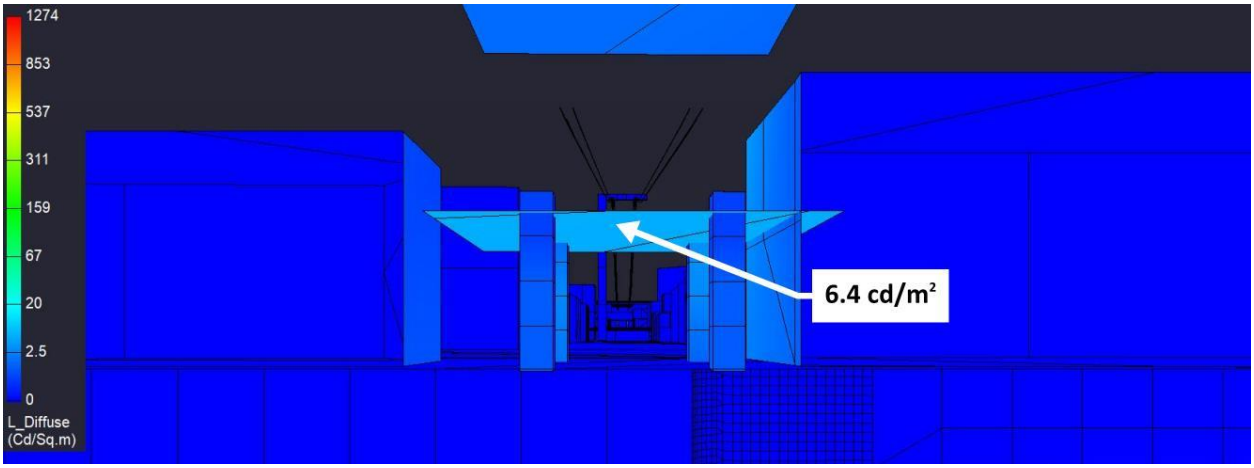




MRA Project, Baseline Ballpark “Phase 1” Scenario Post-Curfew

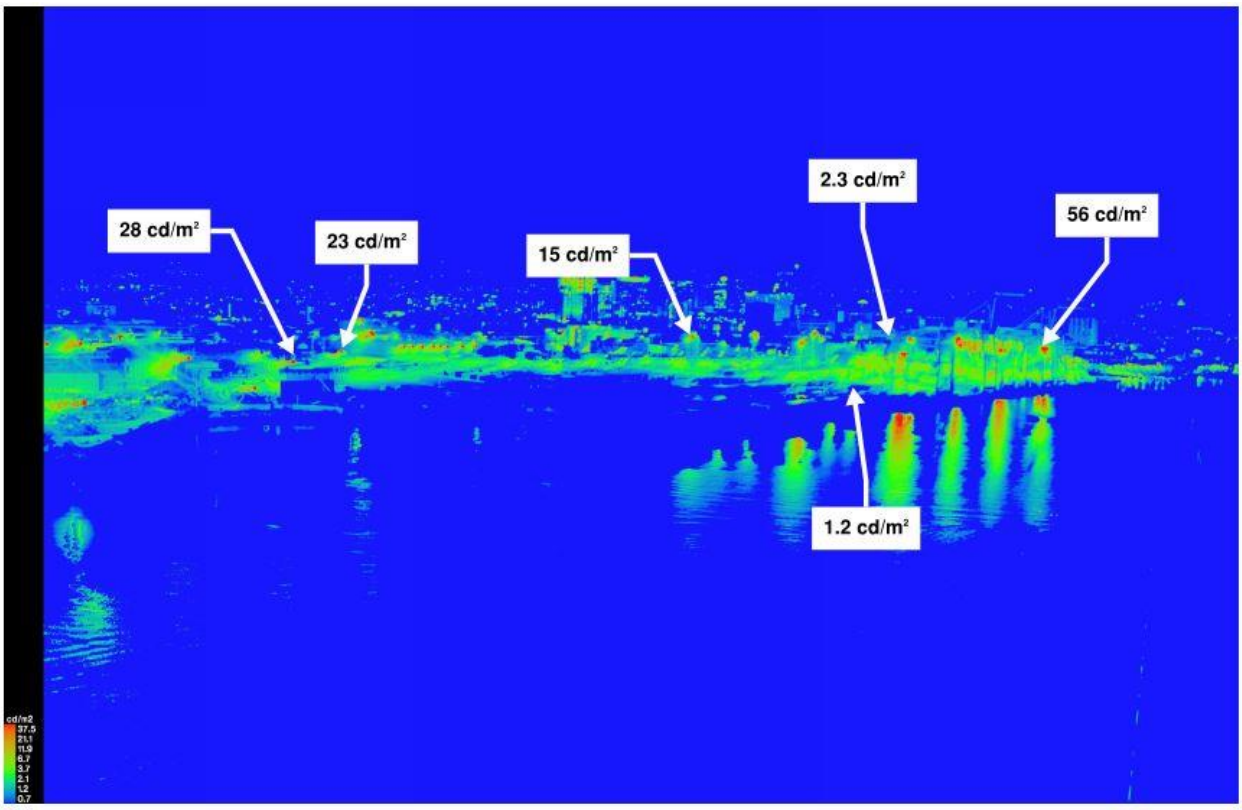
Receptor Site 1A - Water Street at Washington (Facing Gondola)

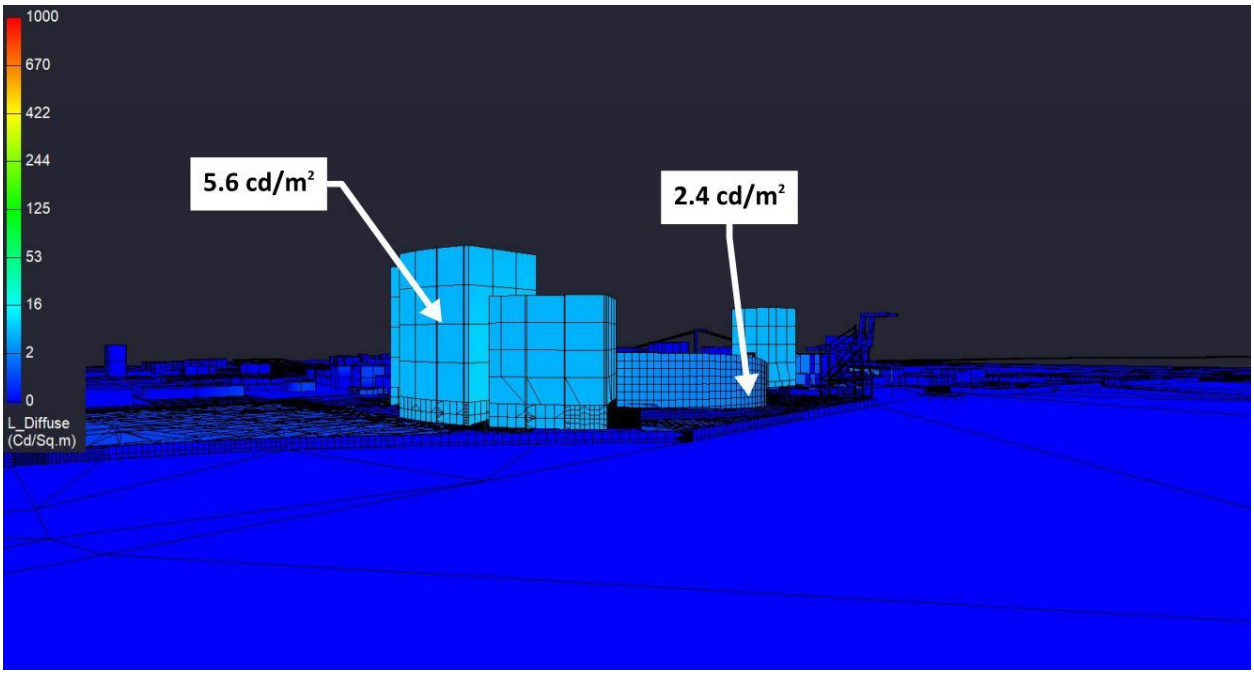




MRA Project, Baseline Ballpark “Phase 1” Scenario Post-Curfew

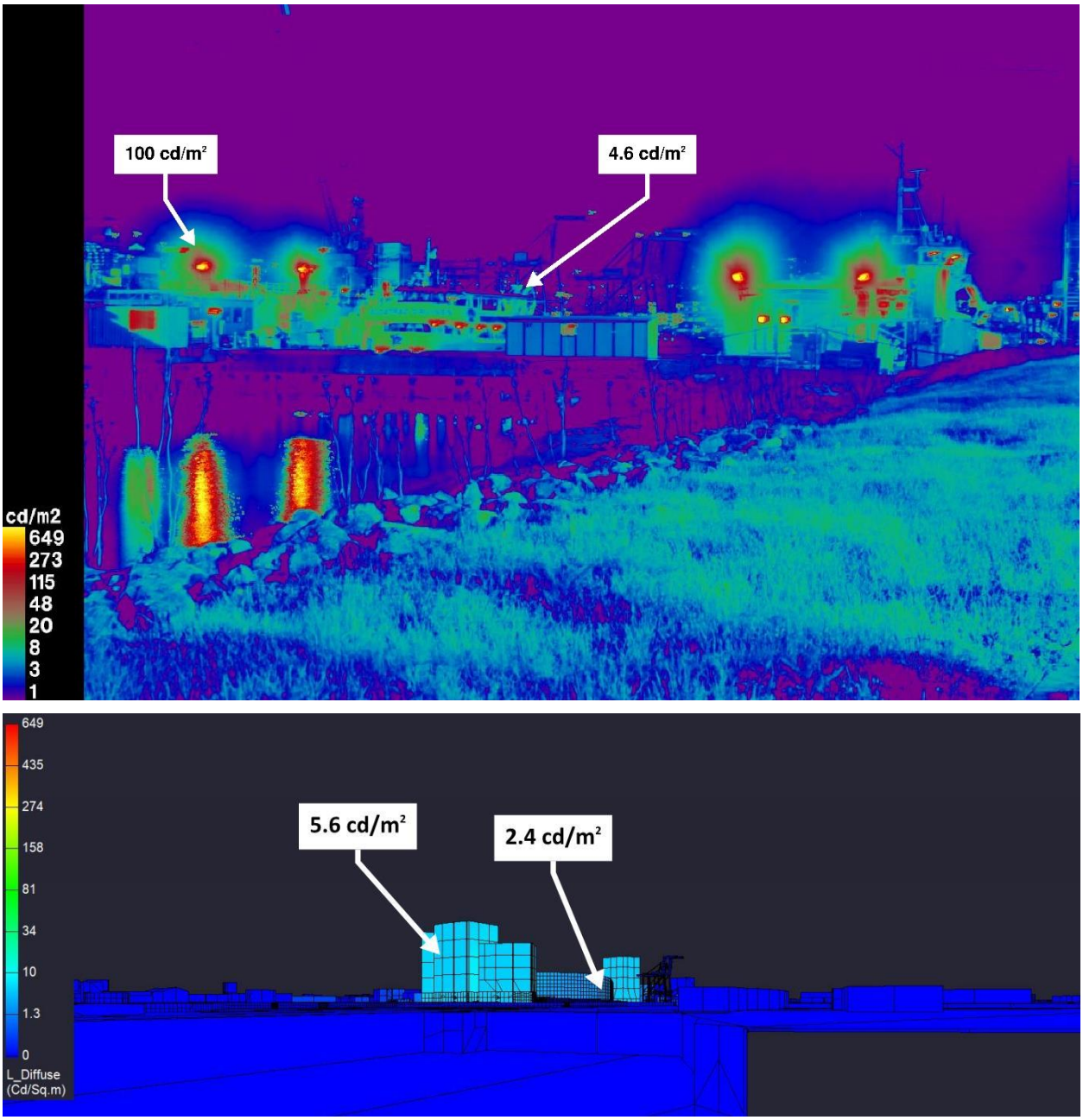
Receptor Site 2 - Inner Harbor Turning Basin @ 190'





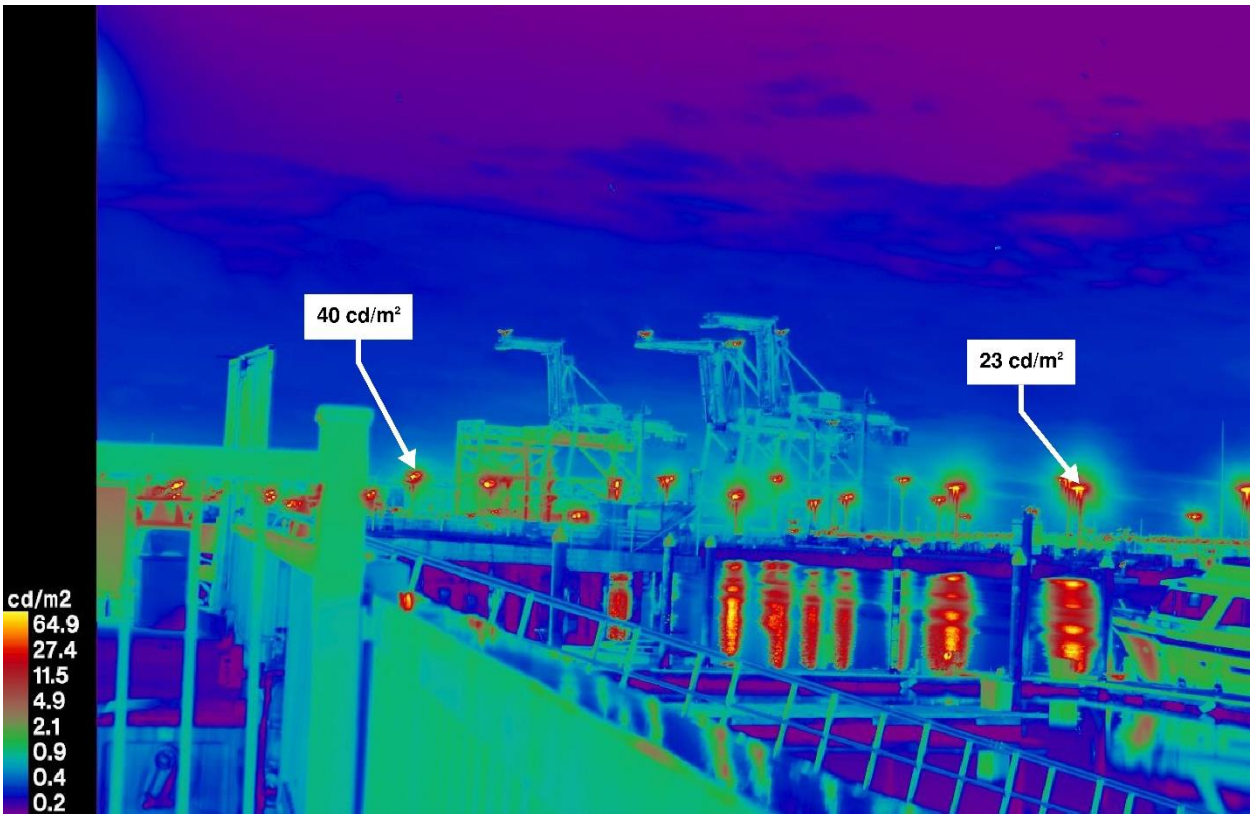
MRA Project, Baseline Ballpark “Phase 1” Scenario Post-Curfew

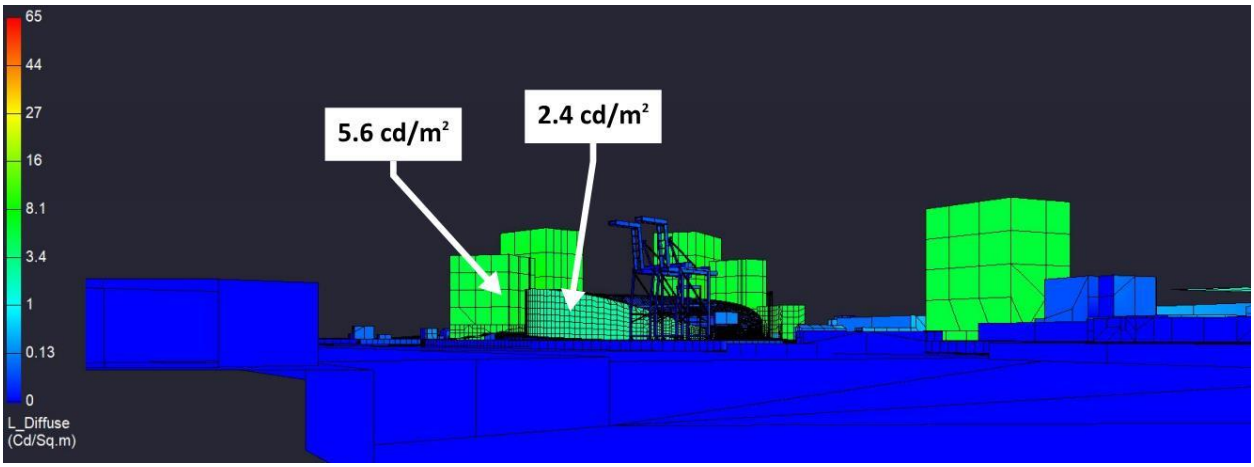
Receptor Site 2A - Turning Basin Line-of-Sight



MRA Project, Baseline Ballpark “Phase 1” Scenario Post-Curfew

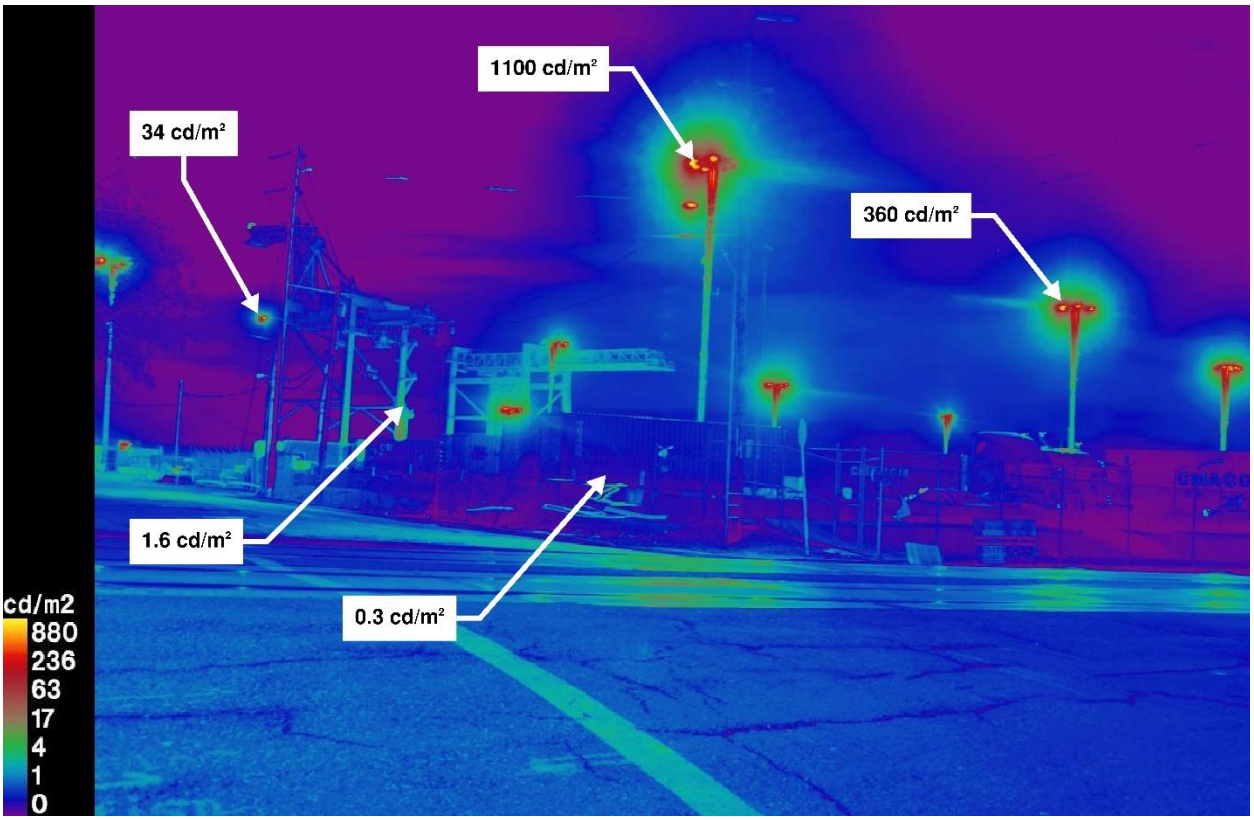
Receptor Site 3 - Alameda Dock

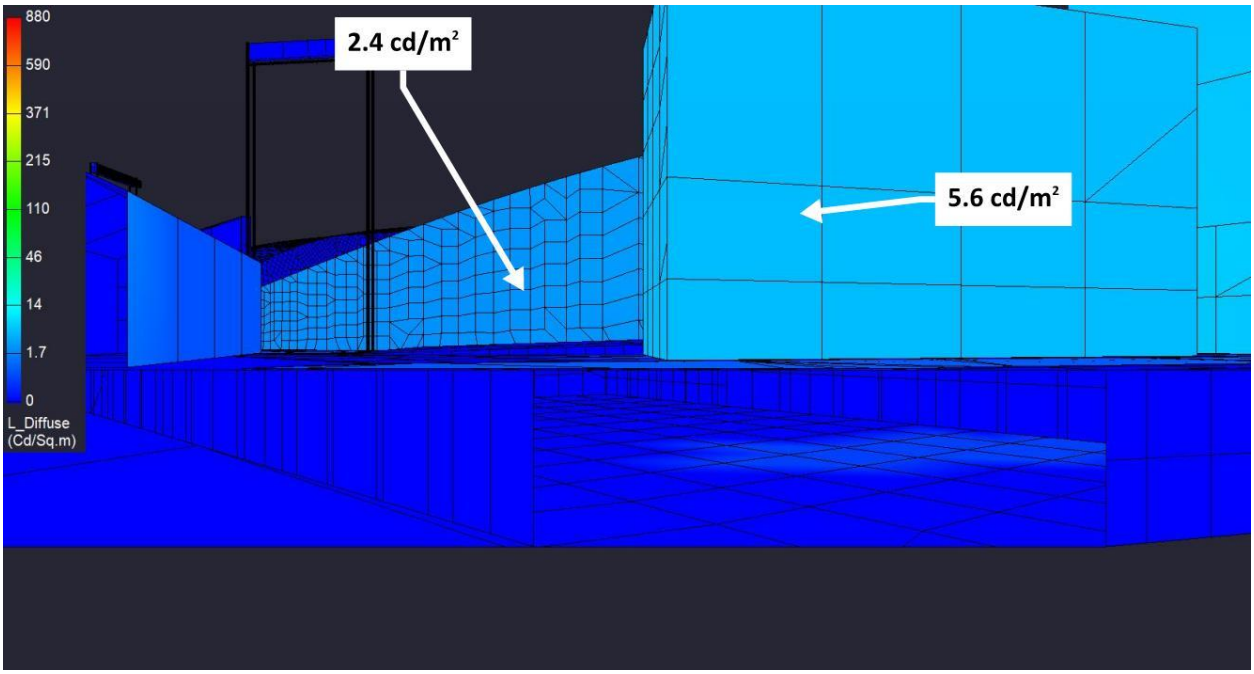




MRA Project, Baseline Ballpark “Phase 1” Scenario Post-Curfew

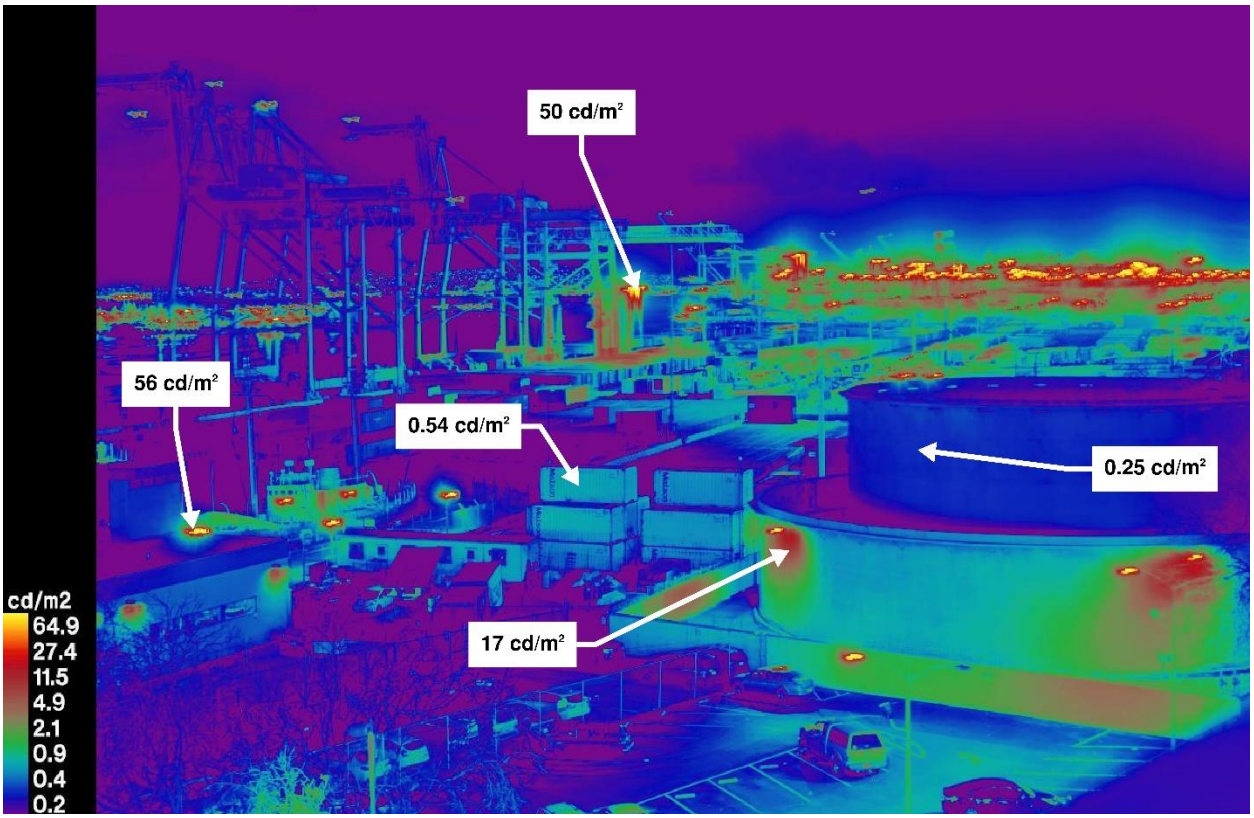
Receptor Site 4 - MLK at Embarcadero

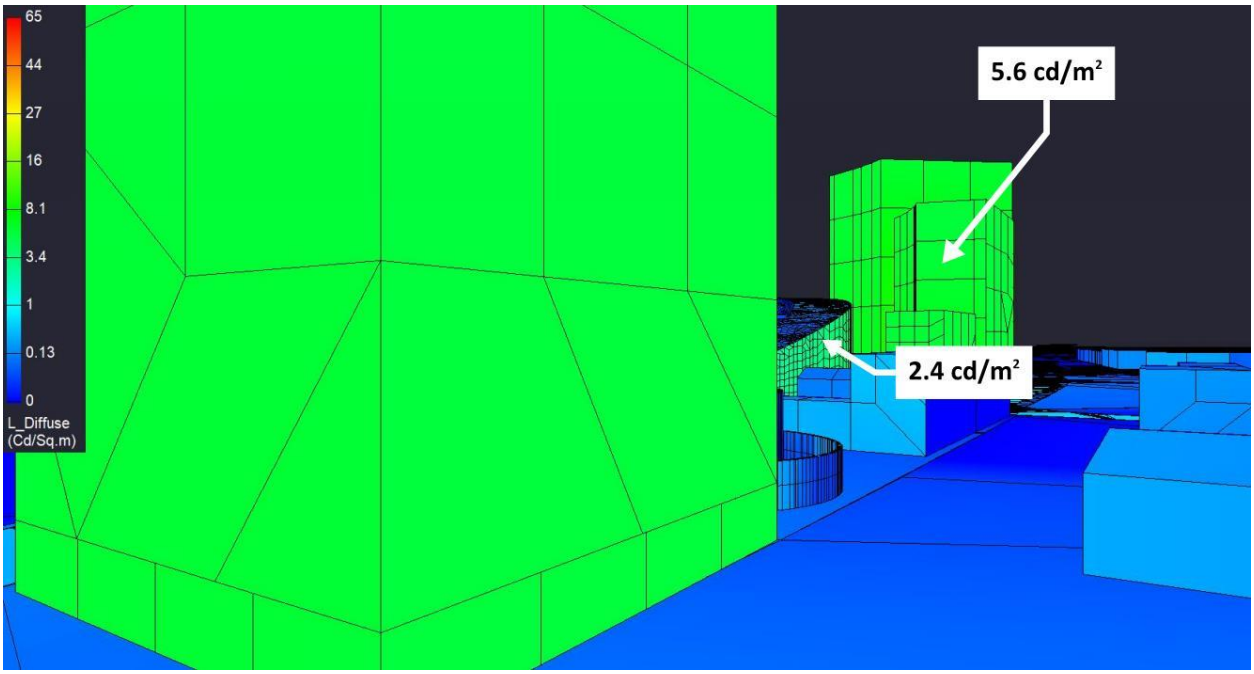




MRA Project, Baseline Ballpark “Phase 1” Scenario Post-Curfew

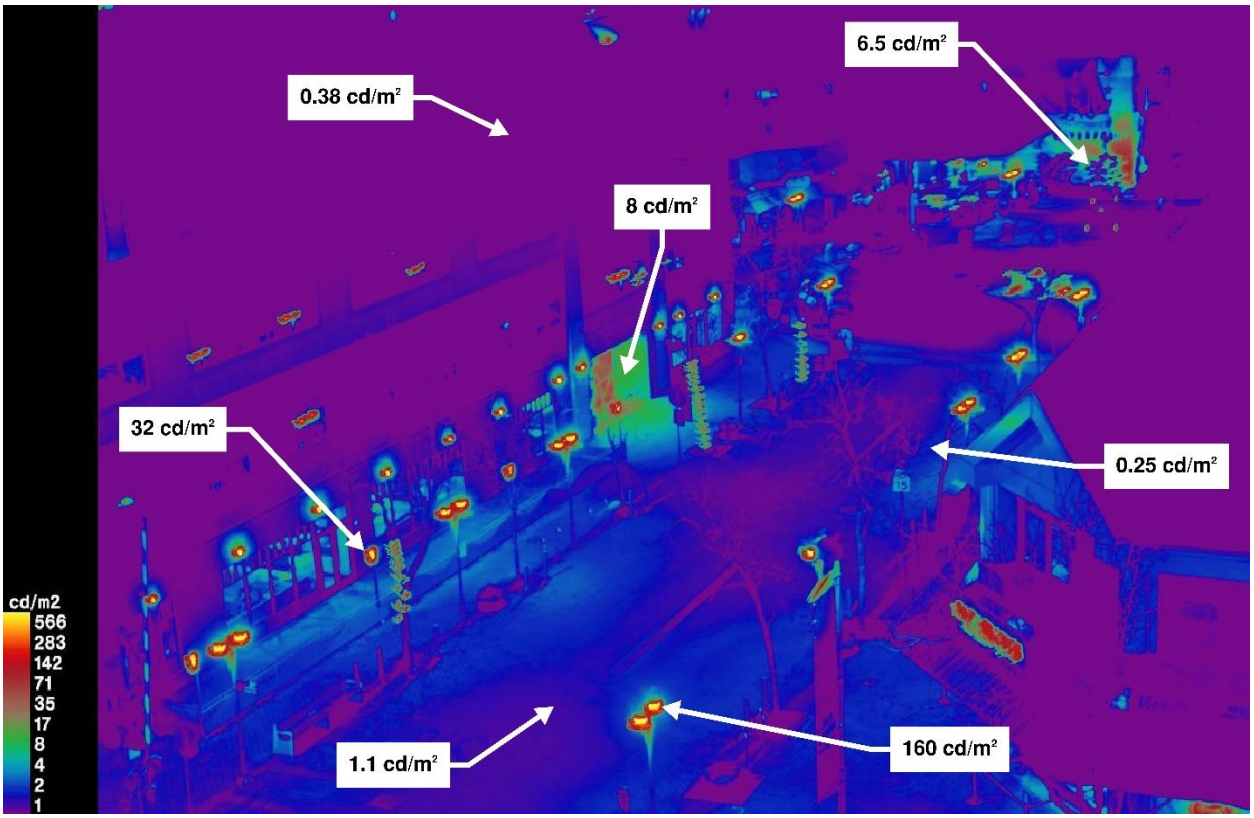
Receptor Site 5A - 2nd at Washington (Facing Stadium)

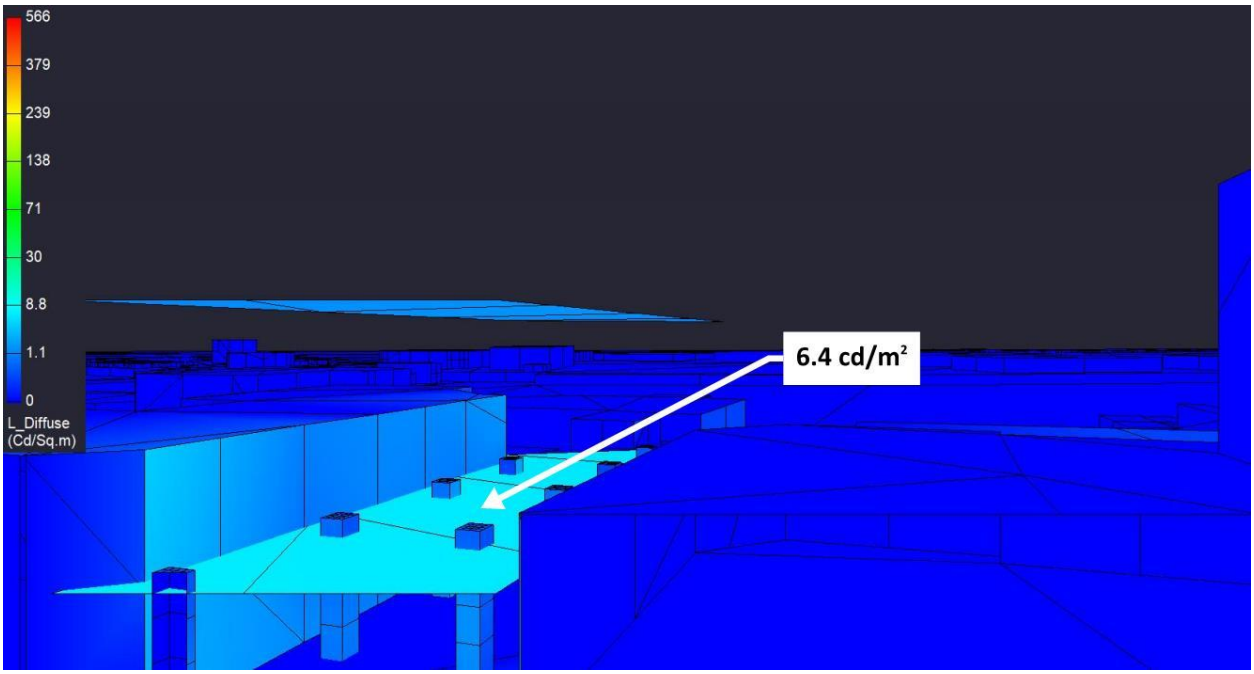




MRA Project, Baseline Ballpark “Phase 1” Scenario Post-Curfew

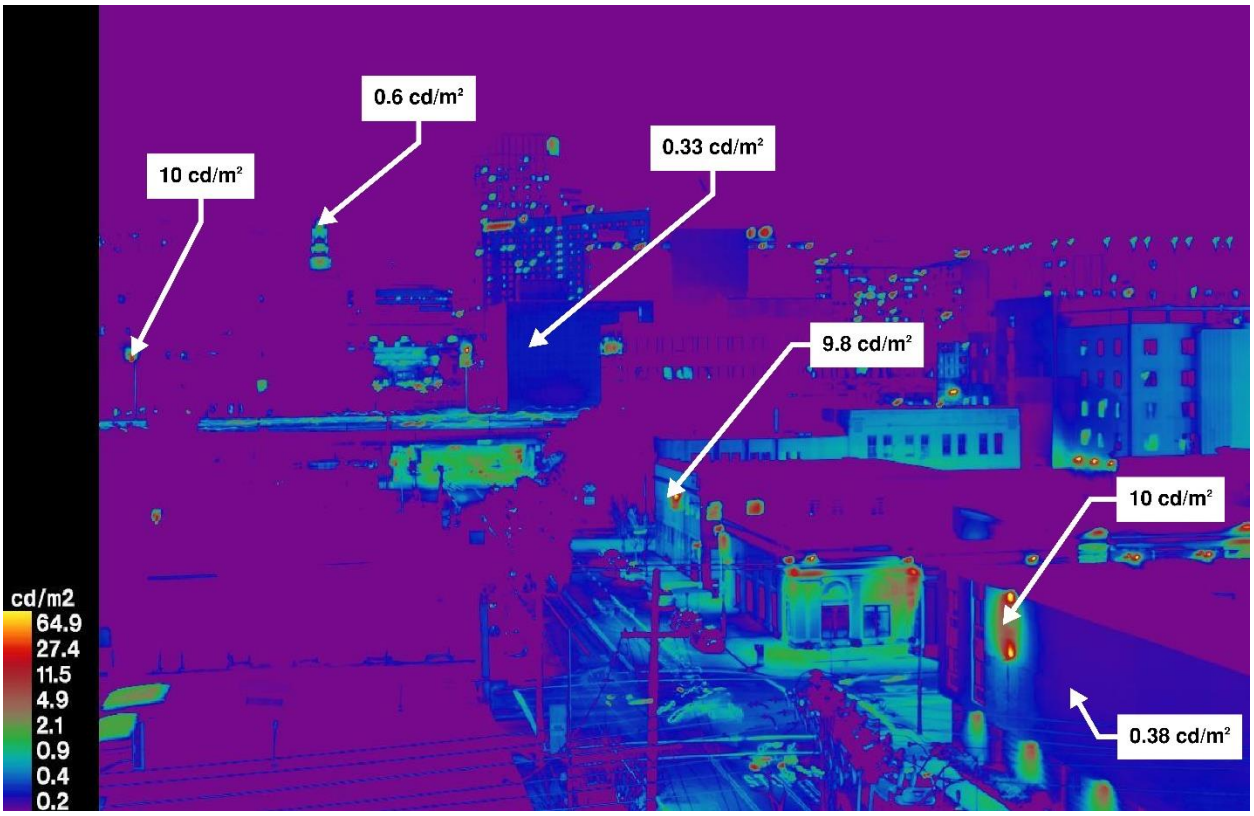
Receptor Site 5B - 2nd at Washington (Facing JLS Station)

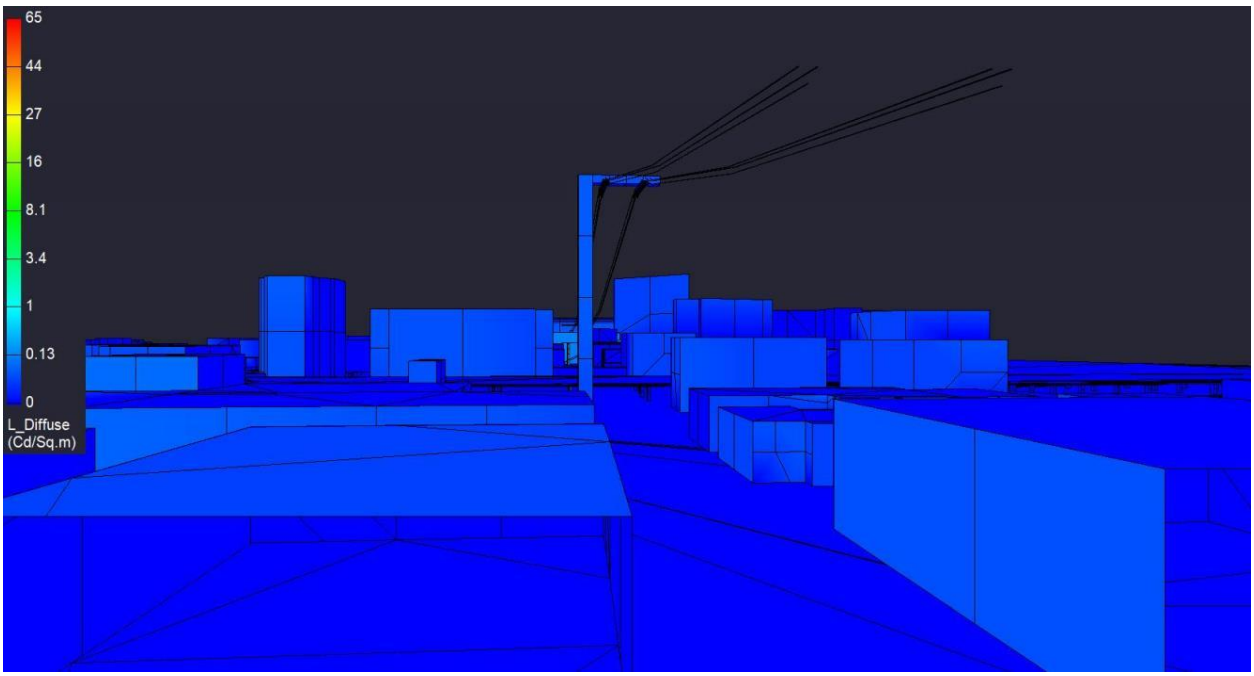




MRA Project, Baseline Ballpark “Phase 1” Scenario Post-Curfew

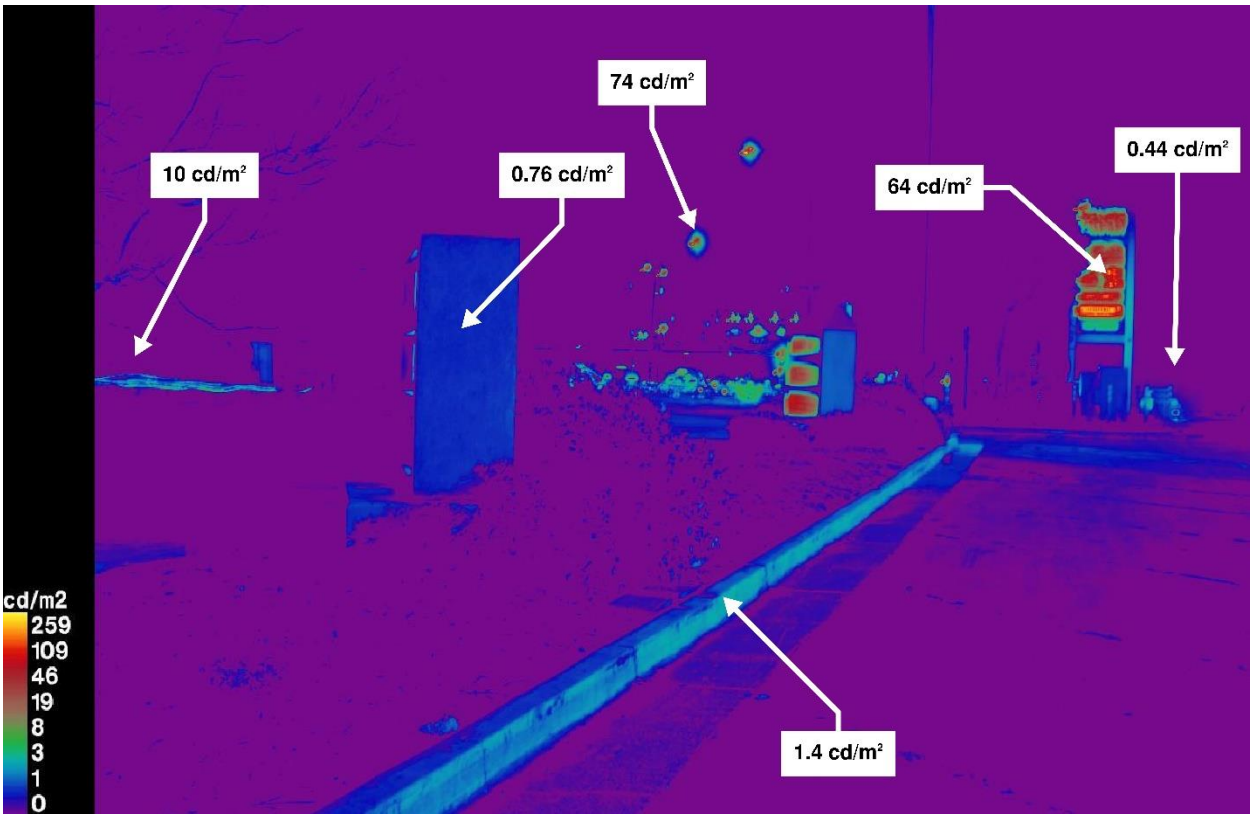
Receptor Site 5C - 2nd at Washington (Facing Convention Center Station)

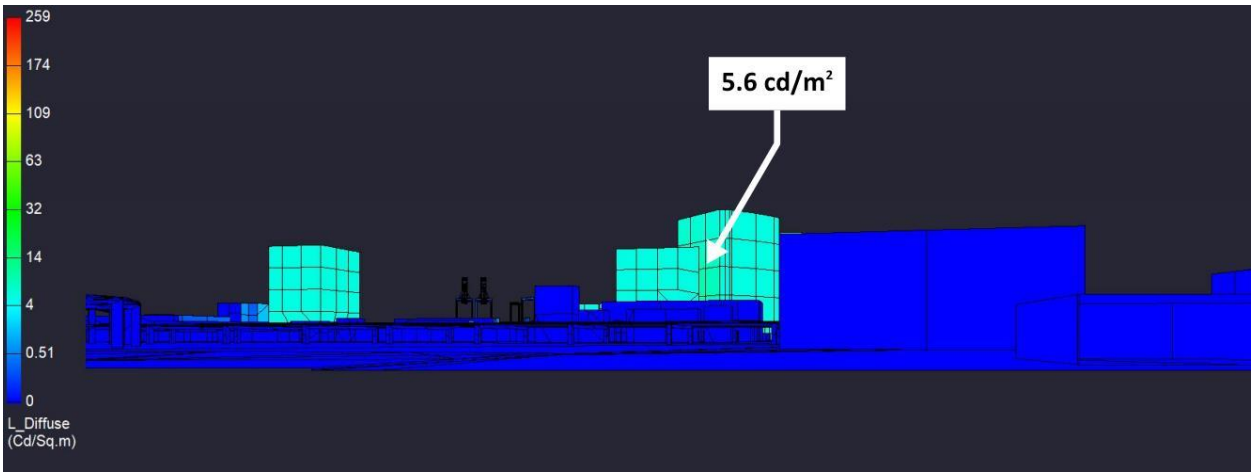




MRA Project, Baseline Ballpark “Phase 1” Scenario Post-Curfew

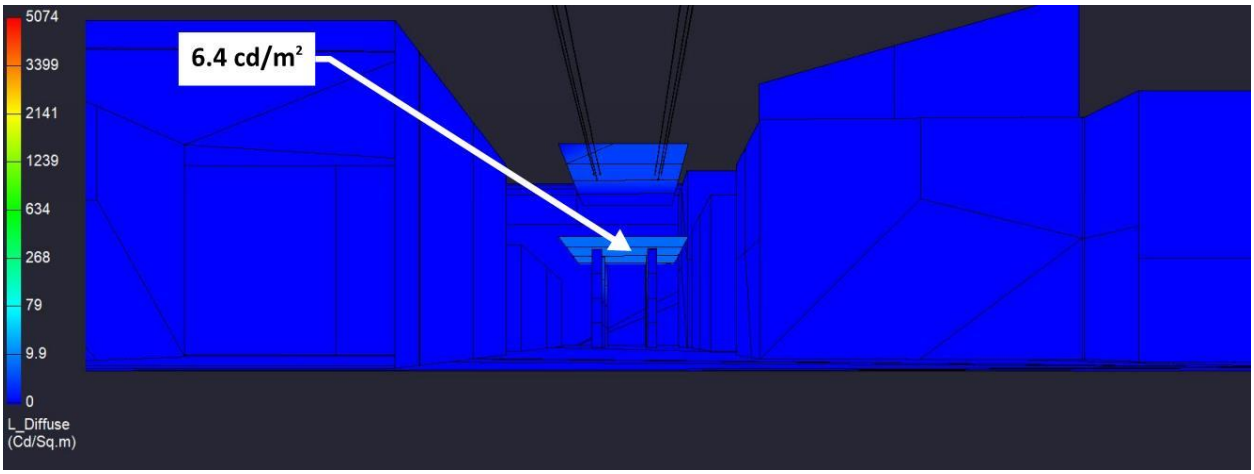
Receptor Site 6A - 7th at Brush





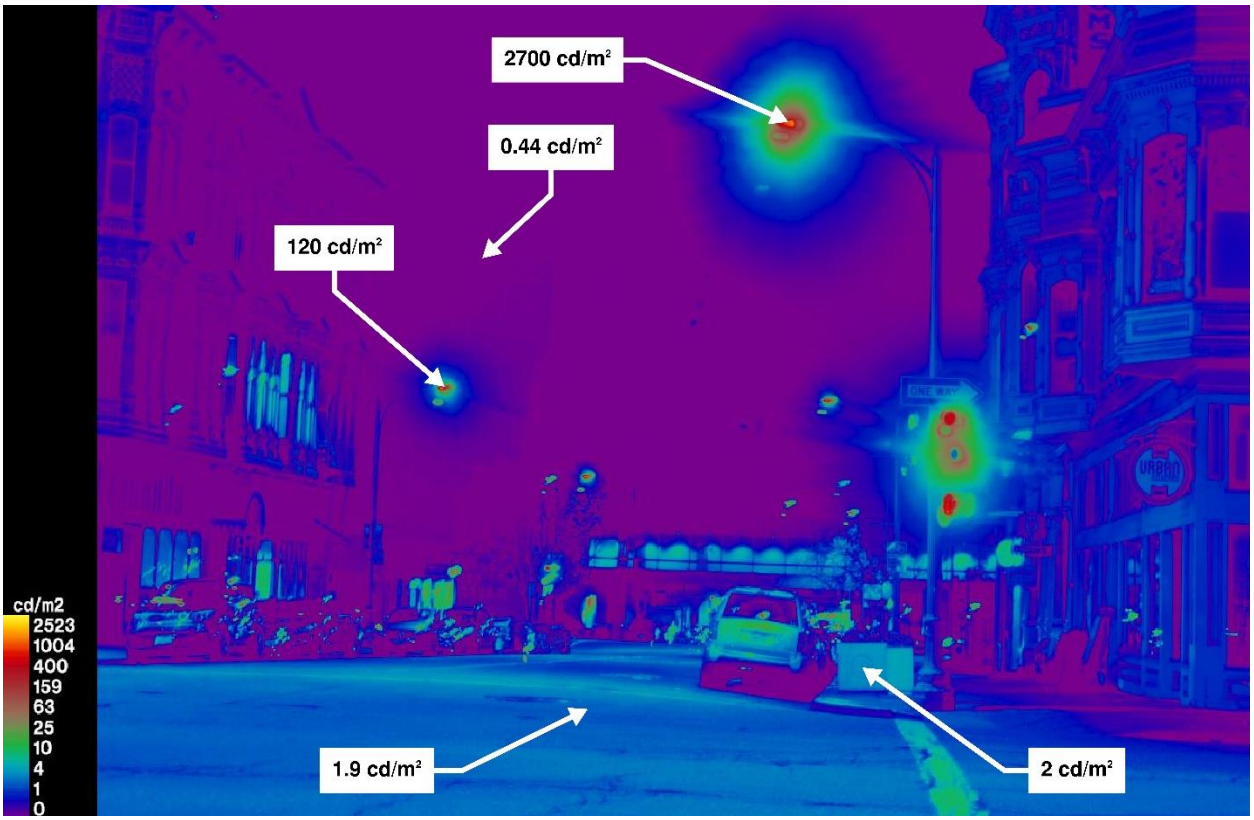
MRA Project, Baseline Ballpark “Phase 1” Scenario Post-Curfew

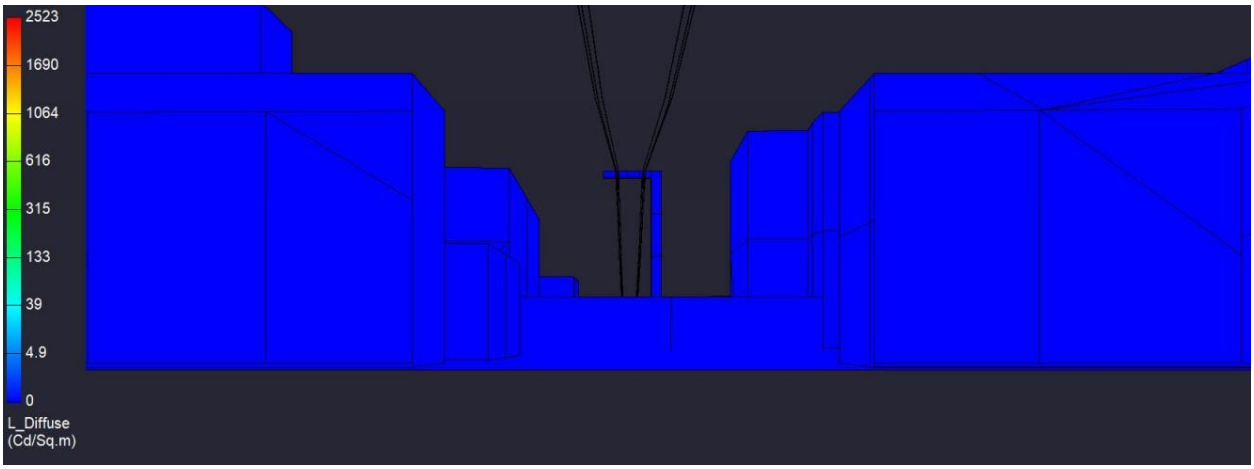
Receptor Site 7 - 8th at Washington (Facing Convention Center Station)



MRA Project, Baseline Ballpark “Phase 1” Scenario Post-Curfew

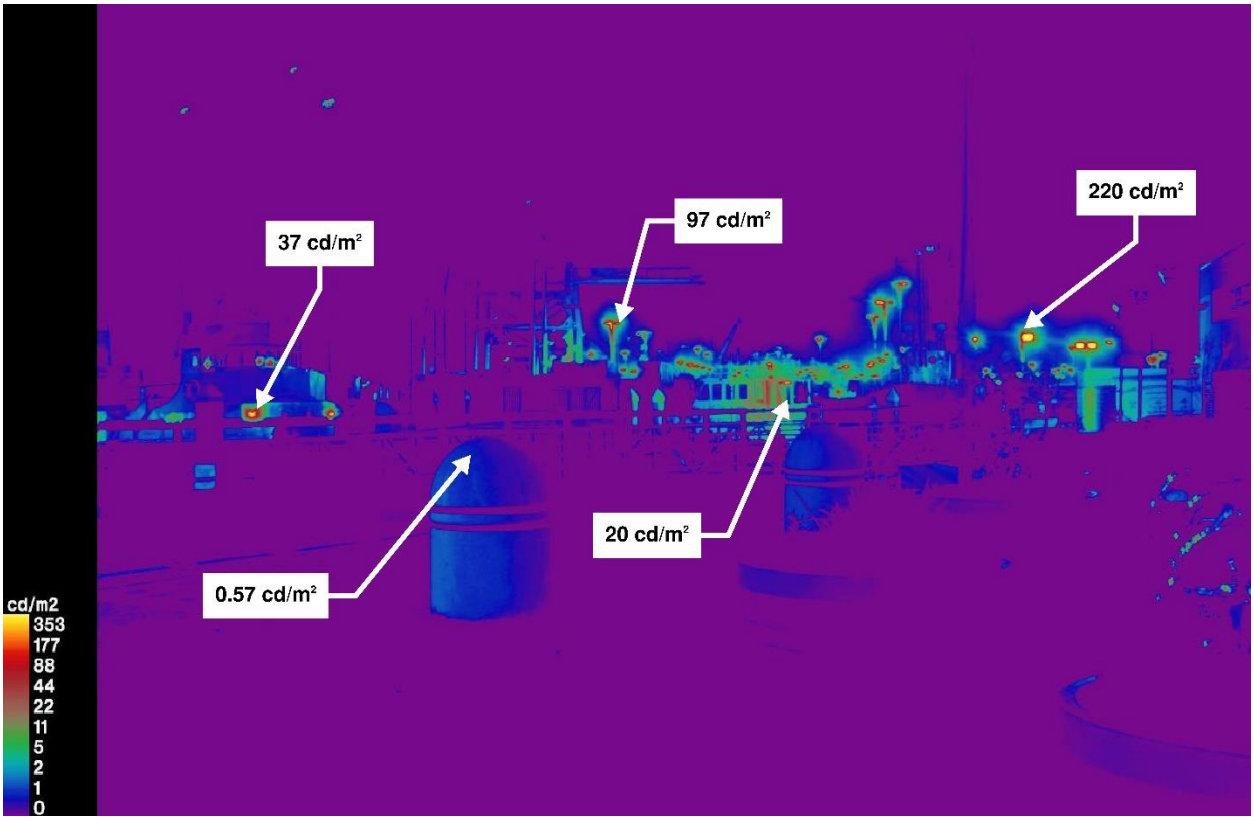
Receptor Site 7A - 8th at Washington (Facing Tower)

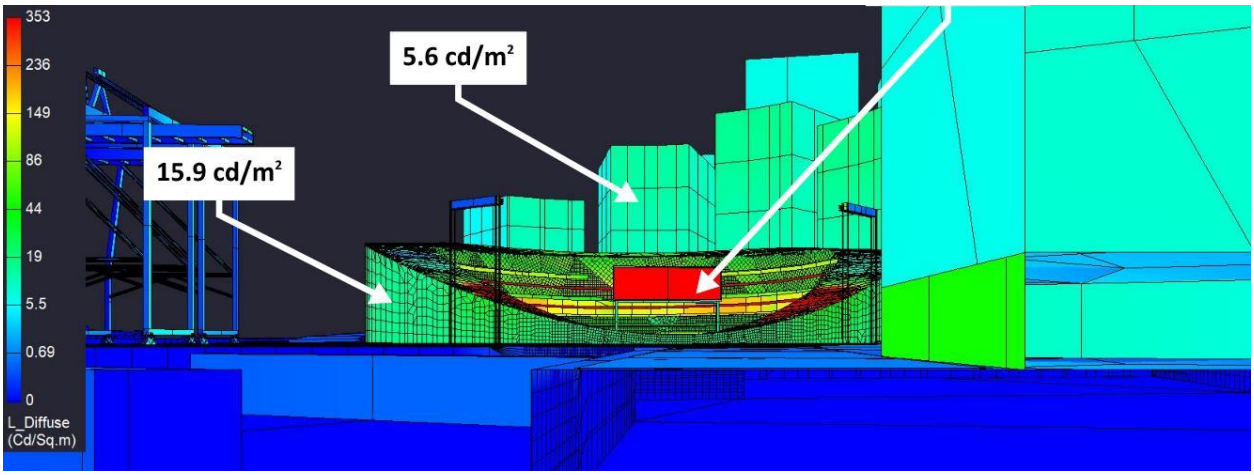




MRA Project, Baseline Ballpark “Full Buildout” Scenario Game Nights

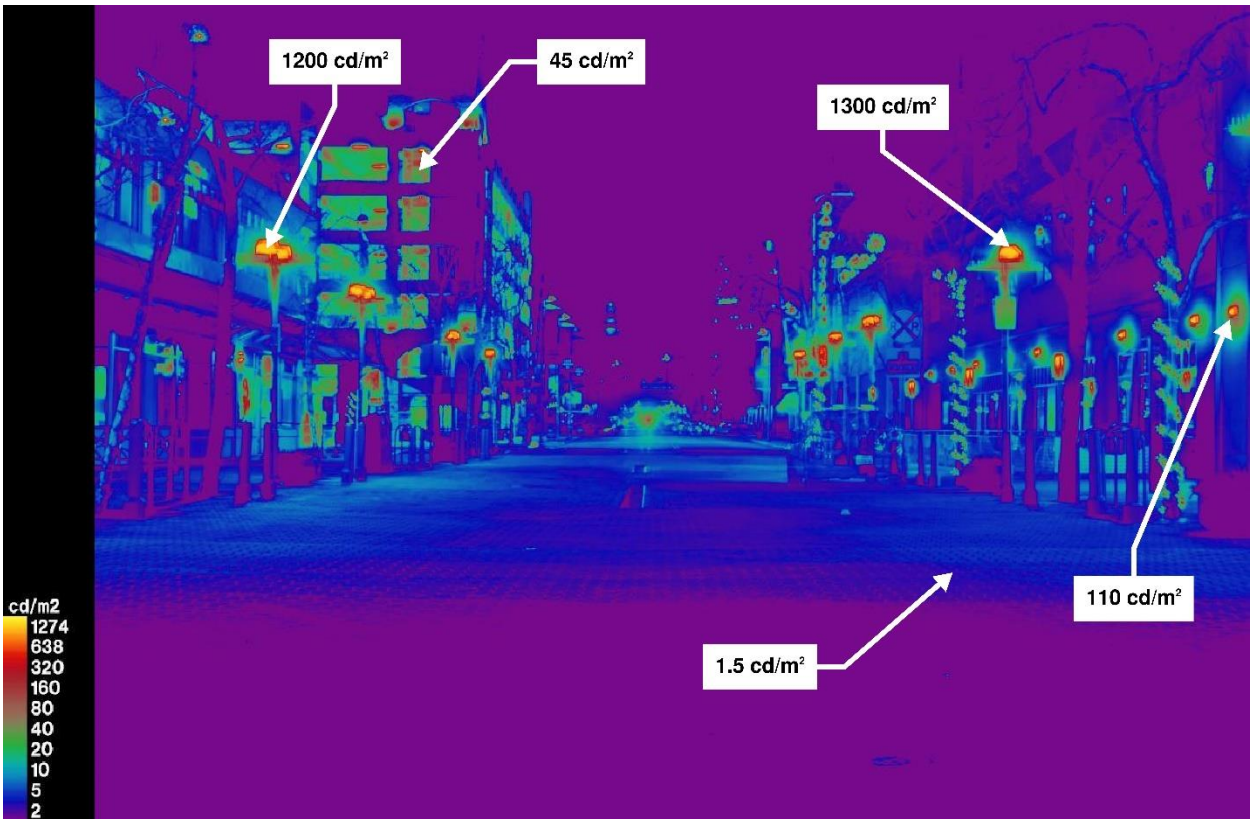
Receptor Site 1 - Water Street at Clay (Facing Ballpark)

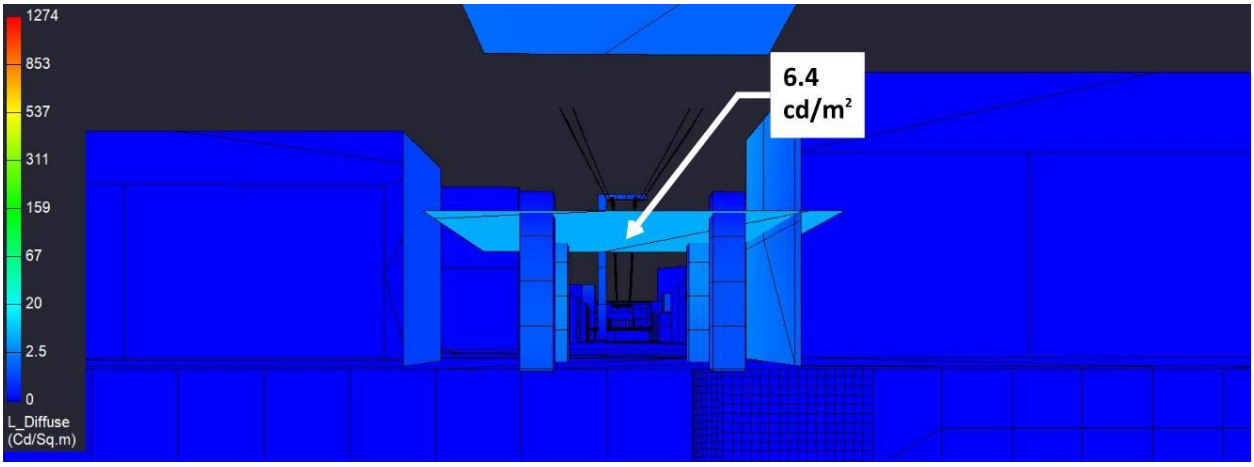




MRA Project, Baseline Ballpark “Full Buildout” Scenario Game Nights

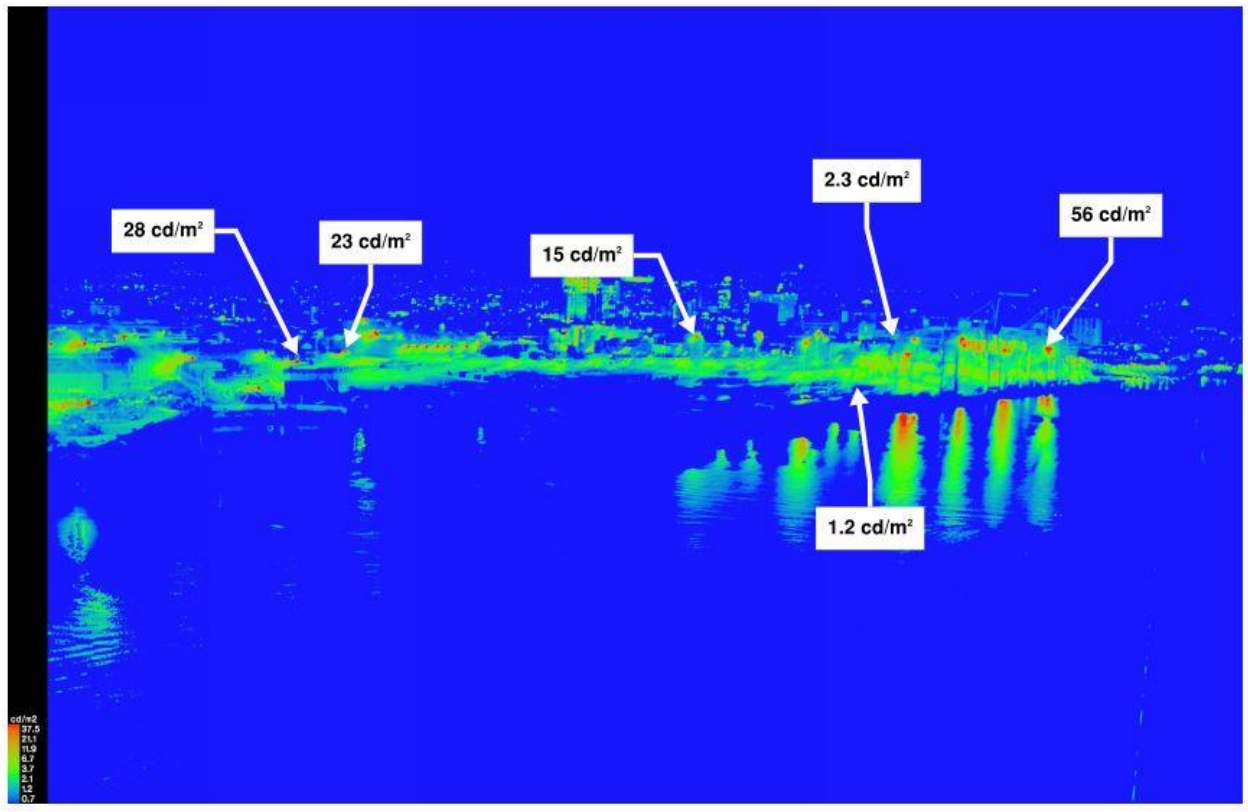
Receptor Site 1A - Water Street at Washington (Facing Gondola)

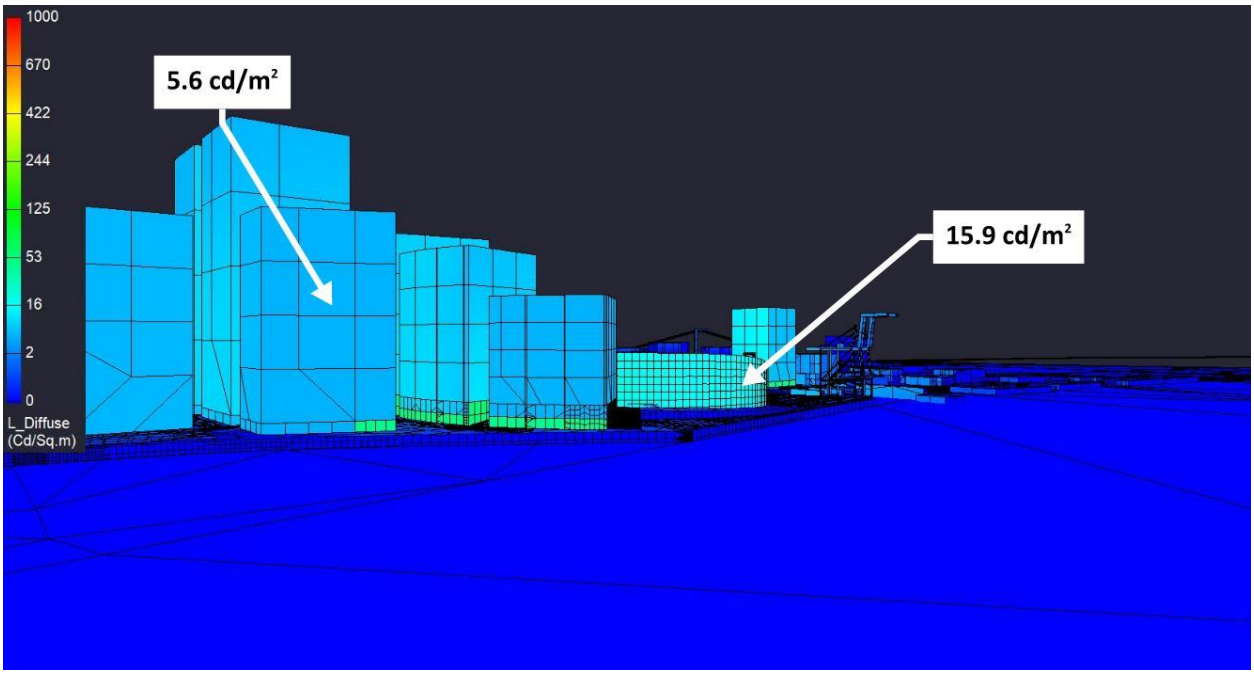




MRA Project, Baseline Ballpark “Full Buildout” Scenario Game Nights

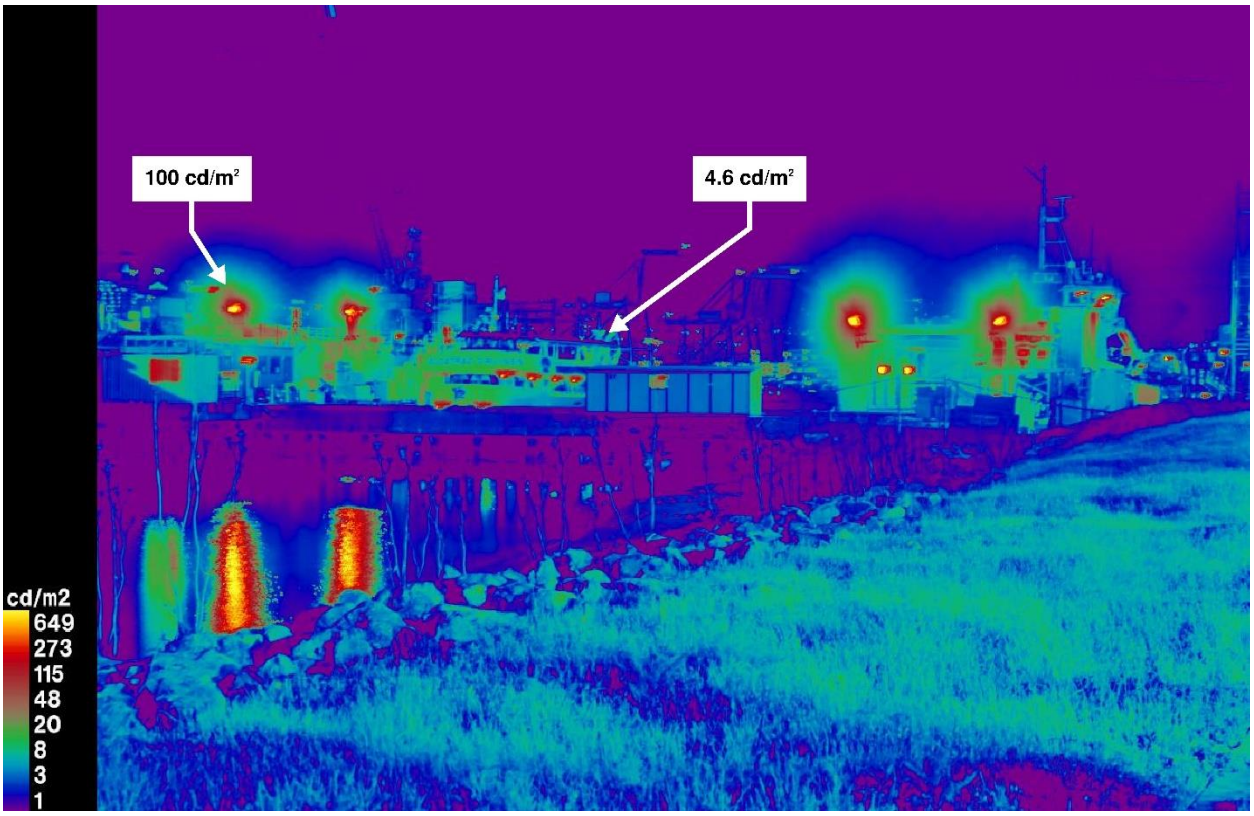
Receptor Site 2 - Inner Harbor Turning Basin @ 190'

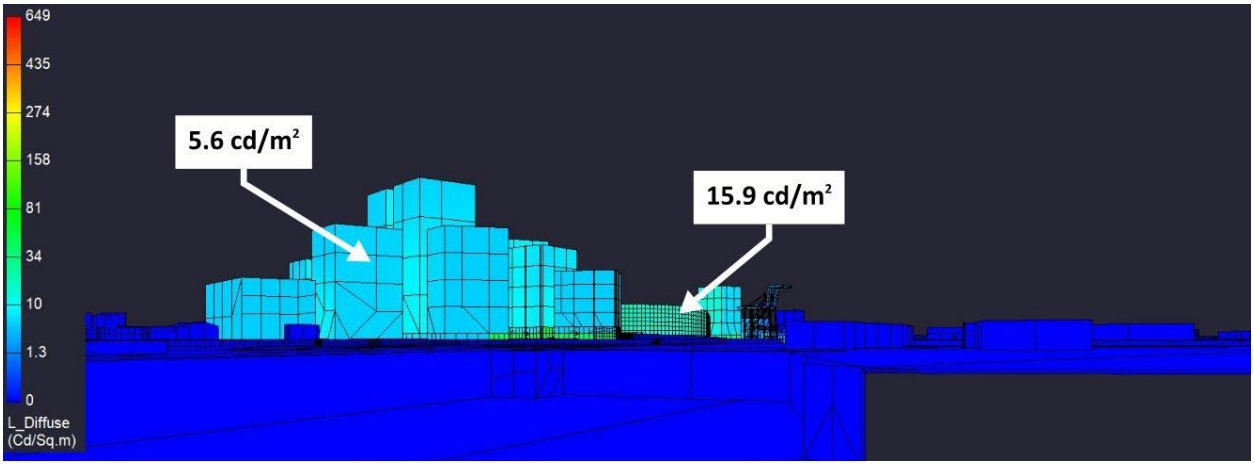




MRA Project, Baseline Ballpark “Full Buildout” Scenario Game Nights

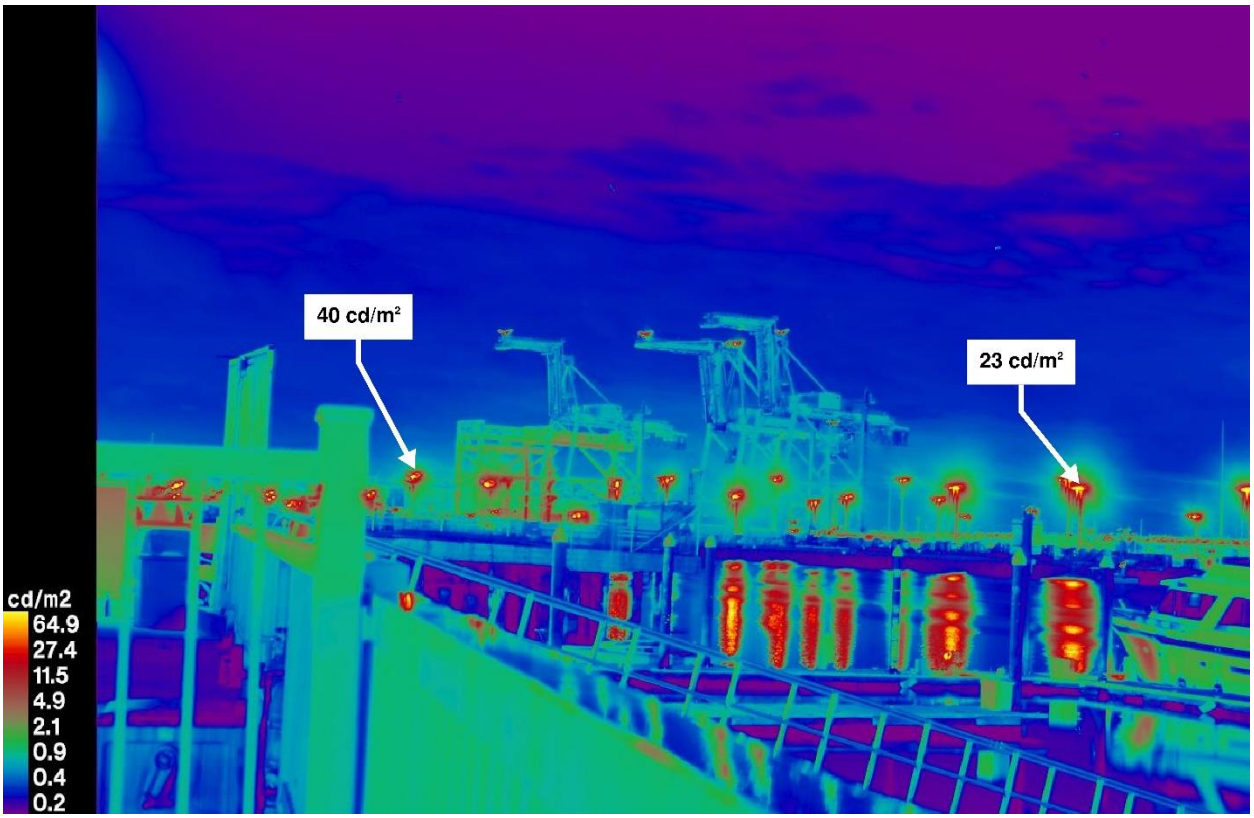
Receptor Site 2A - Turning Basin Line-of-Sight

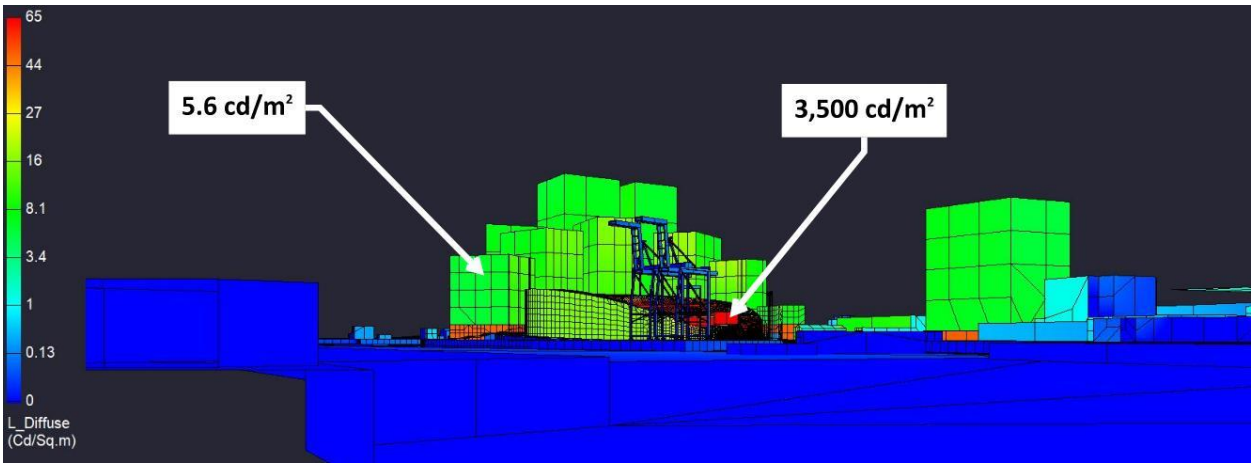




MRA Project, Baseline Ballpark “Full Buildout” Scenario Game Nights

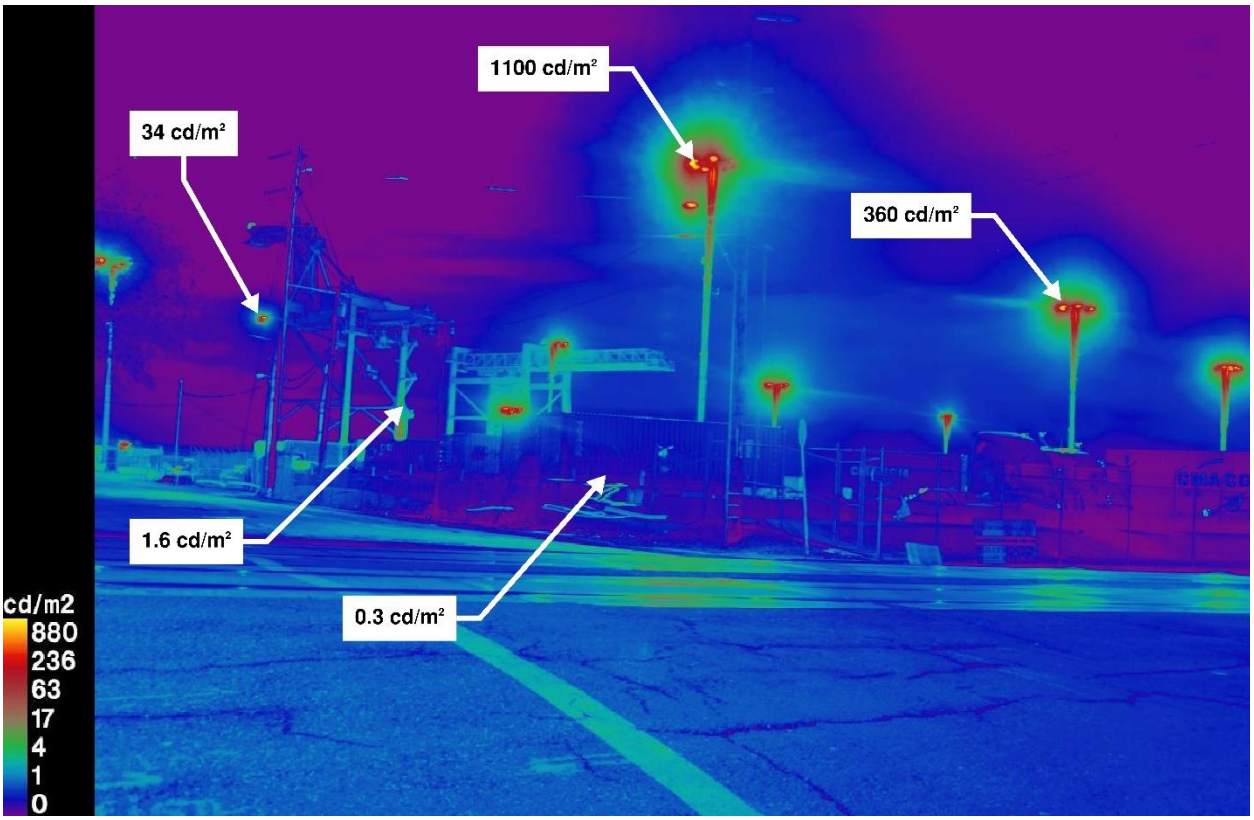
Receptor Site 3 - Alameda Dock

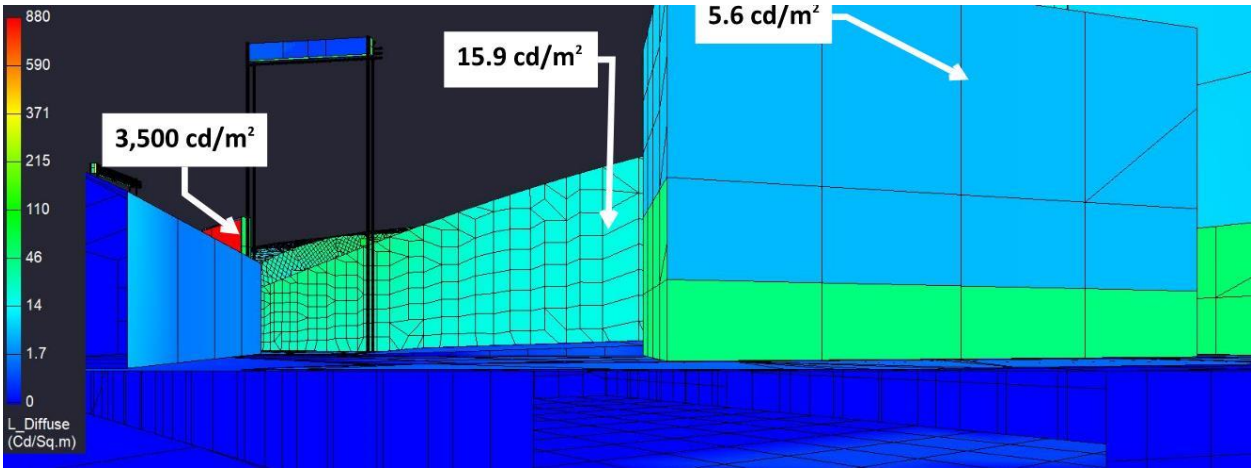




MRA Project, Baseline Ballpark “Full Buildout” Scenario Game Nights

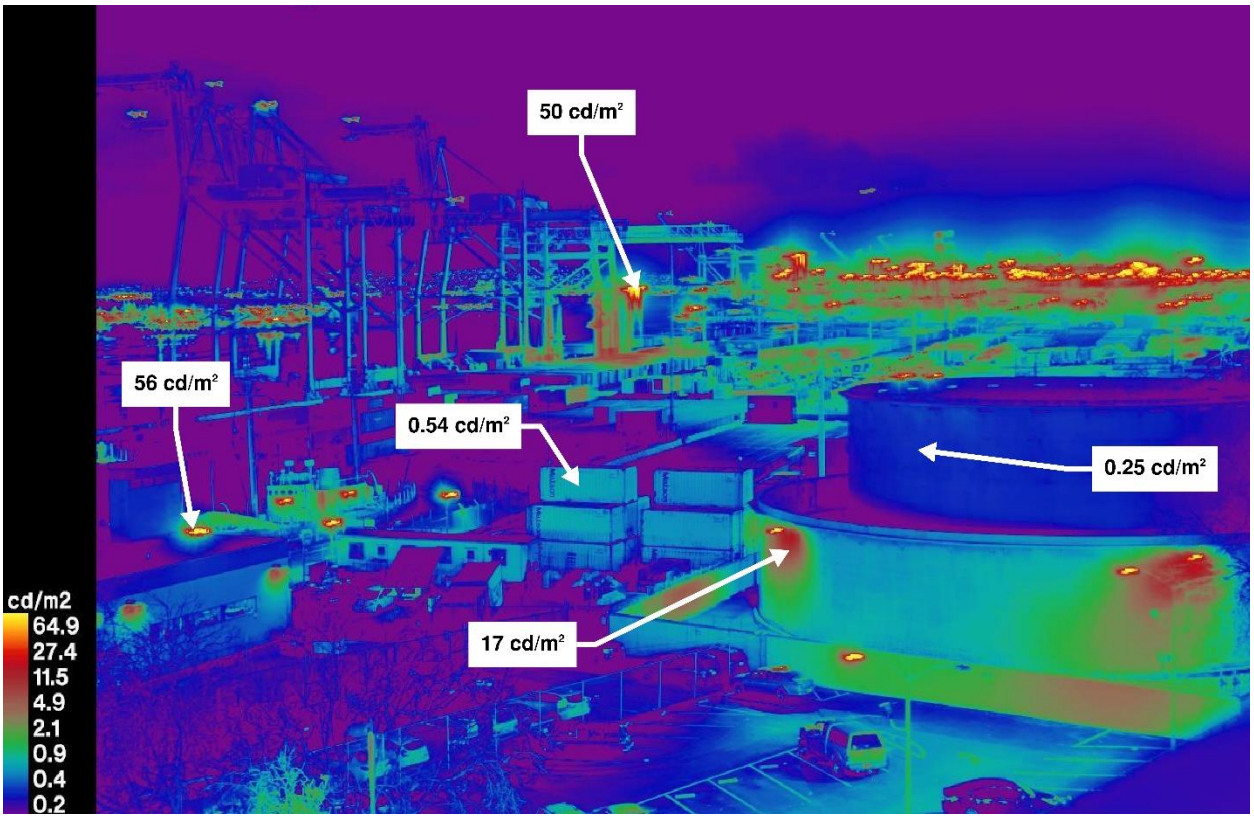
Receptor Site 4 - MLK at Embarcadero

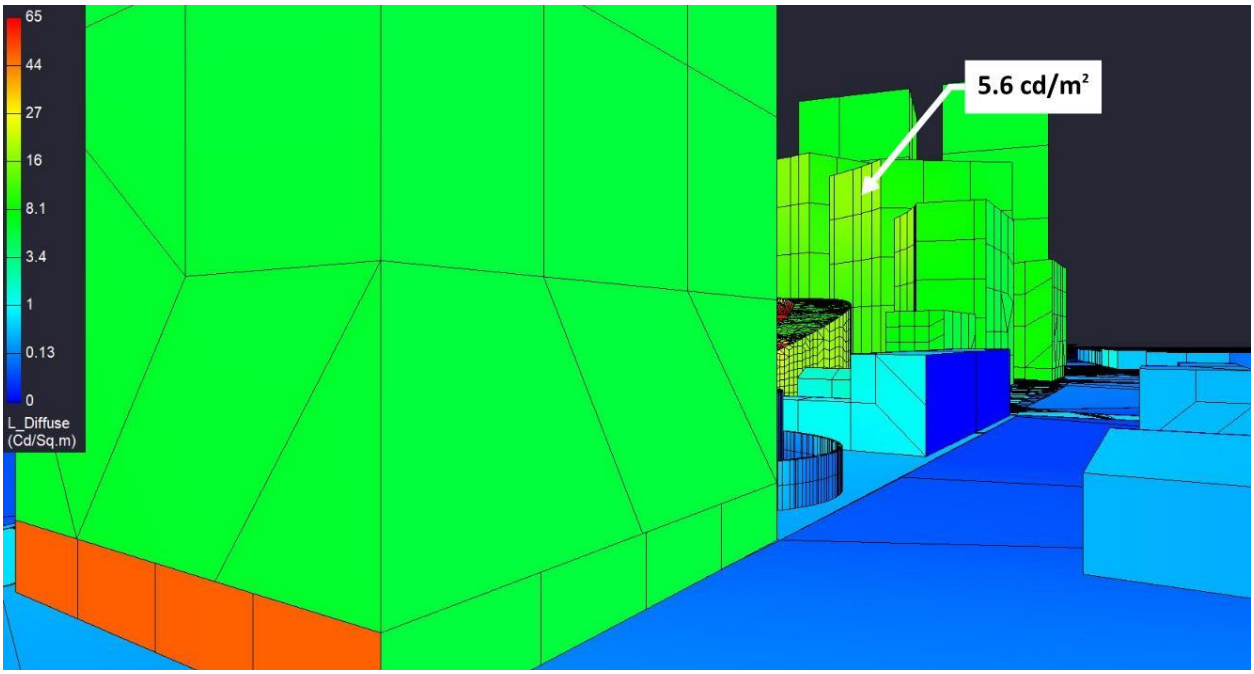




MRA Project, Baseline Ballpark “Full Buildout” Scenario Game Nights

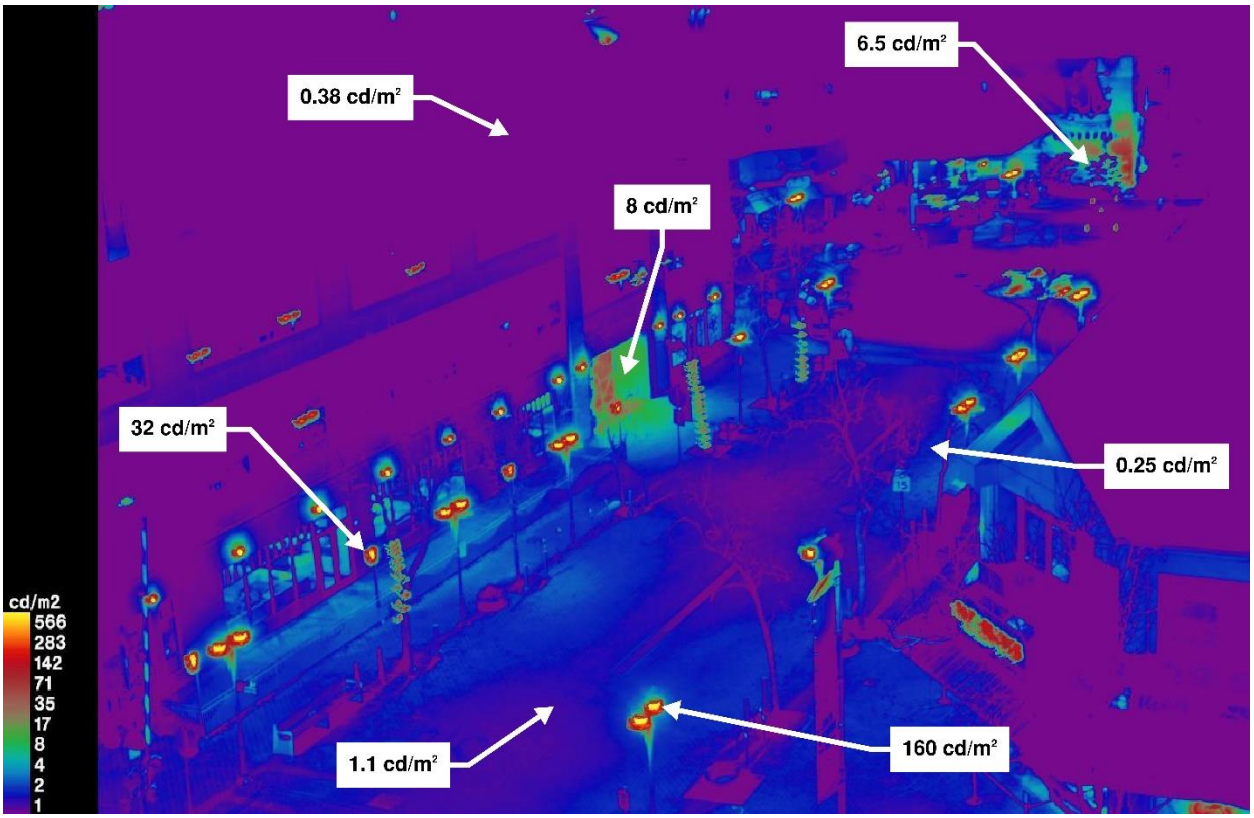
Receptor Site 5A - 2nd at Washington (Facing Stadium)

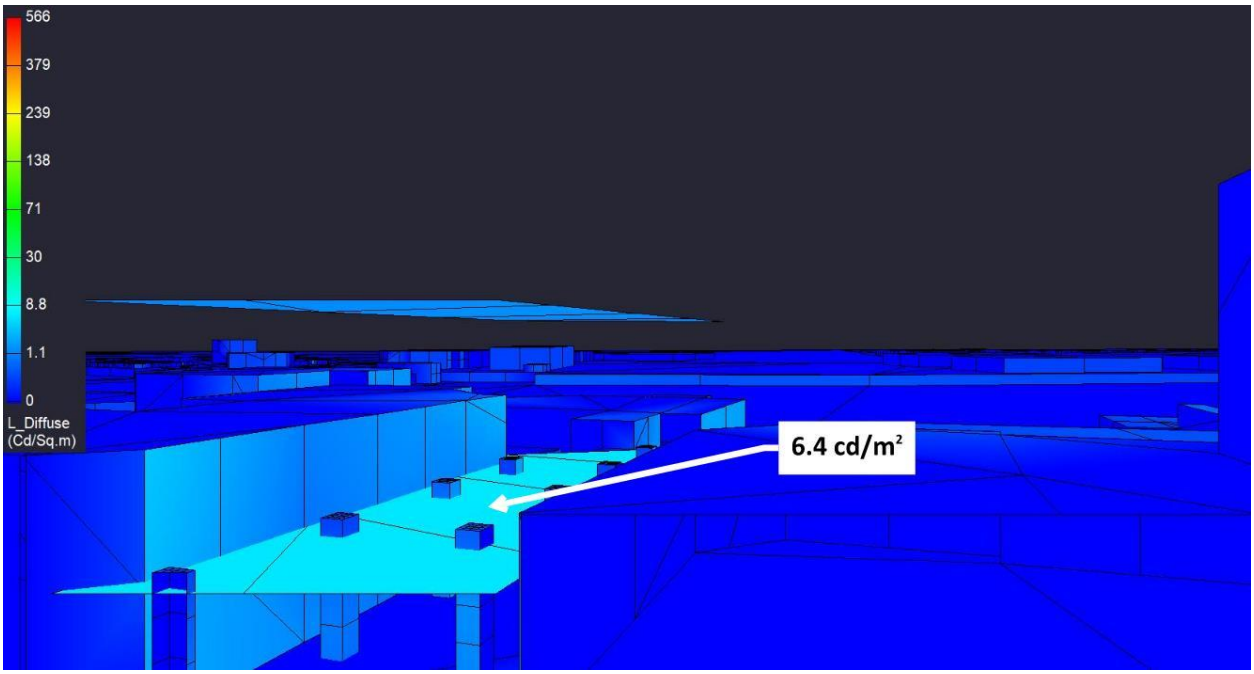




MRA Project, Baseline Ballpark “Full Buildout” Scenario Game Nights

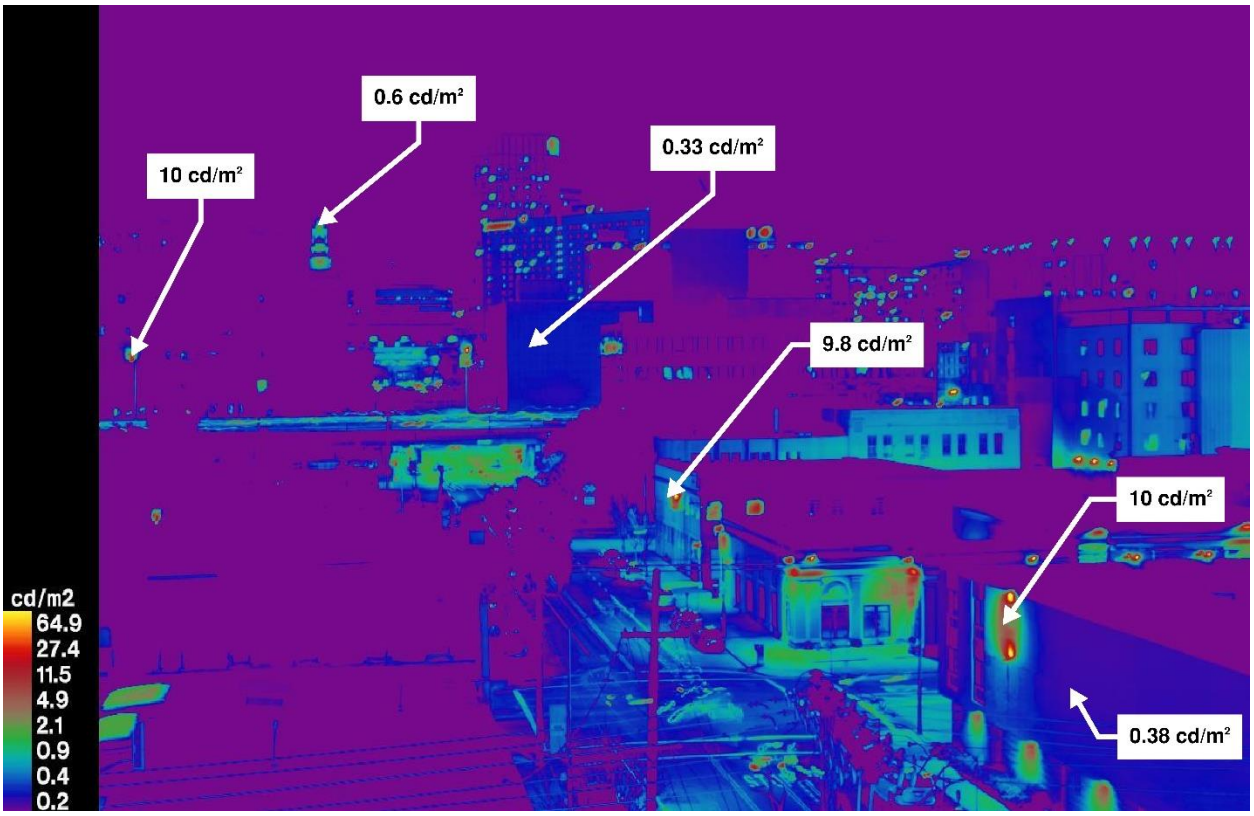
Receptor Site 5B - 2nd at Washington (Facing JLS Station)

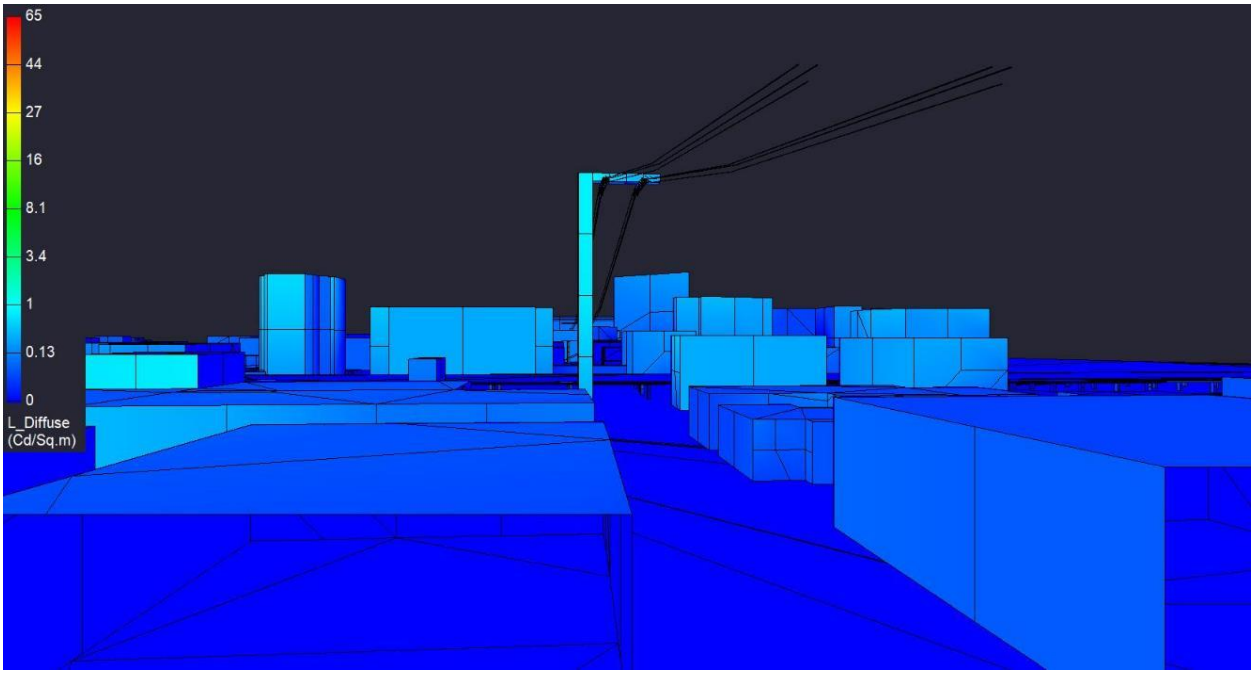




MRA Project, Baseline Ballpark “Full Buildout” Scenario Game Nights

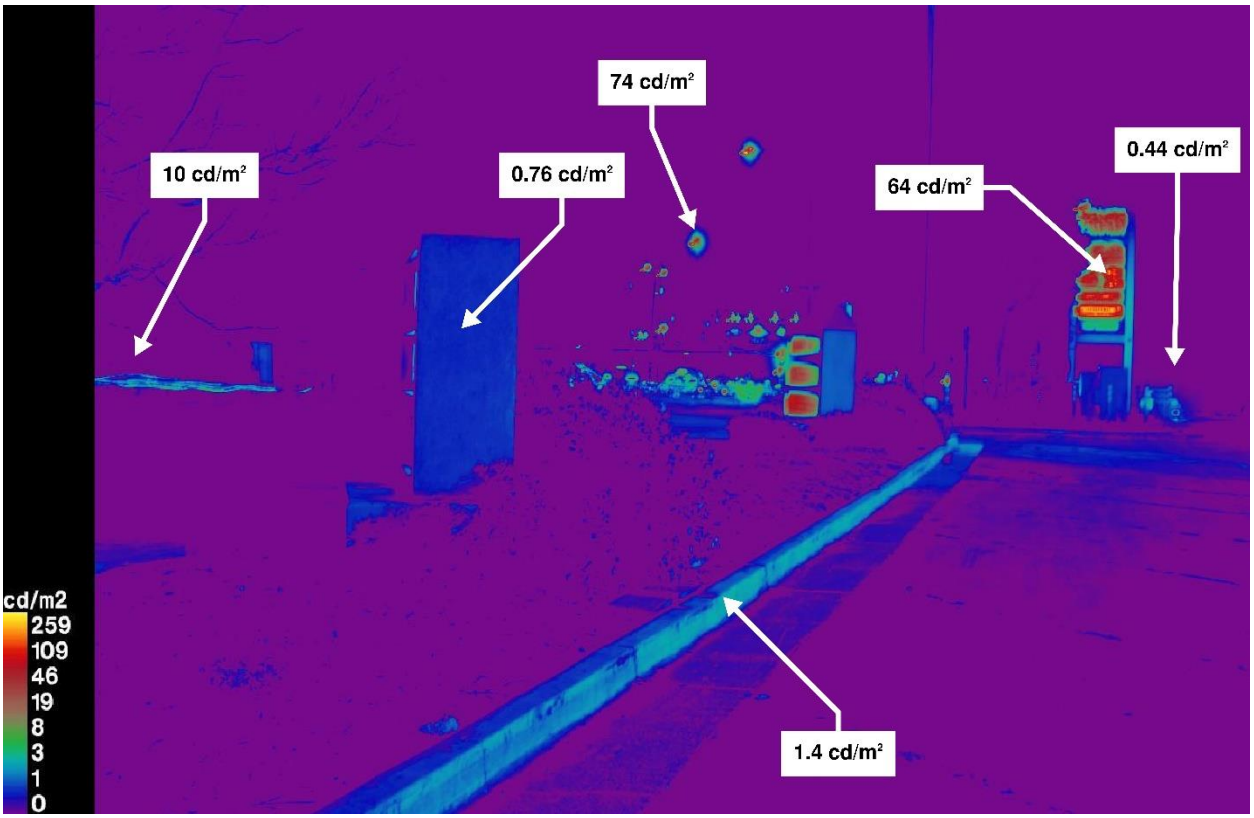
Receptor Site 5C - 2nd at Washington (Facing Convention Center Station)

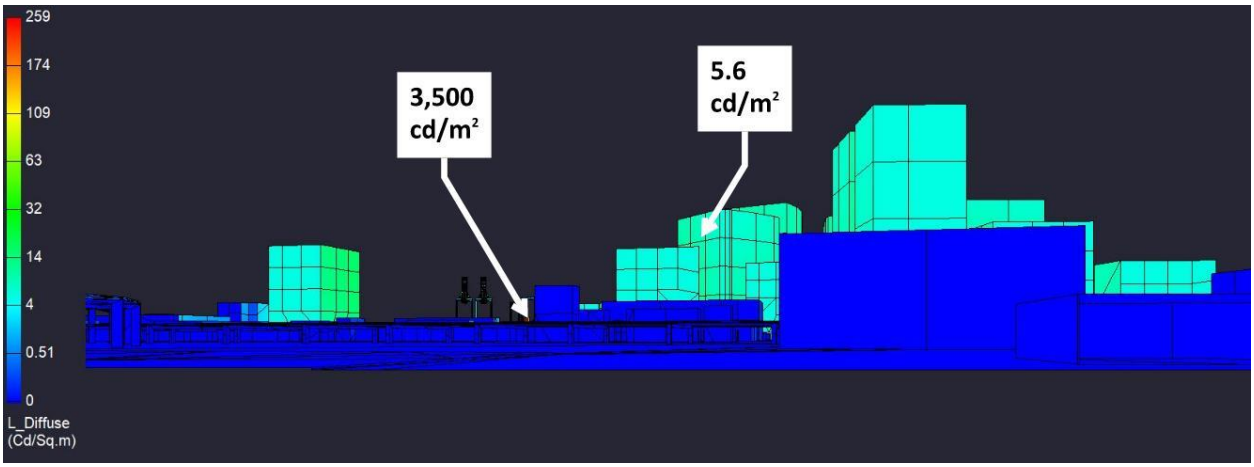




MRA Project, Baseline Ballpark “Full Buildout” Scenario Game Nights

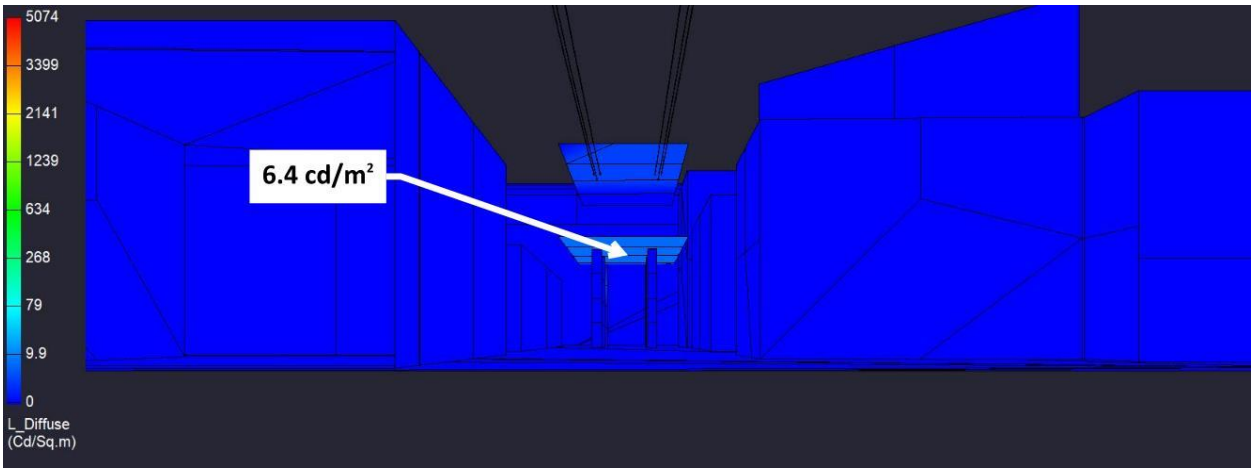
Receptor Site 6A - 7th at Brush





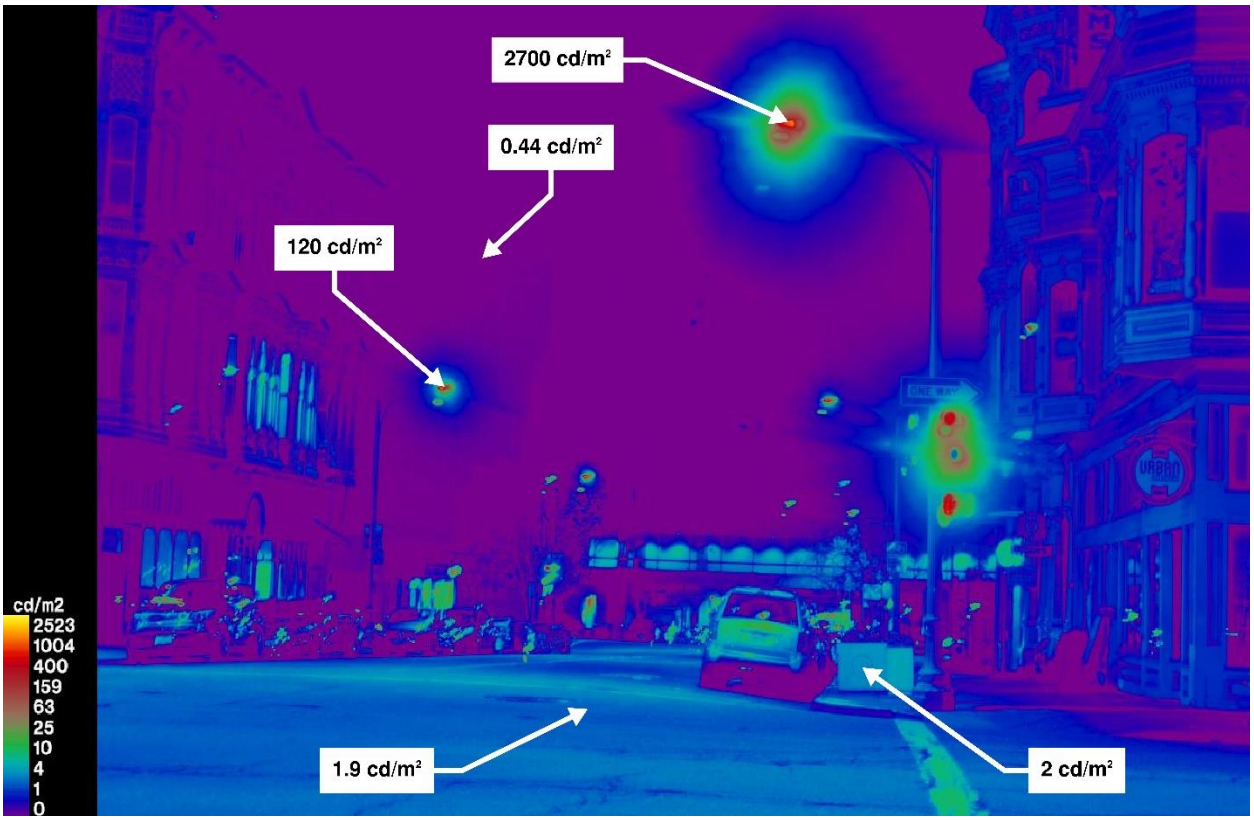
MRA Project, Baseline Ballpark “Full Buildout” Scenario Game Nights

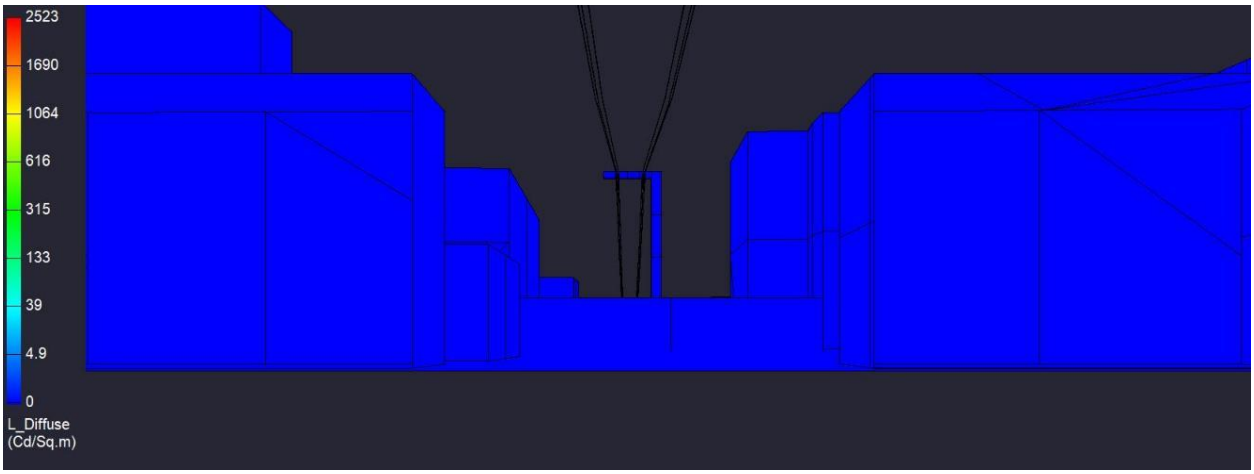
Receptor Site 7 - 8th at Washington (Facing Convention Center Station)



MRA Project, Baseline Ballpark “Full Buildout” Scenario Game Nights

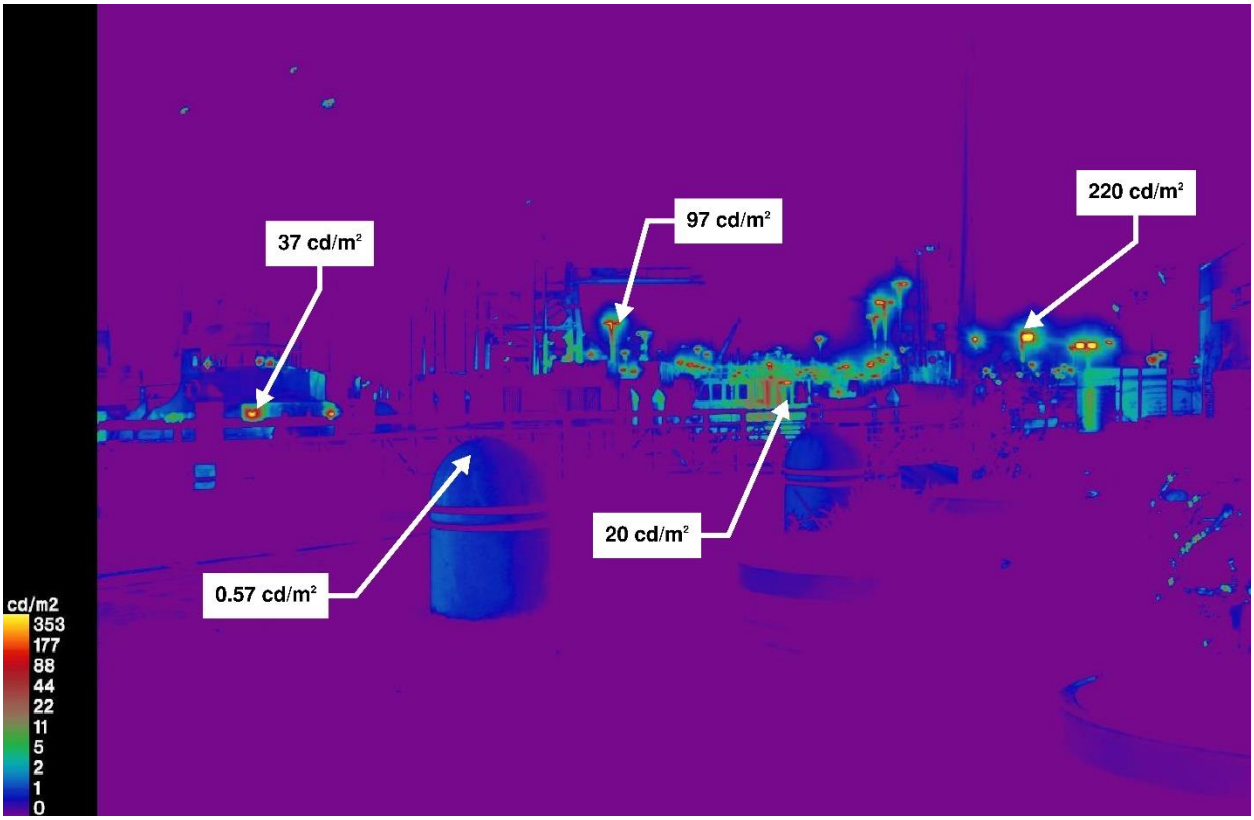
Receptor Site 7A - 8th at Washington (Facing Tower)

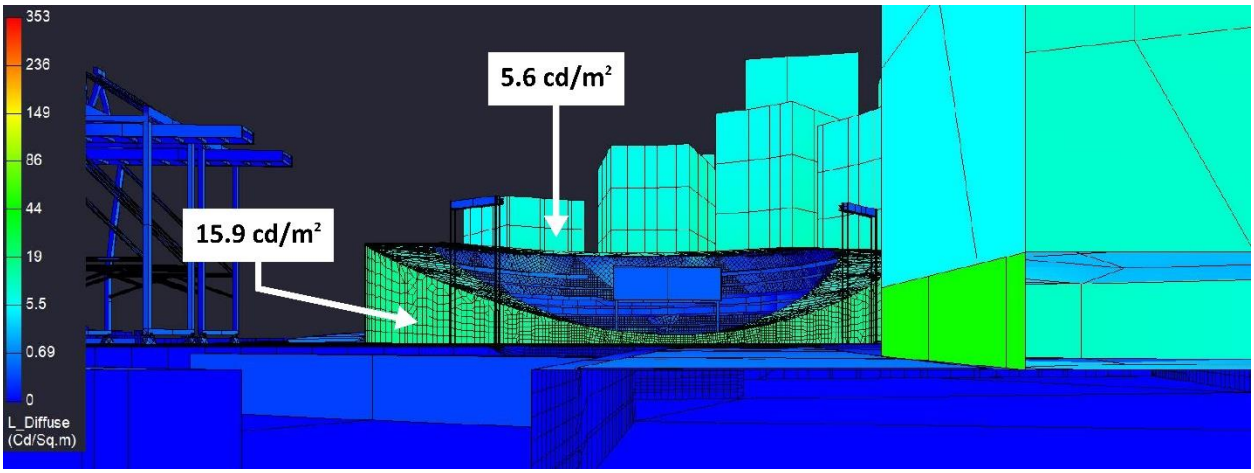




MRA Project, Baseline Ballpark “Full Buildout” Scenario Non-Game Nights Pre-Curfew

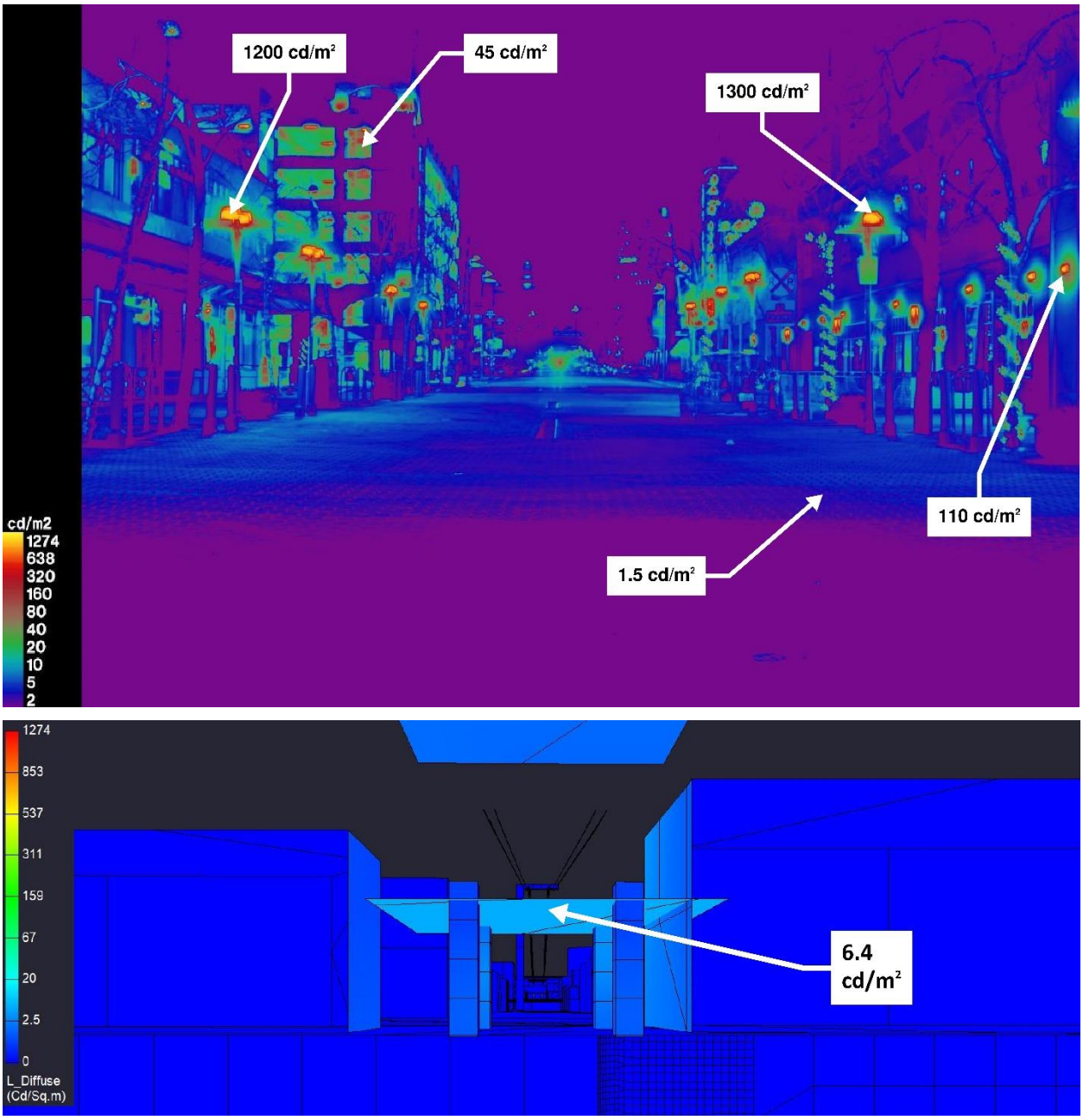
Receptor Site 1 - Water Street at Clay (Facing Ballpark)





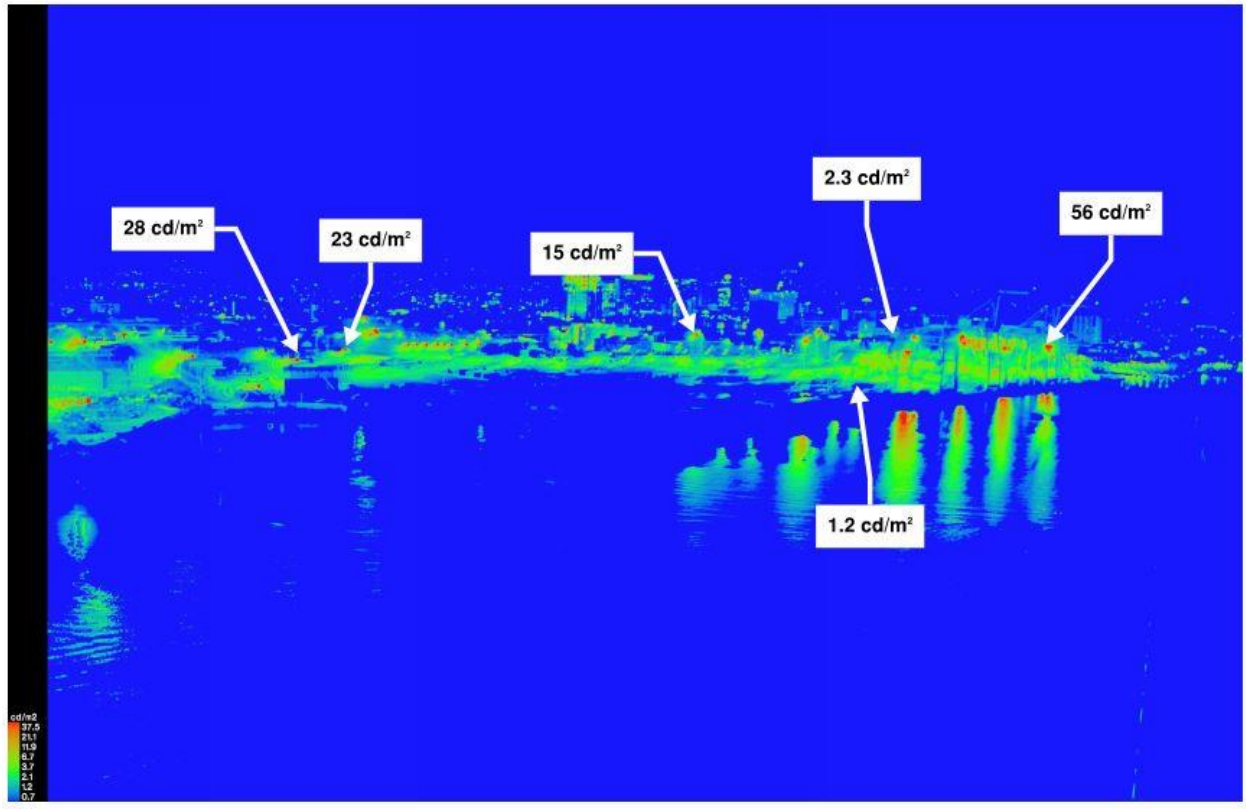
MRA Project, Baseline Ballpark “Full Buildout” Scenario Non-Game Nights Pre-Curfew

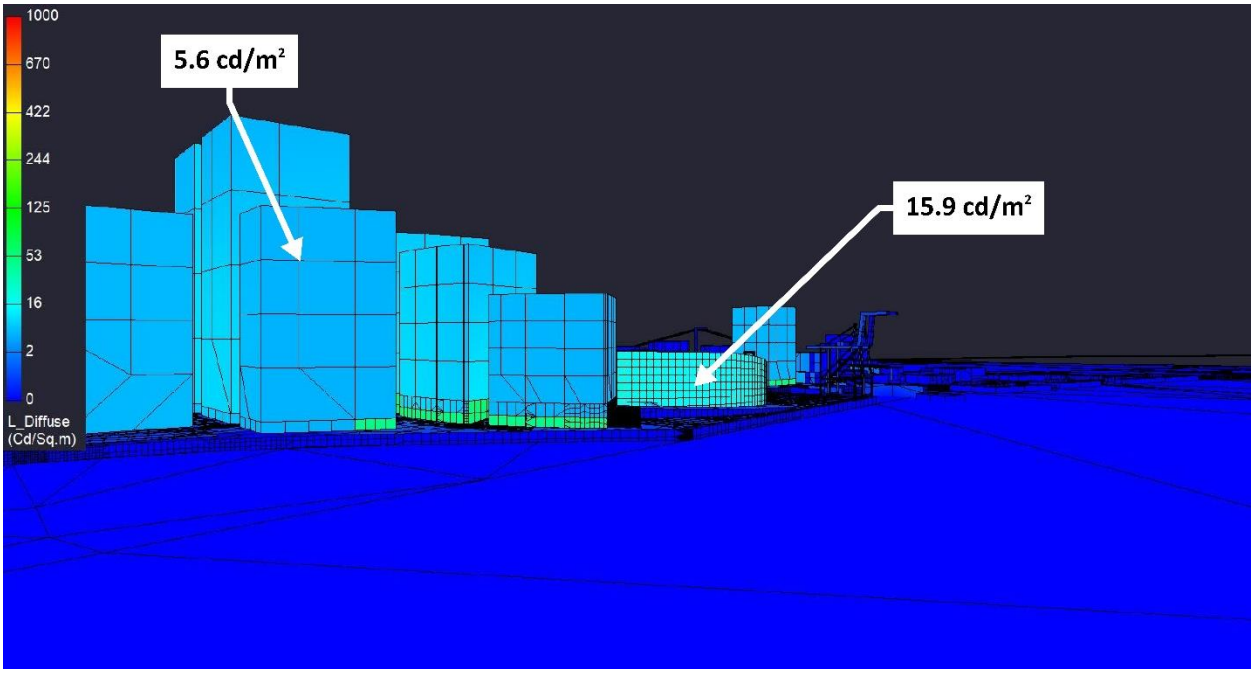
Receptor Site 1A - Water Street at Washington (Facing Gondola)



MRA Project, Baseline Ballpark “Full Buildout” Scenario Non-Game Nights Pre-Curfew

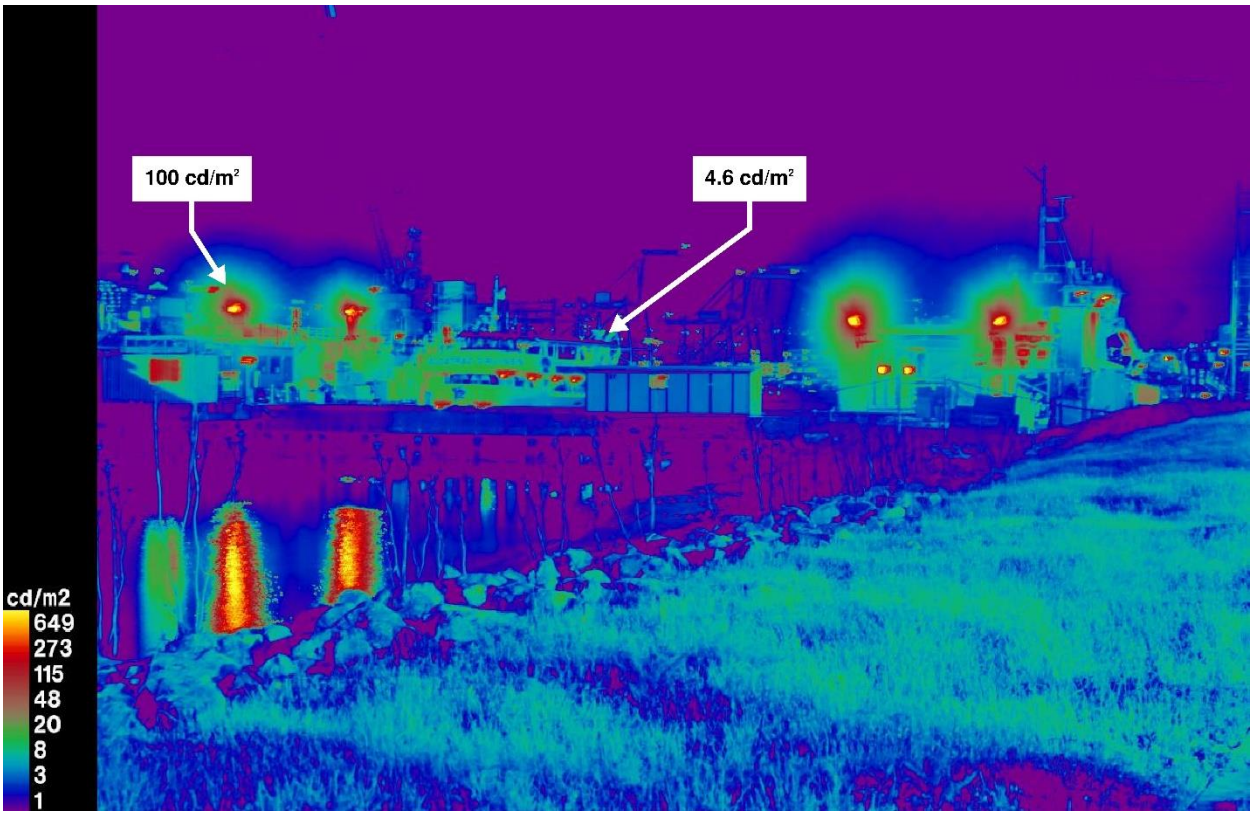
Receptor Site 2 - Inner Harbor Turning Basin @ 190'

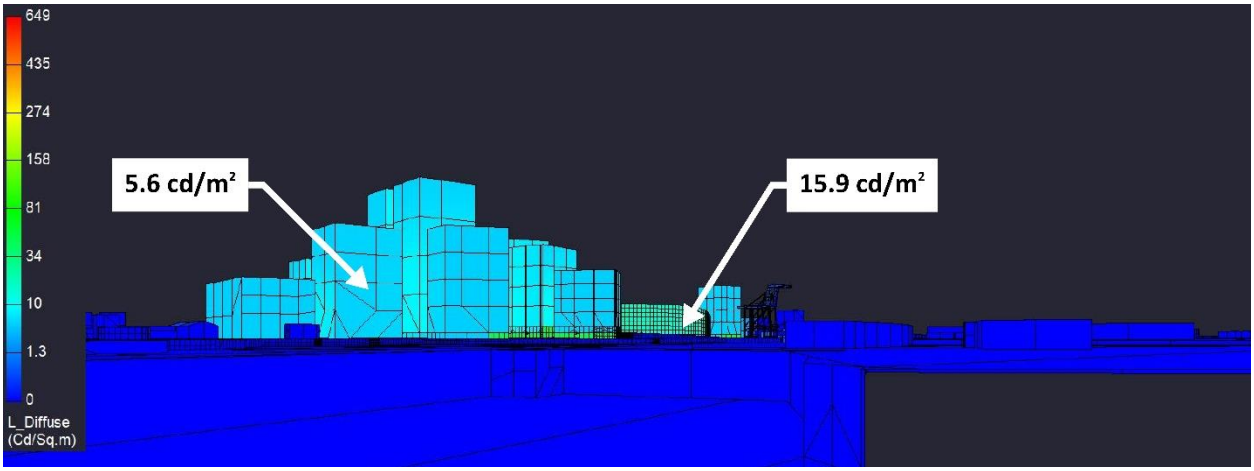




MRA Project, Baseline Ballpark “Full Buildout” Scenario Non-Game Nights Pre-Curfew

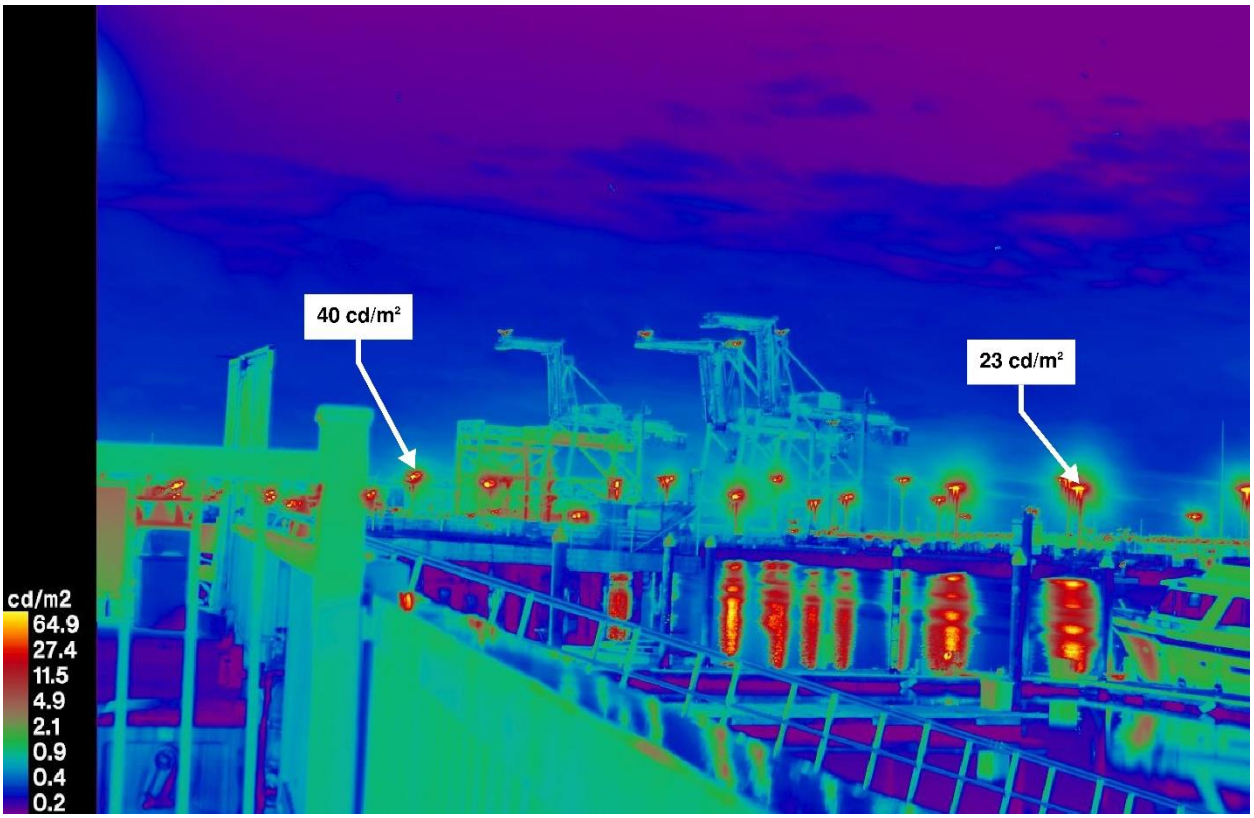
Receptor Site 2A - Turning Basin Line-of-Sight

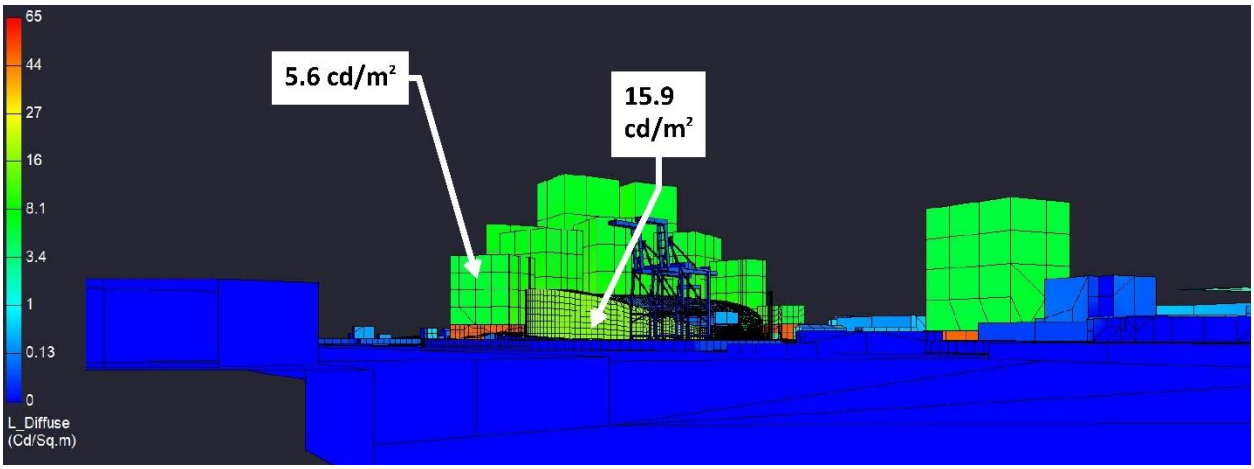




MRA Project, Baseline Ballpark “Full Buildout” Scenario Non-Game Nights Pre-Curfew

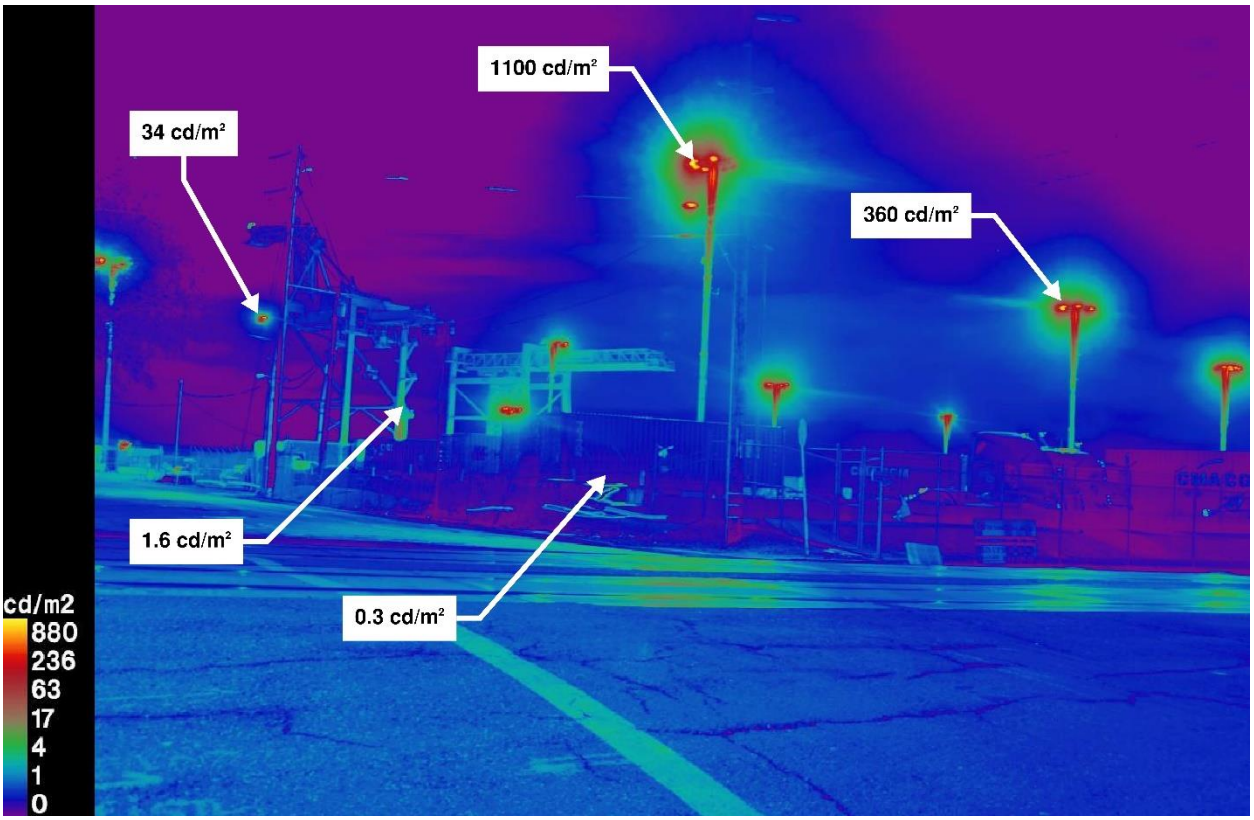
Receptor Site 3 - Alameda Dock

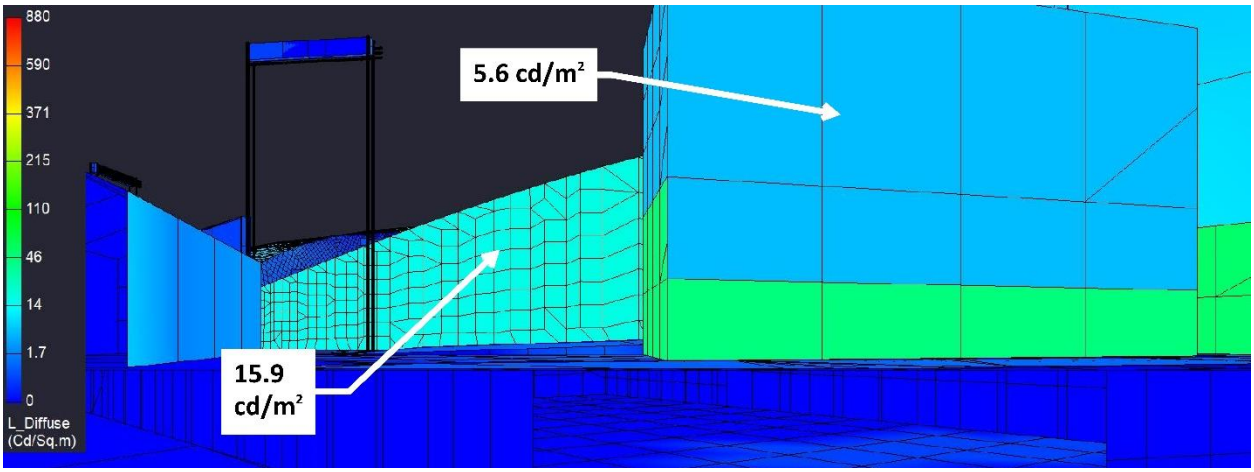




MRA Project, Baseline Ballpark “Full Buildout” Scenario Non-Game Nights Pre-Curfew

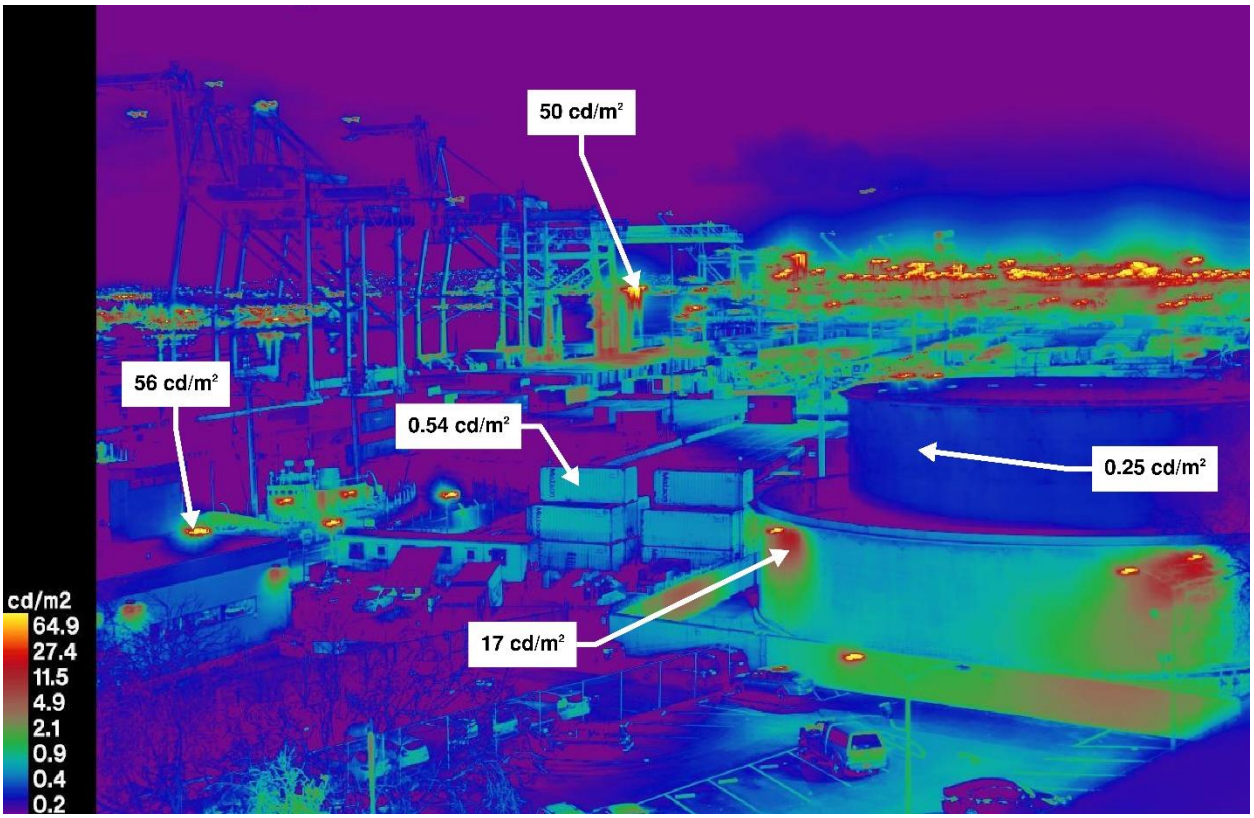
Receptor Site 4 - MLK at Embarcadero

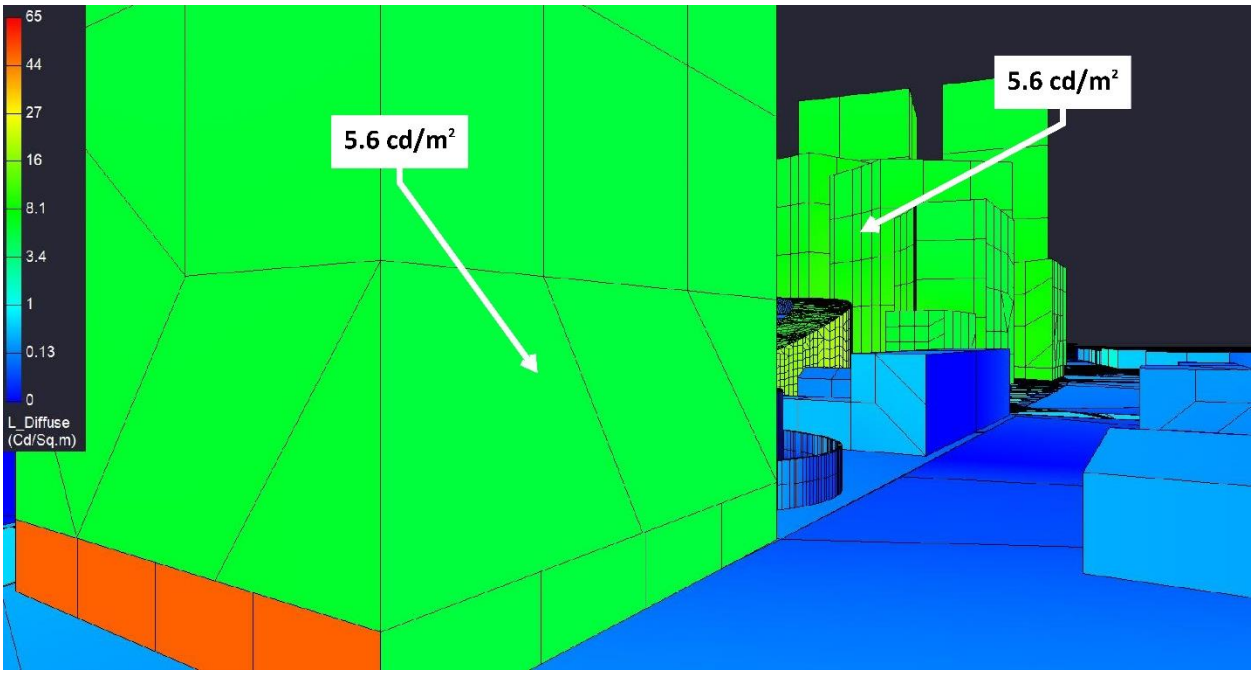




MRA Project, Baseline Ballpark “Full Buildout” Scenario Non-Game Nights Pre-Curfew

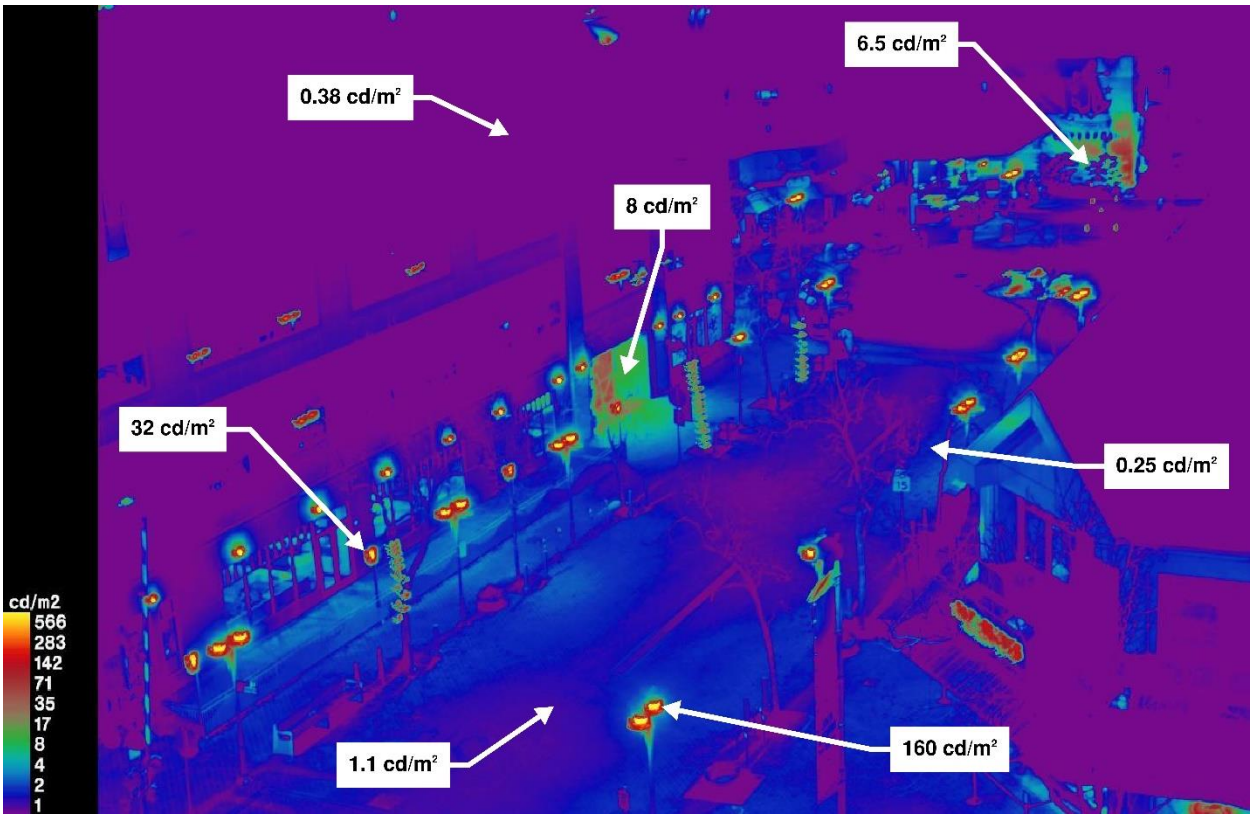
Receptor Site 5A - 2nd at Washington (Facing Stadium)

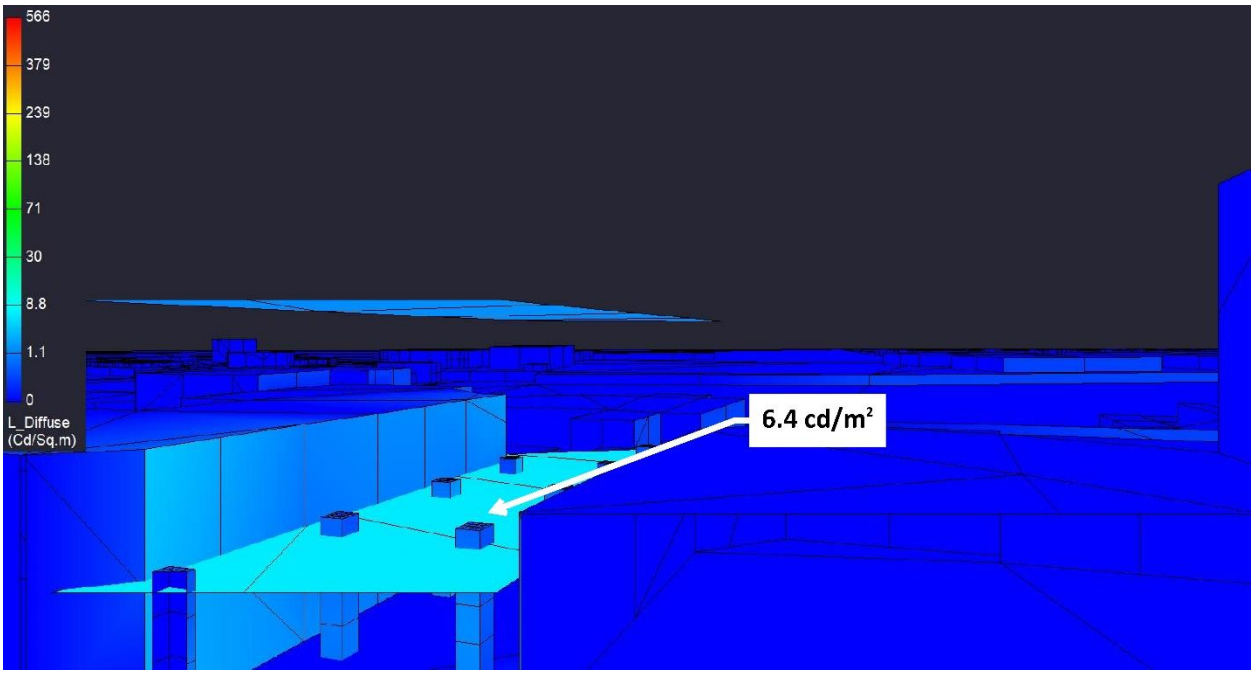




MRA Project, Baseline Ballpark “Full Buildout” Scenario Non-Game Nights Pre-Curfew

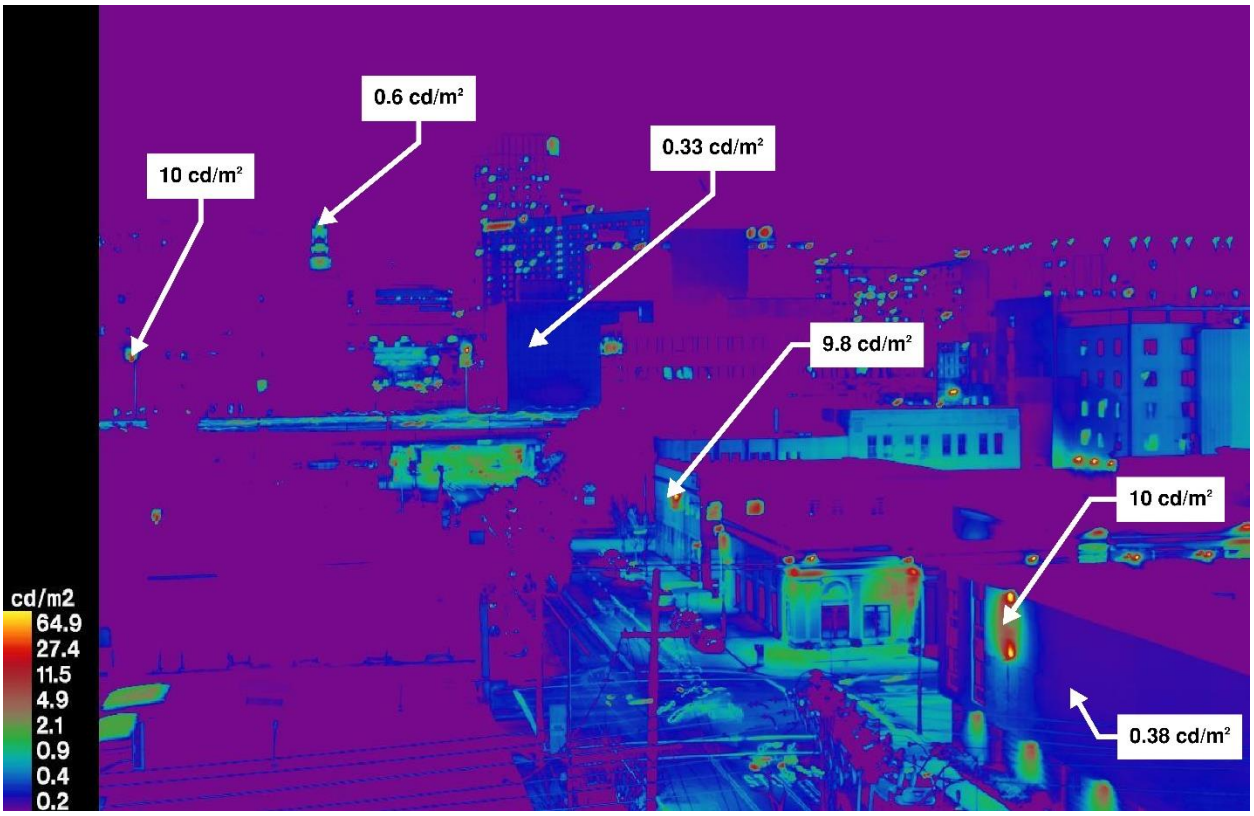
Receptor Site 5B - 2nd at Washington (Facing JLS Station)

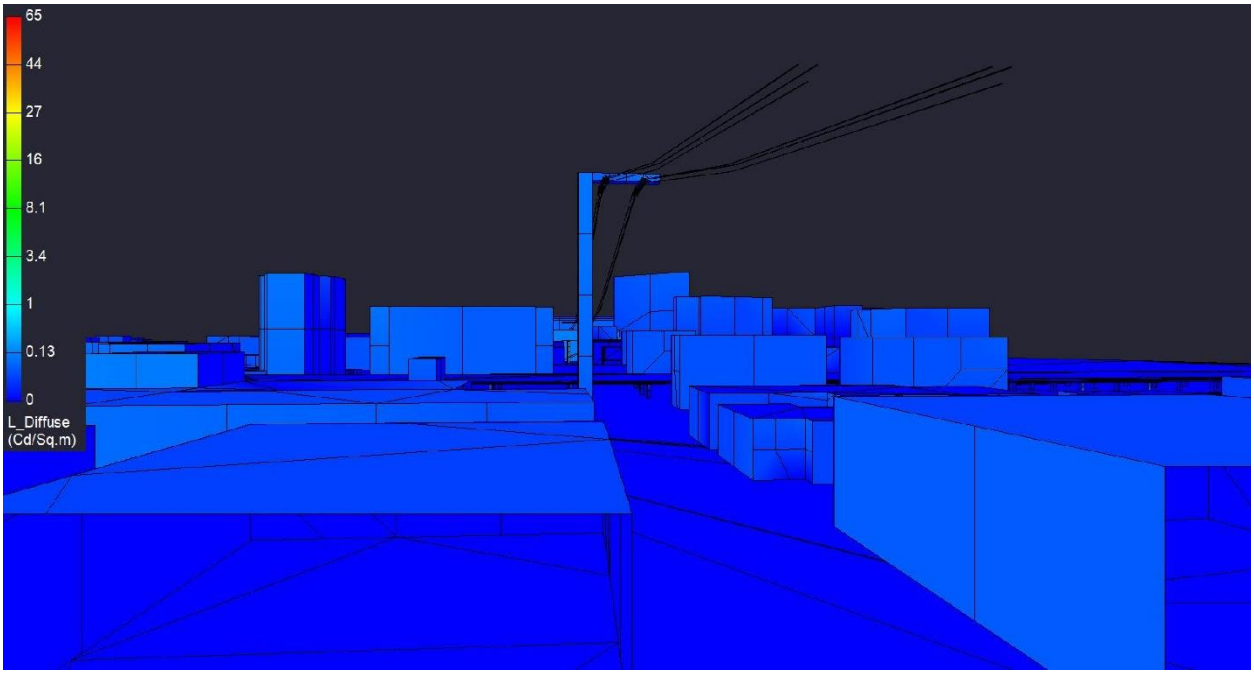




MRA Project, Baseline Ballpark “Full Buildout” Scenario Non-Game Nights Pre-Curfew

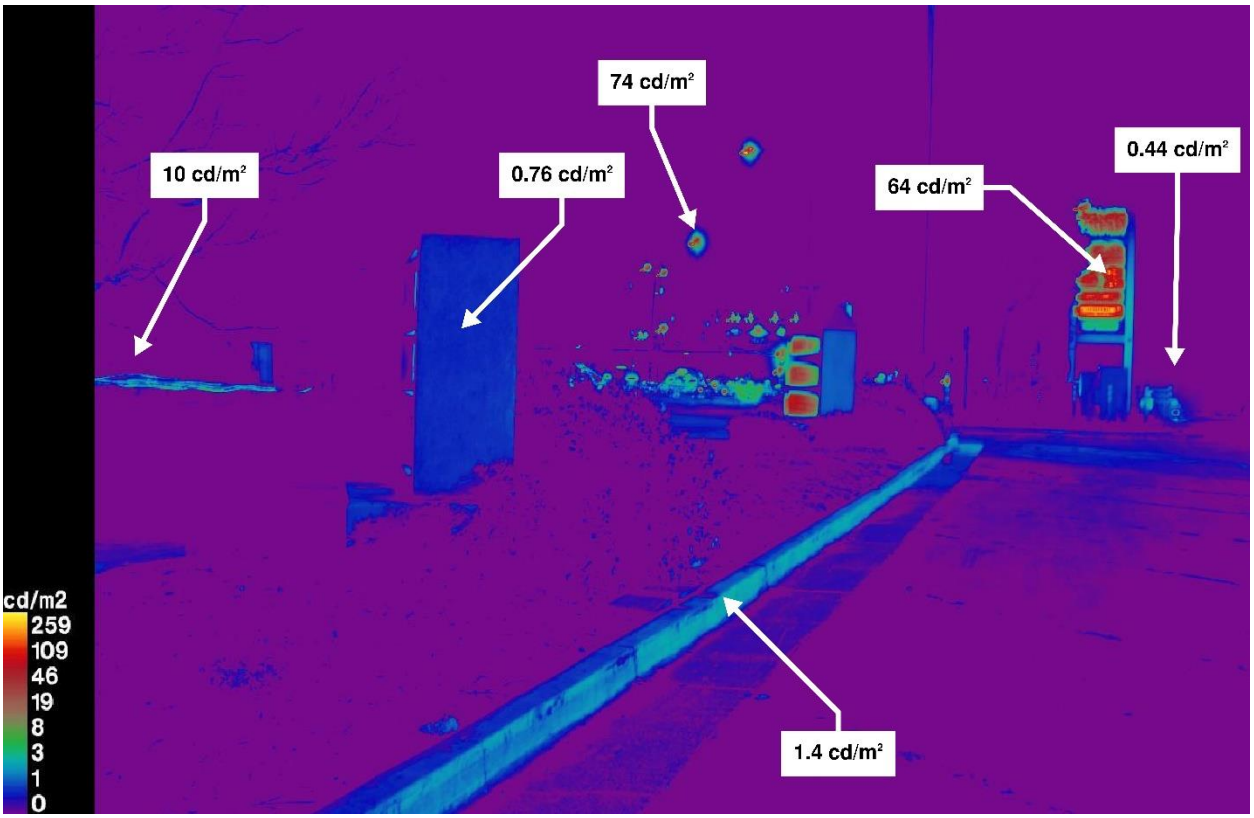
Receptor Site 5C - 2nd at Washington (Facing Convention Center Station)

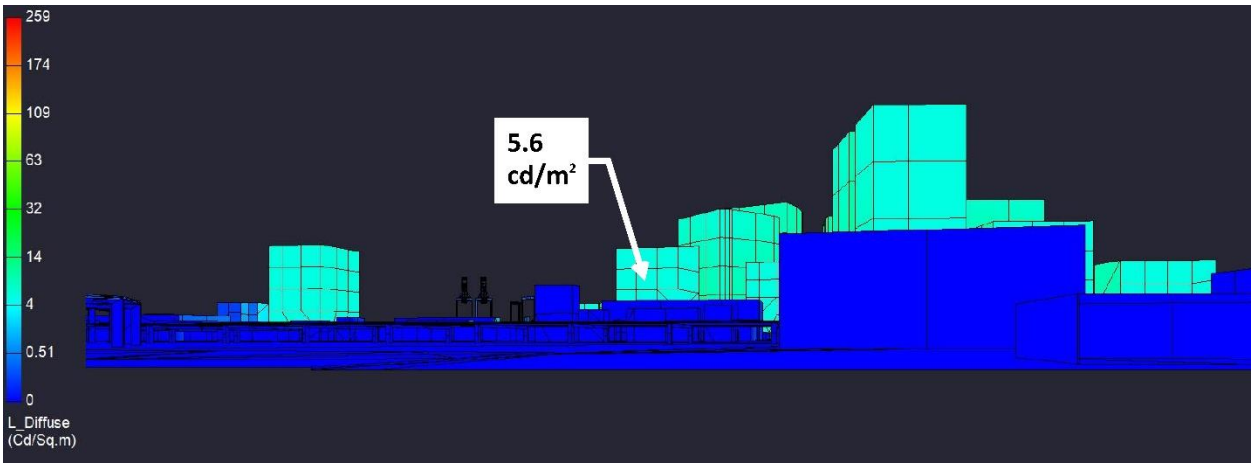




MRA Project, Baseline Ballpark “Full Buildout” Scenario Non-Game Nights Pre-Curfew

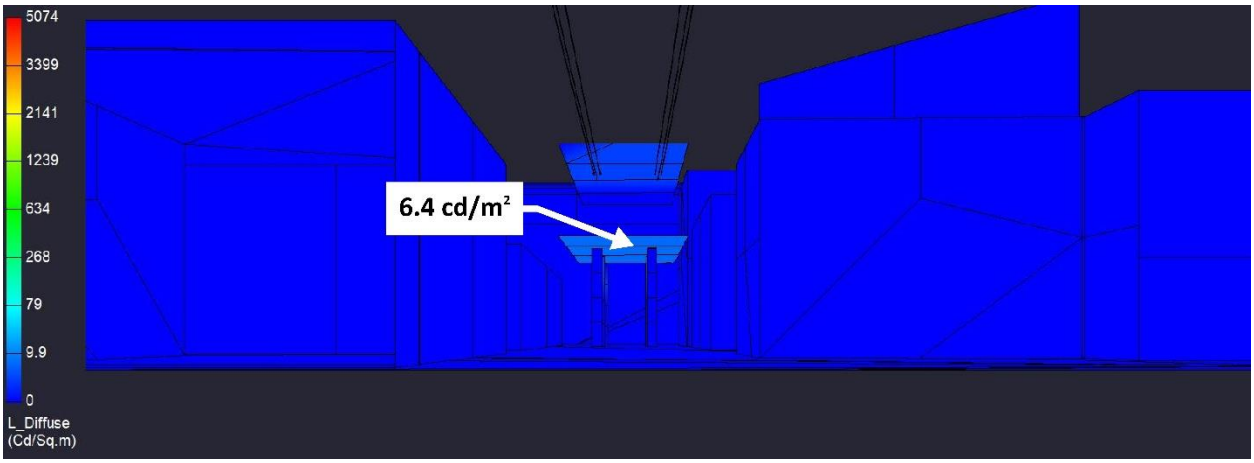
Receptor Site 6A - 7th at Brush





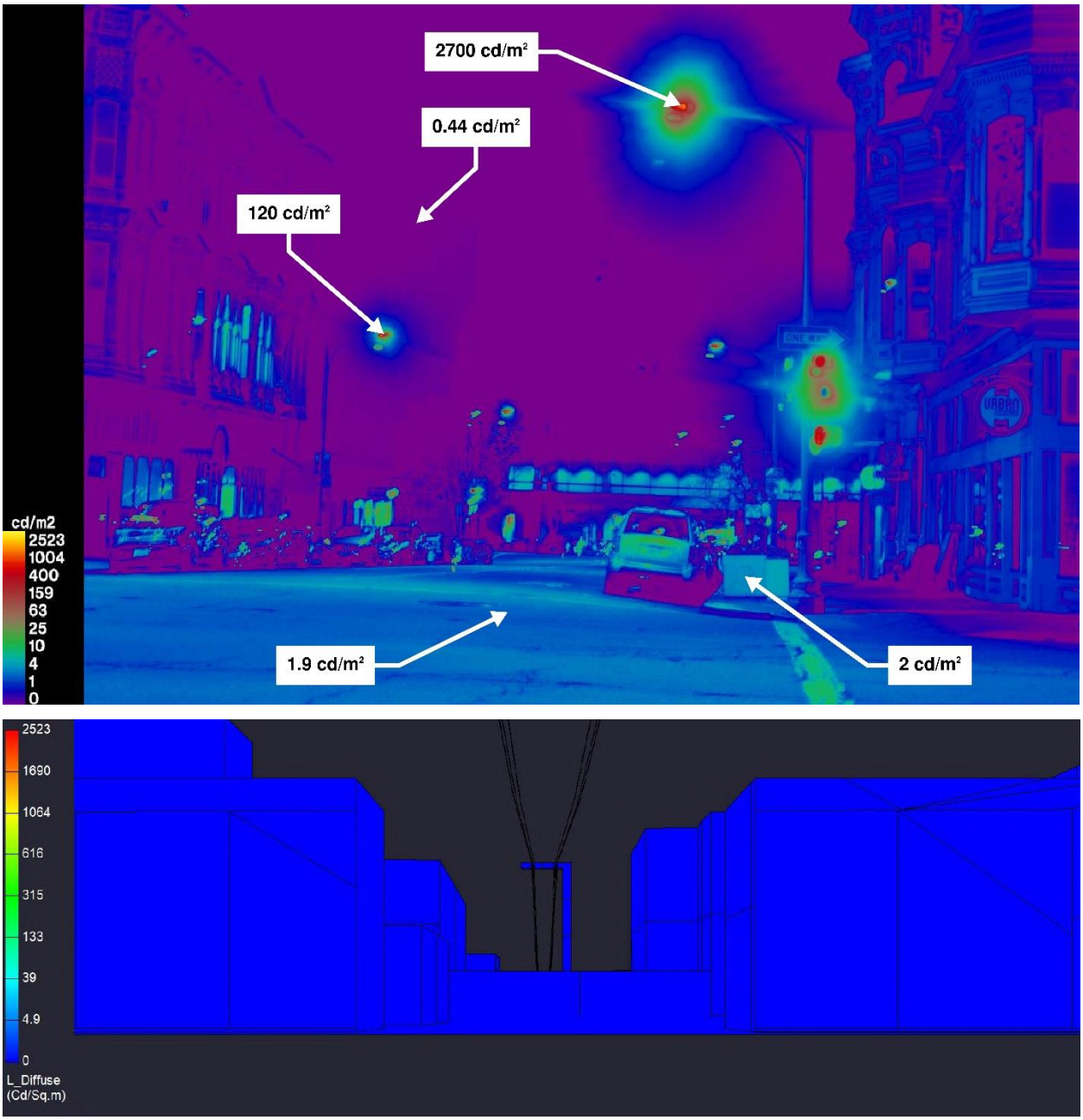
MRA Project, Baseline Ballpark “Full Buildout” Scenario Non-Game Nights Pre-Curfew

Receptor Site 7 - 8th at Washington (Facing Convention Center Station)



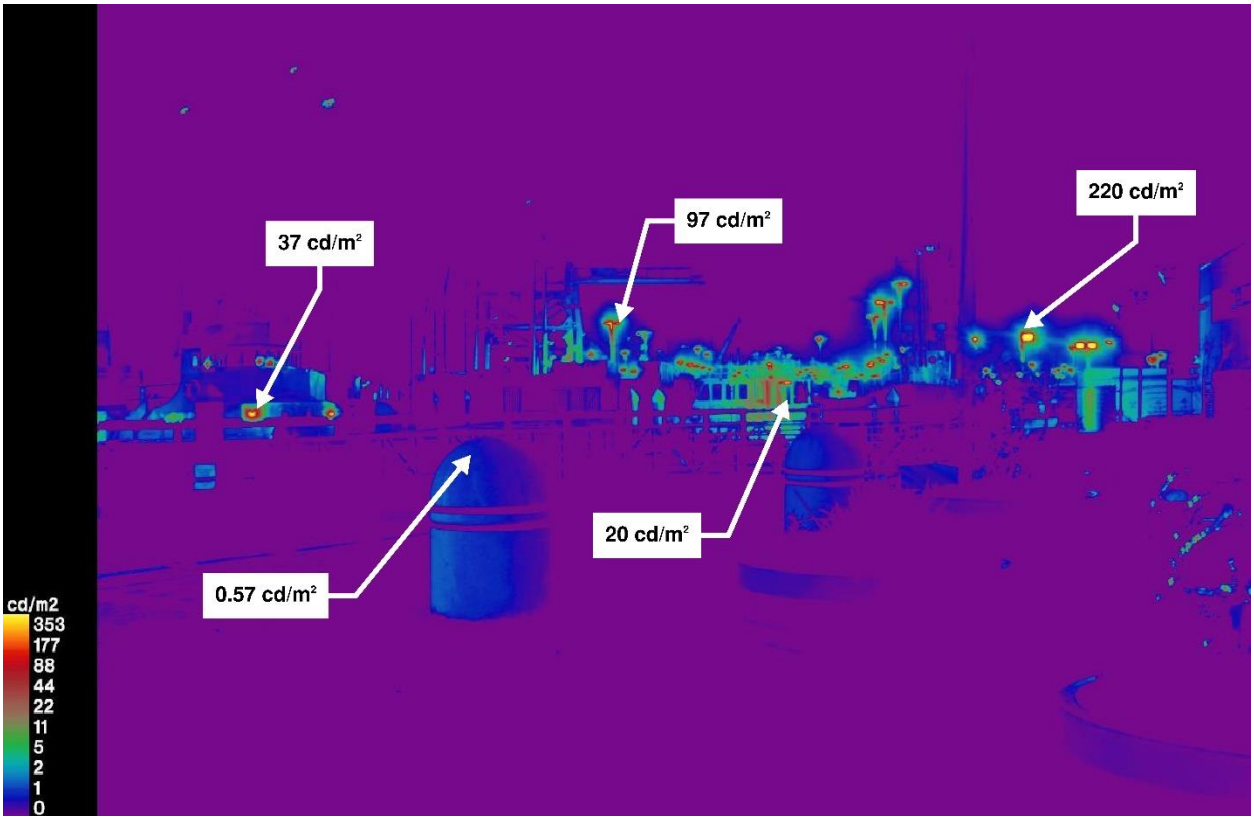
MRA Project, Baseline Ballpark “Full Buildout” Scenario Non-Game Nights Pre-Curfew

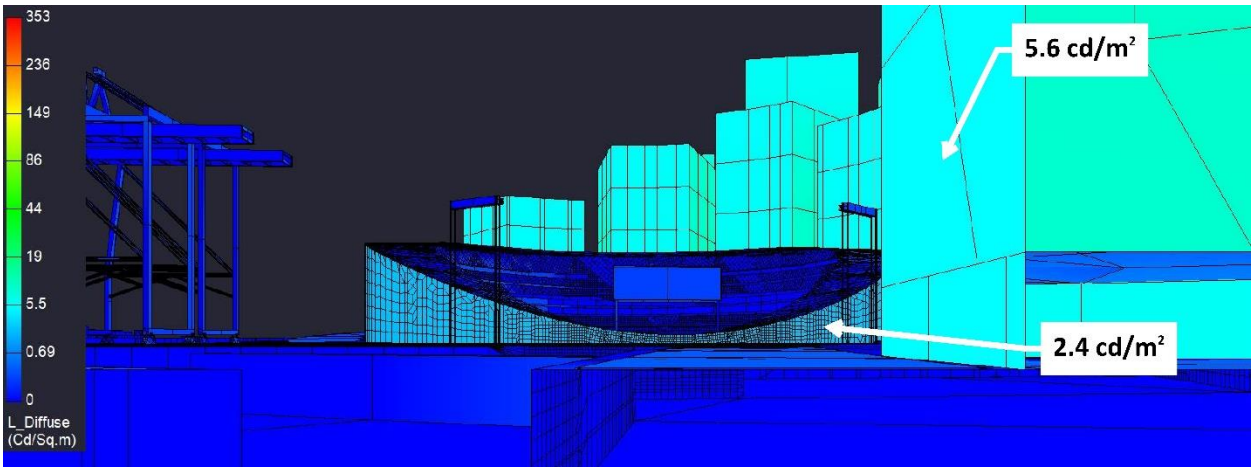
Receptor Site 7A - 8th at Washington (Facing Tower)



MRA Project, Baseline Ballpark “Full Buildout” Scenario Post-Curfew

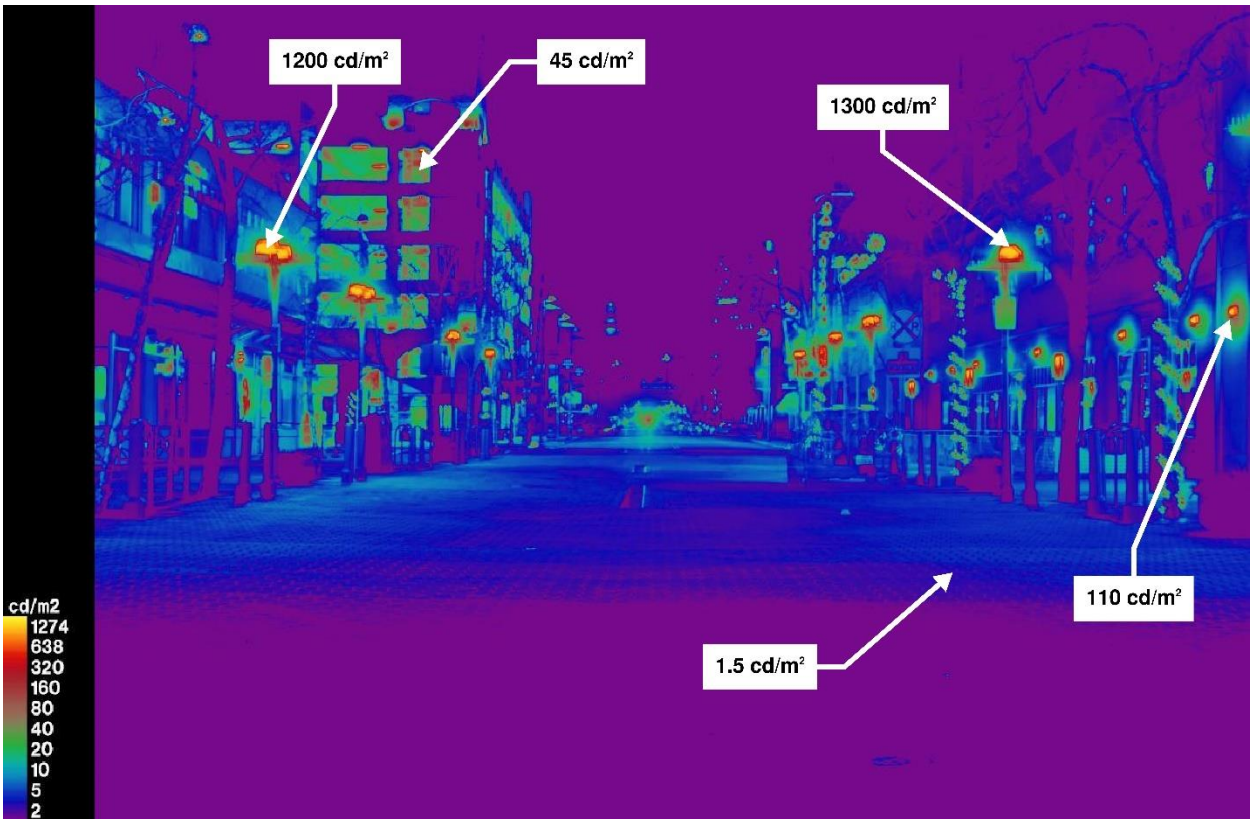
Receptor Site 1 - Water Street at Clay (Facing Ballpark)

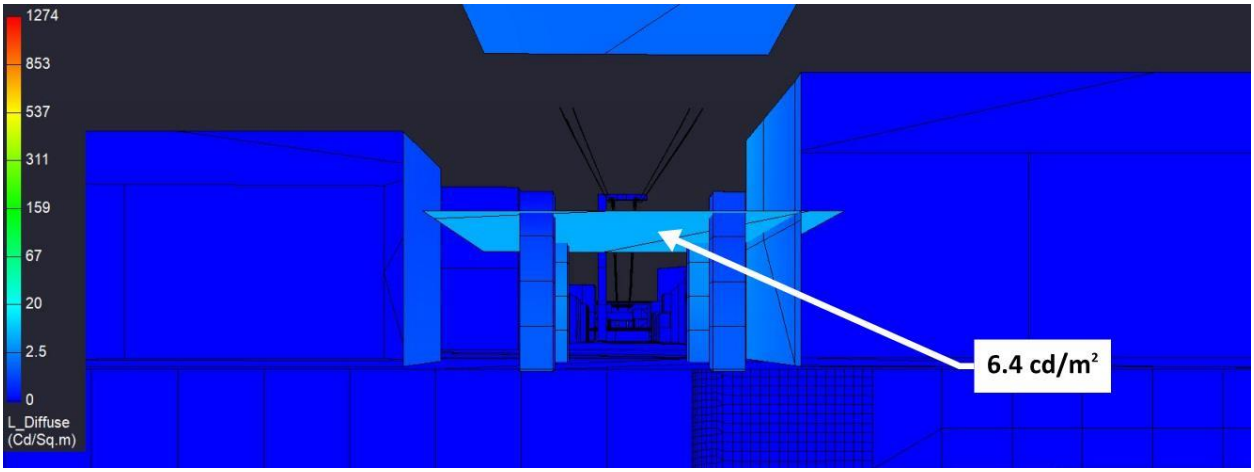




MRA Project, Baseline Ballpark “Full Buildout” Scenario Post-Curfew

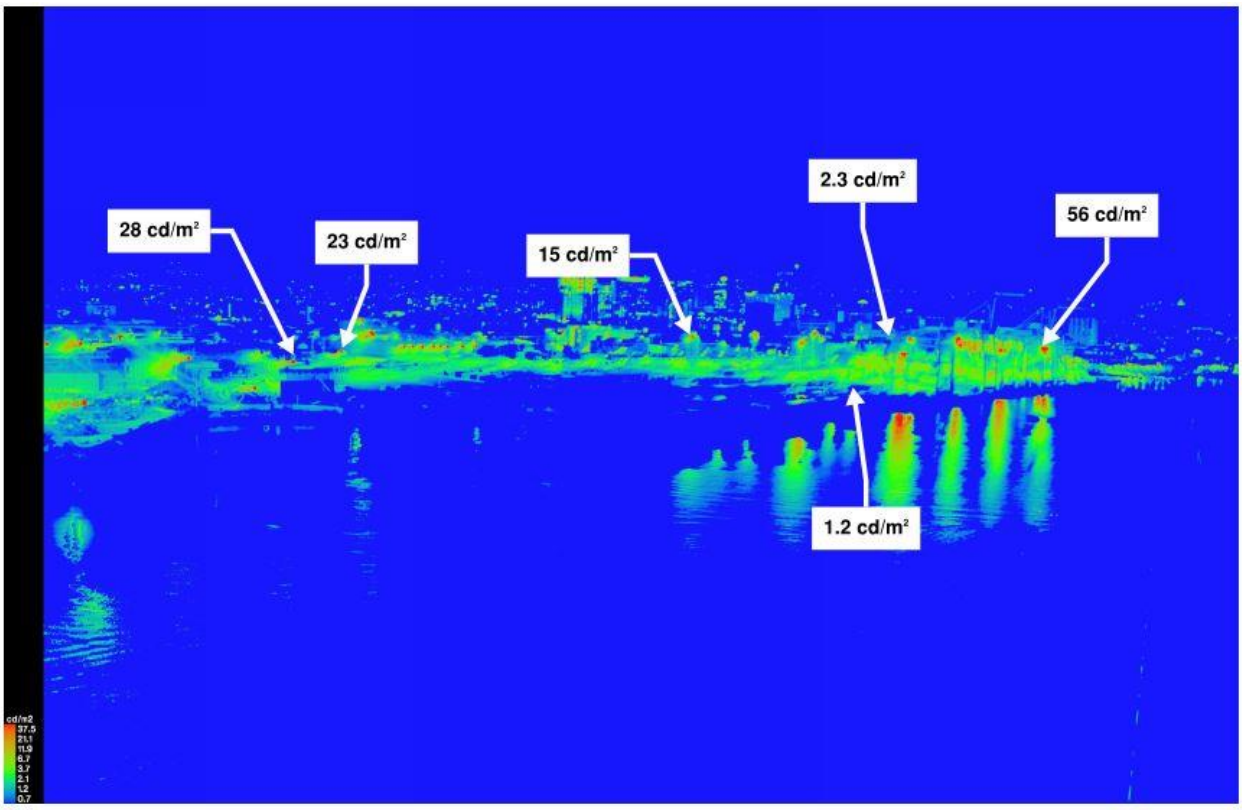
Receptor Site 1A - Water Street at Washington (Facing Gondola)

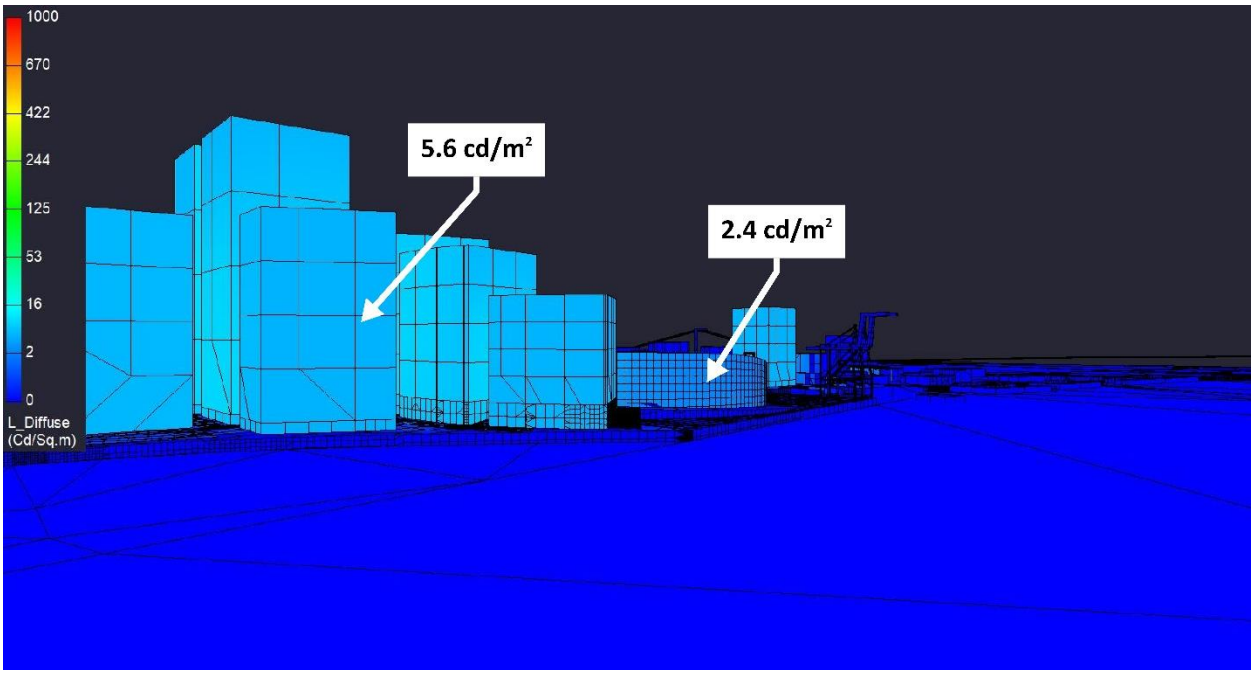




MRA Project, Baseline Ballpark “Full Buildout” Scenario Post-Curfew

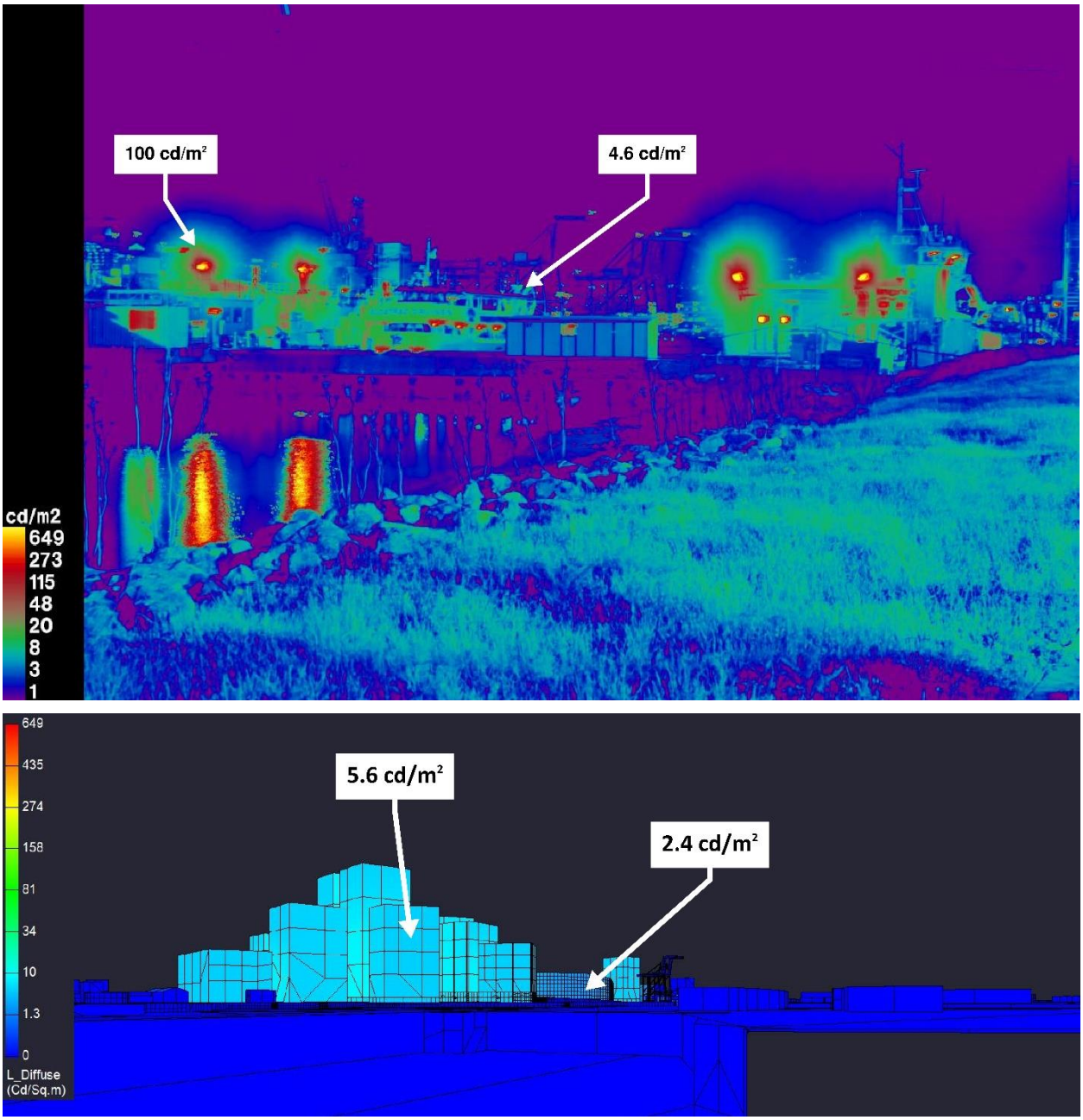
Receptor Site 2 - Inner Harbor Turning Basin @ 190'





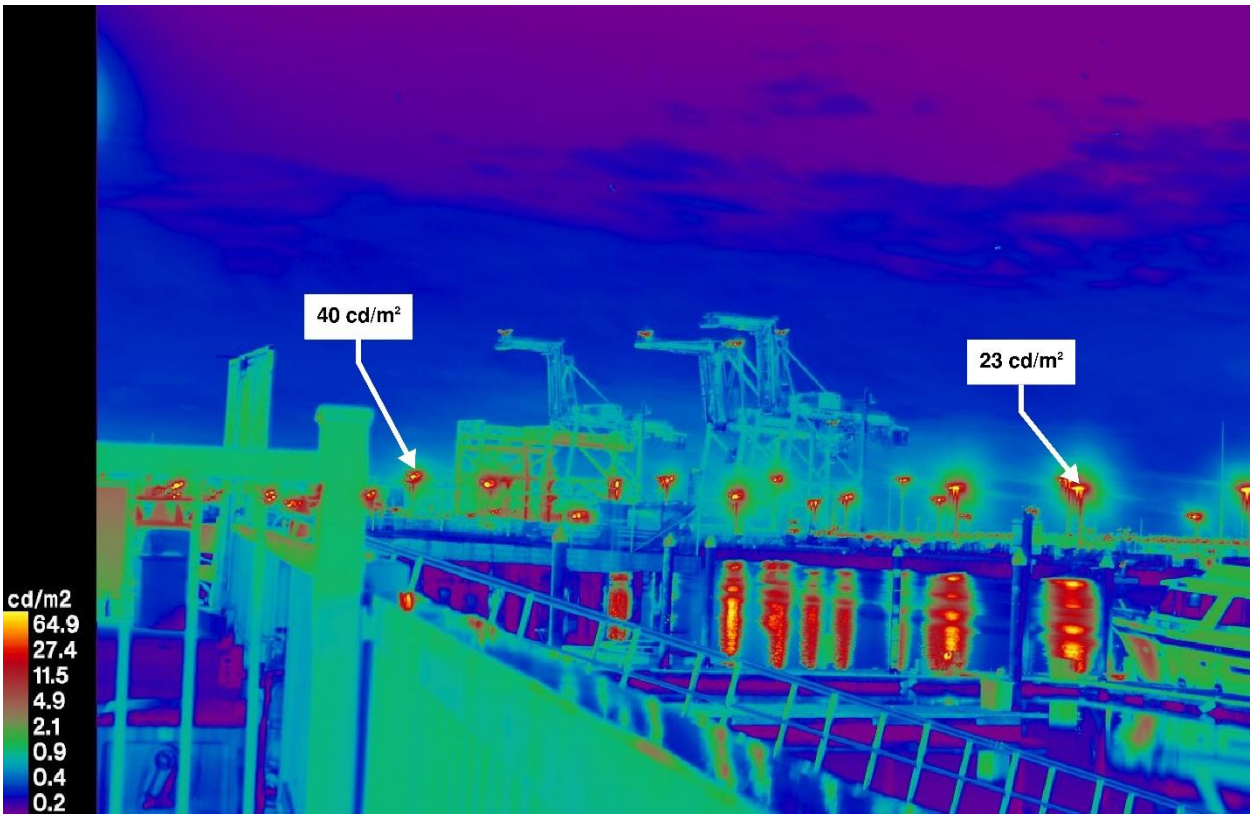
MRA Project, Baseline Ballpark “Full Buildout” Scenario Post-Curfew

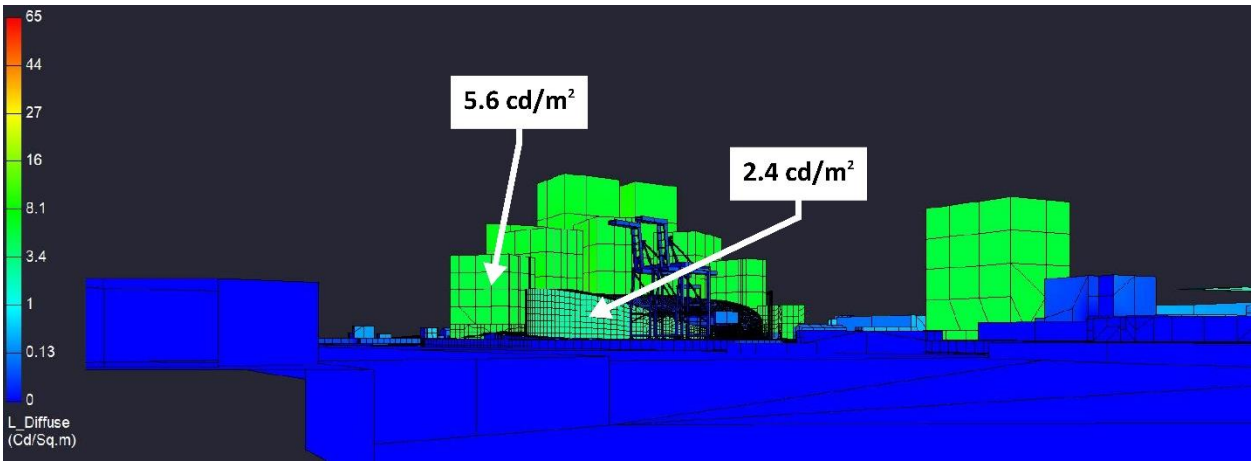
Receptor Site 2A - Turning Basin Line-of-Sight



MRA Project, Baseline Ballpark “Full Buildout” Scenario Post-Curfew

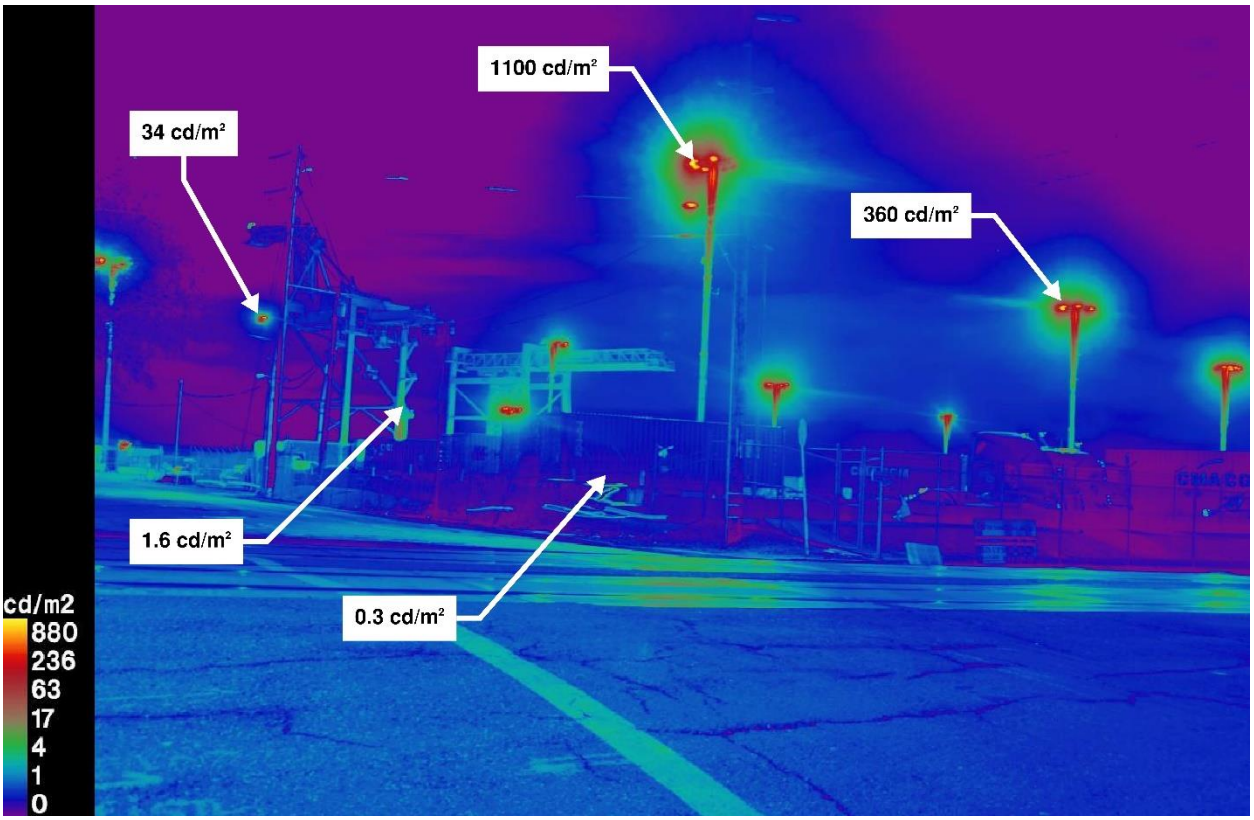
Receptor Site 3 - Alameda Dock

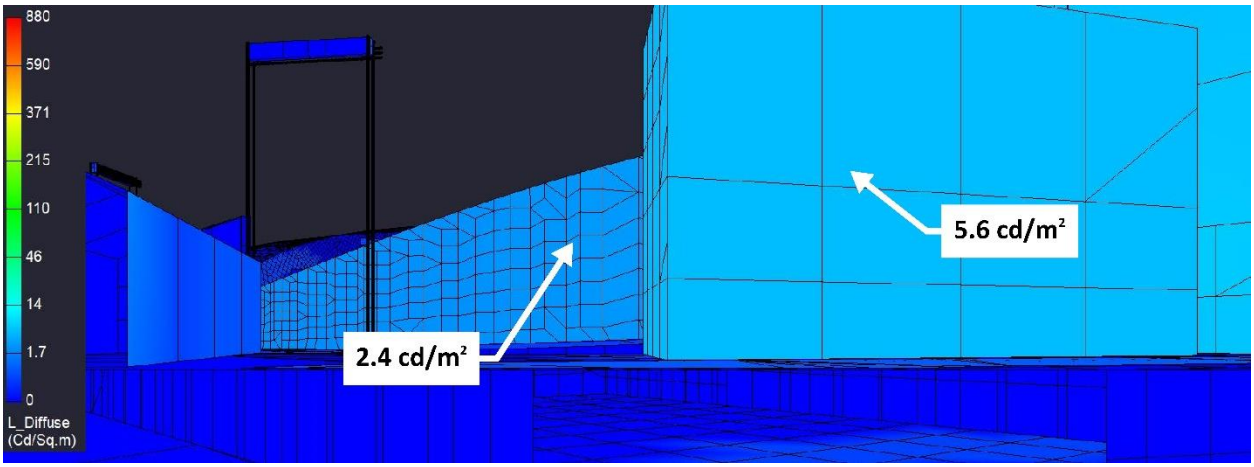




MRA Project, Baseline Ballpark “Full Buildout” Scenario Post-Curfew

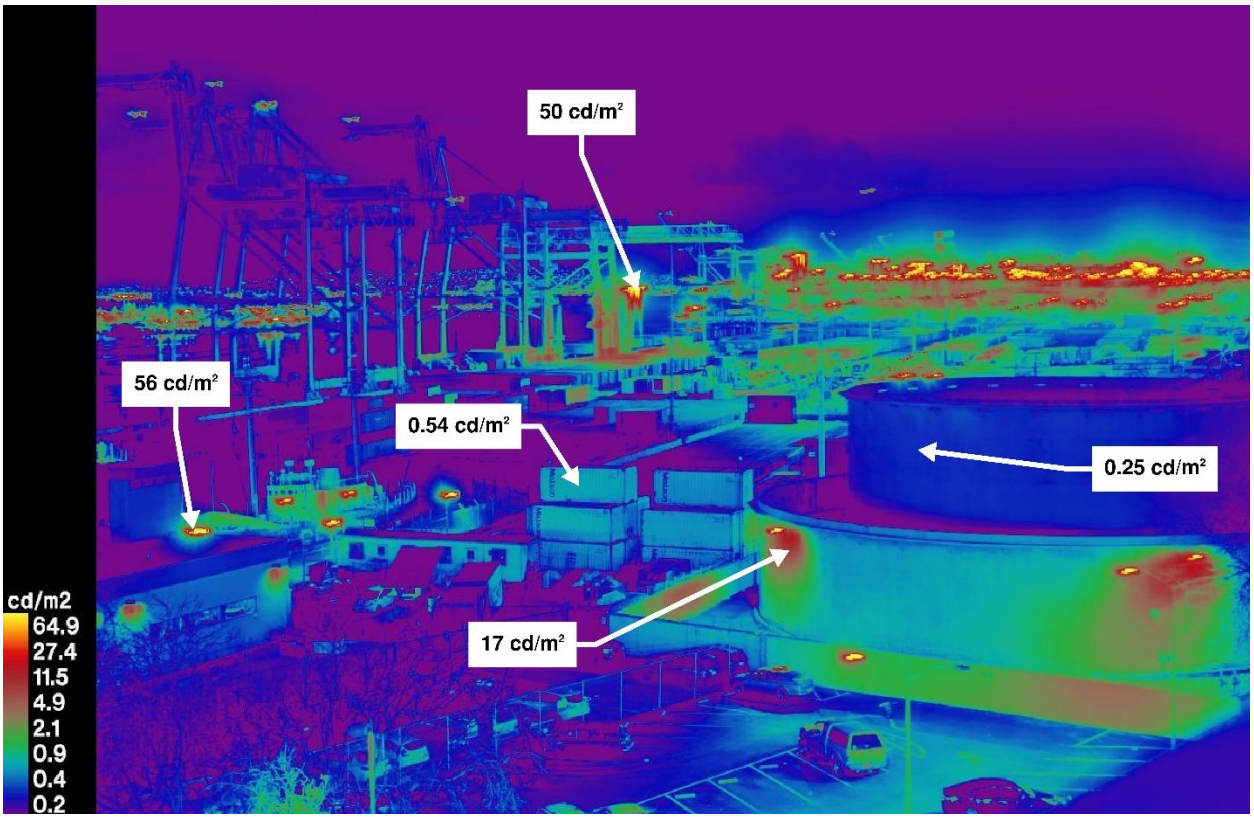
Receptor Site 4 - MLK at Embarcadero

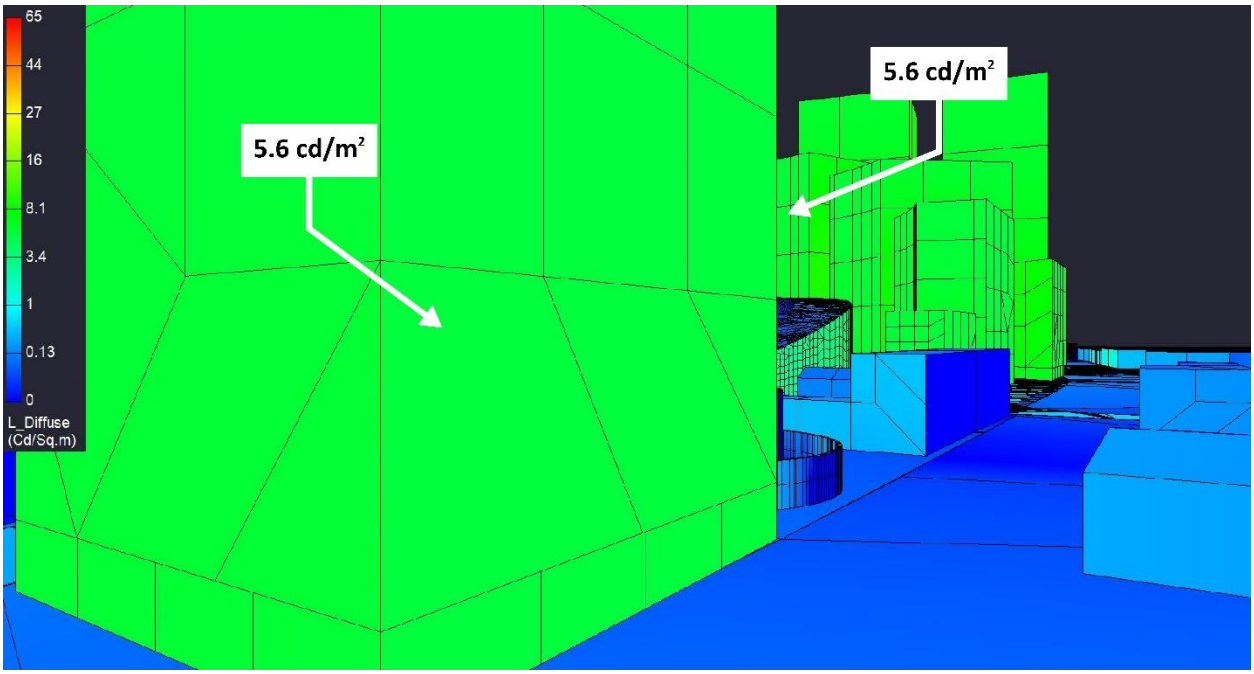




MRA Project, Baseline Ballpark “Full Buildout” Scenario Post-Curfew

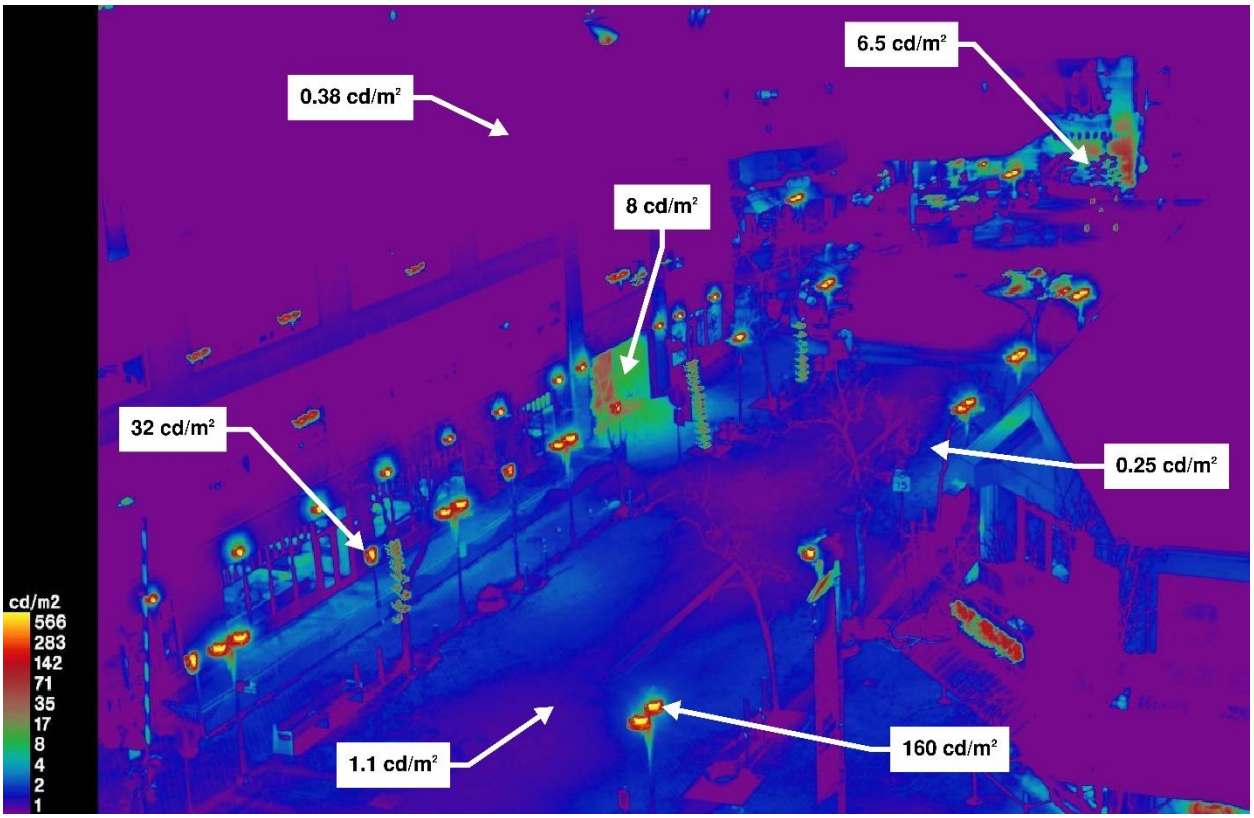
Receptor Site 5A - 2nd at Washington (Facing Stadium)

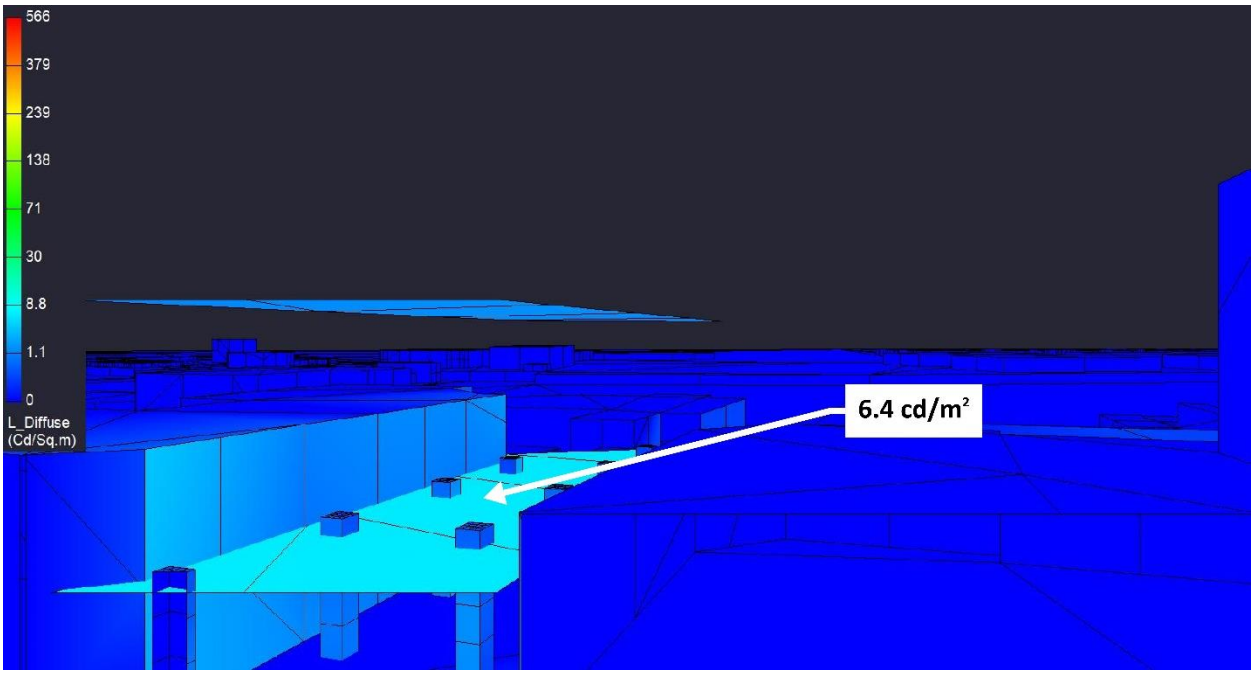




MRA Project, Baseline Ballpark “Full Buildout” Scenario Post-Curfew

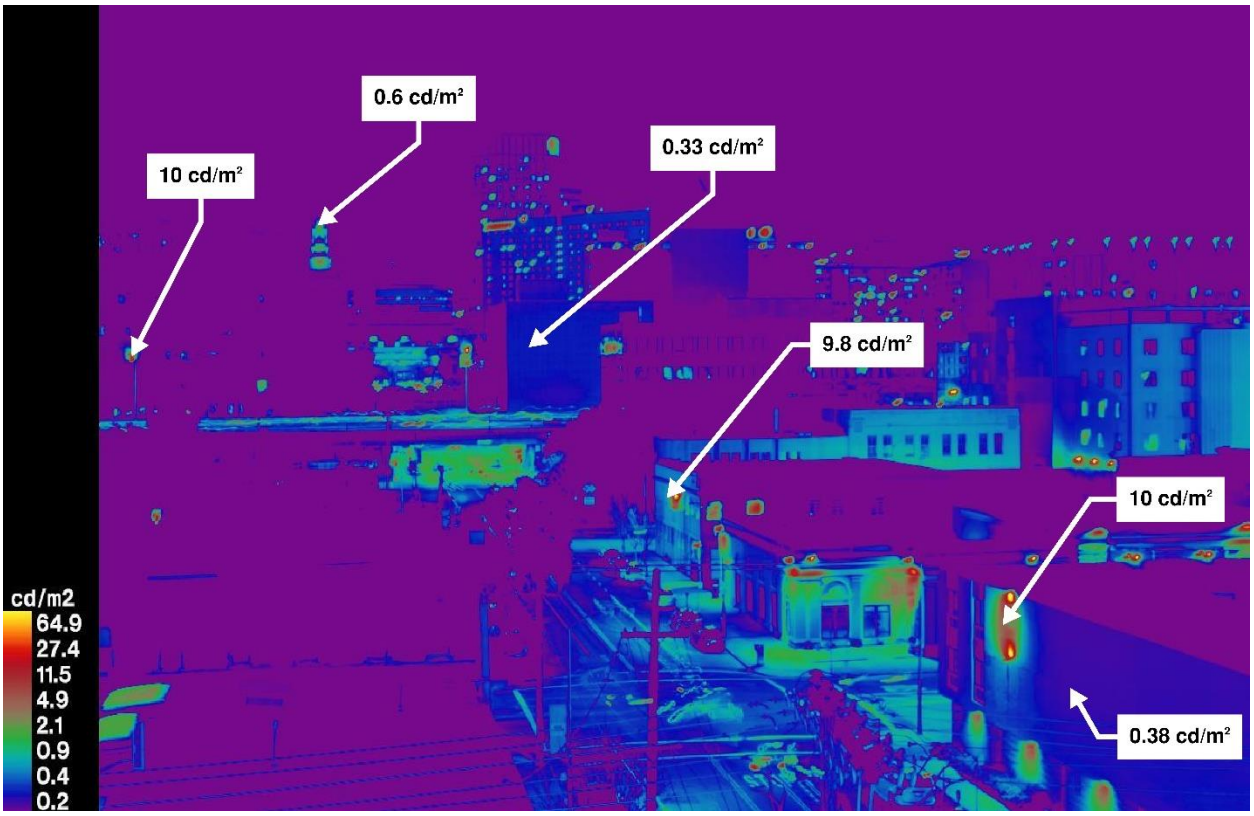
Receptor Site 5B - 2nd at Washington (Facing JLS Station)

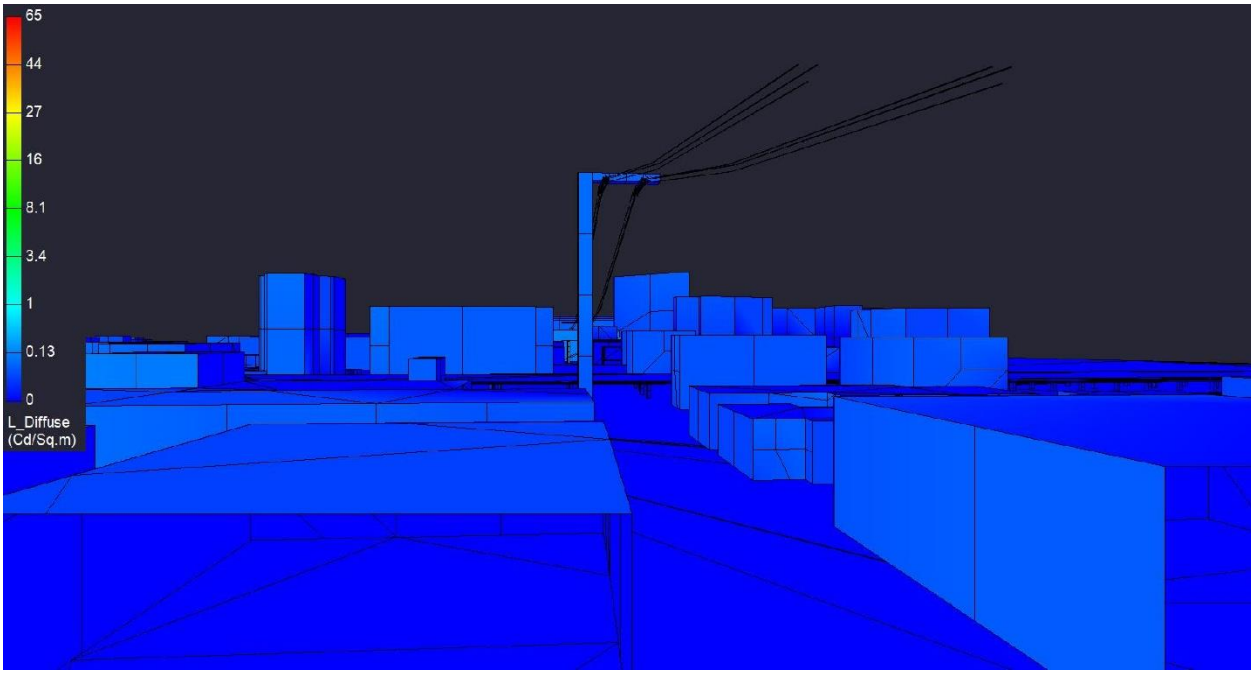




MRA Project, Baseline Ballpark “Full Buildout” Scenario Post-Curfew

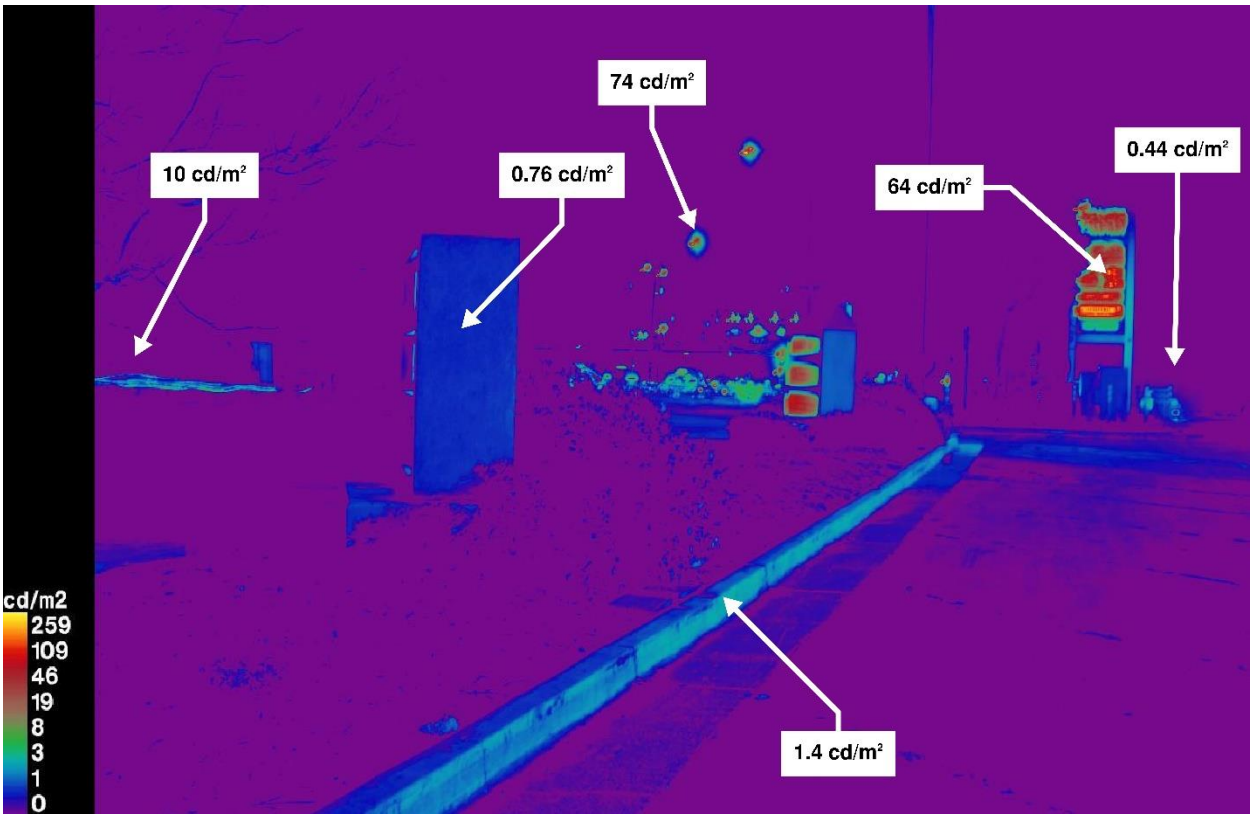
Receptor Site 5C - 2nd at Washington (Facing Convention Center Station)

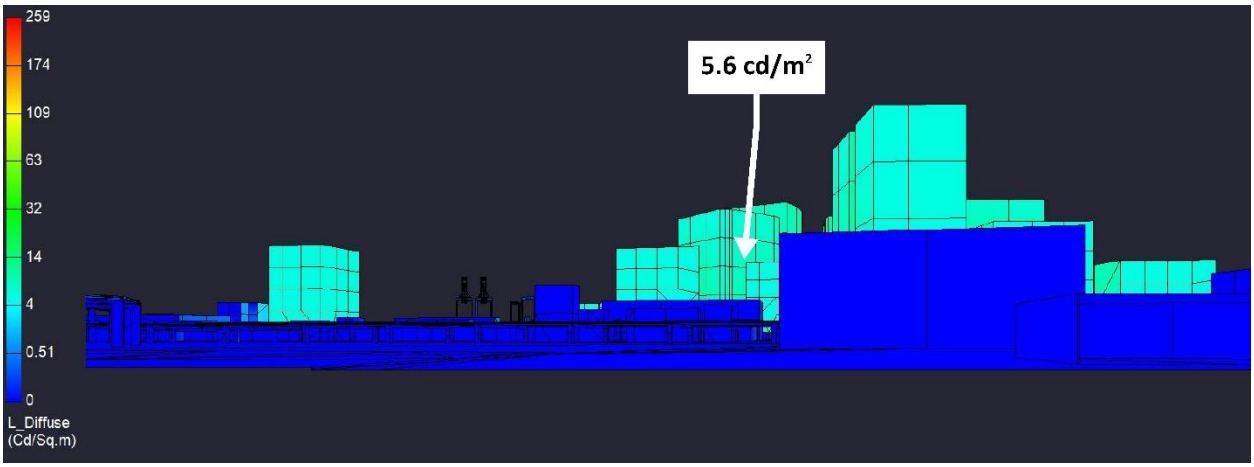




MRA Project, Baseline Ballpark “Full Buildout” Scenario Post-Curfew

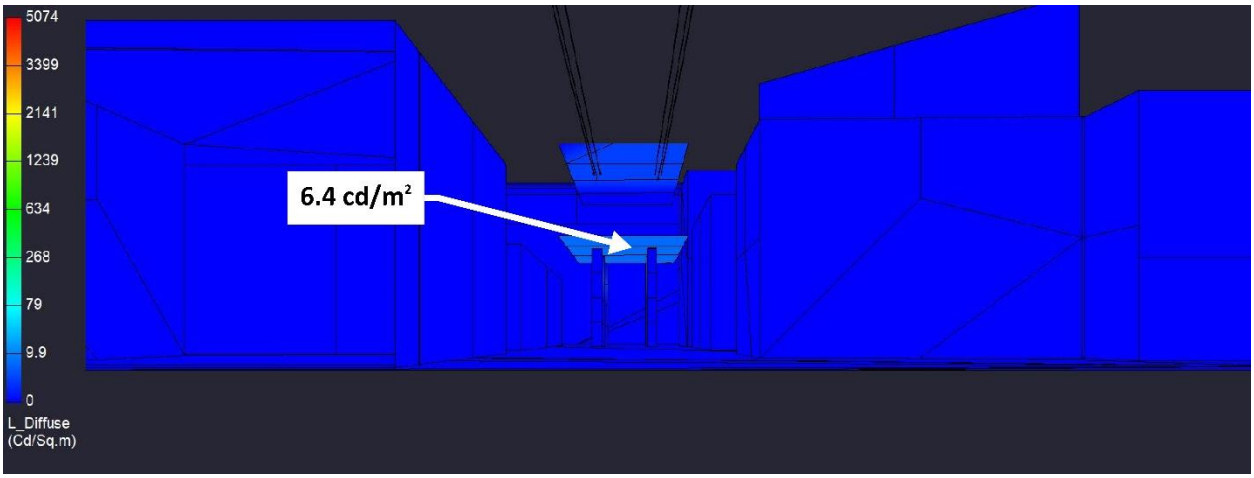
Receptor Site 6A - 7th at Brush





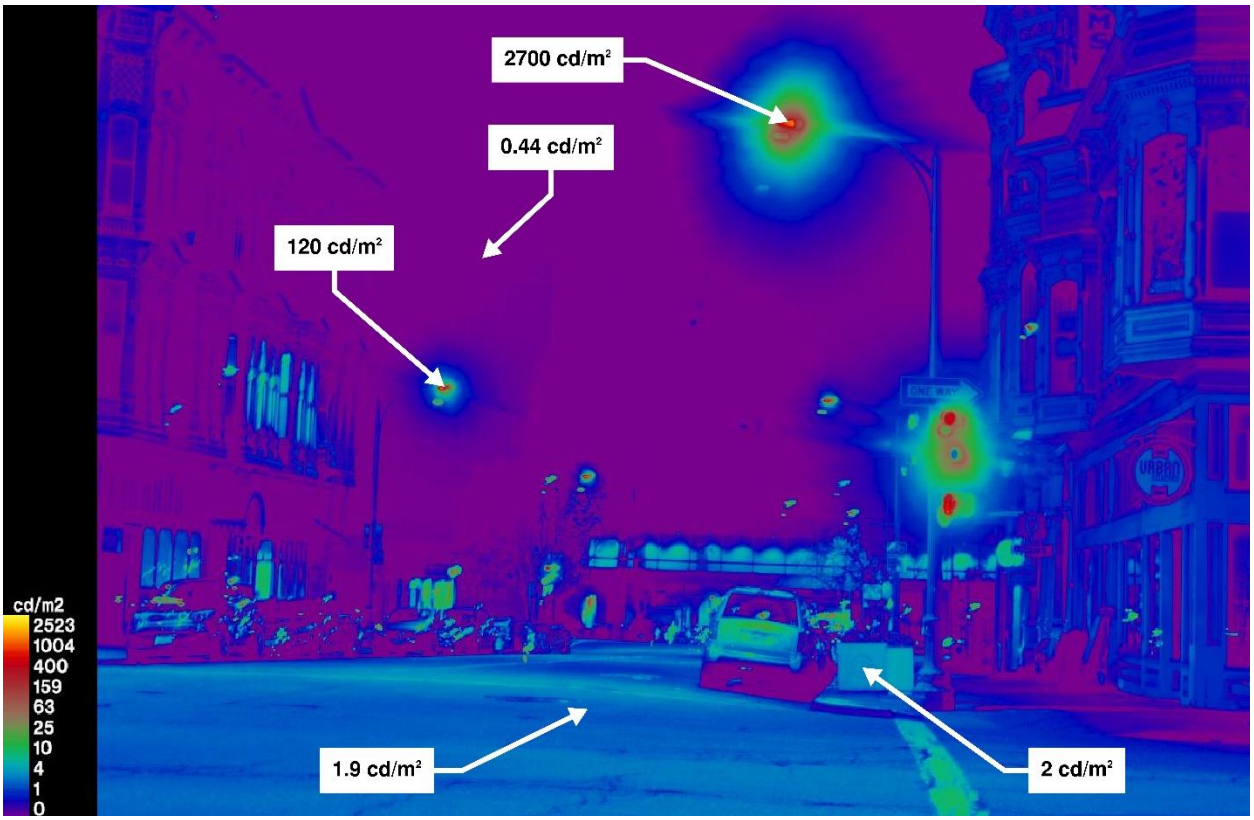
MRA Project, Baseline Ballpark “Full Buildout” Scenario Post-Curfew

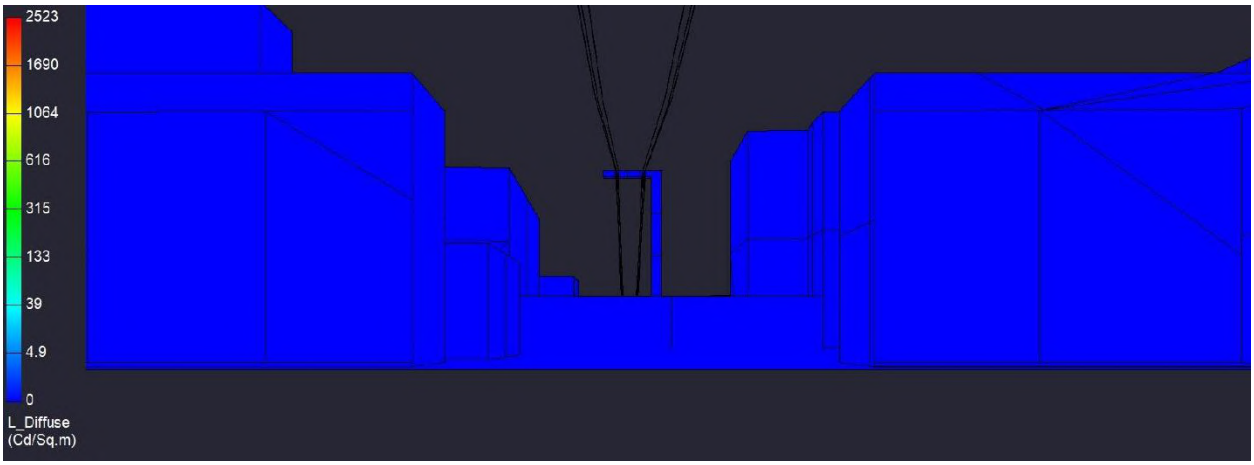
Receptor Site 7 - 8th at Washington (Facing Convention Center Station)



MRA Project, Baseline Ballpark “Full Buildout” Scenario Post-Curfew

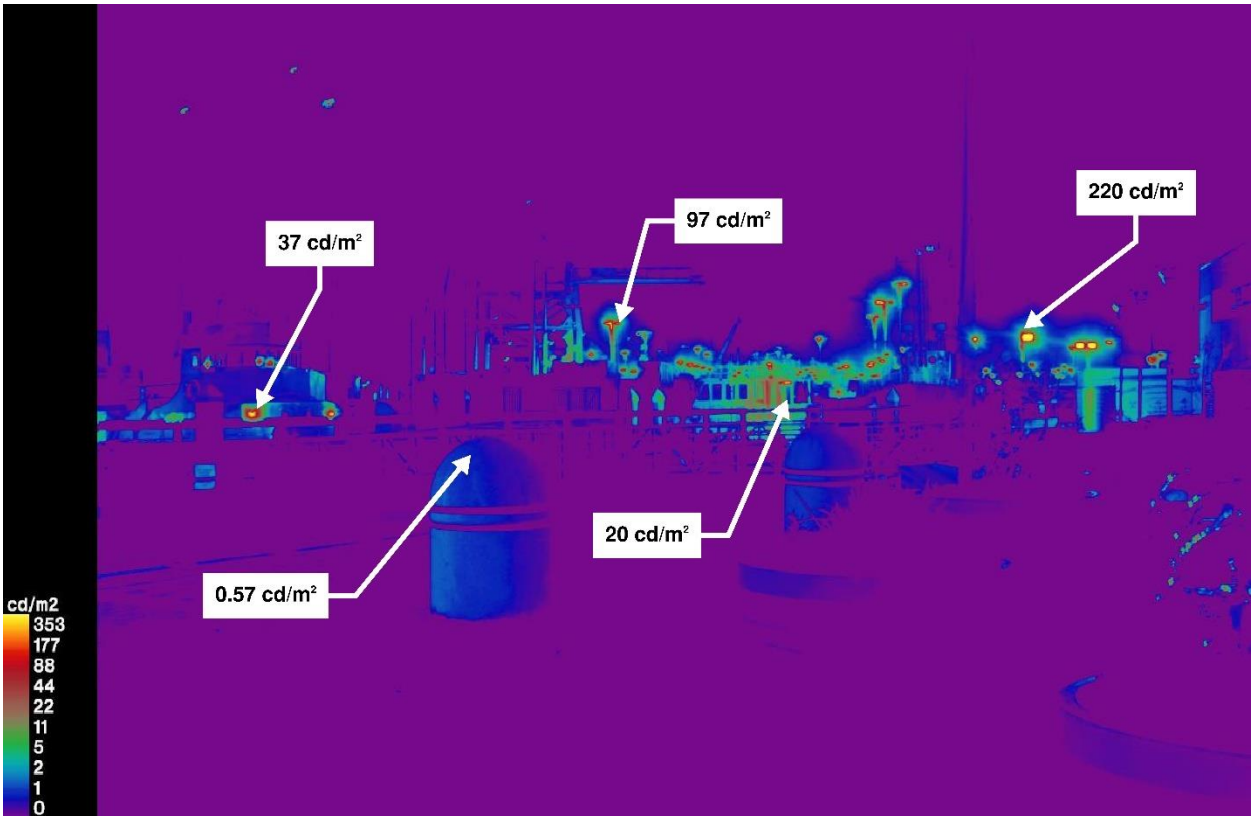
Receptor Site 7A - 8th at Washington (Facing Tower)

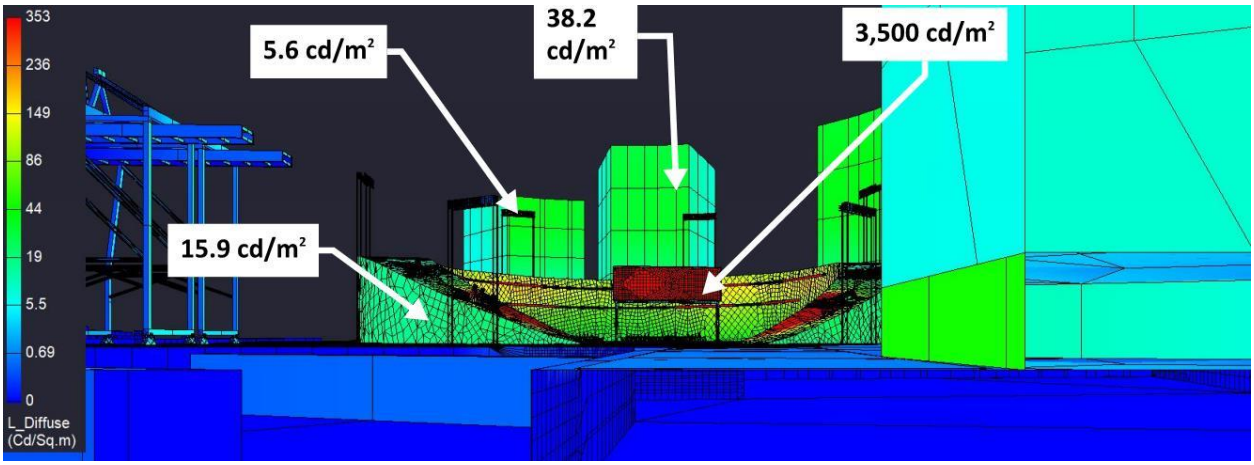




MRA Project, Reduced Ballpark Height “Phase 1” Scenario Game Nights

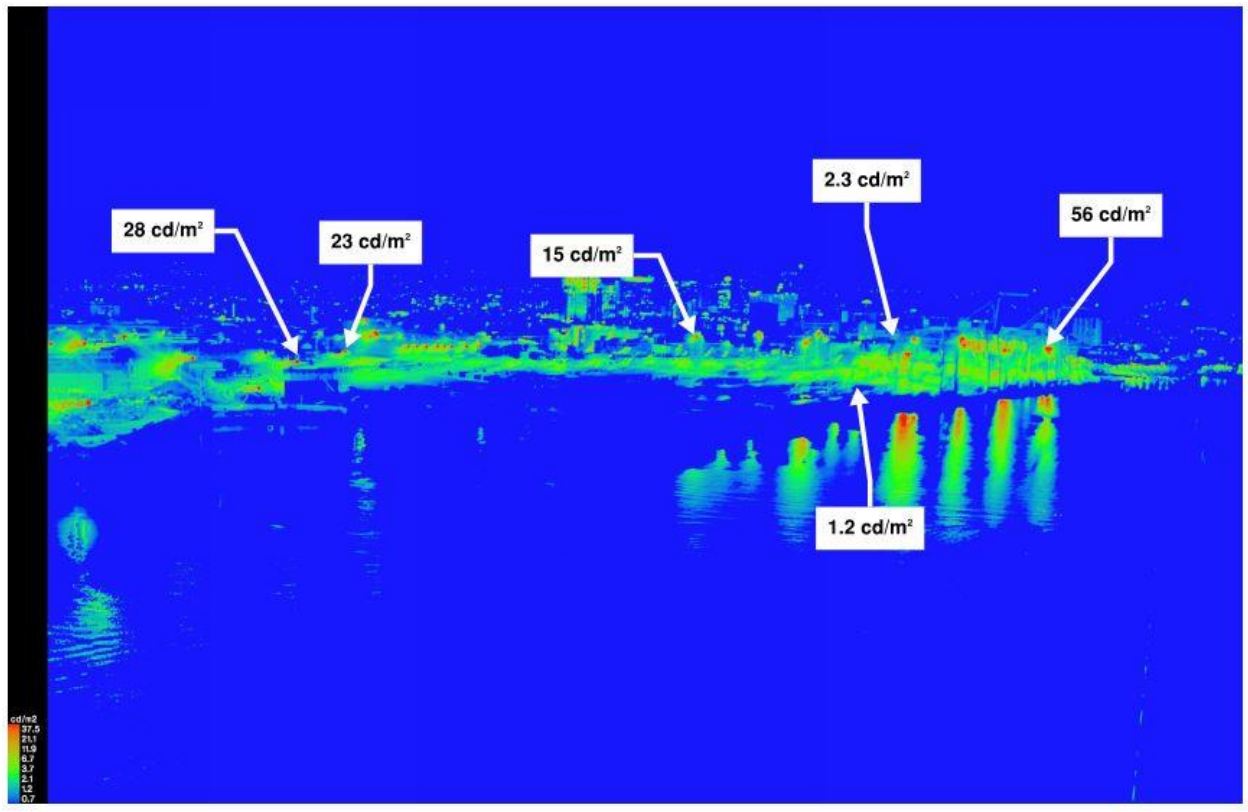
Receptor Site 1 - Water Street at Clay (Facing Ballpark)

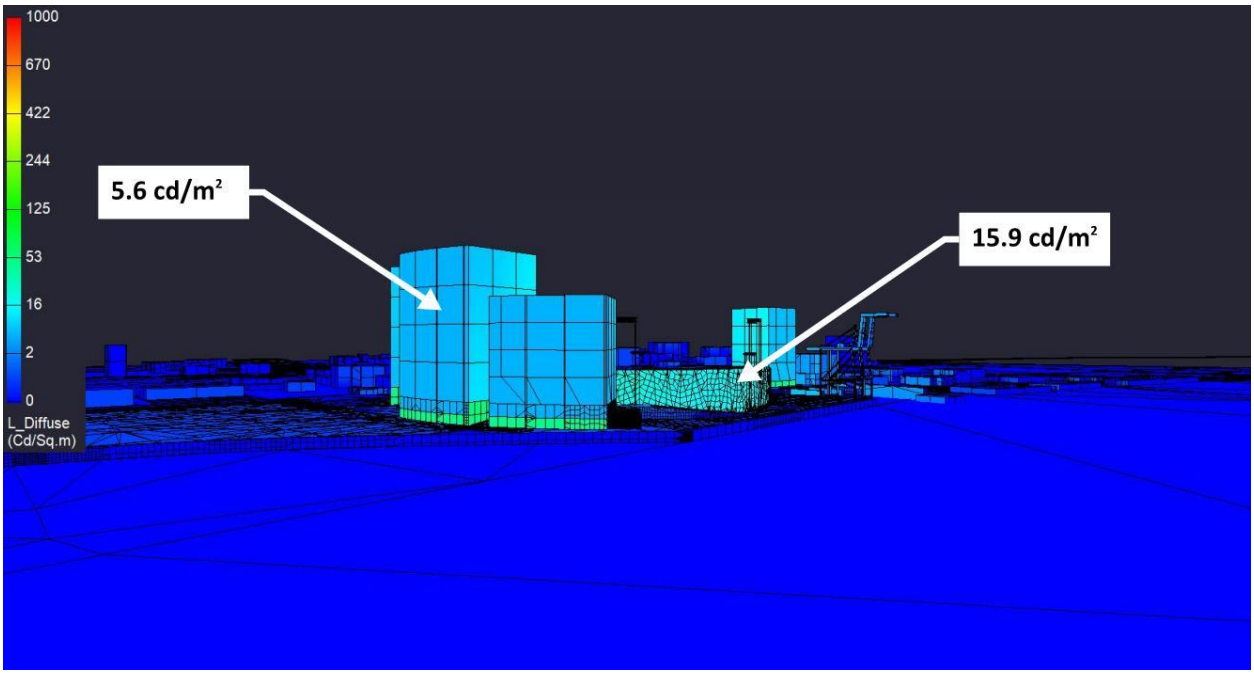




MRA Project, Reduced Ballpark Height “Phase 1” Scenario Game Nights

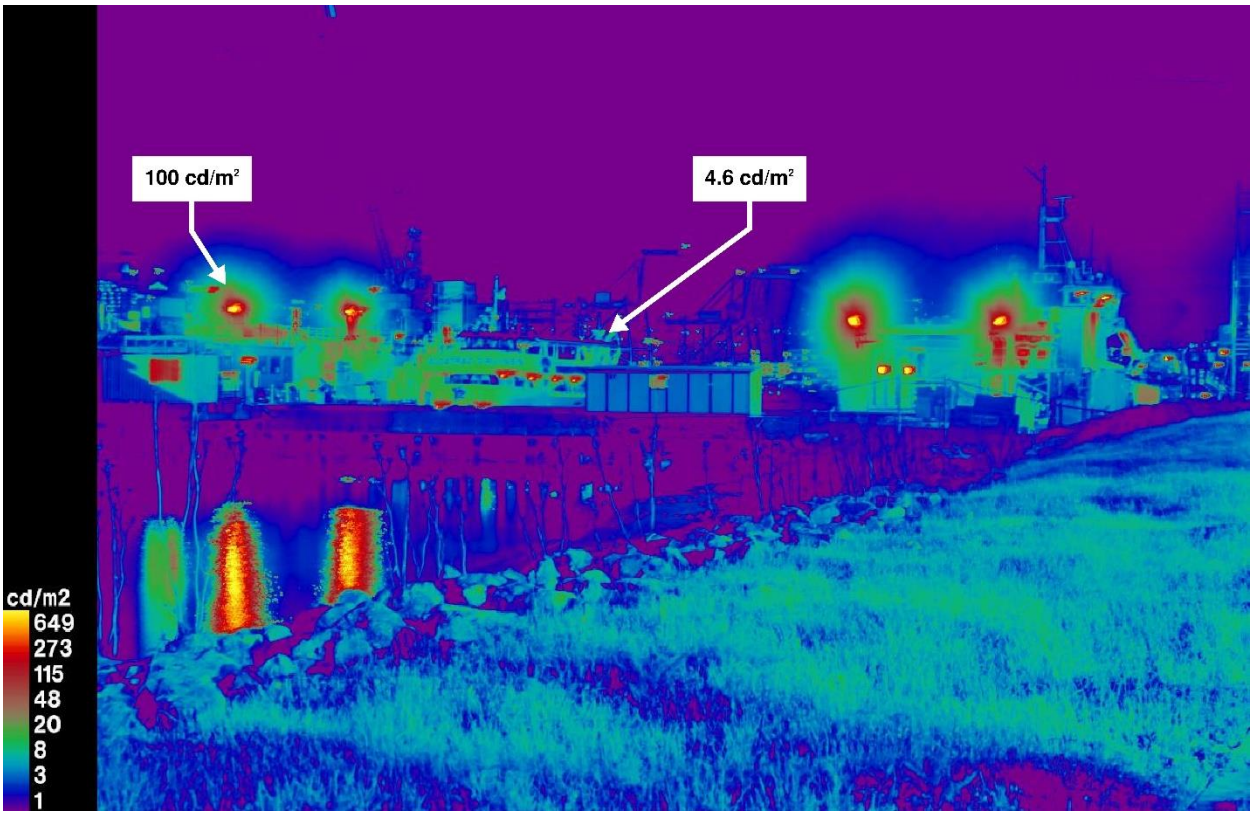
Receptor Site 2 - Inner Harbor Turning Basin @ 190'

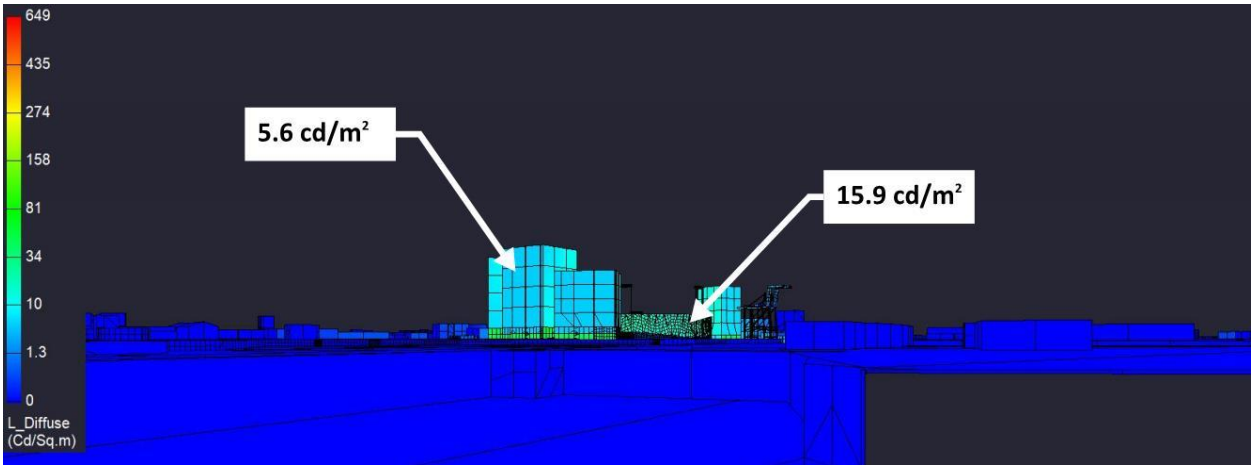




MRA Project, Reduced Ballpark Height “Phase 1” Scenario Game Nights

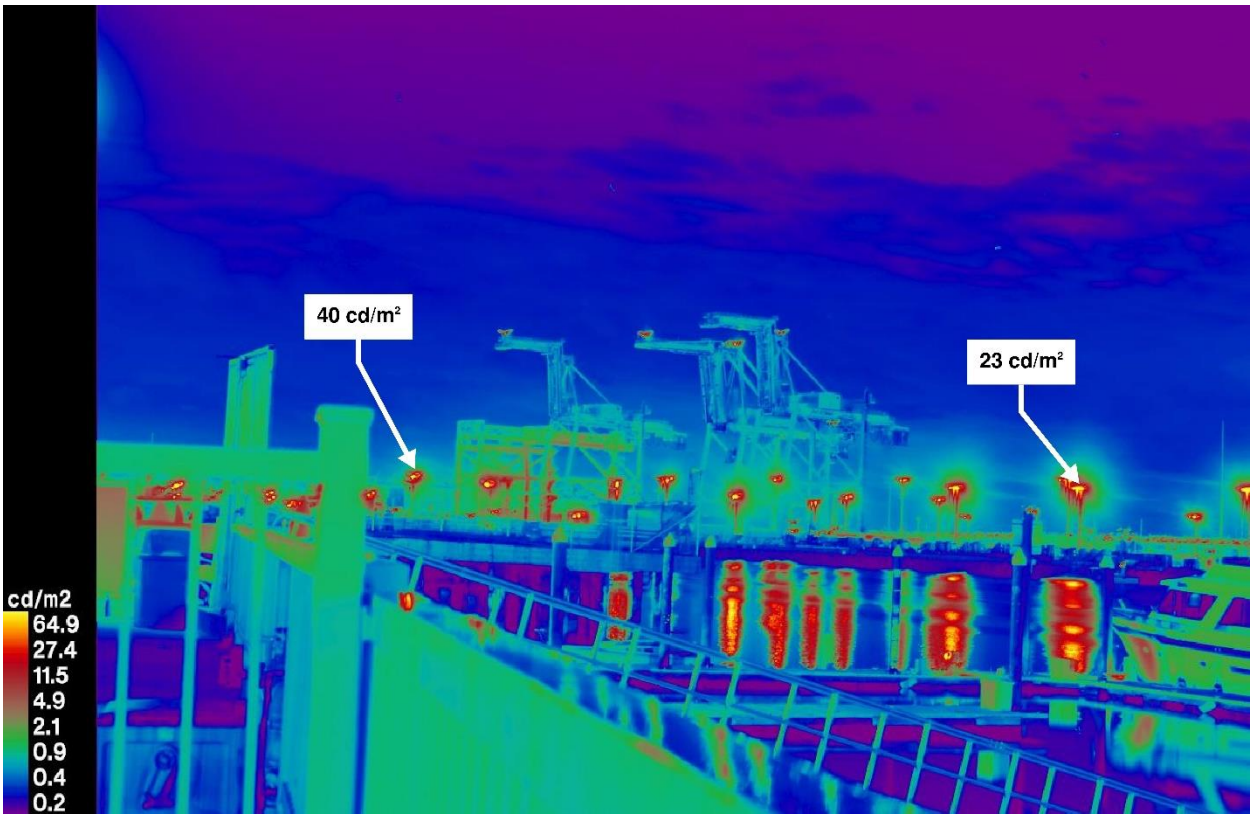
Receptor Site 2A - Turning Basin Line-of-Sight

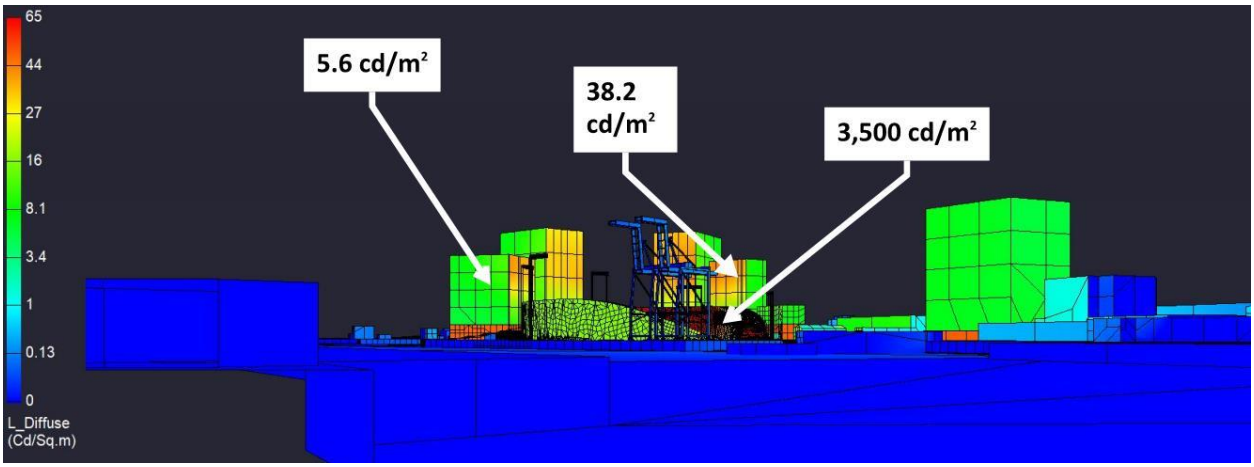




MRA Project, Reduced Ballpark Height “Phase 1” Scenario Game Nights

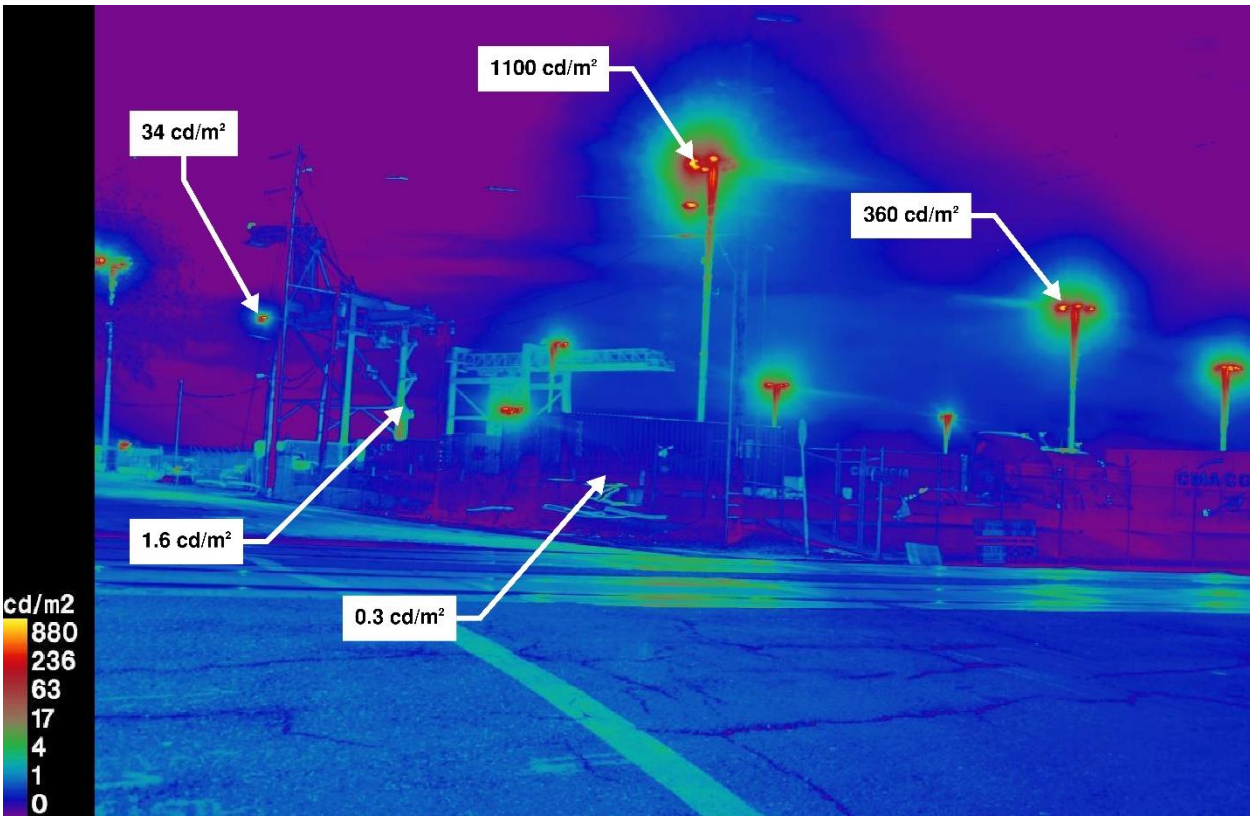
Receptor Site 3 - Alameda Dock

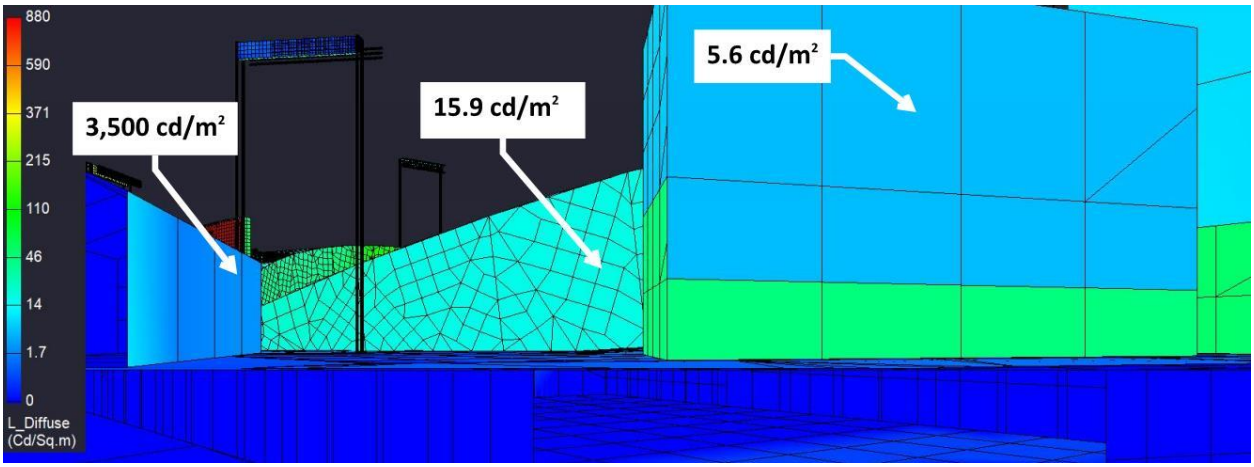




MRA Project, Reduced Ballpark Height “Phase 1” Scenario Game Nights

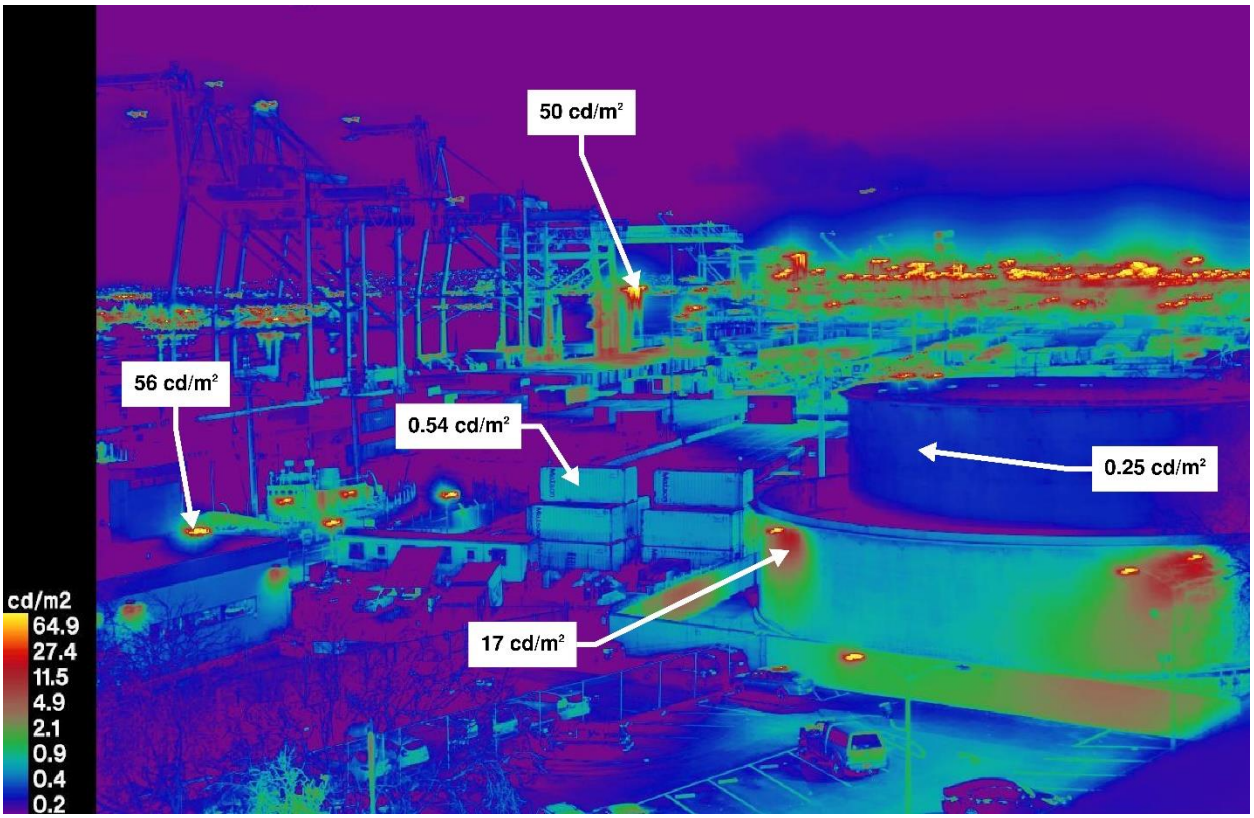
Receptor Site 4 - MLK at Embarcadero

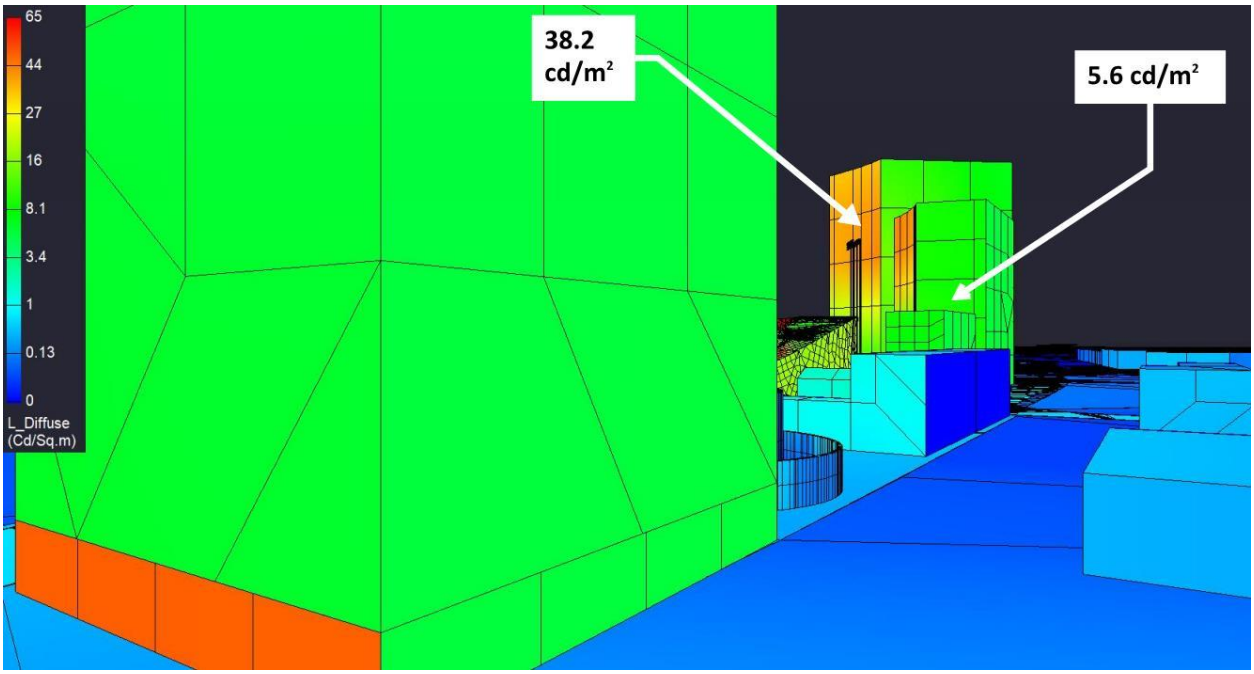




MRA Project, Reduced Ballpark Height “Phase 1” Scenario Game Nights

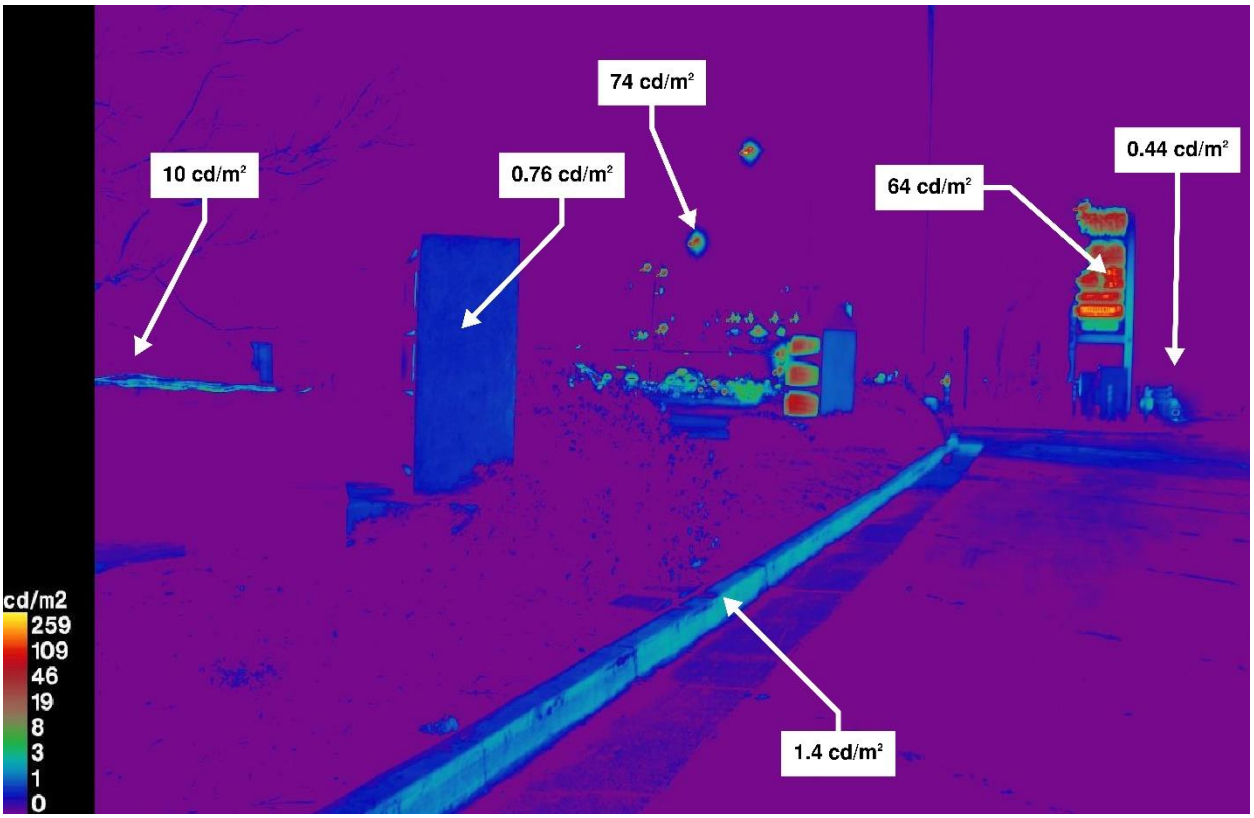
Receptor Site 5A - 2nd at Washington (Facing Stadium)

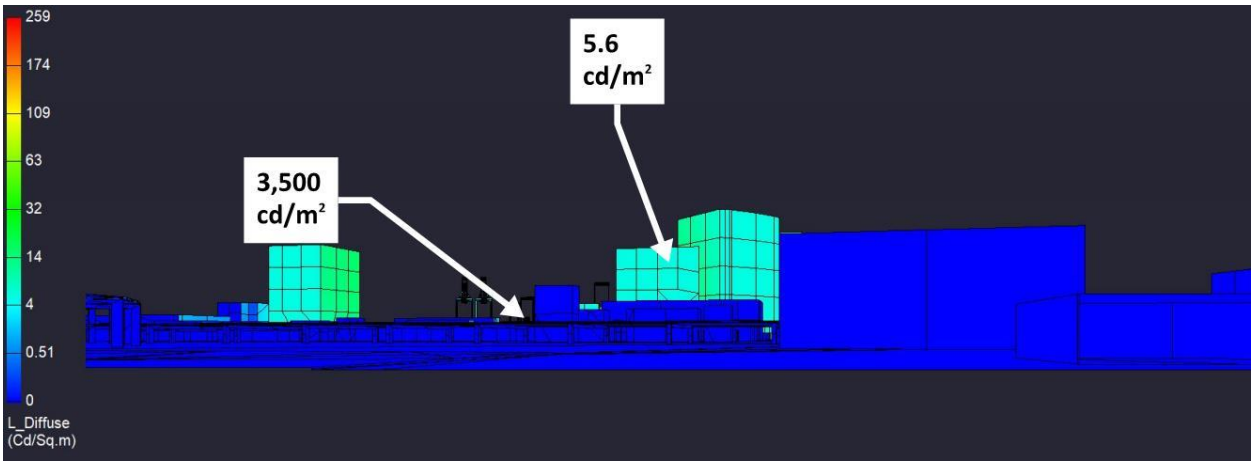




MRA Project, Reduced Ballpark Height “Phase 1” Scenario Game Nights

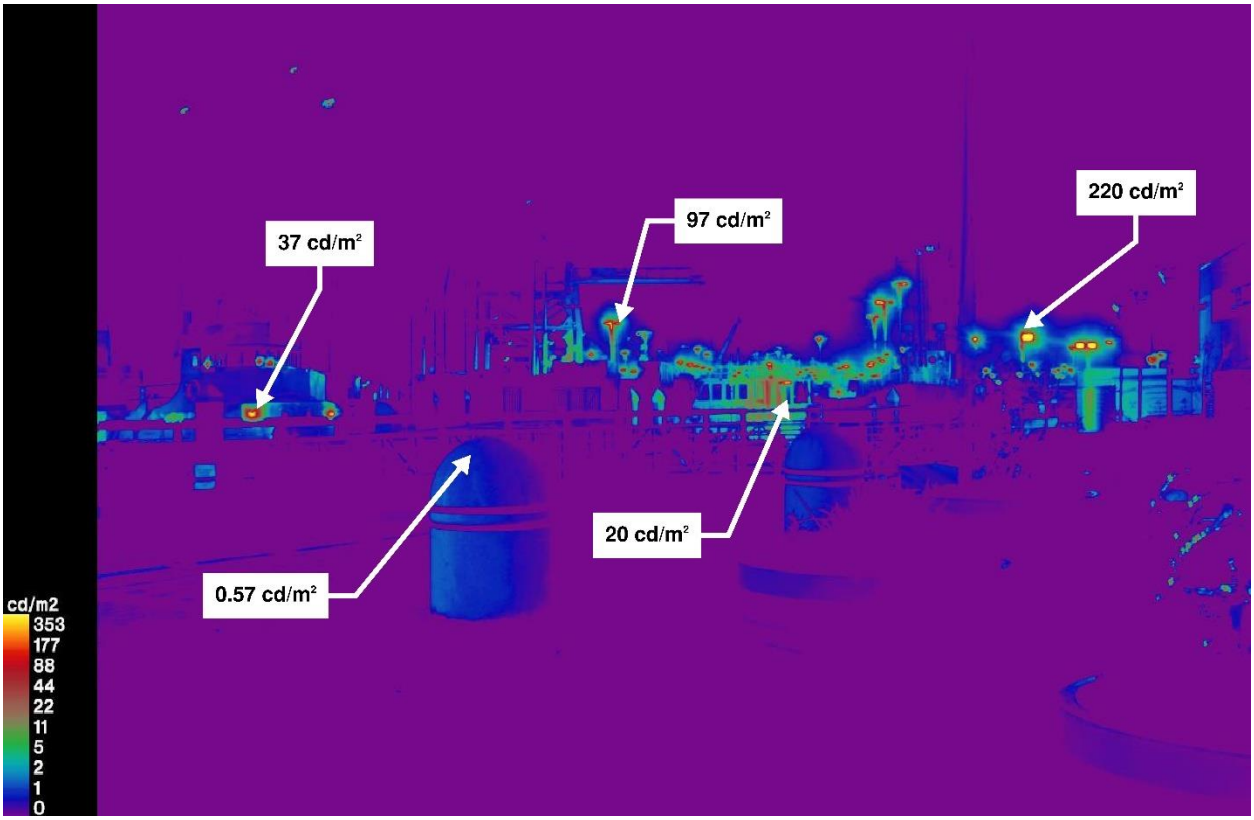
Receptor Site 6A - 7th at Brush

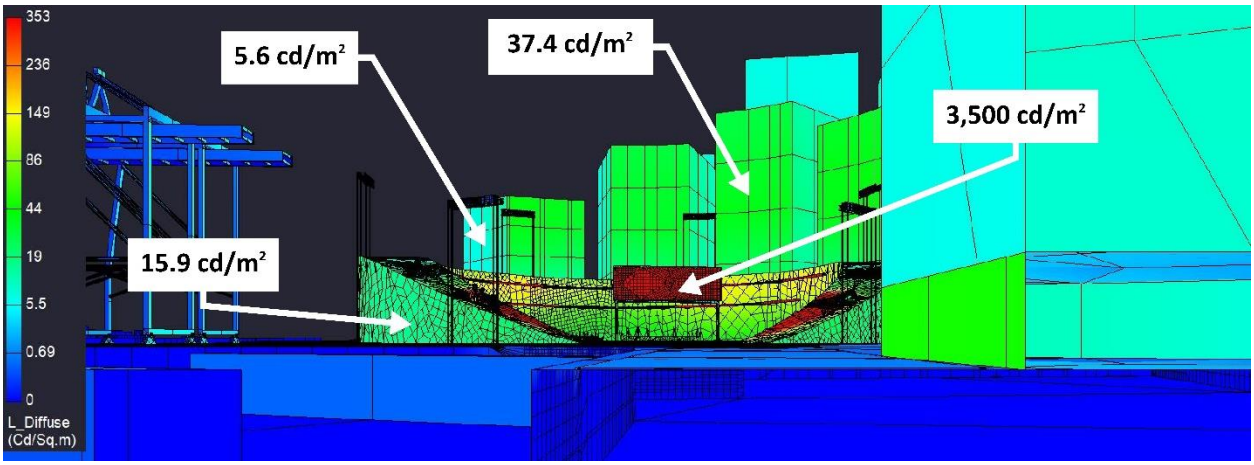




MRA Project, Reduced Ballpark Height “Full Buildout” Scenario Game Nights

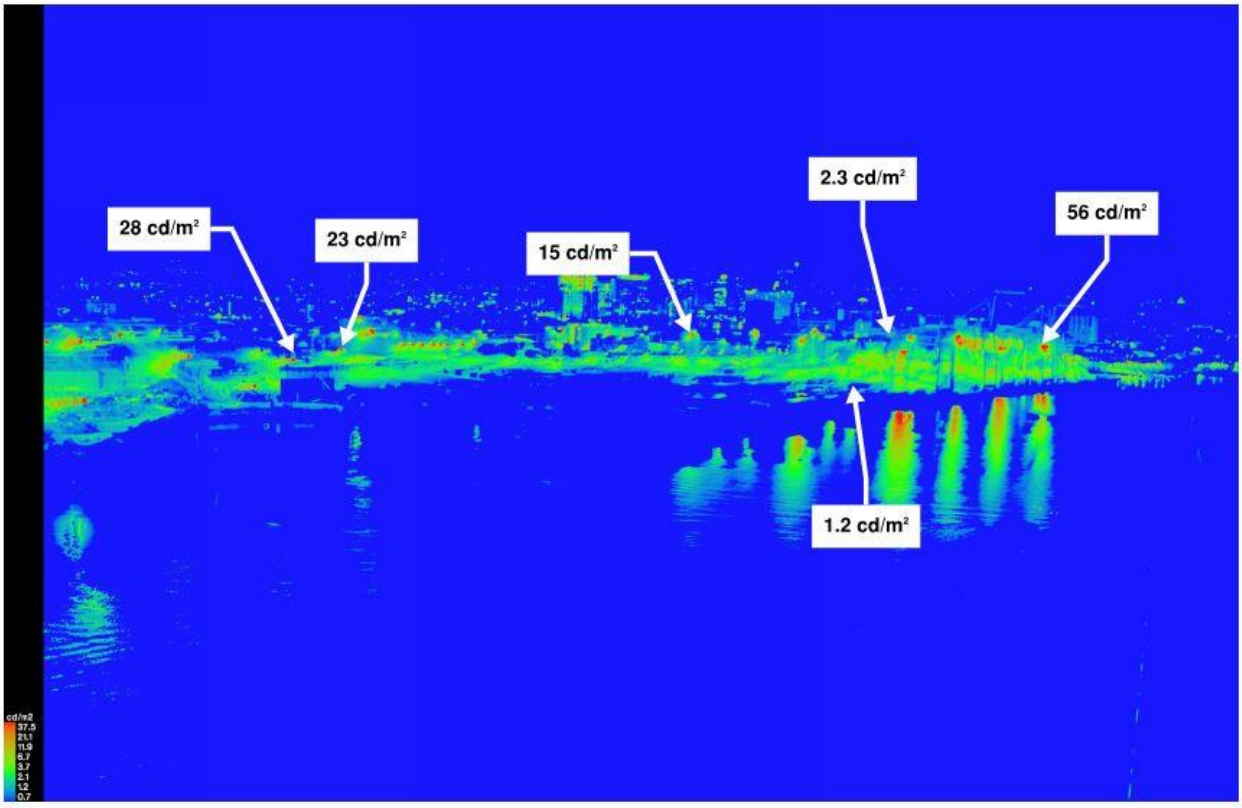
Receptor Site 1 - Water Street at Clay (Facing Ballpark)

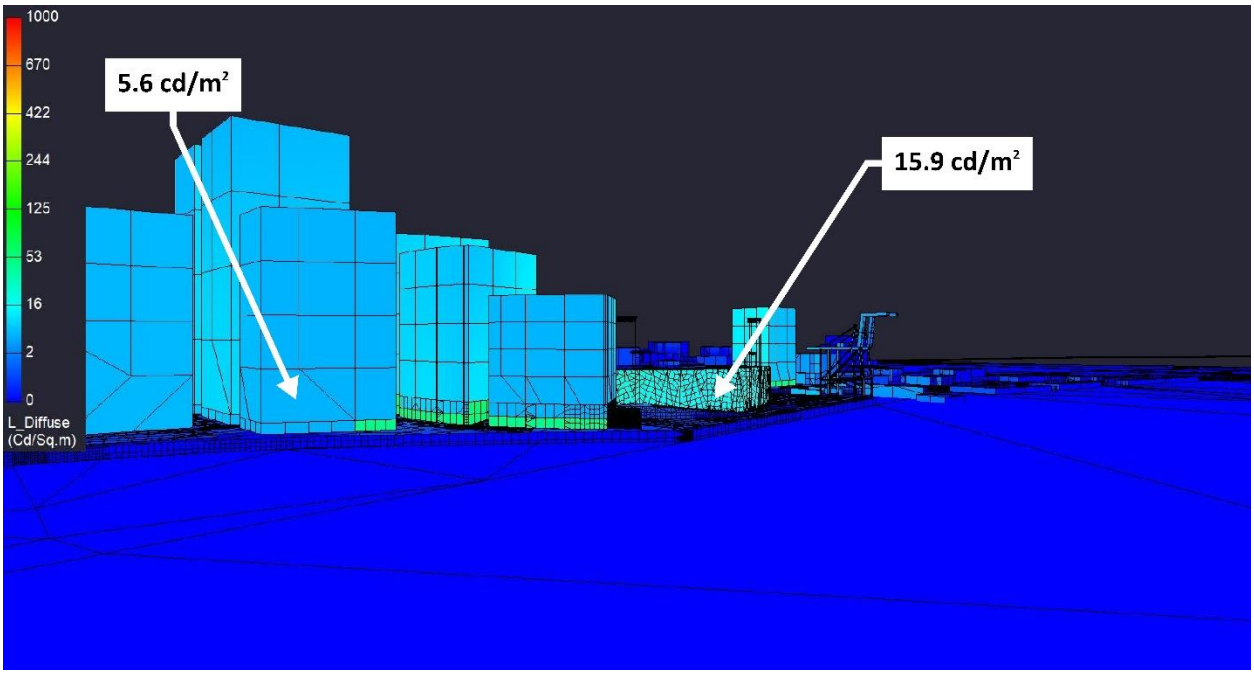




MRA Project, Reduced Ballpark Height “Full Buildout” Scenario Game Nights

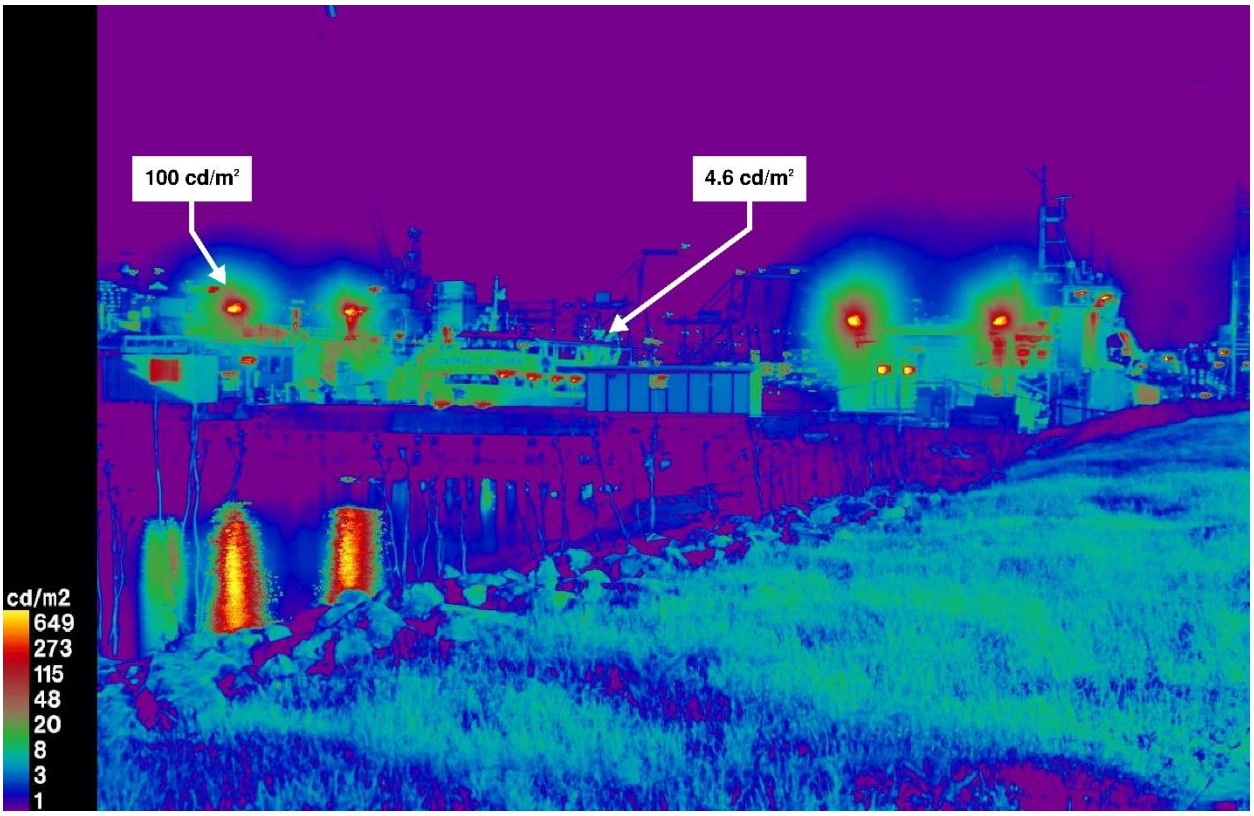
Receptor Site 2 - Inner Harbor Turning Basin @ 190'

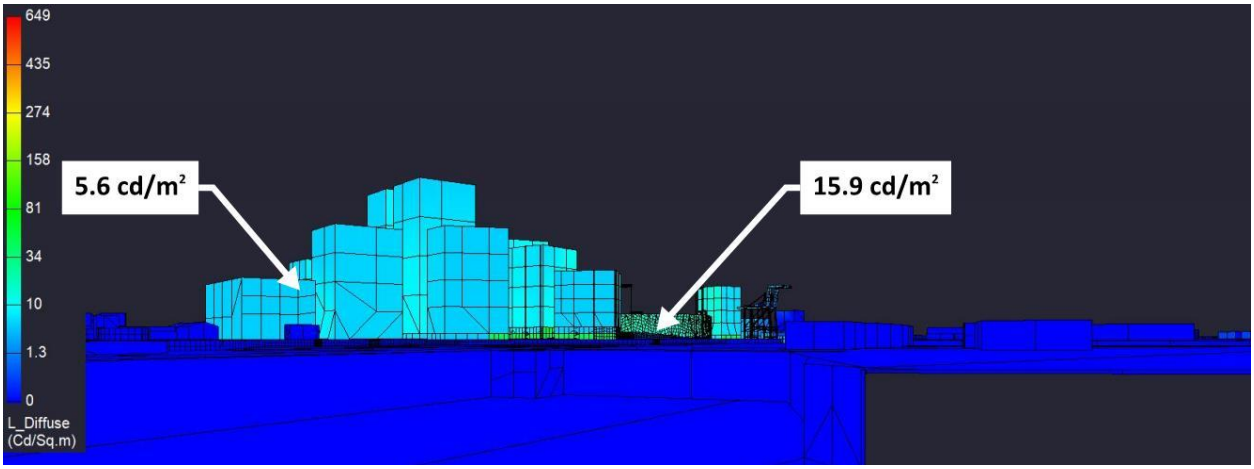




MRA Project, Reduced Ballpark Height “Full Buildout” Scenario Game Nights

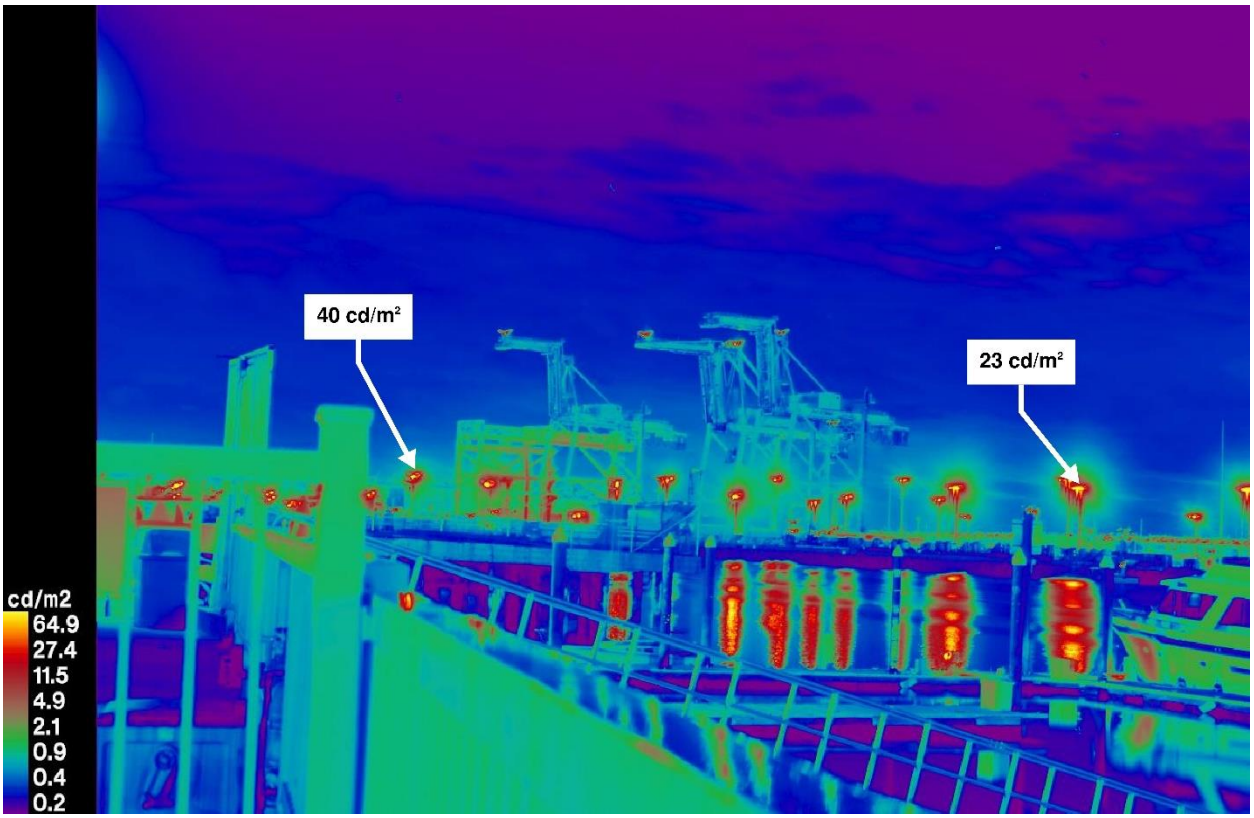
Receptor Site 2A - Turning Basin Line-of-Sight

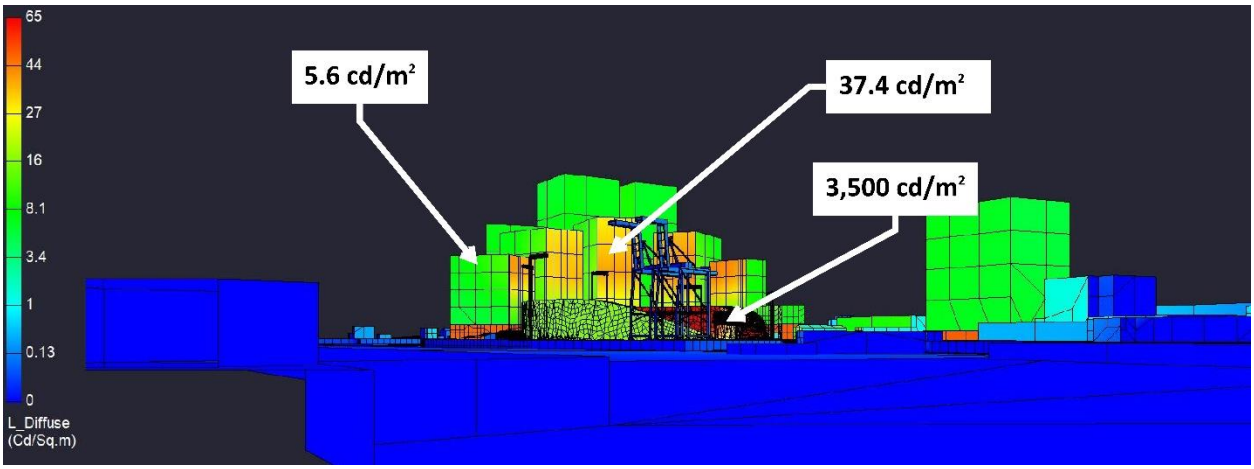




MRA Project, Reduced Ballpark Height “Full Buildout” Scenario Game Nights

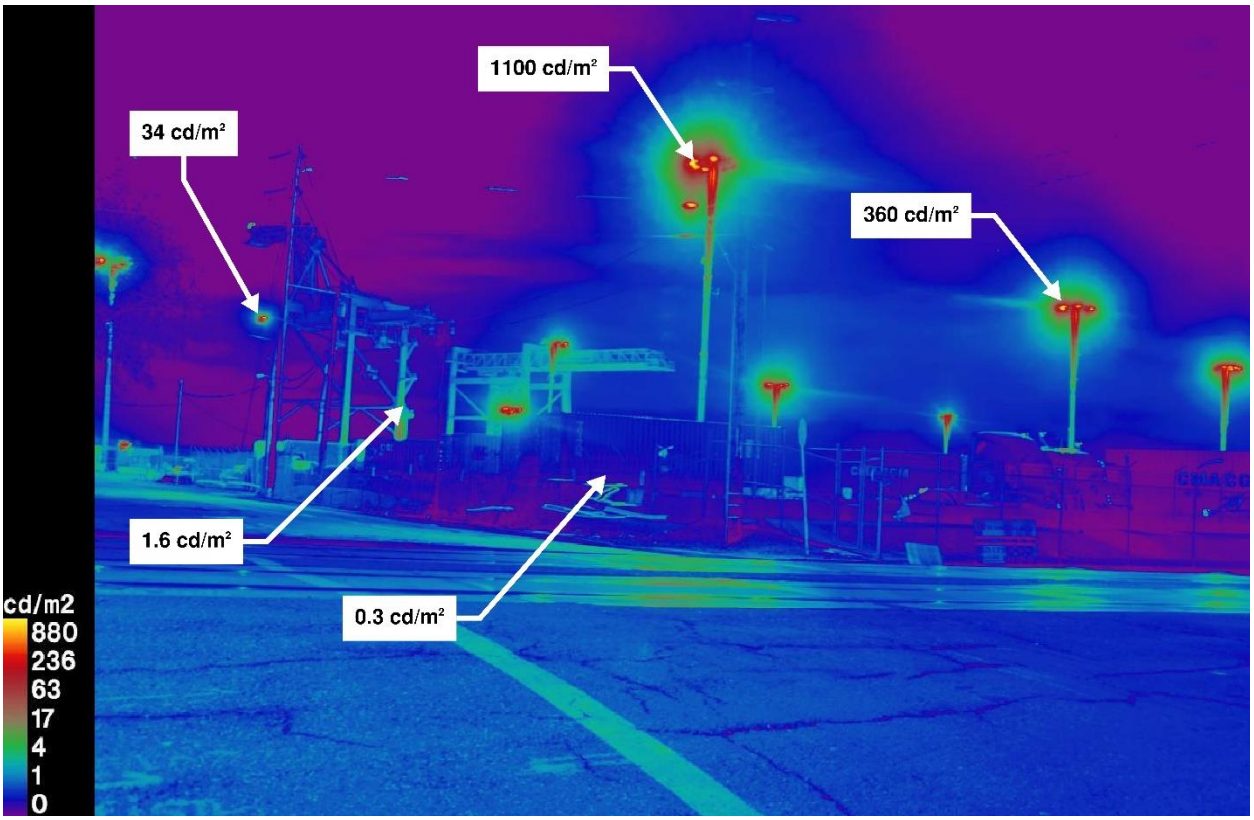
Receptor Site 3 - Alameda Dock

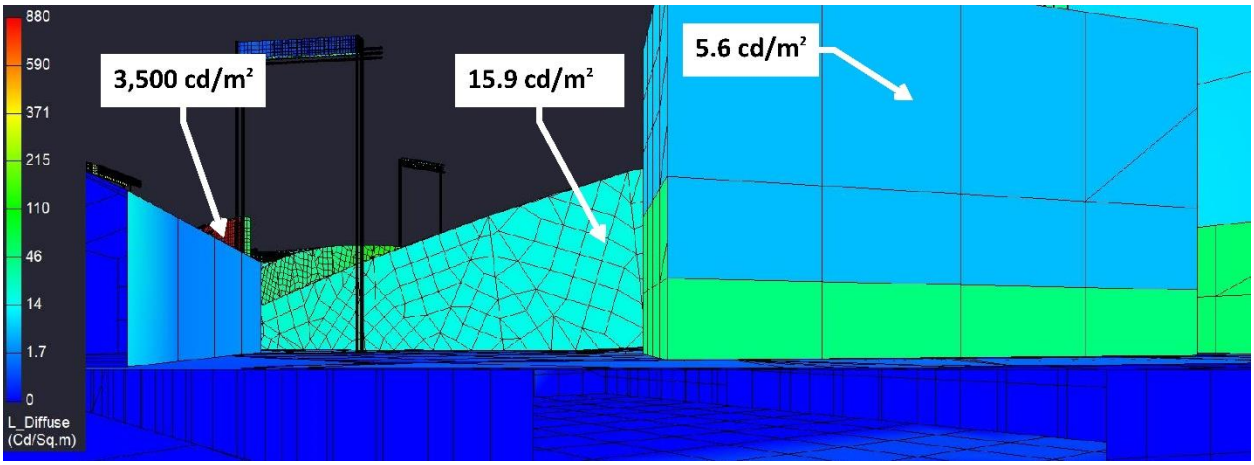




MRA Project, Reduced Ballpark Height “Full Buildout” Scenario Game Nights

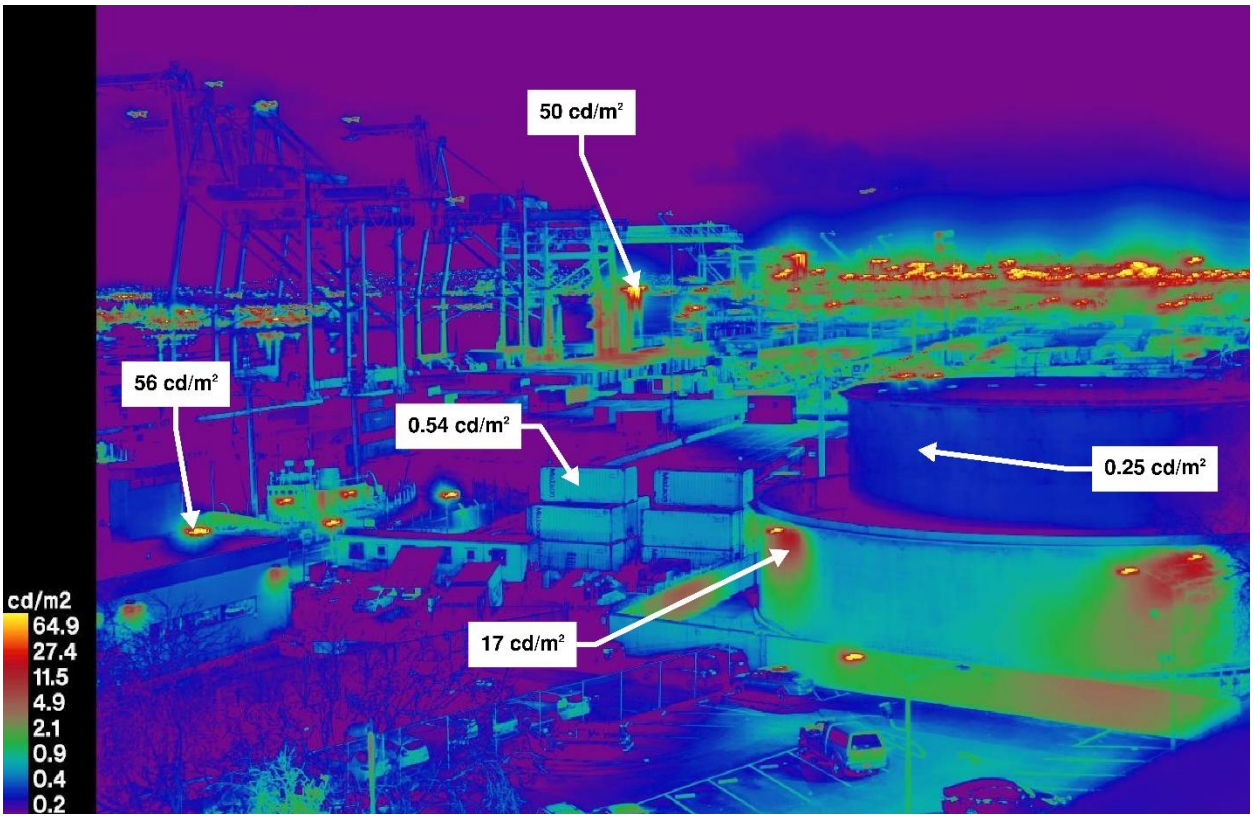
Receptor Site 4 - MLK at Embarcadero

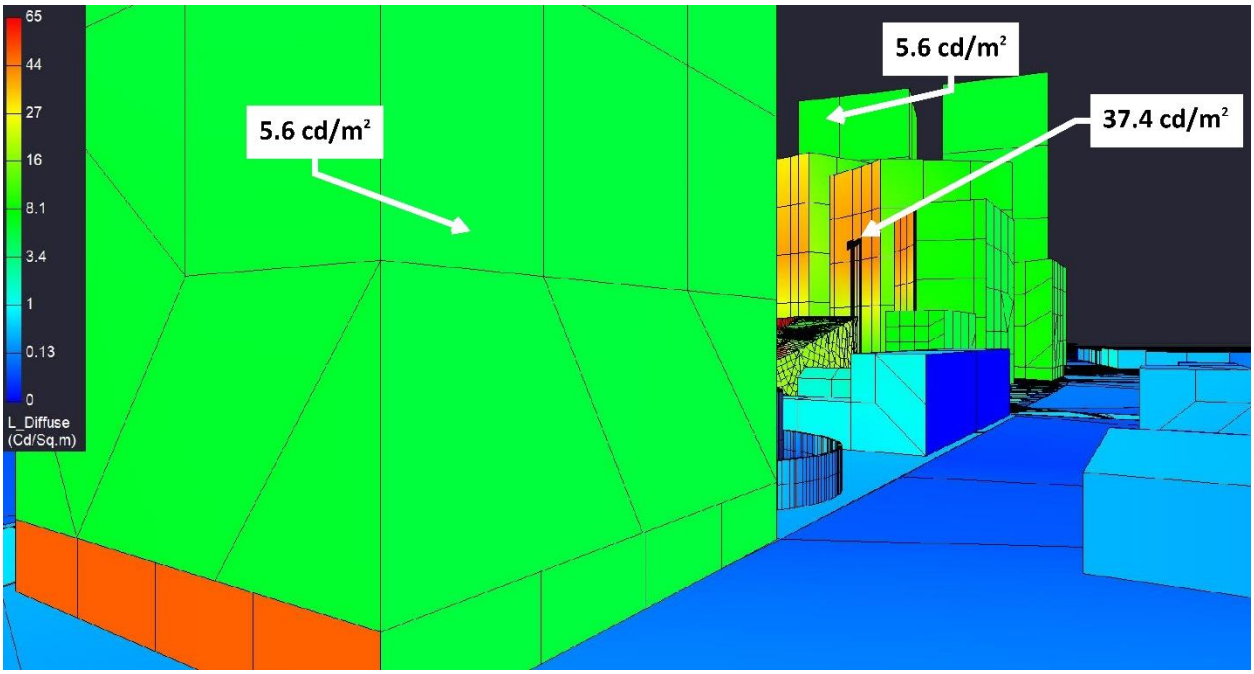




MRA Project, Reduced Ballpark Height “Full Buildout” Scenario Game Nights

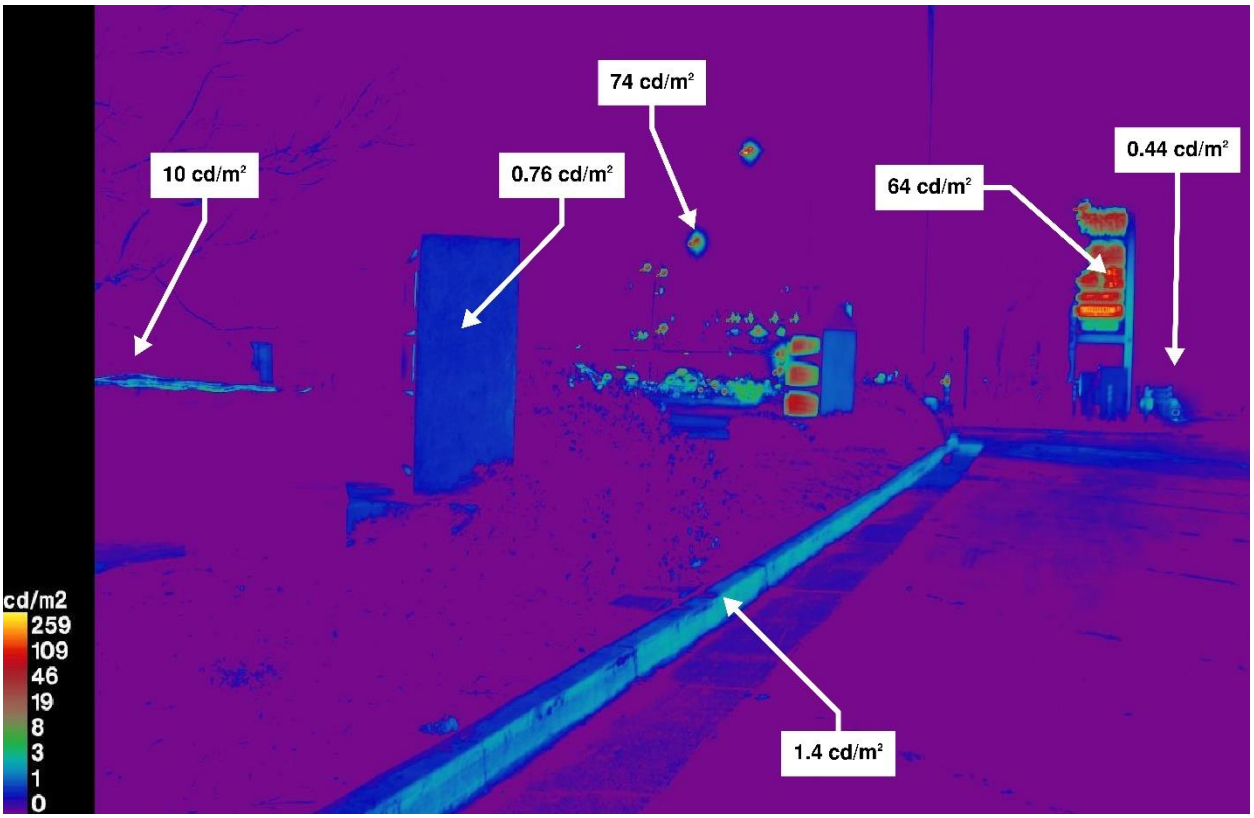
Receptor Site 5A - 2nd at Washington (Facing Stadium)

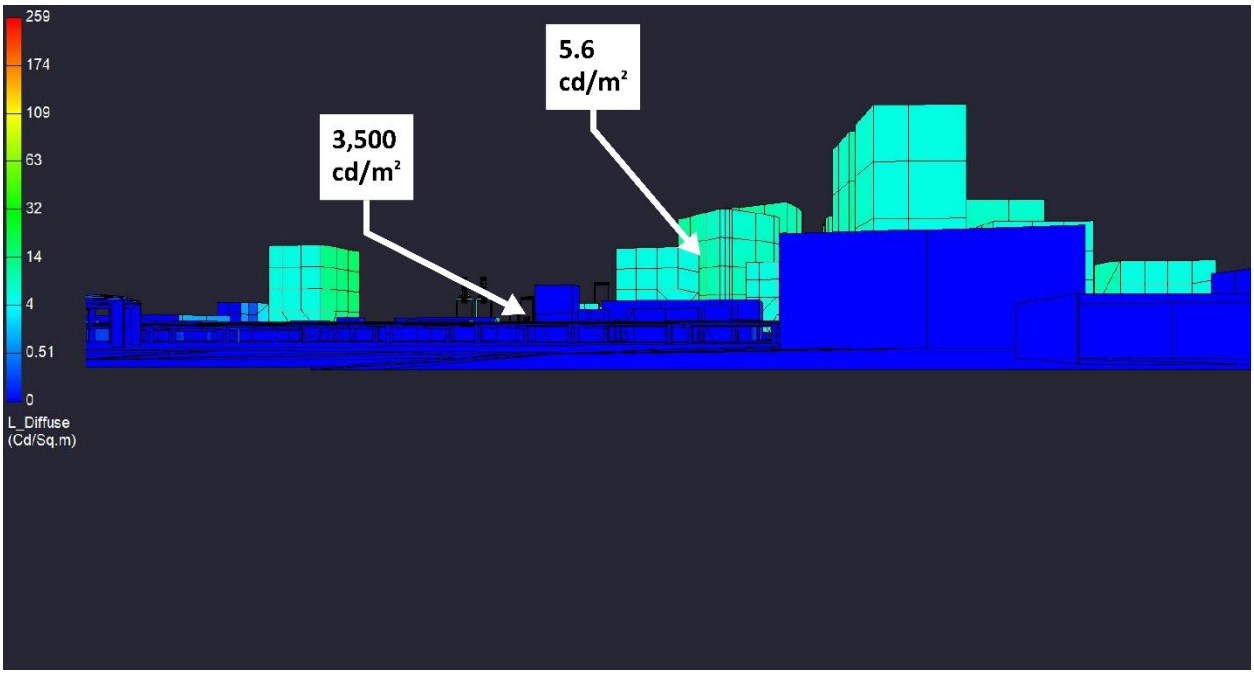




MRA Project, Reduced Ballpark Height “Full Buildout” Scenario Game Nights

Receptor Site 6A - 7th at Brush





AES.2 Pedestrian Wind Study

REPORT

OAKLAND ATHLETICS' NEW BALLPARK

OAKLAND, CA

PEDESTRIAN WIND STUDY
RWDI # 1900310
October 21, 2020

SUBMITTED TO

Noah Rosen
Project Manager
nrosen@athletics.com

Oakland Athletics
Oakland-Alameda County Coliseum
7000 Coliseum Way
Oakland, CA. 94621
T: 510.638.4900

SUBMITTED BY

Kevin Bauman, P.Eng.
Project Engineer
Kevin.Bauman@rwdi.com

Raisa Lalui, M.Eng.
Project Manager
Raisa.lalui@rwdi.com

Dan Bacon
Senior Project Manager / Principal
Dan.Bacon@rwdi.com

RWDI
600 Southgate Drive
Guelph, Ontario, N1G 4P6
T: 519.823.1311
F: 519.823.1316

CANADA'S BEST MANAGED COMPANIES Platinum member

This document is intended for the sole use of the party to whom it is addressed and may contain information that is privileged and/or confidential. If you have received this in error, please notify us immediately. Accessible document formats provided upon request.
® RWDI name and logo are registered trademarks in Canada and the United States of America

EXECUTIVE SUMMARY

RWDI was retained to conduct a pedestrian wind assessment for the Oakland Athletics' proposed new ballpark and mixed-use project along the Oakland Estuary waterfront in Oakland, CA (Image 1). Based on wind-tunnel testing for the existing site and the proposed development under the five (5) configuration options (Images 2A through 2F), and the local wind records (Image 3), the potential wind hazard and comfort conditions are predicted as shown on site plans in **Figures 1A through 2F** respectively, while the associated wind speeds are listed in **Tables 1 and 2**.

These results can be summarized as follows:

GRADE LEVEL (Locations 1 through 169)

Configurations		WIND COMFORT			WIND HAZARD		
		Average Speed	Average (%)	Total Exceedances	Average Speed	Total Hours	Total Exceedances
A	Existing	12 mph	17%	122 / 149	27 mph	0	0 / 149
B	Stadium + Phase 1	13 mph	17%	109 / 169	31 mph	151	46 / 169
C	Maritime	13 mph	18%	104 / 167	33 mph	131	54 / 167
D	Full Buildout	13 mph	18%	105 / 167	32 mph	103	48 / 167
E	Variants	13 mph	18%	107 / 167	33 mph	116	53 / 167
F	Cumulative (Full Buildout)*	13 mph	18%	101 / 167	32 mph	109	48 / 167

STADIUM ROOF (Locations 170 through 179)

Configurations		WIND COMFORT			WIND HAZARD		
		Average Speed	Average (%)	Total Exceedances	Average Speed	Total Hours	Total Exceedances
A	Existing	-	-	-	-	-	-
B	Stadium + Phase 1	8 mph	3%	0 / 15	25 mph	0	0 / 15
C	Maritime	8 mph	3%	0 / 15	23 mph	0	0 / 15
D	Full Buildout	7 mph	2%	0 / 15	22 mph	0	0 / 15
E	Variants	7 mph	2%	0 / 15	22 mph	0	0 / 15
F	Cumulative (Full Buildout)*	7 mph	2%	0 / 15	23 mph	0	0 / 15

* Maritime Cumulative (Full Buildout) conditions discussed in Section 3.1.6 in the body of the report.

TABLE OF CONTENTS

EXECUTIVE SUMMARY

1 INTRODUCTION 1

1.1 Project Description 1

1.2 Objectives 1

2 BACKGROUND AND APPROACH 2

2.1 Wind Tunnel Study Model 2

2.2 Meteorological Data 9

2.3 Planning Code Requirements 10

3 RESULTS AND DISCUSSION 10

3.1 Grade Level 11

3.1.1 Existing 11

3.1.2 Existing + Stadium + Phase 1 11

3.1.3 Existing + Stadium + Phase 1 + Maritime 11

3.1.4 Existing + Stadium + Phase 1 + Full Buildout 11

3.1.5 Existing + Stadium + Phase 1 + Full Buildout + Variants 12

3.1.6 Existing + Stadium + Phase 1 + Full Buildout + Cumulative 12

3.2 Stadium Roof 12

4 WIND REDUCTION AND DESIGN GUIDELINES 13

5 APPLICABILITY OF RESULTS 17

LIST OF FIGURES

Figure 1A: Wind Hazard Conditions – Existing
Figure 1B: Wind Hazard Conditions – Existing + Stadium + Phase 1
Figure 1C: Wind Hazard Conditions – Existing + Stadium + Phase 1 + Maritime Reservation Scenario
Figure 1D: Wind Hazard Conditions – Existing + Stadium + Phase 1 + Full Buildout
Figure 1E: Wind Hazard Conditions – Existing + Stadium + Phase 1 + Full Buildout + Variants
Figure 1F: Wind Hazard Conditions – Existing + Stadium + Phase 1 + Full Buildout + Cumulative

Figure 2A: Wind Comfort Conditions – Existing
Figure 2B: Wind Comfort Conditions – Existing + Stadium + Phase 1
Figure 2C: Wind Comfort Conditions – Existing + Stadium + Phase 1 + Maritime Reservation Scenario
Figure 2D: Wind Comfort Conditions – Existing + Stadium + Phase 1 + Full Buildout
Figure 2E: Wind Comfort Conditions – Existing + Stadium + Phase 1 + Full Buildout + Variants
Figure 2F: Wind Comfort Conditions – Existing + Stadium + Phase 1 + Full Buildout + Cumulative

LIST OF TABLES

Table 1: Pedestrian Wind Comfort and Hazard Conditions – Grade Level
Table 2: Pedestrian Wind Comfort and Hazard Conditions – Stadium Roof

1 INTRODUCTION

RWDI was retained to conduct a pedestrian wind assessment for the Oakland Athletics' proposed new ballpark and mixed-use project along the Oakland Estuary waterfront in Oakland, CA (**Image 1**). This report presents the project objectives, background and approach, and the results from RWDI's assessment.

1.1 Project Description

It is our understanding that the project is adjacent to the Inner Harbor and includes the construction of both the ballpark at approximately 120 feet in height and several residential and office towers ranging from 100 to 600 feet in height.

1.2 Objectives

The objective of the study was to assess the effect of the proposed development on local conditions in pedestrian areas on and around the study site and provide recommendations for minimizing adverse effects, if needed. This quantitative assessment was based on wind speed measurements on a scale model of the project and its surroundings in one of RWDI's boundary-layer wind tunnels. These measurements were combined with the local wind records and compared to appropriate criteria for gauging wind comfort and safety in pedestrian areas on the project site.

Image 1: Aerial View of Site and Surroundings (Photo Courtesy of Google™ Earth)

2 BACKGROUND AND APPROACH

2.1 Wind Tunnel Study Model

To assess the wind environment around the proposed project, a 1" = 25' (1:300) scale model of the project site and surroundings was constructed for the wind tunnel test with the following configurations tested:

	Configuration Name & Description
A	**Existing** Existing project site with existing surroundings (Image 2A)
B	**Existing + Stadium + Phase 1** Configuration A with proposed stadium and "Phase 1" developments (Image 2B)
C	**Existing + Stadium + Phase 1 + Maritime Reservation Scenario** Configuration B with proposed "Maritime Reservation Scenario" developments (Image 2C)
D	**Existing + Stadium + Phase 1 + Full Buildout** Configuration B with proposed "Full Buildout" developments (Image 2D)
E	**Existing + Stadium + Phase 1 + Full Buildout + Variants** Configuration D with proposed "Variant" buildings (Image 2E)
F	**Existing + Stadium + Phase 1 + Full Buildout + Cumulative** Configuration D with proposed cumulative developments (Image 2F)

The wind tunnel model included all relevant surrounding buildings and topography within an approximately 1500 ft radius of the study site. The wind and turbulence profiles in the atmospheric boundary layer beyond the modelled area were also simulated in RWDI's wind tunnel. The wind tunnel model was instrumented with 184 specially designed wind speed sensors (169 at grade level 15 on the stadium roof) to measure mean and gust speeds at a full-scale height of approximately 5 ft above local grade in pedestrian areas throughout the study site. Wind speeds were measured for 36 directions in a 10-degree increment. The measurements at each sensor location were recorded in the form of ratios of local mean and gust speeds to the mean wind speed at a reference height above the model. The placement of wind measurement locations was based on our experience and understanding of the pedestrian usage for this site and reviewed by Oakland Athletics and ESA.

Image 2A: Wind Tunnel Study Model - Existing

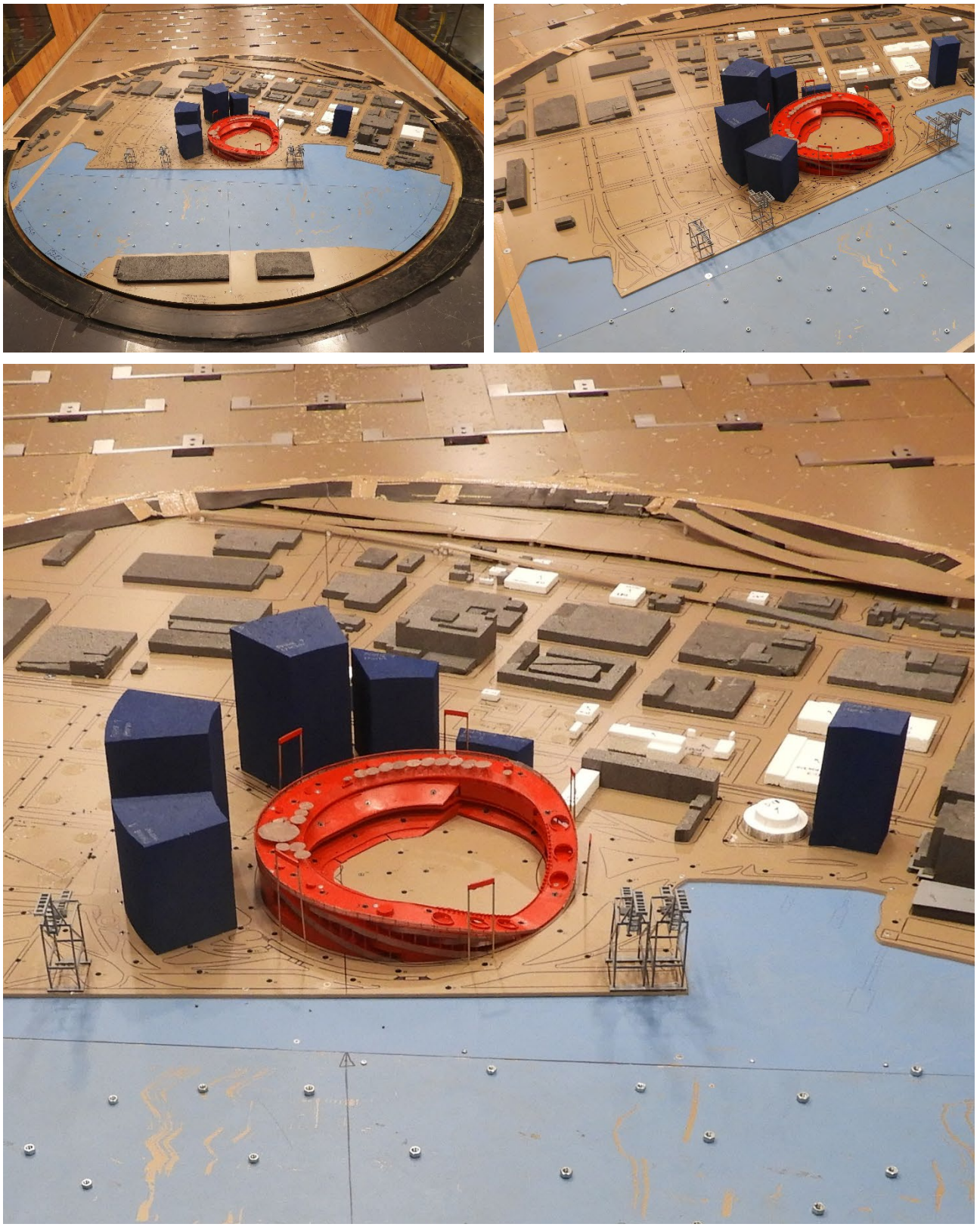
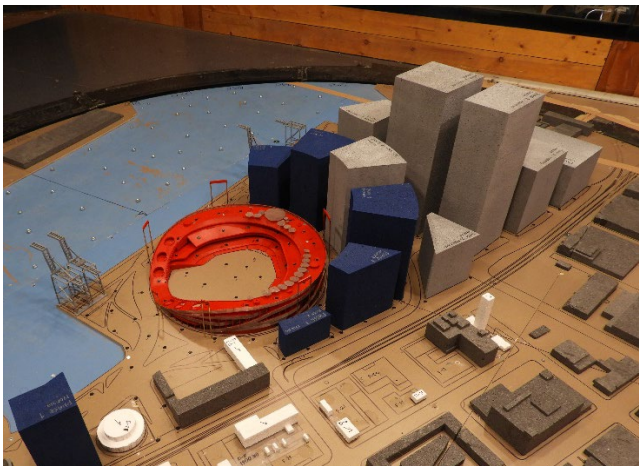


Image 2B: Wind Tunnel Study Model - Existing + Stadium + Phase 1



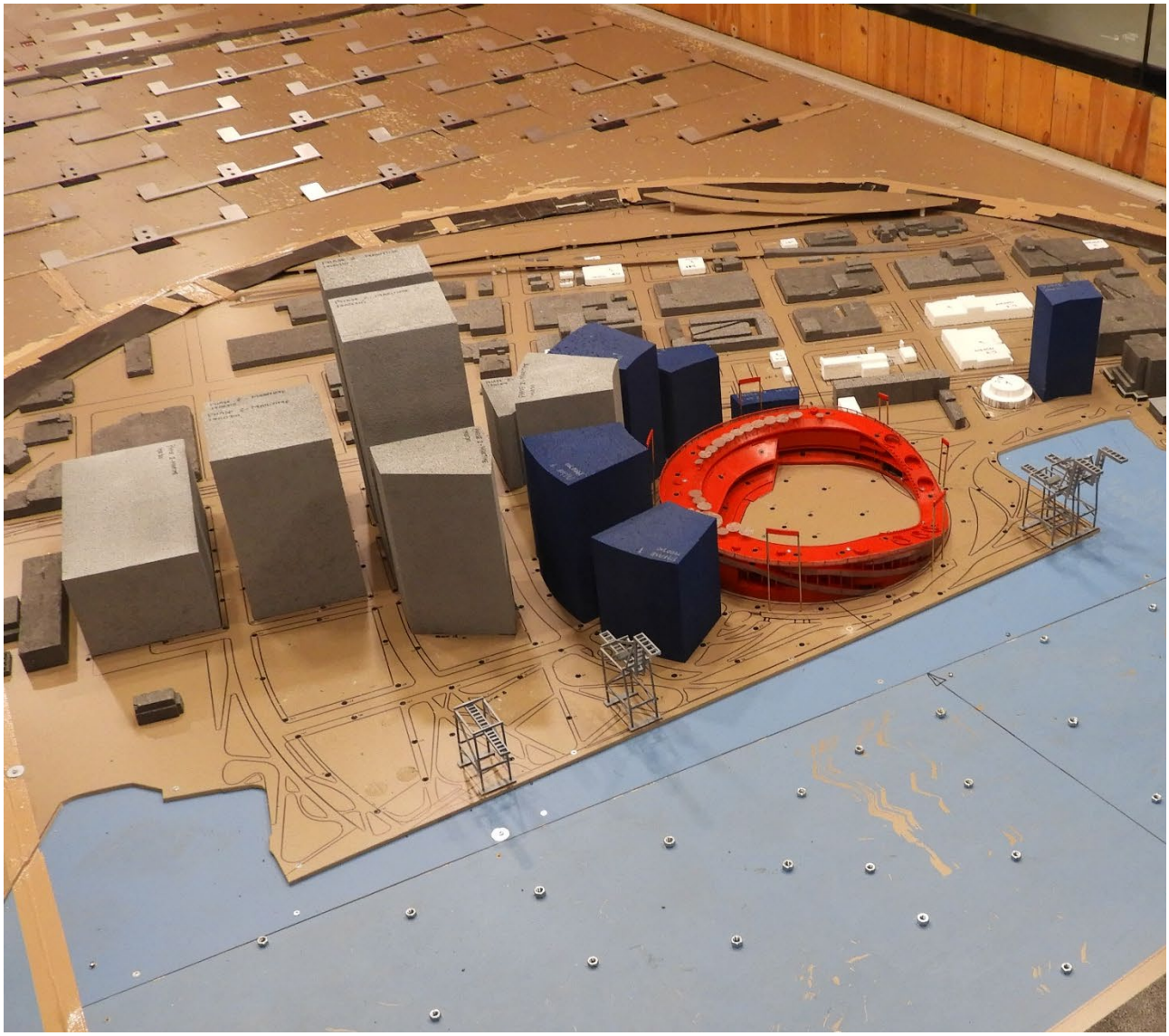


Image 2C: Wind Tunnel Study Model - Existing + Stadium + Phase 1 + Maritime Reservation Scenario

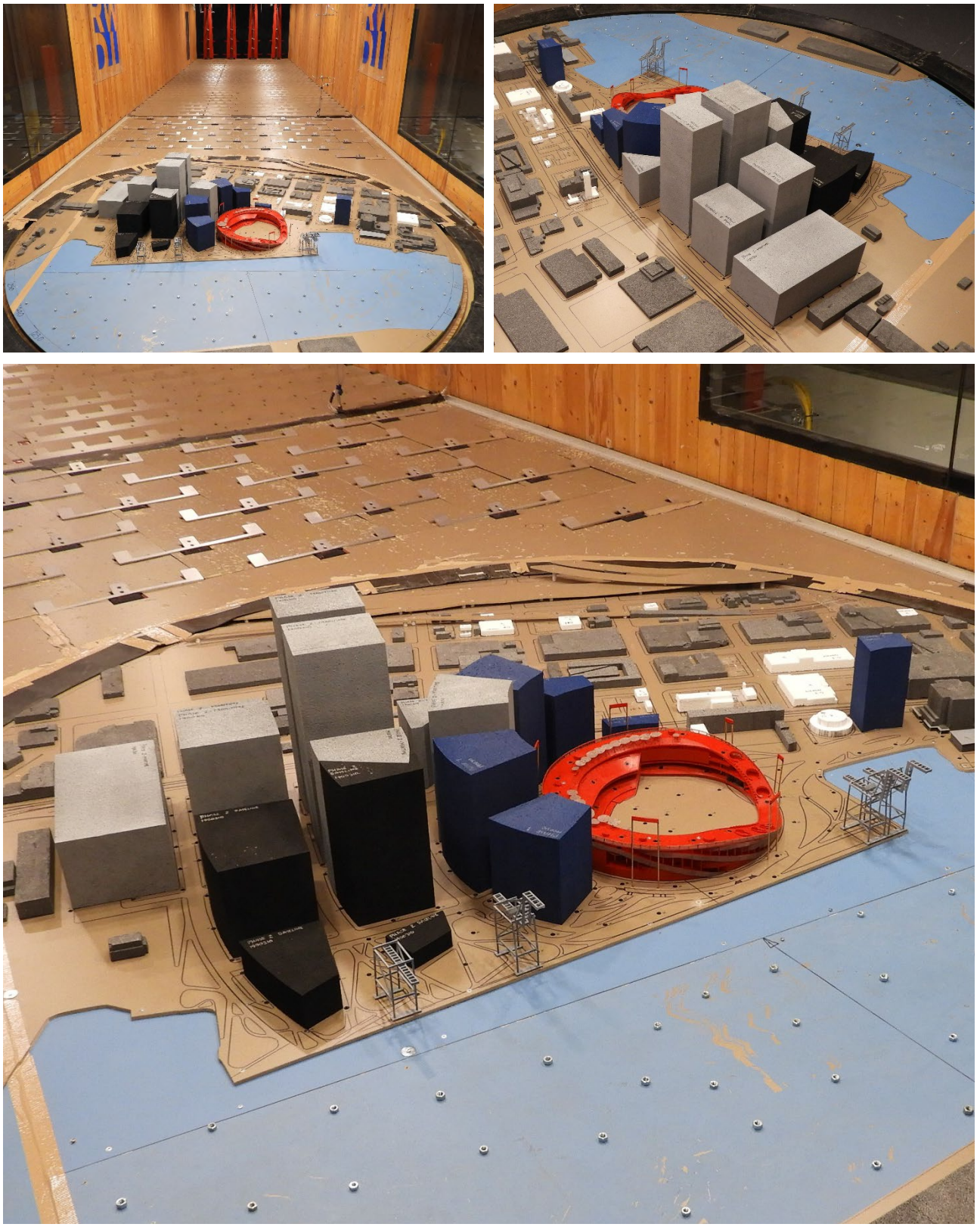


Image 2D: Wind Tunnel Study Model - Existing + Stadium + Phase 1 + Full Buildout

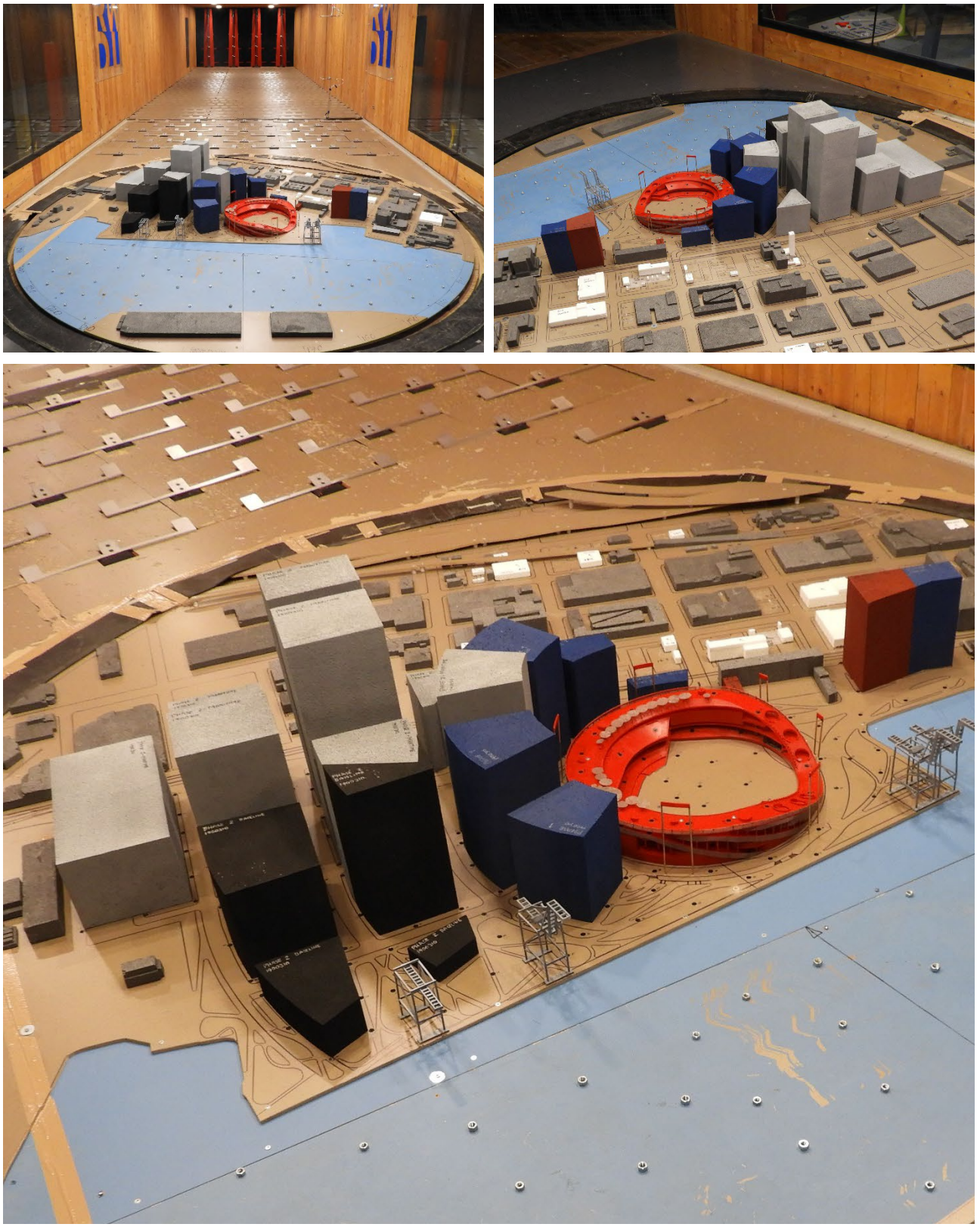


Image 2E: Wind Tunnel Study Model - Existing + Stadium + Phase 1 + Variants

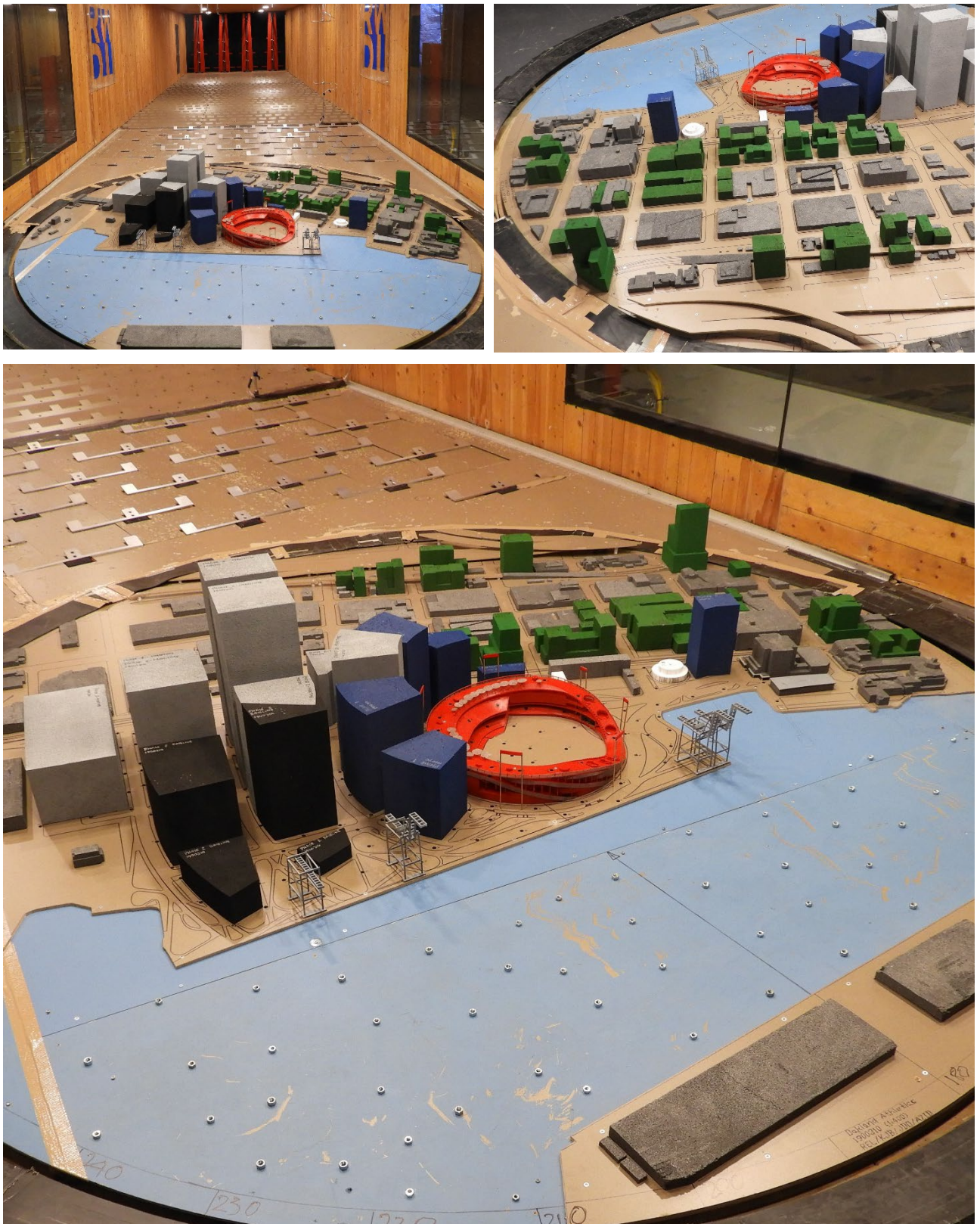
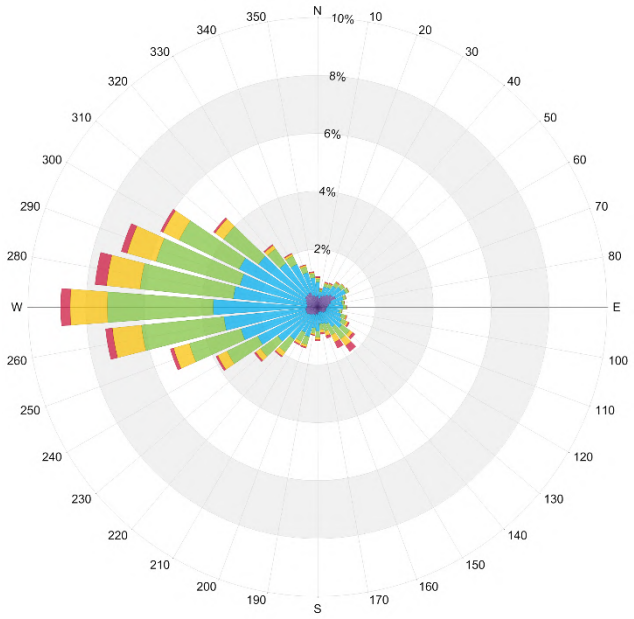


Image 2F: Wind Tunnel Study Model - Existing + Stadium + Phase 1 + Full Buildout + Cumulative

2.2 Meteorological Data

Wind statistics recorded at Metropolitan Oakland International Airport between 1987 and 2017 were analyzed for annual wind conditions. Image 3 graphically depicts the directional distributions of annual wind frequencies and speeds. Winds are frequent from the west-southwest through northwest directions throughout the year, as indicated by the wind rose. Strong winds of a mean speed greater than 15 mph measured at the airport (at an anemometer height of 33 feet) occur 11.5% of the time annually.

Wind statistics from Metropolitan Oakland International Airport were combined with the wind tunnel data to predict the frequency of occurrence of full-scale wind speeds. The full-scale wind predictions were then compared with the City of Oakland Significant Wind Impact Criterion.



Wind Speed (mph)	Probability (%)
Calm	11.6
1-5	13.5
6-10	36.9
11-15	26.4
16-20	8.7
>20	2.8

Image 3: Directional Distribution of Winds Approaching Metropolitan Oakland International Airport from 1987 to 2017

2.3 Planning Code Requirements

A wind analysis needs to be done if the height of the project is 100 feet or greater (measured to the roof) and one of the following conditions exists: (a) the project is located adjacent to a substantial water body (i.e. Oakland Estuary, Lake Merritt or San Francisco Bay); or (b) the project is located Downtown. Since the proposed project (approximately 430 feet tall) exceeds 100 feet in height and is located Downtown, it is subject to the thresholds of significance.

For the purposes of this study, the City of Oakland considers a significant wind impact to occur if a project were to "Create winds exceeding 36 mph for more than one hour during daylight hours during the year". The Planning Code defines these wind speeds in terms of equivalent wind speeds, and average wind speed (mean velocity), adjusted to include the level of gustiness and turbulence. Equivalent wind speeds were calculated according to the specifications in the City of Oakland Significant Wind Impact Criterion, whereby the mean hourly wind speed is increased when the turbulence intensity is greater than 15% according to the following formula:

$$\boldsymbol{EWS} = \boldsymbol{V_m} \times (\mathbf{2} \times \boldsymbol{TI} + \mathbf{0.7})$$

where $\boldsymbol{EWS}$ = equivalent wind speed

$\boldsymbol{V_m}$ = mean pedestrian-level wind speed

$\boldsymbol{TI}$ = turbulence intensity

Pedestrian Comfort

Although not applicable towards Significant Wind Impacts as defined by the City of Oakland, wind comfort speeds have been calculated for informational purposes. The comfort criteria are that wind speeds do not exceed 11 mph for more than 10% of the time during the year, when calculated for daylight hours, in substantial pedestrian use areas. A lower wind speed threshold of 7 mph may be considered for public seating areas where calmer wind conditions are ideal.

3 RESULTS AND DISCUSSION

This section presents the results of the wind tunnel measurements analyzed in terms of equivalent wind speeds as defined by the equation in Section 2.3. The text in the report simply refers to the data as wind speeds. The wind hazard and comfort results for the configurations tested are depicted on a site plan in Figures 1A through 1F and Figures 2A through 2F, respectively for hazard and comfort, where locations have been color-coded according to the hazard criteria of 36mph, and the 7-mph and 11-mph comfort categories explained in the Planning Code. This same data is also numerically depicted in Table 1 for grade level locations and Table 2 for the stadium roof locations.

For the comfort conditions at each measurement point, the measured 10% exceeded (90th percentile) equivalent wind speed and the percentage of time that the wind speed exceeds 11 mph are listed. The point is marked as a comfort exceedance if the 11-mph threshold is exceeded. A letter "e" in the last column of each configuration indicates a wind comfort exceedance. Although the analysis of wind comfort conditions is not required by California Environmental Quality Act (CEQA), this section describes the wind comfort conditions on and around the project site and can be used as a reference for further understanding of the wind conditions.

For the hazard conditions at each measurement point, the predicted wind speed to be exceeded one hour per year is listed, as well as the predicted number of hours per year that the 36-mph wind hazard criterion is exceeded. A letter “e” in the last column of each configuration indicates a wind hazard exceedance.

3.1 Grade Level

3.1.1 Existing

For the Existing configuration, the wind hazard criterion is met at all the 149 test locations (Figure 1A) and the average wind speed which is exceeded for 1 hour per year is 27 mph (Table 1 and Figure 1A).

The average 90th percentile wind speed for the 149 test locations is approximately 12 mph. Wind speeds at 122 of 149 grade level test locations exceed the Planning Code's pedestrian-comfort criterion of 11 mph for 17% of the time (Table 1 and Figure 2A).

3.1.2 Existing + Stadium + Phase 1

With the addition of the proposed stadium and “Phase 1” developments, the wind hazard criterion is expected to be exceeded at 46 of the 169 test locations for a total of 151 hours. For all locations, the average wind speed which is exceeded for 1 hour per year is expected to be 31 mph (Table 1 and Figure 1B).

The average 90th percentile wind speed for the 169 grade level test locations with the addition of the stadium and “Phase 1” developments to the existing site is expected to increase to 13 mph with wind speeds at 109 of 169 grade level test locations expected to exceed the Planning Code's pedestrian-comfort criterion of 11 mph for 17% of the time (Table 1 and Figure 2B).

3.1.3 Existing + Stadium + Phase 1 + Maritime

The proposed “Maritime Reservation Scenario” (MRS) developments are expected to provide sheltering to the winds experienced around the project site. The wind hazard criterion is expected to be exceeded at 54 of the 167 test locations for a total of 131 hours. For all locations, the average wind speed which is expected to exceed the wind hazard criterion is expected to be 33 mph (Table 1 and Figure 1C).

The average 90th percentile wind speed for the 167 grade level test locations is expected to be 13 mph with the addition of the “Maritime Reservation Scenario” developments to the west. Wind speeds at 104 of 167 grade level test locations are expected to exceed the Planning Code's pedestrian-comfort criterion of 11 mph for 18% of the time (Table 1 and Figure 2C).

3.1.4 Existing + Stadium + Phase 1 + Full Buildout

The proposed “Full Buildout” developments to the west of the stadium, are expected to provide sheltering to the winds experienced around the project site. The wind hazard criterion is expected to be exceeded at 48 of the 167 test locations with the addition of the “Full Buildout” developments to the west for a total of 103 hours. For all locations, the average wind speed which is expected to exceed the wind hazard criterion is expected to remain at 32 mph (Table 1 and Figure 1D).

The average 90th percentile wind speed for the 167 grade level test locations is expected to increase to 13 mph with the addition of the “Full Buildout” developments to the west. Wind speeds at 105 of 167 grade level test locations are expected to exceed the Planning Code's pedestrian-comfort criterion of 11 mph for 18% of the time (Table 1 and Figure 2D).

3.1.5 Existing + Stadium + Phase 1 + Full Buildout + Variants

The proposed "Variant" developments (Oakland Power Plant) to the east of the stadium are expected to increase wind speeds on the east side of the project site. The wind hazard criterion is expected to be exceeded at 53 of the 167 test locations for a total of 116 hours. For all locations, the average wind speed which exceeds the wind hazard criterion is expected to remain at 33 mph (Table 1 and Figure 1E).

The average 90th percentile wind speed for the 167 grade level test locations is expected to 13 mph with the addition of the "Variant" developments. Wind speeds at 107 of 167 grade level test locations are expected to exceed the Planning Code's pedestrian-comfort criterion of 11 mph for 18% of the time (Table 1 and Figure 2E).

Although not explicitly tested, it is expected that the "Variant" buildings would have a similar influence on the wind conditions with the addition of the "Maritime Reservation Scenario" developments as to the "Full Buildout" condition.

3.1.6 Existing + Stadium + Phase 1 + Full Buildout + Cumulative

The future Cumulative developments to the north / northeast of the project site are expected to have minimal influence on the overall wind conditions on the project site. The wind hazard criterion is expected to be exceeded at 48 of the 167 test locations for a total of 109 hours. For all locations, the average wind speed which exceeds the wind hazard criterion is expected to be 32 mph (Table 1 and Figure 1F).

The average 90th percentile wind speed for the 167 grade level test locations is expected to be 12 mph with the addition of the cumulative developments. Wind speeds at 101 of 167 grade level test locations are expected to exceed the Planning Code's pedestrian-comfort criterion of 13 mph for 18% of the time (Table 1 and Figure 2F).

Although not explicitly tested, it is expected that the Cumulative developments to the northeast of the site would have a similar influence on the wind conditions with the addition of the "Maritime Reservation Scenario" developments as to the "Full Buildout" condition.

3.2 Stadium Roof

All locations on the proposed stadium roof are expected to meet the wind hazard criterion for all configurations (Figures 1A through 1G and Table 2). The average wind speed which exceeds the wind hazard criterion is expected to be 25 mph for the Existing + Stadium + Phase 1 configuration, 23 mph with the addition of the "Maritime Reservation Scenario" developments, 22 mph with the addition of the "Full Buildout" and "Variant" developments and 23 mph with the addition of the Cumulative developments to the "Full Buildout" configuration (Table 2).

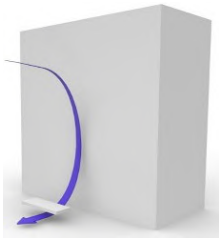
The average 90th percentile wind speed for the 15 roof level test locations is expected to be 8 mph for the Existing + Stadium + Phase 1 configuration and "Maritime Reservation Scenario" developments, and 7 mph with the addition of the "Full Buildout", "Variant" and Cumulative developments.

Wind speeds at all of the roof level test locations for all tested configurations are expected to meet the Planning Code's pedestrian-comfort criterion of 11 mph (Table 2 and Figures 2A through 2G).

4 WIND REDUCTION AND DESIGN GUIDELINES

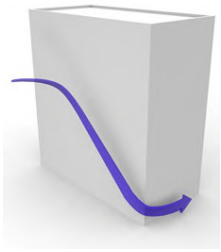
In general, the addition of project-related buildings to a site is likely to result in a reduction in wind speeds on the leeward side of buildings (east side in this case) as the buildings would shelter the leeward side from winds. On the windward side of the stadium where the" Phase 1" and "Full Buildout" developments are proposed, these buildings are expected to intercept, deflect and redirect winds and result in increased wind activity.

The following is a discussion of these generalized wind phenomenon:



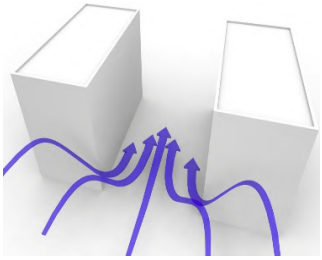
DOWNWASHING

Tall buildings tend to intercept the stronger winds at higher elevations and redirect them to the ground level. This is often the main cause for wind accelerations around large buildings at the pedestrian level.



CORNER ACCELERATION

When winds approach at an oblique angle to a tall facade and are deflected down, a localized increase in the wind activity or corner acceleration can be expected around the exposed building corners at pedestrian level.



CHANNELING EFFECT

When two buildings are situated side by side, wind flow tends to accelerate through the space between the buildings due to channeling effect caused by the narrow gap.

Image 4: Generalized Wind Flows

When these building/wind combinations occur for prevailing winds, particularly in an already windy area like the Oakland Estuary waterfront area, there is a greater potential for increased wind activity. Design details like setting back a tall tower from the edges of a podium, deep canopies close to ground level, wind screens, tall trees with dense landscaping, etc. can help reduce wind speeds to a large extent (**Image 7**).

Podium/tower setback, canopy, landscaping and wind screens (left to right)

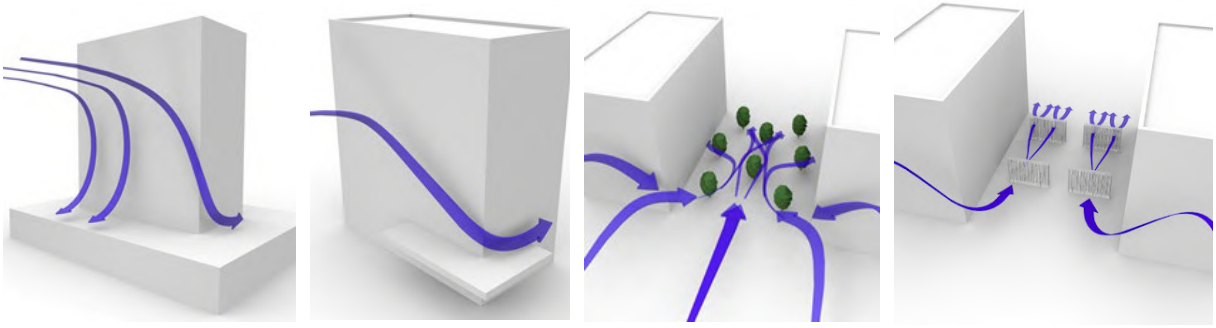
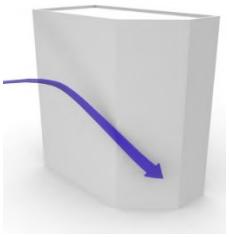


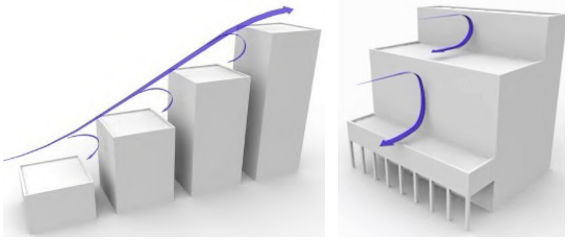
Image 5: Common Wind Control Measures

The choice and effectiveness of these measures would depend on the exposure and orientation of the site with respect to the prevailing wind directions and the size and massing of the proposed buildings.
Large scale measures may be required to the large upwind buildings due to high winds and may include the following (see **Image 8**).



ROUNDED / RE-ENTRANT / CHAMFERED BUILDING CORNERS

Rounded, re-entrant (inside corners that forms an angle < 180°) or chamfered building corners (45° sloped or angled corner edges), are more aerodynamic than sharp 90° corners, in that the modified corner profiles disrupt wind acceleration at building corners.



STEPPED FACADES

Vertical steps can be incorporated into the overall massing's (left) or to individual massing's (right) to help disrupt down-washing flows from influencing pedestrian areas at grade.

Image 6: Larger Scale Massing Modifications for Wind Control

Additional measures may also include:

- Covered walkways, colonnades or street art that would provide a sheltered area for pedestrians to walk.
- Staggered arrangement of balcony slabs that project out from the main tower facade. A uniform arrangement of balconies is ineffective against strong winds as the balconies get pressurized and the uniform pockets of air would in effect behave like a solid wall. A staggered arrangement would be more beneficial in disrupting vertical wind flows along tower facades.

Examples of some of the features listed are provided in **Images 9 and 10**.

Image 7: Examples of Stepped facades and Modified Building Corners

Image 8: Examples of Walkways Sheltered by a Canopy, Overhang or Street Art

Localized wind screens or landscaping that slows winds along sidewalks and protects places where pedestrians are expected to gather or linger can also be effective. These localized measures should be placed to the west of the areas of concern.

Landscaping typically affects winds locally - the larger the tree crown and canopy, the greater the area of influence. Tall, slender trees with little foliage have little to no effect on local winds speeds at ground level because of the height of the foliage above ground. Shorter street trees with larger canopies help reduce winds around them but their influence on conditions farther away is limited.

Solid windscreens have a greater effect at reducing the wind speeds to immediate leeward side of the screens, however, outside of this area of influence, the winds are either unaffected or accelerated. Porous windscreens have less of an effect to the immediate leeward side. However, they have an increased area of influence and are less likely to cause any accelerations of the winds further downwind. Examples of effective localized wind reduction measures are shown in **Image 11**.

Image 9: Examples of Localized Mitigation Measures

5 APPLICABILITY OF RESULTS

The drawings and information listed below were used to construct the scale model of the proposed Oakland Athletics' New Ballpark. The wind conditions presented in this report pertain to the proposed as detailed in the architectural design drawings listed in the table below. Should there be any design changes that deviate from this list of drawings, the wind condition predictions presented may change. Therefore, if changes in the design are made, it is recommended that RWDI be contacted and requested to review their potential effects on wind conditions.

File Name	File Type	Date Received (mm/dd/yyyy)
200413_BallparkModel.3dm	.3dm	09/14/2020

FIGURES

MARKET STREET
BRUSH STREET
2ND STREET
CASTRO STREET
MARTIN LUTHER KING JR. WAY
JEFFERSON STREET
EMBARCADERO WEST
CLAY STREET
INNER HARBOR
SF-OAKLAND
FERRY TERMINAL

LEGEND:

HAZARD CATEGORIES:
- Pass
- Exceeded

SENSOR LOCATION:
- Grade Level

0 100 200ft

Pedestrian Wind Hazard Conditions
Existing
Annual

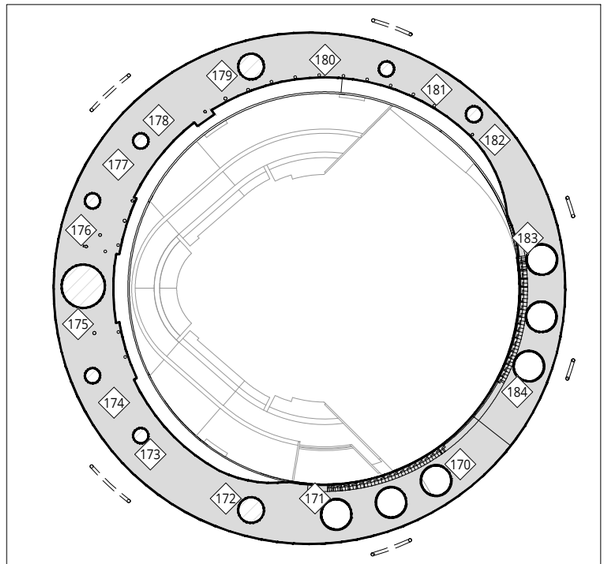
Oakland Athletics' New Ballpark - Oakland, CA

True North

Project #1900310

Drawn by:	GRE	Figure:	1A
Approx. Scale:	1"=200'		
Date Revised:	Oct. 20, 2020		

EMBARCADERO WEST
MARKET STREET
BRUSH STREET
2ND STREET
CASTRO STREET
MARTIN LUTHER KING JR. WAY
MARTIN LUTHER KING JR. WAY
MARKET STREET
EMBARCADERO WEST
CLAY STREET
BLOCK 4
MIXED-USE
BLOCK 3
MIXED-USE
BLOCK 2
MIXED-USE
BLOCK 6
MIXED-USE
BLOCK 1
BALLPARK
BLOCK 7
HOTEL
BLOCK 18
MIXED-USE
INNER HARBOR
SF-OAKLAND
FERRY TERMINAL



ROOF LEVEL PLAN
SCALE - 1"=200'

LEGEND:

HAZARD CATEGORIES:
- Pass
- Exceeded

SENSOR LOCATION:
- Grade Level
- Roof Level

0 100 200ft

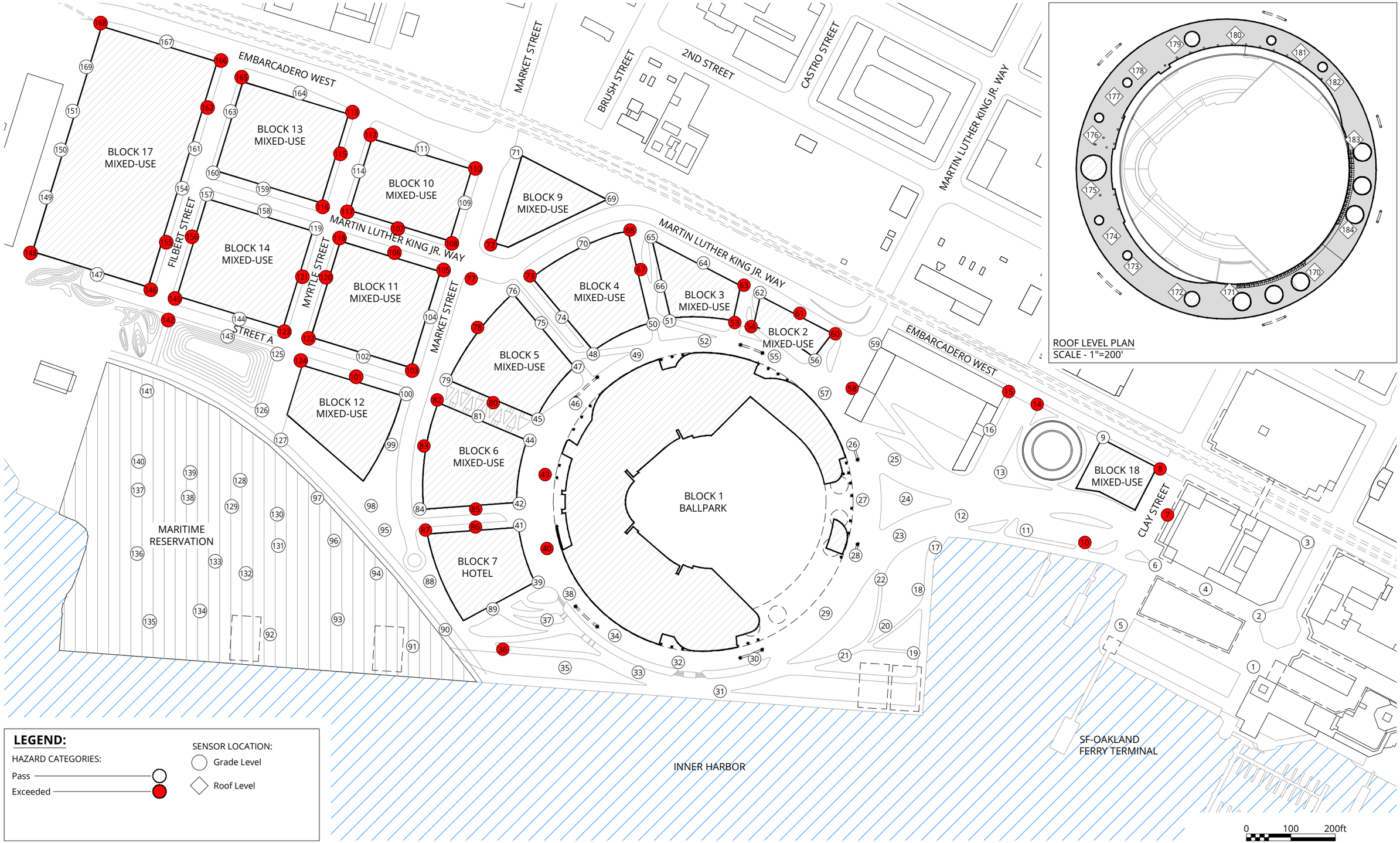
Pedestrian Wind Hazard Conditions
Existing + Stadium + Phase 1
Annual

Oakland Athletics' New Ballpark - Oakland, CA

True North

Drawn by:	GRE	Figure:	1B
Approx. Scale:	1"=200'		
Date Revised:	Oct. 20, 2020		

Project #1900310



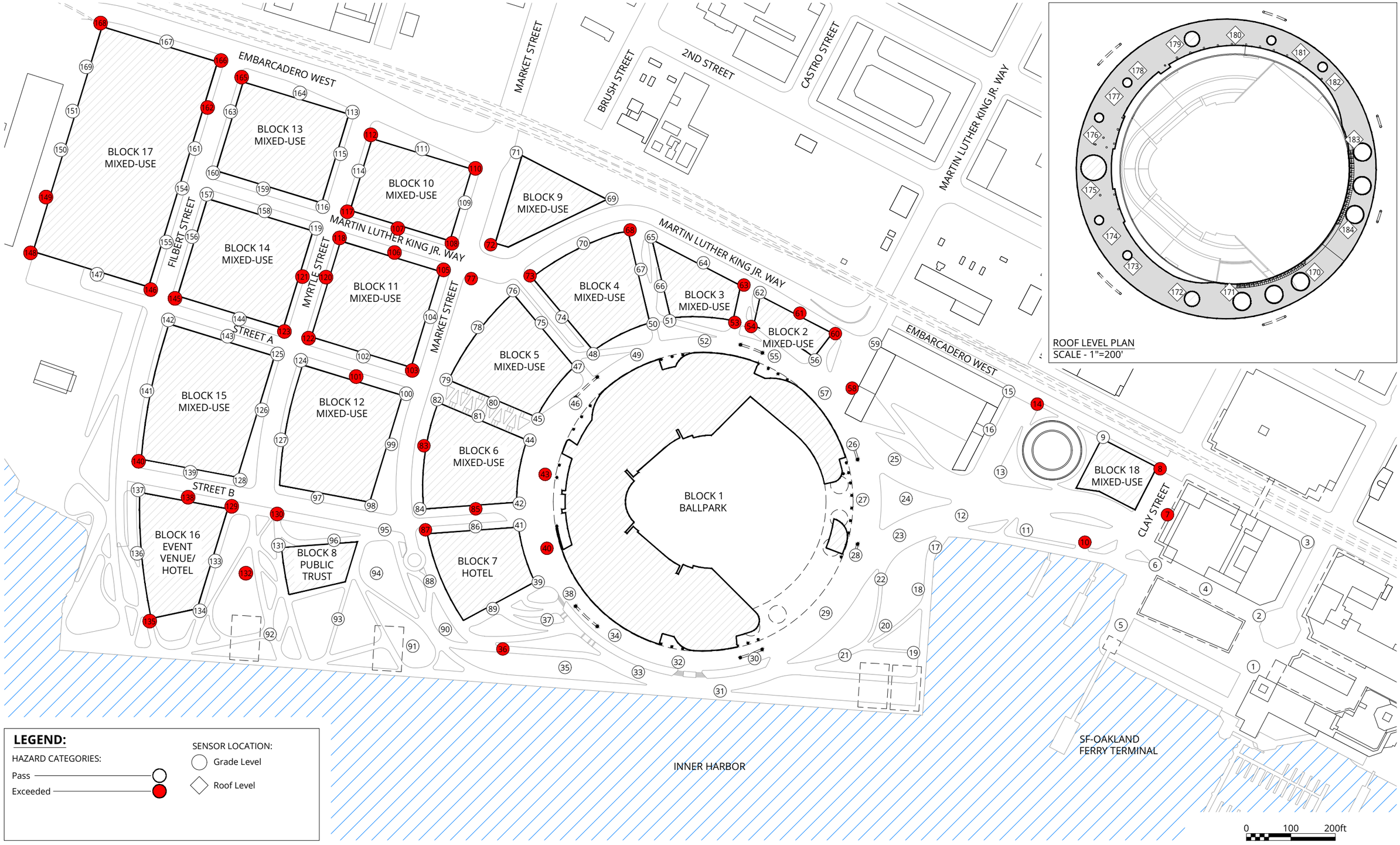
Pedestrian Wind Hazard Conditions
Existing + Stadium + Phase 1 + Maritime Reservation Scenario
Annual

Oakland Athletics' New Ballpark - Oakland, CA

True North

Project #1900310

Drawn by:	GRE	Figure:	1C
Approx. Scale:	1"=200'		
Date Revised:	Oct. 20, 2020		



ROOF LEVEL PLAN
SCALE - 1"=200'

LEGEND:

HAZARD CATEGORIES:
- Pass
- Exceeded

SENSOR LOCATION:
- Grade Level
- Roof Level

Pedestrian Wind Hazard Conditions

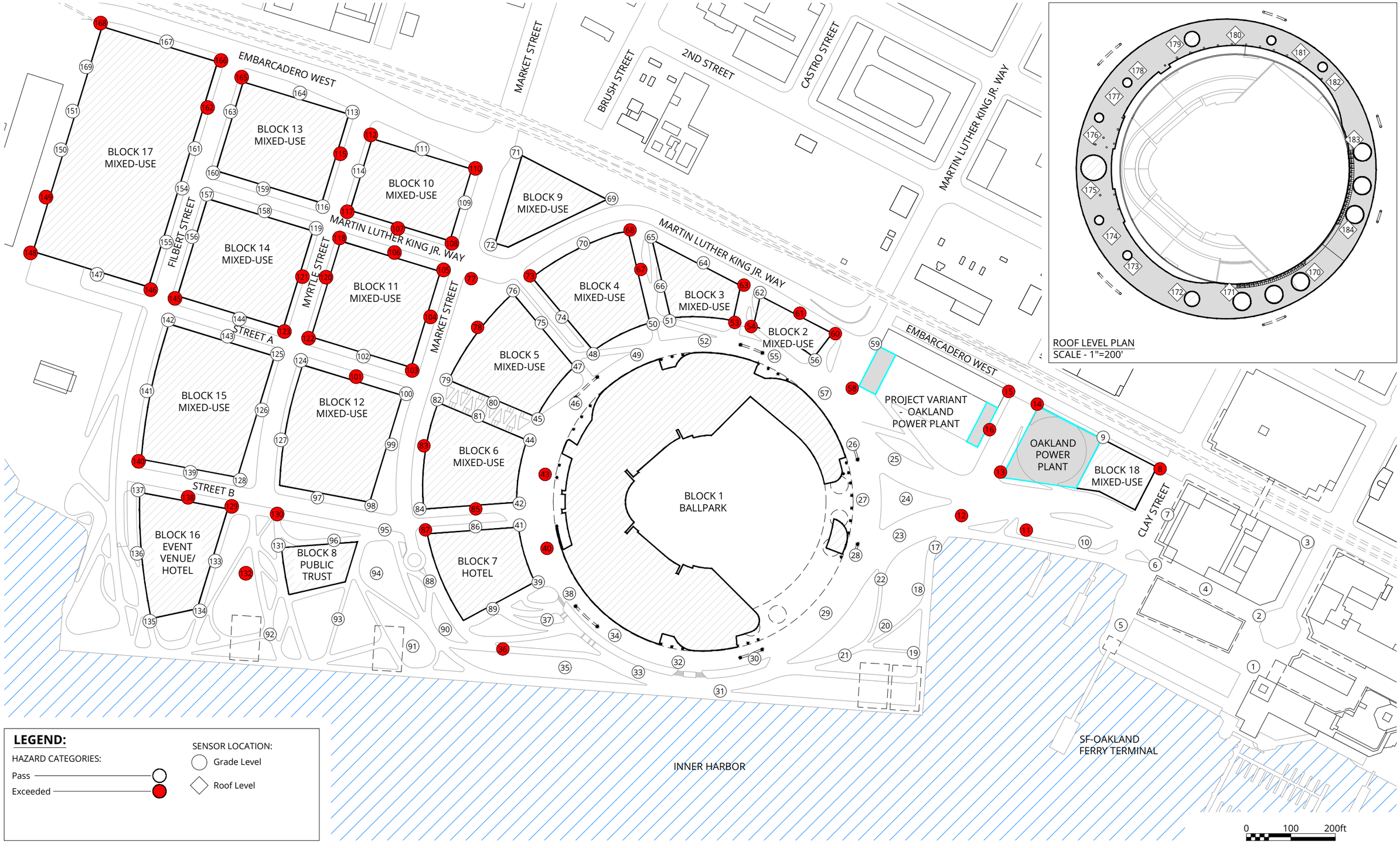
Existing + Stadium + Phase 1 + Full Buildout
Annual

Oakland Athletics' New Ballpark - Oakland, CA

True North

Project #1900310

Drawn by: GRE	Figure: 1D
Approx. Scale:	1"=200'
Date Revised:	Oct. 20, 2020



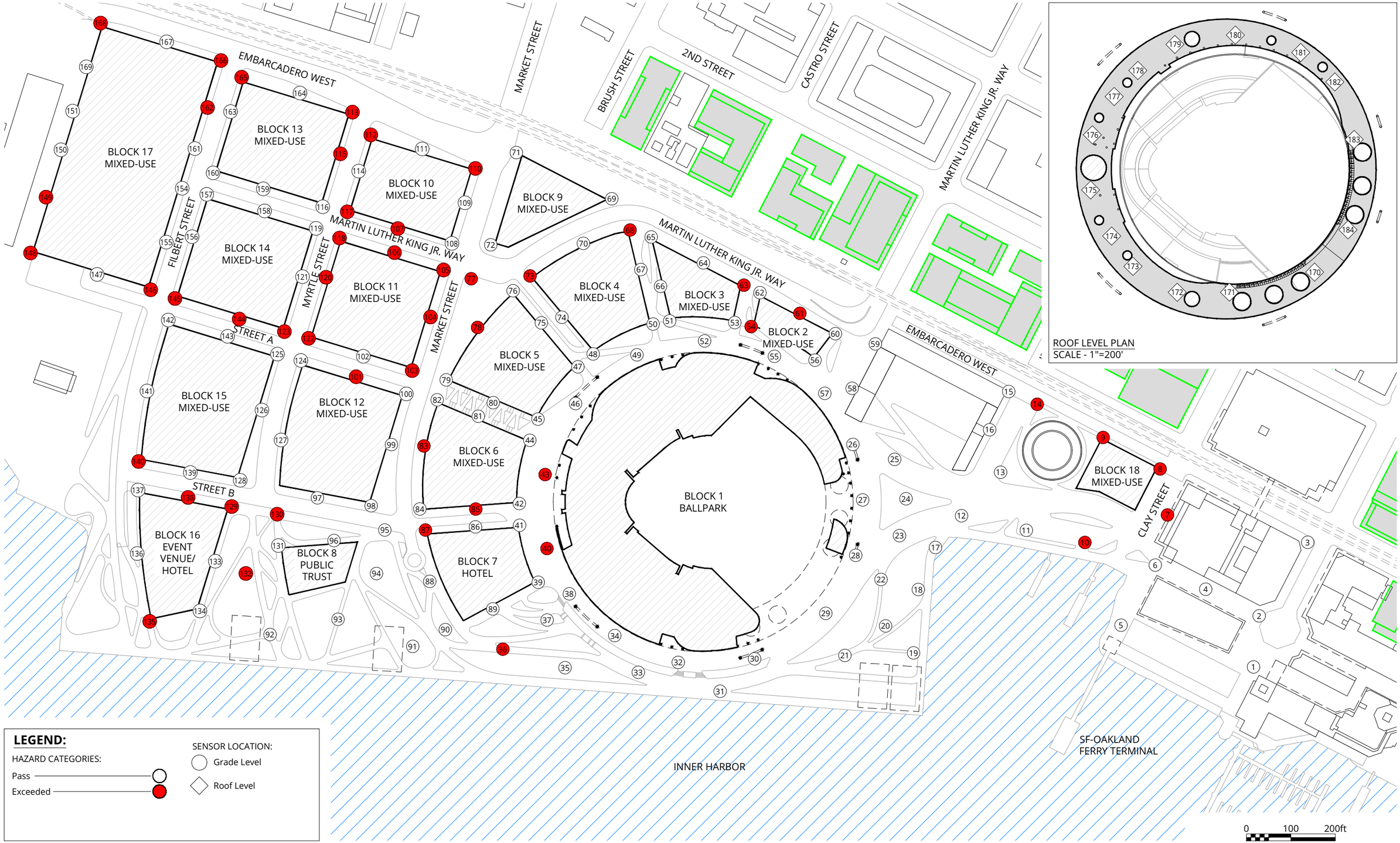
Pedestrian Wind Hazard Conditions
Existing + Stadium + Phase 1 + Full Buildout + Variants
Annual

Oakland Athletics' New Ballpark - Oakland, CA

True North

Project #1900310

Drawn by: GRE	Figure: 1E
Approx. Scale:	1"=200'
Date Revised:	Oct. 20, 2020



ROOF LEVEL PLAN
SCALE - 1"=200'

LEGEND:

HAZARD CATEGORIES:
- Pass
- Exceeded

SENSOR LOCATION:
- Grade Level
- Roof Level

0 100 200ft

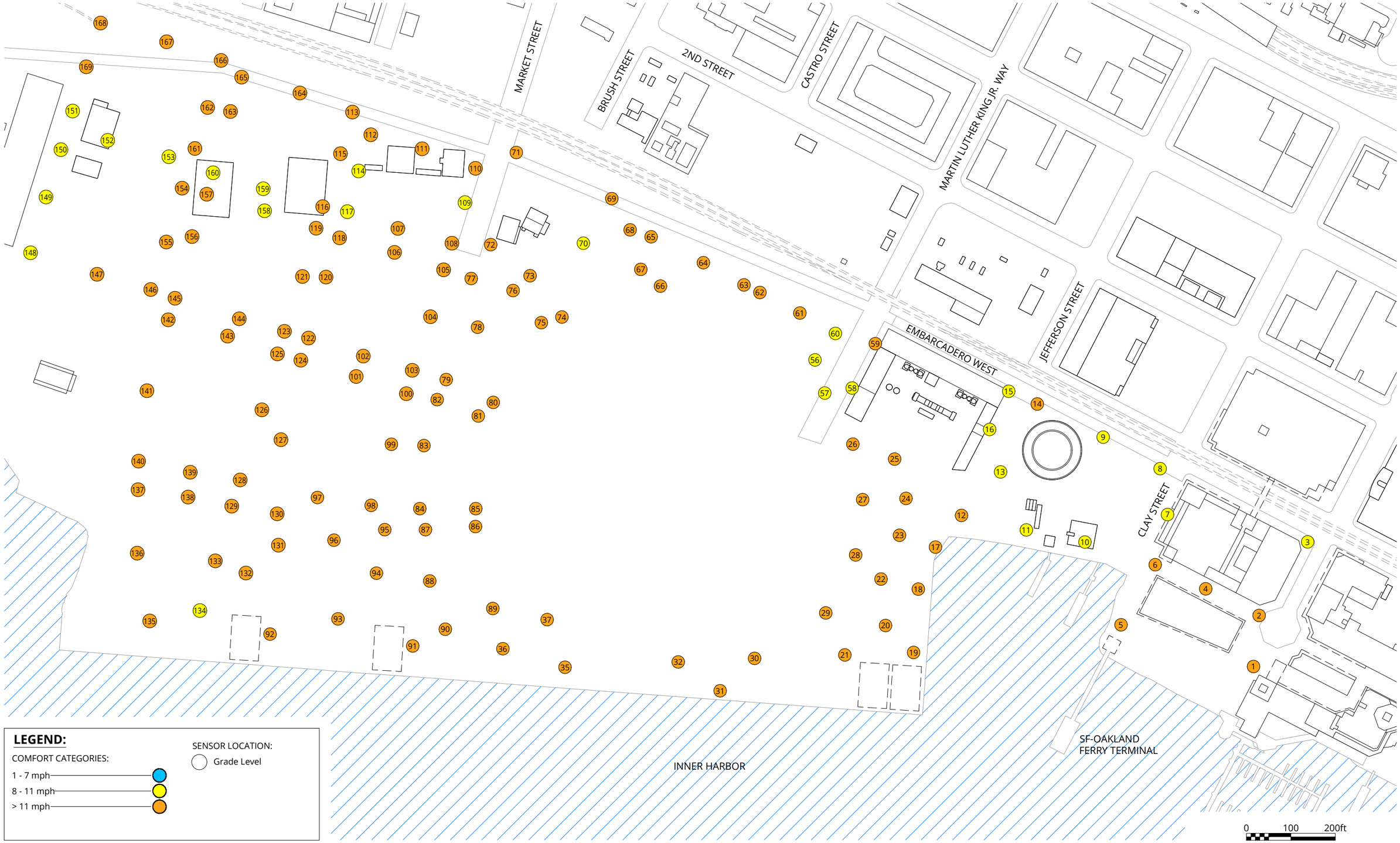
Pedestrian Wind Hazard Conditions
Existing + Stadium + Phase 1 + Full Buildout + Cumulative
Annual

Oakland Athletics' New Ballpark - Oakland, CA

True North

Drawn by:	GRE	Figure:	1F
Approx. Scale:	1"=200'		
Date Revised:	Oct. 20, 2020		

Project #1900310



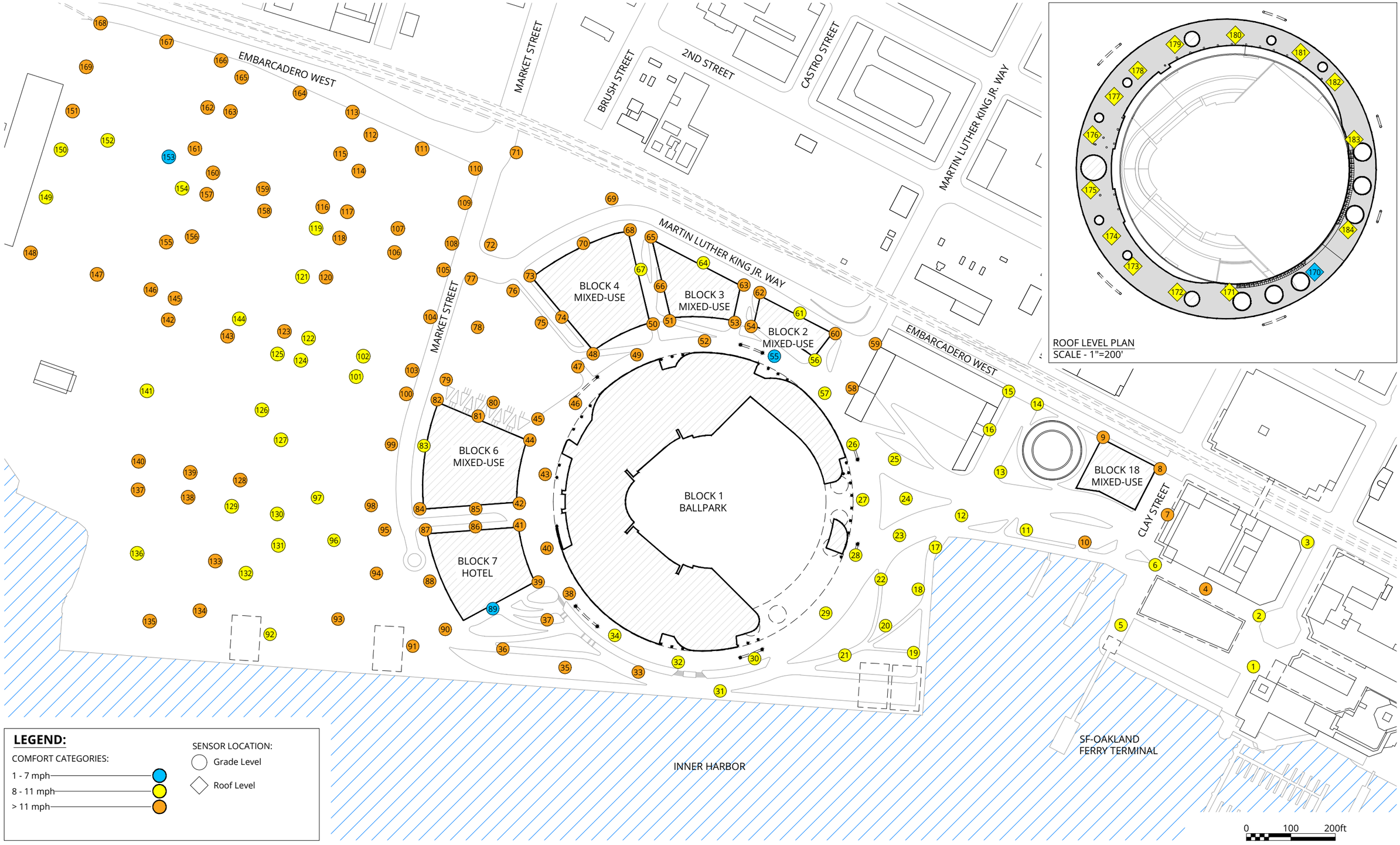
Pedestrian Wind Comfort Conditions
Existing
Annual

Oakland Athletics' New Ballpark - Oakland, CA

True North

Project #1900310

Drawn by: GRE	Figure: 2A
Approx. Scale:	1"=200'
Date Revised:	Oct. 20, 2020



LEGEND:

COMFORT CATEGORIES:
- 1 - 7 mph
- 8 - 11 mph
- > 11 mph

SENSOR LOCATION:
- Grade Level
- Roof Level

Pedestrian Wind Comfort Conditions

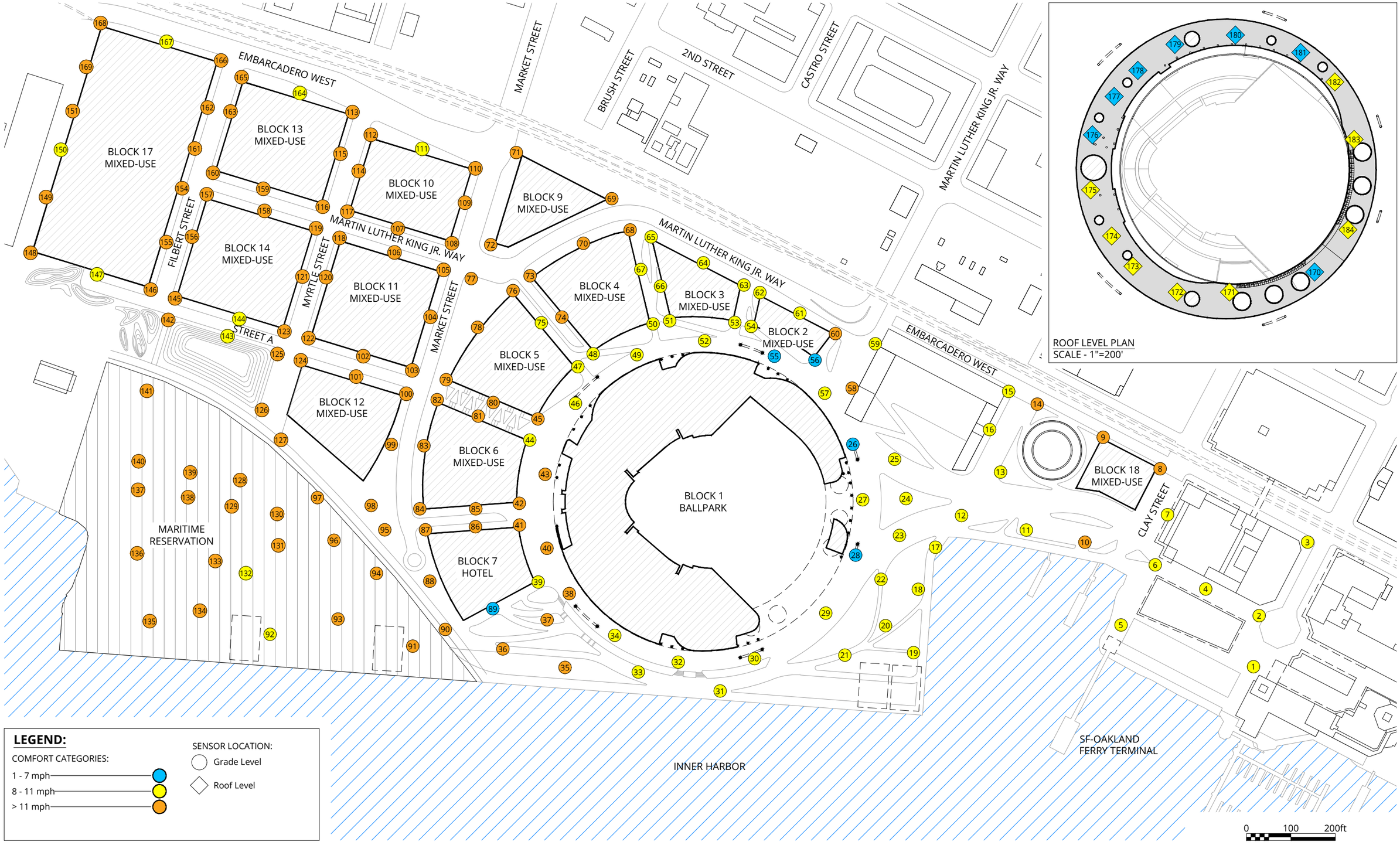
Existing + Stadium + Phase 1
Annual

Oakland Athletics' New Ballpark - Oakland, CA

True North

Project #1900310

Drawn by:	GRE	Figure:	2B
Approx. Scale:	1"=200'		
Date Revised:	Oct. 20, 2020		



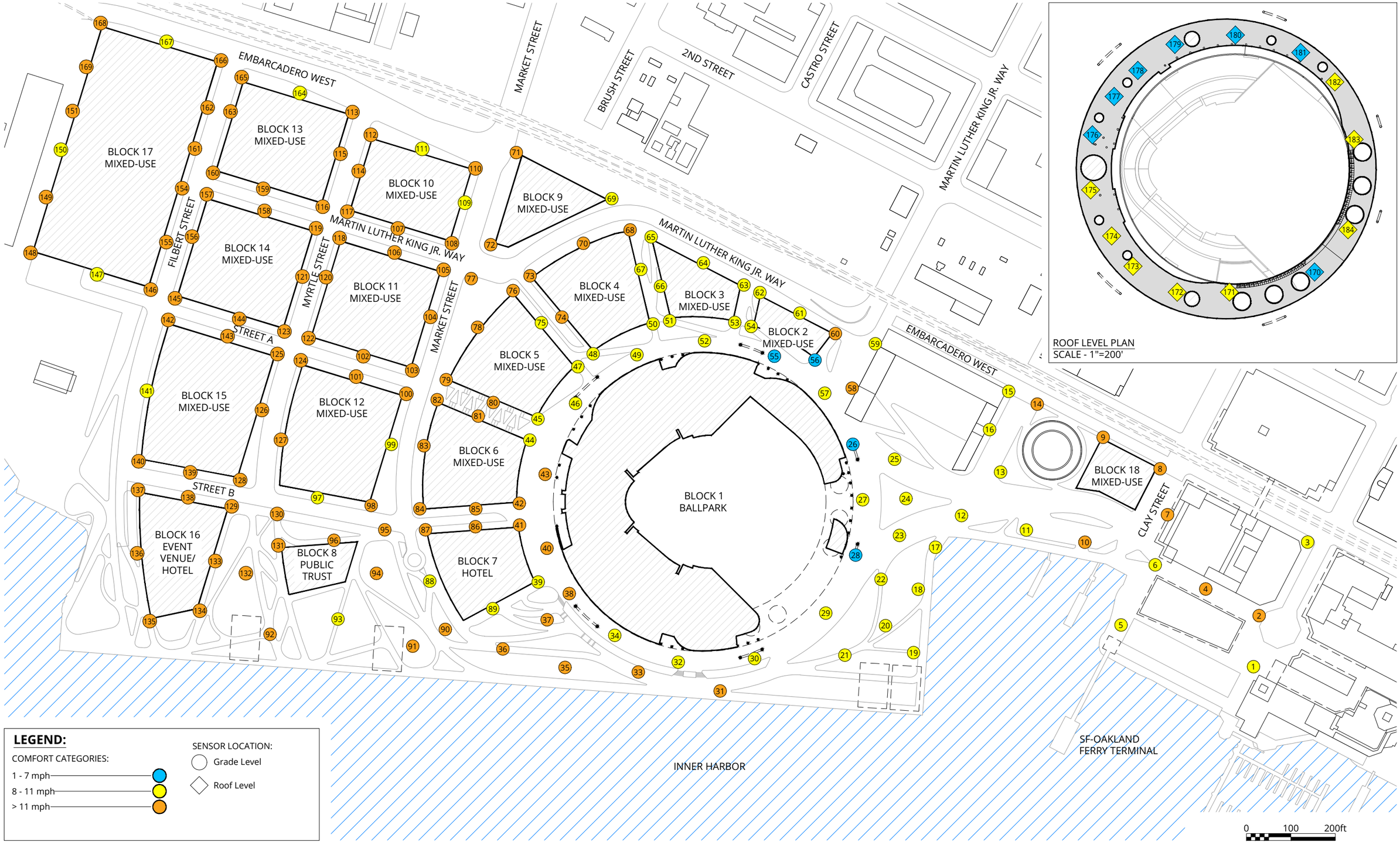
Pedestrian Wind Comfort Conditions
Existing + Stadium + Phase 1 + Maritime Reservation Scenario
Annual

Oakland Athletics' New Ballpark - Oakland, CA

True North

Project #1900310

Drawn by:	GRE	Figure:	2C
Approx. Scale:	1"=200'		
Date Revised:	Oct. 20, 2020		



LEGEND:

COMFORT CATEGORIES:

- 1 - 7 mph
- 8 - 11 mph
- > 11 mph

SENSOR LOCATION:

- Grade Level
- Roof Level

Pedestrian Wind Comfort Conditions

Existing + Stadium + Phase 1 + Full Buildout

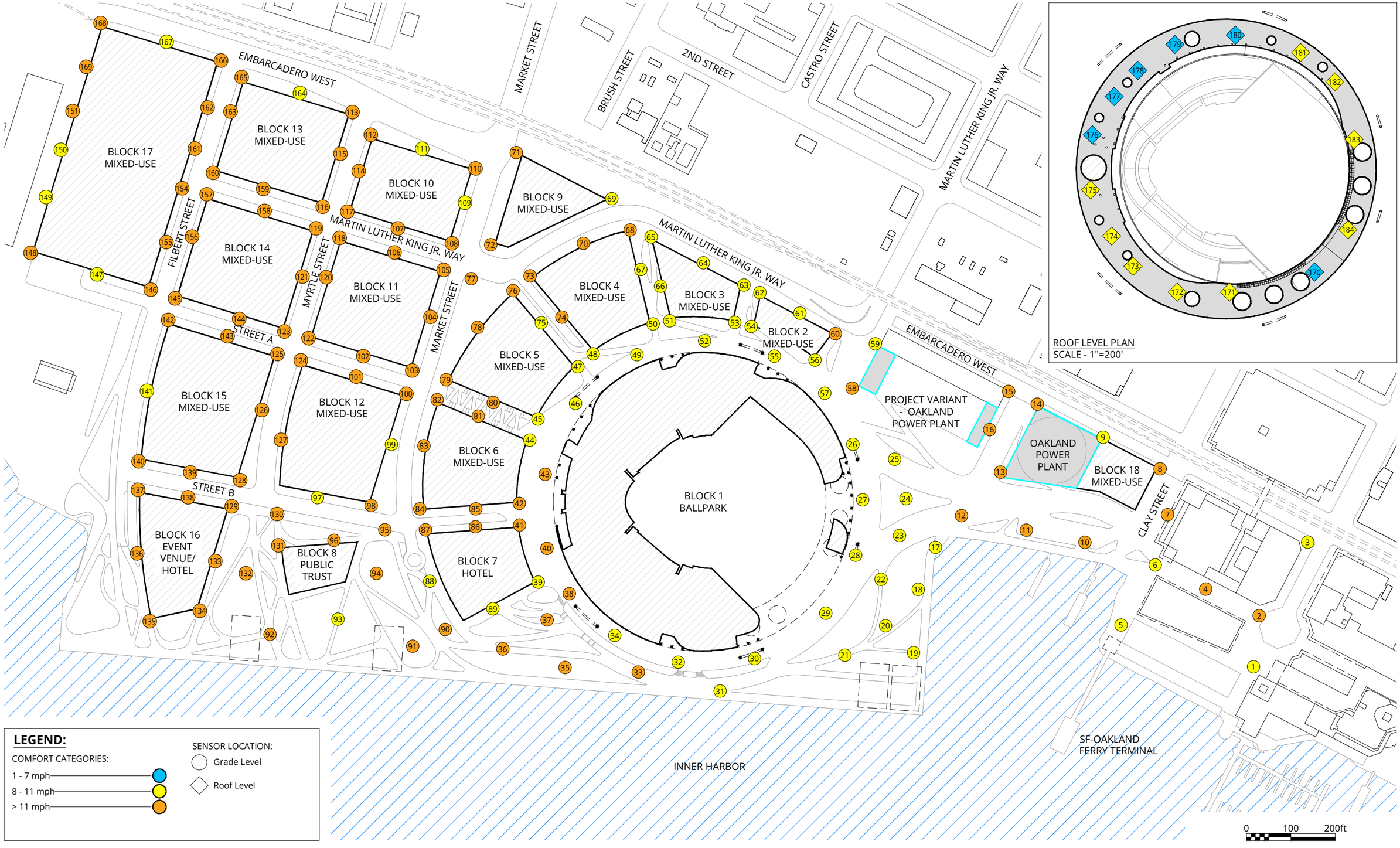
Annual

Oakland Athletics' New Ballpark - Oakland, CA

True North

Project #1900310

Drawn by: GRE	Figure: 2D
Approx. Scale:	1"=200'
Date Revised:	Oct. 20, 2020



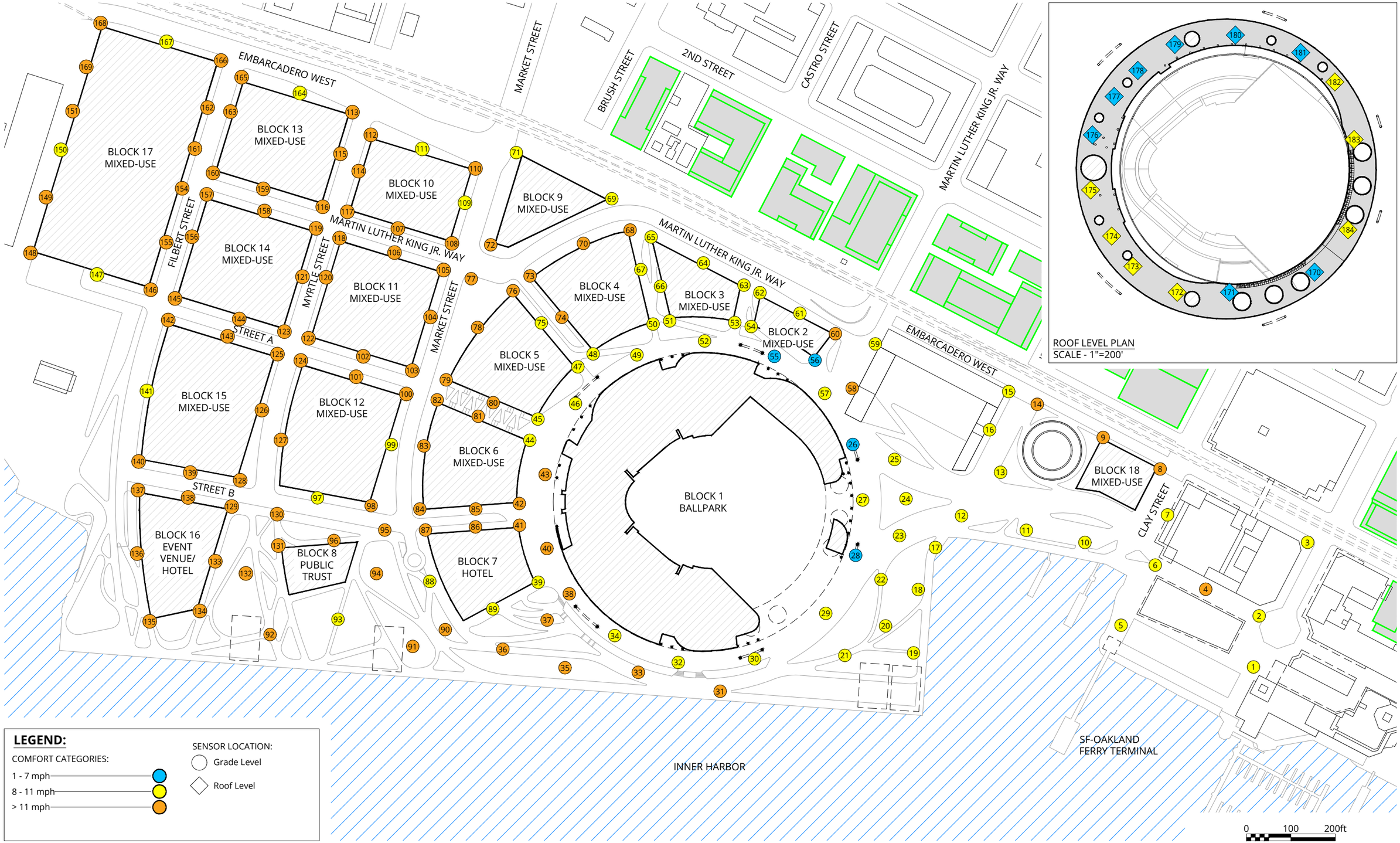
Pedestrian Wind Comfort Conditions
Existing + Stadium + Phase 1 + Full Buildout + Variants
Annual

Oakland Athletics' New Ballpark - Oakland, CA

True North

Project #1900310

Drawn by: GRE	Figure: 2E
Approx. Scale:	1"=200'
Date Revised:	Oct. 20, 2020



LEGEND:

COMFORT CATEGORIES:
- 1 - 7 mph
- 8 - 11 mph
- > 11 mph

SENSOR LOCATION:
- Grade Level
- Roof Level

0 100 200ft

Pedestrian Wind Comfort Conditions
Existing + Stadium + Phase 1 + Full Buildout + Cumulative
Annual

Oakland Athletics' New Ballpark - Oakland, CA

True North

Drawn by:	GRE	Figure:	2F
Approx. Scale:	1"=200'		
Date Revised:	Oct. 20, 2020		

Project #1900310

TABLES

Table 1: Pedestrian Wind Comfort and Hazard Conditions - Grade Level

Location	Configuration	WIND COMFORT				WIND HAZARD			
		Wind Speed Exceeded (mph)	% of Time Exceeding	Speed Change (mph)	Exceeds	Wind Speed Exceeded (mph)	Hours per Year Exceeding	Hours Change	Exceeds
1	Existing	12	18	-	e	27	0	-	
	Stadium + Phase 1	11	10	-1		27	0	0	
	Maritime	11	10	-1		28	0	0	
	Full Buildout	11	10	-1		27	0	0	
	Variants	11	10	-1		29	0	0	
	Cumulative (Full Buildout)	11	10	-1		27	0	0	
2	Existing	13	23	-	e	30	0	-	
	Stadium + Phase 1	11	10	-2		32	0	0	
	Maritime	11	10	-2		33	0	0	
	Full Buildout	12	12	-1	e	33	0	0	
	Variants	12	12	-1	e	33	0	0	
	Cumulative (Full Buildout)	11	10	-2		32	0	0	
3	Existing	9	5	-		28	0	-	
	Stadium + Phase 1	11	10	2		30	0	0	
	Maritime	11	10	2		31	0	0	
	Full Buildout	11	10	2		31	0	0	
	Variants	11	10	2		32	0	0	
	Cumulative (Full Buildout)	11	10	2		30	0	0	
4	Existing	15	33	-	e	33	0	-	
	Stadium + Phase 1	12	14	-3	e	31	0	0	
	Maritime	11	10	-4		32	0	0	
	Full Buildout	12	13	-3	e	32	0	0	
	Variants	13	16	-2	e	31	0	0	
	Cumulative (Full Buildout)	12	12	-3	e	32	0	0	
5	Existing	12	16	-	e	27	0	-	
	Stadium + Phase 1	11	10	-1		27	0	0	
	Maritime	10	7	-2		27	0	0	
	Full Buildout	10	7	-2		27	0	0	
	Variants	10	5	-2		23	0	0	
	Cumulative (Full Buildout)	10	5	-2		25	0	0	
6	Existing	12	13	-	e	30	0	-	
	Stadium + Phase 1	11	10	-1		28	0	0	
	Maritime	11	10	-1		28	0	0	
	Full Buildout	11	10	-1		27	0	0	
	Variants	11	10	-1		27	0	0	
	Cumulative (Full Buildout)	11	10	-1		28	0	0	
7	Existing	8	1	-		18	0	-	
	Stadium + Phase 1	12	12	4	e	37	1	1	e
	Maritime	11	10	3		36	1	1	e
	Full Buildout	12	12	4	e	36	1	1	e
	Variants	12	12	4	e	35	0	0	
	Cumulative (Full Buildout)	11	10	3		37	1	1	e
8	Existing	11	10	-		26	0	-	
	Stadium + Phase 1	14	17	3	e	49	14	14	e
	Maritime	14	19	3	e	47	12	12	e
	Full Buildout	14	21	3	e	46	12	12	e
	Variants	13	14	2	e	45	8	8	e
	Cumulative (Full Buildout)	14	18	3	e	49	16	16	e

Table 1: Pedestrian Wind Comfort and Hazard Conditions - Grade Level

Location	Configuration	WIND COMFORT				WIND HAZARD			
		Wind Speed Exceeded (mph)	% of Time Exceeding	Speed Change (mph)	Exceeds	Wind Speed Exceeded (mph)	Hours per Year Exceeding	Hours Change	Exceeds
9	Existing	10	5	-		25	0	-	
	Stadium + Phase 1	15	27	5	e	37	2	2	e
	Maritime	12	14	2	e	32	0	0	
	Full Buildout	12	12	2	e	32	0	0	
	Variants	9	4	-1		27	0	0	
	Cumulative (Full Buildout)	13	16	3	e	37	1	1	e
10	Existing	8	2	-		18	0	-	
	Stadium + Phase 1	13	18	5	e	35	0	0	
	Maritime	13	16	5	e	36	1	1	e
	Full Buildout	13	16	5	e	36	1	1	e
	Variants	12	13	4	e	35	0	0	
	Cumulative (Full Buildout)	11	10	3		36	1	1	e
11	Existing	10	7	-		23	0	-	
	Stadium + Phase 1	11	10	1		29	0	0	
	Maritime	11	10	1		29	0	0	
	Full Buildout	11	10	1		30	0	0	
	Variants	13	18	3	e	37	1	1	e
	Cumulative (Full Buildout)	11	10	1		34	0	0	
12	Existing	13	19	-	e	26	0	-	
	Stadium + Phase 1	9	5	-4		27	0	0	
	Maritime	9	5	-4		24	0	0	
	Full Buildout	10	7	-3		24	0	0	
	Variants	14	20	1	e	36	1	1	e
	Cumulative (Full Buildout)	10	6	-3		24	0	0	
13	Existing	10	5	-		22	0	-	
	Stadium + Phase 1	11	10	1		34	0	0	
	Maritime	11	10	1		32	0	0	
	Full Buildout	11	10	1		33	0	0	
	Variants	13	20	3	e	38	2	2	e
	Cumulative (Full Buildout)	10	8	0		32	0	0	
14	Existing	13	18	-	e	29	0	-	
	Stadium + Phase 1	11	10	-2		40	3	3	e
	Maritime	12	11	-1	e	39	3	3	e
	Full Buildout	12	14	-1	e	38	2	2	e
	Variants	14	22	1	e	36	1	1	e
	Cumulative (Full Buildout)	12	14	-1	e	39	3	3	e
15	Existing	10	7	-		30	0	-	
	Stadium + Phase 1	9	6	-1		35	0	0	
	Maritime	10	8	0		36	1	1	e
	Full Buildout	11	10	1		35	0	0	
	Variants	13	18	3	e	37	1	1	e
	Cumulative (Full Buildout)	11	10	1		32	0	0	
16	Existing	11	10	-		27	0	-	
	Stadium + Phase 1	8	4	-3		28	0	0	
	Maritime	9	4	-2		27	0	0	
	Full Buildout	9	5	-2		27	0	0	
	Variants	12	13	1	e	46	8	8	e
	Cumulative (Full Buildout)	9	5	-2		26	0	0	

Table 1: Pedestrian Wind Comfort and Hazard Conditions - Grade Level

Location	Configuration	WIND COMFORT				WIND HAZARD			
		Wind Speed Exceeded (mph)	% of Time Exceeding	Speed Change (mph)	Exceeds	Wind Speed Exceeded (mph)	Hours per Year Exceeding	Hours Change	Exceeds
17	Existing	14	23	-	e	28	0	-	
	Stadium + Phase 1	10	6	-4		26	0	0	
	Maritime	10	6	-4		27	0	0	
	Full Buildout	10	8	-4		27	0	0	
	Variants	11	10	-3		31	0	0	
	Cumulative (Full Buildout)	10	8	-4		26	0	0	
18	Existing	14	25	-	e	28	0	-	
	Stadium + Phase 1	11	10	-3		26	0	0	
	Maritime	10	8	-4		27	0	0	
	Full Buildout	11	10	-3		27	0	0	
	Variants	11	10	-3		30	0	0	
	Cumulative (Full Buildout)	11	10	-3		26	0	0	
19	Existing	14	24	-	e	29	0	-	
	Stadium + Phase 1	11	10	-3		25	0	0	
	Maritime	11	10	-3		24	0	0	
	Full Buildout	11	10	-3		24	0	0	
	Variants	11	10	-3		25	0	0	
	Cumulative (Full Buildout)	11	10	-3		24	0	0	
20	Existing	14	25	-	e	28	0	-	
	Stadium + Phase 1	11	10	-3		26	0	0	
	Maritime	11	10	-3		27	0	0	
	Full Buildout	11	10	-3		27	0	0	
	Variants	11	10	-3		27	0	0	
	Cumulative (Full Buildout)	11	10	-3		27	0	0	
21	Existing	12	16	-	e	26	0	-	
	Stadium + Phase 1	11	10	-1		28	0	0	
	Maritime	11	10	-1		28	0	0	
	Full Buildout	10	8	-2		28	0	0	
	Variants	10	8	-2		26	0	0	
	Cumulative (Full Buildout)	10	8	-2		27	0	0	
22	Existing	13	19	-	e	27	0	-	
	Stadium + Phase 1	10	7	-3		29	0	0	
	Maritime	10	6	-3		28	0	0	
	Full Buildout	10	8	-3		28	0	0	
	Variants	11	10	-2		29	0	0	
	Cumulative (Full Buildout)	10	8	-3		27	0	0	
23	Existing	13	20	-	e	27	0	-	
	Stadium + Phase 1	10	5	-3		27	0	0	
	Maritime	9	6	-4		28	0	0	
	Full Buildout	10	7	-3		27	0	0	
	Variants	11	10	-2		30	0	0	
	Cumulative (Full Buildout)	10	7	-3		27	0	0	
24	Existing	12	17	-	e	25	0	-	
	Stadium + Phase 1	9	5	-3		27	0	0	
	Maritime	9	5	-3		27	0	0	
	Full Buildout	10	7	-2		27	0	0	
	Variants	11	10	-1		31	0	0	
	Cumulative (Full Buildout)	10	6	-2		27	0	0	

Table 1: Pedestrian Wind Comfort and Hazard Conditions - Grade Level

Location	Configuration	WIND COMFORT				WIND HAZARD			
		Wind Speed Exceeded (mph)	% of Time Exceeding	Speed Change (mph)	Exceeds	Wind Speed Exceeded (mph)	Hours per Year Exceeding	Hours Change	Exceeds
25	Existing	12	14	-	e	24	0	-	
	Stadium + Phase 1	8	3	-4		25	0	0	
	Maritime	8	3	-4		25	0	0	
	Full Buildout	8	3	-4		26	0	0	
	Variants	11	10	-1		32	0	0	
	Cumulative (Full Buildout)	8	3	-4		25	0	0	
26	Existing	13	21	-	e	27	0	-	
	Stadium + Phase 1	8	3	-5		22	0	0	
	Maritime	7	2	-6		23	0	0	
	Full Buildout	7	3	-6		23	0	0	
	Variants	8	4	-5		25	0	0	
	Cumulative (Full Buildout)	7	2	-6		22	0	0	
27	Existing	13	21	-	e	27	0	-	
	Stadium + Phase 1	8	3	-5		26	0	0	
	Maritime	8	2	-5		24	0	0	
	Full Buildout	9	3	-4		24	0	0	
	Variants	9	4	-4		25	0	0	
	Cumulative (Full Buildout)	8	3	-5		23	0	0	
28	Existing	13	19	-	e	27	0	-	
	Stadium + Phase 1	8	2	-5		24	0	0	
	Maritime	7	1	-6		23	0	0	
	Full Buildout	7	1	-6		24	0	0	
	Variants	8	2	-5		23	0	0	
	Cumulative (Full Buildout)	7	1	-6		21	0	0	
29	Existing	13	20	-	e	27	0	-	
	Stadium + Phase 1	9	4	-4		27	0	0	
	Maritime	8	3	-5		28	0	0	
	Full Buildout	8	4	-5		28	0	0	
	Variants	8	3	-5		27	0	0	
	Cumulative (Full Buildout)	8	4	-5		28	0	0	
30	Existing	13	19	-	e	27	0	-	
	Stadium + Phase 1	10	6	-3		27	0	0	
	Maritime	10	7	-3		29	0	0	
	Full Buildout	10	7	-3		29	0	0	
	Variants	10	6	-3		28	0	0	
	Cumulative (Full Buildout)	10	7	-3		29	0	0	
31	Existing	13	19	-	e	28	0	-	
	Stadium + Phase 1	11	10	-2		26	0	0	
	Maritime	11	10	-2		27	0	0	
	Full Buildout	12	12	-1	e	26	0	0	
	Variants	11	10	-2		26	0	0	
	Cumulative (Full Buildout)	12	12	-1	e	26	0	0	
32	Existing	13	20	-	e	28	0	-	
	Stadium + Phase 1	11	10	-2		26	0	0	
	Maritime	11	10	-2		27	0	0	
	Full Buildout	11	10	-2		27	0	0	
	Variants	11	10	-2		27	0	0	
	Cumulative (Full Buildout)	11	10	-2		27	0	0	

Table 1: Pedestrian Wind Comfort and Hazard Conditions - Grade Level

Location	Configuration	WIND COMFORT				WIND HAZARD			
		Wind Speed Exceeded (mph)	% of Time Exceeding	Speed Change (mph)	Exceeds	Wind Speed Exceeded (mph)	Hours per Year Exceeding	Hours Change	Exceeds
33	Existing	-	-	-	-	-	-	-	-
	Stadium + Phase 1	12	12	-	e	26	0	-	
	Maritime	11	10	-		27	0	-	
	Full Buildout	12	13	-	e	26	0	-	
	Variants	12	12	-	e	25	0	-	
	Cumulative (Full Buildout)	12	13	-	e	25	0	-	
34	Existing	-	-	-	-	-	-	-	-
	Stadium + Phase 1	9	4	-		26	0	-	
	Maritime	9	4	-		23	0	-	
	Full Buildout	9	4	-		23	0	-	
	Variants	9	4	-		23	0	-	
	Cumulative (Full Buildout)	9	4	-		24	0	-	
35	Existing	13	19	-	e	28	0	-	
	Stadium + Phase 1	15	25	2	e	34	0	0	
	Maritime	15	25	2	e	35	0	0	
	Full Buildout	16	27	3	e	35	0	0	
	Variants	16	26	3	e	34	0	0	
	Cumulative (Full Buildout)	16	27	3	e	35	0	0	
36	Existing	13	18	-	e	28	0	-	
	Stadium + Phase 1	18	35	5	e	37	2	2	e
	Maritime	18	41	5	e	38	2	2	e
	Full Buildout	17	32	4	e	36	1	1	e
	Variants	17	32	4	e	36	1	1	e
	Cumulative (Full Buildout)	17	33	4	e	36	1	1	e
37	Existing	13	20	-	e	28	0	-	
	Stadium + Phase 1	13	18	0	e	29	0	0	
	Maritime	12	12	-1	e	29	0	0	
	Full Buildout	12	14	-1	e	30	0	0	
	Variants	12	13	-1	e	31	0	0	
	Cumulative (Full Buildout)	12	14	-1	e	31	0	0	
38	Existing	-	-	-	-	-	-	-	-
	Stadium + Phase 1	16	31	-	e	33	0	-	
	Maritime	15	30	-	e	32	0	-	
	Full Buildout	12	13	-	e	28	0	-	
	Variants	12	12	-	e	27	0	-	
	Cumulative (Full Buildout)	12	13	-	e	28	0	-	
39	Existing	-	-	-	-	-	-	-	-
	Stadium + Phase 1	13	18	-	e	37	1	-	e
	Maritime	10	8	-		34	0	-	
	Full Buildout	11	10	-		34	0	-	
	Variants	11	10	-		34	0	-	
	Cumulative (Full Buildout)	11	10	-		35	0	-	
40	Existing	-	-	-	-	-	-	-	-
	Stadium + Phase 1	19	47	-	e	44	7	-	e
	Maritime	18	40	-	e	40	3	-	e
	Full Buildout	15	22	-	e	40	2	-	e
	Variants	15	22	-	e	40	2	-	e
	Cumulative (Full Buildout)	15	23	-	e	41	3	-	e

Table 1: Pedestrian Wind Comfort and Hazard Conditions - Grade Level

Location	Configuration	WIND COMFORT				WIND HAZARD			
		Wind Speed Exceeded (mph)	% of Time Exceeding	Speed Change (mph)	Exceeds	Wind Speed Exceeded (mph)	Hours per Year Exceeding	Hours Change	Exceeds
41	Existing	-	-	-	-	-	-	-	-
	Stadium + Phase 1	19	42	-	e	39	3	-	e
	Maritime	17	34	-	e	35	0	-	
	Full Buildout	14	19	-	e	31	0	-	
	Variants	14	19	-	e	31	0	-	
	Cumulative (Full Buildout)	14	20	-	e	32	0	-	
42	Existing	-	-	-	-	-	-	-	-
	Stadium + Phase 1	13	18	-	e	37	1	-	e
	Maritime	13	21	-	e	35	0	-	
	Full Buildout	12	13	-	e	35	0	-	
	Variants	12	13	-	e	35	0	-	
	Cumulative (Full Buildout)	12	14	-	e	35	0	-	
43	Existing	-	-	-	-	-	-	-	-
	Stadium + Phase 1	19	47	-	e	42	7	-	e
	Maritime	15	30	-	e	40	2	-	e
	Full Buildout	12	15	-	e	40	2	-	e
	Variants	12	14	-	e	39	2	-	e
	Cumulative (Full Buildout)	12	15	-	e	39	2	-	e
44	Existing	-	-	-	-	-	-	-	-
	Stadium + Phase 1	18	42	-	e	41	5	-	e
	Maritime	9	5	-		30	0	-	
	Full Buildout	10	6	-		30	0	-	
	Variants	10	6	-		30	0	-	
	Cumulative (Full Buildout)	10	6	-		31	0	-	
45	Existing	-	-	-	-	-	-	-	-
	Stadium + Phase 1	16	33	-	e	37	1	-	e
	Maritime	12	14	-	e	26	0	-	
	Full Buildout	11	10	-		24	0	-	
	Variants	11	10	-		24	0	-	
	Cumulative (Full Buildout)	11	10	-		24	0	-	
46	Existing	-	-	-	-	-	-	-	-
	Stadium + Phase 1	12	13	-	e	31	0	-	
	Maritime	10	7	-		26	0	-	
	Full Buildout	8	4	-		26	0	-	
	Variants	8	4	-		26	0	-	
	Cumulative (Full Buildout)	9	4	-		28	0	-	
47	Existing	-	-	-	-	-	-	-	-
	Stadium + Phase 1	15	28	-	e	32	0	-	
	Maritime	10	9	-		34	0	-	
	Full Buildout	10	8	-		34	0	-	
	Variants	10	8	-		34	0	-	
	Cumulative (Full Buildout)	10	8	-		35	0	-	
48	Existing	-	-	-	-	-	-	-	-
	Stadium + Phase 1	20	48	-	e	42	6	-	e
	Maritime	9	6	-		30	0	-	
	Full Buildout	9	6	-		30	0	-	
	Variants	9	5	-		30	0	-	
	Cumulative (Full Buildout)	9	6	-		29	0	-	

Table 1: Pedestrian Wind Comfort and Hazard Conditions - Grade Level

Location	Configuration	WIND COMFORT				WIND HAZARD			
		Wind Speed Exceeded (mph)	% of Time Exceeding	Speed Change (mph)	Exceeds	Wind Speed Exceeded (mph)	Hours per Year Exceeding	Hours Change	Exceeds
49	Existing	-	-	-	-	-	-	-	-
	Stadium + Phase 1	21	49	-	e	42	9	-	e
	Maritime	8	4	-		28	0	-	
	Full Buildout	8	4	-		27	0	-	
	Variants	8	4	-		27	0	-	
	Cumulative (Full Buildout)	9	5	-		29	0	-	
50	Existing	-	-	-	-	-	-	-	-
	Stadium + Phase 1	14	24	-	e	36	1	-	e
	Maritime	10	7	-		32	0	-	
	Full Buildout	10	7	-		32	0	-	
	Variants	9	7	-		33	0	-	
	Cumulative (Full Buildout)	10	7	-		34	0	-	
51	Existing	-	-	-	-	-	-	-	-
	Stadium + Phase 1	12	15	-	e	34	0	-	
	Maritime	9	6	-		32	0	-	
	Full Buildout	9	6	-		32	0	-	
	Variants	9	7	-		32	0	-	
	Cumulative (Full Buildout)	9	7	-		32	0	-	
52	Existing	-	-	-	-	-	-	-	-
	Stadium + Phase 1	12	12	-	e	36	1	-	e
	Maritime	9	5	-		35	0	-	
	Full Buildout	9	6	-		35	0	-	
	Variants	9	6	-		35	0	-	
	Cumulative (Full Buildout)	9	6	-		34	0	-	
53	Existing	-	-	-	-	-	-	-	-
	Stadium + Phase 1	15	32	-	e	36	1	-	e
	Maritime	8	4	-		37	1	-	e
	Full Buildout	8	4	-		38	1	-	e
	Variants	8	5	-		37	1	-	e
	Cumulative (Full Buildout)	8	4	-		30	0	-	
54	Existing	-	-	-	-	-	-	-	-
	Stadium + Phase 1	13	20	-	e	39	2	-	e
	Maritime	11	10	-		39	2	-	e
	Full Buildout	11	10	-		39	2	-	e
	Variants	11	10	-		40	3	-	e
	Cumulative (Full Buildout)	11	10	-		38	2	-	e
55	Existing	-	-	-	-	-	-	-	-
	Stadium + Phase 1	7	2	-		26	0	-	
	Maritime	7	2	-		27	0	-	
	Full Buildout	7	2	-		26	0	-	
	Variants	8	3	-		27	0	-	
	Cumulative (Full Buildout)	7	2	-		23	0	-	
56	Existing	10	7	-		26	0	-	
	Stadium + Phase 1	10	5	0		22	0	0	
	Maritime	7	2	-3		23	0	0	
	Full Buildout	7	2	-3		23	0	0	
	Variants	8	3	-2		26	0	0	
	Cumulative (Full Buildout)	7	2	-3		24	0	0	

Table 1: Pedestrian Wind Comfort and Hazard Conditions - Grade Level

Location	Configuration	WIND COMFORT				WIND HAZARD			
		Wind Speed Exceeded (mph)	% of Time Exceeding	Speed Change (mph)	Exceeds	Wind Speed Exceeded (mph)	Hours per Year Exceeding	Hours Change	Exceeds
57	Existing	10	6	-		30	0	-	
	Stadium + Phase 1	9	5	-1		24	0	0	
	Maritime	8	3	-2		23	0	0	
	Full Buildout	8	4	-2		24	0	0	
	Variants	9	4	-1		25	0	0	
	Cumulative (Full Buildout)	8	3	-2		23	0	0	
58	Existing	10	7	-		28	0	-	
	Stadium + Phase 1	13	17	3	e	37	1	1	e
	Maritime	12	15	2	e	38	2	2	e
	Full Buildout	12	14	2	e	38	1	1	e
	Variants	13	19	3	e	38	1	1	e
	Cumulative (Full Buildout)	12	12	2	e	34	0	0	
59	Existing	12	14	-	e	28	0	-	
	Stadium + Phase 1	12	13	0	e	27	0	0	
	Maritime	10	6	-2		27	0	0	
	Full Buildout	9	5	-3		28	0	0	
	Variants	10	7	-2		34	0	0	
	Cumulative (Full Buildout)	9	4	-3		24	0	0	
60	Existing	11	10	-		26	0	-	
	Stadium + Phase 1	12	12	1	e	37	1	1	e
	Maritime	12	12	1	e	37	1	1	e
	Full Buildout	12	12	1	e	37	1	1	e
	Variants	12	14	1	e	37	2	2	e
	Cumulative (Full Buildout)	12	12	1	e	35	0	0	
61	Existing	12	14	-	e	27	0	-	
	Stadium + Phase 1	11	10	-1		37	1	1	e
	Maritime	10	8	-2		38	1	1	e
	Full Buildout	10	8	-2		37	1	1	e
	Variants	11	10	-1		38	2	2	e
	Cumulative (Full Buildout)	11	10	-1		38	2	2	e
62	Existing	13	18	-	e	27	0	-	
	Stadium + Phase 1	13	19	0	e	31	0	0	
	Maritime	10	7	-3		30	0	0	
	Full Buildout	10	7	-3		30	0	0	
	Variants	10	6	-3		31	0	0	
	Cumulative (Full Buildout)	10	7	-3		30	0	0	
63	Existing	13	21	-	e	27	0	-	
	Stadium + Phase 1	12	13	-1	e	37	1	1	e
	Maritime	11	10	-2		37	2	2	e
	Full Buildout	11	10	-2		37	2	2	e
	Variants	11	10	-2		38	2	2	e
	Cumulative (Full Buildout)	11	10	-2		36	1	1	e
64	Existing	13	20	-	e	27	0	-	
	Stadium + Phase 1	10	8	-3		30	0	0	
	Maritime	8	4	-5		26	0	0	
	Full Buildout	8	3	-5		26	0	0	
	Variants	9	4	-4		26	0	0	
	Cumulative (Full Buildout)	9	4	-4		26	0	0	

Table 1: Pedestrian Wind Comfort and Hazard Conditions - Grade Level

Location	Configuration	WIND COMFORT				WIND HAZARD			
		Wind Speed Exceeded (mph)	% of Time Exceeding	Speed Change (mph)	Exceeds	Wind Speed Exceeded (mph)	Hours per Year Exceeding	Hours Change	Exceeds
65	Existing	13	19	-	e	28	0	-	
	Stadium + Phase 1	15	22	2	e	35	0	0	
	Maritime	11	10	-2		30	0	0	
	Full Buildout	10	8	-3		30	0	0	
	Variants	10	8	-3		31	0	0	
	Cumulative (Full Buildout)	10	8	-3		29	0	0	
66	Existing	13	19	-	e	26	0	-	
	Stadium + Phase 1	15	28	2	e	37	1	1	e
	Maritime	10	7	-3		33	0	0	
	Full Buildout	10	7	-3		33	0	0	
	Variants	10	7	-3		33	0	0	
	Cumulative (Full Buildout)	10	7	-3		32	0	0	
67	Existing	13	18	-	e	27	0	-	
	Stadium + Phase 1	9	6	-4		40	3	3	e
	Maritime	9	6	-4		36	1	1	e
	Full Buildout	9	6	-4		35	0	0	
	Variants	9	6	-4		36	1	1	e
	Cumulative (Full Buildout)	9	5	-4		34	0	0	
68	Existing	12	16	-	e	28	0	-	
	Stadium + Phase 1	18	41	6	e	41	5	5	e
	Maritime	12	13	0	e	38	3	3	e
	Full Buildout	12	13	0	e	38	2	2	e
	Variants	12	14	0	e	38	1	1	e
	Cumulative (Full Buildout)	12	14	0	e	38	2	2	e
69	Existing	13	19	-	e	28	0	-	
	Stadium + Phase 1	16	36	3	e	36	1	1	e
	Maritime	12	13	-1	e	32	0	0	
	Full Buildout	11	10	-2		33	0	0	
	Variants	11	10	-2		33	0	0	
	Cumulative (Full Buildout)	11	10	-2		32	0	0	
70	Existing	11	10	-		27	0	-	
	Stadium + Phase 1	15	29	4	e	33	0	0	
	Maritime	14	20	3	e	33	0	0	
	Full Buildout	14	19	3	e	34	0	0	
	Variants	13	20	2	e	33	0	0	
	Cumulative (Full Buildout)	13	19	2	e	34	0	0	
71	Existing	12	12	-	e	27	0	-	
	Stadium + Phase 1	12	17	0	e	29	0	0	
	Maritime	12	13	0	e	32	0	0	
	Full Buildout	12	12	0	e	33	0	0	
	Variants	12	13	0	e	31	0	0	
	Cumulative (Full Buildout)	11	10	-1		32	0	0	
72	Existing	12	16	-	e	28	0	-	
	Stadium + Phase 1	14	21	2	e	35	0	0	
	Maritime	16	34	4	e	36	1	1	e
	Full Buildout	15	28	3	e	36	1	1	e
	Variants	15	27	3	e	35	0	0	
	Cumulative (Full Buildout)	15	26	3	e	35	0	0	

Table 1: Pedestrian Wind Comfort and Hazard Conditions - Grade Level

Location	Configuration	WIND COMFORT				WIND HAZARD			
		Wind Speed Exceeded (mph)	% of Time Exceeding	Speed Change (mph)	Exceeds	Wind Speed Exceeded (mph)	Hours per Year Exceeding	Hours Change	Exceeds
73	Existing	13	18	-	e	26	0	-	
	Stadium + Phase 1	17	36	4	e	41	6	6	e
	Maritime	13	20	0	e	38	2	2	e
	Full Buildout	12	14	-1	e	37	2	2	e
	Variants	12	14	-1	e	38	2	2	e
	Cumulative (Full Buildout)	12	15	-1	e	38	2	2	e
74	Existing	13	22	-	e	27	0	-	
	Stadium + Phase 1	14	24	1	e	31	0	0	
	Maritime	13	16	0	e	32	0	0	
	Full Buildout	14	19	1	e	32	0	0	
	Variants	14	19	1	e	33	0	0	
	Cumulative (Full Buildout)	14	20	1	e	33	0	0	
75	Existing	13	19	-	e	27	0	-	
	Stadium + Phase 1	15	31	2	e	42	6	6	e
	Maritime	8	5	-5		31	0	0	
	Full Buildout	8	5	-5		31	0	0	
	Variants	8	5	-5		32	0	0	
	Cumulative (Full Buildout)	8	5	-5		32	0	0	
76	Existing	13	18	-	e	27	0	-	
	Stadium + Phase 1	14	25	1	e	37	1	1	e
	Maritime	15	27	2	e	34	0	0	
	Full Buildout	13	20	0	e	33	0	0	
	Variants	14	21	1	e	33	0	0	
	Cumulative (Full Buildout)	14	21	1	e	33	0	0	
77	Existing	13	18	-	e	27	0	-	
	Stadium + Phase 1	14	22	1	e	36	1	1	e
	Maritime	16	36	3	e	38	2	2	e
	Full Buildout	16	31	3	e	37	1	1	e
	Variants	16	31	3	e	37	2	2	e
	Cumulative (Full Buildout)	16	31	3	e	37	1	1	e
78	Existing	13	20	-	e	27	0	-	
	Stadium + Phase 1	16	32	3	e	39	3	3	e
	Maritime	18	35	5	e	40	3	3	e
	Full Buildout	15	26	2	e	35	0	0	
	Variants	15	26	2	e	36	1	1	e
	Cumulative (Full Buildout)	15	26	2	e	36	1	1	e
79	Existing	13	22	-	e	28	0	-	
	Stadium + Phase 1	18	42	5	e	37	2	2	e
	Maritime	14	25	1	e	35	0	0	
	Full Buildout	13	21	0	e	33	0	0	
	Variants	14	21	1	e	33	0	0	
	Cumulative (Full Buildout)	13	21	0	e	33	0	0	
80	Existing	13	19	-	e	28	0	-	
	Stadium + Phase 1	19	37	6	e	43	10	10	e
	Maritime	17	31	4	e	38	1	1	e
	Full Buildout	14	21	1	e	32	0	0	
	Variants	14	21	1	e	32	0	0	
	Cumulative (Full Buildout)	14	21	1	e	32	0	0	

Table 1: Pedestrian Wind Comfort and Hazard Conditions - Grade Level

Location	Configuration	WIND COMFORT				WIND HAZARD			
		Wind Speed Exceeded (mph)	% of Time Exceeding	Speed Change (mph)	Exceeds	Wind Speed Exceeded (mph)	Hours per Year Exceeding	Hours Change	Exceeds
81	Existing	13	18	-	e	27	0	-	
	Stadium + Phase 1	14	23	1	e	30	0	0	
	Maritime	12	13	-1	e	26	0	0	
	Full Buildout	12	12	-1	e	29	0	0	
	Variants	12	12	-1	e	29	0	0	
	Cumulative (Full Buildout)	12	13	-1	e	29	0	0	
82	Existing	13	21	-	e	27	0	-	
	Stadium + Phase 1	21	48	8	e	44	14	14	e
	Maritime	18	39	5	e	39	2	2	e
	Full Buildout	15	31	2	e	34	0	0	
	Variants	16	31	3	e	34	0	0	
	Cumulative (Full Buildout)	15	31	2	e	34	0	0	
83	Existing	12	14	-	e	26	0	-	
	Stadium + Phase 1	11	10	-1		33	0	0	
	Maritime	20	44	8	e	42	8	8	e
	Full Buildout	16	31	4	e	36	1	1	e
	Variants	16	31	4	e	36	1	1	e
	Cumulative (Full Buildout)	16	31	4	e	36	1	1	e
84	Existing	13	21	-	e	27	0	-	
	Stadium + Phase 1	18	40	5	e	41	4	4	e
	Maritime	15	27	2	e	31	0	0	
	Full Buildout	14	23	1	e	30	0	0	
	Variants	14	22	1	e	30	0	0	
	Cumulative (Full Buildout)	14	23	1	e	30	0	0	
85	Existing	13	18	-	e	27	0	-	
	Stadium + Phase 1	18	41	5	e	40	3	3	e
	Maritime	16	33	3	e	37	1	1	e
	Full Buildout	15	24	2	e	37	1	1	e
	Variants	15	24	2	e	37	1	1	e
	Cumulative (Full Buildout)	15	24	2	e	37	1	1	e
86	Existing	13	21	-	e	28	0	-	
	Stadium + Phase 1	19	42	6	e	41	7	7	e
	Maritime	17	37	4	e	36	1	1	e
	Full Buildout	13	16	0	e	30	0	0	
	Variants	13	16	0	e	29	0	0	
	Cumulative (Full Buildout)	13	16	0	e	30	0	0	
87	Existing	13	21	-	e	28	0	-	
	Stadium + Phase 1	15	31	2	e	35	0	0	
	Maritime	18	40	5	e	37	2	2	e
	Full Buildout	16	29	3	e	36	1	1	e
	Variants	16	29	3	e	36	1	1	e
	Cumulative (Full Buildout)	16	29	3	e	36	1	1	e
88	Existing	13	20	-	e	28	0	-	
	Stadium + Phase 1	16	32	3	e	37	1	1	e
	Maritime	14	25	1	e	30	0	0	
	Full Buildout	10	6	-3		25	0	0	
	Variants	10	6	-3		25	0	0	
	Cumulative (Full Buildout)	10	7	-3		27	0	0	

Table 1: Pedestrian Wind Comfort and Hazard Conditions - Grade Level

Location	Configuration	WIND COMFORT				WIND HAZARD			
		Wind Speed Exceeded (mph)	% of Time Exceeding	Speed Change (mph)	Exceeds	Wind Speed Exceeded (mph)	Hours per Year Exceeding	Hours Change	Exceeds
89	Existing	13	21	-	e	28	0	-	
	Stadium + Phase 1	7	2	-6		22	0	0	
	Maritime	7	2	-6		22	0	0	
	Full Buildout	8	3	-5		22	0	0	
	Variants	8	3	-5		22	0	0	
	Cumulative (Full Buildout)	8	3	-5		22	0	0	
90	Existing	13	20	-	e	28	0	-	
	Stadium + Phase 1	17	40	4	e	39	3	3	e
	Maritime	17	37	4	e	35	0	0	
	Full Buildout	15	26	2	e	32	0	0	
	Variants	15	26	2	e	32	0	0	
	Cumulative (Full Buildout)	15	27	2	e	34	0	0	
91	Existing	14	25	-	e	29	0	-	
	Stadium + Phase 1	15	26	1	e	37	2	2	e
	Maritime	13	19	-1	e	33	0	0	
	Full Buildout	13	21	-1	e	31	0	0	
	Variants	13	20	-1	e	32	0	0	
	Cumulative (Full Buildout)	13	21	-1	e	35	0	0	
92	Existing	13	19	-	e	29	0	-	
	Stadium + Phase 1	11	10	-2		29	0	0	
	Maritime	11	10	-2		26	0	0	
	Full Buildout	15	28	2	e	33	0	0	
	Variants	15	28	2	e	33	0	0	
	Cumulative (Full Buildout)	15	30	2	e	33	0	0	
93	Existing	12	16	-	e	29	0	-	
	Stadium + Phase 1	12	13	0	e	31	0	0	
	Maritime	12	13	0	e	27	0	0	
	Full Buildout	10	6	-2		25	0	0	
	Variants	10	6	-2		25	0	0	
	Cumulative (Full Buildout)	10	6	-2		26	0	0	
94	Existing	13	21	-	e	28	0	-	
	Stadium + Phase 1	14	24	1	e	37	1	1	e
	Maritime	13	18	0	e	30	0	0	
	Full Buildout	14	19	1	e	30	0	0	
	Variants	13	18	0	e	30	0	0	
	Cumulative (Full Buildout)	13	18	0	e	31	0	0	
95	Existing	13	22	-	e	28	0	-	
	Stadium + Phase 1	16	34	3	e	36	1	1	e
	Maritime	13	21	0	e	28	0	0	
	Full Buildout	16	32	3	e	34	0	0	
	Variants	16	33	3	e	33	0	0	
	Cumulative (Full Buildout)	16	32	3	e	33	0	0	
96	Existing	13	23	-	e	28	0	-	
	Stadium + Phase 1	11	10	-2		34	0	0	
	Maritime	14	25	1	e	30	0	0	
	Full Buildout	16	32	3	e	35	0	0	
	Variants	16	32	3	e	35	0	0	
	Cumulative (Full Buildout)	16	32	3	e	35	0	0	

Table 1: Pedestrian Wind Comfort and Hazard Conditions - Grade Level

Location	Configuration	WIND COMFORT				WIND HAZARD			
		Wind Speed Exceeded (mph)	% of Time Exceeding	Speed Change (mph)	Exceeds	Wind Speed Exceeded (mph)	Hours per Year Exceeding	Hours Change	Exceeds
97	Existing	13	22	-	e	28	0	-	
	Stadium + Phase 1	11	10	-2		33	0	0	
	Maritime	15	30	2	e	31	0	0	
	Full Buildout	11	10	-2		24	0	0	
	Variants	10	8	-3		23	0	0	
	Cumulative (Full Buildout)	10	8	-3		25	0	0	
98	Existing	13	21	-	e	28	0	-	
	Stadium + Phase 1	15	30	2	e	33	0	0	
	Maritime	15	30	2	e	31	0	0	
	Full Buildout	14	20	1	e	35	0	0	
	Variants	14	20	1	e	35	0	0	
	Cumulative (Full Buildout)	14	21	1	e	35	0	0	
99	Existing	13	22	-	e	27	0	-	
	Stadium + Phase 1	13	21	0	e	36	1	1	e
	Maritime	15	29	2	e	34	0	0	
	Full Buildout	11	10	-2		31	0	0	
	Variants	11	10	-2		31	0	0	
	Cumulative (Full Buildout)	11	10	-2		31	0	0	
100	Existing	13	22	-	e	27	0	-	
	Stadium + Phase 1	16	34	3	e	38	2	2	e
	Maritime	14	21	1	e	32	0	0	
	Full Buildout	15	25	2	e	35	0	0	
	Variants	15	24	2	e	35	0	0	
	Cumulative (Full Buildout)	15	24	2	e	35	0	0	
101	Existing	13	22	-	e	27	0	-	
	Stadium + Phase 1	11	10	-2		31	0	0	
	Maritime	16	32	3	e	36	1	1	e
	Full Buildout	16	32	3	e	37	1	1	e
	Variants	16	32	3	e	37	2	2	e
	Cumulative (Full Buildout)	16	32	3	e	36	1	1	e
102	Existing	13	21	-	e	27	0	-	
	Stadium + Phase 1	11	10	-2		30	0	0	
	Maritime	15	30	2	e	35	0	0	
	Full Buildout	16	34	3	e	32	0	0	
	Variants	16	35	3	e	32	0	0	
	Cumulative (Full Buildout)	16	34	3	e	33	0	0	
103	Existing	13	21	-	e	27	0	-	
	Stadium + Phase 1	17	35	4	e	36	1	1	e
	Maritime	16	33	3	e	40	3	3	e
	Full Buildout	15	31	2	e	40	3	3	e
	Variants	15	32	2	e	40	3	3	e
	Cumulative (Full Buildout)	15	31	2	e	39	2	2	e
104	Existing	13	23	-	e	28	0	-	
	Stadium + Phase 1	15	24	2	e	36	1	1	e
	Maritime	13	19	0	e	35	0	0	
	Full Buildout	12	16	-1	e	35	0	0	
	Variants	12	16	-1	e	36	1	1	e
	Cumulative (Full Buildout)	12	16	-1	e	36	1	1	e

Table 1: Pedestrian Wind Comfort and Hazard Conditions - Grade Level

Location	Configuration	WIND COMFORT				WIND HAZARD			
		Wind Speed Exceeded (mph)	% of Time Exceeding	Speed Change (mph)	Exceeds	Wind Speed Exceeded (mph)	Hours per Year Exceeding	Hours Change	Exceeds
105	Existing	13	17	-	e	27	0	-	
	Stadium + Phase 1	13	18	0	e	33	0	0	
	Maritime	15	29	2	e	38	2	2	e
	Full Buildout	15	30	2	e	38	2	2	e
	Variants	15	29	2	e	37	2	2	e
	Cumulative (Full Buildout)	15	31	2	e	38	2	2	e
106	Existing	13	20	-	e	27	0	-	
	Stadium + Phase 1	12	14	-1	e	29	0	0	
	Maritime	14	22	1	e	44	6	6	e
	Full Buildout	14	25	1	e	46	9	9	e
	Variants	14	25	1	e	46	9	9	e
	Cumulative (Full Buildout)	14	26	1	e	43	5	5	e
107	Existing	12	16	-	e	26	0	-	
	Stadium + Phase 1	12	15	0	e	28	0	0	
	Maritime	19	40	7	e	41	4	4	e
	Full Buildout	18	38	6	e	39	2	2	e
	Variants	18	39	6	e	39	2	2	e
	Cumulative (Full Buildout)	18	39	6	e	39	2	2	e
108	Existing	13	18	-	e	27	0	-	
	Stadium + Phase 1	13	17	0	e	32	0	0	
	Maritime	15	29	2	e	36	1	1	e
	Full Buildout	15	28	2	e	37	1	1	e
	Variants	15	28	2	e	37	1	1	e
	Cumulative (Full Buildout)	15	28	2	e	35	0	0	
109	Existing	11	10	-		25	0	-	
	Stadium + Phase 1	12	16	1	e	31	0	0	
	Maritime	12	12	1	e	34	0	0	
	Full Buildout	11	10	0		33	0	0	
	Variants	11	10	0		33	0	0	
	Cumulative (Full Buildout)	11	10	0		34	0	0	
110	Existing	12	13	-	e	26	0	-	
	Stadium + Phase 1	12	16	0	e	30	0	0	
	Maritime	14	19	2	e	42	6	6	e
	Full Buildout	13	19	1	e	42	5	5	e
	Variants	14	19	2	e	42	5	5	e
	Cumulative (Full Buildout)	14	19	2	e	43	6	6	e
111	Existing	12	13	-	e	25	0	-	
	Stadium + Phase 1	12	17	0	e	28	0	0	
	Maritime	9	4	-3		25	0	0	
	Full Buildout	8	3	-4		25	0	0	
	Variants	8	3	-4		25	0	0	
	Cumulative (Full Buildout)	8	4	-4		25	0	0	
112	Existing	13	19	-	e	26	0	-	
	Stadium + Phase 1	12	16	-1	e	26	0	0	
	Maritime	18	43	5	e	39	2	2	e
	Full Buildout	18	41	5	e	39	2	2	e
	Variants	18	42	5	e	40	2	2	e
	Cumulative (Full Buildout)	18	41	5	e	39	2	2	e

Table 1: Pedestrian Wind Comfort and Hazard Conditions - Grade Level

Location	Configuration	WIND COMFORT				WIND HAZARD			
		Wind Speed Exceeded (mph)	% of Time Exceeding	Speed Change (mph)	Exceeds	Wind Speed Exceeded (mph)	Hours per Year Exceeding	Hours Change	Exceeds
113	Existing	13	20	-	e	26	0	-	
	Stadium + Phase 1	12	16	-1	e	26	0	0	
	Maritime	16	30	3	e	36	1	1	e
	Full Buildout	16	33	3	e	35	0	0	
	Variants	16	33	3	e	35	0	0	
	Cumulative (Full Buildout)	16	34	3	e	36	1	1	e
114	Existing	11	10	-		27	0	-	
	Stadium + Phase 1	12	16	1	e	27	0	0	
	Maritime	17	37	6	e	34	0	0	
	Full Buildout	16	35	5	e	34	0	0	
	Variants	16	35	5	e	34	0	0	
	Cumulative (Full Buildout)	16	35	5	e	33	0	0	
115	Existing	12	15	-	e	27	0	-	
	Stadium + Phase 1	12	15	0	e	27	0	0	
	Maritime	13	19	1	e	36	1	1	e
	Full Buildout	13	20	1	e	35	0	0	
	Variants	13	20	1	e	36	1	1	e
	Cumulative (Full Buildout)	13	20	1	e	36	1	1	e
116	Existing	12	13	-	e	27	0	-	
	Stadium + Phase 1	12	15	0	e	27	0	0	
	Maritime	17	36	5	e	36	1	1	e
	Full Buildout	16	34	4	e	34	0	0	
	Variants	16	33	4	e	34	0	0	
	Cumulative (Full Buildout)	16	34	4	e	34	0	0	
117	Existing	11	10	-		27	0	-	
	Stadium + Phase 1	12	13	1	e	27	0	0	
	Maritime	17	38	6	e	38	2	2	e
	Full Buildout	16	34	5	e	37	1	1	e
	Variants	16	34	5	e	38	2	2	e
	Cumulative (Full Buildout)	17	35	6	e	38	2	2	e
118	Existing	12	14	-	e	27	0	-	
	Stadium + Phase 1	12	13	0	e	27	0	0	
	Maritime	18	43	6	e	40	3	3	e
	Full Buildout	18	40	6	e	39	3	3	e
	Variants	18	40	6	e	40	3	3	e
	Cumulative (Full Buildout)	17	39	5	e	38	3	3	e
119	Existing	12	17	-	e	26	0	-	
	Stadium + Phase 1	11	10	-1		26	0	0	
	Maritime	15	27	3	e	35	0	0	
	Full Buildout	14	28	2	e	34	0	0	
	Variants	14	28	2	e	34	0	0	
	Cumulative (Full Buildout)	15	28	3	e	34	0	0	
120	Existing	13	18	-	e	27	0	-	
	Stadium + Phase 1	12	13	-1	e	27	0	0	
	Maritime	16	31	3	e	37	2	2	e
	Full Buildout	15	27	2	e	36	1	1	e
	Variants	15	28	2	e	37	1	1	e
	Cumulative (Full Buildout)	15	28	2	e	36	1	1	e

Table 1: Pedestrian Wind Comfort and Hazard Conditions - Grade Level

Location	Configuration	WIND COMFORT				WIND HAZARD			
		Wind Speed Exceeded (mph)	% of Time Exceeding	Speed Change (mph)	Exceeds	Wind Speed Exceeded (mph)	Hours per Year Exceeding	Hours Change	Exceeds
121	Existing	13	19	-	e	28	0	-	
	Stadium + Phase 1	11	10	-2		27	0	0	
	Maritime	12	15	-1	e	37	1	1	e
	Full Buildout	13	20	0	e	36	1	1	e
	Variants	13	20	0	e	36	1	1	e
	Cumulative (Full Buildout)	13	20	0	e	35	0	0	
122	Existing	13	19	-	e	27	0	-	
	Stadium + Phase 1	11	10	-2		29	0	0	
	Maritime	16	34	3	e	37	1	1	e
	Full Buildout	17	35	4	e	37	1	1	e
	Variants	17	36	4	e	37	1	1	e
	Cumulative (Full Buildout)	17	36	4	e	37	1	1	e
123	Existing	13	19	-	e	27	0	-	
	Stadium + Phase 1	12	12	-1	e	28	0	0	
	Maritime	16	36	3	e	46	5	5	e
	Full Buildout	16	33	3	e	36	1	1	e
	Variants	15	33	2	e	36	1	1	e
	Cumulative (Full Buildout)	15	33	2	e	36	1	1	e
124	Existing	13	20	-	e	28	0	-	
	Stadium + Phase 1	11	10	-2		29	0	0	
	Maritime	17	36	4	e	36	1	1	e
	Full Buildout	16	32	3	e	34	0	0	
	Variants	16	33	3	e	33	0	0	
	Cumulative (Full Buildout)	16	33	3	e	33	0	0	
125	Existing	13	23	-	e	28	0	-	
	Stadium + Phase 1	11	10	-2		28	0	0	
	Maritime	14	27	1	e	35	0	0	
	Full Buildout	15	27	2	e	31	0	0	
	Variants	15	28	2	e	32	0	0	
	Cumulative (Full Buildout)	15	29	2	e	32	0	0	
126	Existing	13	22	-	e	28	0	-	
	Stadium + Phase 1	11	10	-2		30	0	0	
	Maritime	15	29	2	e	32	0	0	
	Full Buildout	12	15	-1	e	31	0	0	
	Variants	12	15	-1	e	31	0	0	
	Cumulative (Full Buildout)	12	15	-1	e	33	0	0	
127	Existing	13	20	-	e	28	0	-	
	Stadium + Phase 1	11	10	-2		30	0	0	
	Maritime	16	35	3	e	34	0	0	
	Full Buildout	14	26	1	e	30	0	0	
	Variants	14	26	1	e	31	0	0	
	Cumulative (Full Buildout)	14	25	1	e	30	0	0	
128	Existing	13	21	-	e	28	0	-	
	Stadium + Phase 1	12	13	-1	e	30	0	0	
	Maritime	14	21	1	e	29	0	0	
	Full Buildout	14	25	1	e	30	0	0	
	Variants	14	25	1	e	31	0	0	
	Cumulative (Full Buildout)	14	26	1	e	32	0	0	

Table 1: Pedestrian Wind Comfort and Hazard Conditions - Grade Level

Location	Configuration	WIND COMFORT				WIND HAZARD			
		Wind Speed Exceeded (mph)	% of Time Exceeding	Speed Change (mph)	Exceeds	Wind Speed Exceeded (mph)	Hours per Year Exceeding	Hours Change	Exceeds
129	Existing	13	21	-	e	28	0	-	
	Stadium + Phase 1	11	10	-2		29	0	0	
	Maritime	13	17	0	e	29	0	0	
	Full Buildout	17	37	4	e	36	1	1	e
	Variants	17	37	4	e	36	1	1	e
	Cumulative (Full Buildout)	18	39	5	e	38	1	1	e
130	Existing	13	22	-	e	28	0	-	
	Stadium + Phase 1	11	10	-2		33	0	0	
	Maritime	13	20	0	e	29	0	0	
	Full Buildout	17	36	4	e	36	1	1	e
	Variants	17	35	4	e	36	1	1	e
	Cumulative (Full Buildout)	17	36	4	e	36	1	1	e
131	Existing	13	24	-	e	28	0	-	
	Stadium + Phase 1	11	10	-2		31	0	0	
	Maritime	13	19	0	e	28	0	0	
	Full Buildout	16	31	3	e	34	0	0	
	Variants	16	32	3	e	35	0	0	
	Cumulative (Full Buildout)	16	32	3	e	35	0	0	
132	Existing	13	20	-	e	28	0	-	
	Stadium + Phase 1	11	10	-2		30	0	0	
	Maritime	11	10	-2		27	0	0	
	Full Buildout	17	33	4	e	38	2	2	e
	Variants	18	33	5	e	38	2	2	e
	Cumulative (Full Buildout)	18	34	5	e	38	2	2	e
133	Existing	13	21	-	e	28	0	-	
	Stadium + Phase 1	12	12	-1	e	28	0	0	
	Maritime	12	15	-1	e	27	0	0	
	Full Buildout	12	13	-1	e	26	0	0	
	Variants	12	14	-1	e	26	0	0	
	Cumulative (Full Buildout)	12	15	-1	e	26	0	0	
134	Existing	11	10	-		30	0	-	
	Stadium + Phase 1	12	14	1	e	29	0	0	
	Maritime	12	14	1	e	27	0	0	
	Full Buildout	12	15	1	e	26	0	0	
	Variants	12	15	1	e	26	0	0	
	Cumulative (Full Buildout)	12	16	1	e	26	0	0	
135	Existing	13	19	-	e	28	0	-	
	Stadium + Phase 1	12	16	-1	e	28	0	0	
	Maritime	12	17	-1	e	27	0	0	
	Full Buildout	17	38	4	e	36	1	1	e
	Variants	17	38	4	e	35	0	0	
	Cumulative (Full Buildout)	18	40	5	e	37	2	2	e
136	Existing	12	17	-	e	28	0	-	
	Stadium + Phase 1	11	10	-1		28	0	0	
	Maritime	12	12	0	e	26	0	0	
	Full Buildout	15	26	3	e	34	0	0	
	Variants	15	27	3	e	34	0	0	
	Cumulative (Full Buildout)	15	28	3	e	34	0	0	

Table 1: Pedestrian Wind Comfort and Hazard Conditions - Grade Level

Location	Configuration	WIND COMFORT				WIND HAZARD			
		Wind Speed Exceeded (mph)	% of Time Exceeding	Speed Change (mph)	Exceeds	Wind Speed Exceeded (mph)	Hours per Year Exceeding	Hours Change	Exceeds
137	Existing	13	21	-	e	28	0	-	
	Stadium + Phase 1	12	17	-1	e	29	0	0	
	Maritime	12	15	-1	e	27	0	0	
	Full Buildout	14	24	1	e	28	0	0	
	Variants	14	24	1	e	28	0	0	
	Cumulative (Full Buildout)	14	26	1	e	29	0	0	
138	Existing	13	20	-	e	28	0	-	
	Stadium + Phase 1	12	14	-1	e	29	0	0	
	Maritime	13	17	0	e	28	0	0	
	Full Buildout	19	39	6	e	41	5	5	e
	Variants	19	39	6	e	41	6	6	e
	Cumulative (Full Buildout)	19	40	6	e	41	5	5	e
139	Existing	13	21	-	e	28	0	-	
	Stadium + Phase 1	12	14	-1	e	29	0	0	
	Maritime	12	13	-1	e	28	0	0	
	Full Buildout	14	24	1	e	31	0	0	
	Variants	14	24	1	e	31	0	0	
	Cumulative (Full Buildout)	14	25	1	e	34	0	0	
140	Existing	13	21	-	e	28	0	-	
	Stadium + Phase 1	12	16	-1	e	29	0	0	
	Maritime	12	13	-1	e	26	0	0	
	Full Buildout	19	42	6	e	40	4	4	e
	Variants	19	43	6	e	40	4	4	e
	Cumulative (Full Buildout)	19	43	6	e	40	4	4	e
141	Existing	12	16	-	e	28	0	-	
	Stadium + Phase 1	11	10	-1		29	0	0	
	Maritime	13	18	1	e	33	0	0	
	Full Buildout	11	10	-1		30	0	0	
	Variants	11	10	-1		31	0	0	
	Cumulative (Full Buildout)	11	10	-1		30	0	0	
142	Existing	13	19	-	e	27	0	-	
	Stadium + Phase 1	12	16	-1	e	28	0	0	
	Maritime	16	33	3	e	37	1	1	e
	Full Buildout	16	32	3	e	33	0	0	
	Variants	16	32	3	e	33	0	0	
	Cumulative (Full Buildout)	16	33	3	e	33	0	0	
143	Existing	13	20	-	e	27	0	-	
	Stadium + Phase 1	12	13	-1	e	28	0	0	
	Maritime	11	10	-2		28	0	0	
	Full Buildout	13	19	0	e	32	0	0	
	Variants	13	19	0	e	33	0	0	
	Cumulative (Full Buildout)	13	21	0	e	33	0	0	
144	Existing	13	22	-	e	27	0	-	
	Stadium + Phase 1	11	10	-2		28	0	0	
	Maritime	9	4	-4		20	0	0	
	Full Buildout	13	20	0	e	35	0	0	
	Variants	13	19	0	e	35	0	0	
	Cumulative (Full Buildout)	14	20	1	e	38	2	2	e

Table 1: Pedestrian Wind Comfort and Hazard Conditions - Grade Level

Location	Configuration	WIND COMFORT				WIND HAZARD			
		Wind Speed Exceeded (mph)	% of Time Exceeding	Speed Change (mph)	Exceeds	Wind Speed Exceeded (mph)	Hours per Year Exceeding	Hours Change	Exceeds
145	Existing	12	17	-	e	27	0	-	
	Stadium + Phase 1	12	14	0	e	27	0	0	
	Maritime	17	36	5	e	41	3	3	e
	Full Buildout	16	35	4	e	36	1	1	e
	Variants	16	35	4	e	36	1	1	e
	Cumulative (Full Buildout)	16	35	4	e	36	1	1	e
146	Existing	13	18	-	e	27	0	-	
	Stadium + Phase 1	12	16	-1	e	27	0	0	
	Maritime	17	39	4	e	40	2	2	e
	Full Buildout	16	37	3	e	42	3	3	e
	Variants	16	36	3	e	42	3	3	e
	Cumulative (Full Buildout)	16	37	3	e	42	4	4	e
147	Existing	12	16	-	e	27	0	-	
	Stadium + Phase 1	12	15	0	e	27	0	0	
	Maritime	9	5	-3		28	0	0	
	Full Buildout	9	2	-3		18	0	0	
	Variants	9	2	-3		18	0	0	
	Cumulative (Full Buildout)	9	2	-3		18	0	0	
148	Existing	10	8	-		30	0	-	
	Stadium + Phase 1	13	21	3	e	30	0	0	
	Maritime	17	32	7	e	41	3	3	e
	Full Buildout	15	27	5	e	39	2	2	e
	Variants	15	28	5	e	39	2	2	e
	Cumulative (Full Buildout)	15	27	5	e	39	2	2	e
149	Existing	9	4	-		27	0	-	
	Stadium + Phase 1	10	6	1		31	0	0	
	Maritime	12	13	3	e	35	0	0	
	Full Buildout	12	12	3	e	37	1	1	e
	Variants	11	10	2		37	1	1	e
	Cumulative (Full Buildout)	12	12	3	e	37	1	1	e
150	Existing	10	6	-		27	0	-	
	Stadium + Phase 1	9	6	-1		27	0	0	
	Maritime	11	10	1		28	0	0	
	Full Buildout	11	10	1		27	0	0	
	Variants	11	10	1		27	0	0	
	Cumulative (Full Buildout)	11	10	1		28	0	0	
151	Existing	10	6	-		27	0	-	
	Stadium + Phase 1	8	5	-2		26	0	0	
	Maritime	12	12	2	e	33	0	0	
	Full Buildout	12	12	2	e	33	0	0	
	Variants	12	12	2	e	32	0	0	
	Cumulative (Full Buildout)	12	13	2	e	34	0	0	
152	Existing	10	7	-		27	0	-	
	Stadium + Phase 1	11	10	1		28	0	0	
	Maritime	-	-	-	-	-	-	-	-
	Full Buildout	-	-	-	-	-	-	-	-
	Variants	-	-	-	-	-	-	-	-
	Cumulative (Full Buildout)	-	-	-	-	-	-	-	-

Table 1: Pedestrian Wind Comfort and Hazard Conditions - Grade Level

Location	Configuration	WIND COMFORT				WIND HAZARD			
		Wind Speed Exceeded (mph)	% of Time Exceeding	Speed Change (mph)	Exceeds	Wind Speed Exceeded (mph)	Hours per Year Exceeding	Hours Change	Exceeds
153	Existing	8	3	-		22	0	-	
	Stadium + Phase 1	12	12	4	e	28	0	0	
	Maritime	-	-	-	-	-	-	-	-
	Full Buildout	-	-	-	-	-	-	-	-
	Variants	-	-	-	-	-	-	-	-
	Cumulative (Full Buildout)	-	-	-	-	-	-	-	-
154	Existing	12	13	-	e	26	0	-	
	Stadium + Phase 1	11	10	-1		26	0	0	
	Maritime	13	22	1	e	35	0	0	
	Full Buildout	13	18	1	e	33	0	0	
	Variants	13	19	1	e	33	0	0	
	Cumulative (Full Buildout)	13	18	1	e	32	0	0	
155	Existing	12	14	-	e	27	0	-	
	Stadium + Phase 1	12	13	0	e	27	0	0	
	Maritime	13	15	1	e	46	6	6	e
	Full Buildout	12	14	0	e	34	0	0	
	Variants	12	14	0	e	34	0	0	
	Cumulative (Full Buildout)	12	14	0	e	34	0	0	
156	Existing	12	14	-	e	27	0	-	
	Stadium + Phase 1	12	13	0	e	27	0	0	
	Maritime	14	23	2	e	38	1	1	e
	Full Buildout	14	23	2	e	34	0	0	
	Variants	14	23	2	e	33	0	0	
	Cumulative (Full Buildout)	14	24	2	e	33	0	0	
157	Existing	13	18	-	e	27	0	-	
	Stadium + Phase 1	12	13	-1	e	27	0	0	
	Maritime	17	36	4	e	35	0	0	
	Full Buildout	17	35	4	e	35	0	0	
	Variants	16	35	3	e	35	0	0	
	Cumulative (Full Buildout)	17	35	4	e	35	0	0	
158	Existing	11	10	-		27	0	-	
	Stadium + Phase 1	12	14	1	e	27	0	0	
	Maritime	13	18	2	e	31	0	0	
	Full Buildout	12	15	1	e	31	0	0	
	Variants	12	16	1	e	31	0	0	
	Cumulative (Full Buildout)	12	16	1	e	30	0	0	
159	Existing	11	10	-		27	0	-	
	Stadium + Phase 1	12	13	1	e	27	0	0	
	Maritime	15	26	4	e	34	0	0	
	Full Buildout	14	27	3	e	32	0	0	
	Variants	15	26	4	e	33	0	0	
	Cumulative (Full Buildout)	15	27	4	e	33	0	0	
160	Existing	11	10	-		27	0	-	
	Stadium + Phase 1	12	14	1	e	26	0	0	
	Maritime	14	25	3	e	30	0	0	
	Full Buildout	14	23	3	e	30	0	0	
	Variants	14	23	3	e	29	0	0	
	Cumulative (Full Buildout)	14	23	3	e	29	0	0	

Table 1: Pedestrian Wind Comfort and Hazard Conditions - Grade Level

Location	Configuration	WIND COMFORT				WIND HAZARD			
		Wind Speed Exceeded (mph)	% of Time Exceeding	Speed Change (mph)	Exceeds	Wind Speed Exceeded (mph)	Hours per Year Exceeding	Hours Change	Exceeds
161	Existing	12	12	-	e	27	0	-	
	Stadium + Phase 1	12	13	0	e	26	0	0	
	Maritime	14	22	2	e	34	0	0	
	Full Buildout	13	21	1	e	32	0	0	
	Variants	13	21	1	e	32	0	0	
	Cumulative (Full Buildout)	13	21	1	e	31	0	0	
162	Existing	13	20	-	e	27	0	-	
	Stadium + Phase 1	12	15	-1	e	26	0	0	
	Maritime	14	26	1	e	41	3	3	e
	Full Buildout	14	23	1	e	42	3	3	e
	Variants	14	24	1	e	41	3	3	e
	Cumulative (Full Buildout)	14	24	1	e	41	3	3	e
163	Existing	13	20	-	e	27	0	-	
	Stadium + Phase 1	12	17	-1	e	26	0	0	
	Maritime	16	31	3	e	34	0	0	
	Full Buildout	16	30	3	e	34	0	0	
	Variants	16	30	3	e	33	0	0	
	Cumulative (Full Buildout)	16	31	3	e	34	0	0	
164	Existing	13	22	-	e	27	0	-	
	Stadium + Phase 1	12	15	-1	e	25	0	0	
	Maritime	10	8	-3		26	0	0	
	Full Buildout	10	7	-3		25	0	0	
	Variants	10	8	-3		25	0	0	
	Cumulative (Full Buildout)	10	8	-3		25	0	0	
165	Existing	13	22	-	e	27	0	-	
	Stadium + Phase 1	13	19	0	e	27	0	0	
	Maritime	18	41	5	e	38	2	2	e
	Full Buildout	18	39	5	e	38	2	2	e
	Variants	18	40	5	e	38	2	2	e
	Cumulative (Full Buildout)	18	39	5	e	38	2	2	e
166	Existing	13	22	-	e	27	0	-	
	Stadium + Phase 1	12	17	-1	e	26	0	0	
	Maritime	17	37	4	e	37	1	1	e
	Full Buildout	17	35	4	e	36	1	1	e
	Variants	16	35	3	e	36	1	1	e
	Cumulative (Full Buildout)	17	35	4	e	37	1	1	e
167	Existing	13	23	-	e	28	0	-	
	Stadium + Phase 1	12	17	-1	e	25	0	0	
	Maritime	11	10	-2		27	0	0	
	Full Buildout	11	10	-2		27	0	0	
	Variants	11	10	-2		26	0	0	
	Cumulative (Full Buildout)	11	10	-2		26	0	0	
168	Existing	14	24	-	e	28	0	-	
	Stadium + Phase 1	13	23	-1	e	28	0	0	
	Maritime	19	43	5	e	41	5	5	e
	Full Buildout	19	42	5	e	41	5	5	e
	Variants	19	43	5	e	41	4	4	e
	Cumulative (Full Buildout)	19	43	5	e	41	5	5	e

Table 1: Pedestrian Wind Comfort and Hazard Conditions - Grade Level

Location	Configuration	WIND COMFORT				WIND HAZARD			
		Wind Speed Exceeded (mph)	% of Time Exceeding	Speed Change (mph)	Exceeds	Wind Speed Exceeded (mph)	Hours per Year Exceeding	Hours Change	Exceeds
169	Existing	13	19	-	e	29	0	-	
	Stadium + Phase 1	12	17	-1	e	28	0	0	
	Maritime	12	15	-1	e	31	0	0	
	Full Buildout	12	15	-1	e	31	0	0	
	Variants	12	15	-1	e	31	0	0	
	Cumulative (Full Buildout)	12	15	-1	e	31	0	0	

SUMMARY	Configurations	WIND COMFORT				WIND HAZARD			
		Average (mph)	Average (%)	Speed Change (mph)	Total	Average (mph)	Total Hours	Hours Change	Total
	Existing	**12 mph**	**17%**	**-**	**122 / 149**	**27 mph**	**0 Hrs**	**-**	**0 / 149**
	Stadium + Phase 1	**13 mph**	**17%**	**1**	**109 / 169**	**31 mph**	**151 Hrs**	**151**	**46 / 169**
	Maritime	**13 mph**	**18%**	**1**	**104 / 167**	**33 mph**	**131 Hrs**	**131**	**54 / 167**
	Full Buildout	**13 mph**	**18%**	**1**	**105 / 167**	**32 mph**	**103 Hrs**	**103**	**48 / 167**
	Variants	**13 mph**	**18%**	**1**	**107 / 167**	**33 mph**	**116 Hrs**	**116**	**53 / 167**
	Cumulative (Full Buildout)	**13 mph**	**18%**	**1**	**101 / 167**	**32 mph**	**109 Hrs**	**109**	**48 / 167**

Notes:
1) Wind Comfort = Wind speeds exceeding 11 mph for ≥ 10% of the time
2) Wind Hazard = Wind speeds exceeding 36 mph for ≥ 1 hour/year

Configurations		
A	**Existing**	Existing project site with existing surrounds
B	**Stadium + Phase 1**	Existing + Stadium + Phase 1
C	**Maritime**	Existing + Stadium + Phase 1 + Maritime Reservation Scenario
D	**Full Buildout**	Existing + Stadium + Phase 1 + Full Buildout
E	**Variants**	Existing + Stadium + Phase 1 + Full Buildout + Variants
F	**Cumulative (Full Buildout)**	Existing + Stadium + Phase 1 + Full Buildout + Cumulative

Table 2: Pedestrian Wind Comfort and Hazard Conditions - Stadium Roof

Location	Configuration	WIND COMFORT				WIND HAZARD			
		Wind Speed Exceeded (mph)	% of Time Exceeding	Speed Change (mph)	Exceeds	Wind Speed Exceeded (mph)	Hours per Year Exceeding	Hours Change	Exceeds
170	Existing	-	-	-	-	-	-	-	-
	Stadium + Phase 1	7	1	-		18	0	-	
	Maritime	6	0	-		15	0	-	
	Full Buildout	7	0	-		16	0	-	
	Variants	6	0	-		16	0	-	
	Cumulative (Full Buildout)	6	0	-		16	0	-	
171	Existing	-	-	-	-	-	-	-	-
	Stadium + Phase 1	8	2	-		22	0	-	
	Maritime	9	4	-		21	0	-	
	Full Buildout	8	1	-		20	0	-	
	Variants	8	1	-		20	0	-	
	Cumulative (Full Buildout)	7	1	-		21	0	-	
172	Existing	-	-	-	-	-	-	-	-
	Stadium + Phase 1	9	3	-		27	0	-	
	Maritime	10	7	-		25	0	-	
	Full Buildout	8	2	-		22	0	-	
	Variants	8	2	-		22	0	-	
	Cumulative (Full Buildout)	8	2	-		23	0	-	
173	Existing	-	-	-	-	-	-	-	-
	Stadium + Phase 1	8	2	-		24	0	-	
	Maritime	9	3	-		22	0	-	
	Full Buildout	8	2	-		21	0	-	
	Variants	8	2	-		20	0	-	
	Cumulative (Full Buildout)	8	2	-		22	0	-	
174	Existing	-	-	-	-	-	-	-	-
	Stadium + Phase 1	9	3	-		21	0	-	
	Maritime	9	3	-		20	0	-	
	Full Buildout	8	2	-		19	0	-	
	Variants	8	2	-		18	0	-	
	Cumulative (Full Buildout)	8	2	-		19	0	-	
175	Existing	-	-	-	-	-	-	-	-
	Stadium + Phase 1	9	3	-		21	0	-	
	Maritime	9	3	-		20	0	-	
	Full Buildout	8	2	-		19	0	-	
	Variants	8	2	-		18	0	-	
	Cumulative (Full Buildout)	8	2	-		19	0	-	
176	Existing	-	-	-	-	-	-	-	-
	Stadium + Phase 1	8	2	-		25	0	-	
	Maritime	6	0	-		21	0	-	
	Full Buildout	5	0	-		20	0	-	
	Variants	5	0	-		20	0	-	
	Cumulative (Full Buildout)	6	0	-		20	0	-	

Table 2: Pedestrian Wind Comfort and Hazard Conditions - Stadium Roof

Location	Configuration	WIND COMFORT				WIND HAZARD			
		Wind Speed Exceeded (mph)	% of Time Exceeding	Speed Change (mph)	Exceeds	Wind Speed Exceeded (mph)	Hours per Year Exceeding	Hours Change	Exceeds
177	Existing	-	-	-	-	-	-	-	-
	Stadium + Phase 1	9	4	-		28	0	-	
	Maritime	7	2	-		24	0	-	
	Full Buildout	6	1	-		23	0	-	
	Variants	6	1	-		23	0	-	
	Cumulative (Full Buildout)	6	1	-		23	0	-	
178	Existing	-	-	-	-	-	-	-	-
	Stadium + Phase 1	9	4	-		28	0	-	
	Maritime	7	2	-		24	0	-	
	Full Buildout	6	1	-		23	0	-	
	Variants	6	1	-		23	0	-	
	Cumulative (Full Buildout)	6	1	-		23	0	-	
179	Existing	-	-	-	-	-	-	-	-
	Stadium + Phase 1	9	5	-		26	0	-	
	Maritime	6	1	-		22	0	-	
	Full Buildout	6	2	-		23	0	-	
	Variants	6	2	-		22	0	-	
	Cumulative (Full Buildout)	6	2	-		23	0	-	
180	Existing	-	-	-	-	-	-	-	-
	Stadium + Phase 1	8	3	-		24	0	-	
	Maritime	6	2	-		23	0	-	
	Full Buildout	6	2	-		23	0	-	
	Variants	6	2	-		23	0	-	
	Cumulative (Full Buildout)	7	2	-		24	0	-	
181	Existing	-	-	-	-	-	-	-	-
	Stadium + Phase 1	8	4	-		29	0	-	
	Maritime	7	3	-		29	0	-	
	Full Buildout	7	4	-		29	0	-	
	Variants	8	4	-		29	0	-	
	Cumulative (Full Buildout)	7	4	-		29	0	-	
182	Existing	-	-	-	-	-	-	-	-
	Stadium + Phase 1	9	6	-		32	0	-	
	Maritime	9	6	-		33	0	-	
	Full Buildout	9	7	-		33	0	-	
	Variants	10	7	-		33	0	-	
	Cumulative (Full Buildout)	9	6	-		33	0	-	
183	Existing	-	-	-	-	-	-	-	-
	Stadium + Phase 1	9	5	-		26	0	-	
	Maritime	8	3	-		26	0	-	
	Full Buildout	9	4	-		26	0	-	
	Variants	9	4	-		27	0	-	
	Cumulative (Full Buildout)	9	3	-		26	0	-	

Table 2: Pedestrian Wind Comfort and Hazard Conditions - Stadium Roof

Location	Configuration	WIND COMFORT				WIND HAZARD			
		Wind Speed Exceeded (mph)	% of Time Exceeding	Speed Change (mph)	Exceeds	Wind Speed Exceeded (mph)	Hours per Year Exceeding	Hours Change	Exceeds
184	Existing	-	-	-	-	-	-	-	-
	Stadium + Phase 1	8	2	-		21	0	-	
	Maritime	8	2	-		19	0	-	
	Full Buildout	8	2	-		19	0	-	
	Variants	8	2	-		20	0	-	
	Cumulative (Full Buildout)	8	3	-		20	0	-	

SUMMARY	Configurations	WIND COMFORT				WIND HAZARD			
		Average (mph)	Average (%)	Speed Change (mph)	Total	Average (mph)	Total Hours	Hours Change	Total
	Existing	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
	Stadium + Phase 1	**8 mph**	**3%**	**-**	**0 / 15**	**25 mph**	**0 Hrs**	**-**	**0 / 15**
	Maritime	**8 mph**	**3%**	**-**	**0 / 15**	**23 mph**	**0 Hrs**	**-**	**0 / 15**
	Full Buildout	**7 mph**	**2%**	**-**	**0 / 15**	**22 mph**	**0 Hrs**	**-**	**0 / 15**
	Variants	**7 mph**	**2%**	**-**	**0 / 15**	**22 mph**	**0 Hrs**	**-**	**0 / 15**
	Cumulative (Full Buildout)	**7 mph**	**2%**	**-**	**0 / 15**	**23 mph**	**0 Hrs**	**-**	**0 / 15**

Notes:
1) Wind Comfort = Wind speeds exceeding 11 mph for ≥ 10% of the time
2) Wind Hazard = Wind speeds exceeding 36 mph for ≥ 1 hour/year

Configurations		
A	**Existing**	Existing project site with existing surrounds
B	**Stadium + Phase 1**	Existing + Stadium + Phase 1
C	**Maritime**	Existing + Stadium + Phase 1 + Maritime Reservation Scenario
D	**Full Buildout**	Existing + Stadium + Phase 1 + Full Buildout
E	**Variants**	Existing + Stadium + Phase 1 + Full Buildout + Variants
F	**Cumulative (Full Buildout)**	Existing + Stadium + Phase 1 + Full Buildout + Cumulative

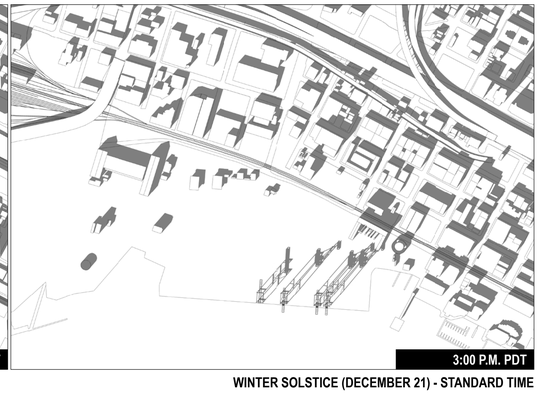
AES.3 MRS Shadow Diagrams

24" x 36" Arch D SHEET SIZE

SPRING EQUINOX (MARCH 21) - DAYLIGHT SAVINGS TIME

SUMMER SOLSTICE (JUNE 21) - DAYLIGHT SAVINGS TIME

FALL EQUINOX (SEPTEMBER 21) - DAYLIGHT SAVINGS TIME



WINTER SOLSTICE (DECEMBER 21) - STANDARD TIME

- PROPOSED PROJECT
- PROJECT VARIANTS
- CUMULATIVE PROJECTS
- EXISTING (CURRENT) SHADOWS
- NEW SHADING BY PROPOSED PROJECT
- NEW SHADING BY CUMULATIVE PROJECTS
- NEW SHADING BY PROJECT VARIANTS

NOTE: VISUAL SIMULATION ILLUSTRATES MAXIMUM ALLOWABLE BUILDING MASSING, REFER TO S1030 MAXIMUM BUILDING HEIGHT PLAN FOR BLOCK HEIGHTS.

THE OAKLAND ATHLETICS HOWARD TERMINAL MASTERPLAN

1 MARKET STREET, OAKLAND, CALIFORNIA 94607, USA

CEQA SUBMITTAL

CLIENT:
THE OAKLAND ATHLETICS
7000 Coliseum Way
Oakland, CA 94621 USA
TEL: +1 510 638 4900

DESIGN CONSULTANT:
BJARKE INGELS GROUP
45 Main Street, Floor 9
Brooklyn, NY 11201 USA
TEL: +1 347-549-4141 FAX: +1 866-738-4336

LANDSCAPE ARCHITECT:
JAMES CORNER FIELD OPERATIONS
633 Battery Street, Suite 118
San Francisco, CA 94111
TEL: +1 415 943 9197

CIVIL ENGINEER:
BKF ENGINEERS
255 Shoreline Drive, Suite 200
Redwood City, CA 94065
TEL: +1 650 482 6377

TRANSPORTATION ENGINEER:
FEHR & PEERS
2201 Broadway, Suite 602
Oakland, CA 94612
TEL: +1 510 834 3200

LIGHTING CONSULTANT:
HLB LIGHTING DESIGN INC.
300 Brannan Street, Suite 212
San Francisco, CA 94107
TEL: +1 415 348 8273

	DATE:	REVISION:

THESE DRAWINGS ARE INSTRUMENTS OF SERVICE AND AS SUCH MAY NOT BE USED FOR OTHER PROJECTS, FOR ADDITIONS TO THIS PROJECT OR COMPLETION OF THIS PROJECT BY OTHERS.

NOT FOR CONSTRUCTION

KEY PLAN

BAR SCALE

0 100 500 1000 2000

DRAWING TITLE:

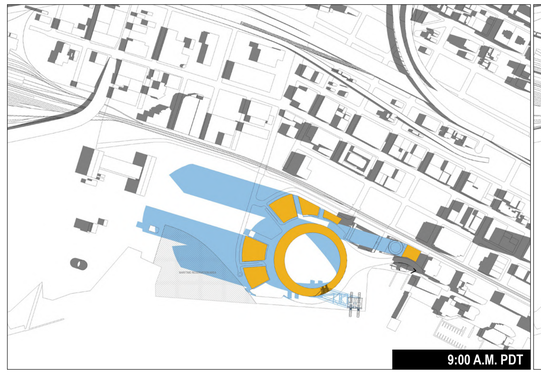
SHADOW ANALYSIS EXISTING - MARITIME RESERVATION SCENARIO

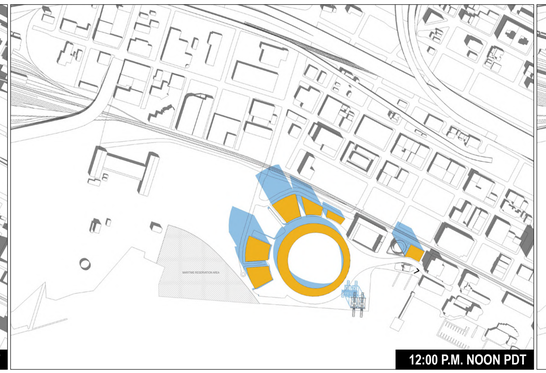
DRAWING NO:

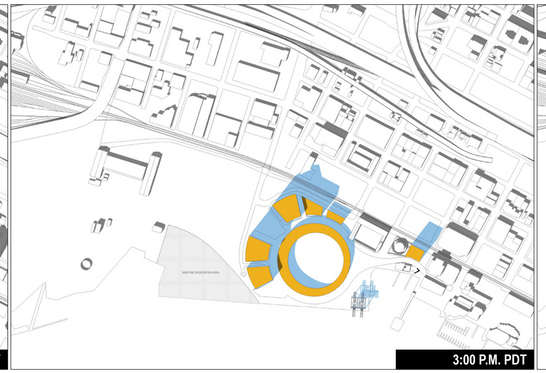
S8310B

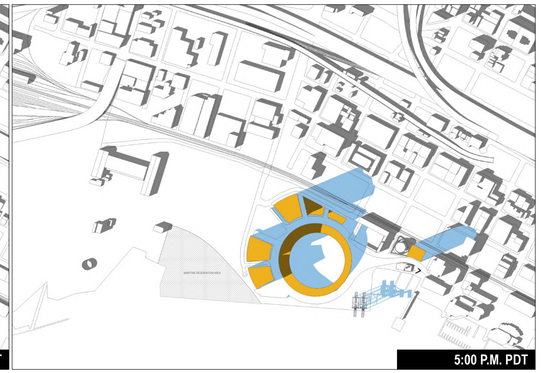
PROJECT NO:	18520
SCALE:	AS NOTED
FORMAT:	ARCH D
DATE:	10/23/2020

24" x 36" Arch D SHEET SIZE

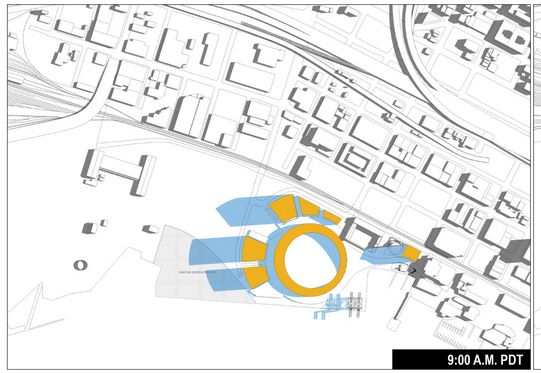


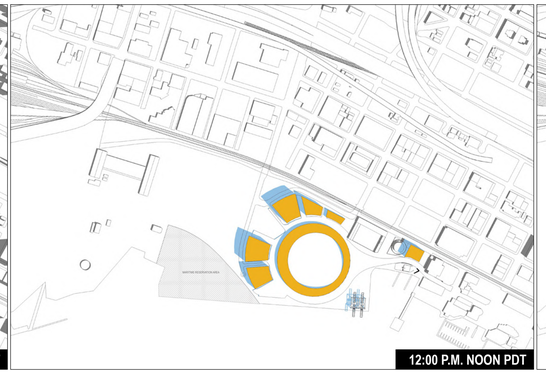


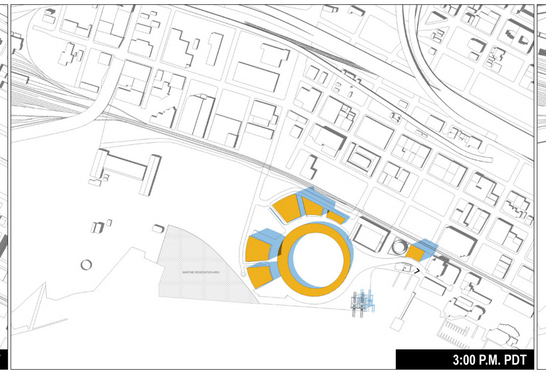


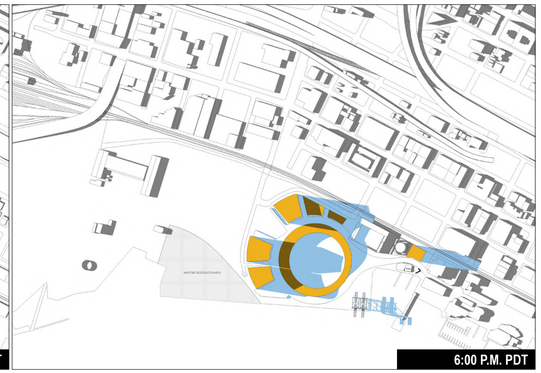


SPRING EQUINOX (MARCH 21) - DAYLIGHT SAVINGS TIME

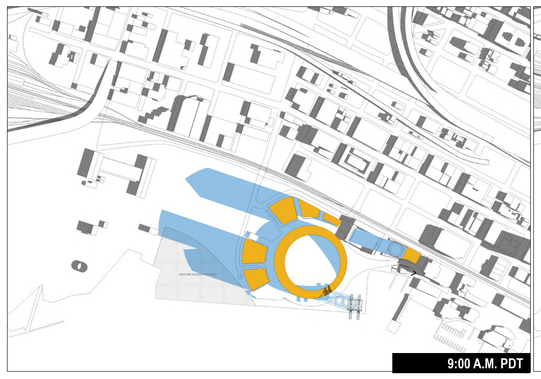


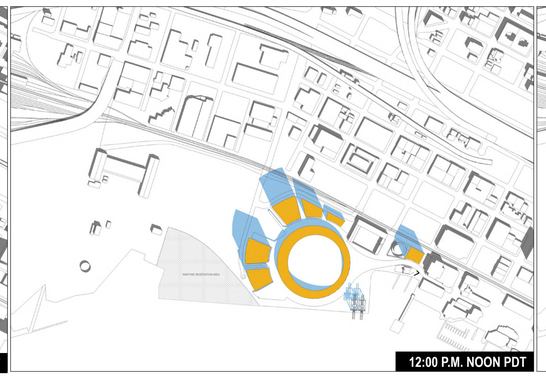


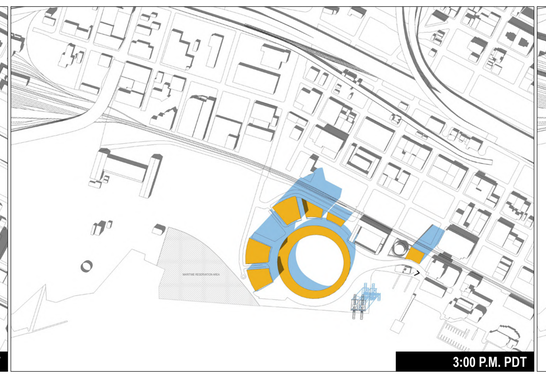


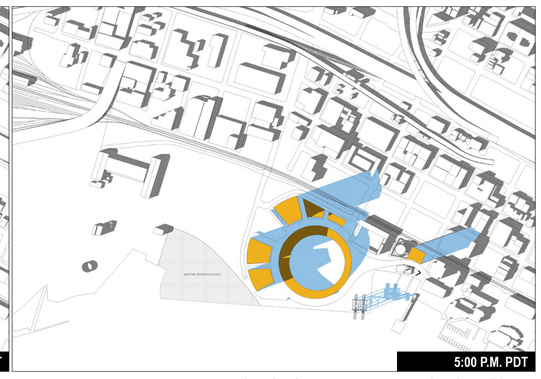


SUMMER SOLSTICE (JUNE 21) - DAYLIGHT SAVINGS TIME

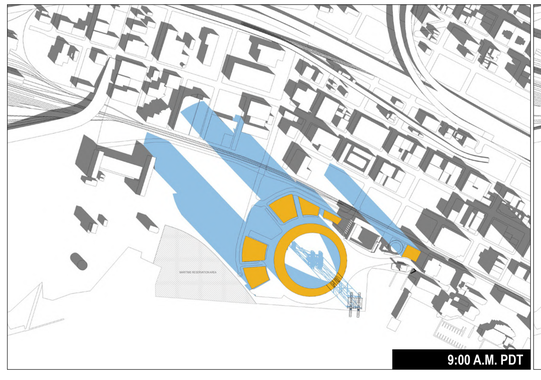


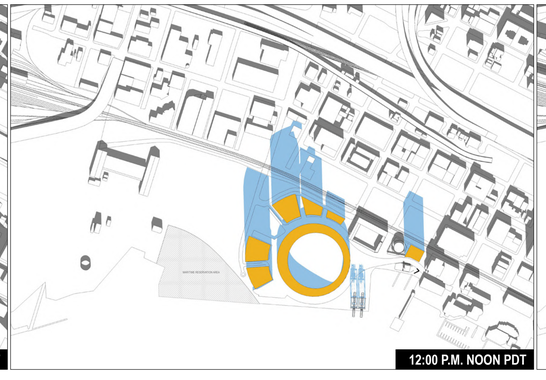


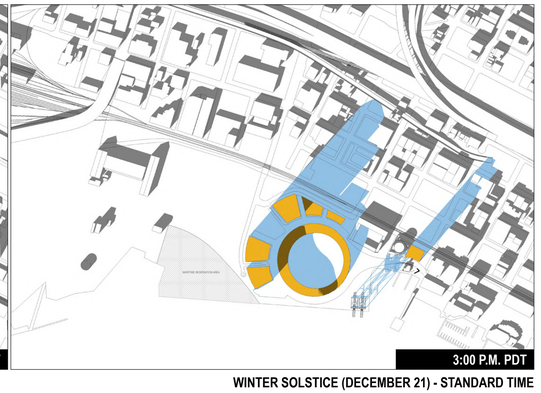




FALL EQUINOX (SEPTEMBER 21) - DAYLIGHT SAVINGS TIME







WINTER SOLSTICE (DECEMBER 21) - STANDARD TIME

- PROPOSED PROJECT
- PROJECT VARIANTS
- CUMULATIVE PROJECTS
- EXISTING (CURRENT) SHADOWS
- NEW SHADING BY PROPOSED PROJECT
- NEW SHADING BY CUMULATIVE PROJECTS
- NEW SHADING BY PROJECT VARIANTS

NOTE: VISUAL SIMULATION ILLUSTRATES MAXIMUM ALLOWABLE BUILDING MASSING, REFER TO S1030 MAXIMUM BUILDING HEIGHT PLAN FOR BLOCK HEIGHTS.

THE OAKLAND ATHLETICS HOWARD TERMINAL MASTERPLAN

1 MARKET STREET, OAKLAND, CALIFORNIA 94607, USA

CEQA SUBMITTAL

CLIENT:
THE OAKLAND ATHLETICS
7000 Coliseum Way
Oakland, CA 94621 USA
TEL: +1 510 638 4900

DESIGN CONSULTANT:
BJARKE INGELS GROUP
45 Main Street, Floor 9
Brooklyn, NY 11201 USA
TEL: +1 347-549-4141 FAX: +1 866-738-4336

LANDSCAPE ARCHITECT:
JAMES CORNER FIELD OPERATIONS
633 Battery Street, Suite 118
San Francisco, CA 94111
TEL: +1 415 943 9197

CIVIL ENGINEER:
BKF ENGINEERS
255 Shoreline Drive, Suite 200
Redwood City, CA 94065
TEL: +1 650 482 6377

TRANSPORTATION ENGINEER:
FEHR & PEERS
2201 Broadway, Suite 602
Oakland, CA 94612
TEL: +1 510 834 3200

LIGHTING CONSULTANT:
HLB LIGHTING DESIGN INC.
300 Brannan Street, Suite 212
San Francisco, CA 94107
TEL: +1 415 348 8273

	DATE:	REVISION:

THESE DRAWINGS ARE INSTRUMENTS OF SERVICE AND AS SUCH MAY NOT BE USED FOR OTHER PROJECTS, FOR ADDITIONS TO THIS PROJECT OR COMPLETION OF THIS PROJECT BY OTHERS.

NOT FOR CONSTRUCTION

KEY PLAN

BAR SCALE
0 100 500 1000 2000

DRAWING TITLE:

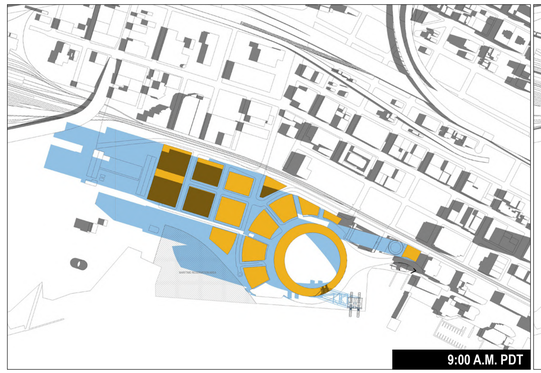
SHADOW ANALYSIS EXISTING & PHASE 1 - MARITIME RESERVATION SCENARIO

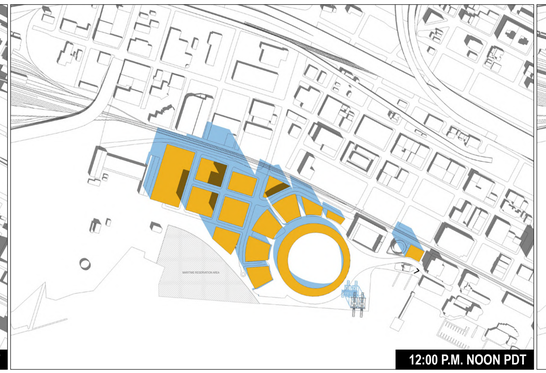
DRAWING NO:

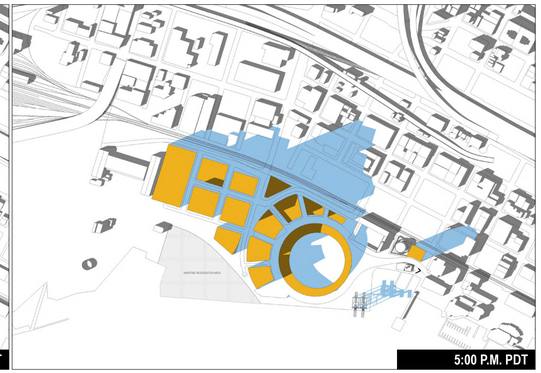
S8320B

PROJECT NO:	18520
SCALE:	AS NOTED
FORMAT:	ARCH D
DATE:	10/23/2020

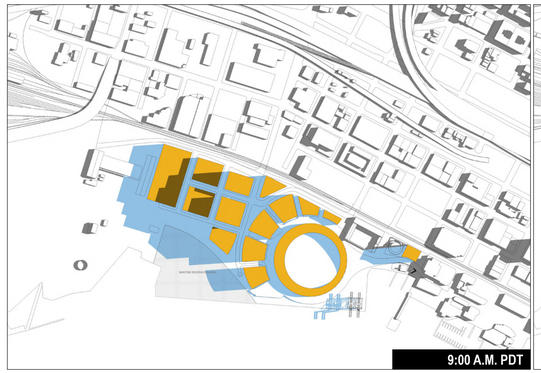
24" x 36" Arch D SHEET SIZE

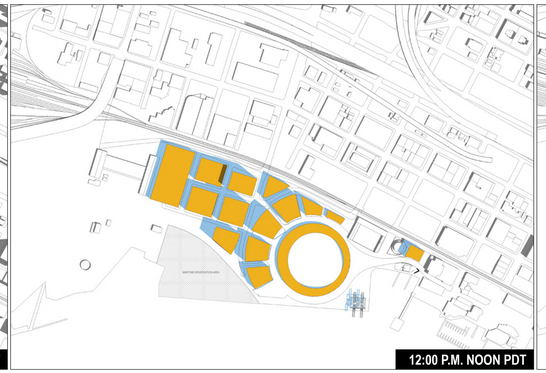


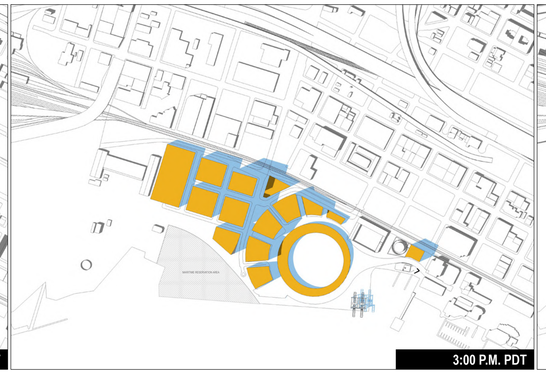


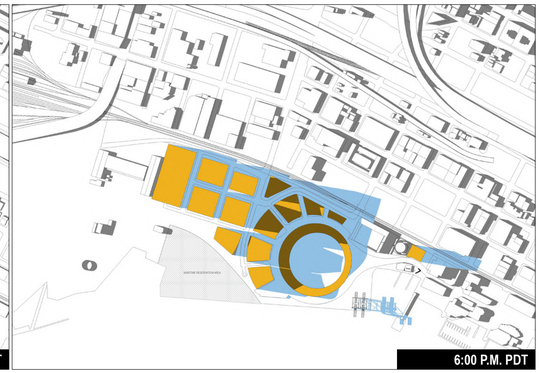


SPRING EQUINOX (MARCH 21) - DAYLIGHT SAVINGS TIME

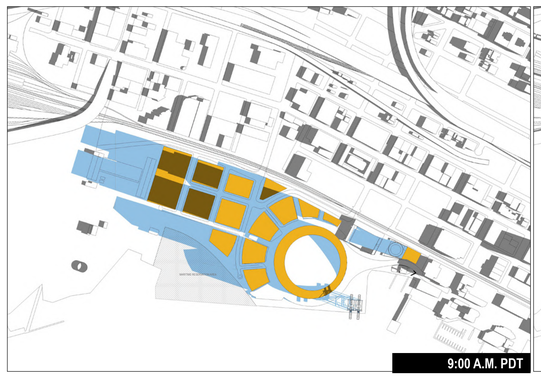


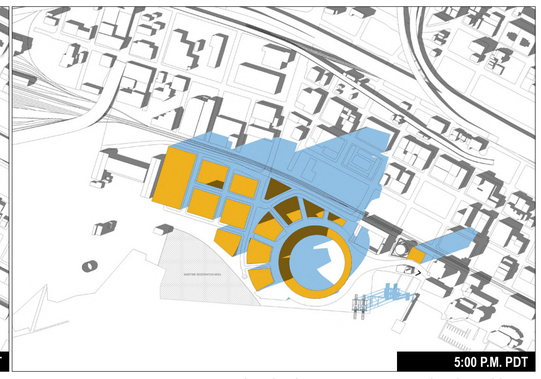




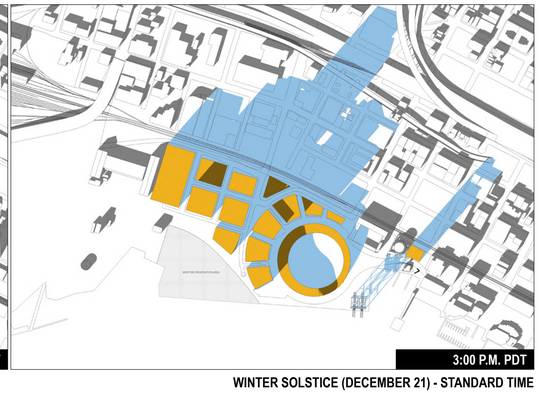


SUMMER SOLSTICE (JUNE 21) - DAYLIGHT SAVINGS TIME





FALL EQUINOX (SEPTEMBER 21) - DAYLIGHT SAVINGS TIME



WINTER SOLSTICE (DECEMBER 21) - STANDARD TIME

- PROPOSED PROJECT
- PROJECT VARIANTS
- CUMULATIVE PROJECTS
- EXISTING (CURRENT) SHADOWS
- NEW SHADING BY PROPOSED PROJECT
- NEW SHADING BY CUMULATIVE PROJECTS
- NEW SHADING BY PROJECT VARIANTS

NOTE: VISUAL SIMULATION ILLUSTRATES MAXIMUM ALLOWABLE BUILDING MASSING, REFER TO S1030 MAXIMUM BUILDING HEIGHT PLAN FOR BLOCK HEIGHTS.

THE OAKLAND ATHLETICS HOWARD TERMINAL MASTERPLAN

1 MARKET STREET, OAKLAND, CALIFORNIA 94607, USA

CEQA SUBMITTAL

CLIENT:
THE OAKLAND ATHLETICS
7000 Coliseum Way
Oakland, CA 94621 USA
TEL: +1 510 638 4900

DESIGN CONSULTANT:
BJARKE INGELS GROUP
45 Main Street, Floor 9
Brooklyn, NY 11201 USA
TEL: +1 347-549-4141 FAX: +1 866-738-4336

LANDSCAPE ARCHITECT:
JAMES CORNER FIELD OPERATIONS
633 Battery Street, Suite 118
San Francisco, CA 94111
TEL: +1 415 943 9197

CIVIL ENGINEER:
BKF ENGINEERS
255 Shoreline Drive, Suite 200
Redwood City, CA 94065
TEL: +1 650 482 6377

TRANSPORTATION ENGINEER:
FEHR & PEERS
2201 Broadway, Suite 602
Oakland, CA 94612
TEL: +1 510 834 3200

LIGHTING CONSULTANT:
HLB LIGHTING DESIGN INC.
300 Brannan Street, Suite 212
San Francisco, CA 94107
TEL: +1 415 348 8273

	DATE:	REVISION:

THESE DRAWINGS ARE INSTRUMENTS OF SERVICE AND AS SUCH MAY NOT BE USED FOR OTHER PROJECTS, FOR ADDITIONS TO THIS PROJECT OR COMPLETION OF THIS PROJECT BY OTHERS.

NOT FOR CONSTRUCTION

KEY PLAN

BAR SCALE
0 100 500 1000 2000

DRAWING TITLE:

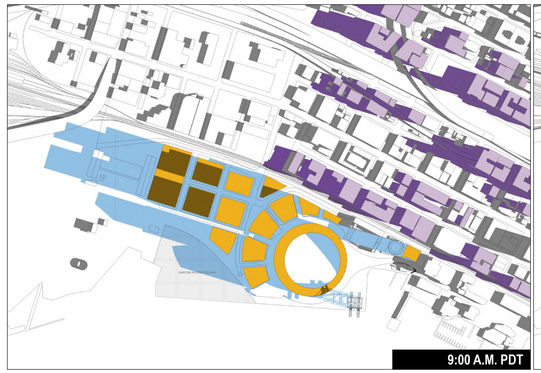
SHADOW ANALYSIS EXISTING & FULL BUILDOUT - MARITIME RESERVATION SCENARIO

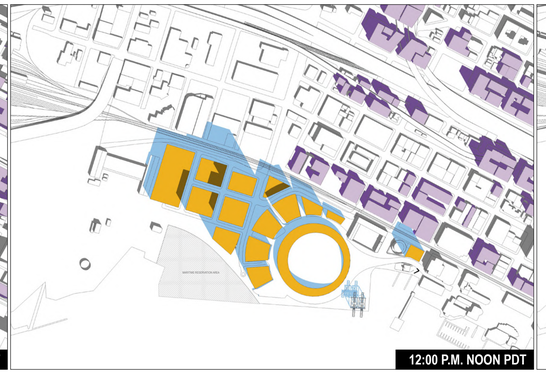
DRAWING NO:

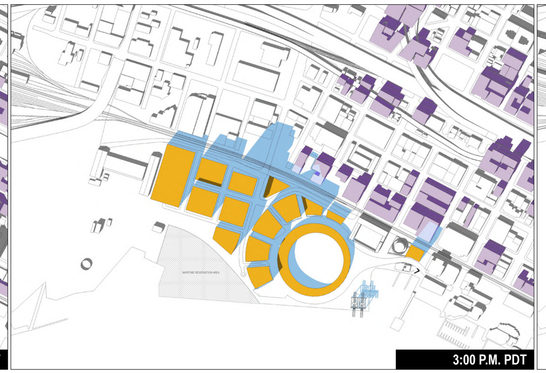
S8330B

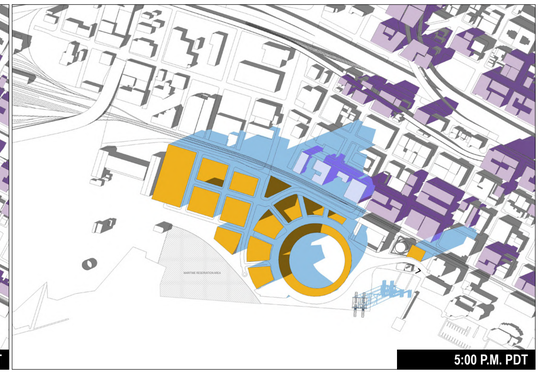
PROJECT NO:	18520
SCALE:	AS NOTED
FORMAT:	ARCH D
DATE:	10/23/2020

24" x 36" Arch D SHEET SIZE

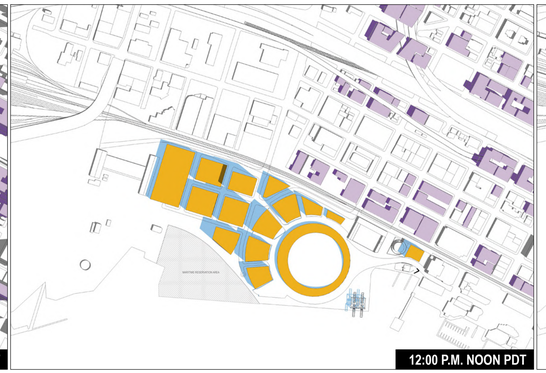




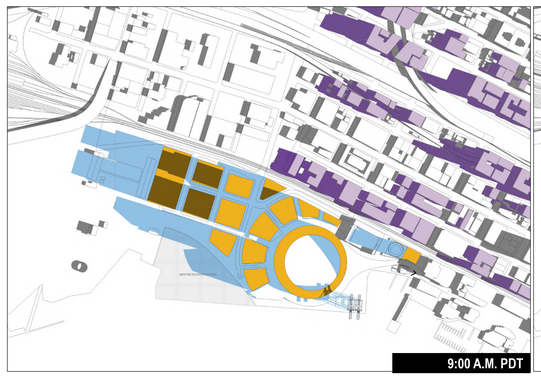


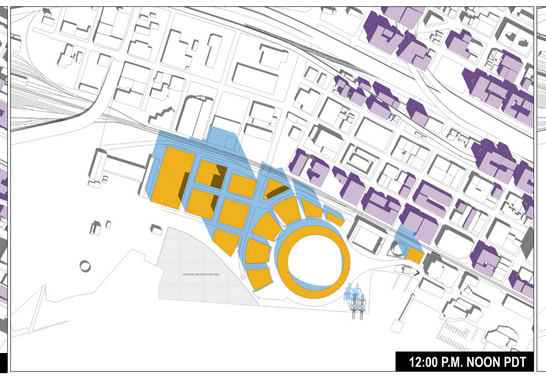


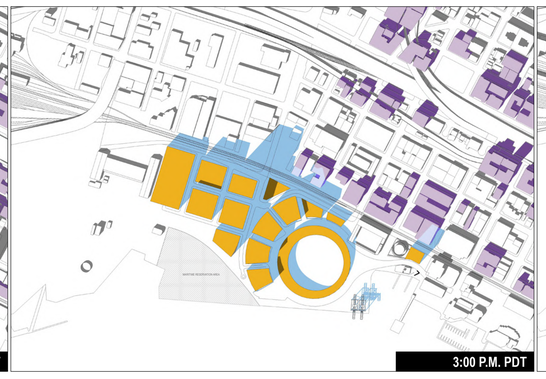
SPRING EQUINOX (MARCH 21) - DAYLIGHT SAVINGS TIME

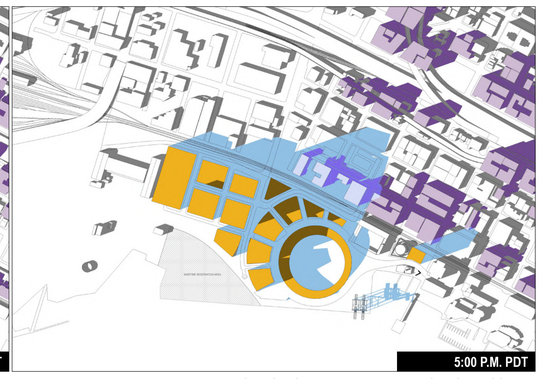


SUMMER SOLSTICE (JUNE 21) - DAYLIGHT SAVINGS TIME

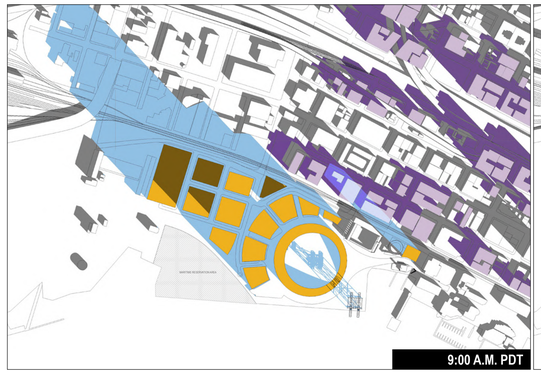


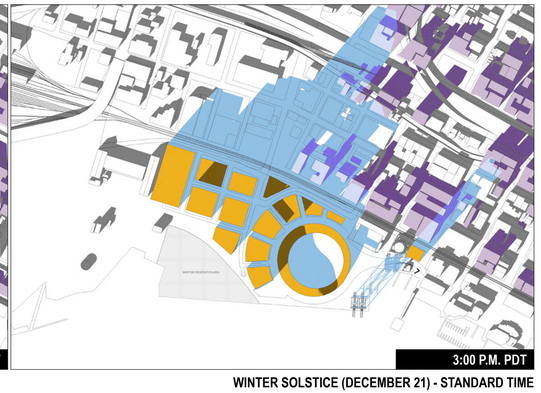






FALL EQUINOX (SEPTEMBER 21) - DAYLIGHT SAVINGS TIME





WINTER SOLSTICE (DECEMBER 21) - STANDARD TIME

- PROPOSED PROJECT
- PROJECT VARIANTS
- CUMULATIVE PROJECTS
- EXISTING (CURRENT) SHADOWS
- NEW SHADING BY PROPOSED PROJECT
- NEW SHADING BY CUMULATIVE PROJECTS
- NEW SHADING BY PROJECT VARIANTS

NOTE: VISUAL SIMULATION ILLUSTRATES MAXIMUM ALLOWABLE BUILDING MASSING, REFER TO S1030 MAXIMUM BUILDING HEIGHT PLAN FOR BLOCK HEIGHTS.

THE OAKLAND ATHLETICS HOWARD TERMINAL MASTERPLAN

1 MARKET STREET, OAKLAND, CALIFORNIA 94607, USA

CEQA SUBMITTAL

CLIENT:
THE OAKLAND ATHLETICS
7000 Coliseum Way
Oakland, CA 94621 USA
TEL: +1 510 638 4900

DESIGN CONSULTANT:
BJARKE INGELS GROUP
45 Main Street, Floor 9
Brooklyn, NY 11201 USA
TEL: +1 347-549-4141 FAX: +1 866-738-4336

LANDSCAPE ARCHITECT:
JAMES CORNER FIELD OPERATIONS
633 Battery Street, Suite 118
San Francisco, CA 94111
TEL: +1 415 943 9197

CIVIL ENGINEER:
BKF ENGINEERS
255 Shoreline Drive, Suite 200
Redwood City, CA 94065
TEL: +1 650 482 6377

TRANSPORTATION ENGINEER:
FEHR & PEERS
2201 Broadway, Suite 602
Oakland, CA 94612
TEL: +1 510 834 3200

LIGHTING CONSULTANT:
HLB LIGHTING DESIGN INC.
300 Brannan Street, Suite 212
San Francisco, CA 94107
TEL: +1 415 348 8273

	DATE:	REVISION:

THESE DRAWINGS ARE INSTRUMENTS OF SERVICE AND AS SUCH MAY NOT BE USED FOR OTHER PROJECTS, FOR ADDITIONS TO THIS PROJECT OR COMPLETION OF THIS PROJECT BY OTHERS.

NOT FOR CONSTRUCTION

KEY PLAN

BAR SCALE
0 100 500 1000 2000

DRAWING TITLE:

SHADOW ANALYSIS FULL BUILDOUT & CUMULATIVE - MARITIME RESERVATION SCENARIO

DRAWING NO:

S8340B

PROJECT NO:	18520
SCALE:	AS NOTED
FORMAT:	ARCH D
DATE:	10/23/2020