

**Appendix A:
Lighting Study**

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City of Hayward, Alameda County

Digital Billboards

Photometric Analysis

Project Number
2017081.00

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Date Submitted
29 May, 2017

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1.0 NARRATIVE

We (exp engineering) have conducted a photometric review of the digital billboard being proposed at 17302 Langton Way and 22083 Arbor Ave in Hayward, CA..

Using the photometric software AGI32, we studied the screen's output brightness to determine the following:

- A) Potential modifications to the sign that may be needed to comply with the OAAA (Outdoor Advertising Association of America) Lighting Level Guideline, and
- B) The impact the sign will have at night on the surrounding community.

The proposed billboard is to be 14'x48' with the top of the sign mounted at +80' above the ground with maximum screen brightness of 300 NITS (300 Candela per Square Meter) in the evening. Per OAAA guidelines, the proposed sign, displaying a full white image (for maximum brightness) should not exceed .3 foot candles over the surrounding ambient light levels at a distance of 250' in any direction.

The photometry used in this study is based on the specified Nichia series 336 LED modules, which output light horizontally at 90° and 45° vertically, at the evening output level of 300 Candela per Square Meter.

As we are unable to determine what the ambient light levels will be at the location, the studies were done assuming the worst-case scenario of no ambient light.

We have included graphical illustrations demonstrating the light levels in foot-candles we expect from the screen.

SHEET 1 of the attachment is a location plan at the 17302 Langton Way site, indicating the 250' boundary overlaid on a map of the proposed site, as well as the projected relative angle of light emanating from the sign.

SHEET 2 shows the overall light levels at the ground, freeway, and adjacent buildings over the entire Langton area.

SHEET 3 is a graphic representation of the light levels impacting the adjacent residential buildings around the Langton site.

SHEET 4 of the attachment is a location plan at the 22083 Arbor Ave site, indicating the 250' boundary overlaid on a map of the proposed site, as well as the projected relative angle of light emanating from the sign.

SHEET 5 shows the overall light levels at the ground, freeway onramp, freeway, and buildings adjacent to the Arbor area.

SHEET 6 is a graphic representation of the light levels impacting the adjacent residential buildings around the Arbor site.

Conclusions

We see no light levels in excess of .3fc beyond the 250' radius of the signs, nor do we find any significant impact to the neighboring property provided the sign brightness is reduced after dark to the 300 NIT level.

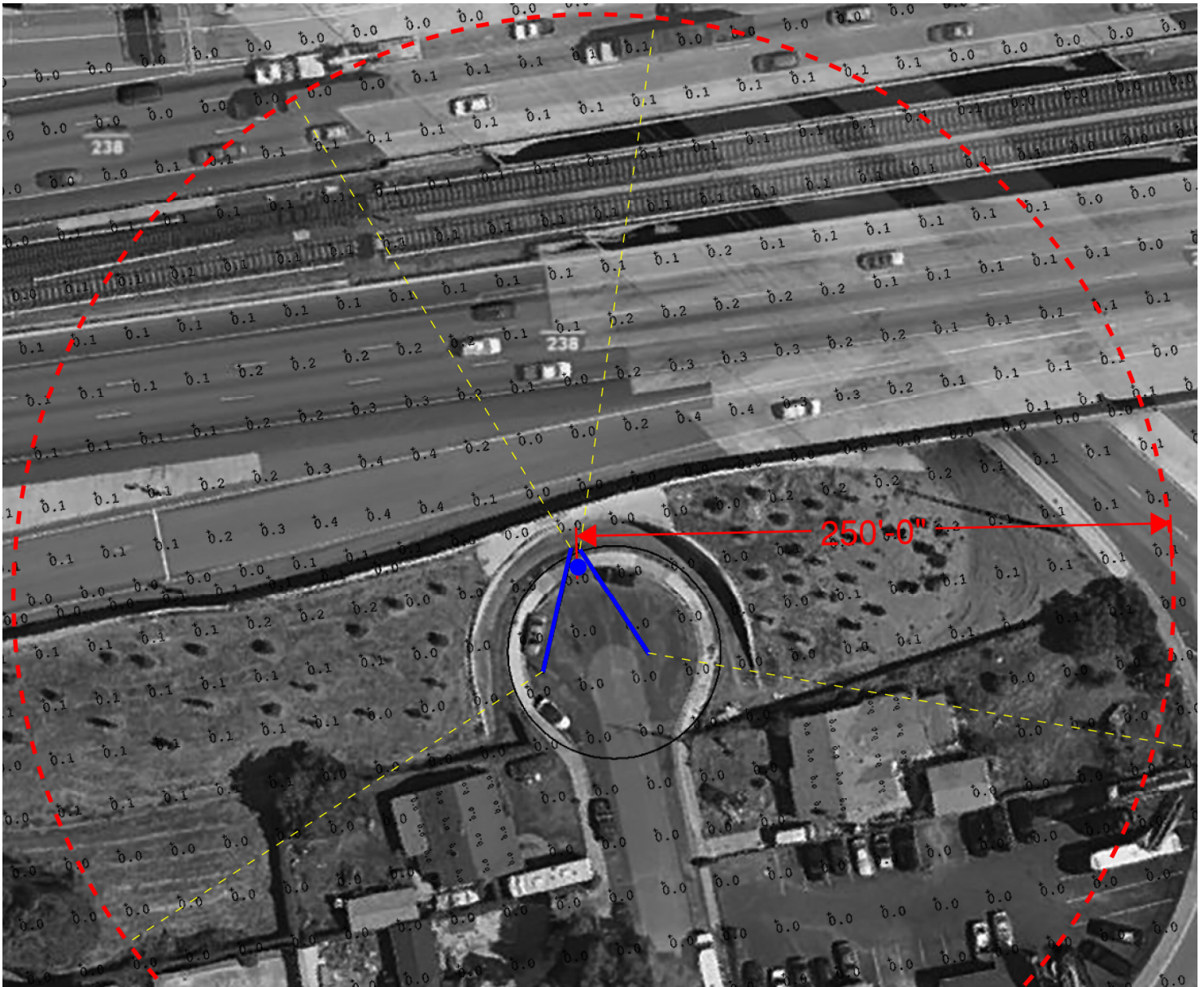
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Appendix

Foot-candle Level Graphic Sheets



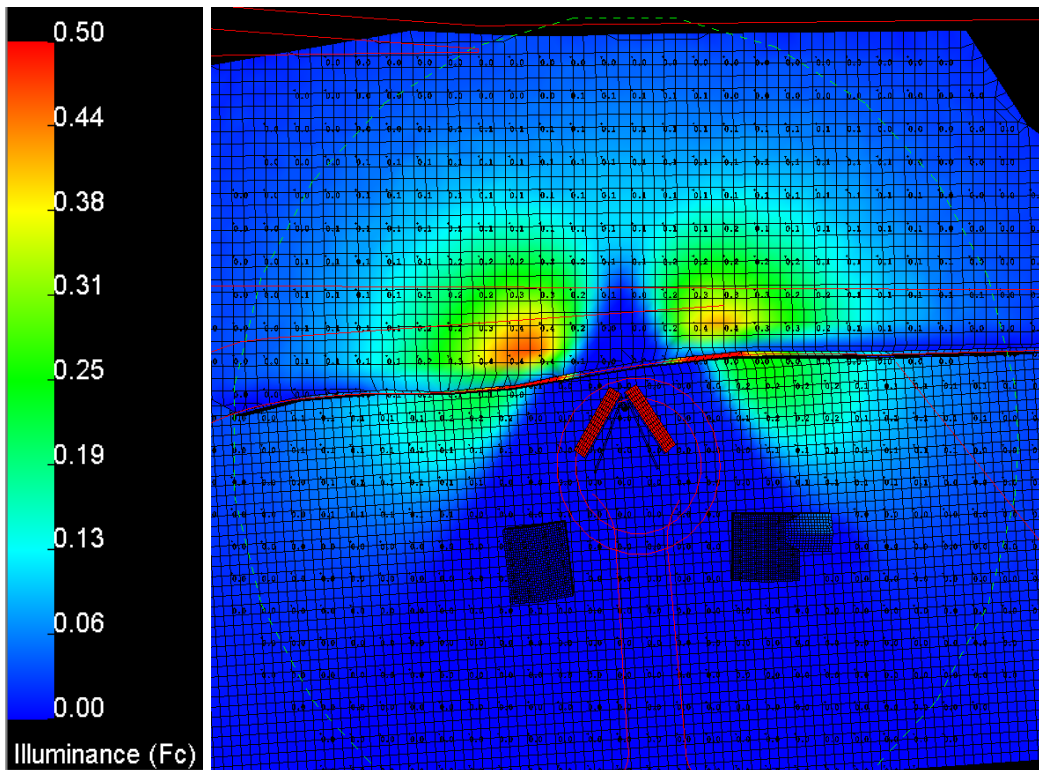
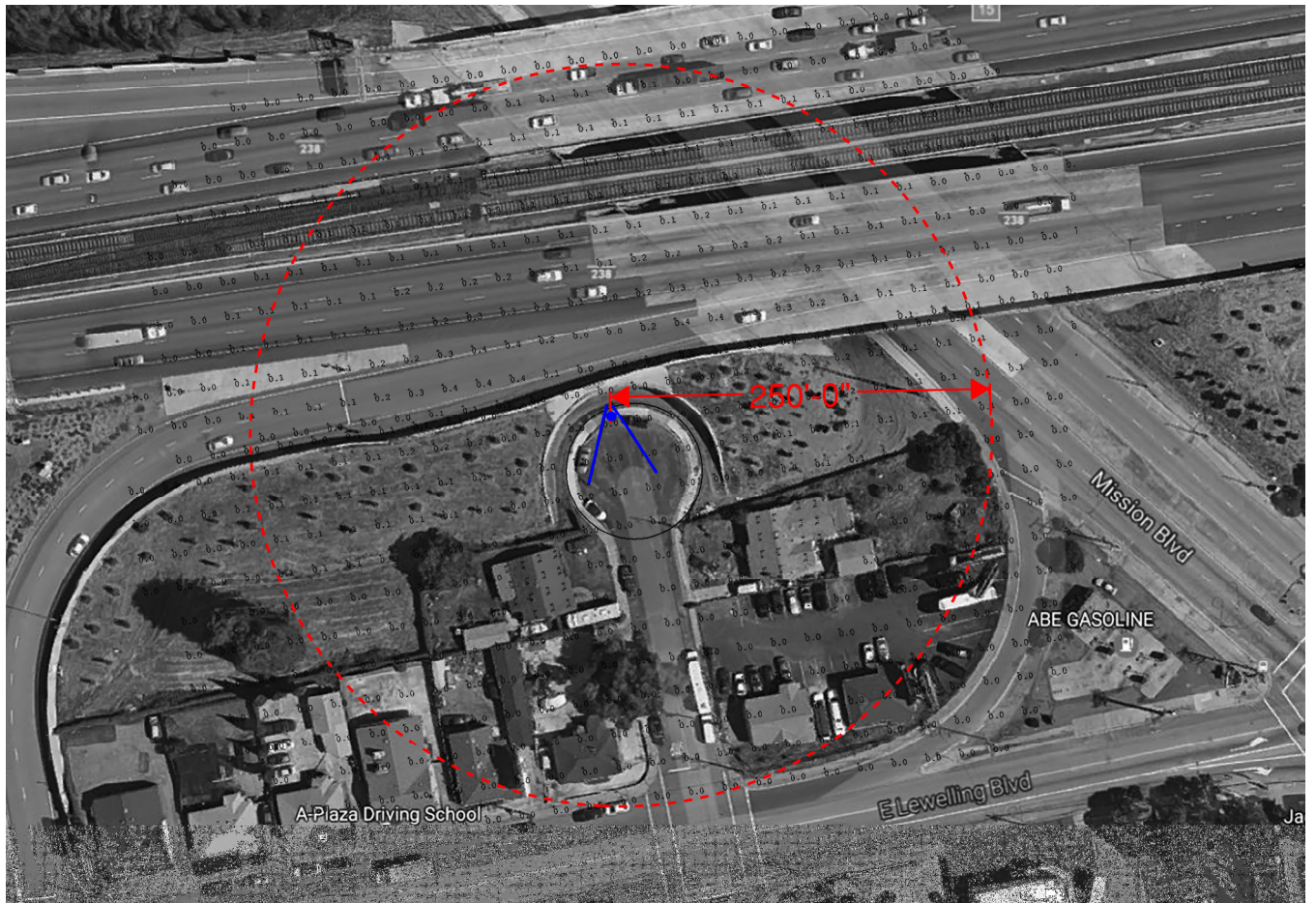


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HAYWARD BILLBOARDS**

**Langton Way
250' Boundary**

Release: 5/29/2017
Revision: 0



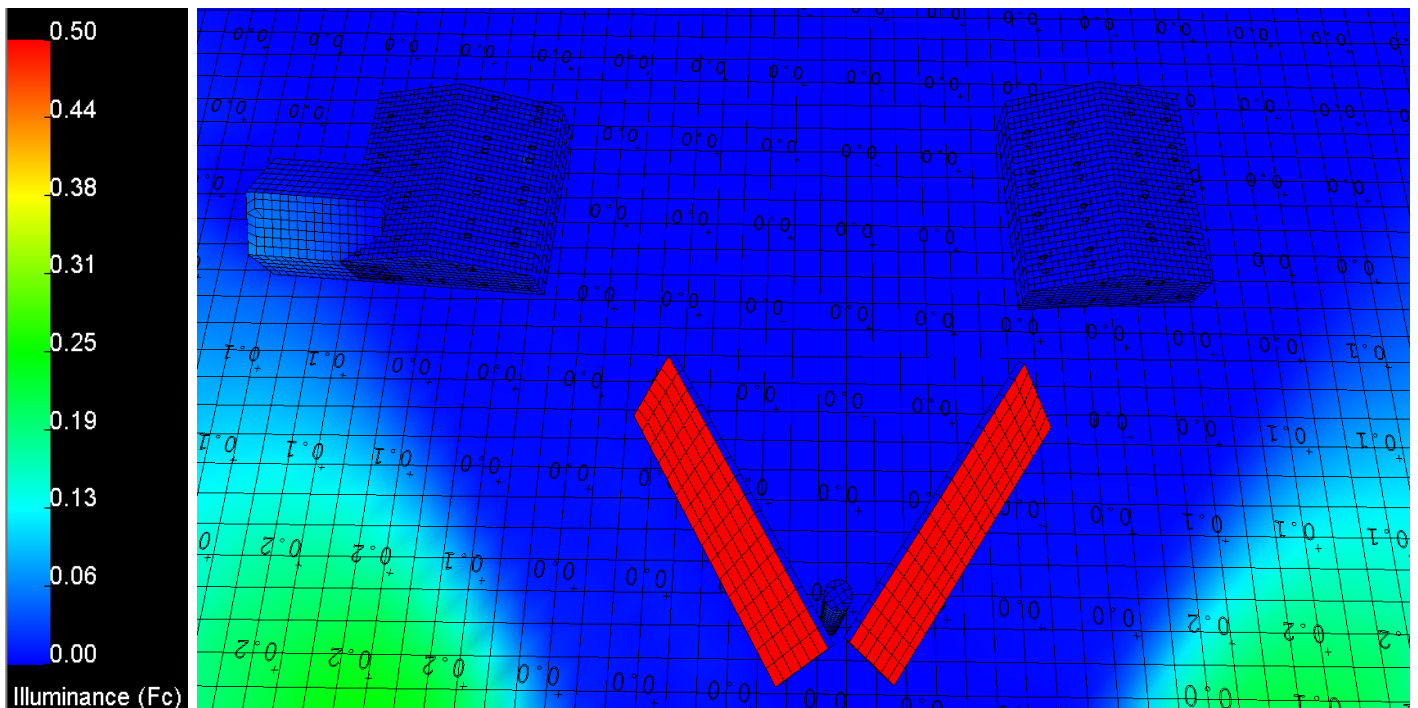
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**Langton Way
Overall Photometry Layout**

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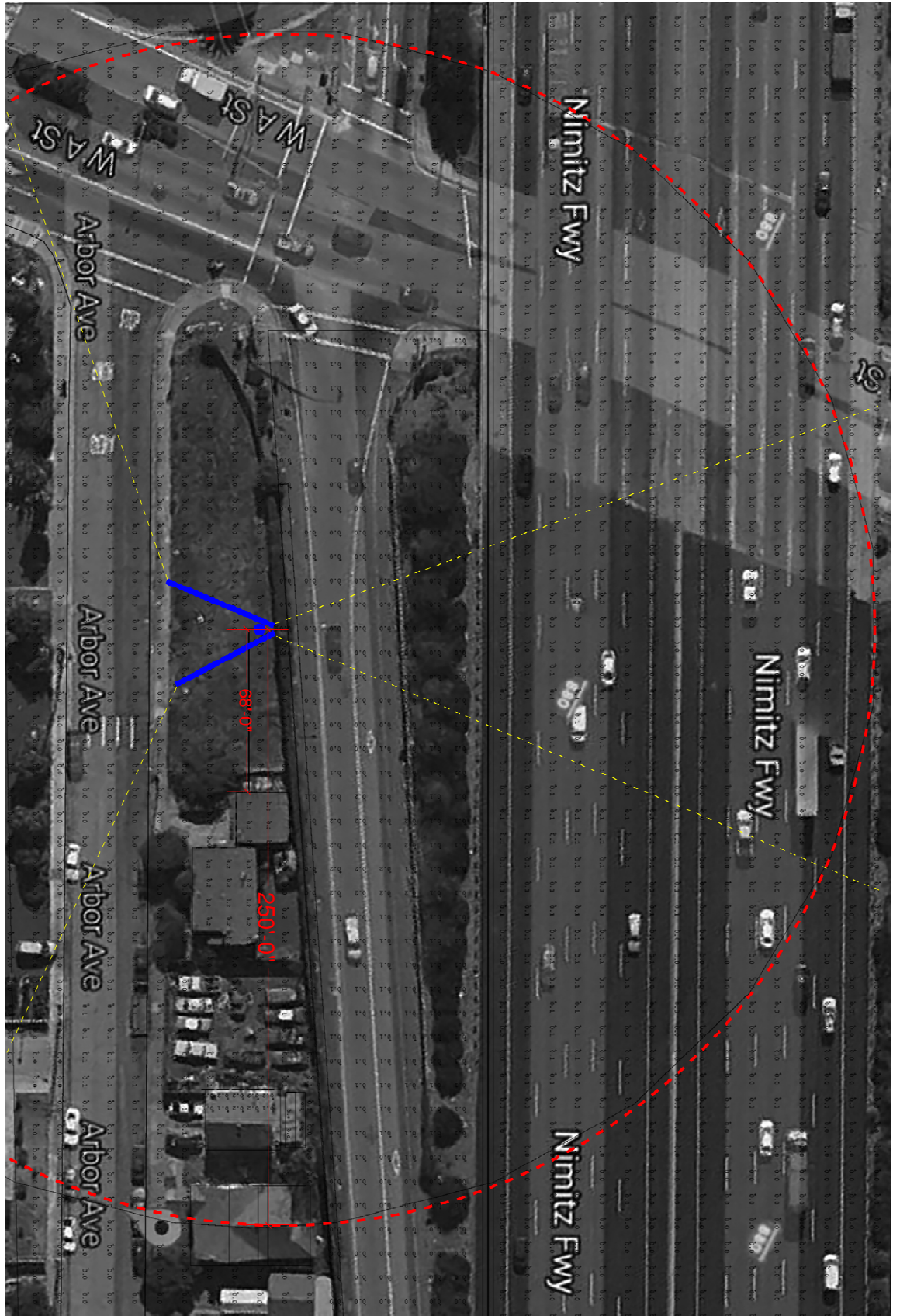
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**Langton Way
Adjacent Buildings**

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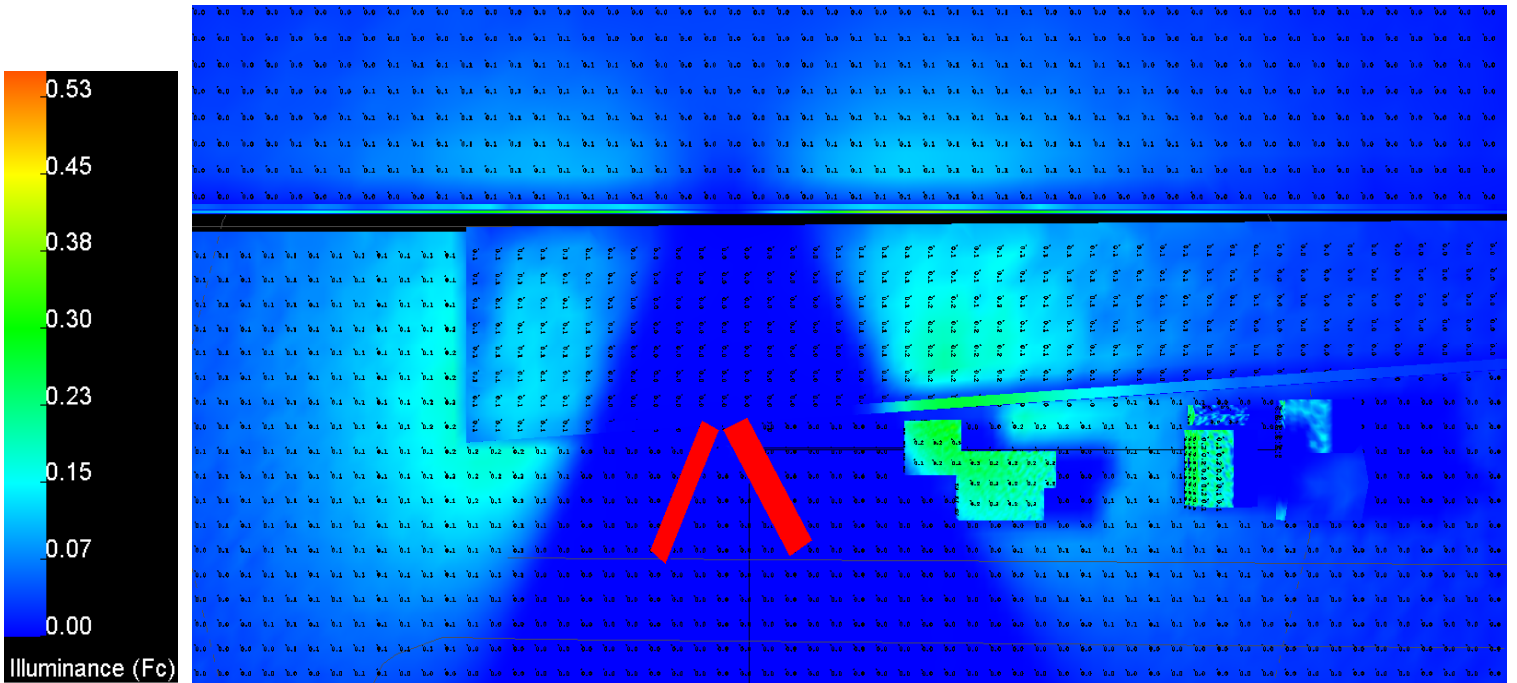
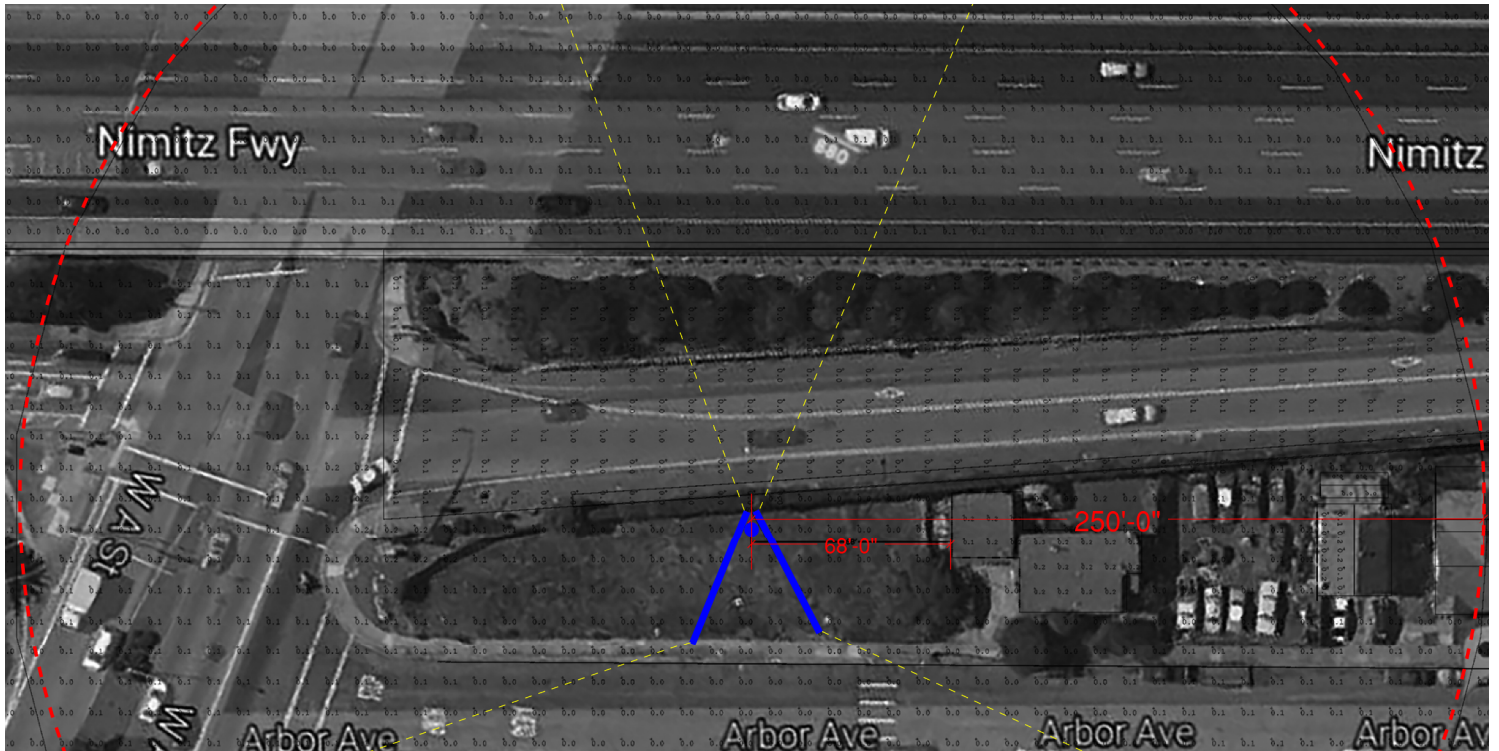


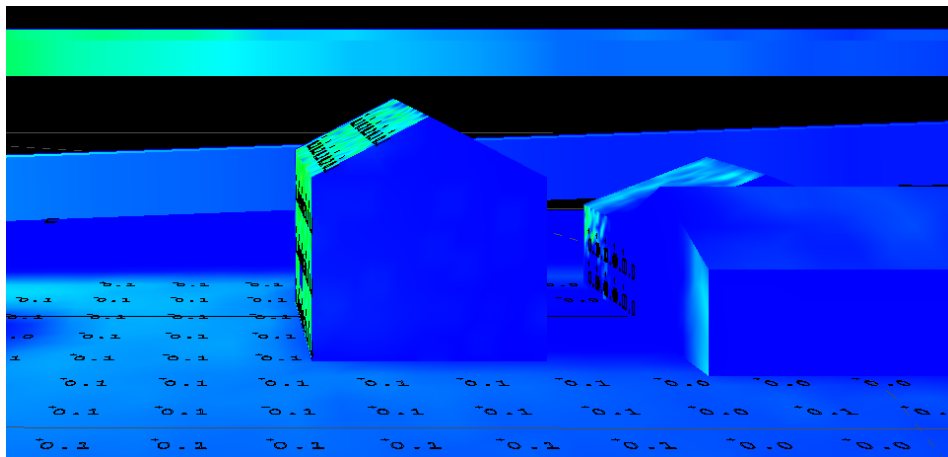
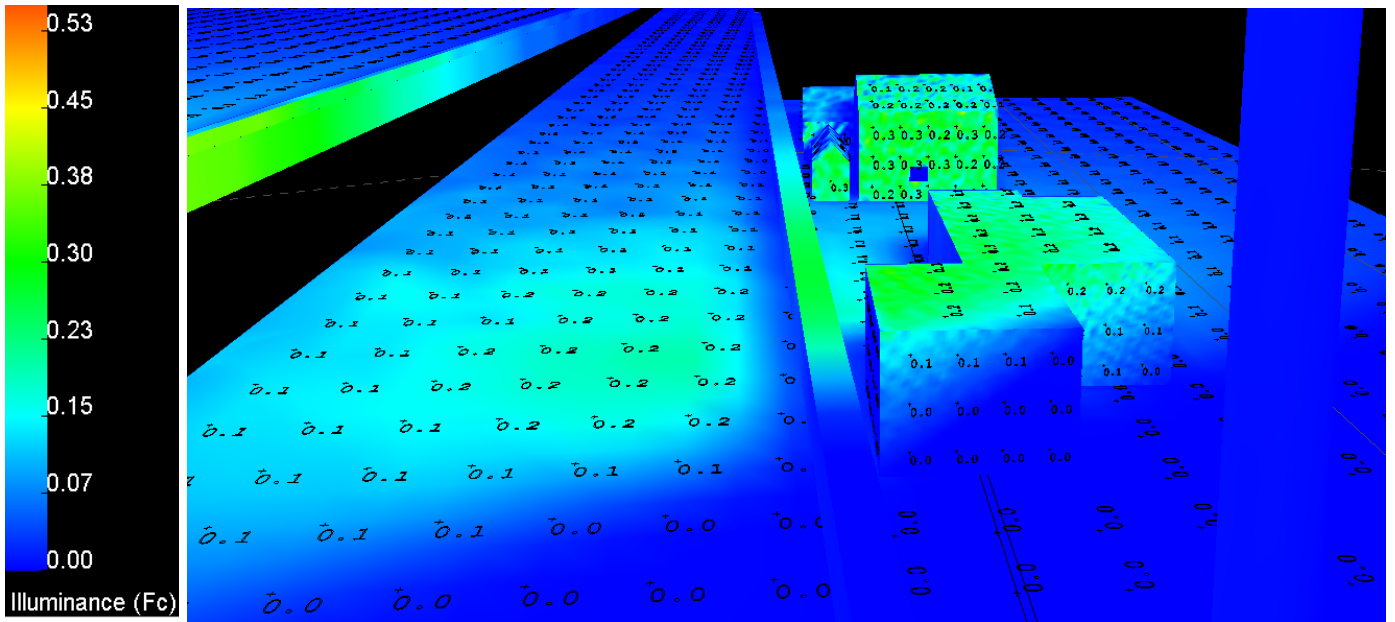
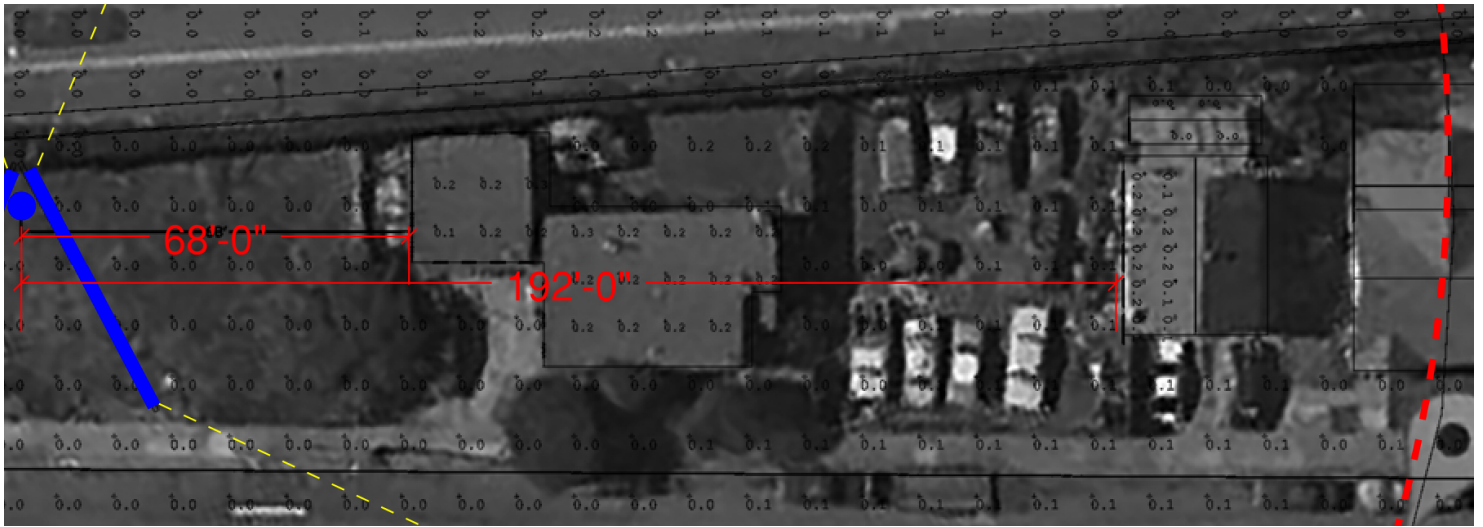
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HAYWARD BILLBOARDS

Arbor Avenue
250' Boundary

Release: 5/29/2017
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**Arbor Avenue
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