Attachment No. 4

IVY STATION TRANSIT ORIENTED MIXED USE DEVELOPMENT PROJECT – NIGHT CONSTRUCTION

Noise and Lighting Technical Report

Prepared for
Bernards Builders & Management Services
8824 National Blvd
Culver City, CA 90232

November 2017

ESA

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IVY STATION TRANSIT ORIENTED MIXED USE DEVELOPMENT PROJECT - NIGHT CONSTRUCTION

Noise Technical Report

Executive Summary

The purpose of this Noise Technical Report is to evaluate the potential short-term temporary noise impacts resulting from implementation of the proposed night construction for the proposed Ivy Station Transit-Oriented Mixed-Use Development Project (Project) at 8824 National Boulevard in Culver City (City), California. The Project consists of the development of a 5-story office building and two interconnected 5- to 6-story residential and hotel buildings on a parcel previously developed as a surface parking lot. The three buildings would be built over a 3-level subterranean parking structure, which would require soil excavation and foundation concrete pouring.

In December 2015, ESA prepared a Noise and Vibration Technical Report for the Project's Mitigated Negative Declaration (MND), in accordance with the California Environmental Quality Act (CEQA). The report included a noise analysis of the project's construction, which was to occur during daytime hours only (i.e., no construction during the nighttime), in accordance with the allowable construction hours of the applicable noise ordinances for the Project. The project site is located within both the City of Los Angeles and Culver City. The proposed Office Building is located within both jurisdictions, with the Residential and Hotel Buildings being located entirely within Culver City.

This technical report has been prepared for Bernards Builders & Management Services to support the Culver City environmental review process regarding potential impacts to ambient noise associated with the proposed Project's construction at night. This noise study is required as part of the Project's proposed night construction work plan to the City to obtain a variance to the Culver City Noise Ordinance, which limits construction to daytime hours. The proposed night construction activities on the project site that would generate elevated noise levels potentially impacting nearby residences includes: 1) soil hauling and mass excavation in Culver City and excavated soil hauling route through the City of Los Angeles; and 2) concrete pouring on the Culver City portion of the project site, both of which would occur, though not simultaneously, during the evening and night hours, outside of Culver City's allowable construction hours (off-hours), potentially on weekdays, Saturdays, and holidays. In addition, Bernards requests to work on concrete-related activities such as install of rebar, formwork, clean-up, backfill during off-hours. Such concrete related activities generates less noise than concrete pumping activities.

Based on the assessment conducted in this report, the Project's night construction activities would generate elevated noise levels primarily from the usage of heavy equipment (i.e., concrete pumps) and trucks (i.e., concrete trucks and soil hauling trucks). Project night construction noise generated on-site would attenuate off-site due to below grade soil excavation on-site for concrete pouring (i.e., earthen walls of the excavated pit serving as noise barriers), and attenuate with distance from location of the equipment operating on-site (i.e., concrete pumps and trucks) to the nearest residential land use off-site in Culver City, i.e., "Access", the new mixed-use commercial-residential development southeast of the Project site at the intersection of National and Washington Boulevards.

This report summarizes the Project night construction noise generated on-site and whether these noise levels off-site, attenuated at the nearest residence in Culver City, would conflict with the noise level limits established by Culver City as conditions of a variance the City's noise ordinance. The findings of the analysis are as follows:

- The Project's maximum night construction noise levels, experienced at the nearest offsite sensitive receptor in Culver City (multi-family residential uses located adjacent to southeast of the Project Site), would not exceed Culver City's maximum residential night noise limit of 65 dBA L_{max} for night construction due the noise attenuation achieved by 1) equipment operating below grade in the excavation pit onsite and 2) the distance between the equipment on-site and the nearest residence off-site.
- In addition, The Project's night construction hourly average noise levels of 64 dBA L_{eq}, during concrete pours, would exceed Culver City's 1995 General Plan Noise Element, Noise Standards, nighttime (10:00 p.m. to 7:00 a.m.) levels of 50 dBA Leq for a duration of 30 minutes (City 1995) at the nearest multi-family residential use in Culver City. However, the measured ambient noise levels at the residence ranged from as high as 65.8 dBA L_{eq} at 7:00 p.m. to as low 56.3 dBA L_{eq} at 3:00 a.m during the evening/nighttime period (7:00 p.m. to 7:00 a.m.), with the measured ambient noise levels over this night period of approximately 65 dBA L_{eq}. Therefore, the Project's night construction noise level during continuous concrete pours of 64 dBA L_{eq} at the multi-family residential use would be slightly less than the average ambient night noise level of approximately 65 dBA L_{eq} over the evening/night period. The combined resultant ambient noise level would increase ambient levels by less than 3 dBA, which would be a less than perceptible increase compared to the existing ambient noise level. However, the ambient night noise level during the quietest hour of 3:00 a.m., was measured at approximately 56.3 dBA L_{eq}. The combined resultant ambient noise level would be approximately 65 dBA L_{eq}, which would be an increase of approximately 8 dBA over the 3:00 a.m. ambient levels, would be a perceptible increase during the quietest hour of 3:00 a.m. Therefore, the ambient increase from the night construction noise would range from 3 dBA to 8 dBA (less than perceptible to perceptible) during the loudest to quietest hours over the evening/night period.

Therefore, the Project's night construction noise levels would not exceed the Culver City noise standards at the nearest residence in Culver City. Furthermore, Project night construction noise would not substantially increase ambient noise levels at the nearest residence in Culver City.

Therefore, a variance to the Culver City Noise Ordinance for the Project's night construction would not result in adverse noise impacts.

The Project construction lighting equipment may generate light trespass and/or glare; however, the light trespass illuminance at the nearest residence in Culver City is very low, and is not significant, and the glare from the construction lighting equipment is not visible at the residence. Therefore, a variance to the Culver City Noise Ordinance for the Project's night construction would not result in adverse noise impacts.

1. Introduction

Culver Station, LLC proposes to construct and operate the proposed Ivy Station Transit-Oriented Mixed-Use Development Project (Project) at 8824 National Boulevard in Culver City (City), California. This technical report has been prepared to support the City's environmental review process regarding potential impacts to ambient noise associated with the proposed Project's construction work at night (i.e., during off-hours). This noise study is required as part of the Project's proposed night construction work plan to the City to obtain a variance to the City' Noise Ordinance, which limits construction to daytime hours.

The Project consists of the development of a 5-story office building, and two interconnected 5- to 6-story residential and hotel buildings on a parcel previously developed as the Metro Culver City Station surface parking lot. The three buildings would be built over a 3-level subterranean parking structure, which would require soil excavation and foundation concrete pouring.

This report identifies applicable noise regulations, and evaluates potential short- and long-term noise impacts associated with the proposed night construction of the Project. Where applicable, measures to mitigate or minimize noise impacts associated with the Project are included.

Information used to prepare this analysis included the noise analysis in the Project's Mitigated Negative Declaration (MND), prepared in accordance with the California Environmental Quality Act (CEQA), the Culver City General Plan Noise Element and Municipal Code Noise Ordinance including meetings with Culver City representatives, Project night construction data provided by Bernards Builders & Management Services, and other sources identified herein.

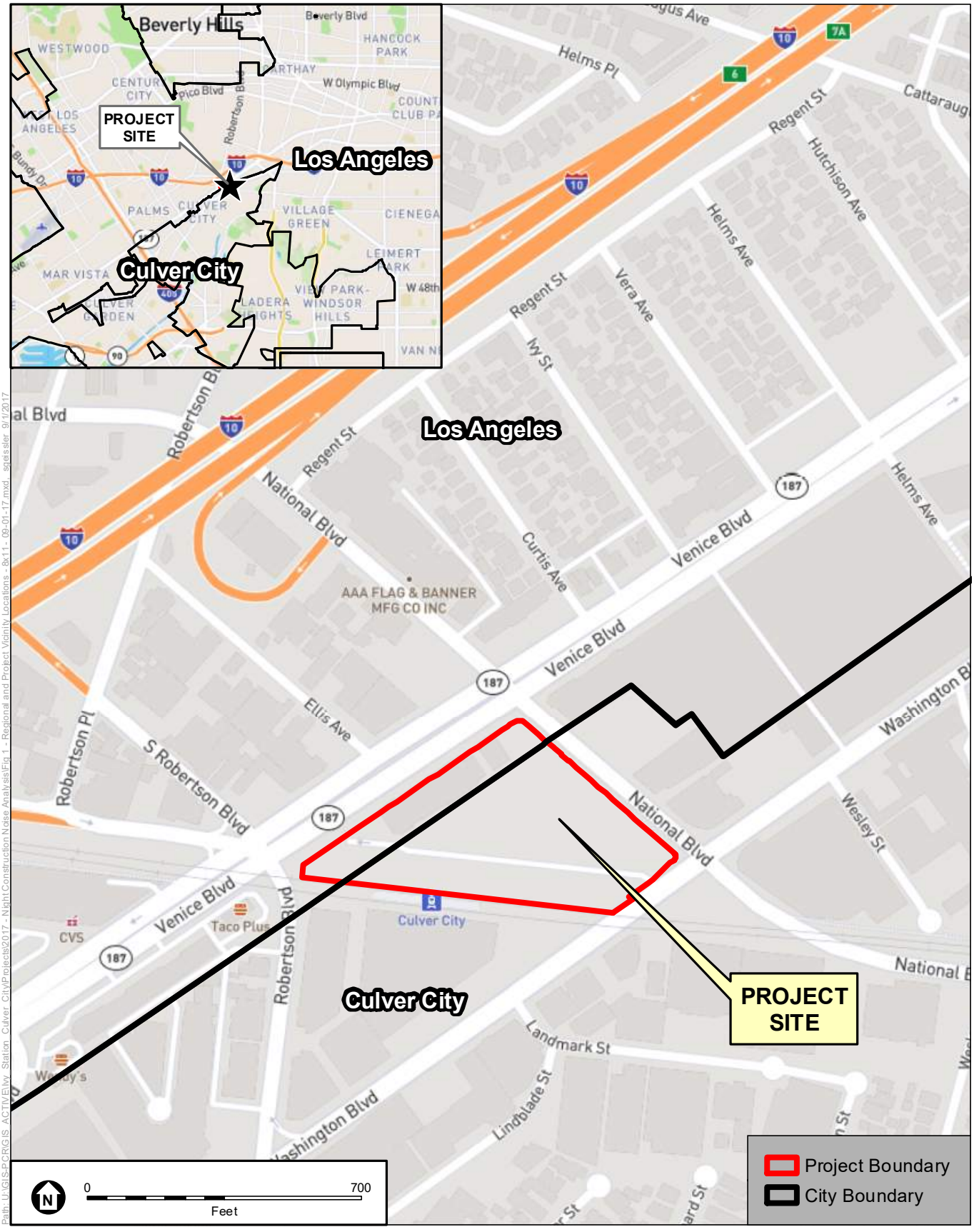
1.1 Project Location

The Project site is located at 8824 National Boulevard in Culver City, California, which is bisected by the boundary of the City of Los Angeles and Culver City, as shown in **Figure 1**. The Project site includes 4.15 acres within Culver City and 1.38 acres within the City of Los Angeles, for a total of approximately 5.53 acres.

The Project site is bounded by Venice Boulevard and commercial uses to the northwest; National Boulevard and commercial uses to the northeast, Washington Boulevard and commercial and light industrial uses to the southeast, and the Metro right-of-way and Metro Station to the south. Interstate 10 (I-10) is located approximately 0.2 miles north of the Project site, as shown in **Figure 2**. Locally, the Project site is within a Transit Oriented Development area, approximately 0.5 miles northeast of Downtown Culver City, approximately 0.1 miles southwest of the Helms District, and approximately 0.3 miles west of the Hayden Tract. Downtown Los Angeles is approximately seven miles east of the Project site.

1.2 Project Background

The Project would include a stand-alone 5-story (approximately 72 feet tall) Office Building with retail and restaurant uses on Level 1 (Ground Level) and office uses on Levels 1 to 5. In addition, two interconnected 5- to 6-story buildings atop a single-level podium are proposed that would



SOURCE: Open Street Map, 2017.

Ivy Station

Figure 1
Regional and Project Vicinity Locations

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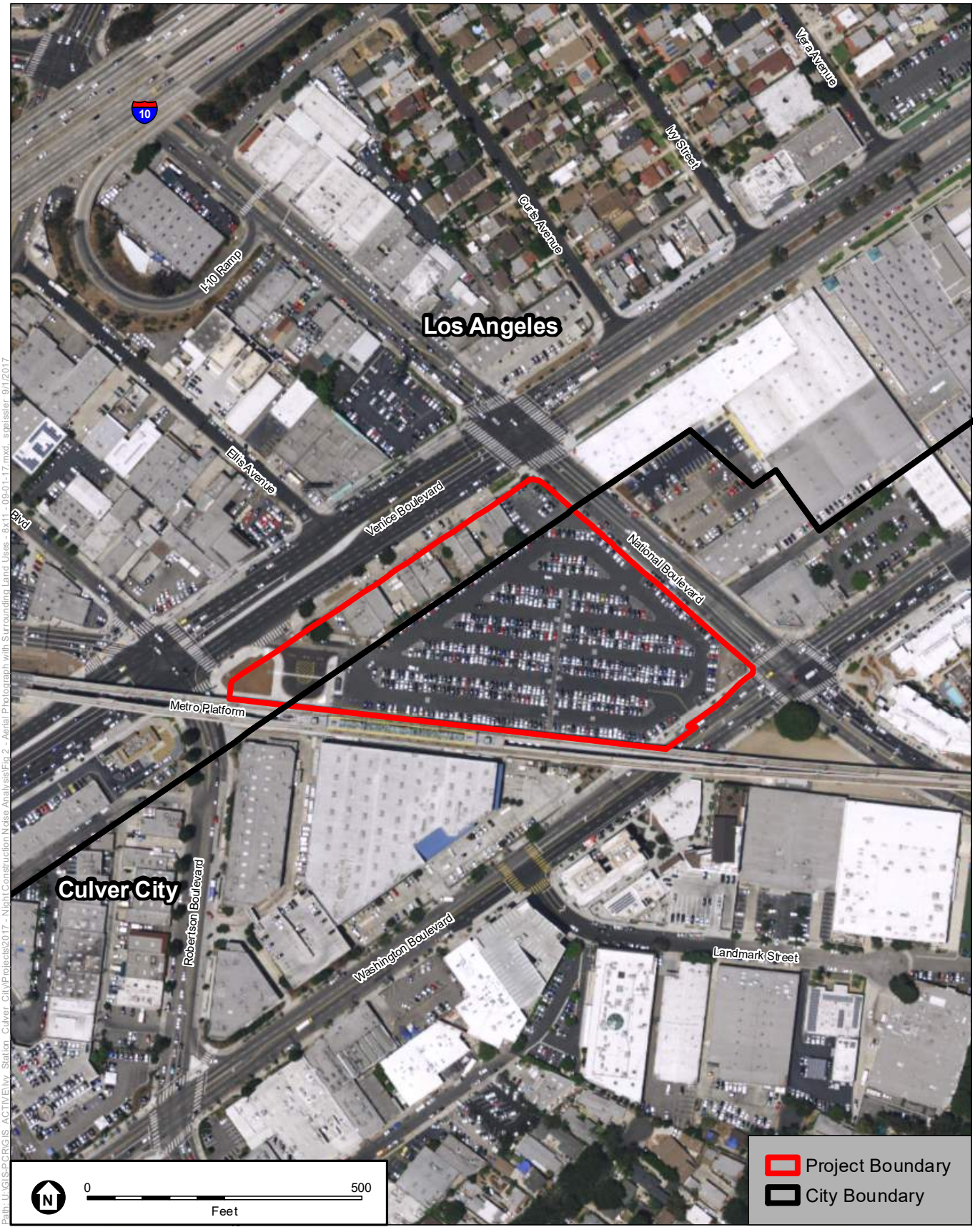

SOURCE: NAIP, 2016-07-11 (Aerial).

Ivy Station

Figure 2
Aerial Photograph with Surrounding Land Uses

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include a 200-unit Residential Building (up to approximately 79 feet tall) and a 148-room Hotel Building (up to approximately 77 feet tall), both of which would have retail and restaurant uses on the Ground Level. The three buildings would be built over a 3-level subterranean parking structure. The buildings would be connected through a series of landscaped courtyards and open spaces at both the pedestrian and podium levels. **Figure 3** identifies the Project Site Plan. Overall, the project would provide a total of 148 hotel rooms, 200 residential units, approximately 185,000 square feet of office use, 36,200 square feet of retail use, and 16,100 square feet of restaurant use. Only the Office Building has uses in both jurisdictions, with the Residential and Hotel Buildings being located entirely within Culver City.

In December 2015, ESA prepared a Noise and Vibration Technical Report for the Project's Mitigated Negative Declaration (MND), in accordance with the California Environmental Quality Act (CEQA). The report included a noise analysis of the project's construction, which was to occur during daytime hours only (i.e., no construction during the nighttime), in accordance with the allowable construction hours of the applicable noise ordinances for the Project.

This technical report has been prepared for Bernards Builders & Management Services (Bernards) to support the Culver City environmental review process regarding potential impacts to ambient noise associated with the proposed Project's construction at night. This noise study is required as part of the Project's proposed night construction work plan to the City to obtain a variance to the Culver City Noise Ordinance, which limits construction to daytime hours. The proposed night construction activities on the project site which would generate elevated noise levels potentially impacting nearby residences includes: 1) soil hauling and mass excavation in Culver City and excavated soil hauling through the City of Los Angeles portion of the project site, and 2) concrete pouring on the Culver City portion of the project site, both to occur during the evening and night hours, outside of Culver City's allowable construction hours. In addition, there is also an off-hours request (if approved) to allow work on weekdays, Saturdays, and during the Culver City holiday slowdown. In addition, Bernards request to work on concrete related activities such as install of rebar, formwork, clean-up, backfill during off-hours. Such concrete related activities generates less noise than concrete pumping activities.

2. Project Description

2.1 Project Understanding

Bernards is proposing to submit a project night construction work plan to Culver City to obtain a variance to its noise ordinance to conduct project construction activities outside of the allowable construction hours of City's Noise Ordinance. Bernards requested that ESA assist in this submittal with the preparation of the noise and lighting studies of the proposed night construction work. Bernards provided ESA example noise and lighting studies for a previous project (C3) night construction work plan submitted to the City. ESA would utilize the 2015 Ivy Station noise technical report and MND in the preparation of these proposed night noise and lighting studies.

The Project's proposed night construction activities at the Project site are based data provided to ESA from Bernard via email and phone conversations. The Project's night construction work would occur on the Project site (within both Culver City and the City of Los Angeles) and

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SOURCE: Lowe Enterprises, 2015

Ivy Station

Figure 3
Site Plan

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surrounding roadways. However, the focus of this study is the impact of the night construction activities on the nearest residence within the Culver City to the Project site, and the submittal of Bernards night work plan to Culver City to obtain a variance to the City's noise ordinance which prohibits construction during the evening and night hours. Culver City's noise ordinance states that construction activity shall be prohibited, except between the hours of 8:00 A.M. and 8:00 P.M. Mondays through Fridays; 9:00 A.M. and 7:00 P.M. Saturdays; 10:00 A.M. and 7:00 P.M. Sundays.

As a condition of the potential variance to the allowable construction hours of the City's noise ordinance, the City established a noise level limit of 65 dBA Lmax for the Project's proposed night construction. The limit is based on the City's Noise Standards in the Noise Element of the City's 1975 General Plan, which establishes nighttime levels of 65 dBA Leq for a duration of one minute at the property line of the noise sensitive receptor (City 1975) (i.e., 65 dBA Lmax at the property line of the nearest residence).

2.2 Project Description

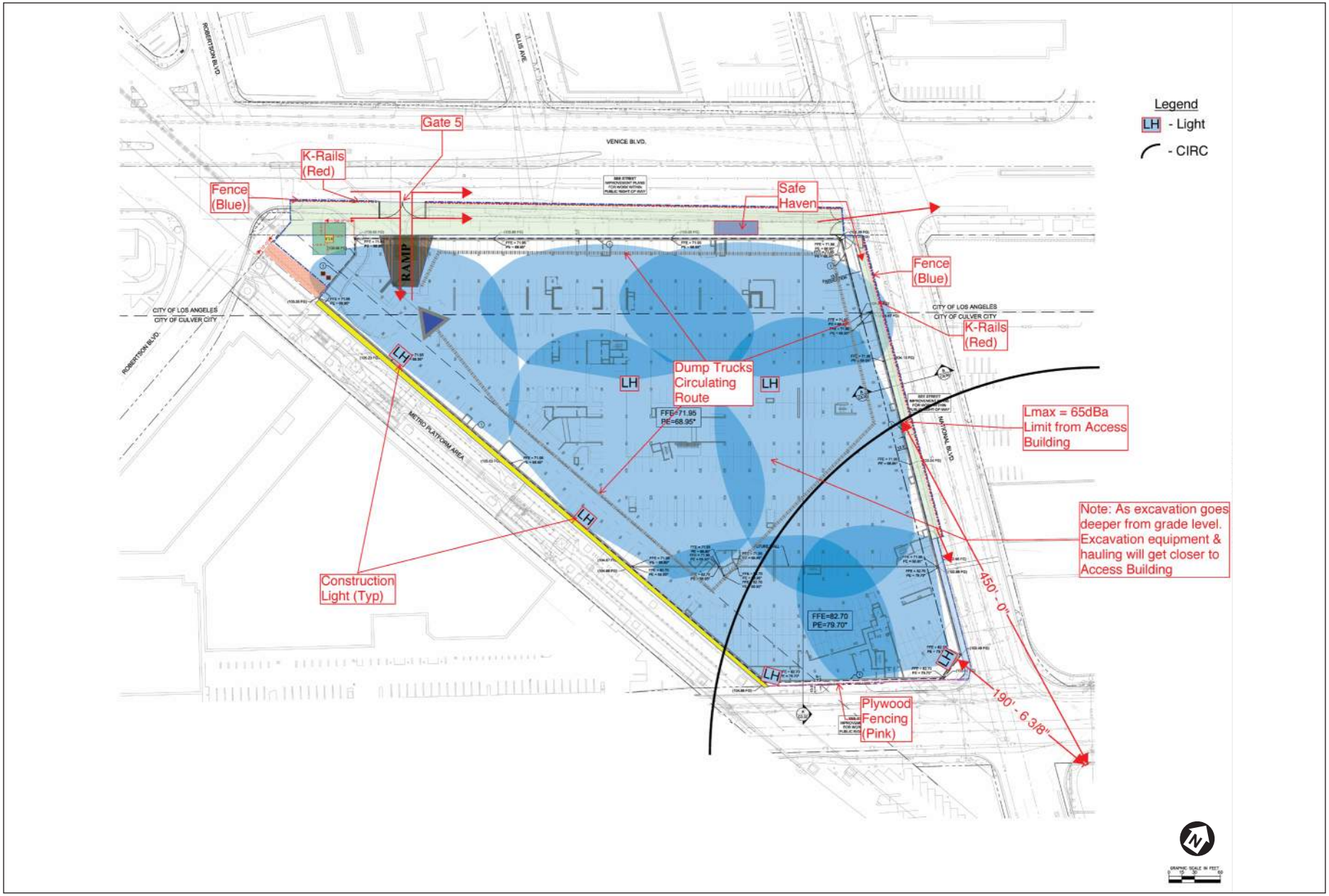
The Project's proposed night construction activity on the Project site would primarily include mass excavation in Culver City with truck hauling through the City of Los Angeles on approved haul routes; and concrete pouring by pumps and boom into the excavated foundations of the proposed buildings on the Project site within Culver City with concrete trucks trips entering and leaving the Project site. In addition, Bernards request to work on concrete related activities such as install of rebar, formwork, clean-up, backfill during off-hours. Such concrete related activities generates less noise than concrete pumping activities.

The Project night construction work would include truck soil hauling for 6 months during excavation, and 13 months for concrete pours, with an estimated 1-2 months of overlap between the soil hauling and concrete pours. During the overlap, the soil hauling and concrete pours may occur on the same day but not at the same time due to limited staging area, since there is only one street access ramp into the Project site's excavation and pour area. Project night construction is anticipated to start in November 2017, and end in November 2018.

Project night construction activity would occur during evening and night hours, potentially anytime outside of the allowable construction hours of the Culver City's noise ordinance of between 8:00 A.M. and 8:00 P.M. Mondays through Fridays; 9:00 A.M. and 7:00 P.M. Saturdays; and 10:00 A.M. and 7:00 P.M. Sundays. Therefore, a variance to the noise ordinance is needed.

Soil Excavation and Hauling

The excavation of soil for the foundations of the proposed buildings on the Project site would occur during the daytime and nighttime. During the off-hours of the City's noise ordinance, all excavation equipment and hauling trucks would be staged approximately 450 feet from the Access Building, not to exceed the 65 dBA Lmax limit. The excavation equipment would gradually move closer to Access as excavation progresses and all equipment is staged below grade night truck hauling, totaling approximately 22,000 heavy truck trips, or 250 trucks per day. **Figure 4** shows the area where the excavation equipment and hauling trucks can operate without exceeding the 65 dBA Lmax threshold (approximately 450 feet from Access at grade level). As



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SOURCE: Bernards Builders & Management Services

Ivy Station

Figure 4
Night Soil Excavation and Hauling

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excavation progresses, the equipment would move further below grade, and the excavation equipment will gradually get closer to the corner of National and Washington Boulevards However, the soil hauling trucks would exit the Project Site utilizing Gate #5 on Venice Boulevard within the City of Los Angeles to access I-10 to the north within City of Los Angeles, and would not utilize any street through Culver City.

Concrete Pouring

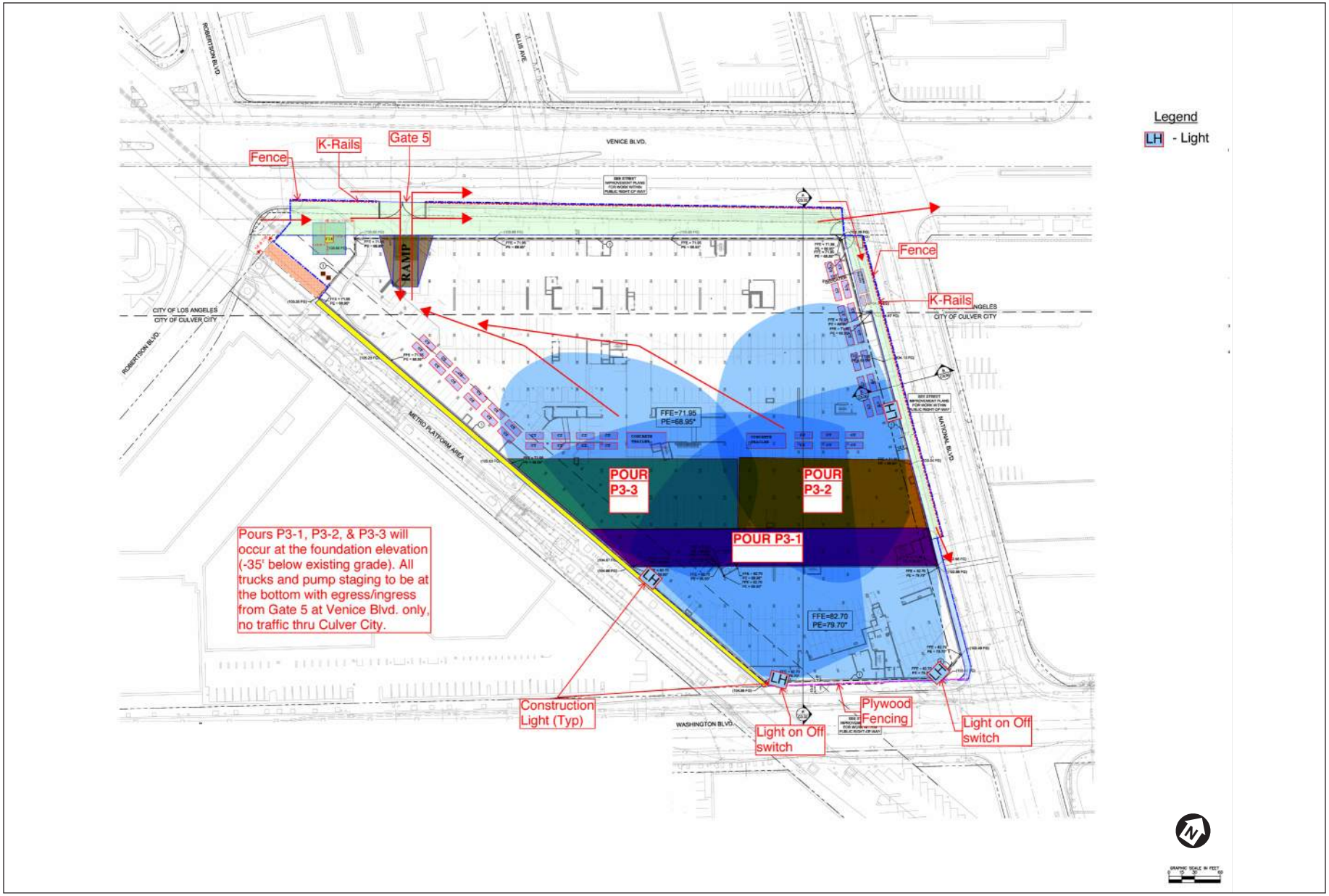
The concrete pouring and staging activities would include the operation of several concrete pumps and concrete trucks, with deliveries related to shoring activities of approximately 400 truck trips. Overall, the Project will have approximately 66 mat foundation and deck pours on the Project site, of which pours P3-1, P3-2, P3-3, and G-4 have been analyzed in this report due to their greater concrete volume (i.e., greater number of pumps and trucks required) and proximity to the nearest residence in Culver City.

Concrete pours P3-1, P3-2, and P3-3 would take place roughly 36 feet below grade, and most of the concrete trucks would be stationed below grade at the bottom of the excavated hole or along Venice Boulevard, and only two concrete trucks would be located at the concrete pump along National Boulevard near the intersection with Venice Boulevard, as shown in **Figure 5**. Concrete pour G-4 would require concrete trucks to stage along National Boulevard; however, to minimize the noise to the nearby receptor, most of the concrete trucks would be staged along Venice Boulevard, and only two concrete trucks would be located at the concrete pump along National Boulevard near the intersection with Venice Boulevard, as shown on **Figure 6**. The concrete pouring plans on Figures 5 and 6, shows the area where the concrete pumps and trucks would be located, and the circulating ingress and egress route the concrete trucks would use during the concrete pouring's. The concrete trucks entering and leaving the Project site would utilize Gate #5 at Venice Boulevard within the City of Los Angeles, and not drive through Culver City. However, the concrete trucks staged along National Boulevard for concrete pour P3-1 would exit the Project site southbound on National Boulevard into Culver City, then turning west on Washington Boulevard (passing within 170 feet of the residential use nearest the Project site in Culver City), and then heading north on Robertson Boulevard, back into the City of Los Angeles towards I-10.

3. Environmental Setting

3.1 Noise Characteristics and Descriptors

Sound can be described as the mechanical energy of a vibrating object transmitted by pressure waves through a liquid or gaseous medium (e.g., air). Noise is generally defined as unwanted sound (i.e., loud, unexpected, or annoying sound). Acoustics is defined as the physics of sound. In acoustics, the fundamental scientific model consists of a sound (or noise) source, a receiver, and the propagation path between the two. The loudness of the noise source and obstructions or atmospheric factors affecting the propagation path to the receiver determines the sound level and characteristics of the noise perceived by the receiver. Acoustics addresses primarily the propagation and control of sound.



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SOURCE: Bernards Builders & Management Services

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Figure 5
Night Concrete Pours P3-1 & P3-2 and P3-3

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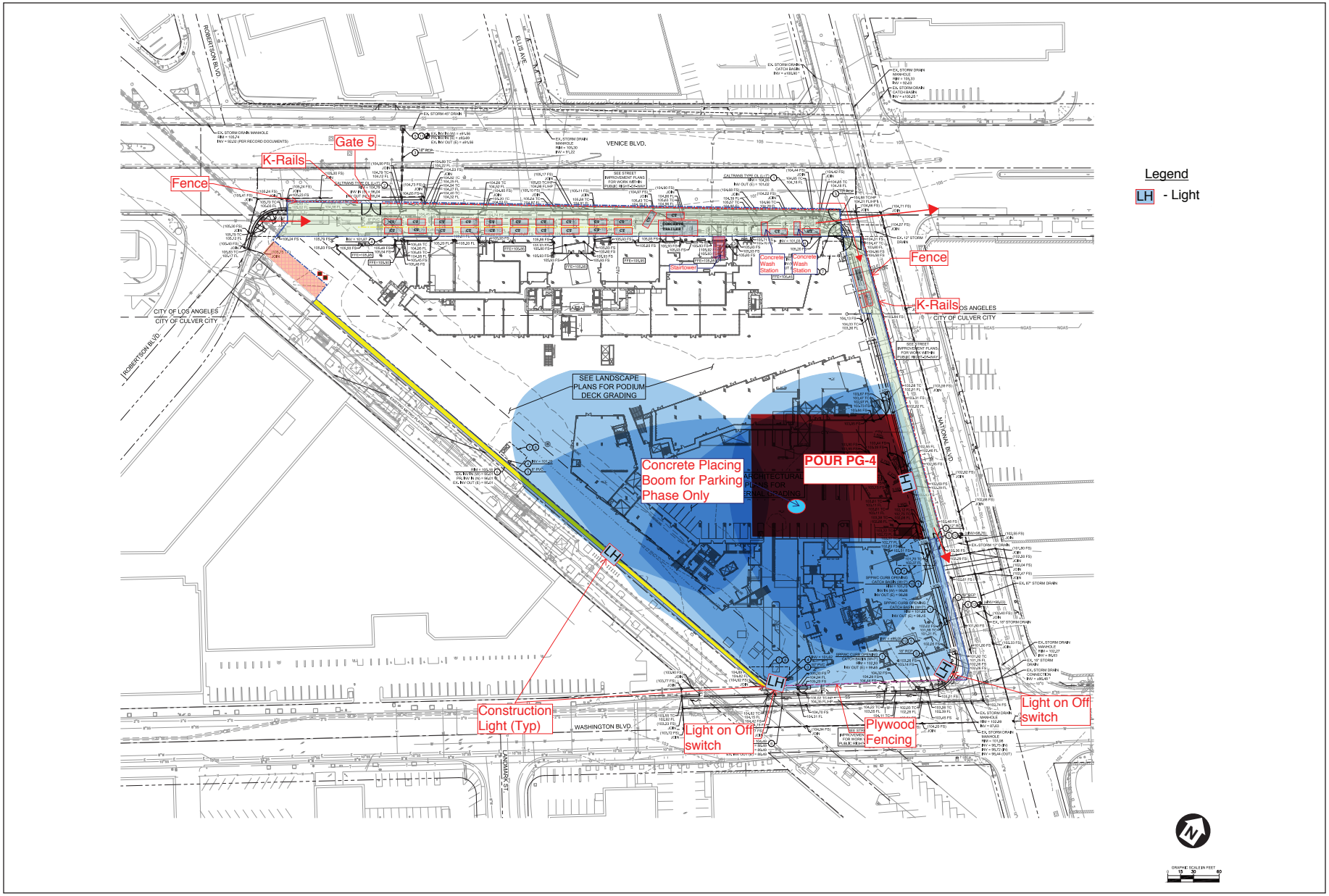

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SOURCE: Bernards Builders & Management Services

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Figure 6
Night Concrete Pour G-4

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Sound, traveling in the form of waves from a source, exerts a sound pressure level (referred to as sound level) that is measured in decibels (dB), which is the standard unit of sound amplitude measurement. The dB scale is a logarithmic scale that describes the physical intensity of the pressure vibrations that make up any sound, with 0 dB corresponding roughly to the threshold of human hearing and 120 to 140 dB corresponding to the threshold of pain. Pressure waves traveling through air exert a force registered by the human ear as sound.

Sound pressure fluctuations can be measured in units of hertz (Hz), which correspond to the frequency of a particular sound. Typically, sound does not consist of a single frequency, but rather a broad band of frequencies varying in levels of magnitude. When all the audible frequencies of a sound are measured, a sound spectrum is plotted consisting of a range of frequency spanning 20 to 20,000 Hz. The sound pressure level, therefore, constitutes the additive force exerted by a sound corresponding to the sound frequency/sound power level spectrum.

The typical human ear is not equally sensitive to all frequencies of the audible sound spectrum. As a consequence, when assessing potential noise impacts, sound is measured using an electronic filter that deemphasizes the frequencies below 1,000 Hz and above 5,000 Hz in a manner corresponding to the human ear's decreased sensitivity to extremely low and extremely high frequencies. This method of frequency weighting is referred to as A-weighting and is expressed in units of A-weighted decibels (dBA). A-weighting follows an international standard methodology of frequency deemphasis and is typically applied to community noise measurements.

Noise Exposure and Community Noise

An individual's noise exposure is a measure of noise over a period of time. A noise level is a measure of noise at a given instant in time. The noise levels are representative of measured noise at a given instant in time; however, they rarely persist consistently over a long period of time. Rather, community noise varies continuously over a period of time with respect to the contributing sound sources of the community noise environment. Community noise is primarily the product of many distant noise sources, which constitute a relatively stable background noise exposure, with the individual contributors unidentifiable. The background noise level changes throughout a typical day, but does so gradually, corresponding with the addition and subtraction of distant noise sources such as traffic. What makes community noise variable throughout a day, besides the slowly changing background noise, is the addition of short-duration, single-event noise sources (e.g., aircraft flyovers, motor vehicles, sirens), which are readily identifiable to the individual.

These successive additions of sound to the community noise environment change the community noise level from instant to instant, requiring the measurement of noise exposure over a period of time to legitimately characterize a community noise environment and evaluate cumulative noise impacts. This time-varying characteristic of environmental noise is described using statistical noise descriptors. The noise descriptors applicable to this Project are summarized below:

L_{eq}: The equivalent sound level used to describe noise over a specified period of time in terms of a single numerical value; the L_{eq} of a time-varying signal and that of a steady signal are

the same if they deliver the same acoustic energy over a given time. The L_{eq} may also be referred to as the average sound level.

L_{max}: The maximum, instantaneous noise level experienced during a given period of time.

CNEL: The Community Noise Equivalent Level, is the average A-weighted noise level during a 24-hour day that is obtained after an addition of 5 dB to measured noise levels between the hours of 7:00 a.m. to 10:00 p.m. and after an addition of 10 dB to noise levels between the hours of 10:00 p.m. to 7:00 a.m. to account for noise sensitivity in the evening and nighttime, respectively.

Noise Effects on People

Noise is generally loud, unpleasant, unexpected, or undesired sound that is typically associated with human activity that is a nuisance or disruptive. The effects of noise on people can be placed into four general categories:

- Subjective effects (e.g., dissatisfaction, annoyance);
- Interference effects (e.g., communication, sleep, and learning interference);
- Physiological effects (e.g., startle response); and
- Physical effects (e.g., hearing loss).

Although exposure to high noise levels has been demonstrated to cause physical and physiological effects, the principal human responses to typical environmental noise exposure are related to subjective effects and interference with activities. Interference effects of environmental noise refer to those effects that interrupt daily activities and include interference with human communication activities, such as normal conversations, watching television, telephone conversations, and interference with sleep. Sleep interference effects can include both awakening and arousal to a lesser state of sleep. With regard to the subjective effects, the responses of individuals to similar noise events are diverse and are influenced by many factors, including the type of noise, the perceived importance of the noise, the appropriateness of the noise to the setting, the duration of the noise, the time of day and the type of activity during which the noise occurs, and individual noise sensitivity.

Overall, there is no completely satisfactory way to measure the subjective effects of noise, or the corresponding reactions of annoyance and dissatisfaction on people. A wide variation in individual thresholds of annoyance exists, and different tolerances to noise tend to develop based on an individual's past experiences with noise. Thus, an important way of predicting a human reaction to a new noise environment is the way it compares to the existing environment to which one has adapted (i.e., comparison to the ambient noise environment). In general, the more a new noise level exceeds the previously existing ambient noise level, the less acceptable the new noise level will be judged by those hearing it. With regard to increases in A-weighted noise level, the following relationships generally occur:

- Except in carefully controlled laboratory experiments, a change of 1 dBA cannot be perceived;

- Outside of the laboratory, a 3 dBA change in noise levels is considered to be a barely perceivable difference;
- A change in noise levels of 5 dBA is considered to be a readily perceivable difference; and
- A change in noise levels of 10 dBA is subjectively heard as doubling of the perceived loudness.

These relationships occur in part because of the logarithmic nature of sound and the dB scale. The human ear perceives sound in a non-linear fashion hence the dB was developed. Because the dB scale is based on logarithms, two noise sources do not combine in a simple additive fashion, but rather logarithmically. Under the dB scale, a doubling of sound energy corresponds to a 3 dBA increase. In other words, when two sources are each producing sound of the same loudness, the resulting sound level at a given distance would be approximately 3 dBA higher than one of the sources under the same conditions. For example, if two identical noise sources produce noise levels of 50 dBA, the combined sound level would be 53 dBA, not 100 dBA. Under the dB scale, three sources of equal loudness together produce a sound level of approximately 5 dBA louder than one source, and ten sources of equal loudness together produce a sound level of approximately 10 dBA louder than the single source.

Noise Attenuation

When noise propagates over a distance, it changes in level and frequency content. The manner in which noise reduces with distance depends on factors such as the type of noise source and the propagation path. Noise from a localized source (i.e., point source) propagates uniformly outward in a spherical pattern; therefore, this type of propagation is referred to as "spherical spreading." Stationary point sources of noise, including stationary mobile sources such as idling vehicles, attenuate (lessen) at a rate between 6 dBA for acoustically "hard" sites and 7.5 dBA for acoustically "soft" sites for each doubling of distance from the reference measurement as their energy is continuously spread out over a spherical surface. Hard sites are those with a reflective surface between the source and the receiver, such as asphalt or concrete surfaces or smooth bodies of water. No excess ground attenuation is assumed for hard sites and the changes in noise levels with distance (drop-off rate) is simply the geometric spreading of the noise from the source. Soft sites have an absorptive ground surface such as soft dirt, grass, or scattered bushes and trees. In addition to geometric spreading, an excess ground attenuation value of 1.5 dBA (per doubling distance) is normally assumed for soft sites.

Roadways and highways consist of several localized noise sources on a defined path, and hence are treated as "line" sources, which approximate the effect of several point sources. Noise from a line source propagates over a cylindrical surface, often referred to as "cylindrical spreading." Line sources (e.g., traffic noise from vehicles) attenuate at a rate between 3 dBA for hard sites and 4.5 dBA for soft sites for each doubling of distance from the reference measurement.[1] Therefore, noise due to a line source attenuates less with distance than that of a point source with increased distance.

[1] California Department of Transportation (Caltrans), *Technical Noise Supplement* (TeNS). September, 2013.

Additionally, receptors located downwind from a noise source can be exposed to increased noise levels relative to calm conditions, whereas locations upwind can have lowered noise levels. Sound levels can be increased at large distances (e.g., more than 500 feet) due to atmospheric temperature inversion (i.e., increasing temperature with elevation). Other factors such as air temperature, humidity, and turbulence can also have significant effects.

3.2 Existing Conditions

The Project site is currently undergoing Project construction. The Project site is bounded on three sides by four-lane arterials of Venice Boulevard, National Boulevard, and Washington Boulevard; and the Metrorail right-of-way and Culver City Metrorail Station. I-10 is located approximately 0.2 miles north of the Project site. The areas adjacent to the Project site are primarily commercial and light industrial, and the residential development within Culver City. Therefore, the predominant noise source surrounding the Project site is vehicle traffic noise on the adjacent roadways and nearby I-10. Secondary noise sources including existing general commercial activities, loading dock/delivery truck activities, trash compaction, refuse service activities, and landscape maintenance activities.

Existing Ambient Noise Levels

To identify the existing ambient noise environment at the residence in Culver City nearest the Project site, a continuous long-term noise measurement was conducted from Friday August 25, 2017 to Sunday August 27, 2017 at the southeastern corner of the Project site (i.e., adjacent to the nearest residence in Culver City), identified as Receptor (R)4 on **Figure 7**.

The noise measurement was conducted with Larson Davis model LxT. Type 2 sound level meter. During the measurement, the microphone for sound level meter was placed five feet above the ground surface. The sound level meter was calibrated with a Larson Davis model CAL 200 before and after the measurement. Following the calibration, a wind screen was placed over the microphone, and the frequency weighting was set on “A” and slow response.

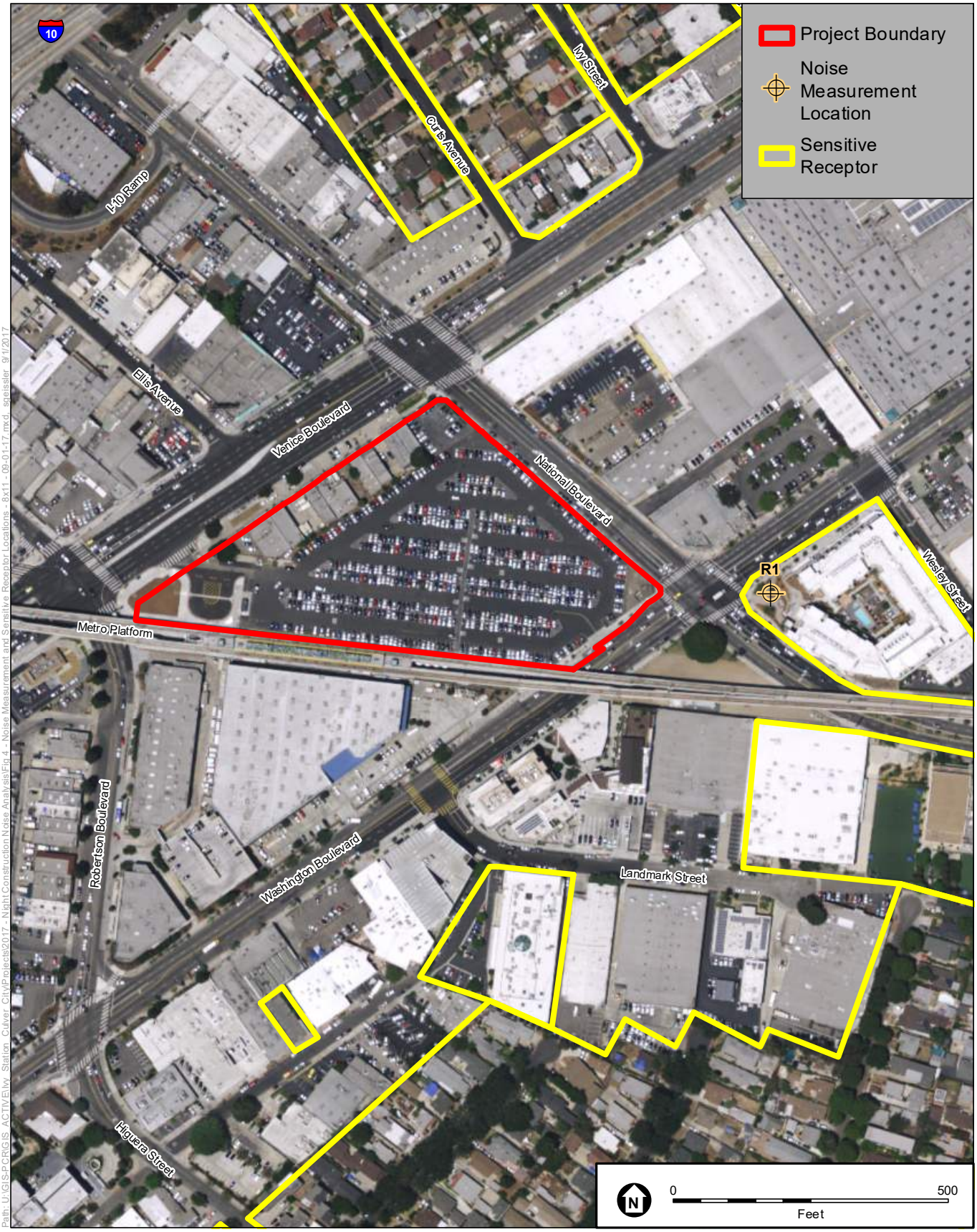
The results of the ambient night noise measurement at location R4 are summarized in **Table 1**. As shown in Table 1, on the night of Friday, August 25, 2017, the measured evening/night hourly average noise levels at location R4 ranged from a high of 69.4 dBA L_{eq} at 7:00 p.m. to a low of 57.6 dBA L_{eq} at 3:00 a.m. Overall, for the 12-hour evening/night period (7:00 p.m. to 7:00 a.m.), the average noise level was 65.4 dBA L_{eq}. On the night of Saturday August 26, the measured evening/night hourly average noise levels at location R4 ranged from a high of 68.6 dBA L_{eq} at 7:00 p.m to a low of 56.3 dBA L_{eq} at 3:00 a.m. Overall, for the 12-hour evening/night period (7:00 p.m. to 7:00 a.m.), the average noise level was 64.5 dBA L_{eq}. The primary noise source during the measurements was vehicle traffic along the roadways adjacent to the Project site.

In addition, in 2015, ambient noise measurements conducted onsite for the 2015 MND provided similar night hourly average noise levels during the midweek at the southwest corner of the project site averaged 66 dBA L_{eq} for the night period (10:00 p.m. to 7:00 a.m.) with hourly averages ranging from 57 to 73 dBA L_{eq}.

TABLE 1
SUMMARY OF AMBIENT NIGHT NOISE MEASUREMENTS

Location, Day of the Week, Date, and Duration	Hourly Average Noise Levels, dBA L_{eq}
R4	
Friday Night, 8/25/17,	
7:00 p.m. to 8:00 p.m.	69.4
8:00 p.m. to 9:00 p.m.	68.7
9:00 p.m. to 10:00 p.m.	66.7
10:00 p.m. to 11:00 p.m.	65.8
11:00 p.m. to 12:00 p.m.	64.5
12:00 p.m. to 1:00 a.m.	65.4
1:00 a.m. to 2:00 a.m.	62.5
2:00 a.m. to 3:00 a.m.	58.6
3:00 a.m. to 4:00 a.m.	57.4
4:00 a.m. to 5:00 a.m.	59.0
5:00 a.m. to 6:00 a.m.	63.0
6:00 a.m. to 7:00 a.m.	65.0
7:00 a.m. to 8:00 a.m.	67.5
7:00 p.m. to 7:00 a.m. (12-hour period)	65.4
R4	
Saturday Night 8/26/17,	
7:00 p.m. to 8:00 p.m.	68.6
8:00 p.m. to 9:00 p.m.	66.5
9:00 p.m. to 10:00 p.m.	65.9
10:00 p.m. to 11:00 p.m.	66.6
11:00 p.m. to 12:00 p.m.	65.5
12:00 p.m. to 1:00 a.m.	62.4
1:00 a.m. to 2:00 a.m.	62.3
2:00 a.m. to 3:00 a.m.	60.9
3:00 a.m. to 4:00 a.m.	56.3
4:00 a.m. to 5:00 a.m.	59.7
5:00 a.m. to 6:00 a.m.	61.6
6:00 a.m. to 7:00 a.m.	63.8
7:00 a.m. to 8:00 a.m.	64.864.5
7:00 p.m. to 7:00 a.m. (12-hour period)	

SOURCE: ESA, 2017.



SOURCE: NAIP, 2016-07-11 (Aerial).

Ivy Station

Figure 7
Ambient Noise Measurement and Sensitive Receptor Locations

ESA

Noise Sensitive Receptors

Noise sensitive land uses are defined as those specific land uses that have associated indoor and/or outdoor human activities that may be subject to stress and/or significant interference from noise produced by community sound sources. The noise sensitive uses in Culver City closest to the Project site are the multi-family residences at the intersection of National and Washington Boulevards, approximately 170 feet southeast of the Project site across the intersection. This residence represents the nearest sensitive receptors to the Project site, and, therefore, illustrates the worst-case scenario for potential noise impacts from the Project's night construction activities.

3.3 Regulatory Setting

Local

Culver City General Plan Noise Element

The Noise Element of the General Plan identifies noise-sensitive land uses and noise sources, defines areas of noise impact, and establishes goals, policies, and programs to ensure that City residents are protected from excessive noise (Culver City 1995). The noise goals and policies of the Noise Element applicable to the Project's night construction includes:

> **Policy 2.A** Create a comprehensive ordinance establishing noise regulation criteria, and standards for noise sources and receptors to include but not be limited to the following:
>
> – Noise reduction features during site planning to mitigate anticipated noise impacts on affected noise sensitive land uses, such as schools, hospitals, convalescent homes, and libraries.
>
> – Temporary sound barrier installation at construction site if construction noise is impacting nearby noise sensitive land uses.
>
> – Noise abatement and acoustical design criteria for construction and operation of any new development.

The City's noise standards are contained in the City's 1995 General Plan Noise Element, which establishes a nighttime (10:00 p.m. to 7:00 a.m.) levels of 50 dBA Leq for a duration of 30 minutes, and 65 dBA Leq for a duration of one minute, at the property line of the noise sensitive receptor, as shown in **Table 2** below (City 1995).

TABLE 2
CULVER CITY NOISE STANDARDS

Daytime levels 7:00 AM – 10:00 PM	Nighttime Levels 10:00 PM – 7:00 AM	Duration
55 dBA - Leq	50 dBA - Leq	30 minute
60 dBA - Leq	55 dBA - Leq	15 minute
65 dBA - Leq	60 dBA - Leq	5 minute
70 dBA - Leq	65 dBA - Leq	1 minute
75 dBA - Leq	70 dBA - Leq	Never

Source: City 1995.

Culver City Municipal Code

Chapter 9.07 of the City of Culver City Municipal Code (CCMC) provides specific noise restrictions and exemptions for noise sources within Culver City. Culver City's noise regulations state that construction activity shall be prohibited, except between the hours of 8:00 A.M. and 8:00 P.M. Mondays through Fridays; 9:00 A.M. and 7:00 P.M. Saturdays; 10:00 A.M. and 7:00 P.M. Sundays.

4. Impacts and Mitigation Measures

This section describes the impact analysis relating to noise and vibration impacts for the project. It describes the methods and applicable thresholds used to determine the impacts of the project.

4.1 Methodology

Project construction noise levels were estimated using the FHWA's Roadway Construction Noise Model (RCNM) and construction equipment information provided by the Applicant. Potential noise levels were identified for the nearest sensitive receptor located offsite in Culver City based on their respective distance from the Project site. To present a conservative impact analysis, the estimated noise levels were calculated for a scenario in which all major heavy construction equipment was assumed to be operating simultaneously for each phase (concrete pouring or excavated soil hauling) and located at the construction area nearest to the affected receptors. These assumptions represent the worst-case noise scenario because construction activities would typically be spread out throughout the project site and would be located further away from the affected receptors. The estimated noise levels at the affected receptor were then analyzed against the construction noise standards established by Culver City to determine whether an exceedance of allowable noise levels would occur.

4.2 Impact Thresholds

As provided to ESA by Culver City, the proposed Project's maximum night construction noise at the property line of the nearest noise sensitive receptor in Culver City shall not exceed 65 dBA $L_{max.}$, based on the City's nighttime noise standards (City 1995). The City's 1995 General Plan

Noise Element, Noise Standards establishes a nighttime (10:00 p.m. to 7:00 a.m.) levels of 50 dBA Leq for a duration of 30 minutes (City 1995), as shown in Table 2.

4.3 Project Impact Analysis

The proposed night construction of the Project would include excavation, truck loading and soil hauling or concrete pouring of building foundations requiring the use of heavy equipment including haul trucks and loaders, and concrete trucks, booms, and pumps, respectively. During the soil hauling or the concrete pours, there would be a different mix of equipment used. As such, construction activity noise levels on and near the Project Site would vary depending on the particular type, number, and duration of use of the equipment for the soil hauling or concrete pours. Individual pieces of construction equipment anticipated during Project night construction could produce maximum noise levels of 79 to 82 dBA L_{max} at a reference distance of 50 feet from the noise source (FHWA 2006). These maximum noise levels would occur when equipment is operating at full power, and includes estimated usage factors for the equipment, which are based on FHWA's RNCM User's Guide.[2]

During Project construction, the nearest and most notable offsite sensitive receptor in Culver City that would be exposed to the Project's night construction noise would be the existing multi-family residential use located adjacent to the southeast corner of the Project site. During construction activities, the highest noise levels would be generated when multiple pieces of construction equipment are being operated concurrently. As discussed previously, the Project's estimated construction noise levels were calculated for a worse-case scenario in which all construction equipment was assumed to be operating simultaneously and located on the Project site during either the soil excavation and hauling or the concrete pourings, as shown respectively in Figure 4, and Figures 5 and 6.

The estimated noise levels at the offsite sensitive receptors were calculated using FHWA's RCNM, and were based on the concurrent operation of equipment for either soil hauling (i.e., haul trucks and loaders) or concrete pours i.e., concrete trucks, booms, and pumps). The results of the modeled calculations are shown in Appendix A, which include the noise level reductions from the following noise reduction measures that shall be implemented to reduce construction noise levels at the adjacent sensitive receptor during project night construction:

> **Noise Reduction Measure NOISE-1**: All mobile off-road construction equipment operating at the project site shall be equipped with properly operating mufflers. Idling equipment shall be turned off when not in use.
>
> **Noise Reduction Measure NOISE-2:** The construction contractor(s) shall ensure that the concrete pumps are muffled and enclosed within temporary sheds, incorporate insulation barriers, or other measures to the extent feasible.

Table 3 shows the estimated construction noise levels that would occur at the nearest offsite sensitive use during the Project's night construction activities at the Project Site, including the

[2] Federal Highway Administration (FHWA), Roadway Construction Noise Model User's Guide, 2006.

implementation of the noise reduction measures. Details for the construction noise calculations for each construction phase are shown in Appendix A.

TABLE 3
ESTIMATED CONSTRUCTION NOISE LEVELS AT OFFSITE NOISE-SENSITIVE USES

Construction Phase	Estimated Maximum Construction Noise Levels (dBA L_{max})	Estimated Average Construction Noise Levels (dBA L_{eq})
Soil Excavation & Hauling	64	62
Concrete Pours:		
P3-1 & P3-2 and P3-3	61	64
G-4	61	64
Culver City Night Noise Standards	*65*	*50*

SOURCE: ESA, 2017.

As shown in Table 3, the Project's maximum night construction noise levels would not exceed Culver City's night noise limit of 65 dBA L_{max} at the nearest multi-family residential uses in Culver City, located adjacent to southeast of the Project Site.

The Project's night construction noise levels during concrete pours of 64 dBA L_{eq} at the nearest offsite sensitive receptor in Culver City, would exceed Culver City's 1995 General Plan Noise Element, Noise Standards, nighttime (10:00 p.m. to 7:00 a.m.) levels of 50 dBA Leq for a duration of 30 minutes (City 1995), as shown in Table 2. However, the measured ambient noise levels at the residence ranged from as high as 65.8 dBA L_{eq} at 7:00 p.m. to as low 56.3 dBA L_{eq} at 3:00 a.m during the nighttime period (10:00 p.m. to 7:00 a.m.), with an average ambient noise level over this night period of approximately 65 dBA L_{eq}. Therefore, the Project's night construction noise during continuous concrete pours of 64 dBA L_{eq} at the multi-family residential use would be slightly below the average ambient night noise level of approximately 65 dBA L_{eq}. The combined resultant ambient noise level would increase ambient levels by less than 3 dBA, which would be a less than perceptible increase. However, during the quietest hour of 3:00 a.m the ambient night noise level would be somewhat lower, measured at approximately 56.3 dBA L_{eq}. , and therefore, the Project's night construction noise of 64 dBA L_{eq} at the multi-family residential use would be higher than the existing ambient levels. The combined construction noise and existing ambient noise level would be approximately 65 dBA L_{eq}, which would be an increase ambient levels of approximately 8 dBA over existing ambient, which would be a perceptible increase during the quietest hour of 3:00 a.m. Therefore, the ambient increase would range from 3 dBA to 8 dBA (less than perceptible to perceptible) during the construction during the night period.

Other off-hours concrete-related activities such as install of rebar, formwork, clean-up, and backfill would not use equipment of concrete pumping activities, and therefore, woul. generate lower noise levels.

5. Conclusion

The Project's night construction maximum noise levels would not exceed the City's maximum noise level limit of 65 dBA $L_{max.}$ at the property line of the nearest noise sensitive receptor (i.e., nearest residence) in Culver City, as provided by Culver City for a variance to the City's Noise Ordinance. Furthermore, Project night construction noise at the property line of the nearest residence would be slightly less than existing average ambient noise level during the nighttime period, which would not perceptibly increase ambient noise levels at the nearest residence in Culver City during night construction. During the quietest hours of the night, the night construction noise would be somewhat higher than the ambient noise levels, resulting in a perceptible increase at the property line of the nearest residence. Therefore, the ambient increase from the night construction noise would range from 3 dBA to 8 dBA (less than perceptible to perceptible) during the loudest to quietest hours over the evening/night period.

Therefore, the Project's night construction maximum noise levels would not exceed the Culver City maximum noise standards at the nearest residence in Culver City. Furthermore, Project night construction noise would not substantially increase ambient noise levels at the nearest residence in Culver City. Therefore, a variance to the Culver City Noise Ordinance for the Project's night construction would not result in adverse noise impacts.

6. References

Culver City (Culver City), 1995 General Plan Noise Element. 1995.

Federal Highway Administration (FHWA), Roadway Construction Noise Model User's Guide, 2006.

Federal Transit Administration (FTA), Transit Noise and Vibration Impact Assessment, May, 2006.

U.S. Environmental Protection Agency (USEPA), *EPA Identifies Noise Levels Affecting Health and Welfare*, April 1974.

Lighting

In addition to noise, the Project's night construction would include the appropriate lighting equipment (i.e., tower portable lights) associated with the night construction activities (i.e. concrete pours and soil excavation).

Lighting Terminology

Lighting is defined as the state of illumination. Illuminance is the measure of emitted light falling on a surface; luminance is the measure of light reflected or emitted by it. The intensity of outdoor artificial lighting is selected based on its designed use (i.e., security, safety, visibility, or construction/maintenance) during periods of low or no natural light. Illuminance is typically measured in units of light intensity as foot-candles (fc)—the illuminance of one candle on a one square foot surface, located one foot away.

Glare is defined as offensive or undesirable light resulting from an excessively high contrast between a light source and its surrounding background. Glare can result in visual discomfort and reduce the ability to see objects. Glare usually results from a direct line-of-sight with an unshielded lighting source (lamp) from vehicles, streets, parking areas, building and site security, or entertainment/sporting venues. Glare can be controlled by proper design, location, and height of light fixtures and their light output.

Light trespass or spill light is unwanted light outside of the area intended to be illuminated by the lighting source. Light trespass is typically an undesirable condition, where surface illumination extends beyond the designed area of illumination; e.g., light spills from the source property onto an adjacent property. Like glare, light trespass can be controlled by the location and height of the lighting pole in addition to the shielding and glare control of the light source.

Lighting Design Considerations

The proposed lighting design contains design performance measures to reduce glare and light trespass, including appropriate lighting pole height and location, and lamp shielding. Pole heights for the Project's night construction would meet industry standards for lighting this type of activity. Strategic placement of the poles in relation to the activities (concrete pouring) is key to the proper lighting of the site in relation to the neighboring properties. Lamp sources would vary in multiple combinations based on the luminance level requirements of the site facilities. The proposed lighting would include external shielding reflectors to provide light shielding and glare control, decreasing the visibility of these high intensity lamps. The reflector and visor system would reduce light spill by 50 percent. Lighting would be strategically located and aimed toward the targeted construction areas of the project site with visor shields. Lighting along the southwestern site boundary would be directed toward the west to minimize viewing angles from the residences. Four tower portable lights would be placed at grade level on-site directed at the locations of the soil excavation and concrete pours, as shown on Figure 4, and Figures 5 and 6, respectively. The Lighting Calculation Graphics for the Project are provided in Appendix B.

Lighting Analysis

The proposed lighting plan would use appropriate lighting design controls including lamp type, pole location and height, and light shields and visors would reduce the potential for light trespass and glare off-site. Project lighting fixtures would direct light toward the interior of the site. The lighting design would prevent disability glare (i.e., reduction of the ability to see or identify objects). Glare and light spill would be minimized based on the design criteria.

The Project's construction lighting equipment may generate light trespass and/or glare on the project site; however, the light trespass and illuminance at the nearest residence in Culver City would be very low, and not significant, and the glare from the construction lighting equipment would not be visible at the residence. Therefore, a variance to the Culver City Noise Ordinance for the Project's night construction would not result in adverse lighting impacts.

Appendix A

Night Construction Noise Calculations

Project: Ivy Station Nighttime Construction Activities

Construction Noise Impact on Sensitive Receptors

Parameters

Construction Hours:	8	Daytime hours (7 am to 7 pm)
	0	Evening hours (7 pm to 10 pm)
	0	Nighttime hours (10 pm to 7 am)
Leq to L10 factor	3	

				Sensitive Receptor				
Construction Phase **Equipment Type**	**No. of Equip.**	**Reference Noise Level at 50ft, Lmax**	**Acoustical Usage Factor**	**Distance (ft)**	**Lmax**	**Leq**	**L10**	**Estimated Noise Shielding, dBA**
Excavation					**61**	***59***		
Semi Trucks	5	76	20%	622	61	54	57	0
Loader	1	79	50%	622	57	54	57	0
Excavator	1	81	40%	622	59	55	58	0
Concrete Pourings: P3-1 & P3-2 & P3-3					**61**	***64***		
Concrete Pump	1	81	20%	575	60	53	56	0
Concrete Trucks	2	79	40%	575	61	57	60	0
Concrete Trucks	2	79	40%	700	59	55	58	0
Concrete Trucks	2	79	40%	715	59	55	58	0
Concrete Trucks	2	79	40%	730	59	55	58	0
Concrete Trucks	2	79	40%	745	59	55	58	0
Concrete Trucks	2	79	40%	760	58	54	57	0
Concrete Trucks	2	79	40%	775	58	54	57	0
Concrete Pouring: G-4					**61**	***64***		
Concrete Pump	1	81	20%	575	60	53	56	0
Concrete Trucks	2	79	40%	575	61	57	60	0
Concrete Trucks	2	79	40%	700	59	55	58	0
Concrete Trucks	2	79	40%	715	59	55	58	0
Concrete Trucks	2	79	40%	730	59	55	58	0
Concrete Trucks	2	79	40%	745	59	55	58	0
Concrete Trucks	2	79	40%	760	58	54	57	0
Concrete Trucks	2	79	40%	775	58	54	57	0

Project: Ivy Station Nighttime Construction Activities

Construction Noise Impact on Sensitive Receptors

Parameters

Construction Ho	8	Daytime hours (7 am to 7 pm)
	0	Evening hours (7 pm to 10 pm)
	0	Nighttime hours (10 pm to 7 am)
Leq to L10 fac	3	

					Sensitive Receptor				
Construction Phase **Equipment Type**	**No. of Equip.**	**Reference Noise Level at 50ft, Lmax**	**Acoustical Usage Factor**	**Equipment Elevation**	**Distance (ft)**	**Lmax**	**Leq**	**L10**	**Estimated Noise Shielding, dBA**
Excavation at the Grade						**64**	***62***		
Semi Trucks	5	76	20%		450	64	57	60	0
Loader	1	79	50%	at the	450	60	57	60	0
Excavator	1	81	40%	grade	450	62	58	61	0
Excavation at 10 feet Below Grade						**59**	***57***		
Semi Trucks	5	76	20%	10 feet	450	59	52	55	5
Loader	1	79	50%	below	450	55	52	55	5
Excavator	1	81	40%	grade	450	57	53	56	5
Excavation at 36 feet Below Grade						**55**	***53***		
Semi Trucks	5	76	20%	36 feet	180	55	48	51	17
Loader	1	79	50%	below	180	51	48	51	17
Excavator	1	81	40%	grade	180	53	49	52	17
Excavation at 10 feet Below Grade						**64**	***62***		
Semi Trucks	5	76	20%	10 feet	250	64	57	60	5
Loader	1	79	50%	below	250	60	57	60	5
Excavator	1	81	40%	grade	250	62	58	61	5
Excavation at 12 feet Below Grade						**64**	***62***		
Semi Trucks	5	76	20%	12 feet	180	64	57	60	8
Loader	1	79	50%	below	180	60	57	60	8
Excavator	1	81	40%	grade	180	62	58	61	8

Appendix B
Night Construction Lighting Calculations

LIGHTING CALCULATION REPORT

Date:9/7/2017

IVY STATION CULVER CITY
CONSTRUCTION SITE LIGHTING
ILLUMINANCE LIGHT TRESPASS ANALYSIS AT ADJACENT RESIDENTIAL PROPERTY
VERTICAL PLANE 1: NATIONAL BOULEVARD
VERTICAL PLANE 2: WASHINGTON BOULEVARD

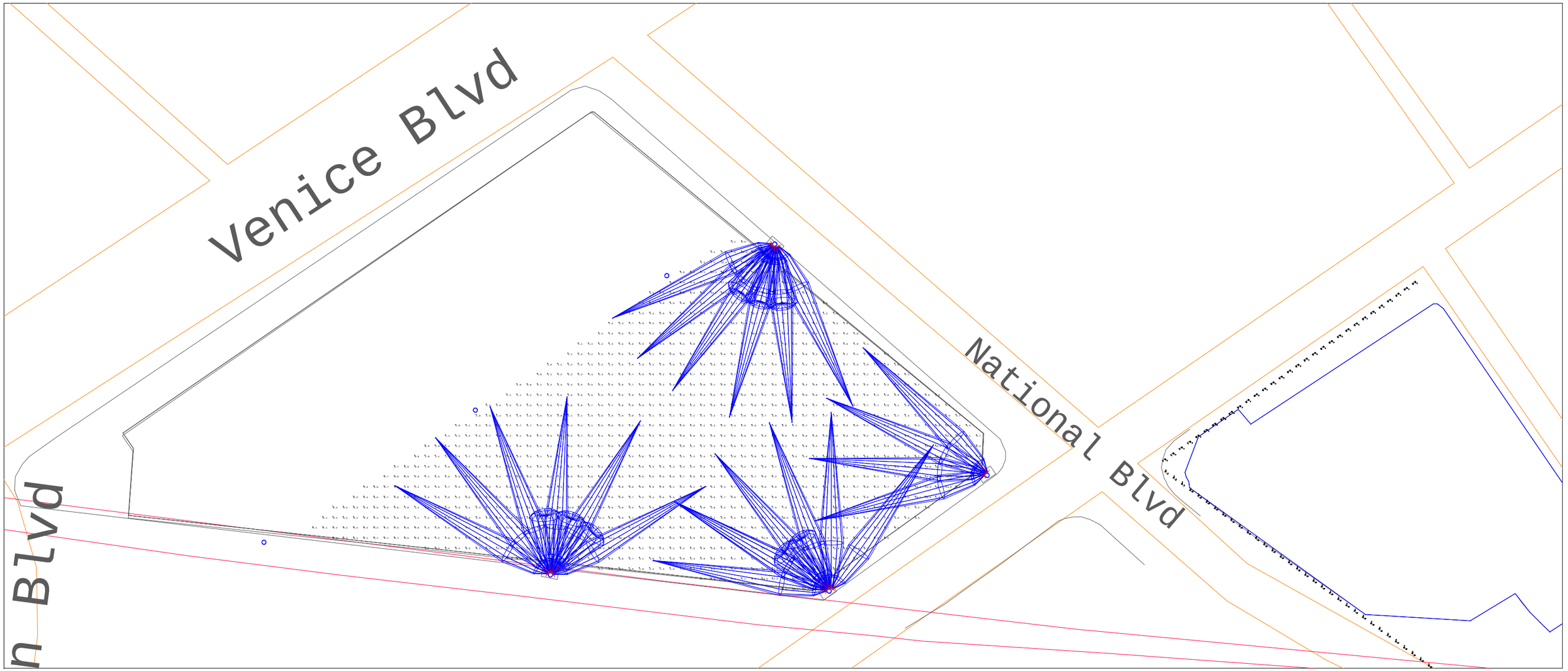
ANALYSIS CRITERIA:
LIGHT TRESPASS ILLUMINANCE: MAX 0.74 fc
CALGREEN LZ3, IESNA TABLE 26.4 LIGHTING ZONE 3
CONSTRUCTION AREA ILLUMINANCE: 10 fc AVERAGE
IESNA 10TH EDITION HANDBOOK

Luminaire Schedule

Symbol	Qty	Label	Total Lamp Lumens	LLF	Description	Lum. Watts
⊙	8	84522	N.A.	1.000		336
⊙	23	84521	N.A.	1.000		336

Calculation Summary

Label	CalcType	Units	Avg	Max	Min	Avg/Min	Max/Min
CalcPts_Site	Illuminance	Fc	6.44	85.6	0.1	64.40	856.00
Vertical Plane_North_Side_1	Illuminance	Fc	0.01	0.1	0.0	N.A.	N.A.
Vertical Plane_West_Side_3	Illuminance	Fc	0.01	0.1	0.0	N.A.	N.A.



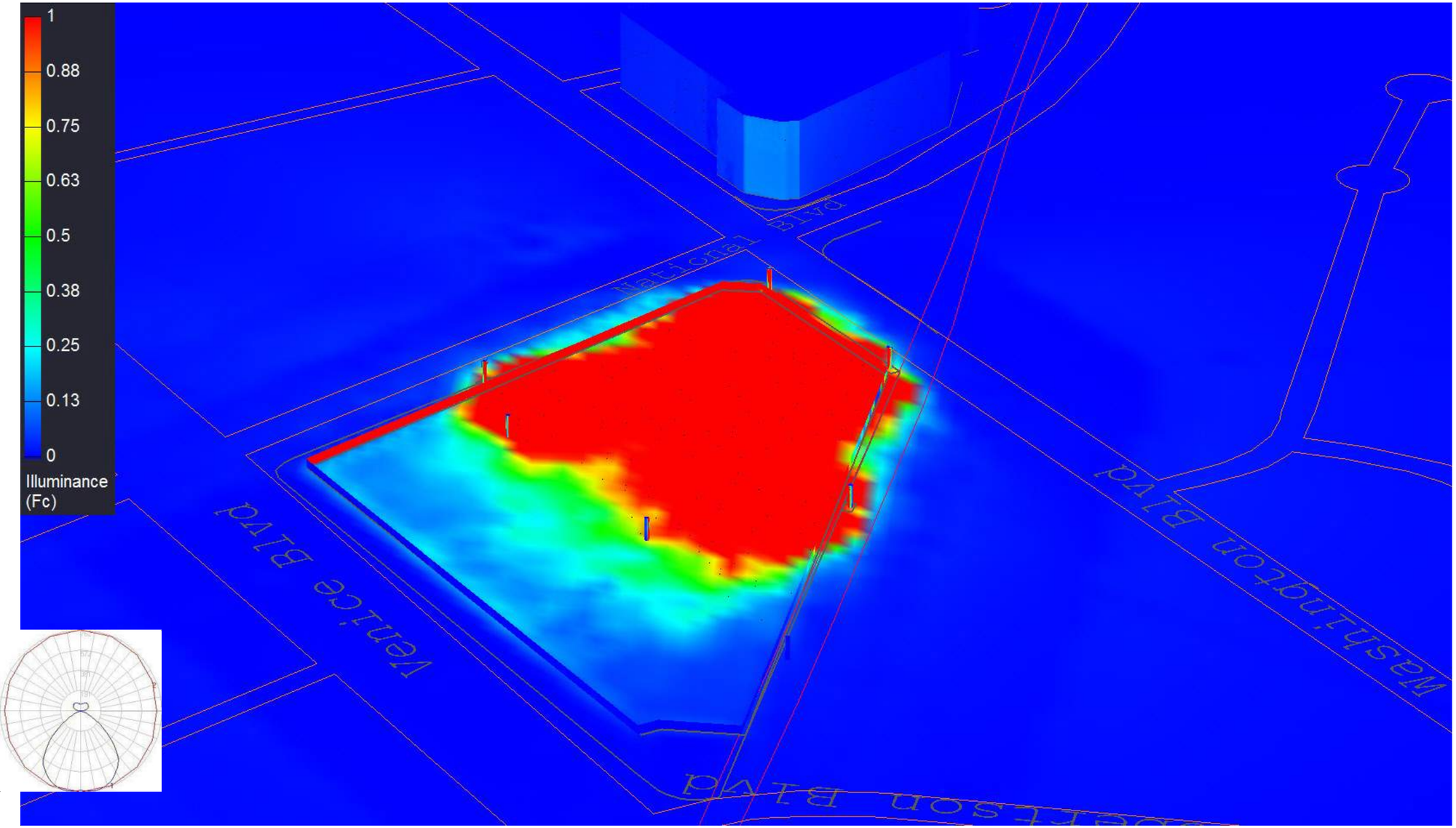
LIGHTING CALCULATION REPORT

Date:9/7/2017

IVY STATION CULVER CITY
CONSTRUCTION SITE LIGHTING
ILLUMINANCE LIGHT TRESPASS ANALYSIS AT ADJACENT RESIDENTIAL PROPERTY
VERTICAL PLANE 1: NATIONAL BOULEVARD
VERTICAL PLANE 2: WASHINGTON BOULEVARD

ANALYSIS CRITERIA:
LIGHT TRESPASS ILLUMINANCE: MAX 0.74 fc
CALGREEN LZ3, IESNA TABLE 26.4 LIGHTING ZONE 3
CONSTRUCTION AREA ILLUMINANCE: 10 fc AVERAGE
IESNA 10TH EDITION HANDBOOK

Date:9/7/2017



RENDERED VIEW

LIGHTING CALCULATION REPORT

Date:9/7/2017

IVY STATION CULVER CITY
CONSTRUCTION SITE LIGHTING
ILLUMINANCE LIGHT TRESPASS ANALYSIS AT ADJACENT RESIDENTIAL PROPERTY
VERTICAL PLANE 1: NATIONAL BOULEVARD
VERTICAL PLANE 2: WASHINGTON BOULEVARD

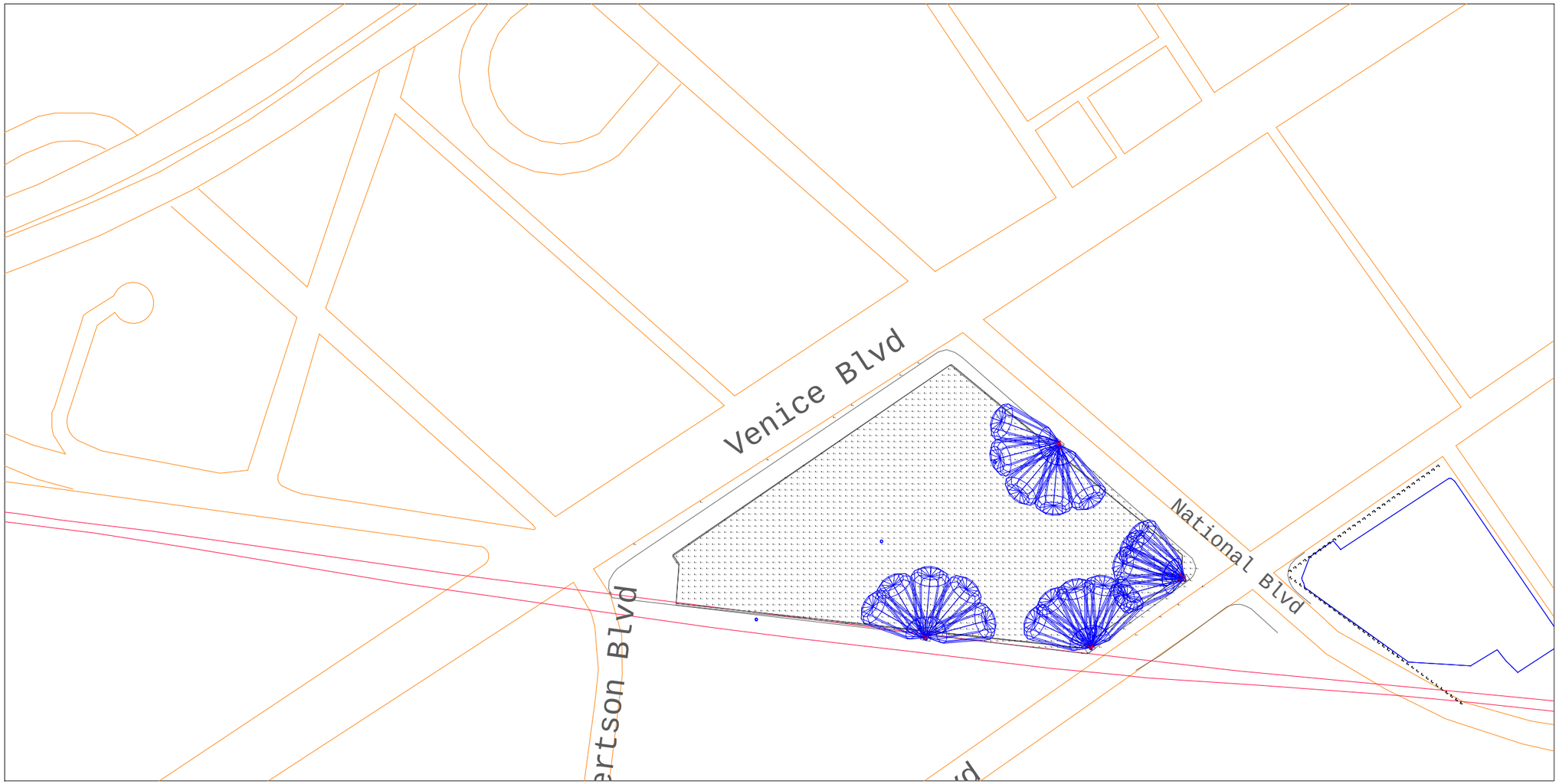
ANALYSIS CRITERIA:
LIGHT TRESPASS ILLUMINANCE: MAX 0.74 fc
CALGREEN LZ3, IESNA TABLE 26.4 LIGHTING ZONE 3
CONSTRUCTION AREA ILLUMINANCE: 10 fc AVERAGE
IESNA 10TH EDITION HANDBOOK

Luminaire Schedule

Symbol	Qty	Label	Total Lamp Lumens	LLF	Description	Lum. Watts
⊙	19	84522	N.A.	2.000		336

Calculation Summary

Label	CalcType	Units	Avg	Max	Min	Avg/Min	Max/Min
CalcPts_Site	Illuminance	Fc	5.53	43.5	0.0	N.A.	N.A.
Vertical Plane_North_Side_1	Illuminance	Fc	0.02	0.2	0.0	N.A.	N.A.
Vertical Plane_West_Side_3	Illuminance	Fc	0.03	0.4	0.0	N.A.	N.A.



Scale: 1 inch= 192 Ft.

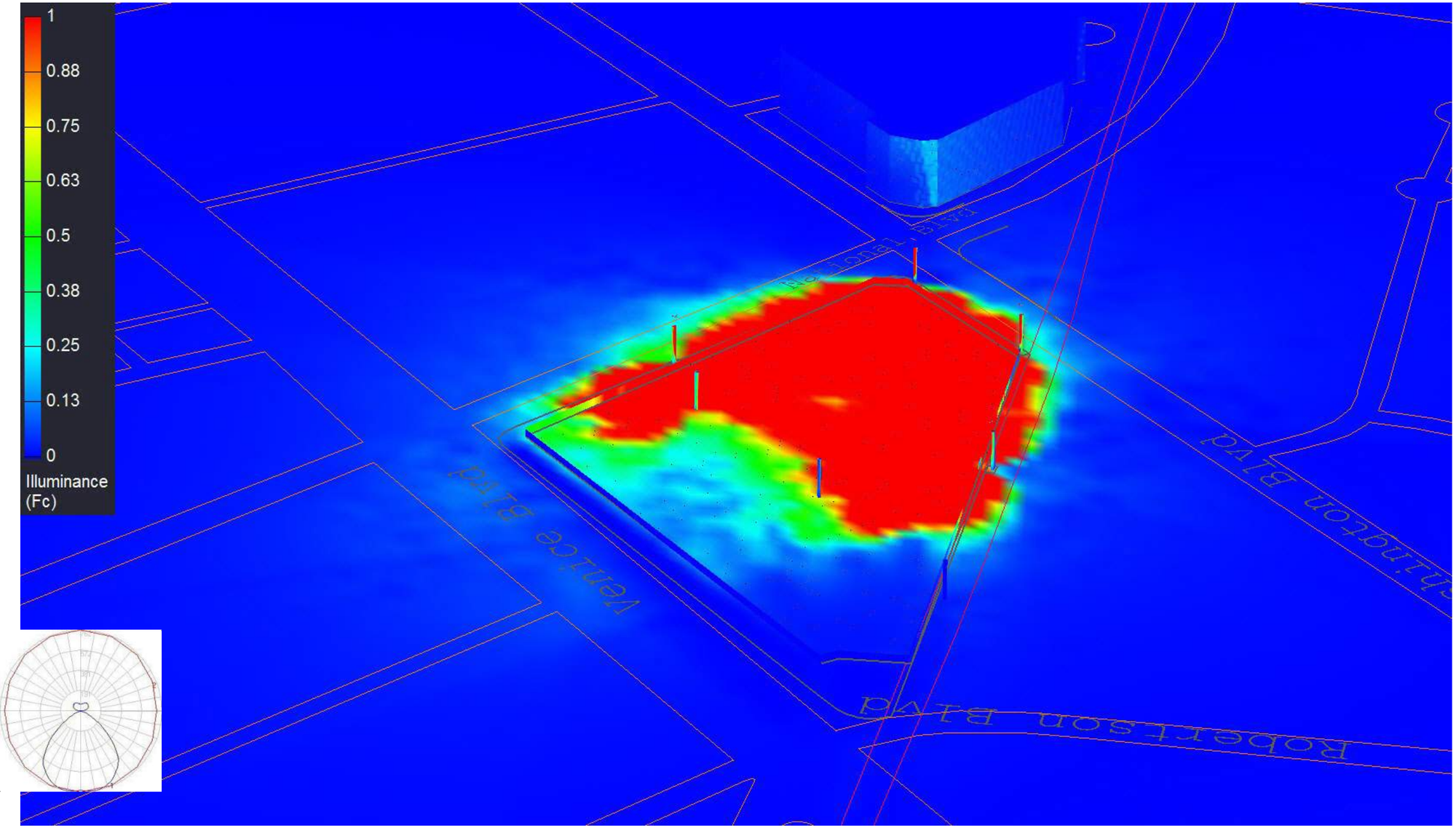
LIGHTING CALCULATION REPORT

Date:9/7/2017

IVY STATION CULVER CITY
CONSTRUCTION SITE LIGHTING
ILLUMINANCE LIGHT TRESPASS ANALYSIS AT ADJACENT RESIDENTIAL PROPERTY
VERTICAL PLANE 1: NATIONAL BOULEVARD
VERTICAL PLANE 2: WASHINGTON BOULEVARD

ANALYSIS CRITERIA:
LIGHT TRESPASS ILLUMINANCE: MAX 0.74 fc
CALGREEN LZ3, IESNA TABLE 26.4 LIGHTING ZONE 3
CONSTRUCTION AREA ILLUMINANCE: 10 fc AVERAGE
IESNA 10TH EDITION HANDBOOK

Date:9/7/2017



RENDERED VIEW

TECHNICAL MEMORANDUM

To:	Miki Bizaoui Bernards Brothers, Inc.
From:	Sri Chakravarthy, PE, TE Saly Heng, EIT Kimley-Horn and Associates, Inc.
Date:	October 9, 2017
Subject:	Ivy Station TOD, Culver City, CA – Construction Hauling Traffic Evaluation

BACKGROUND

Kimley-Horn and Associates, Inc. (Kimley-Horn) was contracted by Bernards Brothers Inc. (Bernards) to analyze daily traffic and construction haul routes to be included in the request to expand Ivy Station's construction hours beyond 8:00AM to 7:00PM during weekdays. Ivy Station's construction site is located at the Expo Line Metro Station in Culver City at the northwest corner of Washington Boulevard and National Boulevard. The project size is approximately 6.2 acres and includes a mix of commercial retail, office, residential, and hotel uses. The project will also provide 1,567 parking spaces with the majority of parking located in the site's subterranean parking structure.

According to Ivy Station's Transportation Management Plan (TMP), the site can be accessed by construction vehicles from Venice Boulevard and from National Boulevard. For site access from National Blvd, trucks would travel southbound on National Blvd and enter from the southwest corner of National Blvd and Venice Blvd. Trucks leaving the site would travel southbound on National Blvd, then westbound on Washington Blvd, and northbound on Robertson Blvd. The construction haul routes for Ivy Station in Culver City can be seen in **Attachment 1**.

Currently, the Culver City work hours are from 8:00 AM to 7:00 PM during weekdays. Bernards is proposing to expand the construction work hours to 24 hours during weekdays to expedite the construction timeline, particularly during the concrete pouring phase. If granted the work-hour extension, the concrete phase is anticipated to be shortened from 13 months to only 8 months. This technical memorandum documents the traffic analysis for the extended construction hours.

EXISTING CONDITIONS

Traffic count data was collected for 4 roadway segments adjacent to Ivy Station - Venice Boulevard, National Boulevard, Washington Boulevard, and Robertson Boulevard. 24-hour roadway segment counts were collected on Thursday, August 24, 2017, and Tuesday, August 29th, 2017. The following list indicates the roadway limits and characteristics for each segment:

1. Venice Boulevard, between Robertson Blvd and National Blvd,
    a. Runs east-west; 3 through lanes in each direction
2. National Boulevard, between Venice Blvd and Washington Blvd,
    a. Runs north-south; 2 through lanes in each direction
3. Washington Boulevard, between National Blvd and Robertson Blvd, and
    a. Runs east-west; 2 through lanes in each direction
4. Robertson Boulevard, between Washington Blvd and Venice Blvd.
    a. Runs north-south; 2 southbound through lanes, and 1 northbound through lane

After reviewing the hourly data, traffic volumes generally peak between 7:00 – 9:00AM in the morning peak period and 4:00 – 6:00PM in the afternoon peak period. Hourly traffic volume trends can be seen in **Figure 1** below. Venice Boulevard experiences higher traffic volumes than the other study segments which may be a result of a greater number of lanes and generally used as an alternative route to Interstate 10, located north of the site. The collected traffic count data are provided in **Attachment 2**.

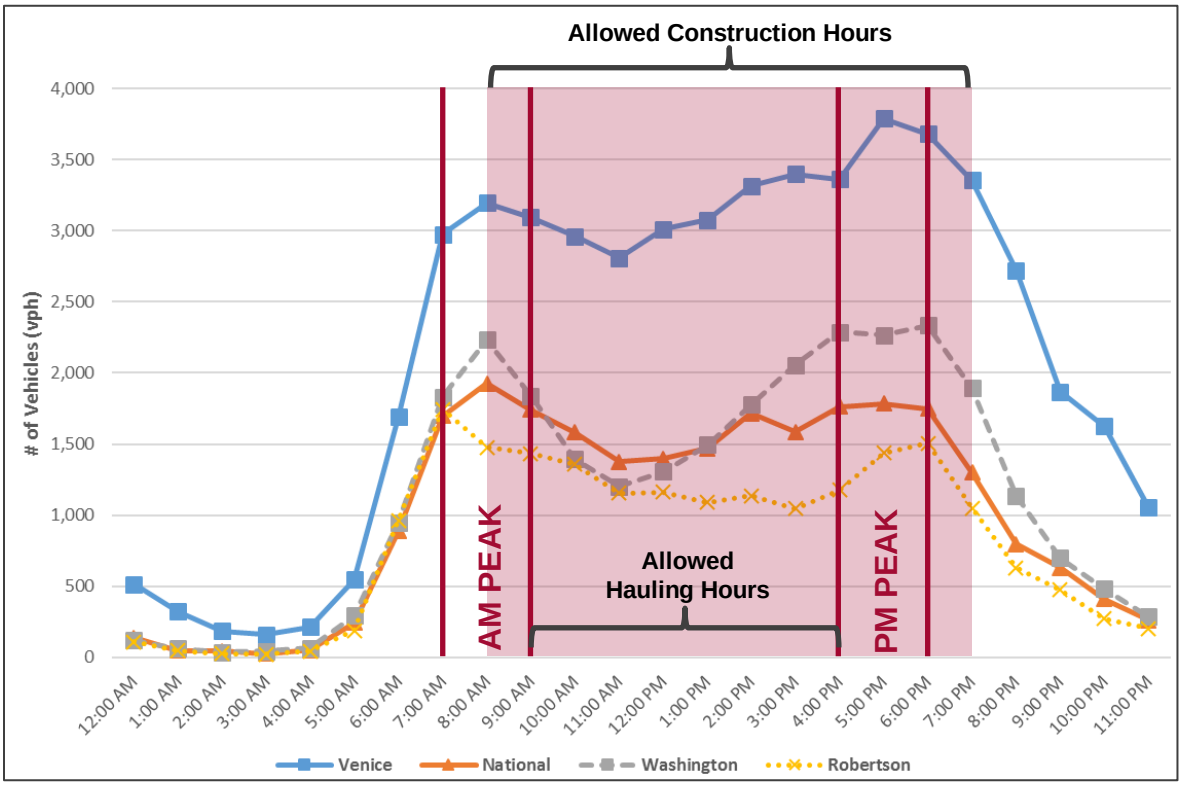


Figure 1: Current 24-Hour Volume Counts & Hour Restrictions

Figure 1 illustrates that the majority of roadway segments experience a drop off of traffic volumes of well over 60 percent when comparing data during work hours (8:00AM to 7:00PM) to off-hours (7:00PM to 8:00AM). The figure also indicates current construction hours, along with allowed hauling hours if AM and PM peak periods were avoided.

ANALYSIS

Using the traffic data collected, the impact of additional truck volumes was evaluated. According to Bernards, trucks volumes may vary between 12 and 36 trucks per hour given an 8-hour construction window. For this analysis, a conservative estimate of 36 trucks per hour was used. A heavy vehicle conversion factor of 2 passenger cars per truck was used to calculate the equivalent passenger car volume, consistent with the 2010 Highway Capacity Manual methodology.

If construction vehicles were to avoid both AM and PM peak traffic periods, hauling would be limited to only seven (7) hours per day from 9:00AM to 4:00PM. Given the nature of concrete work, a constant flow of concrete will need to travel to the site until the full pour for each section is completed. With currently permitted work hours, a 7-hour hauling window would require a greater volume of trucks per hour. If work hours were expanded to a 24-hour schedule, there would be greater flexibility with scheduling concrete pours. An expanded schedule would allow hauling between 6:00 PM to 7:00 AM, a 13-hour window thereby avoiding peak periods. **Table 1** presents hourly traffic with construction traffic during work hours and off-hours.

Table 1: Average Non-Peak Hourly Volumes with Construction Traffic

Study Segment	No Construction Trucks		With Construction Trucks	
	Non-Peak Work Hours (9AM – 4PM)	Non-Peak Off Hours (6PM-7AM)	Non-Peak Work Hours (9AM – 4PM)	Non-Peak Off-Hours (6PM-7AM)
Venice Boulevard, between Robertson Blvd and National Blvd	3,095	1,380	3,167	1,452
National Boulevard, between Venice Blvd and Washington Blvd	1,552	507	1,624	579
Washington Boulevard, between National Blvd and Robertson Blvd	1,582	647	1,654	719
Robertson Boulevard, between Washington Blvd and Venice Blvd	1,197	426	1,269	498

Construction truck volumes were added to the average hourly volumes during non-peak work hours and non-peak off-hours. With construction traffic, the maximum 36 trucks, which is equivalent to 72 passenger cars, were added to current roadway volumes. From **Table 1**, the average hourly volumes during non-peak off-hours with construction traffic are still less than that of the average hourly volumes during non-peak work hours without construction traffic. It should also be noted that given there are two access points to the site, one on Venice Blvd and one on National Blvd, construction trucks may occupy different roadway segments depending on the haul route utilized.

CONCLUSION

If work hours were expanded to a 24-hour schedule, there would be greater flexibility with scheduling concrete pours. The frequency of trucks entering the construction area could be lowered by lengthening the hauling period. The analysis indicates that the average hourly volumes during non-peak off-hours with construction traffic are still less than that of the average hourly volumes during non-peak work hours without construction traffic. In addition, extended work hours would allow workers and

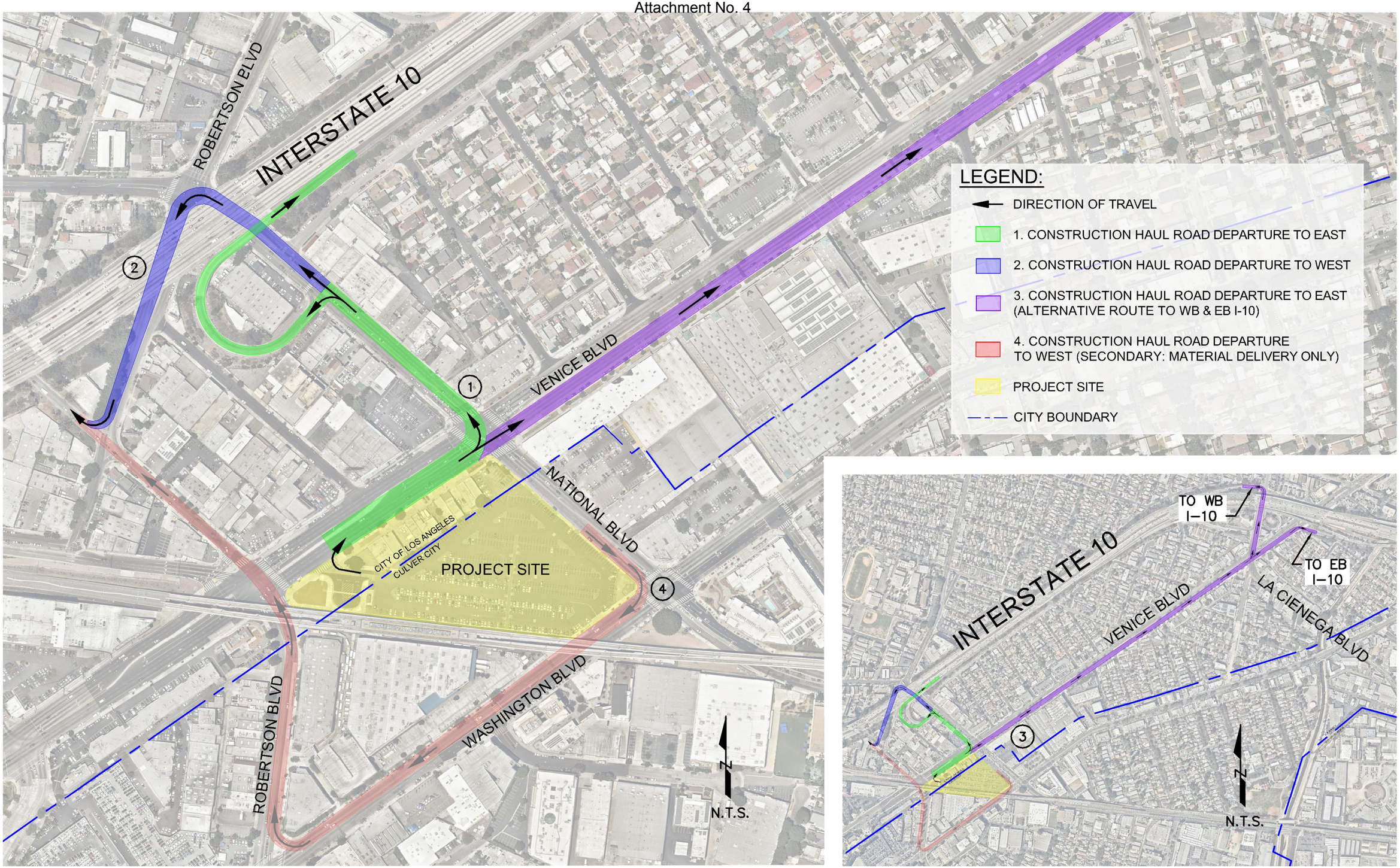
construction trucks to travel and arrive to the site during non-peak periods. For example, if an 8-hour work period is scheduled from 9:00PM to 5:00AM, workers would be able to travel to and from the construction site well outside both the PM and AM peak periods.

Attachment 1

Construction Hauling Routes

CONSTRUCTION HAUL ROUTE - APPROACH

Kimley»Horn



CONSTRUCTION HAUL ROUTE - DEPARTURE

Kimley»Horn

Attachment 2

24-Hour Volume Counts

Attachment No. 4

Prepared by NDS/ATD

VOLUME

Venice Blvd Bet. Robertson Blvd & National Blvd

Day: Thursday
Date: 8/24/2017

City: Culver City
Project #: CA17_5512_001

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	28,142	24,780	52,922

AM Period	NB	SB	EB		WB		TOTAL		PM Period	NB	SB	EB		WB		TOTAL	
00:00			96		52		148		12:00			364		373		737	
00:15			73		72		145		12:15			359		396		755	
00:30			86		56		142		12:30			375		386		761	
00:45			40	295	38	218	78	513	12:45			404	1502	355	1510	759	3012
01:00			56		36		92		13:00			377		374		751	
01:15			53		39		92		13:15			461		320		781	
01:30			42		33		75		13:30			418		322		740	
01:45			47	198	18	126	65	324	13:45			446	1702	358	1374	804	3076
02:00			25		25		50		14:00			444		377		821	
02:15			31		16		47		14:15			463		376		839	
02:30			24		22		46		14:30			431		401		832	
02:45			23	103	17	80	40	183	14:45			421	1759	403	1557	824	3316
03:00			27		19		46		15:00			468		399		867	
03:15			20		17		37		15:15			460		404		864	
03:30			22		24		46		15:30			456		397		853	
03:45			13	82	18	78	31	160	15:45			466	1850	349	1549	815	3399
04:00			20		16		36		16:00			441		356		797	
04:15			20		26		46		16:15			450		398		848	
04:30			26		33		59		16:30			463		397		860	
04:45			34	100	40	115	74	215	16:45			463	1817	393	1544	856	3361
05:00			45		37		82		17:00			492		440		932	
05:15			57		60		117		17:15			466		463		929	
05:30			65		81		146		17:30			523		457		980	
05:45			79	246	123	301	202	547	17:45			483	1964	467	1827	950	3791
06:00			99		134		233		18:00			516		412		928	
06:15			149		196		345		18:15			501		427		928	
06:30			171		303		474		18:30			506		391		897	
06:45			241	660	396	1029	637	1689	18:45			492	2015	437	1667	929	3682
07:00			263		413		676		19:00			506		365		871	
07:15			315		453		768		19:15			498		377		875	
07:30			365		417		782		19:30			501		362		863	
07:45			383	1326	365	1648	748	2974	19:45			445	1950	302	1406	747	3356
08:00			450		367		817		20:00			473		250		723	
08:15			458		349		807		20:15			492		254		746	
08:30			502		274		776		20:30			424		253		677	
08:45			463	1873	333	1323	796	3196	20:45			362	1751	215	972	577	2723
09:00			424		339		763		21:00			338		179		517	
09:15			410		388		798		21:15			295		178		473	
09:30			360		397		757		21:30			238		198		436	
09:45			363	1557	413	1537	776	3094	21:45			265	1136	176	731	441	1867
10:00			332		416		748		22:00			285		147		432	
10:15			368		398		766		22:15			225		139		364	
10:30			330		439		769		22:30			216		187		403	
10:45			320	1350	356	1609	676	2959	22:45			216	942	211	684	427	1626
11:00			357		345		702		23:00			170		166		336	
11:15			310		344		654		23:15			160		96		256	
11:30			337		381		718		23:30			125		101		226	
11:45			352	1356	381	1451	733	2807	23:45			153	608	81	444	234	1052
TOTALS				9146		9515		18661	TOTALS				18996		15265		34261
SPLIT %				49.0%		51.0%		35.3%	SPLIT %				55.4%		44.6%		64.7%

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	28,142	24,780	52,922

AM Peak Hour			08:00	06:45	08:00	PM Peak Hour			17:30	17:00	17:00
AM Pk Volume			1873	1679	3196	PM Pk Volume			2023	1827	3791
Pk Hr Factor			0.933	0.927	0.978	Pk Hr Factor			0.967	0.978	0.967
7 - 9 Volume	0	0	3199	2971	6170	4 - 6 Volume	0	0	3781	3371	7152
7 - 9 Peak Hour			08:00	07:00	08:00	4 - 6 Peak Hour			17:00	17:00	17:00
7 - 9 Pk Volume	0	0	1873	1648	3196	4 - 6 PK Volume	0	0	1964	1827	3791
Pk Hr Factor	0.000	0.000	0.933	0.909	0.978	Pk Hr Factor	0.000	0.000	0.939	0.978	0.967

Attachment No. 4

Prepared by NDS/ATD

VOLUME

National Blvd Bet. Venice Blvd & Washington Blvd

Day: Tuesday
Date: 8/29/2017

City: Culver City
Project #: CA17_5512_002

DAILY TOTALS	NB	SB	EB	WB	Total
	13,031	11,585	0	0	24,616

AM Period	NB		SB		EB		WB		TOTAL		PM Period	NB		SB		EB		WB		TOTAL	
00:00	23		18						41		12:00	198		131						329	
00:15	22		18						40		12:15	221		146						367	
00:30	9		16						25		12:30	229		142						371	
00:45	18	72	15	67					33	139	12:45	170	818	159	578					329	1396
01:00	4		9						13		13:00	175		151						326	
01:15	6		6						12		13:15	178		170						348	
01:30	6		6						12		13:30	176		185						361	
01:45	6	22	4	25					10	47	13:45	197	726	238	744					435	1470
02:00	5		9						14		14:00	215		212						427	
02:15	4		5						9		14:15	182		228						410	
02:30	3		7						10		14:30	209		230						439	
02:45	7	19	3	24					10	43	14:45	187	793	251	921					438	1714
03:00	3		1						4		15:00	163		230						393	
03:15	8		5						13		15:15	155		252						407	
03:30	1		2						3		15:30	155		207						362	
03:45	5	17	2	10					7	27	15:45	165	638	258	947					423	1585
04:00	3		6						9		16:00	164		276						440	
04:15	6		7						13		16:15	185		262						447	
04:30	11		2						13		16:30	182		273						455	
04:45	12	32	3	18					15	50	16:45	177	708	245	1056					422	1764
05:00	20		13						33		17:00	204		243						447	
05:15	19		15						34		17:15	191		247						438	
05:30	35		31						66		17:30	215		227						442	
05:45	63	137	45	104					108	241	17:45	205	815	253	970					458	1785
06:00	59		26						85		18:00	215		244						459	
06:15	133		54						187		18:15	223		245						468	
06:30	213		48						261		18:30	206		239						445	
06:45	282	687	73	201					355	888	18:45	174	818	202	930					376	1748
07:00	289		105						394		19:00	184		186						370	
07:15	313		107						420		19:15	168		194						362	
07:30	277		126						403		19:30	148		173						321	
07:45	303	1182	179	517					482	1699	19:45	110	610	138	691					248	1301
08:00	246		240						486		20:00	87		95						182	
08:15	272		216						488		20:15	104		107						211	
08:30	275		189						464		20:30	115		102						217	
08:45	248	1041	240	885					488	1926	20:45	89	395	99	403					188	798
09:00	242		193						435		21:00	95		84						179	
09:15	247		234						481		21:15	79		72						151	
09:30	231		175						406		21:30	72		73						145	
09:45	244	964	176	778					420	1742	21:45	86	332	69	298					155	630
10:00	259		173						432		22:00	61		64						125	
10:15	263		154						417		22:15	46		62						108	
10:30	266		115						381		22:30	38		49						87	
10:45	231	1019	120	562					351	1581	22:45	46	191	42	217					88	408
11:00	220		112						332		23:00	32		40						72	
11:15	213		145						358		23:15	40		31						71	
11:30	228		128						356		23:30	34		29						63	
11:45	193	854	135	520					328	1374	23:45	35	141	19	119					54	260
TOTALS		6046		3711						9757	TOTALS		6985		7874						14859
SPLIT %		62.0%		38.0%						39.6%	SPLIT %		47.0%		53.0%						60.4%

DAILY TOTALS	NB	SB	EB	WB	Total
	13,031	11,585	0	0	24,616

AM Peak Hour	07:00	08:00			08:00	PM Peak Hour	17:30	15:45			17:45
AM Pk Volume	1182	885			1926	PM Pk Volume	858	1069			1830
Pk Hr Factor	0.944	0.922			0.987	Pk Hr Factor	0.962	0.968			0.978
7 - 9 Volume	2223	1402	0	0	3625	4 - 6 Volume	1523	2026	0	0	3549
7 - 9 Peak Hour	07:00	08:00			08:00	4 - 6 Peak Hour	17:00	16:00			17:00
7 - 9 Pk Volume	1182	885	0	0	1926	4 - 6 PK Volume	815	1056	0	0	1785
Pk Hr Factor	0.944	0.922	0.000	0.000	0.987	Pk Hr Factor	0.948	0.957	0.000	0.000	0.974

Attachment No. 4

Prepared by NDS/ATD

VOLUME

Washington Blvd Bet. National Blvd & Robertson Blvd

Day: Thursday
Date: 8/24/2017

City: Culver City
Project #: CA17_5512_003

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	13,442	14,647	28,089

AM Period	NB	SB	EB		WB		TOTAL		PM Period	NB	SB	EB		WB		TOTAL	
00:00			29		8		37		12:00			134		150		284	
00:15			21		14		35		12:15			148		172		320	
00:30			16		2		18		12:30			143		185		328	
00:45			16	82	13	37	29	119	12:45			147	572	229	736	376	1308
01:00			6		12		18		13:00			153		187		340	
01:15			7		4		11		13:15			163		198		361	
01:30			9		7		16		13:30			183		191		374	
01:45			6	28	12	35	18	63	13:45			193	692	227	803	420	1495
02:00			7		6		13		14:00			231		221		452	
02:15			7		2		9		14:15			193		201		394	
02:30			6		4		10		14:30			237		213		450	
02:45			3	23	1	13	4	36	14:45			264	925	216	851	480	1776
03:00			8		5		13		15:00			269		202		471	
03:15			2		3		5		15:15			312		204		516	
03:30			8		5		13		15:30			354		174		528	
03:45			7	25	6	19	13	44	15:45			325	1260	216	796	541	2056
04:00			5		5		10		16:00			318		221		539	
04:15			3		2		5		16:15			366		217		583	
04:30			4		16		20		16:30			359		274		633	
04:45			14	26	16	39	30	65	16:45			290	1333	242	954	532	2287
05:00			18		24		42		17:00			304		240		544	
05:15			17		35		52		17:15			344		239		583	
05:30			20		62		82		17:30			327		278		605	
05:45			31	86	87	208	118	294	17:45			253	1228	282	1039	535	2267
06:00			29		100		129		18:00			312		209		521	
06:15			45		129		174		18:15			375		306		681	
06:30			62		193		255		18:30			324		274		598	
06:45			89	225	303	725	392	950	18:45			276	1287	260	1049	536	2336
07:00			104		289		393		19:00			303		216		519	
07:15			108		287		395		19:15			298		255		553	
07:30			159		344		503		19:30			252		175		427	
07:45			193	564	347	1267	540	1831	19:45			221	1074	172	818	393	1892
08:00			196		333		529		20:00			206		143		349	
08:15			207		357		564		20:15			176		133		309	
08:30			193		337		530		20:30			146		80		226	
08:45			227	823	384	1411	611	2234	20:45			136	664	116	472	252	1136
09:00			177		289		466		21:00			125		83		208	
09:15			190		314		504		21:15			122		88		210	
09:30			144		314		458		21:30			66		63		129	
09:45			170	681	242	1159	412	1840	21:45			77	390	73	307	150	697
10:00			145		273		418		22:00			72		66		138	
10:15			117		212		329		22:15			77		58		135	
10:30			110		203		313		22:30			56		50		106	
10:45			142	514	191	879	333	1393	22:45			47	252	57	231	104	483
11:00			144		177		321		23:00			40		45		85	
11:15			106		165		271		23:15			49		39		88	
11:30			144		167		311		23:30			38		15		53	
11:45			131	525	167	676	298	1201	23:45			36	163	24	123	60	286
TOTALS				3602		6468		10070	TOTALS				9840		8179		18019
SPLIT %				35.8%		64.2%		35.9%	SPLIT %				54.6%		45.4%		64.1%

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	13,442	14,647	28,089

AM Peak Hour			08:00	08:00	08:00	PM Peak Hour			15:45	17:30	17:30
AM Pk Volume			823	1411	2234	PM Pk Volume			1368	1075	2342
Pk Hr Factor			0.906	0.919	0.914	Pk Hr Factor			0.934	0.878	0.860
7 - 9 Volume	0	0	1387	2678	4065	4 - 6 Volume	0	0	2561	1993	4554
7 - 9 Peak Hour			08:00	08:00	08:00	4 - 6 Peak Hour			16:00	17:00	16:15
7 - 9 Pk Volume	0	0	823	1411	2234	4 - 6 PK Volume	0	0	1333	1039	2292
Pk Hr Factor	0.000	0.000	0.906	0.919	0.914	Pk Hr Factor	0.000	0.000	0.911	0.921	0.905

Attachment No. 4

Prepared by NDS/ATD

VOLUME

Robertson Blvd Bet. Washington Blvd & Venice Blvd

Day: Thursday
Date: 8/24/2017

City: Culver City
Project #: CA17_5512_004

DAILY TOTALS	NB	SB	EB	WB	Total
	7,091	12,651	0	0	19,742

AM Period	NB		SB		EB	WB	TOTAL		PM Period	NB		SB		EB	WB	TOTAL	
00:00	13		25				38		12:00	86		193				279	
00:15	8		21				29		12:15	74		215				289	
00:30	6		9				15		12:30	105		221				326	
00:45	7	34	18	73			25	107	12:45	103	368	166	795			269	1163
01:00	9		4				13		13:00	90		171				261	
01:15	5		6				11		13:15	109		174				283	
01:30	8		6				14		13:30	90		168				258	
01:45	2	24	6	22			8	46	13:45	95	384	192	705			287	1089
02:00	1		5				6		14:00	106		205				311	
02:15	1		5				6		14:15	95		173				268	
02:30	3		4				7		14:30	87		203				290	
02:45	2	7	6	20			8	27	14:45	89	377	179	760			268	1137
03:00	4		3				7		15:00	110		153				263	
03:15	0		8				8		15:15	107		153				260	
03:30	1		1				2		15:30	98		152				250	
03:45	1	6	5	17			6	23	15:45	107	422	166	624			273	1046
04:00	0		3				3		16:00	128		161				289	
04:15	4		6				10		16:15	111		179				290	
04:30	6		11				17		16:30	129		178				307	
04:45	3	13	12	32			15	45	16:45	117	485	172	690			289	1175
05:00	9		20				29		17:00	164		199				363	
05:15	8		20				28		17:15	128		186				314	
05:30	8		35				43		17:30	177		212				389	
05:45	25	50	62	137			87	187	17:45	169	638	201	798			370	1436
06:00	29		59				88		18:00	213		207				420	
06:15	58		132				190		18:15	177		208				385	
06:30	80		209				289		18:30	172		196				368	
06:45	119	286	277	677			396	963	18:45	155	717	178	789			333	1506
07:00	122		280				402		19:00	137		180				317	
07:15	146		302				448		19:15	130		165				295	
07:30	174		267				441		19:30	97		147				244	
07:45	164	606	290	1139			454	1745	19:45	84	448	108	600			192	1048
08:00	99		224				323		20:00	70		88				158	
08:15	112		264				376		20:15	66		105				171	
08:30	133		263				396		20:30	44		117				161	
08:45	146	490	235	986			381	1476	20:45	50	230	89	399			139	629
09:00	138		225				363		21:00	39		95				134	
09:15	141		232				373		21:15	51		78				129	
09:30	129		220				349		21:30	30		72				102	
09:45	112	520	237	914			349	1434	21:45	25	145	86	331			111	476
10:00	117		245				362		22:00	32		61				93	
10:15	81		254				335		22:15	20		45				65	
10:30	94		258				352		22:30	13		37				50	
10:45	78	370	229	986			307	1356	22:45	17	82	46	189			63	271
11:00	96		211				307		23:00	28		32				60	
11:15	78		204				282		23:15	13		40				53	
11:30	70		223				293		23:30	10		35				45	
11:45	84	328	188	826			272	1154	23:45	10	61	35	142			45	203
TOTALS		2734		5829				8563	TOTALS		4357		6822				11179
SPLIT %		31.9%		68.1%				43.4%	SPLIT %		39.0%		61.0%				56.6%

DAILY TOTALS	NB	SB	EB	WB	Total
	7,091	12,651	0	0	19,742

AM Peak Hour	07:00	07:00			07:00	PM Peak Hour	17:30	17:30			17:30
AM Pk Volume	606	1139			1745	PM Pk Volume	736	828			1564
Pk Hr Factor	0.871	0.943			0.961	Pk Hr Factor	0.864	0.976			0.931
7 - 9 Volume	1096	2125	0	0	3221	4 - 6 Volume	1123	1488	0	0	2611
7 - 9 Peak Hour	07:00	07:00			07:00	4 - 6 Peak Hour	17:00	17:00			17:00
7 - 9 Pk Volume	606	1139	0	0	1745	4 - 6 PK Volume	638	798	0	0	1436
Pk Hr Factor	0.871	0.943	0.000	0.000	0.961	Pk Hr Factor	0.901	0.941	0.000	0.000	0.923