APPENDIX E NOISE METHODOLOGY AND ASSUMPTIONS

626 Wilshire Boulevard
Suite 1100
Los Angeles, CA 90017
213.599.4300 phone
213.599.4301 fax

esassoc.com

memorandum

date	October 27, 2021
to	Gena Guisar, AICP, Planner, City of Carson
from	Olivia Chan, Managing Associate
subject	The District at South Bay Specific Plan Amendment Noise Methodology and Assumptions

Noise Methodology and Assumptions

Introduction

ESA conducted a comprehensive operational noise impact analysis for the 2021 Project. Noise associated with operation of the 2021 Project were quantified. Construction methodology, impacts, mitigation measures, and conclusions are assumed to be substantially the same as those disclosed in the 2018 SEIR for the 2018 Project and, therefore, construction noise has not been reevaluated for the 2021 Project. This technical memorandum does not discuss modeling results or determination of impacts. This technical memorandum describes the methodology and assumptions used to estimate operational noise of the 2021 Project.

Noise Attenuation

When noise propagates over a distance, the noise level reduces with distance depending on 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, referred to as "spherical spreading." Stationary point sources of noise, including stationary mobile sources such as idling vehicles, attenuate (i.e., reduce) at a rate between 6 A-weighted decibels (dBA) for acoustically "hard" sites and 7.5 dBA for "soft" sites for each doubling of distance from the reference measurement, as their energy is continuously spread out over a spherical surface (e.g., for hard surfaces, 80 dBA at 50 feet attenuates to 74 dBA at 100 feet, 68 dBA at 200 feet, etc.). 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 reduction 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, which in addition to geometric spreading, provides an excess ground attenuation value of 1.5 dBA (per doubling distance).[1]

[1] Caltrans, *Technical Noise Supplement* (TeNS), Section 2.1.4.2, September 2013.

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.[2] Therefore, noise due to a line source attenuates less with distance than that of a point source with increased distance.

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. Atmospheric temperature inversion (i.e., increasing temperature with elevation) can increase sound levels at long distances (e.g., more than 500 feet). Other factors such as air temperature, humidity, and turbulence can also have significant effects on noise levels.[3]

Existing Noise Levels

Noise-Sensitive Receptor Locations and Ambient Noise Levels

Some land uses are considered more sensitive to intrusive noise than others, due to the types of activities typically involved at the receptor location. Specifically, the City of Carson has identified residences, public and private school classrooms, libraries, hospitals, and elderly care facilities as noise-sensitive receptors. As identified in the 2018 SEIR, the nearest sensitive residential receptors that may be affected by the 2021 Project are the one- and two-story detached residences and mobile homes that are located across the Torrance Lateral Channel (Torrance Lateral) to the south and west of the Project Site and multifamily residential uses across Del Amo Boulevard. Planning Area 1 (PA1) of the 2021 Project, located at the northeast corner of the Project Site, would include residential uses, and the 2021 Project includes outdoor recreational components at the southeast corner of the Project Site. Although these uses considered on-site receptors, the analysis of environmental impacts to on-site uses is not required by CEQA. The revised noise analysis provided by this 2021 SEIR includes an analysis of impacts at the same representative sensitive receptors as the 2018 SEIR. However, due to land use changes proposed by the 2021 Project to PA3, additional receptor points have been added in locations that would be most affected by the proposed 2021 Project land use plan. All of the additional receptor points are within areas that were accounted for and represented by the receptors analyzed in the 2018 SEIR. The noise-sensitive land uses in the Project area are depicted in **Figure 1, Noise-Sensitive Receptors and Measurement Locations**.

Sound measurement data are summarized in **Table 1, Summary of Ambient Noise Measurement Data (dBA)—2021 Project Supplement (2017)**. The 2018 SEIR evaluated noise impacts at three locations determined to be representative of the nearby off-site sensitive receptors, listed as noise measurement location M1 (residential uses north of Del Amo Boulevard), M3 (residential uses south and southeast of the Torrance Lateral), and M4 (residential uses south of the Torrance Lateral and east of Main Street). These three groups of receptors remain the basis of the evaluation herein. However, due to the proposed land use changes proposed by the 2021 Project to Planning Area 3 (PA3), additional receptor points to the west and south of the Torrance Lateral, which were all represented by 2018 Project receptors, have been included at locations that would be most impacted by the 2021 Project design. Sensitive receptor locations R1 through R9 are shown in Figure 1. Note that measurement location M2 is located adjacent to the 405 Freeway and does not represent a sensitive receptor.

[2] Caltrans, *Technical Noise Supplement* (TeNS), Section 2.1.4.1, September 2013.
[3] Caltrans, *Technical Noise Supplement* (TeNS), Section 2.1.4.3 September 2013.

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SOURCE: ESA, 2021

The District at South Bay

Figure 1
Noise-Sensitive Receptors and Measurement Locations

ESA

Table 1
Summary of Ambient Noise Measurement Data (dBA)—2021 Project Supplement (2017)

Location Number[a]	Measurement Location[a]	Representative Receptor[b]	Monitoring Data			
			Distance of Receptor to Property[b]	Daytime Hourly L_{eq}	Nighttime 10 p.m. – 11 p.m. L_{eq}	Nighttime 11 p.m.– 7 a.m. L_{eq}
M1	South of Del Amo Blvd	R9	125	72.7	71.2	68.7
M2	Northeast, west of I-405	No sensitive receptor	N/A	74.3	76.6	75.1
M3	Southeast portion of Property north of Channel	R2–R8	175	55.2	53.3	48.8
M4	Northwest portion of Property north of Channel	R1	150	58.9	57.4	54.9

SOURCE: ESA 2021.

NOTES:

Based on ambient sound measurements conducted from August 3 through August 4, 2017. Noise measurement data is provided in Noise and Vibration Calculations and Model Outputs, *below. Short-term daytime measurements were taken at M1 and M4. Therefore, nighttime data is not available for M1 and M4. However, the nighttime to daytime trends recorded at M2 and M3 were used to calculate the nighttime ambient noise levels for locations M1 and M4, which would be representative.*

[a] *Noise measurement locations and representative sensitive receptor locations are shown on Figure 1.*

[b] *Although noise measurements were taken at limited locations on the Project Site boundary, measured noise levels are representative of the ambient noise level at nearby receptors in the general location of the measurement location.*

Neither the 2006 Project nor the 2018 Project anticipated substantial nighttime activity at the Project Site. As such, nighttime ambient noise levels were not required to conduct noise analyses in terms of Project-related increases in noise over ambient levels. The 2021 Project, however, includes nighttime operations within PA3. Therefore, ambient noise data during nighttime hours are required to perform the operational noise analysis. Long-term, 24-hour, noise measurements were taken at measurement locations M2 and M3. Daytime noise measurements were taken at locations M1 and M4. However, between nighttime ambient noise levels were not required to conduct noise analyses in the 2018 SEIR, nighttime noise measurements were not recorded and are not available for locations M1 and M4. Measurement locations M1 and M2 are both located along Del Amo Boulevard where the main contributor of ambient noise consists of on-road vehicular travel and similar fluctuations in daytime to nighttime noise levels can be expected. Measurement locations M3 and M4 are both located along the Torrance Lateral Channel, generally separated from major roadways and representative of daytime to nighttime noise within a residential neighborhood. Therefore, it is appropriate and reasonable to interpolate nighttime measurement data to derive nighttime ambient noise levels at measurement locations M1 and M4. Based on the fluctuations in hourly noise levels collected at measurement locations M2 and M3, the nighttime to daytime trends recorded at M2 and M3 were used to calculate the nighttime ambient noise levels for locations M1 and M4, which would be representative.

Existing Roadway Noise Levels

Existing roadway Community Noise Equivalent Level (CNEL) noise levels were calculated for roadway segments located within the study area based on vehicular turning movement data at intersections identified for

The District at South Bay 2021 Project Transportation Impact Analysis (TIA) by the City.[4] Existing traffic volumes provided in the TIA do not account for volumes attributed to trucks. Therefore, the existing traffic volumes were adjusted to account for medium-duty trucks using traffic volume data collected in 2017 along designated truck routes. Turning movements at each studied intersection were used to determine traffic volumes along 43 roadway segments within the Project vicinity. The roadway segments, when compared to roadways located farther away from the Project Site, would experience the greatest percentage increase in traffic generated by the Project (i.e., as distances are increased from the Project Site, traffic is spread out over a greater geographic area, and its effects are reduced).

Existing roadway CNEL noise levels were calculated using the Federal Highway Administration's (FHWA's) Highway Traffic Noise Model (FHWA-TNM)[5] and traffic volumes at the study intersections reported in the TIA. The FHWA-TNM model calculates the average noise level at specific locations based on traffic volumes, average speeds, and site environmental conditions. **Table 2, Existing Roadway Traffic Noise Impacts at Representative Noise-Sensitive Locations**, summarizes the traffic noise modeling results for existing conditions and identifies the land uses adjacent to each roadway segment as well as the compatibility of existing traffic noise with the land use based on the City's community noise/land use compatibility criteria.[6]

Table 2
Existing Roadway Traffic Noise Impacts at Representative Noise-Sensitive Locations

Roadway Segment	Existing Land Uses Located along Roadway Segment	CNEL at 50 Feet from Centerline (dBA)	Land Use Compatibility[a]
VERMONT AVENUE			
North of Del Amo Blvd	Industrial, Hotel, Place of Worship, School	68.1	NU
Del Amo Blvd and Carson St	Residential, Care Facility, Commercial	68.6	NU
South of Carson St	Commercial, Wellness Center, Residential	68.1	NU
HAMILTON AVENUE			
Del Amo Blvd and 101 SB Ramps	Industrial	63.8	NA
110 SB Ramps and Torrance Blvd	Industrial, Commercial	64.4	NA
FIGUEROA STREET			
405 NB Off Ramp and 405 SB On Ramp	N/A	69.4	NA
405 SB On Ramp and Del Amo Blvd	Industrial	70.5	NA
Del Amo Blvd and 110 NB Ramps	Industrial, Commercial	69.6	CA
110 NB Ramps and Torrance Blvd	Commercial	70.3	CA
Torrance Blvd and Carson St	Commercial, Place of Worship, Residential	66.9	NU
South of Carson St	Residential, Place of Worship, School	66.8	NU

4 Fehr & Peers, *The District at South Bay 2021 Project Transportation Impact Analysis*, October 2021.

5 The traffic noise model was developed based on calculation methodologies provided in the Caltrans TeNS document and traffic data provided in the TIA. This methodology, considered an industry standard, allows for the definition of roadway configurations, barrier information (if any), and receiver locations.

6 City of Carson, *General Plan Noise Element*, Table N-2 Noise and Land Use Compatibility Matrix, 2004

Table 2
Existing Roadway Traffic Noise Impacts at Representative Noise-Sensitive Locations

Roadway Segment	Existing Land Uses Located along Roadway Segment	CNEL at 50 Feet from Centerline (dBA)	Land Use Compatibility[a]
MAIN STREET			
405 NB Ramp and 405 SB Ramp	N/A	69.2	NA
405 SB Ramp and Del Amo Blvd	Industrial	70.3	NA
Del Amo Blvd and Lenardo Dr	Commercial	68.8	CA
Lenardo Dr and Torrance Blvd	Residential, Commercial	67.9	NU
Torrance Blvd and 213th St	Residential, Commercial, Industrial, Place of Worship	71.0	NU
213th St and Carson St	Residential, Commercial, Recreation	70.2	NU
South of Carson St	Industrial, Commercial, School, Residential	68.9	NU
AVALON BOULEVARD			
North of Del Amo Blvd	Residential, Commercial	68.4	NU
Del Amo Blvd and 405 NB Ramp	Commercial, School	68.7	NU
405 NB Ramp and 405 SB Ramp	N/A	68.1	NA
405 SB Ramp and 213th St	Residential, Commercial	67.8	NU
213th St and Carson St	Residential, Commercial	67.5	NU
South of Carson St	Commercial, Hotel, Residential	66.9	NU
DEL AMO BOULEVARD			
West of Vermont Ave	Residential	66.9	NU
Vermont Ave and Hamilton Ave	Residential, Industrial	69.2	NU
Hamilton Ave and Figueroa St	Industrial	72.3	NA
Figueroa St and Main St	Industrial, Commercial	72.6	NA
Main St and Stamps Dr	Residential	69.9	NU
Stamps Dr and Avalon Blvd	Residential	69.7	NU
TORRANCE BOULEVARD			
West of Hamilton Ave	Residential, Commercial	69.4	NU
Hamilton Ave and Figueroa St	Residential	70.2	NU
Figueroa St and Main St	Commercial, Place of Worship, Industrial	68.3	NU
East of Main St	Residential	60.2	NA
213TH STREET			
Main St and Avalon Blvd	Residential	61.5	CA
East of Avalon Blvd	Commercial, Residential	60.0	CA

Table 2
Existing Roadway Traffic Noise Impacts at Representative Noise-Sensitive Locations

Roadway Segment	Existing Land Uses Located along Roadway Segment	CNEL at 50 Feet from Centerline (dBA)	Land Use Compatibility[a]
CARSON STREET			
West of Vermont Ave	Commercial, Hotel, Medical Office	67.6	CA
Vermont Ave and Figueroa St	Commercial	67.5	NA
Figueroa St and Main St	Commercial, Place of Worship, Residential	66.8	NU
Main St and Avalon Blvd	Commercial, School, Residential	66.9	NU
Avalon Blvd and 405 SB Ramp	Residential, Commercial, Hotel	68.0	NU
405 SB Ramp and 405 NB Ramp	N/A	67.6	NA
LENARDO DRIVE			
405 SB Ramp and Avalon Blvd	Residential	54.8	NA

SOURCE: *ESA 2021; City of Carson,* Carson General Plan, *Chapter 7, Noise Element, 2004, Table N-2, Noise and Land Use Compatibility Matrix.*

NOTES:

Exterior 24-hour CNEL noise levels.

[a] *Land use compatibility:*

NA = Normally Acceptable: Specified land use is satisfactory, based upon the assumption buildings involved are conventional construction, without any special noise insulation.

AC = Conditionally Acceptable: New construction or development only after a detailed analysis of noise mitigation is made and needed noise insulation features are included in project design. Conventional construction, but with closed windows and fresh air supply systems or air conditioning will suffice.

NU = Normally Unacceptable: New construction or development generally should be discouraged. A detailed analysis of the noise reduction requirements must be made and noise insulation features included in the design of a project.

CU = Clearly Unacceptable: New construction or development should generally not be undertaken.

Construction Noise

The construction noise analysis evaluates the worst case day of construction activity. While the construction dates and amount of overlap have changed for the 2021 Project as compared to the 2018 Project, it is assumed that the single worst-case day of construction would remain the same because construction techniques and equipment required for the 2021 Project would be similar to what was analyzed in the 2018 SEIR. Therefore, the construction noise and vibration analysis included in the 2018 FEIR (see 2018 SEIR pp. IV.H-11 to IV.H-19 [Unmitigated] and IV.H-33 to IV.H-37 [Level of Significance after Mitigation] for construction noise and vibration analyses) remains applicable. See **Table 3, Mitigated Construction Noise Impacts from the 2018 Project**, for a summary of mitigated construction noise impacts as shown in the 2018 SEIR. Although the worst-case day of construction activity as analyzed in the 2018 SEIR would remain relevant for 2021 Project construction, it should be noted that DDC would not be conducted within PA3.

Table 3
Mitigated Construction Noise Impacts from the 2018 Project

On-Site Construction Noise Sources	Noise Levels, dBA L_{eq}[a]		
	2018 Receptor R1[b]	2018 Receptor R3[c]	2018 Receptor R4[d]
(A) EXISTING			
Ambient Noise Level	72.7	55.2	58.9
(B) MITIGATED CONSTRUCTION NOISE			
Deep Dynamic Compaction – 1 Rig	59.0	57.0	57.0
Deep Dynamic Compaction – 3 Rigs	61.0	60.0	60.0
Pile Driving	66.0	65.0	65.0
Pile Driving (3 Rigs) & DDC (3 Rigs)	67.0	65.0	65.0
General Construction	53.0	51.0	51.0
(C) EXISTING + MITIGATED CONSTRUCTION NOISE			
Deep Dynamic Compaction – 1 Rig	72.9	59.2	61.1
Deep Dynamic Compaction – 3 Rigs	73.0	61.2	62.5
Pile Driving	73.5	65.4	66.0
Pile Driving (3 Rigs) & DDC (3 Rigs)	73.7	65.4	66.0
General Construction	72.7	56.6	59.6
(D) DIFFERENCE FROM EXISTING NOISE LEVEL (C-A)			
Deep Dynamic Compaction – 1 Rig	0.2	4.0	2.2
Deep Dynamic Compaction – 3 Rigs	0.3	**6.0**	3.6
Pile Driving	0.8	**10.2**	**7.1**
Pile Driving (3 Rigs) & DDC (3 Rigs)	1.0	**10.2**	**7.1**
General Construction	0.0	1.4	0.7

SOURCE: 2018 SEIR Table IV.H-8.

NOTES:

[a] *Construction noise levels exceeding the significance threshold of 5 dBA over the ambient noise level are in bold. According to the Caltrans TeNS to the Traffic Noise Analysis Protocol (Section 2.2.1.1, September 2013), a change of 5 dBA in ambient noise levels is considered to be a readily perceivable difference.*

[b] *This sensitive receptor location is shown in Figure IV.E-1 as R9 for the 2021 Project:*

[c] *This sensitive receptor location is shown in Figure IV.E-1 as R2 through R8 for the 2021 Project:*

[d] *This sensitive receptor location is shown in Figure IV.E-1 as R1 for the 2021 Project:*

Operational Noise Assumptions

Off-Site Roadway Noise (Operation)

Roadway noise impacts were evaluated using the FHWA-TNM based on the roadway traffic volume data provided in the TIA prepared for the Project and included in Appendix C1, *Transportation Impact Analysis*, of

the 2021 SEIR.[7] This method allows for the definition of roadway configurations, barrier information (if any), and receiver locations. Roadway noise attributable to Project development was calculated and compared to baseline noise levels that would occur under the "Without Project" condition. With respect to operational traffic noise, impacts are evaluated for future years 2024, 2025, and 2026 under the 2021 Project.

On-Site Stationary Noise (Operation)

Stationary noise impacts were evaluated by identifying the noise levels generated by outdoor stationary noise sources, such as open spaces, outdoor activity, mechanical equipment, parking, and loading area activity, calculating the hourly L_{eq} noise level from each noise source at sensitive receptor property lines, and comparing such noise levels to existing ambient noise levels.

On-site operational activity associated with the proposed project development for PA1 and PA2 under this 2021SEIR will remain unchanged from that contemplated in the 2018 SEIR. Therefore, the methodology used for the analysis of on-site operational noise sources associated with PA1 and PA2 remain unchanged. The 2021 Project includes modifications to the land uses proposed for PA3. The proposed zoning for the 2021 Project includes a range of allowable uses for PA3. However, the most noise-insensitive uses including Fulfillment Center, Parcel Hub/Distribution Center uses, amplified sound, and outdoor recreational and gathering spaces, have been assumed for this analysis to allow for a conservative analysis. All other allowable uses for PA3 would be less noise-intensive and impacts would be covered by the analysis herein. Due to the level of activity and number of operational noise sources associated with the land uses proposed for PA3, potential impacts from on-site operational noise sources associated with the uses proposed for PA3 have been analyzed utilizing the Computer Aided Noise Abatement (CadnaA) noise program (Version 2019). CadnaA is a Windows-based software program that predicts and assesses noise levels in the vicinity of noise sources based on International Organization for Standardization 9613-2 algorithms for noise propagation calculations. The calculations account for classical sound wave divergence plus attenuation factors resulting from air absorption, basic ground effects (elevation), and barrier/shielding. The anticipated configuration of proposed buildings and shielding, worst-case location of noise sources, and elevation have been accounted for in CadnaA.

Assumptions associated with each on-site stationary noise source is discussed below.

Mechanical Equipment

Like the 2006 Project and the 2018 Project, 2021 Project development would include mechanical equipment including heating, ventilation, and air conditioning (HVAC) systems, rooftop ventilation systems, and emergency generators. Mechanical equipment could generate noise levels that are audible at both on- and off-site noise-sensitive locations. As discussed in the 2006 FEIR (see 2006 FEIR [DEIR pp. 444–445]), this mechanical equipment would include noise control measures and shielding that would ensure that noise levels would not exceed 50 dBA during daytime hours and 45 dBA during nighttime hours at the nearest sensitive receptors. For purposes of the 2021 Project analysis, mechanical equipment noise from PA2 has not been recalculated and noise levels are assumed to reach a worst-case daytime level of 50 dBA L_{eq} at all sensitive receptors. Where shielding would be provided, blocking line-of-sight to PA2, by Project buildings, a noise level reduction of 10 dBA L_{eq} has been applied.

[7] Fehr & Peers, *The District at South Bay 2021 Project Transportation Impact Analysis*, October 2021.

Industrial buildings within PA3(a) would require rooftop mechanical equipment to ventilate interior spaces. Ventilation system requirements for each building are not known as the buildings are speculative and tenants are not yet known. Therefore, consistent with the 2018 SEIR, it is assumed that ventilation noise from PA3 would be designed to not exceed 50 dBA L_{eq} during daytime hours and 45 dBA L_{eq} during nighttime hours at all sensitive receptors.

Each industrial building would include office space that would require air conditioning systems. Using a reference noise level of 81.9 dBA L_{eq} at a reference distance of 50 feet, air conditioning equipment has been assumed on the rooftop above all industrial office spaces and programmed into the CadnaA model.

In the case of power outages, each industrial building is assumed to include an emergency generator. Because generators are intended for emergency use only it is assumed that they would be operational during regular testing during daytime hours. Each generator is assumed to include a sound enclosure, generating noise levels of approximately 79 dBA L_{eq} at a reference distance of 23 feet.[8] Generators were assumed to be located on the ground level and programmed into the CadnaA model.

The Carson County Mart (PA[b]) includes commercial uses with rooftop HVAC equipment. Based on speculative sheets for proposed equipment provided by the applicant (attached as a part of this technical memorandum), rooftop equipment has been programmed into the CadnaA model.

Loading Dock and Waste Collection/Recycling Areas

Like the 2018 Project, the various operations-related activities within PA2 and PA3 (e.g., loading, waste collection, cardboard compaction, etc.) would occur at several different locations within the Project Site. As discussed in the 2018 SEIR (see 2018 SEIR pp. IV.H-24), commercial loading dock noise is assumed to generate levels of approximately 70 dBA Equivalent Continuous Sound Pressure (L_{eq}) at a reference distances of 50 feet. All loading dock areas associated with PA2 is assumed to operate only during daytime hours and would be fully or partially enclosed or screened with portions of the building, architectural wing walls, and freestanding walls that block the line-of-sight between these noise sources and noise-sensitive receptors. Assuming that commercial loading activities would generate levels of 70 dBA L_{eq} at a reference distance of 50 feet, accounting for barrier-insertion loss by screening (minimum 10 dBA insertion loss), and distance attenuation (minimum 6 dBA loss per doubling of distance), commercial loading dock noise associated with PA2 has been calculated at representative receptor locations included in this analysis.

Potential impacts associated with loading activities for the proposed PA3(a) uses utilizes the CadnaA noise program. The proposed locations and configurations of proposed logistics buildings and docking bays were programmed into the CadnaA model in addition to basic elevation characteristics of the anticipated finished grade of PA3 and the off-site residential uses to the west and south of the Project Site. The number of medium- and heavy-duty trucks assumed for each proposed logistics building is based on Institute of Traffic Engineers (ITE) trip generation rates (AM peak hour) for fulfillment center, parcel hub, and cold storage uses. The number of trucks assumed for each building is summarized in **Table 4, Loading Trucks**.

[8] Kohler, Industrial Generator Set Accessories, http://resources.kohler.com/power/kohler/industrial/pdf/KD800-2500_G6154.pdf, accessed May 14, 2021.

Table 4
Loading Trucks

Building	Building Type	Medium-Duty Trucks	Heavy-Duty Trucks
A	Fulfillment	2	1
B	Fulfillment	1	1
C	Fulfillment	3	2
D	Distribution	108	37
E	Distribution	73	25
F	Fulfillment	2	1

Main sources of loading activity noise include truck idling, backup alarms, and maneuvering of trucks within the truck parking and loading areas. Based on representative data, heavy-duty trucks would generate noise levels of approximately 71.5 dBA Continuous Sound Pressure (L_{eq}) at a reference distance of 50 feet per truck[9] and that medium-duty trucks would generate noise levels of approximately 67 dBA L_{eq} at a reference distance of 50 feet per truck when carrying out loading activities.[10]

The Carson Country Mart includes food services uses are anticipated to receive daily supply deliveries. As a worst case assumption, it is assumed that across the entire Carson Country Mart, deliveries would be fulfilled by an average of four heavy-duty trucks per hour and that the trucks would idle on site, generating noise levels of approximately 69 dBA L_{eq} per truck at a reference distance of 50 feet.[11]

Parking Facility Noise

Like the 2006 Project and the 2018 Project, various noise events would occur within the on-site surface parking lots as well as any covered parking that may be constructed within PA1 and PA2. Within these parking facilities, the activation of car alarms, sounding of car horns, slamming of car doors, engine revs, and tire squeals would occur periodically. A summary of maximum noise levels contained in the 2006 FEIR Table 58 (see 2006 FEIR [DEIR p. 447]) remains fully relevant as related to typical parking facility noise events. As summarized in the 2006 FEIR Table 58, a composite noise level of 60 dBA L_{eq} (1-hour) at a reference distance of 50 feet would be typical of a parking facility. Assuming that PA1 and PA2 parking areas would generate levels of 60 dBA L_{eq} at a reference distance of 50 feet, accounting for barrier-insertion loss by screening (minimum 10 dBA insertion loss), and distance attenuation (minimum 6 dBA loss per doubling of distance), parking noise associated with PA1 and PA2 has been calculated at revised representative receptor locations included in this analysis.

Potential impacts associated with automobile parking for the proposed PA3 uses utilizes the CadnaA noise program. The proposed locations and configurations of proposed buildings and parking facilities were programmed into the CadnaA model. To ensure a worst-case analysis, the number of cars contributing to parking facility noise is

[9] Based on field noise measurements conducted by ESA in July 2020 at a representative logistics facility, loading dock activity would generate noise levels of approximately 71.5 dBA L_{eq} per heavy-duty truck at a reference distance of 50 feet from the dock.

[10] David Evans and Associates, Inc., *Noise Impact Analysis, Wal-Mart Supercenter, City of Ontario California,* March 2007.

[11] Based on field noise measurements conducted by ESA in July 2020 at a representative logistics facility, idling would generate noise levels of approximately 69.0 dBA L_{eq} per heavy-duty truck at a reference distance of 50 feet from the dock.

equivalent to the total automobile parking spaces identified in the 2021 Project design for PA3. Parking noise levels were estimated utilizing the methodology recommended by the Federal Transit Administration (FTA) for the general assessment of stationary transit noise sources.[12] The 2021 Project's peak hourly noise level that would be generated by the on-site parking levels was estimated using the following FTA equation for a parking lot:[13]

$L_{eq}(h) = SEL_{ref} + 10\log(NA/1000) - 35.6$, where
$L_{eq}(h)$ = hourly L_{eq} noise level at 50 feet
SEL_{ref} = reference noise level for stationary noise source represented in sound exposure level (SEL) at 50 feet
N_A = number of automobiles per hour

On-Site Circulation

Like the 2006 Project and the 2018 Project, internal circulation consists of Lenardo Drive from Main Street to the I-405 ramps and Stamps Drive from Del Amo Boulevard to Lenardo Drive. The 2021 Project does not propose the realignment of either Stamps Drive or Lenardo Drive. Utilizing the traffic noise model methodology and traffic volumes included in the TIA, on-site circulation noise has been estimated for daytime and nighttime hours. Peak hour traffic volumes have been assumed for daytime hours to account for worst-case daytime conditions and average hourly traffic volumes have been assumed for nighttime hours. Worst-case daytime traffic is based on the AM peak hour traffic volumes in the TIA. Average hourly traffic volumes were calculated by applying a heavy truck volume expansion factor of 17.53 to the p.m. peak hour volumes provided by the traffic consultant, then divided by 24 hours.

Outdoor Open Space

Outdoor open spaces were not anticipated as part of the 2006 Project or the 2018 Project. The 2021 Project includes the operation of publicly accessible open space and commercial/community-use and amenity areas. The main contributors of outdoor open space noise within the Carson Country Mart would include a dog park, children's play area, beer garden, and the proposed performance pavilion area and flexible event/social lawn, with associated amplified sound, and the games terrace. With the exception of the performance pavilion, it is assumed that all outdoor spaces would operate during daytime hours (between 7:00 a.m. and 10:00 p.m.). It is assumed that occasional events held at the performance pavilion and flexible event/social lawn area could extend until 11:00 p.m.

Based on occupancy assumptions provided by the Applicant, the dog park has an occupancy load of approximately 57 people. As a conservative analysis, it is assumed that the space would be at full capacity consisting of one-third male adults, one-third female adults, and one-third children. Half of the occupants are assumed to be speaking loudly. Adult males speaking loudly would generate a noise level of 76 dBA L_{eq}, adult females speaking loudly would generate a noise level of 71 dBA L_{eq}, and a child speaking loudly would generate a noise level of 74 dBA L_{eq}.[14] In addition, it is assumed that there would be 15 dogs barking within the dog park, which each dog generating a noise level of 85 dBA L_{eq}.

The children's play area has an occupancy load of approximately 254 people. As a conservative analysis, it is assumed that the space would be at full capacity consisting of one-third male adults, one-third female adults, and one-third children. Due to this space being a play area, it is assumed that all 85 children would be speaking loudly and one-quarter of the adults (half male and half female) would be speaking loudly.

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12 Federal Transit Administration (FTA), *Transit Noise and Vibration Impact Assessment Manual*, September 2018.
13 FTA, Section 4.4, Tables 4.13-14, September 2018.
14 *American Journal of Audiology* Vol.7 21-25 October 1998. doi:10.1044/1059-0889(1998/012).

The performance pavilion and social lawn has an occupancy load of approximately 978 people. As a conservative analysis, it is assumed that the space would be at full capacity consisting of one-third male adults, one-third female adults, and one-third children. Half of the occupants are assumed to be speaking loudly. Included in this area is a performance pavilion which includes an outdoor stage. It is assumed that the sound system for this performance pavilion would generate noise levels of 80 dBA L_{eq} at a reference distance of 25 feet.

The games terrace has an occupancy of approximately 83 people. It is assumed that this space would be at full capacity consisting of one-third male adults, one-third female adults, and one-third children speaking loudly.

The botanic garden has an occupancy load of approximately 39 people. It is assumed that this space would be at full capacity consisting of one-third male adults, one-third female adults, and one-third children speaking at normal volumes. Adult males speaking normally would generate a noise level of 58 dBA L_{eq}, adult females speaking normally would generate a noise level of 55 dBA L_{eq}, and a child speaking normally would generate a noise level of 58 dBA L_{eq}.[15] Speakers playing ambient music would be located throughout the outdoor spaces within the Carson Country Mart. Ambient speakers are assumed to generate noise levels of 58 dBA L_{eq} at 3.3 feet.

The beer garden has an occupancy of approximately 58 people. It is assumed that this space would be at full capacity consisting of one-half male adults and one-half female adults speaking at shouting levels. Several other outdoor dining spaces would be interspersed amongst the retail buildings within PA3(b). All of these spaces, with a total capacity of 1,006 people, have been programmed into the CadnaA model assuming that each space would be at full capacity consisting of one-third male adults, one-third female adults, and one-third children speaking loudly.

Restaurant Drive Through/Pick-Up and Delivery

The Carson Country Mart includes commercial/retail and restaurant uses, including four restaurants with drive through capability. The primary noise sources at a typical drive through consists of the customer order display/speaker and idling vehicles. A composite noise level of 54.8 dBA L_{eq} at a reference distance of 50 feet has been assumed for each drive through location.[16] It is assumed that the hours of operation for each drive through would be from 7:00 a.m. to 11:00 p.m.

Noise and Vibration Calculations and Model Outputs

The calculations and modeling outputs on the following pages are divided into seven attachments:

1. Ambient Noise Measurements
2. 2017 Truck Route Volumes
3. 2018 Construction Noise Calculations
4. Concurrent Construction and Operation Summary
5. Off-Site Traffic Noise Calculations
6. On-Site Operations
7. References

[15] *American Journal of Audiology* Vol.7 21-25 October 1998. doi:10.1044/1059-0889(1998/012).
[16] Noise Expert, LLC, *Noise Analysis for the Proposed McDonald's Restaurant*, November 2014.

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Attachment 1
Ambient Noise Measurements

C:\PROGRA~1\SLMUTIL\DISTRICT.bin Interval Data

Site	Location	Wind Meas Number	Wind Avg Date	Wind Max Time	RMS Dir Duration	Excd Leq	SEL	Lmax	Lmin	Peak	Uwpk	L(1)	L(10)	L(25)	L(50)	L(90)	L(99)	Hz	Hz	@ Max	Count	
0	M1	0	03Aug 17	8:16:47	900	72.7	102.4	86.3	62.6	104	108.6	81.7	75.5	73.3	70.8	65.9	63.9	0	N	6	0	
0	M4	0	03Aug 17	8:45:23	900	58.9	94.3	80.2	45.4	92	96.4	71	58.1	53	50.7	48.1	46.2	0	0 N		0	

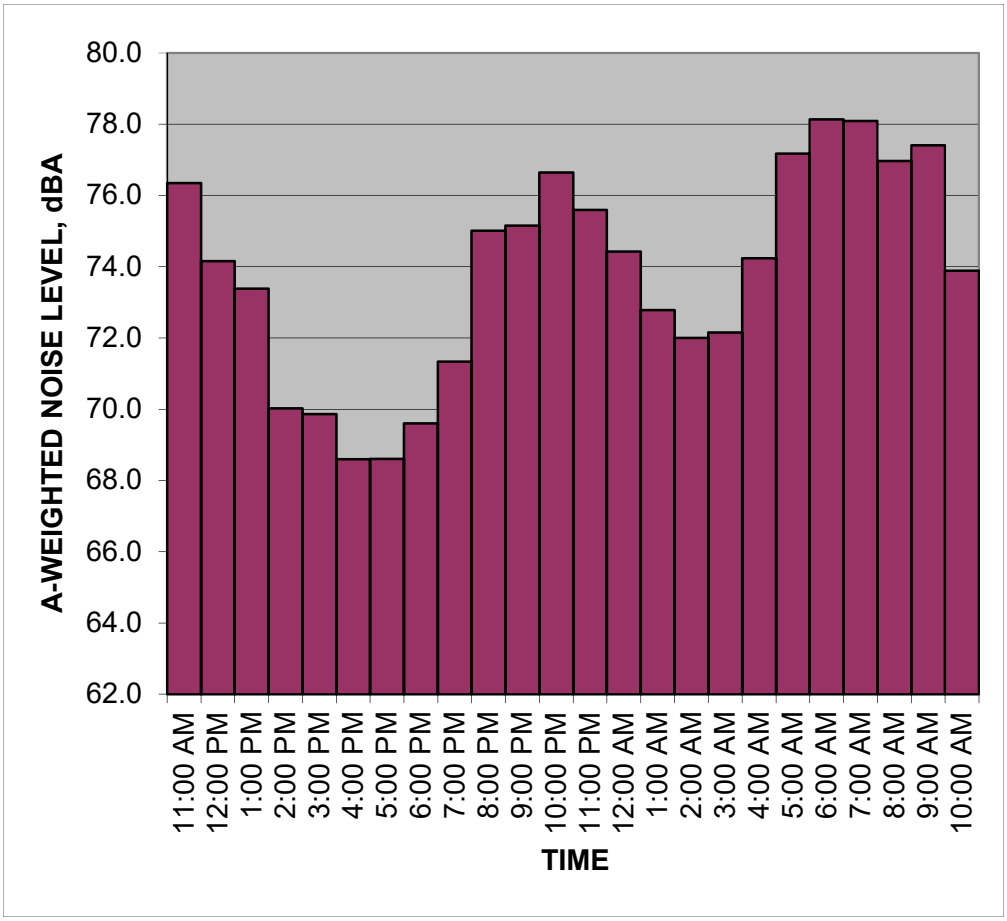
C:\PROGRA~1\SLMUTIL\DISTRICT.bin Calibration Data

Measured Ambient Noise Levels

Project: The District
Location: M2: Northeast of the Project Site
Sources: Ambient

Date: August 3-4, 2017

TIME	HNL, dB(A)
11:00 AM	76.3
12:00 PM	74.2
1:00 PM	73.4
2:00 PM	70.0
3:00 PM	69.9
4:00 PM	68.6
5:00 PM	68.6
6:00 PM	69.6
7:00 PM	71.3
8:00 PM	75.0
9:00 PM	75.2
10:00 PM	76.6
11:00 PM	75.6
12:00 AM	74.4
1:00 AM	72.8
2:00 AM	72.0
3:00 AM	72.2
4:00 AM	74.2
5:00 AM	77.2
6:00 AM	78.1
7:00 AM	78.1
8:00 AM	77.0
9:00 AM	77.4
10:00 AM	73.9
CNEL, dB(A):	**81.8**



NOTES:

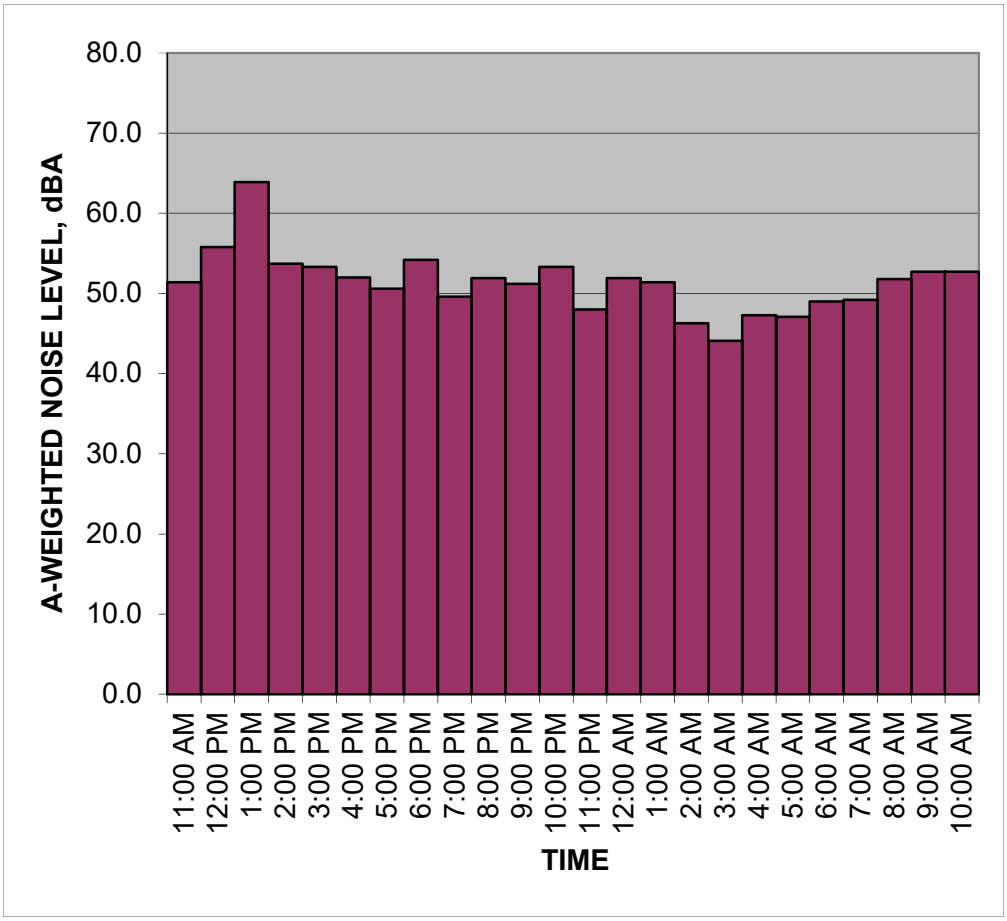
fieldcnel.xls

Measured Ambient Noise Levels

Project: SCORE
Location: R3: Southeast, across from Torrance Channel
Sources: Ambient

Date: August 3-4, 2016

TIME	HNL, dB(A)
11:00 AM	51.4
12:00 PM	55.8
1:00 PM	63.9
2:00 PM	53.7
3:00 PM	53.3
4:00 PM	52.0
5:00 PM	50.6
6:00 PM	54.2
7:00 PM	49.6
8:00 PM	51.9
9:00 PM	51.2
10:00 PM	53.3
11:00 PM	48.0
12:00 AM	51.9
1:00 AM	51.4
2:00 AM	46.3
3:00 AM	44.1
4:00 AM	47.3
5:00 AM	47.1
6:00 AM	49.0
7:00 AM	49.2
8:00 AM	51.8
9:00 AM	52.7
10:00 AM	52.7
CNEL, dB(A):	**57.7**



NOTES:

fieldcnel.xls

Attachment 2
2017 Truck Route Volumes

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: 16-5771-007 **Day:** Wednesday

City: Carson **Date:** 11/16/2016

TOTALS

AM

NS/EW Streets:	Figueroa St			Figueroa St			Del Amo Blvd			Del Amo Blvd			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
LANES:	NL 1	NT 2	NR 1	SL 1	ST 2	SR 1	EL 1	ET 2	ER 0	WL 1	WT 2	WR 1	TOTAL
7:00 AM	26	144	67	4	38	53	23	47	12	40	190	41	685
7:15 AM	36	140	70	8	73	76	26	82	19	42	244	45	861
7:30 AM	31	159	75	9	103	130	29	95	25	49	227	60	992
7:45 AM	67	178	87	10	121	126	35	107	27	27	236	40	1061
8:00 AM	47	205	79	14	85	101	48	103	22	36	213	36	989
8:15 AM	50	175	81	9	67	78	33	74	24	32	233	23	879
8:30 AM	50	138	71	8	82	82	27	86	24	20	198	30	816
8:45 AM	35	118	61	9	50	58	32	56	30	24	189	16	678
9:00 AM	30	103	55	7	53	65	26	49	23	21	167	20	619
9:15 AM	26	78	54	12	50	42	13	66	25	14	142	17	539
9:30 AM	36	104	41	12	51	43	27	50	30	18	105	15	532
9:45 AM	30	97	53	6	39	51	12	72	32	16	93	20	521
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
TOTAL VOLUMES :	464	1639	794	108	812	905	331	887	293	339	2237	363	9172
APPROACH %'s :	16.02%	56.58%	27.41%	5.92%	44.49%	49.59%	21.91%	58.70%	19.39%	11.53%	76.11%	12.35%	
PEAK HR START TIME :	730 AM												TOTAL
PEAK HR VOL :	195	717	322	42	376	435	145	379	98	144	909	159	3921
PEAK HR FACTOR :		0.929			0.830			0.899			0.902		0.924

UTURNS	NB	SB	EB	WB
	0	0		
	1	0		
	0	0		
	0	0		
	0	0		
	0	0		
	0	0		
	0	0		
	0	0		
	0	0		
	0	1		
	1	0		
	NB	SB	EB	WB
TOTAL VOLUMES :	2	1	0	0

CONTROL : Signalized

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: 16-5771-007 **Day:** Wednesday

City: Carson **Date:** 11/16/2016

TOTALS

PM

NS/EW Streets:	Figueroa St			Figueroa St			Del Amo Blvd			Del Amo Blvd			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
LANES:	NL 1	NT 2	NR 1	SL 1	ST 2	SR 1	EL 1	ET 2	ER 0	WL 1	WT 2	WR 1	TOTAL
4:00 PM	14	122	69	40	110	67	14	192	39	28	101	22	818
4:15 PM	18	108	80	44	123	37	20	155	35	44	182	19	865
4:30 PM	13	107	79	26	116	56	13	177	52	39	131	22	831
4:45 PM	15	125	91	42	127	60	14	202	32	31	144	29	912
5:00 PM	9	98	77	57	161	59	11	206	50	35	133	21	917
5:15 PM	13	114	96	50	159	49	6	205	46	81	198	35	1052
5:30 PM	16	103	89	45	126	57	27	225	35	53	187	31	994
5:45 PM	7	105	73	46	120	49	16	188	31	56	156	17	864
6:00 PM	7	90	57	33	116	64	15	193	37	39	141	21	813
6:15 PM	10	80	72	41	112	46	9	151	22	47	134	22	746
6:30 PM	13	89	59	34	104	39	11	123	24	17	134	11	658
6:45 PM	14	45	53	15	88	38	12	64	29	31	119	10	518
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
TOTAL VOLUMES :	149	1186	895	473	1462	621	168	2081	432	501	1760	260	9988
APPROACH %'s :	6.68%	53.18%	40.13%	18.51%	57.20%	24.30%	6.27%	77.62%	16.11%	19.87%	69.81%	10.31%	
PEAK HR START TIME :	445 PM												TOTAL
PEAK HR VOL :	53	440	353	194	573	225	58	838	163	200	662	116	3875
PEAK HR FACTOR :		0.916			0.895			0.922			0.779		0.921

UTURNS	NB	SB	EB	WB
	0	0	0	0
	0	0	1	0
	1	0	0	0
	0	1	0	0
	0	0	0	0
	2	1	0	1
	1	0	0	0
	0	0	1	1
	0	0	0	0
	0	0	0	0
	1	0	0	0
	NB	SB	EB	WB
	5	2	2	2

CONTROL : Signalized

ITM Peak Hour Summary

Prepared by:

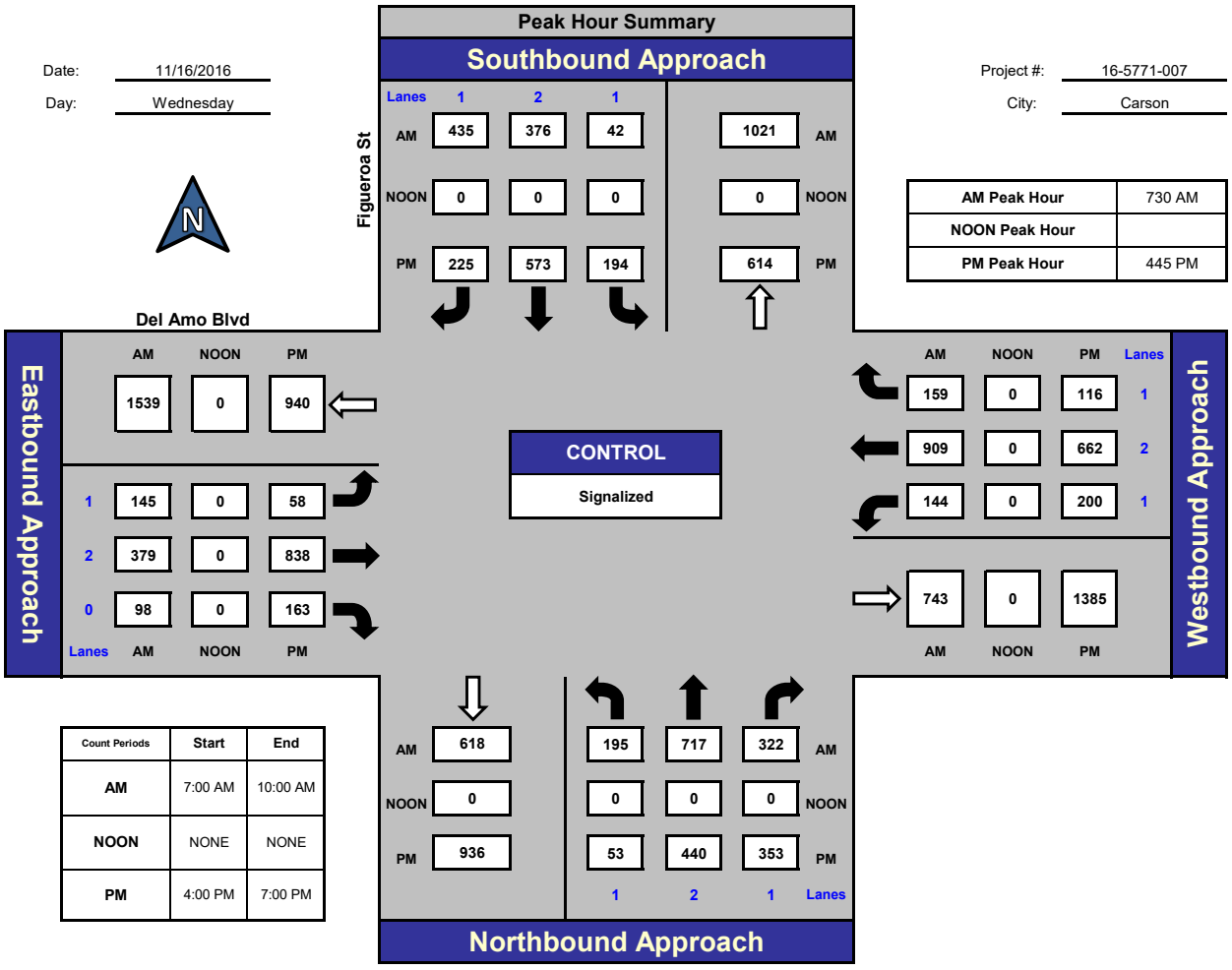
National Data & Surveying Services

Figueroa St and Del Amo Blvd , Carson

Date: 11/16/2016
Day: Wednesday

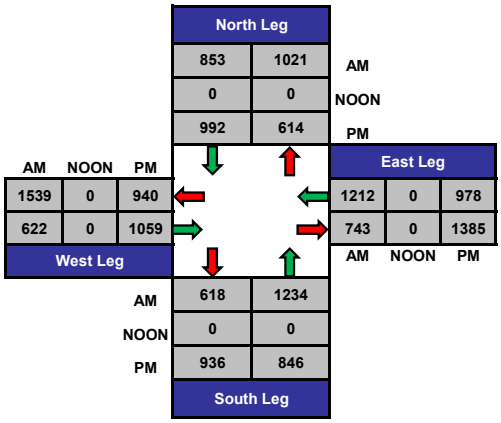
Project #: 16-5771-007
City: Carson

AM Peak Hour	730 AM
NOON Peak Hour	
PM Peak Hour	445 PM

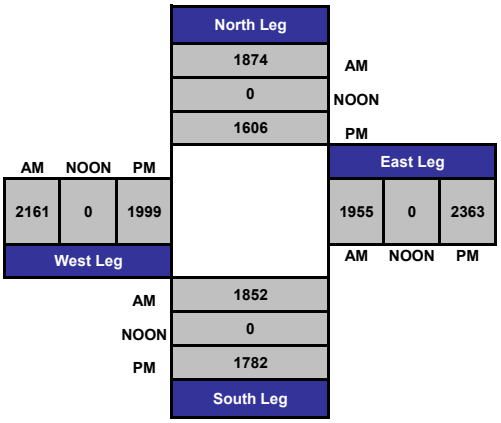


Count Periods	Start	End
AM	7:00 AM	10:00 AM
NOON	NONE	NONE
PM	4:00 PM	7:00 PM

Total Ins & Outs



Total Volume Per Leg



Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: 16-5771-007 **Day:** Wednesday

City: Carson **Cars** **Date:** 11/16/2016

AM

NS/EW Streets:	Figueroa St			Figueroa St			Del Amo Blvd			Del Amo Blvd			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
LANES:	NL 1	NT 2	NR 1	SL 1	ST 2	SR 1	EL 1	ET 2	ER 0	WL 1	WT 2	WR 1	TOTAL
7:00 AM	24	139	64	2	36	47	22	44	11	35	183	34	641
7:15 AM	34	139	68	7	68	68	21	80	18	42	232	43	820
7:30 AM	31	152	74	9	99	127	27	93	23	47	218	57	957
7:45 AM	64	170	84	9	114	118	33	103	25	24	229	37	1010
8:00 AM	46	195	77	14	79	95	44	97	21	36	206	30	940
8:15 AM	45	162	80	8	62	71	28	74	22	31	218	22	823
8:30 AM	49	125	68	7	72	75	23	83	20	20	174	26	742
8:45 AM	34	102	58	9	44	52	25	53	26	21	175	14	613
9:00 AM	24	94	55	5	52	58	20	47	20	21	157	19	572
9:15 AM	25	69	53	10	43	38	11	62	21	11	128	15	486
9:30 AM	33	95	40	12	46	37	20	47	28	15	97	15	485
9:45 AM	29	90	50	5	35	43	9	69	27	15	89	19	480
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
TOTAL VOLUMES :	438	1532	771	97	750	829	283	852	262	318	2106	331	8569
APPROACH %'s :	15.98%	55.89%	28.13%	5.79%	44.75%	49.46%	20.26%	60.99%	18.75%	11.54%	76.44%	12.01%	
PEAK HR START TIME :	730 AM												TOTAL
PEAK HR VOL :	186	679	315	40	354	411	132	367	91	138	871	146	3730
PEAK HR FACTOR :		0.928			0.835			0.910			0.897		0.923

UTURNS	NB	SB	EB	WB
	0	0		
	1	0		
	0	0		
	0	0		
	0	0		
	0	0		
	0	0		
	0	0		
	0	0		
	0	0		
	0	1		
	1	0		
	NB	SB	EB	WB
	2	1	0	0

CONTROL : Signalized

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: 16-5771-007 **Day:** Wednesday

City: Carson **Cars** **Date:** 11/16/2016

PM

NS/EW Streets:	Figueroa St			Figueroa St			Del Amo Blvd			Del Amo Blvd			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
LANES:	NL 1	NT 2	NR 1	SL 1	ST 2	SR 1	EL 1	ET 2	ER 0	WL 1	WT 2	WR 1	TOTAL
4:00 PM	9	105	62	39	105	64	14	189	36	27	95	19	764
4:15 PM	14	95	70	43	122	31	17	149	29	41	171	18	800
4:30 PM	12	83	72	25	114	50	10	169	51	39	121	19	765
4:45 PM	12	115	86	38	122	50	12	197	32	30	135	26	855
5:00 PM	6	92	71	53	161	50	10	200	50	33	127	20	873
5:15 PM	13	108	94	48	158	46	5	197	45	80	192	33	1019
5:30 PM	16	97	85	43	123	52	23	220	35	52	184	29	959
5:45 PM	5	95	70	43	119	46	8	183	28	54	153	17	821
6:00 PM	5	83	57	30	115	60	11	186	37	39	136	21	780
6:15 PM	7	69	64	37	107	43	8	146	22	47	130	21	701
6:30 PM	12	66	54	27	103	36	9	118	23	17	134	9	608
6:45 PM	13	36	48	14	85	33	12	61	25	31	113	9	480
TOTAL VOLUMES :	124	1044	833	440	1434	561	139	2015	413	490	1691	241	9425
APPROACH %'s :	6.20%	52.17%	41.63%	18.07%	58.89%	23.04%	5.41%	78.50%	16.09%	20.23%	69.82%	9.95%	
PEAK HR START TIME :	445 PM												TOTAL
PEAK HR VOL :	47	412	336	182	564	198	50	814	162	195	638	108	3706
PEAK HR FACTOR :		0.924			0.894			0.923			0.771		0.909

UTURNS	NB	SB	EB	WB
4:00 PM	0	0	0	0
4:15 PM	0	0	1	0
4:30 PM	1	0	0	0
4:45 PM	0	1	0	0
5:00 PM	0	0	0	0
5:15 PM	2	1	0	1
5:30 PM	1	0	0	0
5:45 PM	0	0	1	1
6:00 PM	0	0	0	0
6:15 PM	0	0	0	0
6:30 PM	0	0	0	0
6:45 PM	1	0	0	0
TOTAL VOLUMES :	5	2	2	2

CONTROL : Signalized

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: 16-5771-007 **Day:** Wednesday

City: Carson **2 Axle+ Commercial Trucks** **Date:** 11/16/2016

AM

NS/EW Streets:	Figueroa St			Figueroa St			Del Amo Blvd			Del Amo Blvd			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	1	2	1	1	2	1	1	2	0	1	2	1	
7:00 AM	2	5	3	2	2	6	1	3	1	5	7	7	44
7:15 AM	2	1	2	1	5	8	5	2	1	0	12	2	41
7:30 AM	0	7	1	0	4	3	2	2	2	2	9	3	35
7:45 AM	3	8	3	1	7	8	2	4	2	3	7	3	51
8:00 AM	1	10	2	0	6	6	4	6	1	0	7	6	49
8:15 AM	5	13	1	1	5	7	5	0	2	1	15	1	56
8:30 AM	1	13	3	1	10	7	4	3	4	0	24	4	74
8:45 AM	1	16	3	0	6	6	7	3	4	3	14	2	65
9:00 AM	6	9	0	2	1	7	6	2	3	0	10	1	47
9:15 AM	1	9	1	2	7	4	2	4	4	3	14	2	53
9:30 AM	3	9	1	0	5	6	7	3	2	3	8	0	47
9:45 AM	1	7	3	1	4	8	3	3	5	1	4	1	41
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
TOTAL VOLUMES :	26	107	23	11	62	76	48	35	31	21	131	32	603
APPROACH %'s :	16.67%	68.59%	14.74%	7.38%	41.61%	51.01%	42.11%	30.70%	27.19%	11.41%	71.20%	17.39%	
PEAK HR START TIME :	730 AM												TOTAL
PEAK HR VOL :	9	38	7	2	22	24	13	12	7	6	38	13	191
PEAK HR FACTOR :		0.711			0.750			0.727			0.838		0.923

UTURNS

NB	SB	EB	WB

NB	SB	EB	WB
0	0	0	0

CONTROL : Signalized

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: 16-5771-007

Day: Wednesday

City: Carson

2 Axle+ Commercial Trucks

Date: 11/16/2016

PM

NS/EW Streets:	Figueroa St			Figueroa St			Del Amo Blvd			Del Amo Blvd			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	1	2	1	1	2	1	1	2	0	1	2	1	
4:00 PM	5	17	7	1	5	3	0	3	3	1	6	3	54
4:15 PM	4	13	10	1	1	6	3	6	6	3	11	1	65
4:30 PM	1	24	7	1	2	6	3	8	1	0	10	3	66
4:45 PM	3	10	5	4	5	10	2	5	0	1	9	3	57
5:00 PM	3	6	6	4	0	9	1	6	0	2	6	1	44
5:15 PM	0	6	2	2	1	3	1	8	1	1	6	2	33
5:30 PM	0	6	4	2	3	5	4	5	0	1	3	2	35
5:45 PM	2	10	3	3	1	3	8	5	3	2	3	0	43
6:00 PM	2	7	0	3	1	4	4	7	0	0	5	0	33
6:15 PM	3	11	8	4	5	3	1	5	0	0	4	1	45
6:30 PM	1	23	5	7	1	3	2	5	1	0	0	2	50
6:45 PM	1	9	5	1	3	5	0	3	4	0	6	1	38
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
TOTAL VOLUMES :	25	142	62	33	28	60	29	66	19	11	69	19	563
APPROACH %'s :	10.92%	62.01%	27.07%	27.27%	23.14%	49.59%	25.44%	57.89%	16.67%	11.11%	69.70%	19.19%	
PEAK HR START TIME :	445 PM												TOTAL
PEAK HR VOL :	6	28	17	12	9	27	8	24	1	5	24	8	169
PEAK HR FACTOR :		0.708			0.632			0.825			0.712		0.909

UTURNS	NB	SB	EB	WB
TOTAL VOLUMES :	0	0	0	0

CONTROL : Signalized

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: 16-5771-008 **Day:** Wednesday

City: Carson **Date:** 11/16/2016

TOTALS

AM

NS/EW Streets:	S Main St			S Main St			E Del Amo Blvd			E Del Amo Blvd			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
LANES:	NL 1	NT 2	NR 0	SL 1	ST 2	SR 0	EL 1	ET 3	ER 0	WL 1	WT 3	WR 0	TOTAL
7:00 AM	18	101	28	7	68	37	21	85	2	45	210	17	639
7:15 AM	13	84	42	10	103	41	38	115	11	42	308	12	819
7:30 AM	19	147	67	13	142	38	37	119	7	68	288	17	962
7:45 AM	23	149	51	11	134	30	32	176	8	59	251	22	946
8:00 AM	21	135	79	17	91	16	34	136	12	49	219	10	819
8:15 AM	14	106	70	14	83	26	35	131	6	44	224	17	770
8:30 AM	13	62	45	7	63	40	27	135	3	34	220	12	661
8:45 AM	10	79	53	9	65	31	24	104	5	25	172	12	589
9:00 AM	8	49	42	8	61	27	12	83	12	24	170	8	504
9:15 AM	8	49	42	9	56	31	15	99	12	33	130	9	493
9:30 AM	7	68	48	4	43	20	21	80	6	30	117	19	463
9:45 AM	12	63	48	12	60	23	23	104	6	30	96	12	489
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
TOTAL VOLUMES :	166	1092	615	121	969	360	319	1367	90	483	2405	167	8154
APPROACH %'s :	8.86%	58.30%	32.84%	8.34%	66.83%	24.83%	17.96%	76.97%	5.07%	15.81%	78.72%	5.47%	
PEAK HR START TIME :	715 AM												TOTAL
PEAK HR VOL :	76	515	239	51	470	125	141	546	38	218	1066	61	3546
PEAK HR FACTOR :		0.883			0.837			0.839			0.901		0.922

UTURNS	NB	SB	EB	WB
	0		0	1
	0		0	0
	2		1	0
	1		0	0
	0		0	0
	0		0	0
	0		0	0
	0		0	0
	0		0	0
	1		0	0
	0		0	1
	0		0	0
	1		0	1
	NB	SB	EB	WB
	5	0	1	3

CONTROL : Signalized

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: 16-5771-008 **Day:** Wednesday

City: Carson **Date:** 11/16/2016

TOTALS

PM

NS/EW Streets:	S Main St			S Main St			E Del Amo Blvd			E Del Amo Blvd			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
LANES:	NL 1	NT 2	NR 0	SL 1	ST 2	SR 0	EL 1	ET 3	ER 0	WL 1	WT 3	WR 0	TOTAL
4:00 PM	7	105	80	31	157	41	32	246	28	40	139	19	925
4:15 PM	12	96	80	29	174	44	31	214	30	46	163	11	930
4:30 PM	8	105	69	32	174	35	39	221	22	48	139	11	903
4:45 PM	7	100	74	26	187	27	40	271	16	47	165	14	974
5:00 PM	10	95	72	27	191	36	47	271	40	55	185	12	1041
5:15 PM	12	108	78	31	186	42	35	271	31	73	225	19	1111
5:30 PM	13	99	70	43	185	45	41	279	28	66	210	15	1094
5:45 PM	6	98	66	31	149	32	36	251	30	62	192	13	966
6:00 PM	14	77	78	34	143	21	21	233	24	41	172	16	874
6:15 PM	4	77	71	23	137	21	28	230	30	48	168	12	849
6:30 PM	7	63	67	19	121	28	18	163	24	35	125	4	674
6:45 PM	2	58	40	11	89	30	16	112	9	42	131	8	548
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
TOTAL VOLUMES :	102	1081	845	337	1893	402	384	2762	312	603	2014	154	10889
APPROACH %'s :	5.03%	53.30%	41.67%	12.80%	71.92%	15.27%	11.10%	79.87%	9.02%	21.76%	72.68%	5.56%	
PEAK HR START TIME :	445 PM												TOTAL
PEAK HR VOL :	42	402	294	127	749	150	163	1092	115	241	785	60	4220
PEAK HR FACTOR :		0.932			0.940			0.957			0.856		0.950

UTURNS

	NB	SB	EB	WB
4:00 PM	1	0	0	0
4:15 PM	0	0	1	1
4:30 PM	0	0	0	0
4:45 PM	0	0	0	0
5:00 PM	0	0	0	0
5:15 PM	0	0	1	0
5:30 PM	0	0	0	0
5:45 PM	1	1	0	0
6:00 PM	2	1	0	1
6:15 PM	0	0	1	1
6:30 PM	0	0	0	1
6:45 PM	0	1	0	0
TOTAL VOLUMES :	4	3	3	4

CONTROL : Signalized

ITM Peak Hour Summary

Prepared by:

National Data & Surveying Services

S Main St and E Del Amo Blvd , Carson

Date: 11/16/2016
Day: Wednesday

Project #: 16-5771-008
City: Carson

AM Peak Hour	715 AM
NOON Peak Hour	
PM Peak Hour	445 PM

Peak Hour Summary

Southbound Approach (S Main St)

	Lanes 0	2	1		
AM	125	470	51	717	AM
NOON	0	0	0	0	NOON
PM	150	749	127	625	PM

Eastbound Approach (E Del Amo Blvd)

Lanes	AM	NOON	PM
	1267	0	977
1	141	0	163
3	546	0	1092
0	38	0	115

Westbound Approach

Lanes	AM	NOON	PM
0	61	0	60
3	1066	0	785
1	218	0	241
	836	0	1513

CONTROL: Signalized

Northbound Approach

	Lanes 1	2	0	
AM	726	76	515	239	AM
NOON	0	0	0	0	NOON
PM	1105	42	402	294	PM

Count Periods	Start	End
AM	7:00 AM	10:00 AM
NOON	NONE	NONE
PM	4:00 PM	7:00 PM

Total Ins & Outs

	AM	NOON	PM
North Leg	646	0	1026
	717	0	625
West Leg	1267	0	977
	725	0	1370
East Leg	1345	0	1086
	836	0	1513
South Leg	726	0	1105
	830	0	738

Total Volume Per Leg

	AM	NOON	PM
North Leg	1363	0	1651
West Leg	1992	0	2347
East Leg	2181	0	2599
South Leg	1556	0	1843

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: 16-5771-008 **Day:** Wednesday

City: Carson **Cars** **Date:** 11/16/2016

AM

NS/EW Streets:	S Main St			S Main St			E Del Amo Blvd			E Del Amo Blvd				UTURNS			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND							
LANES:	NL 1	NT 2	NR 0	SL 1	ST 2	SR 0	EL 1	ET 3	ER 0	WL 1	WT 3	WR 0	TOTAL	NB	SB	EB	WB
7:00 AM	18	99	27	5	66	31	17	83	2	43	199	15	605	0		0	1
7:15 AM	13	82	42	7	100	36	37	112	9	41	298	12	789	0		0	0
7:30 AM	19	140	67	13	141	34	35	119	7	67	277	17	936	2		1	0
7:45 AM	23	146	51	10	128	27	29	172	8	58	242	19	913	1		0	0
8:00 AM	19	130	79	15	87	15	31	134	10	47	208	10	785	0		0	0
8:15 AM	13	99	65	14	82	23	35	128	6	43	216	17	741	0		0	0
8:30 AM	12	60	45	7	62	29	25	132	2	34	198	12	618	0		0	0
8:45 AM	7	72	52	7	62	27	23	99	5	22	162	8	546	0		0	0
9:00 AM	8	49	41	7	58	25	12	81	12	23	161	6	483	1		0	0
9:15 AM	7	46	41	8	54	27	13	95	11	33	113	8	456	0		0	1
9:30 AM	7	67	48	4	39	16	18	78	6	24	107	16	430	0		0	0
9:45 AM	12	60	46	12	57	23	20	99	6	30	92	9	466	1		0	1
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL	NB	SB	EB	WB
TOTAL VOLUMES :	158	1050	604	109	936	313	295	1332	84	465	2273	149	7768	5	0	1	3
APPROACH %'s :	8.72%	57.95%	33.33%	8.03%	68.92%	23.05%	17.24%	77.85%	4.91%	16.11%	78.73%	5.16%					
PEAK HR START TIME :	715 AM												TOTAL				
PEAK HR VOL :	74	498	239	45	456	112	132	537	34	213	1025	58	3423				
PEAK HR FACTOR :		0.889			0.815			0.841			0.898		0.914				

CONTROL : Signalized

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: 16-5771-008 **Day:** Wednesday

City: Carson **Cars** **Date:** 11/16/2016

PM

NS/EW Streets:	S Main St			S Main St			E Del Amo Blvd			E Del Amo Blvd			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
LANES:	NL 1	NT 2	NR 0	SL 1	ST 2	SR 0	EL 1	ET 3	ER 0	WL 1	WT 3	WR 0	TOTAL
4:00 PM	7	102	78	27	151	36	29	237	27	40	133	15	882
4:15 PM	12	90	78	27	171	39	27	202	30	45	151	10	882
4:30 PM	7	100	68	31	171	30	39	208	22	46	133	11	866
4:45 PM	6	99	72	22	182	24	37	259	15	46	158	12	932
5:00 PM	10	93	70	22	184	30	44	258	40	55	179	10	995
5:15 PM	10	103	78	28	183	42	34	262	31	72	218	16	1077
5:30 PM	13	98	65	37	182	44	37	272	28	66	206	14	1062
5:45 PM	6	97	66	25	148	30	34	243	30	62	188	13	942
6:00 PM	13	77	76	29	140	21	21	222	24	40	169	14	846
6:15 PM	4	75	69	17	135	21	26	215	29	46	163	10	810
6:30 PM	7	61	67	16	119	27	16	148	24	34	123	4	646
6:45 PM	2	56	40	10	88	25	14	105	9	42	128	7	526
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
TOTAL VOLUMES :	97	1051	827	291	1854	369	358	2631	309	594	1949	136	10466
APPROACH %'s :	4.91%	53.22%	41.87%	11.58%	73.75%	14.68%	10.86%	79.78%	9.37%	22.17%	72.75%	5.08%	
PEAK HR START TIME :	445 PM												TOTAL
PEAK HR VOL :	39	393	285	109	731	140	152	1051	114	239	761	52	4066
PEAK HR FACTOR :		0.938			0.932			0.963			0.859		0.944

UTURNS	NB	SB	EB	WB
	1	0	0	0
	0	0	1	1
	0	0	0	0
	0	0	0	0
	0	0	0	0
	0	0	1	0
	0	0	0	0
	1	1	0	0
	2	1	0	1
	0	0	1	1
	0	0	0	1
	0	1	0	0
	NB	SB	EB	WB
	4	3	3	4

CONTROL : Signalized

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: 16-5771-008 **Day:** Wednesday

City: Carson **2 Axle+ Commercial Trucks** **Date:** 11/16/2016

AM

NS/EW Streets:	S Main St			S Main St			E Del Amo Blvd			E Del Amo Blvd			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	1	2	0	1	2	0	1	3	0	1	3	0	
7:00 AM	0	2	1	2	2	6	4	2	0	2	11	2	34
7:15 AM	0	2	0	3	3	5	1	3	2	1	10	0	30
7:30 AM	0	7	0	0	1	4	2	0	0	1	11	0	26
7:45 AM	0	3	0	1	6	3	3	4	0	1	9	3	33
8:00 AM	2	5	0	2	4	1	3	2	2	2	11	0	34
8:15 AM	1	7	5	0	1	3	0	3	0	1	8	0	29
8:30 AM	1	2	0	0	1	11	2	3	1	0	22	0	43
8:45 AM	3	7	1	2	3	4	1	5	0	3	10	4	43
9:00 AM	0	0	1	1	3	2	0	2	0	1	9	2	21
9:15 AM	1	3	1	1	2	4	2	4	1	0	17	1	37
9:30 AM	0	1	0	0	4	4	3	2	0	6	10	3	33
9:45 AM	0	3	2	0	3	0	3	5	0	0	4	3	23
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
TOTAL VOLUMES :	8	42	11	12	33	47	24	35	6	18	132	18	386
APPROACH %'s :	13.11%	68.85%	18.03%	13.04%	35.87%	51.09%	36.92%	53.85%	9.23%	10.71%	78.57%	10.71%	
PEAK HR START TIME :	715 AM												TOTAL
PEAK HR VOL :	2	17	0	6	14	13	9	9	4	5	41	3	123
PEAK HR FACTOR :		0.679			0.750			0.786			0.942		0.914

UTURNS	NB	SB	EB	WB

	NB	SB	EB	WB
TOTAL VOLUMES :	0	0	0	0

CONTROL : Signalized

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: 16-5771-008 | **Day:** Wednesday

City: Carson | **Date:** 11/16/2016

2 Axle+ Commercial Trucks

PM

NS/EW Streets:	S Main St			S Main St			E Del Amo Blvd			E Del Amo Blvd			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	1	2	0	1	2	0	1	3	0	1	3	0	
4:00 PM	0	3	2	4	6	5	3	9	1	0	6	4	43
4:15 PM	0	6	2	2	3	5	4	12	0	1	12	1	48
4:30 PM	1	5	1	1	3	5	0	13	0	2	6	0	37
4:45 PM	1	1	2	4	5	3	3	12	1	1	7	2	42
5:00 PM	0	2	2	5	7	6	3	13	0	0	6	2	46
5:15 PM	2	5	0	3	3	0	1	9	0	1	7	3	34
5:30 PM	0	1	5	6	3	1	4	7	0	0	4	1	32
5:45 PM	0	1	0	6	1	2	2	8	0	0	4	0	24
6:00 PM	1	0	2	5	3	0	0	11	0	1	3	2	28
6:15 PM	0	2	2	6	2	0	2	15	1	2	5	2	39
6:30 PM	0	2	0	3	2	1	2	15	0	1	2	0	28
6:45 PM	0	2	0	1	1	5	2	7	0	0	3	1	22
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
TOTAL VOLUMES :	5	30	18	46	39	33	26	131	3	9	65	18	423
APPROACH %'s :	9.43%	56.60%	33.96%	38.98%	33.05%	27.97%	16.25%	81.88%	1.88%	9.78%	70.65%	19.57%	
PEAK HR START TIME :	445 PM												TOTAL
PEAK HR VOL :	3	9	9	18	18	10	11	41	1	2	24	8	154
PEAK HR FACTOR :	0.750			0.639			0.828			0.773			0.944

UTURNS	NB	SB	EB	WB
TOTAL VOLUMES :	0	0	0	0

CONTROL : Signalized

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: 16-5771-010 **Day:** Wednesday

City: Carson **Date:** 11/16/2016

TOTALS

AM

NS/EW Streets:	S Avalon Blvd			S Avalon Blvd			E Del Amo Blvd			E Del Amo Blvd			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
LANES:	NL 1	NT 3	NR 1	SL 2	ST 3	SR 0	EL 1	ET 2	ER 1	WL 1	WT 2	WR 1	TOTAL
7:00 AM	44	97	17	25	102	35	32	80	4	25	225	19	705
7:15 AM	52	142	43	30	155	59	50	103	5	36	204	19	898
7:30 AM	64	158	28	36	183	50	46	116	9	35	234	16	975
7:45 AM	74	243	32	43	146	52	64	161	20	50	201	32	1118
8:00 AM	56	241	36	42	126	53	79	143	18	50	178	23	1045
8:15 AM	61	240	38	44	130	56	72	117	15	39	188	27	1027
8:30 AM	57	148	25	39	112	49	45	92	16	46	187	24	840
8:45 AM	54	147	30	37	120	36	51	89	12	57	166	25	824
9:00 AM	38	153	27	29	97	23	42	77	18	62	123	20	709
9:15 AM	34	155	31	39	102	36	42	81	11	52	134	26	743
9:30 AM	23	155	32	38	88	47	59	67	17	49	159	22	756
9:45 AM	41	178	33	41	124	28	47	82	16	37	93	18	738
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
TOTAL VOLUMES :	598	2057	372	443	1485	524	629	1208	161	538	2092	271	10378
APPROACH %'s :	19.76%	67.96%	12.29%	18.07%	60.56%	21.37%	31.48%	60.46%	8.06%	18.55%	72.11%	9.34%	
PEAK HR START TIME :	730 AM												TOTAL
PEAK HR VOL :	255	882	134	165	585	211	261	537	62	174	801	98	4165
PEAK HR FACTOR :		0.910			0.893			0.878			0.941		0.931

UTURNS	NB	SB	EB	WB
	8	7	0	2
	5	11	2	6
	7	12	1	3
	16	18	0	3
	16	18	2	10
	13	16	2	8
	11	13	0	10
	6	13	0	10
	8	5	2	13
	4	14	2	4
	11	20	1	8
	17	15	2	6
	NB	SB	EB	WB
	122	162	14	83

CONTROL : Signalized

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: 16-5771-010 **Day:** Wednesday

City: Carson **Date:** 11/16/2016

TOTALS

PM

NS/EW Streets:	S Avalon Blvd			S Avalon Blvd			E Del Amo Blvd			E Del Amo Blvd			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
LANES:	NL 1	NT 3	NR 1	SL 2	ST 3	SR 0	EL 1	ET 2	ER 1	WL 1	WT 2	WR 1	TOTAL
4:00 PM	41	178	45	68	254	73	61	214	60	52	140	35	1221
4:15 PM	26	237	44	59	178	54	61	199	64	70	91	34	1117
4:30 PM	45	221	56	88	243	53	50	218	61	66	132	36	1269
4:45 PM	42	241	48	89	233	64	53	226	64	60	161	43	1324
5:00 PM	50	228	61	87	171	67	53	215	56	60	159	31	1238
5:15 PM	41	246	38	71	234	75	46	243	55	66	183	32	1330
5:30 PM	54	209	49	78	231	73	57	213	48	69	136	29	1246
5:45 PM	48	201	47	91	239	48	47	208	60	54	129	31	1203
6:00 PM	40	210	45	88	173	64	55	221	59	59	109	35	1158
6:15 PM	34	206	33	62	232	53	42	228	57	63	121	18	1149
6:30 PM	31	210	43	84	213	42	57	196	57	53	105	24	1115
6:45 PM	37	171	30	74	197	40	37	195	43	48	69	33	974
TOTAL VOLUMES :	NL 489	NT 2558	NR 539	SL 939	ST 2598	SR 706	EL 619	ET 2576	ER 684	WL 720	WT 1535	WR 381	TOTAL 14344
APPROACH %'s :	13.64%	71.33%	15.03%	22.13%	61.23%	16.64%	15.96%	66.41%	17.63%	27.31%	58.23%	14.45%	
PEAK HR START TIME :	430 PM												TOTAL
PEAK HR VOL :	178	936	203	335	881	259	202	902	236	252	635	142	5161
PEAK HR FACTOR :		0.971			0.955			0.974			0.915		0.970

UTURNS	NB	SB	EB	WB
	5	16	0	9
	7	15	4	11
	8	30	0	5
	5	21	1	8
	5	26	1	10
	7	19	1	5
	5	17	1	11
	10	21	1	5
	5	25	0	10
	5	13	4	17
	8	28	0	12
	10	14	2	8
TOTAL VOLUMES :	NB 80	SB 245	EB 15	WB 111

CONTROL : Signalized

ITM Peak Hour Summary

Prepared by:

National Data & Surveying Services

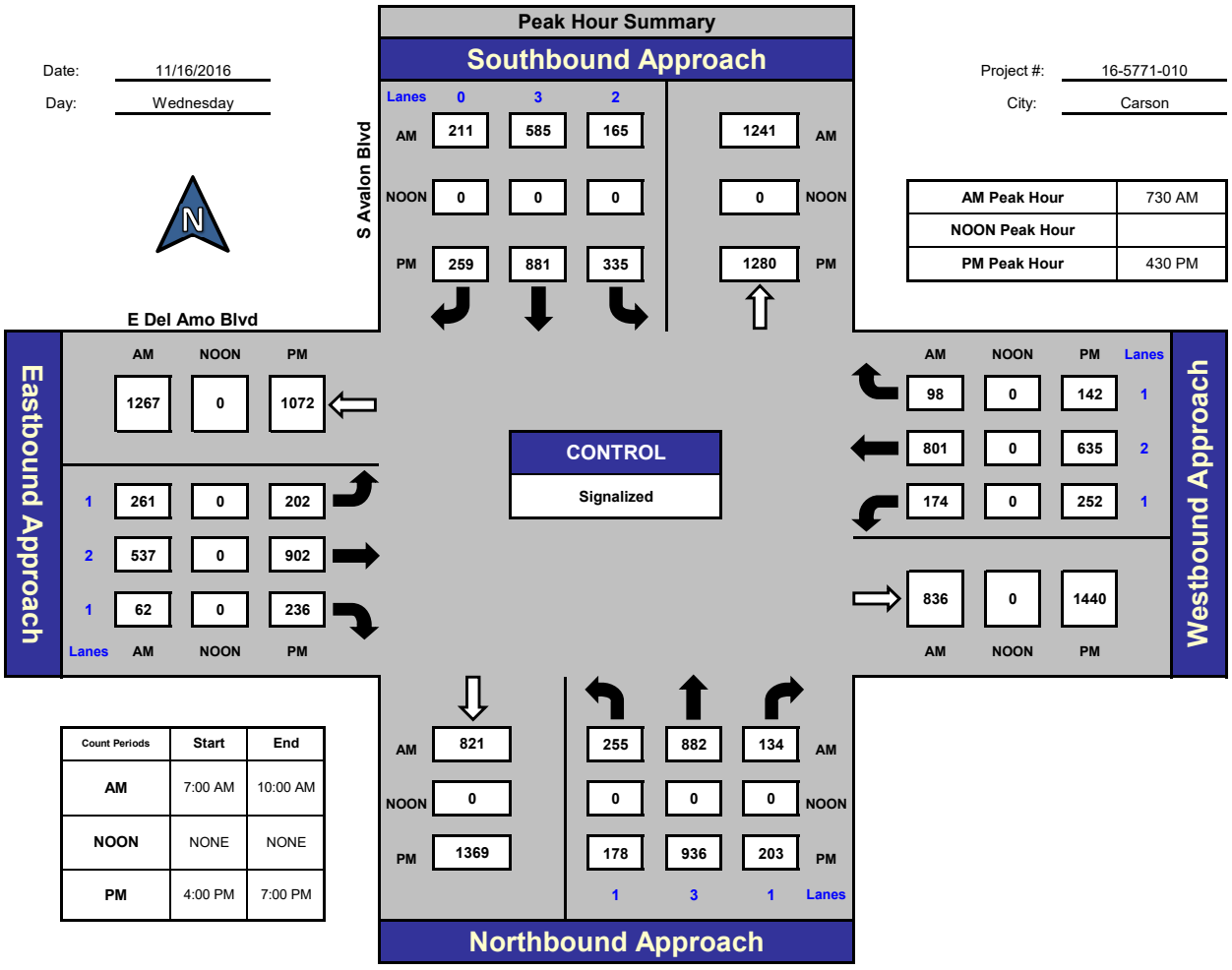
S Avalon Blvd and E Del Amo Blvd , Carson

Date: 11/16/2016

Day: Wednesday

Project #: 16-5771-010

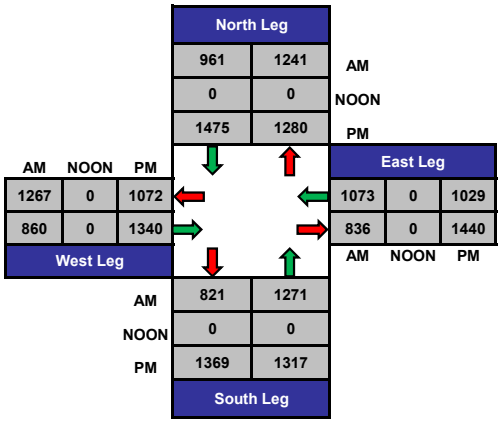
City: Carson



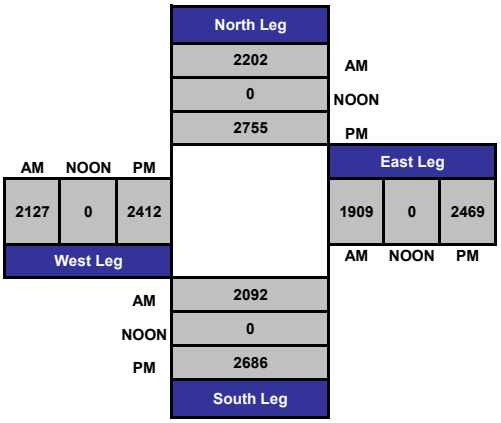
AM Peak Hour	730 AM
NOON Peak Hour	
PM Peak Hour	430 PM

Count Periods	Start	End
AM	7:00 AM	10:00 AM
NOON	NONE	NONE
PM	4:00 PM	7:00 PM

Total Ins & Outs



Total Volume Per Leg



Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: 16-5771-010 **Day:** Wednesday

City: Carson **Cars** **Date:** 11/16/2016

AM

NS/EW Streets:	S Avalon Blvd			S Avalon Blvd			E Del Amo Blvd			E Del Amo Blvd			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
LANES:	NL 1	NT 3	NR 1	SL 2	ST 3	SR 0	EL 1	ET 2	ER 1	WL 1	WT 2	WR 1	TOTAL
7:00 AM	43	95	14	22	98	33	31	74	4	24	211	17	666
7:15 AM	52	137	39	26	152	59	49	96	5	36	191	15	857
7:30 AM	63	154	26	35	182	50	46	113	9	33	220	16	947
7:45 AM	71	240	31	41	145	52	62	160	20	48	191	29	1090
8:00 AM	53	234	30	41	125	52	79	137	16	50	168	22	1007
8:15 AM	61	234	37	42	128	54	72	112	14	39	178	26	997
8:30 AM	57	145	18	37	108	47	44	87	16	45	176	22	802
8:45 AM	53	137	29	35	118	33	51	86	11	55	157	23	788
9:00 AM	36	149	24	27	94	22	41	74	17	61	110	17	672
9:15 AM	33	150	27	38	101	32	42	75	11	50	125	25	709
9:30 AM	22	151	31	36	87	44	57	63	17	48	143	20	719
9:45 AM	38	170	27	38	122	24	45	76	15	36	88	17	696
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
TOTAL VOLUMES :	582	1996	333	418	1460	502	619	1153	155	525	1958	249	9950
APPROACH %'s :	19.99%	68.57%	11.44%	17.56%	61.34%	21.09%	32.12%	59.83%	8.04%	19.22%	71.67%	9.11%	
PEAK HR START TIME :	730 AM												TOTAL
PEAK HR VOL :	248	862	124	159	580	208	259	522	59	170	757	93	4041
PEAK HR FACTOR :		0.902			0.887			0.868			0.948		0.927

UTURNS

NB	SB	EB	WB
8	7	0	2
5	11	2	6
7	12	1	3
16	18	0	3
16	18	2	10
13	16	2	8
11	13	0	10
6	13	0	10
8	5	2	13
4	14	2	4
11	20	1	8
17	15	2	6
NB	SB	EB	WB
122	162	14	83

CONTROL : Signalized

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: 16-5771-010 **Day:** Wednesday

City: Carson **Cars** **Date:** 11/16/2016

PM

NS/EW Streets:	S Avalon Blvd			S Avalon Blvd			E Del Amo Blvd			E Del Amo Blvd			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
LANES:	NL 1	NT 3	NR 1	SL 2	ST 3	SR 0	EL 1	ET 2	ER 1	WL 1	WT 2	WR 1	TOTAL
4:00 PM	40	169	44	66	252	73	59	202	58	50	134	35	1182
4:15 PM	25	233	41	57	177	53	60	183	63	70	88	32	1082
4:30 PM	43	216	51	86	241	52	50	199	60	64	126	34	1222
4:45 PM	40	235	41	87	230	64	51	213	64	59	149	42	1275
5:00 PM	50	227	59	87	171	67	53	197	56	59	152	30	1208
5:15 PM	41	240	37	68	233	74	44	231	55	65	172	31	1291
5:30 PM	52	207	47	77	228	73	57	200	48	68	132	28	1217
5:45 PM	48	198	42	87	238	48	47	197	59	53	122	29	1168
6:00 PM	40	207	45	85	172	64	55	205	59	58	104	33	1127
6:15 PM	34	204	32	62	232	52	41	215	56	61	120	18	1127
6:30 PM	30	208	39	81	212	40	57	185	57	53	102	23	1087
6:45 PM	37	170	27	73	196	39	37	187	42	48	67	29	952
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
TOTAL VOLUMES :	480	2514	505	916	2582	699	611	2414	677	708	1468	364	13938
APPROACH %'s :	13.72%	71.85%	14.43%	21.83%	61.52%	16.65%	16.50%	65.21%	18.29%	27.87%	57.80%	14.33%	
PEAK HR START TIME :	430 PM												TOTAL
PEAK HR VOL :	174	918	188	328	875	257	198	840	235	247	599	137	4996
PEAK HR FACTOR :		0.952			0.958			0.964			0.917		0.967

UTURNS	NB	SB	EB	WB
	5	16	0	9
	7	15	4	11
	8	30	0	5
	5	21	1	8
	5	26	1	10
	7	19	1	5
	5	17	1	11
	10	21	1	5
	5	25	0	10
	5	13	4	17
	8	28	0	12
	10	14	2	8
	NB	SB	EB	WB
TOTAL VOLUMES :	80	245	15	111

CONTROL : Signalized

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: 16-5771-010 **Day:** Wednesday

City: Carson **2 Axle+ Commercial Trucks** **Date:** 11/16/2016

AM

NS/EW Streets:	S Avalon Blvd			S Avalon Blvd			E Del Amo Blvd			E Del Amo Blvd			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	1	3	1	2	3	0	1	2	1	1	2	1	
7:00 AM	1	2	3	3	4	2	1	6	0	1	14	2	39
7:15 AM	0	5	4	4	3	0	1	7	0	0	13	4	41
7:30 AM	1	4	2	1	1	0	0	3	0	2	14	0	28
7:45 AM	3	3	1	2	1	0	2	1	0	2	10	3	28
8:00 AM	3	7	6	1	1	1	0	6	2	0	10	1	38
8:15 AM	0	6	1	2	2	2	0	5	1	0	10	1	30
8:30 AM	0	3	7	2	4	2	1	5	0	1	11	2	38
8:45 AM	1	10	1	2	2	3	0	3	1	2	9	2	36
9:00 AM	2	4	3	2	3	1	1	3	1	1	13	3	37
9:15 AM	1	5	4	1	1	4	0	6	0	2	9	1	34
9:30 AM	1	4	1	2	1	3	2	4	0	1	16	2	37
9:45 AM	3	8	6	3	2	4	2	6	1	1	5	1	42
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
TOTAL VOLUMES :	16	61	39	25	25	22	10	55	6	13	134	22	428
APPROACH %'s :	13.79%	52.59%	33.62%	34.72%	34.72%	30.56%	14.08%	77.46%	8.45%	7.69%	79.29%	13.02%	
PEAK HR START TIME :	730 AM												TOTAL
PEAK HR VOL :	7	20	10	6	5	3	2	15	3	4	44	5	124
PEAK HR FACTOR :		0.578			0.583			0.625			0.828		0.927

UTURNS

NB	SB	EB	WB

NB	SB	EB	WB
0	0	0	0

CONTROL : Signalized

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: 16-5771-010 | **Day:** Wednesday

City: Carson | **Date:** 11/16/2016

2 Axle+ Commercial Trucks

PM

NS/EW Streets:	S Avalon Blvd			S Avalon Blvd			E Del Amo Blvd			E Del Amo Blvd			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	1	3	1	2	3	0	1	2	1	1	2	1	
4:00 PM	1	9	1	2	2	0	2	12	2	2	6	0	39
4:15 PM	1	4	3	2	1	1	1	16	1	0	3	2	35
4:30 PM	2	5	5	2	2	1	0	19	1	2	6	2	47
4:45 PM	2	6	7	2	3	0	2	13	0	1	12	1	49
5:00 PM	0	1	2	0	0	0	0	18	0	1	7	1	30
5:15 PM	0	6	1	3	1	1	2	12	0	1	11	1	39
5:30 PM	2	2	2	1	3	0	0	13	0	1	4	1	29
5:45 PM	0	3	5	4	1	0	0	11	1	1	7	2	35
6:00 PM	0	3	0	3	1	0	0	16	0	1	5	2	31
6:15 PM	0	2	1	0	0	1	1	13	1	2	1	0	22
6:30 PM	1	2	4	3	1	2	0	11	0	0	3	1	28
6:45 PM	0	1	3	1	1	1	0	8	1	0	2	4	22
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
TOTAL VOLUMES :	9	44	34	23	16	7	8	162	7	12	67	17	406
APPROACH %'s :	10.34%	50.57%	39.08%	50.00%	34.78%	15.22%	4.52%	91.53%	3.95%	12.50%	69.79%	17.71%	
PEAK HR START TIME :	430 PM												TOTAL
PEAK HR VOL :	4	18	15	7	6	2	4	62	1	5	36	5	165
PEAK HR FACTOR :		0.617			0.750			0.838			0.821		0.967

UTURNS	NB	SB	EB	WB
TOTAL VOLUMES :	0	0	0	0

CONTROL : Signalized

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: 16-5771-015 **Day:** Wednesday

City: Carson **Date:** 11/16/2016

TOTALS

AM

NS/EW Streets:	Figueroa St			Figueroa St			W Torrance Blvd			W Torrance Blvd			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
LANES:	NL 1	NT 2	NR 0	SL 1	ST 2	SR 1	EL 1.5	ET 1	ER 0.5	WL 1	WT 2	WR 1	TOTAL
7:00 AM	30	110	9	7	49	58	124	61	23	5	96	35	607
7:15 AM	37	116	7	8	54	89	146	71	44	7	94	43	716
7:30 AM	45	126	11	9	100	114	146	102	61	20	115	36	885
7:45 AM	25	154	23	14	94	113	154	105	43	19	130	39	913
8:00 AM	58	176	12	16	69	100	144	118	33	9	113	42	890
8:15 AM	50	129	12	16	59	97	153	119	21	11	103	33	803
8:30 AM	33	117	12	29	59	66	157	90	34	6	68	22	693
8:45 AM	43	84	12	15	46	91	121	101	31	4	63	24	635
9:00 AM	32	103	12	15	49	52	118	107	26	3	69	23	609
9:15 AM	18	61	13	21	35	53	101	92	29	7	63	38	531
9:30 AM	37	76	7	16	39	66	114	86	22	2	60	30	555
9:45 AM	23	66	7	15	33	60	137	90	29	5	54	25	544
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
TOTAL VOLUMES :	431	1318	137	181	686	959	1615	1142	396	98	1028	390	8381
APPROACH %'s :	22.85%	69.88%	7.26%	9.91%	37.57%	52.52%	51.22%	36.22%	12.56%	6.46%	67.81%	25.73%	
PEAK HR START TIME :	730 AM												TOTAL
PEAK HR VOL :	178	585	58	55	322	424	597	444	158	59	461	150	3491
PEAK HR FACTOR :		0.834			0.898			0.970			0.891		0.956

UTURNS			
NB	SB	EB	WB
0	0		
0	0		
0	0		
0	0		
0	0		
0	0		
0	0		
0	0		
0	0		
0	0		
0	0		
1	1		
0	0		
NB	SB	EB	WB
1	1	0	0

CONTROL : Signalized

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: 16-5771-015 **Day:** Wednesday

City: Carson **Date:** 11/16/2016

TOTALS

PM

NS/EW Streets:	Figueroa St			Figueroa St			W Torrance Blvd			W Torrance Blvd			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
LANES:	NL 1	NT 2	NR 0	SL 1	ST 2	SR 1	EL 1.5	ET 1	ER 0.5	WL 1	WT 2	WR 1	TOTAL
4:00 PM	23	78	17	21	82	64	190	169	43	12	72	29	800
4:15 PM	21	101	8	35	104	82	155	152	31	16	69	26	800
4:30 PM	28	87	6	20	97	75	150	177	32	10	64	38	784
4:45 PM	32	110	15	33	105	79	131	154	48	9	67	10	793
5:00 PM	27	78	15	28	106	87	143	191	38	11	75	41	840
5:15 PM	21	100	11	33	136	95	161	173	39	9	101	35	914
5:30 PM	20	68	7	19	94	104	151	155	32	13	103	43	809
5:45 PM	17	82	17	34	101	82	142	162	48	15	88	41	829
6:00 PM	26	66	12	29	90	54	180	163	44	8	76	27	775
6:15 PM	26	63	6	29	77	61	139	164	37	5	74	32	713
6:30 PM	17	62	10	34	67	42	140	138	32	5	70	31	648
6:45 PM	21	52	5	28	91	41	116	92	29	2	48	27	552
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
TOTAL VOLUMES :	279	947	129	343	1150	866	1798	1890	453	115	907	380	9257
APPROACH %'s :	20.59%	69.89%	9.52%	14.54%	48.75%	36.71%	43.42%	45.64%	10.94%	8.20%	64.69%	27.10%	
PEAK HR START TIME :	500 PM												TOTAL
PEAK HR VOL :	85	328	50	114	437	368	597	681	157	48	367	160	3392
PEAK HR FACTOR :		0.877			0.870			0.962			0.904		0.928

UTURNS

NB	SB	EB	WB
0	0		
0	0		
0	1		
0	1		
1	0		
0	0		
0	0		
1	0		
1	0		
2	0		
2	0		
0	0		
NB	SB	EB	WB
7	2	0	0

CONTROL : Signalized

ITM Peak Hour Summary

Prepared by:

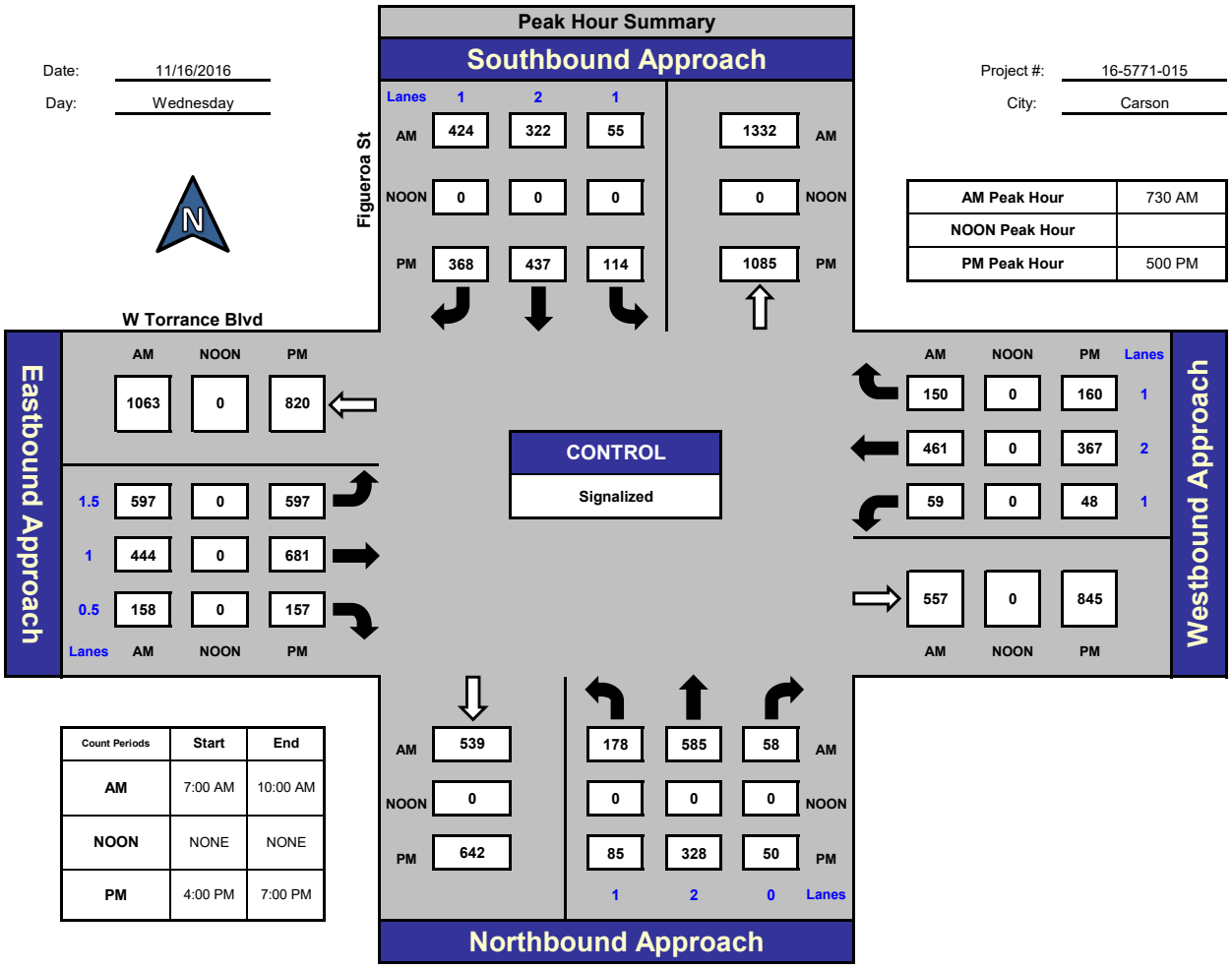
National Data & Surveying Services

Figueroa St and W Torrance Blvd , Carson

Date: 11/16/2016
Day: Wednesday

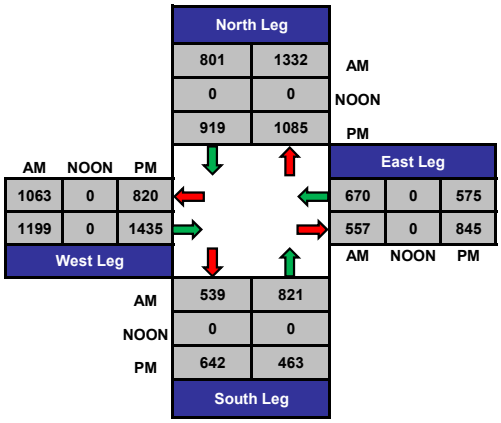
Project #: 16-5771-015
City: Carson

AM Peak Hour	730 AM
NOON Peak Hour	
PM Peak Hour	500 PM

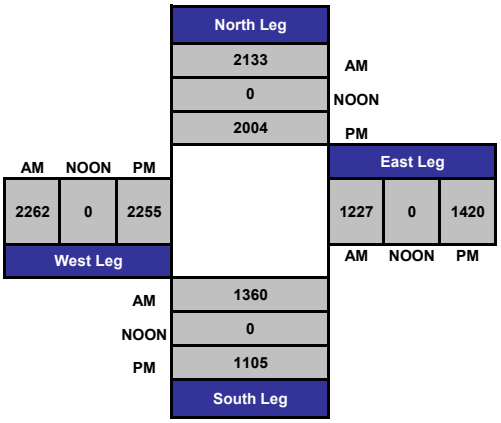


Count Periods	Start	End
AM	7:00 AM	10:00 AM
NOON	NONE	NONE
PM	4:00 PM	7:00 PM

Total Ins & Outs



Total Volume Per Leg



Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: 16-5771-015 **Day:** Wednesday

City: Carson **Cars** **Date:** 11/16/2016

AM

NS/EW Streets:	Figueroa St			Figueroa St			W Torrance Blvd			W Torrance Blvd			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
LANES:	NL 1	NT 2	NR 0	SL 1	ST 2	SR 1	EL 1.5	ET 1	ER 0.5	WL 1	WT 2	WR 1	TOTAL
7:00 AM	30	105	8	7	46	55	122	60	22	4	93	33	585
7:15 AM	37	116	7	8	52	86	142	68	43	7	90	42	698
7:30 AM	45	124	10	9	94	113	139	101	58	20	114	35	862
7:45 AM	25	150	21	13	91	110	149	102	42	18	128	37	886
8:00 AM	58	169	11	16	64	99	143	115	31	9	107	41	863
8:15 AM	49	122	12	16	56	97	151	116	21	11	100	30	781
8:30 AM	31	112	11	29	51	64	150	89	32	6	68	22	665
8:45 AM	42	77	12	15	43	86	110	97	31	3	60	22	598
9:00 AM	30	100	11	14	46	50	116	104	25	3	67	22	588
9:15 AM	18	58	12	20	31	49	96	89	29	6	61	34	503
9:30 AM	36	70	5	16	34	60	112	83	22	2	59	30	529
9:45 AM	23	61	6	15	31	55	132	87	27	3	51	25	516
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
TOTAL VOLUMES :	424	1264	126	178	639	924	1562	1111	383	92	998	373	8074
APPROACH %'s :	23.37%	69.68%	6.95%	10.22%	36.70%	53.07%	51.11%	36.35%	12.53%	6.29%	68.22%	25.50%	
PEAK HR START TIME :	730 AM												TOTAL
PEAK HR VOL :	177	565	54	54	305	419	582	434	152	58	449	143	3392
PEAK HR FACTOR :		0.836			0.900			0.980			0.888		0.957

UTURNS

NB	SB	EB	WB
0	0		
0	0		
0	0		
0	0		
0	0		
0	0		
0	0		
0	0		
0	0		
0	0		
0	0		
1	1		
0	0		
NB	SB	EB	WB
1	1	0	0

CONTROL : Signalized

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: 16-5771-015 **Day:** Wednesday

City: Carson **Cars** **Date:** 11/16/2016

PM

NS/EW Streets:	Figueroa St			Figueroa St			W Torrance Blvd			W Torrance Blvd			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
LANES:	NL 1	NT 2	NR 0	SL 1	ST 2	SR 1	EL 1.5	ET 1	ER 0.5	WL 1	WT 2	WR 1	TOTAL
4:00 PM	23	71	17	20	78	60	183	167	43	12	72	29	775
4:15 PM	20	94	6	34	97	76	152	151	30	15	66	25	766
4:30 PM	28	79	5	20	94	74	143	171	30	9	64	37	754
4:45 PM	30	106	15	33	100	73	129	153	48	9	66	9	771
5:00 PM	27	75	13	26	105	84	138	189	38	11	75	41	822
5:15 PM	20	98	11	33	133	94	156	171	38	9	100	35	898
5:30 PM	20	66	7	19	91	103	149	151	32	13	102	42	795
5:45 PM	17	79	16	33	100	82	138	162	48	15	87	41	818
6:00 PM	26	64	12	29	90	51	177	161	42	8	74	26	760
6:15 PM	26	60	6	28	74	59	137	163	34	5	73	31	696
6:30 PM	16	62	8	34	66	39	136	138	32	5	69	28	633
6:45 PM	21	52	5	28	90	41	115	91	29	2	47	27	548
TOTAL VOLUMES :	274	906	121	337	1118	836	1753	1868	444	113	895	371	9036
APPROACH %'s :	21.06%	69.64%	9.30%	14.71%	48.80%	36.49%	43.12%	45.95%	10.92%	8.19%	64.90%	26.90%	
PEAK HR START TIME :	500 PM												TOTAL
PEAK HR VOL :	84	318	47	111	429	363	581	673	156	48	364	159	3333
PEAK HR FACTOR :		0.870			0.868			0.966			0.909		0.928

UTURNS	NB	SB	EB	WB
	0	0		
	0	0		
	0	1		
	0	1		
	1	0		
	0	0		
	0	0		
	1	0		
	1	0		
	2	0		
	2	0		
	0	0		
TOTAL VOLUMES :	7	2	0	0

CONTROL : Signalized

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: 16-5771-015 **Day:** Wednesday

City: Carson **2 Axle+ Commercial Trucks** **Date:** 11/16/2016

AM

NS/EW Streets:	Figueroa St			Figueroa St			W Torrance Blvd			W Torrance Blvd			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	1	2	0	1	2	1	1.5	1	0.5	1	2	1	
7:00 AM	0	5	1	0	3	3	2	1	1	1	3	2	22
7:15 AM	0	0	0	0	2	3	4	3	1	0	4	1	18
7:30 AM	0	2	1	0	6	1	7	1	3	0	1	1	23
7:45 AM	0	4	2	1	3	3	5	3	1	1	2	2	27
8:00 AM	0	7	1	0	5	1	1	3	2	0	6	1	27
8:15 AM	1	7	0	0	3	0	2	3	0	0	3	3	22
8:30 AM	2	5	1	0	8	2	7	1	2	0	0	0	28
8:45 AM	1	7	0	0	3	5	11	4	0	1	3	2	37
9:00 AM	2	3	1	1	3	2	2	3	1	0	2	1	21
9:15 AM	0	3	1	1	4	4	5	3	0	1	2	4	28
9:30 AM	1	6	2	0	5	6	2	3	0	0	1	0	26
9:45 AM	0	5	1	0	2	5	5	3	2	2	3	0	28
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
TOTAL VOLUMES :	7	54	11	3	47	35	53	31	13	6	30	17	307
APPROACH %'s :	9.72%	75.00%	15.28%	3.53%	55.29%	41.18%	54.64%	31.96%	13.40%	11.32%	56.60%	32.08%	
PEAK HR START TIME :	730 AM												TOTAL
PEAK HR VOL :	1	20	4	1	17	5	15	10	6	1	12	7	99
PEAK HR FACTOR :		0.781			0.821			0.705			0.714		0.957

UTURNS	NB	SB	EB	WB
TOTAL VOLUMES :	0	0	0	0

CONTROL : Signalized

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: 16-5771-015 | **Day:** Wednesday

City: Carson | **Date:** 11/16/2016

2 Axle+ Commercial Trucks

PM

NS/EW Streets:	Figueroa St			Figueroa St			W Torrance Blvd			W Torrance Blvd			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	1	2	0	1	2	1	1.5	1	0.5	1	2	1	
4:00 PM	0	7	0	1	4	4	7	2	0	0	0	0	25
4:15 PM	1	7	2	1	7	6	3	1	1	1	3	1	34
4:30 PM	0	8	1	0	3	1	7	6	2	1	0	1	30
4:45 PM	2	4	0	0	5	6	2	1	0	0	1	1	22
5:00 PM	0	3	2	2	1	3	5	2	0	0	0	0	18
5:15 PM	1	2	0	0	3	1	5	2	1	0	1	0	16
5:30 PM	0	2	0	0	3	1	2	4	0	0	1	1	14
5:45 PM	0	3	1	1	1	0	4	0	0	0	1	0	11
6:00 PM	0	2	0	0	0	3	3	2	2	0	2	1	15
6:15 PM	0	3	0	1	3	2	2	1	3	0	1	1	17
6:30 PM	1	0	2	0	1	3	4	0	0	0	1	3	15
6:45 PM	0	0	0	0	1	0	1	1	0	0	1	0	4
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
TOTAL VOLUMES :	5	41	8	6	32	30	45	22	9	2	12	9	221
APPROACH %'s :	9.26%	75.93%	14.81%	8.82%	47.06%	44.12%	59.21%	28.95%	11.84%	8.70%	52.17%	39.13%	
PEAK HR START TIME :	500 PM												TOTAL
PEAK HR VOL :	1	10	3	3	8	5	16	8	1	0	3	1	59
PEAK HR FACTOR :		0.700			0.667			0.781			0.500		0.928

UTURNS

NB	SB	EB	WB

NB	SB	EB	WB
0	0	0	0

CONTROL : Signalized

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: 16-5771-016 **Day:** Wednesday

City: Carson **Date:** 11/16/2016

TOTALS

AM

NS/EW Streets:	S Main St			S Main St			W Torrance Blvd			W Torrance Blvd			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
LANES:	NL 2	NT 2	NR 0	SL 1	ST 2	SR 1	EL 0.5	ET 0.5	ER 1	WL 0	WT 1	WR 0	TOTAL
7:00 AM	69	86	1	6	65	38	41	6	23	3	18	10	366
7:15 AM	87	95	0	4	102	51	37	2	28	3	17	10	436
7:30 AM	92	165	4	4	153	72	64	5	49	3	20	9	640
7:45 AM	98	158	3	1	135	76	52	8	61	3	27	15	637
8:00 AM	88	150	0	5	88	48	69	5	64	0	15	7	539
8:15 AM	81	115	2	2	82	54	65	5	51	4	13	4	478
8:30 AM	56	78	0	6	66	40	51	4	39	5	12	11	368
8:45 AM	56	62	2	2	62	35	58	1	55	1	13	5	352
9:00 AM	61	47	1	2	66	31	47	3	57	1	9	5	330
9:15 AM	63	56	2	5	61	43	41	5	37	2	9	10	334
9:30 AM	53	65	0	3	46	31	44	4	35	1	11	11	304
9:45 AM	37	68	3	5	52	37	48	6	39	5	8	6	314
TOTAL VOLUMES :	841	1145	18	45	978	556	617	54	538	31	172	103	5098
APPROACH %'s :	41.97%	57.14%	0.90%	2.85%	61.94%	35.21%	51.03%	4.47%	44.50%	10.13%	56.21%	33.66%	
PEAK HR START TIME :	730 AM												TOTAL
PEAK HR VOL :	359	588	9	12	458	250	250	23	225	10	75	35	2294
PEAK HR FACTOR :		0.916			0.786			0.902			0.667		0.896

CONTROL : Signalized

UTURNS	NB	SB	EB	WB
	0	1		0
	0	1		0
	0	1		0
	0	1		0
	0	2		0
	0	0		1
	0	1		0
	0	0		0
	1	0		0
	0	0		0
	0	1		0
	1	3		0
TOTAL VOLUMES :	2	11	0	1

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: 16-5771-016 **Day:** Wednesday

City: Carson **Date:** 11/16/2016

TOTALS

PM

NS/EW Streets:	S Main St			S Main St			W Torrance Blvd			W Torrance Blvd			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
LANES:	NL 2	NT 2	NR 0	SL 1	ST 2	SR 1	EL 0.5	ET 0.5	ER 1	WL 0	WT 1	WR 0	TOTAL
4:00 PM	44	114	1	7	166	51	81	10	112	1	13	4	604
4:15 PM	52	101	3	6	178	45	69	11	118	0	7	7	597
4:30 PM	46	85	3	9	187	46	85	7	111	2	11	2	594
4:45 PM	39	100	3	5	217	52	66	15	114	1	4	6	622
5:00 PM	58	100	1	11	182	70	77	15	139	1	10	5	669
5:15 PM	57	109	5	13	210	76	77	15	125	4	10	7	708
5:30 PM	77	116	1	12	181	78	60	13	117	2	12	7	676
5:45 PM	83	111	2	9	182	68	71	27	117	4	11	6	691
6:00 PM	65	103	2	8	147	40	71	14	106	3	5	6	570
6:15 PM	62	73	1	10	167	40	66	10	105	0	9	3	546
6:30 PM	67	68	0	11	118	30	56	15	102	1	7	5	480
6:45 PM	50	81	3	5	106	54	27	10	67	3	10	2	418
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
TOTAL VOLUMES :	700	1161	25	106	2041	650	806	162	1333	22	109	60	7175
APPROACH %'s :	37.12%	61.56%	1.33%	3.79%	72.97%	23.24%	35.03%	7.04%	57.93%	11.52%	57.07%	31.41%	
PEAK HR START TIME :	500 PM												TOTAL
PEAK HR VOL :	275	436	9	45	755	292	285	70	498	11	43	25	2744
PEAK HR FACTOR :		0.918			0.913			0.923			0.940		0.969

UTURNS

NB	SB	EB	WB
	0		
	0		
	1		
	0		
	1		
	1		
	1		
	1		
	1		
	2		
	1		
	0		
NB	SB	EB	WB
0	9	0	0

CONTROL : Signalized

ITM Peak Hour Summary

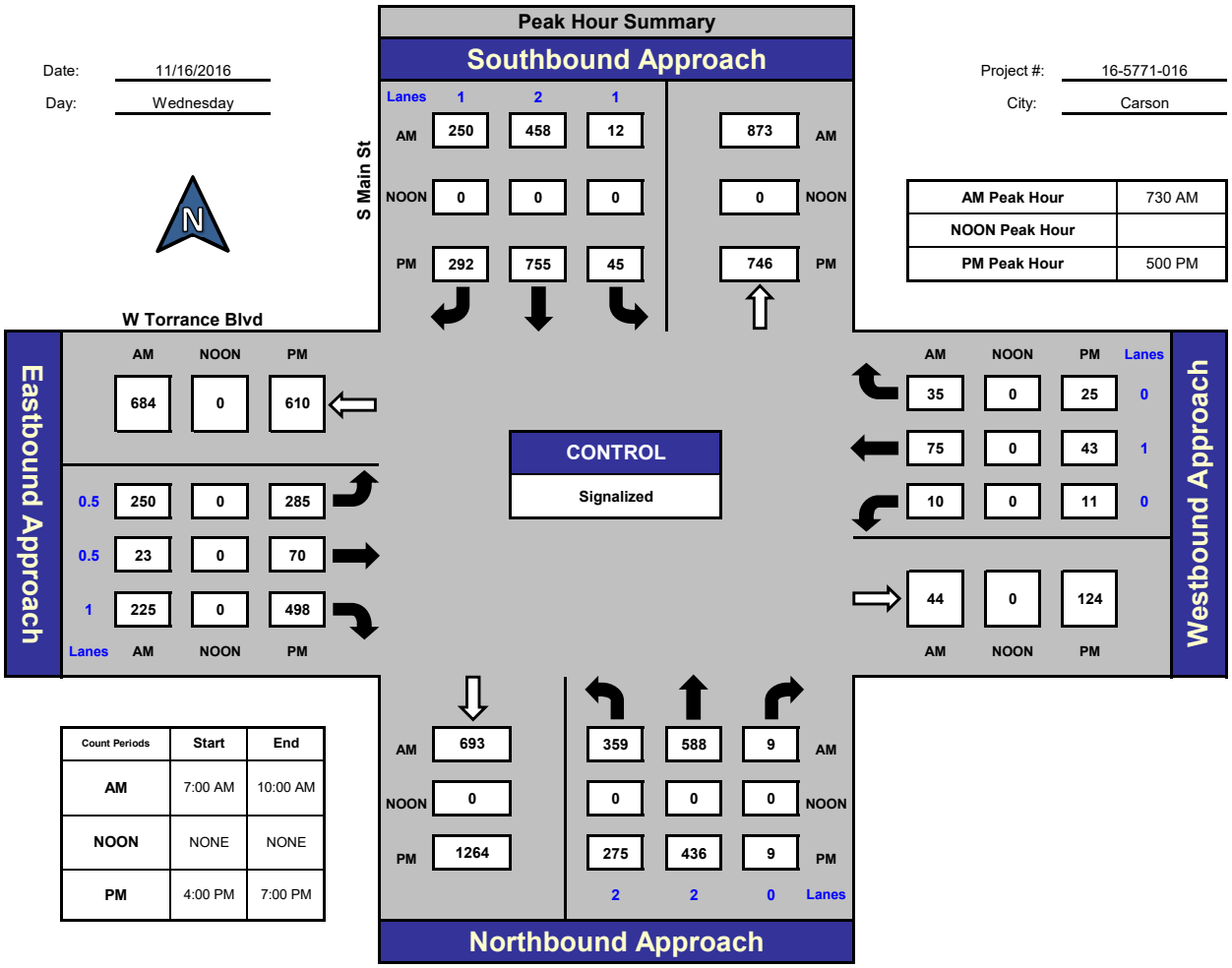
Prepared by:

National Data & Surveying Services

S Main St and W Torrance Blvd , Carson

Date: 11/16/2016
Day: Wednesday

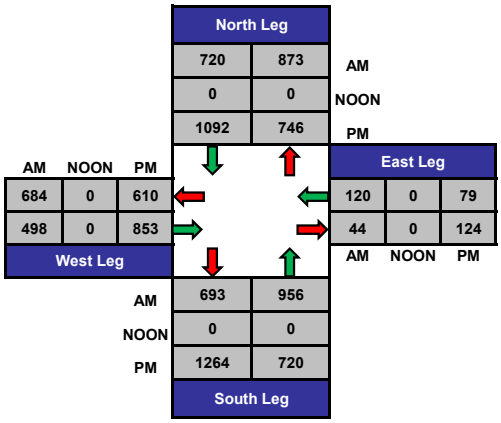
Project #: 16-5771-016
City: Carson



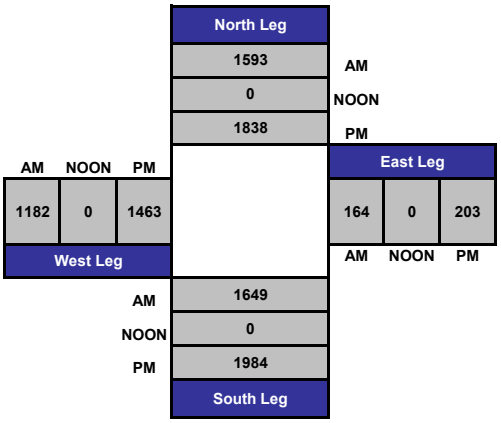
AM Peak Hour	730 AM
NOON Peak Hour	
PM Peak Hour	500 PM

Count Periods	Start	End
AM	7:00 AM	10:00 AM
NOON	NONE	NONE
PM	4:00 PM	7:00 PM

Total Ins & Outs



Total Volume Per Leg



Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: 16-5771-016 **Day:** Wednesday

City: Carson **Cars** **Date:** 11/16/2016

AM

NS/EW Streets:	S Main St			S Main St			W Torrance Blvd			W Torrance Blvd			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
LANES:	NL 2	NT 2	NR 0	SL 1	ST 2	SR 1	EL 0.5	ET 0.5	ER 1	WL 0	WT 1	WR 0	TOTAL
7:00 AM	66	85	0	6	62	37	40	6	21	3	18	10	354
7:15 AM	86	93	0	4	101	47	37	2	27	3	17	10	427
7:30 AM	92	160	4	4	151	71	62	5	49	3	20	9	630
7:45 AM	98	156	3	1	131	72	50	8	57	3	27	15	621
8:00 AM	85	145	0	5	84	47	68	5	62	0	15	7	523
8:15 AM	78	105	2	2	80	53	60	5	51	4	13	4	457
8:30 AM	55	72	0	5	64	40	51	4	37	5	12	10	355
8:45 AM	55	58	2	2	58	33	57	1	53	1	13	5	338
9:00 AM	59	46	1	2	63	30	47	3	55	1	9	5	321
9:15 AM	59	55	2	5	58	42	38	5	35	2	9	10	320
9:30 AM	53	64	0	3	40	28	44	4	32	1	11	11	291
9:45 AM	36	63	3	5	51	35	47	6	36	5	8	6	301
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
TOTAL VOLUMES :	822	1102	17	44	943	535	601	54	515	31	172	102	4938
APPROACH %'s :	42.35%	56.77%	0.88%	2.89%	61.96%	35.15%	51.37%	4.62%	44.02%	10.16%	56.39%	33.44%	
PEAK HR START TIME :	730 AM												TOTAL
PEAK HR VOL :	353	566	9	12	446	243	240	23	219	10	75	35	2231
PEAK HR FACTOR :		0.903			0.775			0.893			0.667		0.885

UTURNS

	NB	SB	EB	WB
7:00 AM	0	1		0
7:15 AM	0	1		0
7:30 AM	0	1		0
7:45 AM	0	1		0
8:00 AM	0	2		0
8:15 AM	0	0		1
8:30 AM	0	1		0
8:45 AM	0	0		0
9:00 AM	1	0		0
9:15 AM	0	0		0
9:30 AM	0	1		0
9:45 AM	1	3		0
TOTAL VOLUMES :	2	11	0	1

CONTROL : Signalized

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: 16-5771-016 **Day:** Wednesday

City: Carson **Cars** **Date:** 11/16/2016

PM

NS/EW Streets:	S Main St			S Main St			W Torrance Blvd			W Torrance Blvd			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
LANES:	NL 2	NT 2	NR 0	SL 1	ST 2	SR 1	EL 0.5	ET 0.5	ER 1	WL 0	WT 1	WR 0	TOTAL
4:00 PM	44	111	1	7	162	48	78	9	111	1	13	4	589
4:15 PM	49	98	3	6	175	42	65	11	116	0	7	7	579
4:30 PM	45	82	3	9	183	46	81	7	107	2	11	2	578
4:45 PM	38	97	3	5	212	50	65	15	114	1	4	6	610
5:00 PM	58	97	1	11	176	70	75	14	137	1	10	5	655
5:15 PM	54	104	5	13	207	75	75	15	123	4	10	7	692
5:30 PM	77	113	1	12	179	78	57	13	117	2	12	7	668
5:45 PM	83	110	2	9	182	67	71	27	115	4	11	6	687
6:00 PM	64	102	2	8	144	39	69	14	105	3	5	6	561
6:15 PM	61	71	1	10	166	38	63	10	105	0	9	3	537
6:30 PM	66	66	0	11	116	28	56	15	101	1	7	5	472
6:45 PM	50	78	3	5	104	54	27	10	66	3	10	2	412
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
TOTAL VOLUMES :	689	1129	25	106	2006	635	782	160	1317	22	109	60	7040
APPROACH %'s :	37.38%	61.26%	1.36%	3.86%	73.03%	23.12%	34.62%	7.08%	58.30%	11.52%	57.07%	31.41%	
PEAK HR START TIME :	500 PM												TOTAL
PEAK HR VOL :	272	424	9	45	744	290	278	69	492	11	43	25	2702
PEAK HR FACTOR :		0.904			0.914			0.928			0.940		0.976

UTURNS	NB	SB	EB	WB
		0		
		0		
		1		
		0		
		1		
		1		
		1		
		1		
		1		
		2		
		1		
		0		
	NB	SB	EB	WB
	0	9	0	0

CONTROL : Signalized

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: 16-5771-016 **Day:** Wednesday

City: Carson **2 Axle+ Commercial Trucks** **Date:** 11/16/2016

AM

NS/EW Streets:	S Main St			S Main St			W Torrance Blvd			W Torrance Blvd			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	2	2	0	1	2	1	0.5	0.5	1	0	1	0	
7:00 AM	3	1	1	0	3	1	1	0	2	0	0	0	12
7:15 AM	1	2	0	0	1	4	0	0	1	0	0	0	9
7:30 AM	0	5	0	0	2	1	2	0	0	0	0	0	10
7:45 AM	0	2	0	0	4	4	2	0	4	0	0	0	16
8:00 AM	3	5	0	0	4	1	1	0	2	0	0	0	16
8:15 AM	3	10	0	0	2	1	5	0	0	0	0	0	21
8:30 AM	1	6	0	1	2	0	0	0	2	0	0	1	13
8:45 AM	1	4	0	0	4	2	1	0	2	0	0	0	14
9:00 AM	2	1	0	0	3	1	0	0	2	0	0	0	9
9:15 AM	4	1	0	0	3	1	3	0	2	0	0	0	14
9:30 AM	0	1	0	0	6	3	0	0	3	0	0	0	13
9:45 AM	1	5	0	0	1	2	1	0	3	0	0	0	13
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
TOTAL VOLUMES :	19	43	1	1	35	21	16	0	23	0	0	1	160
APPROACH %'s :	30.16%	68.25%	1.59%	1.75%	61.40%	36.84%	41.03%	0.00%	58.97%	0.00%	0.00%	100.00%	
PEAK HR START TIME :	730 AM												TOTAL
PEAK HR VOL :	6	22	0	0	12	7	10	0	6	0	0	0	63
PEAK HR FACTOR :		0.538			0.594			0.667			0.000		0.885

UTURNS

NB	SB	EB	WB

NB	SB	EB	WB
0	0	0	0

CONTROL : Signalized

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

Project ID: 16-5771-016 | **Day:** Wednesday

City: Carson | **Date:** 11/16/2016

2 Axle+ Commercial Trucks

PM

NS/EW Streets:	S Main St			S Main St			W Torrance Blvd			W Torrance Blvd			
	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	2	2	0	1	2	1	0.5	0.5	1	0	1	0	
4:00 PM	0	3	0	0	4	3	3	1	1	0	0	0	15
4:15 PM	3	3	0	0	3	3	4	0	2	0	0	0	18
4:30 PM	1	3	0	0	4	0	4	0	4	0	0	0	16
4:45 PM	1	3	0	0	5	2	1	0	0	0	0	0	12
5:00 PM	0	3	0	0	6	0	2	1	2	0	0	0	14
5:15 PM	3	5	0	0	3	1	2	0	2	0	0	0	16
5:30 PM	0	3	0	0	2	0	3	0	0	0	0	0	8
5:45 PM	0	1	0	0	0	1	0	0	2	0	0	0	4
6:00 PM	1	1	0	0	3	1	2	0	1	0	0	0	9
6:15 PM	1	2	0	0	1	2	3	0	0	0	0	0	9
6:30 PM	1	2	0	0	2	2	0	0	1	0	0	0	8
6:45 PM	0	3	0	0	2	0	0	0	1	0	0	0	6
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
TOTAL VOLUMES :	11	32	0	0	35	15	24	2	16	0	0	0	135
APPROACH %'s :	25.58%	74.42%	0.00%	0.00%	70.00%	30.00%	57.14%	4.76%	38.10%	#DIV/0!	#DIV/0!	#DIV/0!	
PEAK HR START TIME :	500 PM												TOTAL
PEAK HR VOL :	3	12	0	0	11	2	7	1	6	0	0	0	42
PEAK HR FACTOR :	0.469			0.542			0.700			0.000			0.976

UTURNS	NB	SB	EB	WB

	NB	SB	EB	WB
TOTAL VOLUMES :	0	0	0	0

CONTROL : Signalized

Attachment 3
2018 Construction Noise Calculations

Project: The District

Construction Noise Impact on Sensitive Receptors

PA-1

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	

				South of the Project Site					West of the Project Site					Residential Uses Deistrict 3				
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**	**Distance (ft)**	**Lmax**	**Leq**	**L10**	**Estimated Noise Shielding, dBA**	**Distance (ft)**	**Lmax**	**Leq**	**L10**	**Estimated Noise Shielding, dBA**
PA-1 Remedial Construction					**58**	***57***				**74**	***74***				**78**	***77***		
Excavator	2	81	40%	2000	52	48	51	0	150	74	70	73	0	100	78	74	77	0
Loader	2	79	40%	2150	49	45	48	0	300	66	62	65	0	250	68	64	67	0
Scraper	2	84	40%	2150	54	50	53	0	300	71	67	70	0	250	73	69	72	0
Dozer	2	82	40%	2300	52	48	51	0	450	66	62	65	0	400	67	63	66	0
Grader	4	85	40%	2300	58	54	57	0	450	72	68	71	0	400	73	69	72	0
Water Truck	4	80	10%	2300	53	43	46	0	450	67	57	60	0	400	68	58	61	0
Rollers	2	80	20%	2300	50	43	46	0	450	64	57	60	0	400	65	58	61	0
PA-1 - Horizontal Construction					**66**	***63***				**80**	***78***				**81**	***80***		
Excavator	2	81	40%	2000	52	48	51	0	150	74	70	73	0	100	78	74	77	0
Loader	2	79	40%	2150	49	45	48	0	300	66	62	65	0	250	68	64	67	0
Excavator	6	81	40%	2150	56	52	55	0	300	73	69	72	0	250	75	71	74	0
Loader	6	79	40%	2300	54	50	53	0	450	68	64	67	0	400	69	65	68	0
Skid Steer Loaders	1	80	40%	2300	47	43	46	0	450	61	57	60	0	400	62	58	61	0
Water Truck	3	80	10%	2300	52	42	45	0	450	66	56	59	0	400	67	57	60	0
Concrete Mixer Trucks	36	79	40%	2300	61	57	60	0	450	75	71	74	0	400	77	73	76	0
Tractor Trailers	18	76	20%	2300	55	48	51	0	450	69	62	65	0	400	70	64	67	0
Roller	2	80	20%	2300	50	43	46	0	450	64	57	60	0	400	65	58	61	0
Trencher	1	80	30%	2300	47	42	45	0	450	61	56	59	0	400	62	57	60	0
Compactor (Ground)	9	83	20%	2300	59	52	55	0	450	73	66	69	0	400	74	67	70	0
Air Compressor	4	78	50%	2300	51	48	51	0	450	65	62	65	0	400	66	63	66	0
Concrete Saw	8	90	20%	2300	66	59	62	0	450	80	73	76	0	400	81	74	77	0
Forklift	11	75	10%	2300	52	42	45	0	450	66	56	59	0	400	67	57	60	0
Cranes	3	81	40%	2300	53	49	52	0	450	67	63	66	0	400	68	64	67	0
PA-1 Vertical Construction - Building/Paving/Architectural Coating					**60**	***58***				**75**	***75***				**79**	***77***		
Rubber Tired Loader	4	79	50%	2000	53	50	53	0	150	75	72	75	0	100	79	76	79	0
Tractor Trailers	2	76	20%	2150	46	39	42	0	300	63	56	59	0	250	65	58	61	0
Forklift	4	75	10%	2150	48	38	41	0	300	65	55	58	0	250	67	57	60	0
Water Truck	2	80	10%	2300	50	40	43	0	450	64	54	57	0	400	65	55	58	0
Welders	2	74	40%	2300	44	40	43	0	450	58	54	57	0	400	59	55	58	0
Tractor Trailers	50	76	20%	2300	60	53	56	0	450	74	67	70	0	400	75	68	71	0
Pavement Scarifier	2	90	20%	2300	60	53	56	0	450	74	67	70	0	400	75	68	71	0
Paver	2	77	50%	2300	47	44	47	0	450	61	58	61	0	400	62	59	62	0
Roller	2	80	20%	2300	50	43	46	0	450	64	57	60	0	400	65	58	61	0
Air Compressor	1	78	50%	2300	45	42	45	0	450	59	56	59	0	400	60	57	60	0

Source for Ref. Noise Levels: FHWA RCNM, 2005

Project: The District

Construction Noise Impact on Sensitive Receptors

PA-2

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	

				South of the Project Site					West of the Project Site					Residential Uses Deistrict 3				
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**	**Distance (ft)**	**Lmax**	**Leq**	**L10**	**Estimated Noise Shielding, dBA**	**Distance (ft)**	**Lmax**	**Leq**	**L10**	**Estimated Noise Shielding, dBA**
PA-2 Remedial Construction					**72**	***73***				**65**	***65***				**78**	***77***		
Excavator	2	81	40%	200	72	68	71	0	750	60	57	60	0	100	78	74	77	0
Loader	2	79	40%	350	65	61	64	0	900	57	53	56	0	250	68	64	67	0
Scraper	2	84	40%	350	70	66	69	0	900	62	58	61	0	250	73	69	72	0
Dozer	2	82	40%	500	65	61	64	0	1050	59	55	58	0	400	67	63	66	0
Grader	4	85	40%	500	71	67	70	0	1050	65	61	64	0	400	73	69	72	0
Water Truck	4	80	10%	500	66	56	59	0	1050	60	50	53	0	400	68	58	61	0
Rollers	2	80	20%	500	63	56	59	0	1050	57	50	53	0	400	65	58	61	0
PA-2 - Horizontal Construction					**78**	***76***				**71**	***69***				**80**	***79***		
Excavator	2	81	40%	200	72	68	71	0	750	60	57	60	0	100	78	74	77	0
Loader	2	79	40%	350	65	61	64	0	900	57	53	56	0	250	68	64	67	0
Excavator	4	81	40%	350	70	66	69	0	900	62	58	61	0	250	73	69	72	0
Loader	4	79	40%	500	65	61	64	0	1050	59	55	58	0	400	67	63	66	0
Water Truck	2	80	10%	500	63	53	56	0	1050	57	47	50	0	400	65	55	58	0
Concrete Mixer Trucks	36	79	40%	500	75	71	74	0	1050	68	64	67	0	400	77	73	76	0
Tractor Trailers	15	76	20%	500	68	61	64	0	1050	61	54	57	0	400	70	63	66	0
Compactor (Ground)	9	83	20%	500	73	66	69	0	1050	66	59	62	0	400	74	67	70	0
Air Compressor	3	78	50%	500	63	60	63	0	1050	56	53	56	0	400	65	62	65	0
Concrete Saw	6	90	20%	500	78	71	74	0	1050	71	64	67	0	400	80	73	76	0
Forklift	9	75	10%	500	65	55	58	0	1050	58	48	51	0	400	66	56	59	0
Cranes	3	81	40%	500	66	62	65	0	1050	59	55	58	0	400	68	64	67	0
PA-2 Vertical Construction - Building/Paving/Architectural Coating					**68**	***68***				**59**	***60***				**74**	***71***		
Water Truck	1	80	10%	200	68	58	61	0	750	56	46	49	0	100	74	64	67	0
Trencher	1	80	30%	350	63	58	61	0	900	55	50	53	0	250	66	61	64	0
Air Compressor	3	78	50%	350	66	63	66	0	900	58	55	58	0	250	69	66	69	0
Forklift	1	75	10%	500	55	45	48	0	1050	49	39	42	0	400	57	47	50	0
Cranes	1	81	40%	500	61	57	60	0	1050	55	51	54	0	400	63	59	62	0
Bobcat	1	75	40%	500	55	51	54	0	1050	49	45	48	0	400	57	53	56	0
Welders	2	74	40%	500	57	53	56	0	1050	51	47	50	0	400	59	55	58	0
Paver	1	77	50%	500	57	54	57	0	1050	51	48	51	0	400	59	56	59	0
Air Compressor	5	78	50%	500	65	62	65	0	1050	59	56	59	0	400	67	64	67	0

Source for Ref. Noise Levels: FHWA RCNM, 2005

Project: The District

Construction Noise Impact on Sensitive Receptors

PA-3

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	

				South of the Project Site					West of the Project Site					Residential Uses Deistrict 3				
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**	**Distance (ft)**	**Lmax**	**Leq**	**L10**	**Estimated Noise Shielding, dBA**	**Distance (ft)**	**Lmax**	**Leq**	**L10**	**Estimated Noise Shielding, dBA**
PA-3 Remedial Construction					**73**	***73***				**74**	***74***				**65**	***66***		
Excavator	2	81	40%	175	73	69	72	0	150	74	70	73	0	650	62	58	61	0
Loader	2	79	40%	325	66	62	65	0	300	66	62	65	0	800	58	54	57	0
Scraper	2	84	40%	325	71	67	70	0	300	71	67	70	0	800	63	59	62	0
Dozer	2	82	40%	475	65	61	64	0	450	66	62	65	0	950	59	55	58	0
Grader	4	85	40%	475	71	67	70	0	450	72	68	71	0	950	65	61	64	0
Water Truck	4	80	10%	475	66	56	59	0	450	67	57	60	0	950	60	50	53	0
Rollers	2	80	20%	475	63	56	59	0	450	64	57	60	0	950	57	50	53	0
PA-3 - Horizontal Construction					**78**	***77***				**79**	***78***				**72**	***70***		
Excavator	2	81	40%	175	73	69	72	0	150	74	70	73	0	650	62	58	61	0
Loader	2	79	40%	325	66	62	65	0	300	66	62	65	0	800	58	54	57	0
Excavator	4	81	40%	325	71	67	70	0	300	71	67	70	0	800	63	59	62	0
Loader	4	79	40%	475	65	61	64	0	450	66	62	65	0	950	59	55	58	0
Water Truck	2	80	10%	475	63	53	56	0	450	64	54	57	0	950	57	47	50	0
Concrete Mixer Trucks	36	79	40%	475	75	71	74	0	450	75	71	74	0	950	69	65	68	0
Tractor Trailers	15	76	20%	475	68	61	64	0	450	69	62	65	0	950	62	55	58	0
Compactor (Ground)	9	83	20%	475	73	66	69	0	450	73	66	69	0	950	67	60	63	0
Air Compressor	3	78	50%	475	63	60	63	0	450	64	61	64	0	950	57	54	57	0
Concrete Saw	6	90	20%	475	78	71	74	0	450	79	72	75	0	950	72	65	68	0
Forklift	9	75	10%	475	65	55	58	0	450	65	55	58	0	950	59	49	52	0
Cranes	3	81	40%	475	66	62	65	0	450	67	63	66	0	950	60	56	59	0
PA-3 Vertical Construction - Building/Paving/Architectural Coating					**78**	***74***				**79**	***74***				**72**	***67***		
Rubber Tired Loader	2	79	50%	175	71	68	71	0	150	72	69	72	0	650	60	57	60	0
Tractor Trailers	2	76	20%	325	63	56	59	0	300	63	56	59	0	800	55	48	51	0
Rubber Tired Loader	10	75	10%	325	69	59	62	0	300	69	59	62	0	800	61	51	54	0
Tractor Trailers	60	80	10%	475	78	68	71	0	450	79	69	72	0	950	72	62	65	0
Forklift	12	75	10%	475	66	56	59	0	450	67	57	60	0	950	60	50	53	0
Cranes	4	81	40%	475	67	63	66	0	450	68	64	67	0	950	61	57	60	0
Welders	4	74	40%	475	60	56	59	0	450	61	57	60	0	950	54	50	53	0
Pavement Scarifier	2	90	20%	475	73	66	69	0	450	74	67	70	0	950	67	60	63	0
Paver	2	77	50%	475	60	57	60	0	450	61	58	61	0	950	54	51	54	0
Roller	2	80	20%	475	63	56	59	0	450	64	57	60	0	950	57	50	53	0
Air Compressor	1	78	50%	475	58	55	58	0	450	59	56	59	0	950	52	49	52	0

Source for Ref. Noise Levels: FHWA RCNM, 2005

Project: The District

Construction Noise Impact on Sensitive Receptors

Pile Driving

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	

				R3 and R4				
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**
					91	***95***		
Pile Driver	1	99	100%	120	91	91	94	0
Pile Driver	1	99	100%	170	88	88	91	0
Pile Driver	1	99	100%	220	86	86	89	0
Pile Driver	1	99	100%	270	84	84	87	0
Pile Driver	1	99	100%	320	83	83	86	0
Pile Driver	1	99	100%	370	82	82	85	0
Pile Driver	1	99	100%	420	81	81	84	0

				R1				
					93	***96***		
Pile Driver	1	99	100%	100	93	93	96	0
Pile Driver	1	99	100%	150	89	89	92	0
Pile Driver	1	99	100%	200	87	87	90	0
Pile Driver	1	99	100%	250	85	85	88	0
Pile Driver	1	99	100%	300	83	83	86	0
Pile Driver	1	99	100%	350	82	82	85	0
Pile Driver	1	99	100%	400	81	81	84	0

Source for Ref. Noise Levels: Table 53 Page 438 of FEIR

Project: The District

Construction Noise Impact on Sensitive Receptors

DDC and Pile Driving (Partially Mitigated)

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	

				R3 and R4				
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**
					81	***85***		
Deep Dynamic Compactor	1	85	100%	120	77	77	80	0
Deep Dynamic Compactor	1	85	100%	170	74	74	77	0
Deep Dynamic Compactor	1	85	100%	220	72	72	75	0
Dozer	1	82	40%	120	64	60	63	10
Dozer	1	82	40%	170	61	57	60	10
Dozer	1	82	40%	220	59	55	58	10
Pile Driver	1	99	100%	120	81	81	84	10
Pile Driver	1	99	100%	170	78	78	81	10
Pile Driver	1	99	100%	220	76	76	79	10

				R1				
					83	***87***		
Deep Dynamic Compactor	1	85	100%	100	79	79	82	0
Deep Dynamic Compactor	1	85	100%	150	75	75	78	0
Deep Dynamic Compactor	1	85	100%	200	73	73	76	0
Dozer	1	82	40%	100	66	62	65	10
Dozer	1	82	40%	150	62	58	61	10
Dozer	1	82	40%	200	60	56	59	10
Pile Driver	1	99	100%	100	83	83	86	10
Pile Driver	1	99	100%	150	79	79	82	10
Pile Driver	1	99	100%	200	77	77	80	10

Source for Ref. Noise Levels: Table 53 Page 438 of FEIR (pile driver); Page 436 of FEIR (DDC)

Pursuant to Mitigation Measure H-1 Part 1, dozers would be equipped with noise control devices achieving 10 dBA reduction.

Pursuant to Mitigation Measure H-1 Part 2, pile drivers would be equipped with noise control devices achieving 10 dBA reduction.

Project: The District

Construction Noise Impact on Sensitive Receptors

DDC and Pile Driving (No Mitigation)

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	

				R3 and R4				
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**
					91	***94***		
Deep Dynamic Compactor	1	85	100%	120	77	77	80	0
Deep Dynamic Compactor	1	85	100%	170	74	74	77	0
Deep Dynamic Compactor	1	85	100%	220	72	72	75	0
Dozer	1	82	40%	120	74	70	73	0
Dozer	1	82	40%	170	71	67	70	0
Dozer	1	82	40%	220	69	65	68	0
Pile Driver	1	99	100%	120	91	91	94	0
Pile Driver	1	99	100%	170	88	88	91	0
Pile Driver	1	99	100%	220	86	86	89	0

				R1				
					93	***95***		
Deep Dynamic Compactor	1	85	100%	100	79	79	82	0
Deep Dynamic Compactor	1	85	100%	150	75	75	78	0
Deep Dynamic Compactor	1	85	100%	200	73	73	76	0
Dozer	1	82	40%	100	76	72	75	0
Dozer	1	82	40%	150	72	68	71	0
Dozer	1	82	40%	200	70	66	69	0
Pile Driver	1	99	100%	100	93	93	96	0
Pile Driver	1	99	100%	150	89	89	92	0
Pile Driver	1	99	100%	200	87	87	90	0

Source for Ref. Noise Levels: Table 53 Page 438 of FEIR (pile driver); Page 436 of FEIR (DDC)

Project: The District

Construction Noise Impact on Sensitive Receptors

Deep Dynamic Compaction - 1 Rig (No Mitigation)

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	

				R3 and R4				
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**
					77	***78***		
Deep Dynamic Compactor	1	85	100%	120	77	77	80	0
Dozer	1	82	40%	120	74	70	73	0

				R1				
					79	***80***		
Deep Dynamic Compactor	1	85	100%	100	79	79	82	0
Dozer	1	82	40%	100	76	72	75	0
	1							
	1							
	1							
	1							

Source for Ref. Noise Levels: Page 436 of FEIR

Project: The District

Construction Noise Impact on Sensitive Receptors

Deep Dynamic Compaction - 1 Rig (partially mitigated)

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	

				R3 and R4				
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**
					77	***77***		
Deep Dynamic Compactor	1	85	100%	120	77	77	80	0
Dozer	1	82	40%	120	64	60	63	10

				R1				
					79	***79***		
Deep Dynamic Compactor	1	85	100%	100	79	79	82	0
Dozer	1	82	40%	100	66	62	65	10
	1							
	1							
	1							
	1							

Source for Ref. Noise Levels: Page 436 of FEIR

Pursuant to Mitigation Measure H-1 Part 1, dozers would be equipped with noise control devices achieving 10 dBA reduction.

Project: The District

Construction Noise Impact on Sensitive Receptors

Deep Dynamic Compaction - 3 Rigs (No Mitigation)

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	

				R3 and R4				
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**
					77	***81***		
Deep Dynamic Compactor	1	85	100%	120	77	77	80	0
Deep Dynamic Compactor	1	85	100%	170	74	74	77	0
Deep Dynamic Compactor	1	85	100%	220	72	72	75	0
Dozer	1	82	40%	120	74	70	73	0
Dozer	1	82	40%	170	71	67	70	0
Dozer	1	82	40%	220	69	65	68	0

				R1				
					79	***82***		
Deep Dynamic Compactor	1	85	100%	100	79	79	82	0
Deep Dynamic Compactor	1	85	100%	150	75	75	78	0
Deep Dynamic Compactor	1	85	100%	200	73	73	76	0
Dozer	1	82	40%	100	76	72	75	0
Dozer	1	82	40%	150	72	68	71	0
Dozer	1	82	40%	200	70	66	69	0

Source for Ref. Noise Levels: Page 436 of FEIR

Project: The District

Construction Noise Impact on Sensitive Receptors

Deep Dynamic Compaction - 3 Rigs (Partially Mitigated)

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	

				R3 and R4				
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**
					77	***80***		
Deep Dynamic Compactor	1	85	100%	120	77	77	80	0
Deep Dynamic Compactor	1	85	100%	170	74	74	77	0
Deep Dynamic Compactor	1	85	100%	220	72	72	75	0
Dozer	1	82	40%	120	64	60	63	10
Dozer	1	82	40%	170	61	57	60	10
Dozer	1	82	40%	220	59	55	58	10

				R1				
					79	***81***		
Deep Dynamic Compactor	1	85	100%	100	79	79	82	0
Deep Dynamic Compactor	1	85	100%	150	75	75	78	0
Deep Dynamic Compactor	1	85	100%	200	73	73	76	0
Dozer	1	82	40%	100	66	62	65	10
Dozer	1	82	40%	150	62	58	61	10
Dozer	1	82	40%	200	60	56	59	10

Source for Ref. Noise Levels: Page 436 of FEIR

Pursuant to Mitigation Measure H-1 Part 1, dozers would be equipped with noise control devices achieving 10 dBA reduction.

Attachment 4

Concurrent Construction and Operation Summary

The District SEIR
Concurrent Construction and Operation (Scenario 1)

		Construction*		Operations	Combined	Ambient +	
	Ambient	PA1 Vertical	PA2 Vertical	PA3	Project Noise	Project	Increase
R1	58.9	45.0	30.0	50.8	51.8	59.7	0.8
R2	55.2	28.0	38.0	51.2	51.4	56.7	1.5
R3	55.2	28.0	38.0	50.9	51.1	56.6	1.4
R4	55.2	28.0	38.0	50.5	50.7	56.5	1.3
R5	55.2	28.0	38.0	50.7	51.0	56.6	1.4
R6	55.2	28.0	38.0	52.3	52.5	57.1	1.9
R7	55.2	28.0	38.0	56.9	57.0	59.2	4.0
R8	55.2	28.0	38.0	54.8	54.9	58.1	2.9
R9	72.7	47.0	41.0	51.8	53.3	72.7	0.0

* Construction noise includes 30 dBA reduction pursuant to MMs E-1 parts 1 (reduce all equipment noise levels by 10 dBA) and 3 (sound barrier achieving a minimum 20 dBA reduction).

The District SEIR
Concurrent Construction and Operation (Scenario 2)

		Construction*	Operations		Combined	Ambient +	
	Ambient	PA1 Vertical	PA2	PA3	Project Noise	Project	Increase
R1	58.9	45.0	41.5	50.8	52.2	59.7	0.8
R2	55.2	28.0	41.7	51.2	51.6	56.8	1.6
R3	55.2	28.0	41.2	50.9	51.3	56.7	1.5
R4	55.2	28.0	40.6	50.5	50.9	56.6	1.4
R5	55.2	28.0	40.7	50.7	51.2	56.6	1.4
R6	55.2	28.0	41.2	52.3	52.6	57.1	1.9
R7	55.2	28.0	45.0	56.9	57.2	59.3	4.1
R8	55.2	28.0	47.6	54.8	55.6	58.4	3.2
R9	72.7	47.0	56.8	51.8	58.3	72.9	0.2

* Construction noise includes 30 dBA reduction pursuant to MMs E-1 parts 1 (reduce all equipment noise levels by 10 dBA) and 3 (sound barrier achieving a minimum 20 dBA reduction).

Attachment 5
Off-Site Traffic Noise Calculations

TRAFFIC NOISE ANALYSIS TOOL

Project Name: District at South Bay
Analysis Scenario: Existing
Source of Traffic Volumes: Fehr & Peers

Roadway Segment	Ground Type	Distance from Roadway to Receiver (feet)	Speed (mph)			Peak Hour Volume			Peak Hour Noise Level (Leq(h) dBA)	Noise Level dBA CNEL
			Auto	MT	HT	Auto	MT	HT		
Vermont Ave north of E Del Amo Blvd	Hard	50	40	40	40	1690	0	0	67.8	68.1
Vermont Ave between E Del Amo Boulevard and W Carson St	Hard	50	40	40	40	1901	0	0	68.3	68.6
Vermont Ave south of E Carson St	Hard	50	40	40	40	1671	0	0	67.8	68.1
Hamilton Ave between E Del Amo Boulevard and 110 SB Ramps	Hard	50	35	35	35	959	0	0	63.5	63.8
Hamilton Ave between 110 SB Ramps and E Torrance Blvd	Hard	50	35	35	35	1099	0	0	64.1	64.4
Figueroa St between 405 NB Off Ramp and 405 SB On Ramp	Hard	50	40	40	40	2263	0	0	69.1	69.4
Figueroa St between 405 SB On Ramp and Del Amo Blvd	Hard	50	40	40	40	1779	189	0	70.2	70.5
Figueroa St between Del Amo Blvd and 110 NB Ramps	Hard	50	40	40	40	1849	86	0	69.3	69.6
Figueroa St between 110 NB Ramps and E Torrance Blvd	Hard	50	40	40	40	2104	110	0	70.0	70.3
Figueroa St between E Torrance Blvd and W Carson St	Hard	59	40	40	40	1180	55	0	66.6	66.9
Figueroa St south of E Carson St	Hard	50	40	40	40	1261	0	0	66.5	66.8
S Main St between 405 NB Ramp and 405 SB Ramp	Hard	59	45	45	45	1773	0	0	68.9	69.2
S Main St between 405 SB Ramp and Del Amo Blvd	Hard	50	45	45	45	1513	79	0	70.0	70.3
S Main St between Del Amo Blvd and Lenardo Dr	Hard	50	45	45	45	1081	54	0	68.5	68.8
S Main St between Lenardo Dr and W Torrance Blvd	Hard	50	45	45	45	790	58	0	67.6	67.9
S Main St between W Torrance Blvd and E 213th St	Hard	50	45	45	45	1980	55	0	70.7	71.0
S Main St between E 213th St and W Carson St	Hard	50	45	45	45	1882	0	0	69.9	70.2
S Main St south of E Carson St	Hard	50	45	45	45	1404	0	0	68.6	68.9
S Avalon Blvd north of E Del Amo Blvd	Hard	50	35	35	35	1967	102	0	68.1	68.4
S Avalon Blvd between E Del Amo Blvd and 405 NB Ramp	Hard	50	35	35	35	2649	40	0	68.4	68.7
S Avalon Blvd between 405 NB Ramp and 405 SB Ramp	Hard	50	35	35	35	2547	0	0	67.8	68.1
S Avalon Blvd between 405 SB Ramp and E 213th Street	Hard	50	35	35	35	2402	0	0	67.5	67.8
S Avalon Blvd between E 213th St and E Carson St	Hard	50	35	35	35	2224	0	0	67.2	67.5
S Avalon Blvd south of E Carson St	Hard	50	35	35	35	1918	0	0	66.6	66.9
E Del Amo Blvd west of S Vermont Ave	Hard	50	45	45	45	879	0	0	66.6	66.9
E Del Amo Blvd between S Vemont Ave and Hamilton Ave	Hard	50	45	45	45	1490	0	0	68.9	69.2
E Del Amo Blvd between Hamilton Ave and Figueroa St	Hard	50	45	45	45	2039	194	0	72.0	72.3
E Del Amo Blvd between Figueroa St and S Main St	Hard	50	45	45	45	1890	260	0	72.3	72.6
E Del Amo Blvd between S Main St and Stamps Dr	Hard	50	45	45	45	1064	127	0	69.6	69.9
E Del Amo Blvd between Stamps Dr and S Avalon Blvd	Hard	50	45	45	45	1000	128	0	69.4	69.7
Torrance Blvd west of Hamilton Ave	Hard	50	40	40	40	2255	0	0	69.1	69.4
Torrance Blvd between Hamilton Ave and Figueroa St	Hard	50	40	40	40	2363	60	0	69.9	70.2
Torrance Blvd between Figueroa St and S Main St	Hard	50	40	40	40	1297	74	0	68.0	68.3
Torrance Blvd east of S Main St	Hard	50	25	25	25	621	34	0	59.9	60.2
E 213th St between S Main St and S Avalon Blvd	Hard	50	30	30	30	865	0	0	61.2	61.5
E 213th St east of S Avalon Blvd	Hard	50	30	30	30	617	0	0	59.7	60.0
Carson St west of S Vermont Ave	Hard	50	35	35	35	2277	0	0	67.3	67.6
Carson St between S Vemont Ave and Figueroa St	Hard	50	35	35	35	2230	0	0	67.2	67.5
Carson St between Figueroa St and S Main St	Hard	50	35	35	35	1911	0	0	66.5	66.8
Carson St between S Main St and N Avalon Blvd	Hard	50	35	35	35	1930	0	0	66.6	66.9
Carson St between N Avalon Blvd and 405 SB Ramp	Hard	50	35	35	35	2510	0	0	67.7	68.0
Carson St between 405 SB Ramp and 405 NB Ramp	Hard	50	35	35	35	2280	0	0	67.3	67.6
Lenardo between 405 SB Ramp and Avalon	Hard	50	25	25	25	307	0	0	54.5	54.8

Model Notes:
The calculation is based on the methodology described in FHWA Traffic Noise Model Technical Manual (1998).
The peak hour noise level at 50 feet was validated with the results from FHWA Traffic Noise Model Version 2.5.
Accuracy of the calculation is within ±0.1 dB when comparing to TNM results.
Noise propagation greater than 50 feet is based on the following assumptions:
For hard ground, the propagation rate is 3 dB per doubling the distance.
For soft ground, the propagation rate is 4.5 dB per doubling the distance.
Vehicles are assumed to be on a long straight roadway with cruise speed.
Roadway grade is less than 1.5%.
CNEL levels were obtained based on Figure 2-19, on page 2-58 Caltran's TeNS 2013.

TRAFFIC NOISE ANALYSIS TOOL

Project Name: District at South Bay
Analysis Scenario: Existing + Project
Source of Traffic Volumes: Fehr & Peers

Roadway Segment	Ground Type	Distance from Roadway to Receiver (feet)	Speed (mph)			Peak Hour Volume			Peak Hour Noise Level (Leq(h) dBA)	Noise Level dBA CNEL
			Auto	MT	HT	Auto	MT	HT		
Vermont Ave north of E Del Amo Blvd	Hard	50	40	40	40	1717	0	0	67.9	68.2
Vermont Ave between E Del Amo Boulevard and W Carson St	Hard	50	40	40	40	1989	0	0	68.5	68.8
Vermont Ave south of E Carson St	Hard	50	40	40	40	1671	0	0	67.8	68.1
Hamilton Ave between E Del Amo Boulevard and 110 SB Ramps	Hard	50	35	35	35	1227	27	13	65.9	66.2
Hamilton Ave between 110 SB Ramps and E Torrance Blvd	Hard	50	35	35	35	1108	6	3	64.5	64.8
Figueroa St between 405 NB Off Ramp and 405 SB On Ramp	Hard	50	40	40	40	2323	0	0	69.2	69.5
Figueroa St between 405 SB On Ramp and Del Amo Blvd	Hard	50	40	40	40	1839	189	0	70.3	70.6
Figueroa St between Del Amo Blvd and 110 NB Ramps	Hard	50	40	40	40	2163	114	13	70.4	70.7
Figueroa St between 110 NB Ramps and E Torrance Blvd	Hard	50	40	40	40	2134	117	4	70.2	70.5
Figueroa St between E Torrance Blvd and W Carson St	Hard	59	40	40	40	1227	55	0	66.8	67.1
Figueroa St south of E Carson St	Hard	50	40	40	40	1308	0	0	66.7	67.0
S Main St between 405 NB Ramp and 405 SB Ramp	Hard	59	45	45	45	1932	0	0	69.3	69.6
S Main St between 405 SB Ramp and Del Amo Blvd	Hard	50	45	45	45	1686	79	0	70.4	70.7
S Main St between Del Amo Blvd and Lenardo Dr	Hard	50	45	45	45	1490	60	3	69.8	70.1
S Main St between Lenardo Dr and W Torrance Blvd	Hard	50	45	45	45	1120	72	7	69.1	69.4
S Main St between W Torrance Blvd and E 213th St	Hard	50	45	45	45	2175	55	0	71.1	71.4
S Main St between E 213th St and W Carson St	Hard	50	45	45	45	2077	0	0	70.3	70.6
S Main St south of E Carson St	Hard	50	45	45	45	1524	0	0	69.0	69.3
S Avalon Blvd north of E Del Amo Blvd	Hard	50	35	35	35	2002	102	0	68.2	68.5
S Avalon Blvd between E Del Amo Blvd and 405 NB Ramp	Hard	50	35	35	35	2749	40	0	68.6	68.9
S Avalon Blvd between 405 NB Ramp and 405 SB Ramp	Hard	50	35	35	35	2838	36	17	69.1	69.4
S Avalon Blvd between 405 SB Ramp and E 213th Street	Hard	50	35	35	35	2720	0	0	68.1	68.4
S Avalon Blvd between E 213th St and E Carson St	Hard	50	35	35	35	2482	0	0	67.7	68.0
S Avalon Blvd south of E Carson St	Hard	50	35	35	35	1976	0	0	66.7	67.0
E Del Amo Blvd west of S Vermont Ave	Hard	50	45	45	45	966	0	0	67.0	67.3
E Del Amo Blvd between S Vemont Ave and Hamilton Ave	Hard	50	45	45	45	1693	0	0	69.4	69.7
E Del Amo Blvd between Hamilton Ave and Figueroa St	Hard	50	45	45	45	2509	221	13	73.0	73.3
E Del Amo Blvd between Figueroa St and S Main St	Hard	50	45	45	45	2734	315	26	73.9	74.2
E Del Amo Blvd between S Main St and Stamps Dr	Hard	50	45	45	45	1707	188	29	72.0	72.3
E Del Amo Blvd between Stamps Dr and S Avalon Blvd	Hard	50	45	45	45	1430	128	0	70.4	70.7
Torrance Blvd west of Hamilton Ave	Hard	50	40	40	40	2332	0	0	69.2	69.5
Torrance Blvd between Hamilton Ave and Figueroa St	Hard	50	40	40	40	2451	66	3	70.2	70.5
Torrance Blvd between Figueroa St and S Main St	Hard	50	40	40	40	1432	87	7	68.7	69.0
Torrance Blvd east of S Main St	Hard	50	25	25	25	663	40	3	60.8	61.1
E 213th St between S Main St and S Avalon Blvd	Hard	50	30	30	30	865	0	0	61.2	61.5
E 213th St east of S Avalon Blvd	Hard	50	30	30	30	642	0	0	59.9	60.2
Carson St west of S Vermont Ave	Hard	50	35	35	35	2439	0	0	67.6	67.9
Carson St between S Vemont Ave and Figueroa St	Hard	50	35	35	35	2373	0	0	67.5	67.8
Carson St between Figueroa St and S Main St	Hard	50	35	35	35	2032	0	0	66.8	67.1
Carson St between S Main St and N Avalon Blvd	Hard	50	35	35	35	1976	0	0	66.7	67.0
Carson St between N Avalon Blvd and 405 SB Ramp	Hard	50	35	35	35	2663	0	0	68.0	68.3
Carson St between 405 SB Ramp and 405 NB Ramp	Hard	50	35	35	35	2433	0	0	67.6	67.9
Lenardo between 405 SB Ramp and Avalon	Hard	50	25	25	25	892	55	26	63.8	64.1

Model Notes:
The calculation is based on the methodology described in FHWA Traffic Noise Model Technical Manual (1998).
The peak hour noise level at 50 feet was validated with the results from FHWA Traffic Noise Model Version 2.5.
Accuracy of the calculation is within ±0.1 dB when comparing to TNM results.
Noise propagation greater than 50 feet is based on the following assumptions:
For hard ground, the propagation rate is 3 dB per doubling the distance.
For soft ground, the propagation rate is 4.5 dB per doubling the distance.
Vehicles are assumed to be on a long straight roadway with cruise speed.
Roadway grade is less than 1.5%.
CNEL levels were obtained based on Figure 2-19, on page 2-58 Caltran's TeNS 2013.

TRAFFIC NOISE ANALYSIS TOOL

Project Name: District at South Bay
Analysis Scenario: Existing + Project [No Avalon]
Source of Traffic Volumes: Fehr & Peers

Roadway Segment	Ground Type	Distance from Roadway to Receiver (feet)	Speed (mph)			Peak Hour Volume			Peak Hour Noise Level (Leq(h) dBA)	Noise Level dBA CNEL
			Auto	MT	HT	Auto	MT	HT		
Vermont Ave north of E Del Amo Blvd	Hard	50	40	40	40	1717	0	0	67.9	68.2
Vermont Ave between E Del Amo Boulevard and W Carson St	Hard	50	40	40	40	1989	0	0	68.5	68.8
Vermont Ave south of E Carson St	Hard	50	40	40	40	1671	0	0	67.8	68.1
Hamilton Ave between E Del Amo Boulevard and 110 SB Ramps	Hard	50	35	35	35	1227	27	13	65.9	66.2
Hamilton Ave between 110 SB Ramps and E Torrance Blvd	Hard	50	35	35	35	1108	6	3	64.5	64.8
Figueroa St between 405 NB Off Ramp and 405 SB On Ramp	Hard	50	40	40	40	2323	0	0	69.2	69.5
Figueroa St between 405 SB On Ramp and Del Amo Blvd	Hard	50	40	40	40	1839	189	0	70.3	70.6
Figueroa St between Del Amo Blvd and 110 NB Ramps	Hard	50	40	40	40	2163	125	19	70.6	70.9
Figueroa St between 110 NB Ramps and E Torrance Blvd	Hard	50	40	40	40	2134	117	4	70.2	70.5
Figueroa St between E Torrance Blvd and W Carson St	Hard	59	40	40	40	1227	55	0	66.8	67.1
Figueroa St south of E Carson St	Hard	50	40	40	40	1308	0	0	66.7	67.0
S Main St between 405 NB Ramp and 405 SB Ramp	Hard	59	45	45	45	1932	25	12	69.8	70.1
S Main St between 405 SB Ramp and Del Amo Blvd	Hard	50	45	45	45	1686	104	12	70.9	71.2
S Main St between Del Amo Blvd and Lenardo Dr	Hard	50	45	45	45	1490	85	15	70.4	70.7
S Main St between Lenardo Dr and W Torrance Blvd	Hard	50	45	45	45	1120	72	7	69.1	69.4
S Main St between W Torrance Blvd and E 213th St	Hard	50	45	45	45	2175	55	0	71.1	71.4
S Main St between E 213th St and W Carson St	Hard	50	45	45	45	2077	0	0	70.3	70.6
S Main St south of E Carson St	Hard	50	45	45	45	1524	0	0	69.0	69.3
S Avalon Blvd north of E Del Amo Blvd	Hard	50	35	35	35	2002	102	0	68.2	68.5
S Avalon Blvd between E Del Amo Blvd and 405 NB Ramp	Hard	50	35	35	35	2749	40	0	68.6	68.9
S Avalon Blvd between 405 NB Ramp and 405 SB Ramp	Hard	50	35	35	35	2838	0	0	68.3	68.6
S Avalon Blvd between 405 SB Ramp and E 213th Street	Hard	50	35	35	35	2720	0	0	68.1	68.4
S Avalon Blvd between E 213th St and E Carson St	Hard	50	35	35	35	2482	0	0	67.7	68.0
S Avalon Blvd south of E Carson St	Hard	50	35	35	35	1976	0	0	66.7	67.0
E Del Amo Blvd west of S Vermont Ave	Hard	50	45	45	45	966	0	0	67.0	67.3
E Del Amo Blvd between S Vemont Ave and Hamilton Ave	Hard	50	45	45	45	1693	0	0	69.4	69.7
E Del Amo Blvd between Hamilton Ave and Figueroa St	Hard	50	45	45	45	2509	221	13	73.0	73.3
E Del Amo Blvd between Figueroa St and S Main St	Hard	50	45	45	45	2734	326	32	74.0	74.3
E Del Amo Blvd between S Main St and Stamps Dr	Hard	50	45	45	45	1707	199	35	72.2	72.5
E Del Amo Blvd between Stamps Dr and S Avalon Blvd	Hard	50	45	45	45	1430	128	0	70.4	70.7
Torrance Blvd west of Hamilton Ave	Hard	50	40	40	40	2332	0	0	69.2	69.5
Torrance Blvd between Hamilton Ave and Figueroa St	Hard	50	40	40	40	2451	66	3	70.2	70.5
Torrance Blvd between Figueroa St and S Main St	Hard	50	40	40	40	1432	87	7	68.7	69.0
Torrance Blvd east of S Main St	Hard	50	25	25	25	663	40	3	60.8	61.1
E 213th St between S Main St and S Avalon Blvd	Hard	50	30	30	30	865	0	0	61.2	61.5
E 213th St east of S Avalon Blvd	Hard	50	30	30	30	642	0	0	59.9	60.2
Carson St west of S Vermont Ave	Hard	50	35	35	35	2439	0	0	67.6	67.9
Carson St between S Vemont Ave and Figueroa St	Hard	50	35	35	35	2373	0	0	67.5	67.8
Carson St between Figueroa St and S Main St	Hard	50	35	35	35	2032	0	0	66.8	67.1
Carson St between S Main St and N Avalon Blvd	Hard	50	35	35	35	1976	0	0	66.7	67.0
Carson St between N Avalon Blvd and 405 SB Ramp	Hard	50	35	35	35	2663	0	0	68.0	68.3
Carson St between 405 SB Ramp and 405 NB Ramp	Hard	50	35	35	35	2433	0	0	67.6	67.9
Lenardo between 405 SB Ramp and Avalon	Hard	50	25	25	25	892	20	9	61.4	61.7

Model Notes:
The calculation is based on the methodology described in FHWA Traffic Noise Model Technical Manual (1998).
The peak hour noise level at 50 feet was validated with the results from FHWA Traffic Noise Model Version 2.5.
Accuracy of the calculation is within ±0.1 dB when comparing to TNM results.
Noise propagation greater than 50 feet is based on the following assumptions:
For hard ground, the propagation rate is 3 dB per doubling the distance.
For soft ground, the propagation rate is 4.5 dB per doubling the distance.
Vehicles are assumed to be on a long straight roadway with cruise speed.
Roadway grade is less than 1.5%.
CNEL levels were obtained based on Figure 2-19, on page 2-58 Caltran's TeNS 2013.

TRAFFIC NOISE ANALYSIS TOOL

Project Name: District at South Bay
Analysis Scenario: Future
Source of Traffic Volumes: Fehr & Peers

Roadway Segment	Ground Type	Distance from Roadway to Receiver (feet)	Speed (mph)			Peak Hour Volume			Peak Hour Noise Level (Leq(h) dBA)	Noise Level dBA CNEL
			Auto	MT	HT	Auto	MT	HT		
Vermont Ave north of E Del Amo Blvd	Hard	50	40	40	40	1777	0	0	68.0	68.3
Vermont Ave between E Del Amo Boulevard and W Carson St	Hard	50	40	40	40	1990	0	0	68.5	68.8
Vermont Ave south of E Carson St	Hard	50	40	40	40	1729	0	0	67.9	68.2
Hamilton Ave between E Del Amo Boulevard and 110 SB Ramps	Hard	50	35	35	35	1473	0	0	65.4	65.7
Hamilton Ave between 110 SB Ramps and E Torrance Blvd	Hard	50	35	35	35	1161	0	0	64.4	64.7
Figueroa St between 405 NB Off Ramp and 405 SB On Ramp	Hard	50	40	40	40	3171	0	0	70.5	70.8
Figueroa St between 405 SB On Ramp and Del Amo Blvd	Hard	50	40	40	40	2896	135	0	71.3	71.6
Figueroa St between Del Amo Blvd and 110 NB Ramps	Hard	50	40	40	40	2538	41	0	70.0	70.3
Figueroa St between 110 NB Ramps and E Torrance Blvd	Hard	50	40	40	40	2280	47	0	69.6	69.9
Figueroa St between E Torrance Blvd and W Carson St	Hard	59	40	40	40	1262	26	0	66.3	66.6
Figueroa St south of E Carson St	Hard	50	40	40	40	1358	0	0	66.9	67.2
S Main St between 405 NB Ramp and 405 SB Ramp	Hard	59	45	45	45	2491	0	0	70.4	70.7
S Main St between 405 SB Ramp and Del Amo Blvd	Hard	50	45	45	45	1648	33	0	69.7	70.0
S Main St between Del Amo Blvd and Lenardo Dr	Hard	50	45	45	45	2057	30	0	70.6	70.9
S Main St between Lenardo Dr and W Torrance Blvd	Hard	50	45	45	45	2072	28	0	70.6	70.9
S Main St between W Torrance Blvd and E 213th St	Hard	50	45	45	45	2159	30	0	70.8	71.1
S Main St between E 213th St and W Carson St	Hard	50	45	45	45	1992	0	0	70.1	70.4
S Main St south of E Carson St	Hard	50	45	45	45	1472	0	0	68.8	69.1
S Avalon Blvd north of E Del Amo Blvd	Hard	50	35	35	35	2413	47	0	68.2	68.5
S Avalon Blvd between E Del Amo Blvd and 405 NB Ramp	Hard	50	35	35	35	3003	17	0	68.7	69.0
S Avalon Blvd between 405 NB Ramp and 405 SB Ramp	Hard	50	35	35	35	3203	0	0	68.8	69.1
S Avalon Blvd between 405 SB Ramp and E 213th Street	Hard	50	35	35	35	3170	0	0	68.7	69.0
S Avalon Blvd between E 213th St and E Carson St	Hard	50	35	35	35	2710	0	0	68.1	68.4
S Avalon Blvd south of E Carson St	Hard	50	35	35	35	2182	0	0	67.1	67.4
E Del Amo Blvd west of S Vermont Ave	Hard	50	45	45	45	912	0	0	66.7	67.0
E Del Amo Blvd between S Vemont Ave and Hamilton Ave	Hard	50	45	45	45	1550	0	0	69.0	69.3
E Del Amo Blvd between Hamilton Ave and Figueroa St	Hard	50	45	45	45	2668	130	0	72.4	72.7
E Del Amo Blvd between Figueroa St and S Main St	Hard	50	45	45	45	2185	112	0	71.6	71.9
E Del Amo Blvd between S Main St and Stamps Dr	Hard	50	45	45	45	2432	54	0	71.5	71.8
E Del Amo Blvd between Stamps Dr and S Avalon Blvd	Hard	50	45	45	45	2390	53	0	71.4	71.7
Torrance Blvd west of Hamilton Ave	Hard	50	40	40	40	2400	0	0	69.3	69.6
Torrance Blvd between Hamilton Ave and Figueroa St	Hard	50	40	40	40	2546	29	0	69.9	70.2
Torrance Blvd between Figueroa St and S Main St	Hard	50	40	40	40	1478	33	0	67.8	68.1
Torrance Blvd east of S Main St	Hard	50	25	25	25	710	16	0	59.3	59.6
E 213th St between S Main St and S Avalon Blvd	Hard	50	30	30	30	908	0	0	61.4	61.7
E 213th St east of S Avalon Blvd	Hard	50	30	30	30	651	0	0	60.0	60.3
Carson St west of S Vermont Ave	Hard	50	35	35	35	2556	0	0	67.8	68.1
Carson St between S Vemont Ave and Figueroa St	Hard	50	35	35	35	2473	0	0	67.7	68.0
Carson St between Figueroa St and S Main St	Hard	50	35	35	35	2073	0	0	66.9	67.2
Carson St between S Main St and N Avalon Blvd	Hard	50	35	35	35	2185	0	0	67.1	67.4
Carson St between N Avalon Blvd and 405 SB Ramp	Hard	50	35	35	35	2713	0	0	68.1	68.4
Carson St between 405 SB Ramp and 405 NB Ramp	Hard	50	35	35	35	2440	0	0	67.6	67.9
Lenardo between 405 SB Ramp and Avalon	Hard	50	25	25	25	1396	0	0	61.1	61.4

Model Notes:
The calculation is based on the methodology described in FHWA Traffic Noise Model Technical Manual (1998).
The peak hour noise level at 50 feet was validated with the results from FHWA Traffic Noise Model Version 2.5.
Accuracy of the calculation is within ±0.1 dB when comparing to TNM results.
Noise propagation greater than 50 feet is based on the following assumptions:
For hard ground, the propagation rate is 3 dB per doubling the distance.
For soft ground, the propagation rate is 4.5 dB per doubling the distance.
Vehicles are assumed to be on a long straight roadway with cruise speed.
Roadway grade is less than 1.5%.
CNEL levels were obtained based on Figure 2-19, on page 2-58 Caltran's TeNS 2013.

TRAFFIC NOISE ANALYSIS TOOL

Project Name: District at South Bay
Analysis Scenario: Future + Project
Source of Traffic Volumes: Fehr & Peers

Roadway Segment	Ground Type	Distance from Roadway to Receiver (feet)	Speed (mph)			Peak Hour Volume			Peak Hour Noise Level (Leq(h) dBA)	Noise Level dBA CNEL
			Auto	MT	HT	Auto	MT	HT		
Vermont Ave north of E Del Amo Blvd	Hard	50	40	40	40	1818	0	0	68.1	68.4
Vermont Ave between E Del Amo Boulevard and W Carson St	Hard	50	40	40	40	2117	0	0	68.8	69.1
Vermont Ave south of E Carson St	Hard	50	40	40	40	1732	0	0	67.9	68.2
Hamilton Ave between E Del Amo Boulevard and 110 SB Ramps	Hard	50	35	35	35	1810	27	13	67.2	67.5
Hamilton Ave between 110 SB Ramps and E Torrance Blvd	Hard	50	35	35	35	1176	6	3	64.8	65.1
Figueroa St between 405 NB Off Ramp and 405 SB On Ramp	Hard	50	40	40	40	3246	0	0	70.6	70.9
Figueroa St between 405 SB On Ramp and Del Amo Blvd	Hard	50	40	40	40	2971	135	0	71.3	71.6
Figueroa St between Del Amo Blvd and 110 NB Ramps	Hard	50	40	40	40	2924	68	13	71.0	71.3
Figueroa St between 110 NB Ramps and E Torrance Blvd	Hard	50	40	40	40	2324	55	4	69.9	70.2
Figueroa St between E Torrance Blvd and W Carson St	Hard	59	40	40	40	1320	26	0	66.5	66.8
Figueroa St south of E Carson St	Hard	50	40	40	40	1416	0	0	67.0	67.3
S Main St between 405 NB Ramp and 405 SB Ramp	Hard	59	45	45	45	2689	0	0	70.7	71.0
S Main St between 405 SB Ramp and Del Amo Blvd	Hard	50	45	45	45	1859	33	0	70.2	70.5
S Main St between Del Amo Blvd and Lenardo Dr	Hard	50	45	45	45	2444	36	3	71.4	71.7
S Main St between Lenardo Dr and W Torrance Blvd	Hard	50	45	45	45	2432	42	7	71.5	71.8
S Main St between W Torrance Blvd and E 213th St	Hard	50	45	45	45	2372	30	0	71.2	71.5
S Main St between E 213th St and W Carson St	Hard	50	45	45	45	2204	0	0	70.6	70.9
S Main St south of E Carson St	Hard	50	45	45	45	1626	0	0	69.2	69.5
S Avalon Blvd north of E Del Amo Blvd	Hard	50	35	35	35	2464	47	0	68.2	68.5
S Avalon Blvd between E Del Amo Blvd and 405 NB Ramp	Hard	50	35	35	35	3102	17	0	68.8	69.1
S Avalon Blvd between 405 NB Ramp and 405 SB Ramp	Hard	50	35	35	35	3558	36	17	69.9	70.2
S Avalon Blvd between 405 SB Ramp and E 213th Street	Hard	50	35	35	35	3575	0	0	69.3	69.6
S Avalon Blvd between E 213th St and E Carson St	Hard	50	35	35	35	3041	0	0	68.6	68.9
S Avalon Blvd south of E Carson St	Hard	50	35	35	35	2252	0	0	67.3	67.6
E Del Amo Blvd west of S Vermont Ave	Hard	50	45	45	45	1015	0	0	67.2	67.5
E Del Amo Blvd between S Vemont Ave and Hamilton Ave	Hard	50	45	45	45	1821	0	0	69.7	70.0
E Del Amo Blvd between Hamilton Ave and Figueroa St	Hard	50	45	45	45	3276	157	13	73.4	73.7
E Del Amo Blvd between Figueroa St and S Main St	Hard	50	45	45	45	3254	167	26	73.6	73.9
E Del Amo Blvd between S Main St and Stamps Dr	Hard	50	45	45	45	3370	115	29	73.5	73.8
E Del Amo Blvd between Stamps Dr and S Avalon Blvd	Hard	50	45	45	45	2881	53	0	72.1	72.4
Torrance Blvd west of Hamilton Ave	Hard	50	40	40	40	2483	0	0	69.5	69.8
Torrance Blvd between Hamilton Ave and Figueroa St	Hard	50	40	40	40	2644	35	3	70.2	70.5
Torrance Blvd between Figueroa St and S Main St	Hard	50	40	40	40	1625	47	7	68.6	68.9
Torrance Blvd east of S Main St	Hard	50	25	25	25	756	22	3	60.3	60.6
E 213th St between S Main St and S Avalon Blvd	Hard	50	30	30	30	908	0	0	61.4	61.7
E 213th St east of S Avalon Blvd	Hard	50	30	30	30	690	0	0	60.2	60.5
Carson St west of S Vermont Ave	Hard	50	35	35	35	2755	0	0	68.1	68.4
Carson St between S Vemont Ave and Figueroa St	Hard	50	35	35	35	2633	0	0	67.9	68.2
Carson St between Figueroa St and S Main St	Hard	50	35	35	35	2211	0	0	67.2	67.5
Carson St between S Main St and N Avalon Blvd	Hard	50	35	35	35	2265	0	0	67.3	67.6
Carson St between N Avalon Blvd and 405 SB Ramp	Hard	50	35	35	35	2894	0	0	68.3	68.6
Carson St between 405 SB Ramp and 405 NB Ramp	Hard	50	35	35	35	2621	0	0	67.9	68.2
Lenardo between 405 SB and Avalon	Hard	50	25	25	25	2204	55	26	65.6	65.9

Model Notes:
The calculation is based on the methodology described in FHWA Traffic Noise Model Technical Manual (1998).
The peak hour noise level at 50 feet was validated with the results from FHWA Traffic Noise Model Version 2.5.
Accuracy of the calculation is within ±0.1 dB when comparing to TNM results.
Noise propagation greater than 50 feet is based on the following assumptions:
For hard ground, the propagation rate is 3 dB per doubling the distance.
For soft ground, the propagation rate is 4.5 dB per doubling the distance.
Vehicles are assumed to be on a long straight roadway with cruise speed.
Roadway grade is less than 1.5%.
CNEL levels were obtained based on Figure 2-19, on page 2-58 Caltran's TeNS 2013.

TRAFFIC NOISE ANALYSIS TOOL

Project Name: District at South Bay
Analysis Scenario: Future + Project [No Avalon]
Source of Traffic Volumes: Fehr & Peers

Roadway Segment	Ground Type	Distance from Roadway to Receiver (feet)	Speed (mph)			Peak Hour Volume			Peak Hour Noise Level (Leq(h) dBA)	Noise Level dBA CNEL
			Auto	MT	HT	Auto	MT	HT		
Vermont Ave north of E Del Amo Blvd	Hard	50	40	40	40	1818	0	0	68.1	68.4
Vermont Ave between E Del Amo Boulevard and W Carson St	Hard	50	40	40	40	2117	0	0	68.8	69.1
Vermont Ave south of E Carson St	Hard	50	40	40	40	1732	0	0	67.9	68.2
Hamilton Ave between E Del Amo Boulevard and 110 SB Ramps	Hard	50	35	35	35	1810	27	13	67.2	67.5
Hamilton Ave between 110 SB Ramps and E Torrance Blvd	Hard	50	35	35	35	1176	6	3	64.8	65.1
Figueroa St between 405 NB Off Ramp and 405 SB On Ramp	Hard	50	40	40	40	3246	0	0	70.6	70.9
Figueroa St between 405 SB On Ramp and Del Amo Blvd	Hard	50	40	40	40	2971	135	0	71.3	71.6
Figueroa St between Del Amo Blvd and 110 NB Ramps	Hard	50	40	40	40	2924	79	19	71.2	71.5
Figueroa St between 110 NB Ramps and E Torrance Blvd	Hard	50	40	40	40	2324	55	4	69.9	70.2
Figueroa St between E Torrance Blvd and W Carson St	Hard	59	40	40	40	1320	26	0	66.5	66.8
Figueroa St south of E Carson St	Hard	50	40	40	40	1416	0	0	67.0	67.3
S Main St between 405 NB Ramp and 405 SB Ramp	Hard	59	45	45	45	2689	25	12	71.1	71.4
S Main St between 405 SB Ramp and Del Amo Blvd	Hard	50	45	45	45	1859	58	12	70.8	71.1
S Main St between Del Amo Blvd and Lenardo Dr	Hard	50	45	45	45	2444	61	15	71.8	72.1
S Main St between Lenardo Dr and W Torrance Blvd	Hard	50	45	45	45	2432	42	7	71.5	71.8
S Main St between W Torrance Blvd and E 213th St	Hard	50	45	45	45	2372	30	0	71.2	71.5
S Main St between E 213th St and W Carson St	Hard	50	45	45	45	2204	0	0	70.6	70.9
S Main St south of E Carson St	Hard	50	45	45	45	1626	0	0	69.2	69.5
S Avalon Blvd north of E Del Amo Blvd	Hard	50	35	35	35	2464	47	0	68.2	68.5
S Avalon Blvd between E Del Amo Blvd and 405 NB Ramp	Hard	50	35	35	35	3102	17	0	68.8	69.1
S Avalon Blvd between 405 NB Ramp and 405 SB Ramp	Hard	50	35	35	35	3558	0	0	69.2	69.5
S Avalon Blvd between 405 SB Ramp and E 213th Street	Hard	50	35	35	35	3575	0	0	69.3	69.6
S Avalon Blvd between E 213th St and E Carson St	Hard	50	35	35	35	3041	0	0	68.6	68.9
S Avalon Blvd south of E Carson St	Hard	50	35	35	35	2252	0	0	67.3	67.6
E Del Amo Blvd west of S Vermont Ave	Hard	50	45	45	45	1015	0	0	67.2	67.5
E Del Amo Blvd between S Vemont Ave and Hamilton Ave	Hard	50	45	45	45	1821	0	0	69.7	70.0
E Del Amo Blvd between Hamilton Ave and Figueroa St	Hard	50	45	45	45	3276	157	13	73.4	73.7
E Del Amo Blvd between Figueroa St and S Main St	Hard	50	45	45	45	3254	178	32	73.7	74.0
E Del Amo Blvd between S Main St and Stamps Dr	Hard	50	45	45	45	3370	126	35	73.6	73.9
E Del Amo Blvd between Stamps Dr and S Avalon Blvd	Hard	50	45	45	45	2881	53	0	72.1	72.4
Torrance Blvd west of Hamilton Ave	Hard	50	40	40	40	2483	0	0	69.5	69.8
Torrance Blvd between Hamilton Ave and Figueroa St	Hard	50	40	40	40	2644	35	3	70.2	70.5
Torrance Blvd between Figueroa St and S Main St	Hard	50	40	40	40	1625	47	7	68.6	68.9
Torrance Blvd east of S Main St	Hard	50	25	25	25	756	22	3	60.3	60.6
E 213th St between S Main St and S Avalon Blvd	Hard	50	30	30	30	908	0	0	61.4	61.7
E 213th St east of S Avalon Blvd	Hard	50	30	30	30	690	0	0	60.2	60.5
Carson St west of S Vermont Ave	Hard	50	35	35	35	2755	0	0	68.1	68.4
Carson St between S Vemont Ave and Figueroa St	Hard	50	35	35	35	2633	0	0	67.9	68.2
Carson St between Figueroa St and S Main St	Hard	50	35	35	35	2211	0	0	67.2	67.5
Carson St between S Main St and N Avalon Blvd	Hard	50	35	35	35	2265	0	0	67.3	67.6
Carson St between N Avalon Blvd and 405 SB Ramp	Hard	50	35	35	35	2894	0	0	68.3	68.6
Carson St between 405 SB Ramp and 405 NB Ramp	Hard	50	35	35	35	2621	0	0	67.9	68.2
Lenardo between 405 SB Ramp and Avalon	Hard	50	25	25	25	2204	20	9	64.1	64.4

Model Notes:
The calculation is based on the methodology described in FHWA Traffic Noise Model Technical Manual (1998).
The peak hour noise level at 50 feet was validated with the results from FHWA Traffic Noise Model Version 2.5.
Accuracy of the calculation is within ±0.1 dB when comparing to TNM results.
Noise propagation greater than 50 feet is based on the following assumptions:
For hard ground, the propagation rate is 3 dB per doubling the distance.
For soft ground, the propagation rate is 4.5 dB per doubling the distance.
Vehicles are assumed to be on a long straight roadway with cruise speed.
Roadway grade is less than 1.5%.
CNEL levels were obtained based on Figure 2-19, on page 2-58 Caltran's TeNS 2013.

Attachment 6
On-Site Operations

The District SEIR
Composite Noise Levels

Day

	Ambient	Mechanical	Loading	Parking	Circulation	Open Space	Drive Through	Total Project	Project + Ambient	Increase	Exceeds Threshold?
R1	58.9	50.4	36.0	50.5	42.7	16.4	-	53.9	60.1	1.2	No
R2	55.2	50.4	44.9	46.1	30.3	18.3	-	52.6	57.1	1.9	No
R3	55.2	50.4	43.5	39.4	23.9	19.6	-	51.5	56.8	1.6	No
R4	55.2	50.4	40.8	32.1	20.9	22.2	-	50.9	56.6	1.4	No
R5	55.2	50.5	41.8	30.7	28.6	33.8	13.6	51.2	56.6	1.4	No
R6	55.2	50.6	47.1	32.2	31.5	40.9	17.5	52.6	57.1	1.9	No
R7	55.2	50.6	45.2	40.4	36.5	55.5	24.2	57.2	59.3	4.1	No
R8	55.2	50.7	49.4	44.1	46.5	49.5	27.5	55.6	58.4	3.2	No
R9	72.7	53.0	54.1	53.5	48.6	29.8	13.9	58.8	72.9	0.2	No

Night: 10PM-11PM

	Ambient	Mechanical	Loading	Parking	Circulation	Open Space	Drive Through	Total Project	Project + Ambient	Increase	Exceeds Threshold?
R1	57.4	45.0	36.0	12.8	40.5	11.6	-	46.7	57.8	0.4	No
R2	53.3	45.0	44.9	10.7	28.3	13.5	-	48.0	54.4	1.1	No
R3	53.3	45.0	43.5	14.1	21.6	14.9	-	47.4	54.3	1.0	No
R4	53.3	45.0	40.8	5.7	18.2	17.8	-	46.4	54.1	0.8	No
R5	53.3	45.0	41.6	14.9	26.0	26.0	13.6	46.7	54.2	0.9	No
R6	53.3	45.0	46.9	11.8	28.9	36.2	17.5	49.4	54.8	1.5	No
R7	53.3	45.7	41.4	14.1	33.9	53.5	24.2	54.4	56.9	3.6	No
R8	53.3	45.8	43.6	19.5	43.7	45.6	27.5	50.9	55.3	2.0	No
R9	71.2	45.0	54.1	16.7	45.0	25.0	13.9	55.0	71.3	0.1	No

Night: 11PM-7AM

	Ambient	Mechanical	Loading	Parking	Circulation	Open Space	Drive Through	Total Project	Project + Ambient	Increase	Exceeds Threshold?
R1	54.9	45.0	36.0	12.5	40.5	-	-	46.7	55.5	0.6	No
R2	48.8	45.0	44.9	10.3	28.3	-	-	48.0	51.4	2.6	No
R3	48.8	45.0	43.5	14.0	21.6	-	-	47.3	51.1	2.3	No
R4	48.8	45.0	40.8	4.3	18.2	-	-	46.4	50.8	2.0	No
R5	48.8	45.0	41.6	14.7	26.0	-	-	46.7	50.9	2.1	No
R6	48.8	45.0	46.9	10.5	28.9	-	-	49.2	52.0	3.2	No
R7	48.8	45.7	41.4	7.1	33.9	-	-	47.3	51.1	2.3	No
R8	48.8	45.8	43.6	6.1	43.7	-	-	49.3	52.0	3.2	No
R9	68.7	45.0	54.1	16.4	45.0	-	-	55.0	68.9	0.2	No

The District SEIR
Mechnical Equipment Noise

	Day							Night (10-11)							Night (11-7)						
	Ambient	PA2 *	PA3 **	Total Site ***	Ambient + Project ***	increase	Exceed Threshold?	Ambient	PA2	PA3 **	Total Site ***	Ambient + Project ***	increase	Exceed Threshold?	Ambient	PA2	PA3 **	Total Site ***	Ambient + Project ***	increase	Exceed Threshold?
R1	58.9	40.0	50.0	50.4	59.5	0.6	No	57.4	-	45.0	45.0	57.6	0.2	No	54.9	-	45.0	45.0	55.3	0.4	No
R2	55.2	40.0	50.0	50.4	56.4	1.2	No	53.3	-	45.0	45.0	53.9	0.6	No	48.8	-	45.0	45.0	50.3	1.5	No
R3	55.2	40.0	50.0	50.4	56.4	1.2	No	53.3	-	45.0	45.0	53.9	0.6	No	48.8	-	45.0	45.0	50.3	1.5	No
R4	55.2	40.0	50.0	50.4	56.4	1.2	No	53.3	-	45.0	45.0	53.9	0.6	No	48.8	-	45.0	45.0	50.3	1.5	No
R5	55.2	40.0	50.1	50.5	56.5	1.3	No	53.3	-	45.0	45.0	53.9	0.6	No	48.8	-	45.0	45.0	50.3	1.5	No
R6	55.2	40.0	50.3	50.6	56.5	1.3	No	53.3	-	45.0	45.0	53.9	0.6	No	48.8	-	45.0	45.0	50.3	1.5	No
R7	55.2	40.0	50.2	50.6	56.5	1.3	No	53.3	-	45.7	45.7	54.0	0.7	No	48.8	-	45.7	45.7	50.5	1.7	No
R8	55.2	40.0	50.3	50.7	56.5	1.3	No	53.3	-	45.8	45.8	54.0	0.7	No	48.8	-	45.8	45.8	50.6	1.8	No
R9	72.7	50.0	50.0	53.0	72.7	0.0	No	71.2	-	45.0	45.0	71.2	0.0	No	68.7	-	45.0	45.0	68.7	0.0	No

Day: Assume PA 2; PA 3 industrial ventilation, emergency generator, industrial HVAC, County Mart HVAC
Night: PA 3 industrial ventilation, industrial HVAC, County Mart HVAC

* As discussed in the 2018 SEIR, mechanical equipment would be designed to not exceed daytime noise levels of 50 dBA. Where Project buildings would shield sensitive receptors (blocking line-of-sight) from PA2 rooftops, a 10 dBA reduction has been applied.

** All mechnical equipment wihtin PA3 (including industrial ventilation, HVAC, and emergency generator and County Mart HVAC) has been modeled using the CadnaA model. The model accounts for building heights and shielding. Consistent with the assumptions in the 2018 SEIR, it is assumed that all mechanical equipment would not generate noise levels exceeding 50 dBA during daytime hours or 45 dBA during nighttime hours at any noise-sensitive receptor.

*** Noise is added logarithmically

The District SEIR
Loading Dock Noise

	Day							Night (10-11)							Night (11-7)						
	Ambient	PA2 *	PA3 **	Total Site ***	Ambient + Project ***	increase	Exceed Threshold?	Ambient	PA2 *	PA3 **	Total Site ***	Ambient + Project ***	increase	Exceed Threshold?	Ambient	PA2 *	PA3 **	Total Site ***	Ambient + Project ***	increase	Exceed Threshold?
R1	58.9	29.4	34.9	36.0	58.9	0.0	No	57.4	29.4	34.9	36.0	57.4	0.0	No	54.9	29.4	34.9	36.0	55.0	0.1	No
R2	55.2	31.1	44.7	44.9	55.6	0.4	No	53.3	31.1	44.7	44.9	53.9	0.6	No	48.8	31.1	44.7	44.9	50.3	1.5	No
R3	55.2	30.5	43.3	43.5	55.5	0.3	No	53.3	30.5	43.3	43.5	53.7	0.4	No	48.8	30.5	43.3	43.5	49.9	1.1	No
R4	55.2	29.2	40.5	40.8	55.4	0.2	No	53.3	29.2	40.5	40.8	53.5	0.2	No	48.8	29.2	40.5	40.8	49.4	0.6	No
R5	55.2	29.6	41.5	41.8	55.4	0.2	No	53.3	29.6	41.3	41.6	53.6	0.3	No	48.8	29.6	41.3	41.6	49.6	0.8	No
R6	55.2	32.1	47.0	47.1	55.8	0.6	No	53.3	32.1	46.8	46.9	54.2	0.9	No	48.8	32.1	46.8	46.9	51.0	2.2	No
R7	55.2	40.0	43.6	45.2	55.6	0.4	No	53.3	40.0	35.7	41.4	53.6	0.3	No	48.8	40.0	35.7	41.4	49.5	0.7	No
R8	55.2	43.1	48.3	49.4	56.2	1.0	No	53.3	43.1	33.6	43.6	53.7	0.4	No	48.8	43.1	33.6	43.6	49.9	1.1	No
R9	72.7	54.0	36.7	54.1	72.8	0.1	No	71.2	54.0	35.8	54.1	71.3	0.1	No	68.7	54.0	35.8	54.1	68.8	0.1	No

Day: Assume PA 2 loading, PA 3 industrial loading, PA 3 restaurant loading
Night: Assume PA 2 loading, PA 3 industrial loading

As discussed in the 2018 SEIR, screening would be required to block line-of-sight to noise-sensitive receptors, providing a 10 dBA reduction in noise. Loading noise at each sensitive receptor has been calculated based a reference noise level of 70 dBA at 50 feet and receptor distance to the anticipated PA2 building location using the following formula:

* ((20*LOG(50/Distance))+70)-10

Loading noise with PA3 includes medium- and heavy-duty truck loading within industrial loading bays and heavy-duty truck deliveries to commercial uses within the Carson Country Mart. Loading noise has been calculated using the CadnaA model,

** accounting for elevation and shielding provided by project buildings.

*** Noise is added logarithmically

The District SEIR
Parking Noise

	Day								Night (10-11)								Night (11-7)							
	Ambient	PA1 *	PA2 *	PA3 **	Total Site ***	Ambient + Project ***	increase	Exceed Threshold?	Ambient	PA1 *	PA2 *	PA3 **	Total Site ***	Ambient + Project ***	increase	Exceed Threshold?	Ambient	PA1 *	PA2 *	PA3 **	Total Site ***	Ambient + Project ***	increase	Exceed Threshold?
R1	58.9	50.5	32.8	12.5	50.5	59.5	0.6	No	57.4	-	-	12.5	12.8	57.4	0.0	No	54.9	-	-	12.3	12.5	54.9	0.0	No
R2	55.2	45.7	35.2	10.3	46.1	55.7	0.5	No	53.3	-	-	10.3	10.7	53.3	0.0	No	48.8	-	-	9.9	10.3	48.8	0.0	No
R3	55.2	38.2	33.3	14.0	39.4	55.3	0.1	No	53.3	-	-	14.0	14.1	53.3	0.0	No	48.8	-	-	13.8	14.0	48.8	0.0	No
R4	55.2	29.5	28.7	4.3	32.1	55.2	0.0	No	53.3	-	-	4.3	5.7	53.3	0.0	No	48.8	-	-	2.3	4.3	48.8	0.0	No
R5	55.2	26.7	28.2	14.8	30.7	55.2	0.0	No	53.3	-	-	14.8	14.9	53.3	0.0	No	48.8	-	-	14.6	14.7	48.8	0.0	No
R6	55.2	25.6	31.1	11.5	32.2	55.2	0.0	No	53.3	-	-	11.5	11.8	53.3	0.0	No	48.8	-	-	10.1	10.5	48.8	0.0	No
R7	55.2	23.1	40.4	14.0	40.4	55.3	0.1	No	53.3	-	-	14.0	14.1	53.3	0.0	No	48.8	-	-	6.1	7.1	48.8	0.0	No
R8	55.2	22.1	44.0	19.5	44.1	55.5	0.3	No	53.3	-	-	19.5	19.5	53.3	0.0	No	48.8	-	-	4.9	6.1	48.8	0.0	No
R9	72.7	50.5	50.5	16.6	53.5	72.8	0.1	No	71.2	-	-	16.6	16.7	71.2	0.0	No	68.7	-	-	16.3	16.4	68.7	0.0	No

Day: Assume PA1 Parking, PA 2 parking, PA 3 industrial parking, Country Mart Parking
10-11: Assume PA 3 industrial parking, Country Mart Parking
11-7: Assume PA 3 Industrial parking

Consistent with the 2018 SEIR, parking noise at each sensitive receptor has been calculated based a reference noise level of 60 dBA at 50 feet and receptor distance to the anticipated PA1 and PA2 building locations using the following formula:

* (20*LOG(50/Distance))+60

** Parking noise with PA3 assumes maximum passenger vehicle activity within industrial and Carson Country Mart parking areas. Parking noise has been calculated using the CadnaA model, accounting for elevation and shielding provided by project buildings.

*** Noise is added logarithmically

The District SEIR
Open Space Noise

	Day							Night (10-11)							Night (11-7)						
	Ambient	PA2	PA3 *	Total Site **	Ambient + Project **	increase	Exceed Threshold?	Ambient	PA2	PA3 *	Total Site **	Ambient + Project **	increase	Exceed Threshold?	Ambient	PA2	PA3 *	Total Site **	Ambient + Project **	increase	Exceed Threshold?
R1	58.9	-	16.4	16.4	58.9	0.0	No	57.4	-	11.3	11.6	57.4	0.0	No	54.9	-	-	-	54.9	0.0	No
R2	55.2	-	18.3	18.3	55.2	0.0	No	53.3	-	13.3	13.5	53.3	0.0	No	48.8	-	-	-	48.8	0.0	No
R3	55.2	-	19.5	19.6	55.2	0.0	No	53.3	-	14.8	14.9	53.3	0.0	No	48.8	-	-	-	48.8	0.0	No
R4	55.2	-	22.2	22.2	55.2	0.0	No	53.3	-	17.7	17.8	53.3	0.0	No	48.8	-	-	-	48.8	0.0	No
R5	55.2	-	33.8	33.8	55.2	0.0	No	53.3	-	26.0	26.0	53.3	0.0	No	48.8	-	-	-	48.8	0.0	No
R6	55.2	-	40.9	40.9	55.4	0.2	No	53.3	-	36.2	36.2	53.4	0.1	No	48.8	-	-	-	48.8	0.0	No
R7	55.2	-	55.5	55.5	58.4	3.2	No	53.3	-	53.5	53.5	56.4	3.1	No	48.8	-	-	-	48.8	0.0	No
R8	55.2	-	49.5	49.5	56.2	1.0	No	53.3	-	45.6	45.6	54.0	0.7	No	48.8	-	-	-	48.8	0.0	No
R9	72.7	-	29.8	29.8	72.7	0.0	No	71.2	-	25.0	25.0	71.2	0.0	No	68.7	-	-	-	68.7	0.0	No

Day: Assume Country Mart outdoor operations including dog park, children's play area, event/social lawn, botanic garden, beer garden, games terrace, outdoor dining areas, and amplified speakers.
10-11: Assume Country Mart event/social lawn, Stage Speaker
11-7: None

Open space noise includes human conversation within all outdoor areas and associated amplified sound. Open space noise has
* been calculated using the CadnaA model, accounting for elevation and shielding provided by project buildings.
** Noise is added logarithmically

The District SEIR
Circulation

	Day					Night (10-11)					Night (11-7)				
	Ambient	Total Site*	Ambient + Project**	increase	Exceed Threshold?	Ambient	Total Site*	Ambient + Project**	increase	Exceed Threshold?	Ambient	Total Site*	Ambient + Project**	increase	Exceed Threshold?
R1	58.9	42.7	59.0	0.1	No	57.4	40.5	57.5	0.1	No	54.9	40.5	55.1	0.2	No
R2	55.2	30.3	55.2	0.0	No	53.3	28.3	53.3	0.0	No	48.8	28.3	48.8	0.0	No
R3	55.2	23.9	55.2	0.0	No	53.3	21.6	53.3	0.0	No	48.8	21.6	48.8	0.0	No
R4	55.2	20.9	55.2	0.0	No	53.3	18.2	53.3	0.0	No	48.8	18.2	48.8	0.0	No
R5	55.2	28.6	55.2	0.0	No	53.3	26.0	53.3	0.0	No	48.8	26.0	48.8	0.0	No
R6	55.2	31.5	55.2	0.0	No	53.3	28.9	53.3	0.0	No	48.8	28.9	48.8	0.0	No
R7	55.2	36.5	55.3	0.1	No	53.3	33.9	53.3	0.0	No	48.8	33.9	48.9	0.1	No
R8	55.2	46.5	55.8	0.6	No	53.3	43.7	53.8	0.5	No	48.8	43.7	50.0	1.2	No
R9	72.7	48.6	72.7	0.0	No	71.2	45.0	71.2	0.0	No	68.7	45.0	68.7	0.0	No

Day: Based on AM Peak hour turning movement volumes provided by Fehr & Peers
Night: Based on average daily turning movement volumes (PM peak hour * 17.53) divided by 24 (hours)

Circulation from generation on internal roadways as well as adjacent off-site roads habve been calculated using AM peak hour volumes for daytime hours and average hourly volumes for nighttime hours. Circulation noise has been calculated using the CadnaA model, accounting for elevation and shielding provided by
* project buildings.
** Noise is added logarithmically

The District SEIR
Drive Through Noise

	Day							Night (10-11)							Night (11-7)						
	Ambient	PA2	PA3 *	Total Site **	Ambient + Project **	increase	Exceed Threshold?	Ambient	PA2	PA3 *	Total Site **	Ambient + Project **	increase	Exceed Threshold?	Ambient	PA2	PA3 *	Total Site **	Ambient + Project **	increase	Exceed Threshold?
R1	58.9	-	-	-	58.9	0.0	No	57.4	-	-	-	57.4	0.0	No	54.9	-	-	-	54.9	0.0	No
R2	55.2	-	-	-	55.2	0.0	No	53.3	-	-	-	53.3	0.0	No	48.8	-	-	-	48.8	0.0	No
R3	55.2	-	-	-	55.2	0.0	No	53.3	-	-	-	53.3	0.0	No	48.8	-	-	-	48.8	0.0	No
R4	55.2	-	-	-	55.2	0.0	No	53.3	-	-	-	53.3	0.0	No	48.8	-	-	-	48.8	0.0	No
R5	55.2	-	13.4	13.6	55.2	0.0	No	53.3	-	13.4	13.6	53.3	0.0	No	48.8	-	-	-	48.8	0.0	No
R6	55.2	-	17.4	17.5	55.2	0.0	No	53.3	-	17.4	17.5	53.3	0.0	No	48.8	-	-	-	48.8	0.0	No
R7	55.2	-	24.2	24.2	55.2	0.0	No	53.3	-	24.2	24.2	53.3	0.0	No	48.8	-	-	-	48.8	0.0	No
R8	55.2	-	27.5	27.5	55.2	0.0	No	53.3	-	27.5	27.5	53.3	0.0	No	48.8	-	-	-	48.8	0.0	No
R9	72.7	-	13.7	13.9	72.7	0.0	No	71.2	-	13.7	13.9	71.2	0.0	No	68.7	-	-	-	68.7	0.0	No

Day: Operational
10-11: Operational
11-7: None

Drive through noise levels includes four drive through locations within the Carson Country Mart with a reference noise level of 54.8 dBA Leq at 50 feet. Drive through noise has been calculated using the CadnaA model, accounting for elevation and
* shielding provided by project buildings.
** Noise is added logarithmically

The District SEIR
CadnaA Output

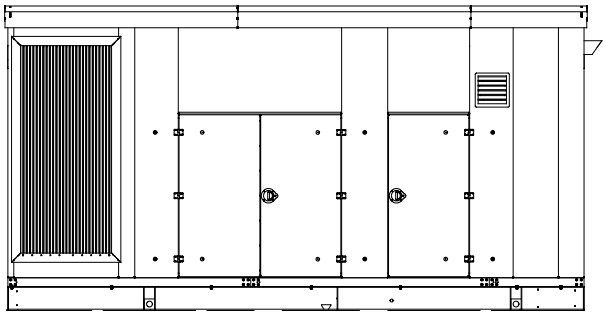
	PA3(a)													PA3(b)											
	Truck			Auto																					
	Project Site Total - Day	PA3 Only - Day	Project Site Total - Night	PA3 Only - Night	Project Site Total - Day	PA3 Only - Day	PA2 Only - Day	Project Site Total/PA3 Only - Night	Emergency Generator	Fan	HVAC	Loading	Parking	HVAC	Parking	Dog Park	Play Ground	Performance Pavillion/Social Lawn	Garden	Delivery Truck Idling	Drive Thru	Outdoor Dining	Beer Garden	Game Terrace	Ambient Speaker	Stage Speaker
R01	39.4	39.4	36.3	36.3	39.9	38.5	30.9	38.4	20.6	47.9	12.6	34.9	12.3	5.3	0	5.9	4	9.6	0	7.7	0	9.8	10.3	0	0	6.4
R02	26.8	26.8	23.7	23.7	27.7	26.4	18.8	26.4	25.2	57.2	7.6	44.7	9.9	6.3	0	8	6.7	11.6	0	9.2	0	11.8	12.1	1	0	8.4
R03	20.8	20.8	17.8	17.8	20.9	19.4	12.3	19.3	26.2	54.6	11.1	43.3	13.8	5.6	0	9.4	7.1	13.1	0	10.2	0	13	13.4	1.8	0	9.9
R04	16.4	16.4	13.4	13.4	19	16.9	10.8	16.5	25.5	55.1	7.3	40.5	2.3	6.4	0	12	10.1	16.1	0	12.5	0	15.4	16	4.6	0	12.7
R05	26.1	26.1	23	23	25.1	23.4	18.5	23	30.9	56.9	14	41.3	14.6	19.5	0.4	16.1	32	25.2	8.4	28.4	13.4	21.5	22.7	15.1	0	18.1
R06	29.5	29.5	26.2	26.2	27.3	25.8	20.5	25.5	37.6	55.1	12.4	46.8	10.1	25.2	5.8	21.7	37.9	35.9	14.2	32.5	17.4	29.6	27.3	25.5	5.4	24.4
R07	37.2	37.2	33.9	33.9	33.9	32.4	26.9	32.2	22	54.3	12.1	34.5	4.4	38.6	16.4	38.7	49.9	50.7	26.6	43.8	29.2	43.8	45.4	39.3	17.7	49.5
R08	45.2	45.2	41.9	41.9	40.8	39.3	33.9	39.1	21.5	56	12.8	33.6	4.9	38.1	19.3	31	45.1	44	15.4	48.1	27.5	41.6	34.3	33.5	15.9	40.6
R09	40.9	40.9	37.5	37.5	47.8	45	42	44.1	23.3	58.1	18.3	35.8	16.3	21.3	4.5	19.5	22.3	24.5	0	29.6	13.7	24.3	18.4	15.5	0	15.6

Attachment 7
References

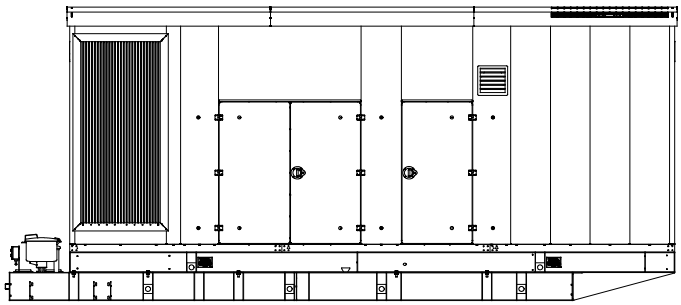
KOHLER®

Industrial Generator Set Accessories

Sound Enclosure and Subbase Fuel Tank Package



Level 1 Sound Enclosure with Lift Base



Level 2 Sound Enclosure with Subbase Fuel Tank
(shown with optional spill containment)

Applicable to the following models:
KD800 - KD2500 (includes KD1250-A, KD1250-4, KD2500-4)

Sound Level 1 Enclosure Standard Features

- Internal silencers with flexible exhaust connectors and exhaust elbows.
- Mounts to lift base and optional subbase fuel tank.
- Aluminum construction with six large, hinged, removable doors for easy maintenance.
- Fade-, scratch-, and corrosion-resistant Kohler® Power Armor™ automotive-grade textured finish.
- Lockable, flush-mounted door latches.
- Air inlet louvers to reduce rain and snow entry.
- Sloped roof to reduce the buildup of moisture and debris.
- Acoustic insulation that meets UL 94 HF1 flammability classification.
- Sound level 1 enclosure is designed to 150 mph (241 kph) wind load rating.
- Sound level 1 enclosure uses internal silencers, acoustic insulation and acoustic-lined air inlet hoods.

Sound Level 2 Enclosure Standard Features

- Includes all of the sound level 1 enclosure features with the addition of up to 51 mm (2 in.) acoustic insulation material, intake sound baffles, secondary silencers, and vertical air discharge with rain caps.
- Vertical outlet hood with 90 degree angles to redirect air and reduce noise.
- Sound level 2 enclosure is certified to 186 mph (299 kph) wind load rating for KD800- 2500 models.

Subbase Fuel Tank Features

- The fuel tank has a Power Armor Plus™ textured epoxy-based rubberized coating.
- The above-ground rectangular secondary containment tank mounts directly to the generator set, below the generator set skid (subbase).
- Both the inner and outer tanks have UL-listed emergency relief vents.
- Flexible fuel lines are provided with subbase fuel tank selection.
- The containment tank's construction protects against fuel leaks or ruptures. The inner (primary) tank is sealed inside the outer (secondary) tank. The outer tank contains the fuel if the inner tank leaks or ruptures.
- The above ground secondary containment subbase fuel tank meets UL 142 requirements.
- State tanks with varying capacities are available. Florida Dept. of Environmental Protection (FDEP) File No. EQ-634 approved.

Enclosure and Subbase Fuel Tank Combinations

Four enclosure configurations are available with the subbase fuel tanks:

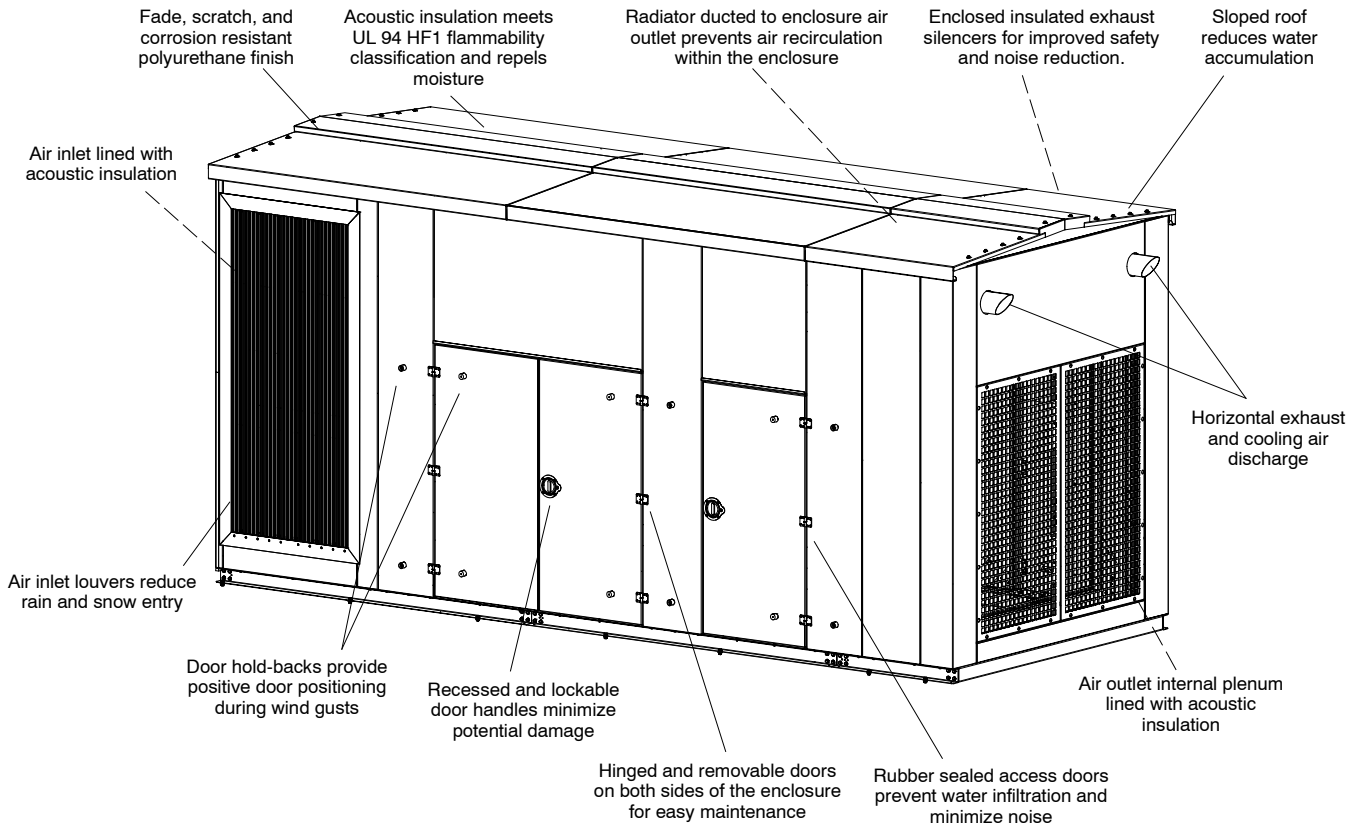
- ○ Sound Enclosure Level 1
- ○ Sound Enclosure Level 1, AQMD Ready
- ○ Sound Enclosure Level 2
- ○ Sound Enclosure Level 2, AQMD Ready

Available Approvals and Listings

- ❑ UL 2200 Listing
- ❑ UL142 Listing (fuel tanks)
- ❑ CSA Approval
- ❑ IBC Seismic Certification
- ❑ California OSHPD Approval (KD800- KD1750 models)
- ❑ cUL Listing (fuel tanks only)
- ❑ Hurricane Rated Enclosure - Available on aluminum Sound Level 2 enclosures, KD800- KD1750 models (Impact rated for Large Missile Level E and Wind load rated per Florida Building Code, tested to TAS201- 94, TAS202- 94 and TAS203- 94 standards)

NOTE: Some models may have limited third-party approvals; see your local distributor for details.

Aluminum Sound Enclosures



Note: Sample sound level 1 (SL1) enclosure shown; other models are similar.
Enclosure ships assembled on lifting base.

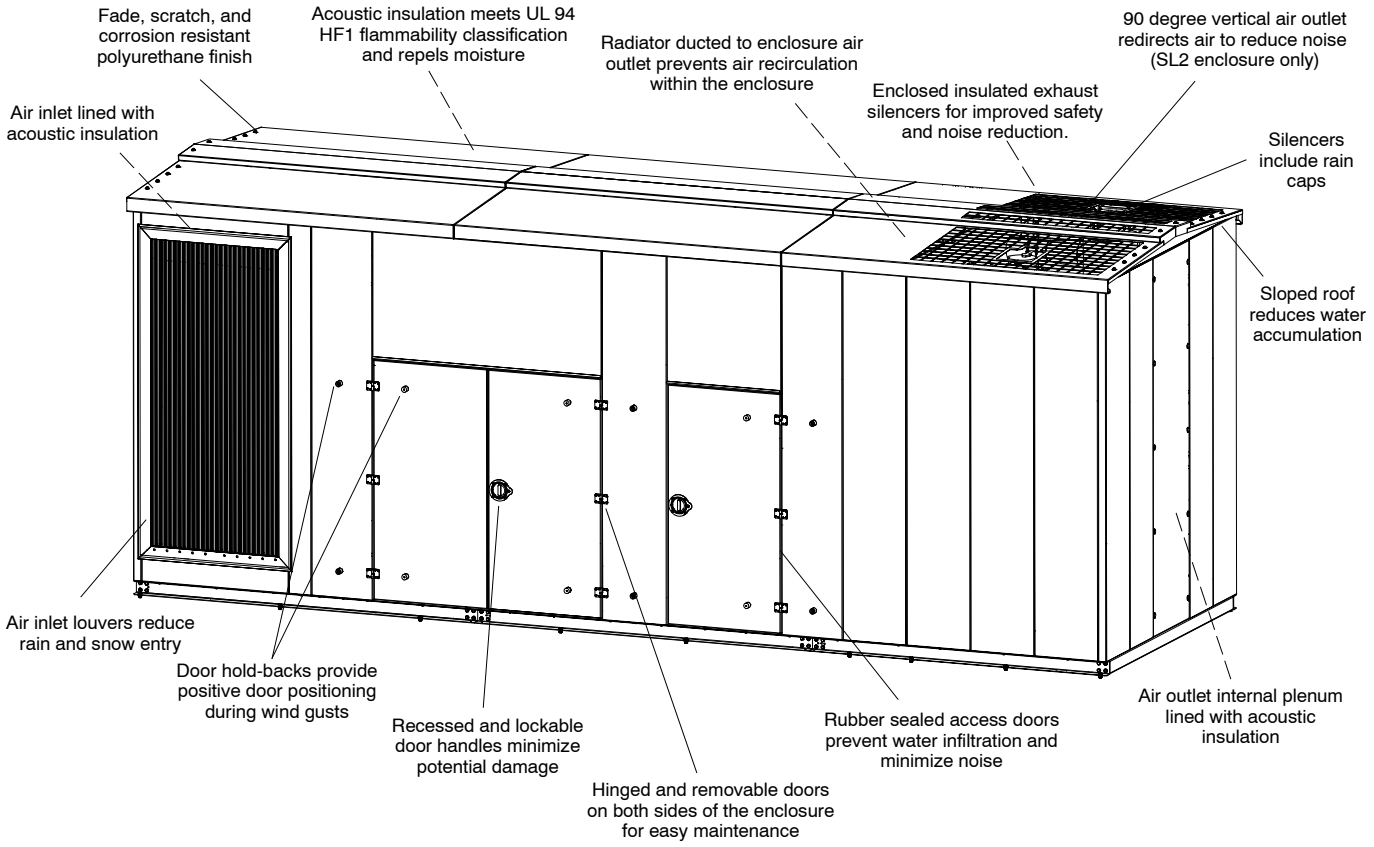
ADV- 8927

Level 1 Sound Enclosure Features

- Heavy-duty formed panels, solid construction. Preassembled package offering corrosion resistant, dent resilient structure mounting directly to lift base or fuel tank.
- Polyurethane enamel paint. Superior finish, durability, and appearance.
- The enclosure has a sloped roof to reduce the buildup of moisture and debris.
- Internal exhaust silencers offering maximum component life and operator safety.

  NOTE: Installing an additional length of exhaust tail pipe may increase backpressure levels. Please refer to the generator set spec sheet for the maximum backpressure value.
- Service access. Multiple personnel doors for easy access to generator set control and servicing of the fuel fill, fuel gauge, oil fill, and battery.
- Interchangeable modular panel construction. Allows complete serviceability or replacement without compromising enclosure design.
- Bolted panels facilitate service, future modification upgrades, or field replacement.
- Cooling/combustion air intake. Fixed air intake louvers.
- Sound-attenuating design using critical silencers. Acoustic insulation UL 94 HF1 listed for flame resistance.
- Horizontal air discharge. Sound level 1 (SL1) enclosures use a horizontal design that directs exhaust and cooling air out the end of the enclosure.

Aluminum Sound Enclosures



Note: Sample sound level 2 (SL2) enclosure shown; other models are similar.

Enclosure ships assembled on lifting base.

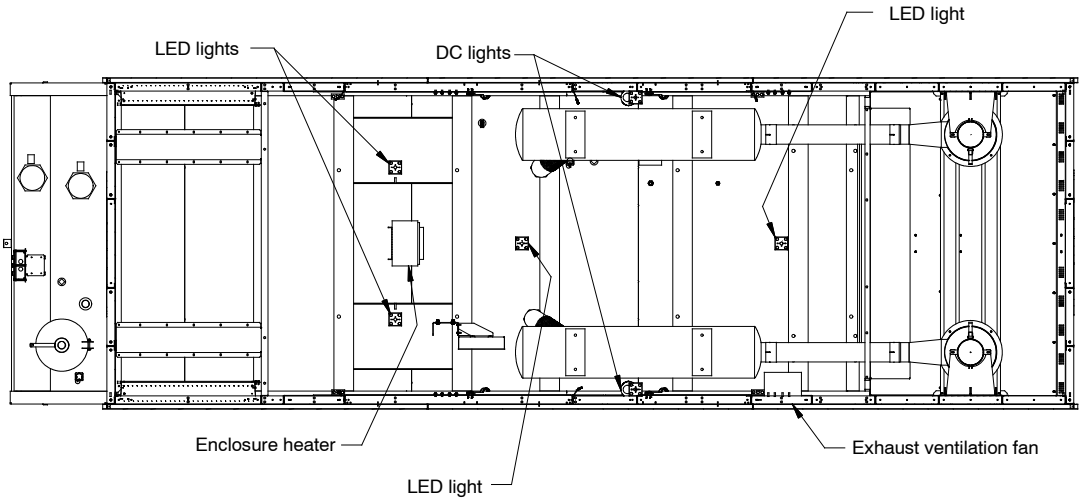
ADV- 8927

Level 2 Sound Enclosure Features

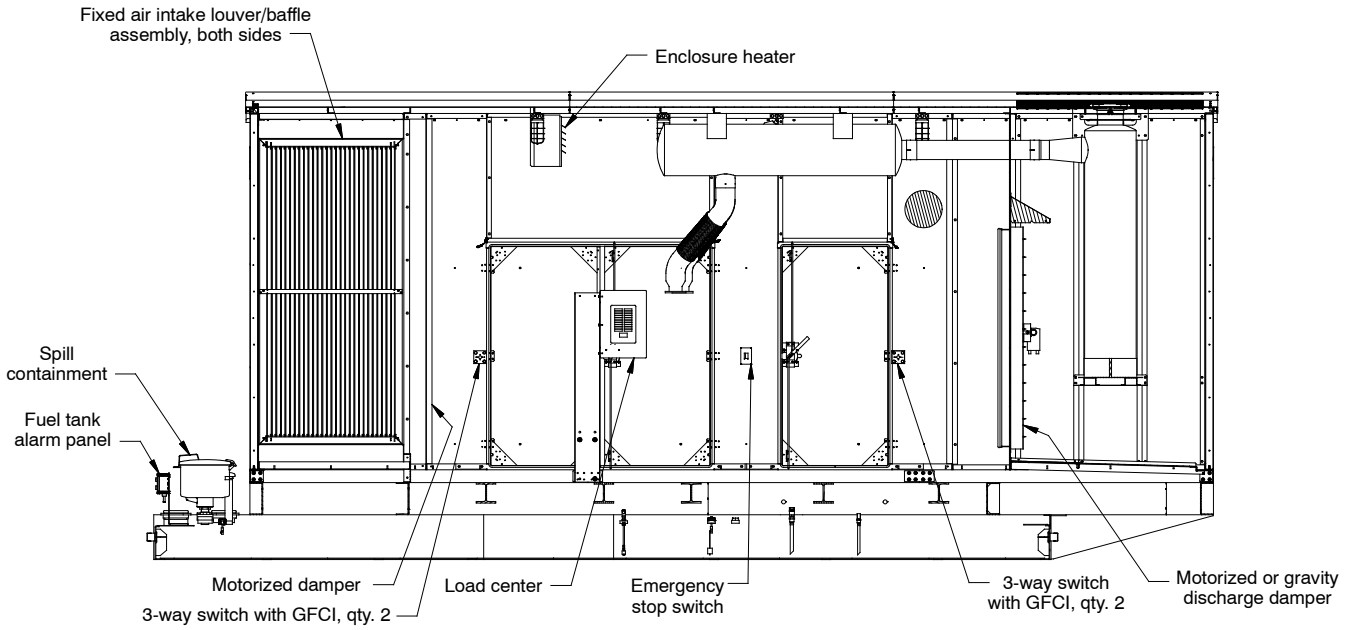
- Heavy-duty formed panels, solid construction. Preassembled package offering corrosion resistant, dent resilient structure mounting directly to lift base or fuel tank.
- Polyurethane enamel paint. Superior finish, durability, and appearance.
- The enclosure has a sloped roof to reduce the buildup of moisture and debris.
- Internal exhaust silencers offering maximum component life and operator safety.
- Service access. Multiple personnel doors on both sides for easy access to generator set control and servicing of the fuel fill, fuel gauge, oil fill, and battery.
- Interchangeable modular panel construction. Allows complete serviceability or replacement without compromising enclosure design.
- Bolted panels facilitate service, future modification upgrades, or field replacement.
- Cooling/combustion air intake. Fixed air intake louvers.
- Sound-attenuating design using additional secondary silencers and up to 51 mm (2 inches) of added acoustic insulation, UL 94 HF1 listed for flame resistance.
- Vertical air discharge. Sound level 2 (SL2) models use a vertical air discharge design that redirects exhaust and cooling air up and above the enclosure to reduce noise.

Aluminum Sound Enclosure Options

Top view of SL2 enclosure, shown with roof removed for illustration only:



Side view of SL2 enclosure, shown with side panels removed for illustration only:

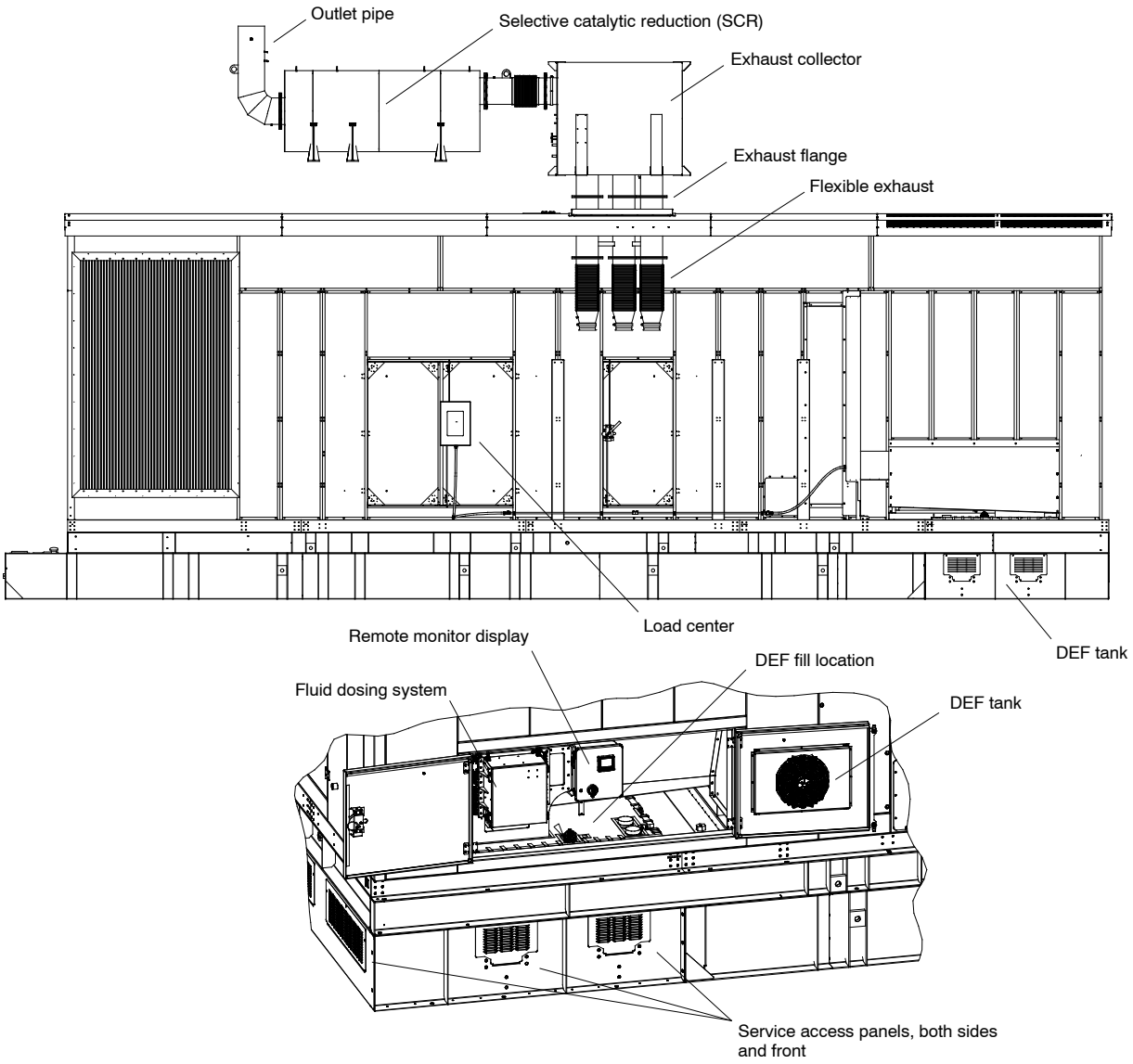


Note: Sample sound level 2 (SL2) enclosure shown; other models are similar.

ADV-8919-5

Tier 4 Aluminum Sound Enclosure

KD2500-4, Side view of SL2 enclosure, shown with side panels removed for illustration only:



Note: Sample sound level 2 (SL2) enclosure shown; other models are similar.

ADV-9179-2

Tier 4, Level 2 Sound Enclosure Features

- Availabe on KD1250- 4 and KD2500- 4
- Tier 4 options only available with sound level 2 enclosures.
- Includes all of the sound level 1 and 2 enclosure features with the addition of DEF tank, SCR, and exhaust collector.
- Remote monitor display
- Locates DEF tanks and lines
- Correctly sizes DEF and diesel tanks
- Service box for control and filter mounting
- Platforms not included
- Diesel fuel state tank is standard
  - KD1250- 4
    - State tank, 5863 L (1549 gal.) or 11205 L (2960 gal.)
    - DEF tank capacity,
      - 620 L (164 gal.) with 5863 L (1549 gal.) state tank
      - 1241 L (328 gal.) with 11205 L (2960 gal.) state tank
  - KD2500- 4
    - State tank, 14130 L (3733 gal.)
    - DEF tank capacity, 1241 L (328 gal.)

Aluminum Sound Enclosure Options

Basic Electrical Package (BEP)

Distribution Panel/Load Center. Prewired AC power distribution of all factory-installed features including block heater, two GFCI-protected internal 120-volt service receptacles, internal lighting, and commercial grade wall switches. Single-phase or three-phase load center powered by building source power and protected by a main circuit breaker, rated for 100, 125, or 200 amps as noted, with capacity and circuit positions for future expansion. AC power distribution installed in accordance with NEC and all wiring within EMT thin wall conduit. LED AC lights located within UL-listed fixtures designed for wet locations.

- ❑ BEP, single-phase, 120/208, 60 Hz or 120/240 VAC, 60 Hz. Includes 100 amp electrical panel, two 3-way switches, four LED lights, and two GFCI receptacles. *
- ❑ BEP, three-phase, 120/208, 60 Hz or 120/240VAC, 60 Hz. Includes 125 amp electrical panel, two 3-way switches, four LED lights, and two GFCI receptacles.
- ❑ BEP, 200 amp, single-phase, 120/208, 60 Hz or 120/240 VAC, 60 Hz. Includes 200 amp electrical panel, two 3-way switches, four LED lights, and two GFCI receptacles. *
- ❑ BEP, 200 amp, three-phase, 120/208, 60 Hz or 120/240VAC, 60 Hz. Includes 200 amp electrical panel, two 3-way switches, four LED lights, and two GFCI receptacles.

DC Light Package

DC Light Package (DLP). Prewired, internal DC light package offering an economical alternative light source within the enclosure, as a complement to the BEP or a source of light when AC power is not available. Battery drain limited with fuse protection and controlled through a 0- 60 minute, spring-wound, no-hold timer.
Available in LED.

Electrical Accessories

Wiring Kits. Electrical wiring for accessories. BEP required.

- ❑ Alternator heater wiring (KD1250- 2500 only)
- ❑ Block heater wiring, single-phase *
- ❑ Block heater wiring, three-phase
- ❑ Battery charger wiring
- ❑ Wire DEF tank heater †
- ❑ Wire power supply (Tier 4 system heaters) §

Emergency Stop Switch

- ❑ Generator set emergency stop switch, qty. 1.

* Not available options with Tier 4 generator set enclosures.
† Only available on enclosed Tier 4 generator set enclosures.
§ Only available on open or enclosed Tier 4 generator sets.

Stepdown Transformers. 100 amp BEP required, 60 Hz only. KD1250- 2500 only. *

- ❑ Single-phase, 120/240 V *
- ❑ Three-phase, 120/208 V *

Disconnect Switches. Disconnect switch for stepdown transformer. 60 Hz only. *

- ❑ Single-phase *
- ❑ Three-phase *

Enclosure Heater

Heater, 3.7/5 kW Ceiling Mounted. Electrical utility heater prewired to load center internal to enclosure. Rated at 17100 Btu. Includes adjustable louvers offering down flow and horizontal air tuning, built-in thermostat with automatic fan delay controls.

- ❑ Heater kit with 1 heater, single/three phase, 208/240 VAC, 60 Hz. BEP required.
- ❑ Heater kit with 2 heaters, for KD1250- 2500 only, single/three phase, 208/240 VAC, 60 Hz. 200 amp BEP required.

Exhaust Fan

- ❑ Exhaust Ventilation Fan. Mounted inside the enclosure. BEP required.

Motorized Inlet Louvers. 60 Hz only; BEP required.

- ❑ Aluminum construction
- ❑ Insulated aluminum construction
- ❑ Galvanized construction

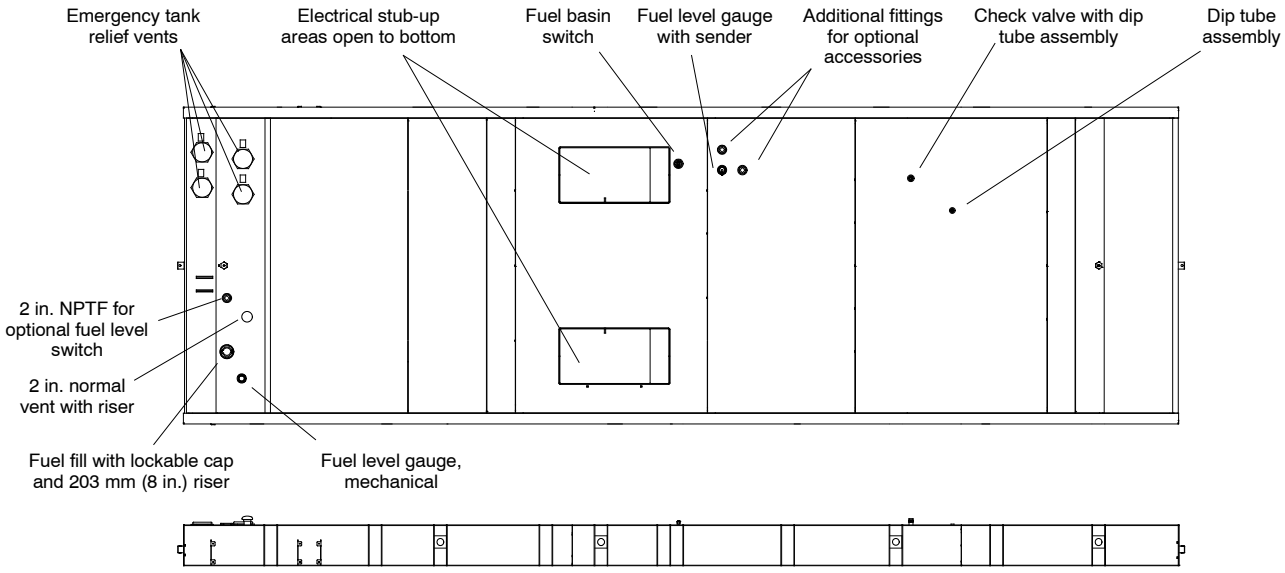
Motorized Outlet Louvers. 60 Hz only; BEP required.

- ❑ Aluminum construction
- ❑ Insulated aluminum construction
- ❑ Galvanized construction

Gravity Air Outlet

- ❑ Aluminum construction

Subbase Fuel Tank



Note: Sample model shown, other models are similar.

ADV-8927

Subbase Fuel Tank Standard Features

- Extended operation. State tanks with various capacities for multiple hour requirements.
- UL listed. Secondary containment generator set base tank meeting UL 142 requirements.
- NFPA compliant. Designed to comply with the installation standards of NFPA 30 and NFPA 37.
- Integral external lift lugs. Enables crane with spreader-bar lifting of the complete package (empty tank, mounted generator set, and enclosure) to ensure safety.
- Emergency pressure relief vents. Vents ensure adequate venting of inner and outer tank under extreme pressure and/or emergency conditions.
- Normal vent with cap. Vent is raised above lockable fuel fill.
- Fuel level gauge with sender.
- Mechanical fuel level gauge.
- Leak detection switch. Annunciates a contained primary tank fuel leak condition at generator set control.
- Electrical stub-up area open to bottom.
- Additional 2 in. NPT fittings for optional accessories.

Subbase Fuel Tank Options

Bottom Clearance

❑ I-beams, provide 102 mm (4 in.) of ground clearance (not available with OSHPD or IBC seismic certification)

Emergency Vent Options

❑ 127 mm (5 in.), IBC
❑ 152.4 mm (6 in.), IBC KD800- 1000 12 hr. tank only

Fuel in Basin Options

❑ Fuel in basin switch, Florida Dept. of Environmental Protection (FDEP) File No. EQ-682 approved
❑ 100% engine fluid containment

Fuel Supply Options

❑ Fire safety valve (installed on fuel supply line)
❑ Ball valve (installed on fuel supply line)

Fuel Fill Options

❑ Fill pipe extension to within 152 mm (6 in.) of bottom of fuel tank
❑ 18.9 L (5 gallon) spill containment
❑ 18.9 L (5 gallon) spill containment with 95% shutoff
❑ 18.9 L (5 gallon) spill containment fill to within 152 mm (6 in.) of bottom of fuel tank
❑ 18.9 L (5 gallon) spill containment, OSHPD/IBC
❑ 18.9 L (5 gallon) spill containment with 95% shutoff, OSHPD/IBC
❑ 28.4 L (7.5 gallon) spill containment, Florida Dept. of Environmental Protection (FDEP) File No. EQ-345 approved
❑ 28.4 L (7.5 gallon) spill containment with 95% shutoff, Florida Dept. of Environmental Protection (FDEP) File No. EQ-345/EQ-257 approved

High Fuel Level Switch

❑ High fuel level switch, 24V
❑ High fuel level switch, 24V, Florida Dept. of Environmental Protection (FDEP) File No. EQ-682 approved
❑ Fuel tank panel, 3 alarm, 24 V
❑ Fuel tank panel, 3 alarm, 24 V, Florida Dept. of Environmental Protection (FDEP) File No. EQ-682 approved

Normal Vent Options

❑ 3.7 m (12 ft.) above grade (without spill containment)
❑ 3.7 m (12 ft.) above grade (with spill containment)

Freestanding Stairs

❑ Stairs only, single door access
❑ Stairs with platform, single door access
❑ Stairs with catwalk, 2 door access, door length only
❑ Stairs with catwalk, 2 door access, full length of enclosure

Tank Marking Options

❑ Decal, Combustible Liquids - Keep Fire Away (qty. 2)
❑ Decal, NFPA 704 identification (qty. 2)
❑ Decal, tank number and safe fuel fill height (qty. 2)

Enclosure and Subbase Fuel Tank Specifications

Fuel Tank Capacity, L (gal.)	Est. Fuel Supply Hours at 60 Hz with Full Load (nominal)	Max. Dimensions, mm (in.)			Max. Weight, † kg (lb.)	Fuel Tank Height, mm (in.)	Sound Pressure Level at 60 Hz with Full Load, dB(A) ‡
		Length	Width §	Height			
KD800 SL1 Sound Enclosure with Internal Silencer and State Code Subbase Fuel Tank *							
Lifting Base	0	6582 (259)	2616 (103)	3350 (132)	10184 (22452)	—	90
3475 (918)	12	7309 (288)		3706 (146)	13772 (30362)	356 (14.0)	
6621 (1749)	24			3934 (155)	14252 (31421)	584 (23.0)	
10573 (2793)	48			4264 (168)	14831 (32698)	914 (36.0)	
15740 (4158)	72	9144 (360)		4366 (172)	16242 (35808)	1016 (40.0)	
KD800 SL2 Sound Enclosure with Internal Silencer and State Code Subbase Fuel Tank *							
Lifting Base	0	7707 (303)	2616 (103)	3350 (132)	10587 (23340)	—	75
3475 (918)	12	8434 (332)		3706 (146)	14175 (31250)	356 (14.0)	
6621 (1749)	24			3934 (155)	14655 (32309)	584 (23.0)	
10573 (2793)	48			4290 (169)	15234 (33586)	915 (36.0)	
15740 (4158)	72	9144 (360)		4366 (172)	16645 (36696)	1016 (40.0)	
KD900 SL1 Sound Enclosure with Internal Silencer and State Code Subbase Fuel Tank *							
Lifting Base	0	6582 (259)	2616 (103)	3350 (132)	10497 (23343)	—	91
3475 (918)	12	7309 (288)		3706 (146)	14085 (31253)	356 (14.0)	
6621 (1749)	24			3934 (155)	14565 (32312)	584 (23.0)	
12969 (3426)	48	8400 (331)		4293 (169)	16348 (36243)	940 (37.0)	
19381 (5120)	72	11050 (435)		4369 (172)	17527 (38840)	1016 (40.0)	
KD900 SL2 Sound Enclosure with Internal Silencer and State Code Subbase Fuel Tank *							
Lifting Base	0	7707 (303)	2616 (103)	3350 (132)	10900 (24231)	—	75
3475 (918)	12	8434 (332)		3706 (146)	14488 (32141)	356 (14.0)	
6621 (1749)	24			3934 (155)	14968 (33200)	584 (23.0)	
12969 (3426)	48			4290 (169)	16751 (37131)	940 (37.0)	
19381 (5120)	72	11050 (435)		4366 (172)	17930 (39728)	1016 (40.0)	
KD1000 SL1 Sound Enclosure with Internal Silencer and State Code Subbase Fuel Tank *							
Lifting Base	0	6582 (259)	2616 (103)	3350 (132)	10810 (23833)	—	92
3475 (918)	12	7309 (288)		3706 (146)	14398 (31743)	356 (14.0)	
6621 (1749)	24			3934 (155)	14878 (32802)	584 (23.0)	
12969 (3426)	48	8400 (331)		4290 (169)	16661 (36733)	940 (37.0)	
19381 (5120)	72	11050 (435)		4366 (172)	17840 (39330)	1016 (40.0)	
KD1000 SL2 Sound Enclosure with Internal Silencer and State Code Subbase Fuel Tank *							
Lifting Base	0	7707 (303)	2616 (103)	3353 (132)	11213 (24721)	—	76
3475 (918)	12	8434 (332)		3706 (146)	14801 (32631)	356 (14.0)	
6621 (1749)	24			3934 (155)	15281 (33690)	584 (23.0)	
12969 (3426)	48			4290 (169)	17064 (37621)	940 (37.0)	
19381 (5120)	72	11050 (435)		4366 (172)	18243 (40218)	1016 (40.0)	
KD1250/1500 SL1 Sound Enclosure with Internal Silencers and State Code Subbase Fuel Tank *							
Lifting Base	0	8831 (348)	3033 (119)	3579 (141)	17116 (37748)	—	93
5863 (1549)	18/15	9594 (378)		3960 (156)	22326 (49234)	381 (15.0)	
9860 (2605)	30/25			4138 (163)	22808 (50296)	559 (22.0)	
11204 (2960)	34/28			4214 (166)	22973 (50661)	635 (25.0)	
19214 (5076)	58/48	11113 (438)		4468 (176)	25277 (55741)	889 (35.0)	
21985 (5808)	66/55			4570 (180)	25684 (56637)	991 (39.0)	
KD1250/1500 SL2 Sound Enclosure with Internal Silencer and State Code Subbase Fuel Tank *							
Lifting Base	0	10420 (410)	3033 (119)	3579 (141)	18031 (39764)	—	79
5863 (1549)	18/15	11147 (439)		3960 (156)	23241 (51250)	381 (15.0)	
9860 (2605)	30/25			4138 (163)	23723 (52312)	559 (22.0)	
11204 (2960)	34/28			4214 (166)	23888 (52677)	635 (25.0)	
19214 (5076)	58/48			4468 (176)	26192 (57757)	889 (35.0)	
21985 (5808)	66/55			4570 (180)	26599 (58653)	991 (39.0)	

***** Data in table is for reference only. Height includes enclosure, lift base, and tank (if equipped). Refer to your authorized Kohler distributor for enclosure and subbase fuel tank specification details.

† Max. weight includes the generator set (wet) with the largest alternator option, enclosure, silencers, lift base, and tank (no fuel).

‡ Log average sound pressure level of 8 measured positions around the perimeter of the unit at a distance of 7 m (23 ft.). Refer to TIB-114 for details. Enclosed generator set sound data for some models was not available at time of print.

§ An additional 940 mm (37 inches) of clearance on each side for opening and closing the access doors is recommended.

NOTE: If the Est. Fuel Supply Hours column shows more than one number, the numbers represent each model in that range.

Enclosure and Subbase Fuel Tank Specifications, continued

Fuel Tank Capacity, L (gal.)	Est. Fuel Supply Hours at 60 Hz with Full Load (nominal)	Max. Dimensions, mm (in.)			Max. Weight, † kg (lb.)	Fuel Tank Height, mm (in.)	Sound Pressure Level at 60 Hz with Full Load, dB(A) ‡
		Length	Width §	Height			
KD1250-4 SL2 Sound Enclosure with State Code Subbase Fuel Tank ◆⁎							
5863 (1549)	17	11147 (439)	3033 (119)	4640 (183)	22507 (49619)	381 (15.0)	75
11204 (2960)	33			4894 (193)	23731 (52318)	635 (25.0)	
KD1250-A/1350 SL1 Sound Enclosure with Internal Silencers and State Code Subbase Fuel Tank *							
Lifting Base	0	8831 (348)	3033 (119)	3579 (141)	17116 (37748)	—	93
5863 (1549)	18/17	9594 (378)		3960 (156)	22326 (49234)	381 (15.0)	
9860 (2605)	30/29			4138 (163)	22808 (50296)	559 (22.0)	
11204 (2960)	34/32			4214 (166)	22973 (50661)	635 (25.0)	
19214 (5076)	58/56	11113 (438)		4468 (176)	25277 (55741)	889 (35.0)	
21985 (5808)	67/64			4570 (180)	25684 (56637)	991 (39.0)	
KD1250-A/1350 SL2 Sound Enclosure with Internal Silencer and State Code Subbase Fuel Tank *							
Lifting Base	0	10420 (410)	3033 (119)	3579 (141)	18031 (39764)	—	76
5863 (1549)	18/17	11147 (439)		3960 (156)	23241 (51250)	381 (15.0)	
9860 (2605)	30/29			4138 (163)	23723 (52312)	559 (22.0)	
11204 (2960)	34/32			4214 (166)	23888 (52677)	635 (25.0)	
19214 (5076)	58/56			4468 (176)	26192 (57757)	889 (35.0)	
21985 (5808)	67/64			4570 (180)	26599 (58653)	991 (39.0)	
KD1600 SL1 Sound Enclosure with Internal Silencers and State Code Subbase Fuel Tank *							
Lifting Base	0	8831 (348)	3033 (119)	3579 (141)	17343 (38248)	—	94
5863 (1549)	14	9594 (378)		3960 (156)	22553 (49734)	381 (15.0)	
9860 (2605)	23			4138 (163)	23035 (50796)	559 (22.0)	
11204 (2960)	26			4214 (166)	23200 (51161)	635 (25.0)	
19214 (5076)	45	11113 (438)		4468 (176)	25504 (56241)	889 (35.0)	
21985 (5808)	52			4570 (180)	25911 (57137)	991 (39.0)	
KD1600 SL2 Sound Enclosure with Internal Silencer and State Code Subbase Fuel Tank *							
Lifting Base	0	10420 (410)	3033 (119)	3579 (141)	18258 (40264)	—	79
5863 (1549)	14	11147 (439)		3960 (156)	23468 (51750)	381 (15.0)	
9860 (2605)	23			4138 (163)	23950 (52812)	559 (22.0)	
11204 (2960)	26			4214 (166)	24115 (53177)	635 (25.0)	
19214 (5076)	45			4468 (176)	26419 (58257)	889 (35.0)	
21985 (5808)	52			4570 (180)	26826 (59153)	991 (39.0)	
KD1750 SL1 Sound Enclosure with Internal Silencers and State Code Subbase Fuel Tank *							
Lifting Base	0	8831 (348)	3033 (119)	3579 (141)	17343 (38248)	—	95
5863 (1549)	13	9594 (378)		3960 (156)	22553 (49734)	381 (15.0)	
9860 (2605)	21			4138 (163)	23035 (50796)	559 (22.0)	
11204 (2960)	24			4214 (166)	23200 (51161)	635 (25.0)	
19214 (5076)	42	11113 (438)		4468 (176)	25504 (56241)	889 (35.0)	
21985 (5808)	48			4570 (180)	25911 (57137)	991 (39.0)	
KD1750 SL2 Sound Enclosure with Internal Silencer and State Code Subbase Fuel Tank *							
Lifting Base	0	10420 (410)	3033 (119)	3579 (141)	18258 (40264)	—	79
5863 (1549)	13	11147 (439)		3960 (156)	23468 (51750)	381 (15.0)	
9860 (2605)	21			4138 (163)	23950 (52812)	559 (22.0)	
11204 (2960)	24			4214 (166)	24115 (53177)	635 (25.0)	
19214 (5076)	42			4468 (176)	26419 (58257)	889 (35.0)	
21985 (5808)	48			4570 (180)	26826 (59153)	991 (39.0)	

***** Data in table is for reference only. Height includes enclosure, lift base, and tank (if equipped). Refer to your authorized Kohler distributor for enclosure and subbase fuel tank specification details.

◆ Tier 4 generator enclosure height includes the fuel tank and enclosure up to the exhaust flange. The height does not include the SCR, or the SCR inlet and outlet pipes.

⁎ Tier 4 generator enclosure weight includes the DEF tank but does not include the SCR or the SCR inlet and outlet pipes.

† Max. weight includes the generator set (wet) with the largest alternator option, enclosure, silencers, lift base, and tank (no fuel).

‡ Log average sound pressure level of 8 measured positions around the perimeter of the unit at a distance of 7 m (23 ft.). Refer to TIB-114 for details. Enclosed generator set sound data for some models was not available at time of print.

§ An additional 940 mm (37 inches) of clearance on each side for opening and closing the access doors is recommended.

NOTE: If the Est. Fuel Supply Hours column shows more than one number, the numbers represent each model in that range.

Enclosure and Subbase Fuel Tank Specifications, continued

Fuel Tank Capacity, L (gal.)	Est. Fuel Supply Hours at 60 Hz with Full Load (nominal)	Max. Dimensions, mm (in.)			Max. Weight, † kg (lb.)	Fuel Tank Height, mm (in.)	Sound Pressure Level at 60 Hz with Full Load, dB(A) ‡
		Length	Width §	Height			
KD2000/2250/2500 SL1 Sound Enclosure with Internal Silencers and State Code Subbase Fuel Tank *							
Lifting Base	0	10774 (424)	3488 (137)	4141 (163)	33073 (72909)	—	90
8577 (2266)	15/14/13	11465 (451)		4522 (178)	40485 (89252)	381 (15)	
14130 (3733)	25/22/22			4700 (185)	41216 (90861)	559 (22)	
16451 (4346)	29/26/25			4776 (188)	41497 (91483)	635 (25)	
KD2000/2250/2500 SL2 Sound Enclosure with Internal Silencer and State Code Subbase Fuel Tank *							
Lifting Base	0	12766 (503)	3488 (137)	4141 (163)	35121 (77426)	—	78
8577 (2266)	15/14/13	13491 (531)		4522 (178)	42533 (93766)	381 (15)	
14130 (3733)	25/22/22			4700 (185)	43264 (95378)	559 (22)	
16451 (4346)	29/26/25			4776 (188)	43545 (95997)	635 (25)	
KD2500-4 SL2 Sound Enclosure with Internal Silencer and State Code Subbase Fuel Tank ▲⁂							
14130 (3733)	21	13491 (531)	3488 (137)	4907 (193)	43583 (96084)	559 (22)	78

* Data in table is for reference only. Height includes enclosure, lift base, and tank (if equipped). Refer to your authorized Kohler distributor for enclosure and sub-base fuel tank specification details.

▲ Tier 4 generator enclosure height includes the lift base, tank, and enclosure up to the exhaust flange. The height does not include the exhaust collector, SCR, or the SCR inlet and outlet pipes.

⁂ Tier 4 generator enclosure weight includes the DEF tank but does not include the exhaust collector, SCR, or SCR inlet and outlet pipes.

† Max. weight includes the generator set (wet) with the largest alternator option, enclosure, silencers, lift base, and tank (no fuel).

‡ Log average sound pressure level of 8 measured positions around the perimeter of the unit at a distance of 7 m (23 ft.). Refer to TIB-114 for details. Enclosed generator set sound data for some models was not available at time of print.

§ An additional 940 mm (37 inches) of clearance on each side for opening and closing the access doors is recommended.

NOTE: If the Est. Fuel Supply Hours column shows more than one number, the numbers represent each model in that range.

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Enclosure and Subbase Fuel Tank Specifications, continued

Fuel Tank Capacity, L (gal.)	Est. Fuel Supply Hours at 60 Hz with Full Load (nominal)	Max. Dimensions, mm (in.)			Max. Weight, † kg (lb.)	Fuel Tank Height, mm (in.)	Sound Pressure Level at 60 Hz with Full Load, dB(A) ‡
		Length	Width §	Height			
KD2000/2250/2500 SL1 Sound Enclosure with Internal Silencers and State Code Subbase Fuel Tank *							
Lifting Base	0	10774 (424)	3488 (137)	4141 (163)	33073 (72909)	—	90
8577 (2266)	15/14/13	11465 (451)		4522 (178)	40485 (89252)	381 (15)	
14130 (3733)	25/22/22			4700 (185)	41216 (90861)	559 (22)	
16451 (4346)	29/26/25			4776 (188)	41497 (91483)	635 (25)	
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Lifting Base	0	12766 (503)	3488 (137)	4141 (163)	35121 (77426)	—	78
8577 (2266)	15/14/13	13491 (531)		4522 (178)	42533 (93766)	381 (15)	
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16451 (4346)	29/26/25			4776 (188)	43545 (95997)	635 (25)	
KD2500-4 SL2 Sound Enclosure with Internal Silencer and State Code Subbase Fuel Tank ▲⁂							
14130 (3733)	21	13491 (531)	3488 (137)	4907 (193)	43583 (96084)	559 (22)	78

***** Data in table is for reference only. Height includes enclosure, lift base, and tank (if equipped). Refer to your authorized Kohler distributor for enclosure and sub-base fuel tank specification details.

▲ Tier 4 generator enclosure height includes the lift base, tank, and enclosure up to the exhaust flange. The height does not include the exhaust collector, SCR, or the SCR inlet and outlet pipes.

⁂ Tier 4 generator enclosure weight includes the DEF tank but does not include the exhaust collector, SCR, or SCR inlet and outlet pipes.

† Max. weight includes the generator set (wet) with the largest alternator option, enclosure, silencers, lift base, and tank (no fuel).

‡ Log average sound pressure level of 8 measured positions around the perimeter of the unit at a distance of 7 m (23 ft.). Refer to TIB-114 for details. Enclosed generator set sound data for some models was not available at time of print.

§ An additional 940 mm (37 inches) of clearance on each side for opening and closing the access doors is recommended.

NOTE: If the Est. Fuel Supply Hours column shows more than one number, the numbers represent each model in that range.

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Time	Leq	Primary Noise Source		Truck Type
	Leq		Activity	
8:17:48	71.9	Truck repositioning container	truck passing	HD
8:18:48	70.7	Truck repositioning container	truck passing	HD
8:19:48	66.8	Truck repositioning container	truck passing	HD
8:20:48	65.1	Employees loading containers	Ambient	
8:21:48	73.8	Truck dropping off trailer	truck passing	HD
8:22:48	70.9	Truck backing up, hitching trailer in lot	idle	HD
8:23:48	70.3	Truck backing up, hitching trailer in lot	idle	HD
8:24:48	54.6	Backup alarms from truck	backup alarm	HD
8:25:48	65.8	Backup alarms from truck	backup alarm	HD
8:26:48	63.9	Backup alarms from truck	backup alarm	HD
8:27:48	72.9	Truck entering, picking up trailer in lot	truck passing	HD
8:28:48	65.6	Truck entering, picking up trailer in lot	idle	HD
8:29:48	57.3	Truck entering, picking up trailer in lot	idle	HD
8:30:48	65.6	Truck entering, backing into dock	truck passing	HD
8:31:48	60.9	Truck entering, backing into dock	truck passing	HD
8:32:48	72.6	Truck entering without trailer	truck passing	HD
8:33:48	68.6	Truck backing up and hitching trailer in lot	idle	HD
8:34:48	71.4	Truck backing up and hitching trailer in lot	idle	HD
8:35:48	78.0	Truck hitching trailer right in front of meter	truck passing	HD
8:36:48	78.2	Truck hitching trailer right in front of meter	truck passing	HD
8:37:48	74.0	Truck hitching trailer right in front of meter, truck idling	idle	HD
8:38:48	66.5	Truck idling while other truck hitches trailer	idle	HD
8:39:48	67.8	Truck leaving with trailer	truck passing	HD
8:40:48	65.8	Different truck leaving with trailer	truck passing	HD
8:41:48	58.4	Noise from loading dock interiors	Ambient	
8:42:48	73.1	Truck leaving with trailer	truck passing	HD
8:43:48	62.9	Noise from loading dock interiors	Ambient	HD
8:44:48	69.2	Truck hitching trailer from lot and leaving	idle	HD
8:45:48	70.0	Truck hitching trailer from lot and leaving	idle	HD
8:46:48	68.4	Truck hitching trailer from lot and leaving	truck passing	HD
8:47:48	70.2	Truck entering with trailer, truck leaving with trailer	truck passing	HD
8:48:48	67.6	Truck entering, idling near meter	idle	HD
8:49:48	66.7	Truck entering, idling near meter	idle	HD
8:50:48	68.7	Truck entering, idling near meter	idle	HD
8:51:48	69.4	Truck entering with trailer	truck passing	HD
8:52:48	77.7	Truck leaving without trailer, followed by truck leaving with trailer	truck passing	HD
8:53:48	66.1	Truck entering without trailer	truck passing	HD
8:54:48	60.5	Backup alarms from truck at dock	backup alarm	HD
8:55:48	63.6	Backup alarms from truck repositioning trailers in lot	backup alarm	HD
8:56:48	71.8	Truck hitching trailer from lot	idle	HD
8:57:48	63.8	Truck idling	idle	HD
8:58:48	62.9	Truck idling	idle	HD
8:59:48	61.8	Truck idling	idle	HD
9:00:48	62.5	Truck idling	idle	HD
9:01:48	72.0	Truck leaving with trailer	truck passing	HD
9:02:48	53.3	Minimal activity	Ambient	HD
9:03:48	49.4	Minimal activity	Ambient	HD
9:04:48	66.0	Passenger car leaving	Ambient	LDA
9:05:48	56.6	Noise from loading dock interiors	Ambient	HD
9:06:48	61.9	Noise from loading dock interiors	Ambient	HD
9:07:48	71.2	Truck entering without trailer	truck passing	HD
9:08:48	63.3	Backup alarms	backup alarm	HD
9:09:48	64.5	Backup alarms	backup alarm	HD
9:10:48	65.7	Backup alarms	backup alarm	HD
9:11:48	66.2	Backup alarms	backup alarm	HD
9:12:48	64.4	Backup alarms	backup alarm	HD
9:13:48	71.0	Truck repositioning container and leaving	truck passing	HD
9:14:48	61.2	Airplane overhead	Ambient	
9:15:48	59.1	Minimal activity	Ambient	
9:16:48	55.0	Minimal activity	Ambient	
9:17:48	55.8	Minimal activity	Ambient	

Leq	Activity	Dist	at 50'
71.9	truck passing	25	68.9
70.7	truck passing	75	72.4
66.8	truck passing	25	63.8
73.8	truck passing	25	70.7
72.9	truck passing	25	69.9
65.6	truck passing	25	62.6
60.9	truck passing	25	57.8
72.6	truck passing	25	69.6
78.0	truck passing	30	75.8
78.2	truck passing	30	75.9
67.8	truck passing	25	64.8
65.8	truck passing	25	62.8
73.1	truck passing	25	70.1
68.4	truck passing	25	65.4
70.2	truck passing	25	67.2
69.4	truck passing	25	66.4
77.7	truck passing	25	74.7
66.1	truck passing	25	63.1
72.0	truck passing	25	69.0
71.2	truck passing	25	68.2
71.0	truck passing	75	72.8
		Avg at 50'	70.4

Leq	Activity	Dist	at 50'
70.9	idle	45	70.4
70.3	idle	45	69.8
65.6	idle	75	67.3
57.3	idle	75	59.1
68.6	idle	100	71.6
71.4	idle	100	74.4
74.0	idle	30	71.8
66.5	idle	25	63.5
69.2	idle	50	69.2
70.0	idle	25	67.0
67.6	idle	25	64.5
66.7	idle	25	63.6
68.7	idle	25	65.7
71.8	idle	75	73.5
63.8	idle	75	65.5
62.9	idle	75	64.7
61.8	idle	75	63.6
62.5	idle	75	64.3
		Avg at 50'	69.0

Leq	Activity	Dist	at 50'
54.6	backup alarm	190	60.4
65.8	backup alarm	120	69.6
63.9	backup alarm	120	67.7
60.5	backup alarm	120	64.3
63.6	backup alarm	150	68.4
63.3	backup alarm	120	67.1
64.5	backup alarm	120	68.3
65.7	backup alarm	120	69.5
66.2	backup alarm	120	70.0
64.4	backup alarm	120	68.2
		Avg at 50'	68.0
			Idle + backup alarm = dock area noise
			71.5

Unit Report For RTU-60

Project: ~Untitled35 03/26/2020
Prepared By: Richard Medina 08:33AM

Unit Parameters

Unit Model: **48GCLM06A2A5-0A0A0**
Unit Size: **06 (5 Tons)**
Volts-Phase-Hertz: **208-3-60**
Heating Type: **Gas**
Duct Cfg: **Vertical Supply / Vertical Return**
Low Nox, Low Heat
Two Stage Cooling Models

Dimensions (ft. in.) & Weight (lb.) ***

Unit Length: **6' 2.375"**
Unit Width: **3' 10.625"**
Unit Height: **3' 5.375"**
*** Total Operating Weight: **600** lb

*** Weights and Dimensions are approximate. Weight does not include unit packaging. Approximate dimensions are provided primarily for shipping purposes. For exact dimensions and weights, refer to appropriate product data catalog.

Unit Configuration

Direct Drive - EcoBlue - Medium Static
Al/Cu - Al/Cu
Base controls set up for field installed air management devices
Standard Packaging

Warranty Information

1-Year parts(std.)
5-Year compressor parts(std.)
Complete Unit 1st Year Carrier CCS Labor
Complete Unit Year 2 Parts Only

NOTE: Please see Warranty Catalog 500-089 for explanation of policies and ordering methods.

Ordering Information

Part Number	Description	Quantity
48GCLM06A2A5-0A0A0	Rooftop Unit	1
	Base Unit	
	Direct Drive - EcoBlue - Medium Static	
	Electromechanical control, No intake or exhaust option.	

Performance Summary For RTU-60

Project: ~Untitled35 03/26/2020
Prepared By: Richard Medina 08:33AM

Part Number:48GCLM06A2A5-0A0A0

ARI SEER:	**16.00**	

Base Unit Dimensions

Unit Length:	**74.4**	in
Unit Width:	**46.6**	in
Unit Height:	**41.4**	in

Operating Weight

Base Unit Weight:	**600**	lb
Total Operating Weight:	**600**	lb

Unit

Unit Voltage-Phase-Hertz:	**208-3-60**	
Air Discharge:	**Vertical**	
Fan Drive Type:	**Direct**	
Actual Airflow:	**2000**	CFM
Site Altitude:	**0**	ft

Cooling Performance

Condenser Entering Air DB:	**95.0**	F
Evaporator Entering Air DB:	**80.0**	F
Evaporator Entering Air WB:	**67.0**	F
Entering Air Enthalpy:	**31.44**	BTU/lb
Evaporator Leaving Air DB:	**57.6**	F
Evaporator Leaving Air WB:	**57.1**	F
Evaporator Leaving Air Enthalpy:	**24.44**	BTU/lb
Gross Cooling Capacity:	**63.00**	MBH
Gross Sensible Capacity:	**48.32**	MBH
Compressor Power Input:	**4.11**	kW
Coil Bypass Factor:	**0.047**	

Heating Performance

Heating Airflow:	**2000**	CFM
Entering Air Temp:	**70.0**	F
Leaving Air Temp:	**92.2**	F
Gas Heating Input Capacity:	**50.0 / 60.0**	MBH
Gas Heating Output Capacity:	**40.0 / 48.0**	MBH
Temperature Rise:	**22.2**	F
Thermal Efficiency (%):	**81.0**	

Supply Fan

External Static Pressure:	**0.50**	in wg
Fan RPM:	**1888**	
Fan Power:	**0.71**	BHP
NOTE:	**Selected IFM RPM Range: 239 - 2390**	

Electrical Data

Voltage Range:	**187 - 253**
Compressor #1 RLA:	**16.2**
Compressor #1 LRA:	**110**
Indoor Fan Motor Type:	**MED**
Indoor Fan Motor FLA:	**8.6**
Combustion Fan Motor FLA (ea):	**0.48**
Power Supply MCA:	**31**
Power Supply MOCP (Fuse or HACR):	**45**
Disconnect Size FLA:	**30**
Disconnect Size LRA:	**126**
Electrical Convenience Outlet:	**None**

Outdoor Fan [Qty / FLA (ea)]: **1 / 1.5**

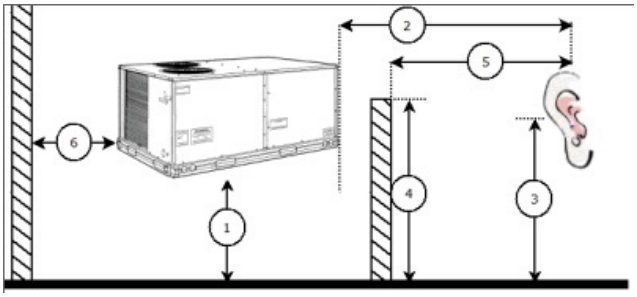
Control Panel SCCR: 5kA RMS at Rated Symmetrical Voltage

Acoustics

Sound Power Levels, db re 10E-12 Watts

	Discharge	Inlet	Outdoor
63 Hz	89.6	87.1	85.6
125 Hz	80.4	76.5	84.7
250 Hz	74.4	70.2	80.5
500 Hz	71.7	63.0	76.0
1000 Hz	67.9	65.8	72.4
2000 Hz	65.5	57.1	68.0
4000 Hz	62.1	50.2	62.8
8000 Hz	58.8	45.0	59.3
A-Weighted	74.7	69.7	79.0

Advanced Acoustics



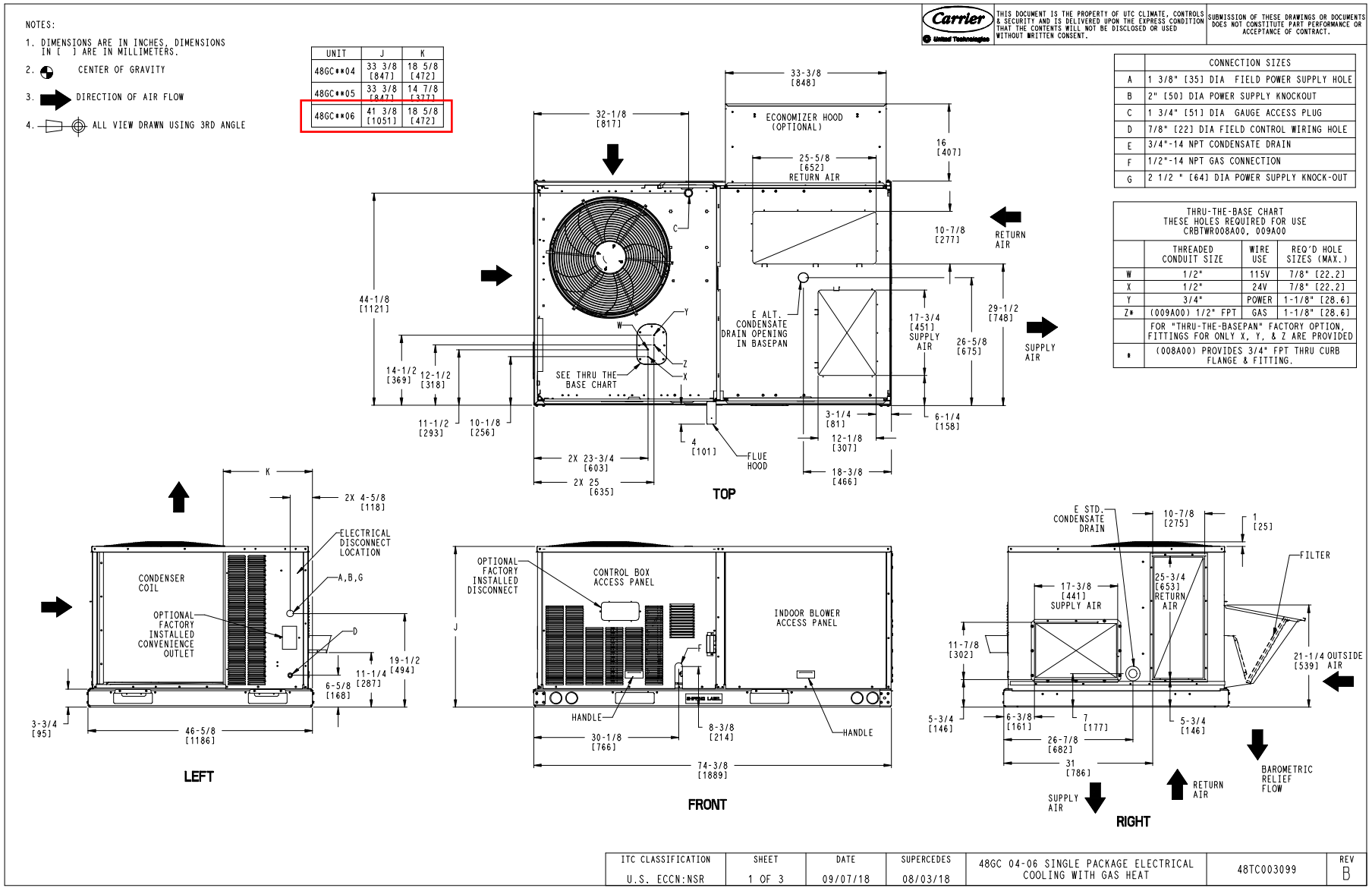
Advanced Accoustics Parameters

1. Unit height above ground: **30.0** ft
2. Horizontal distance from unit to receiver: **50.0** ft
3. Receiver height above ground: **5.7** ft
4. Height of obstruction: **0.0** ft
5. Horizontal distance from obstruction to receiver: **0.0** ft
6. Horizontal distance from unit to obstruction: **0.0** ft

Detailed Acoustics Information

Octave Band Center Freq. Hz	63	125	250	500	1k	2k	4k	8k	Overall
A	85.6	84.7	80.5	76.0	72.4	68.0	62.8	59.3	89.2 Lw
B	59.4	68.6	71.9	72.8	72.4	69.2	63.8	58.2	78.5 LwA
C	53.2	52.3	48.1	43.6	40.0	35.6	30.4	26.9	56.8 Lp
D	27.0	36.2	39.5	40.4	40.0	36.8	31.4	25.8	46.1 LpA

Legend
A Sound Power Levels at Unit's Acoustic Center, Lw
B A-Weighted Sound Power Levels at Unit's Acoustic Center, LwA
C Sound Pressure Levels at Specific Distance from Unit, Lp
D A-Weighted Sound Pressure Levels at Specific Distance from Unit, LpA


NOTES:
1. DIMENSIONS ARE IN INCHES. DIMENSIONS IN [ ] ARE IN MILLIMETERS.
2. CENTER OF GRAVITY
3. DIRECTION OF AIR FLOW
4. ALL VIEW DRAWN USING 3RD ANGLE
Carrier
United Technologies
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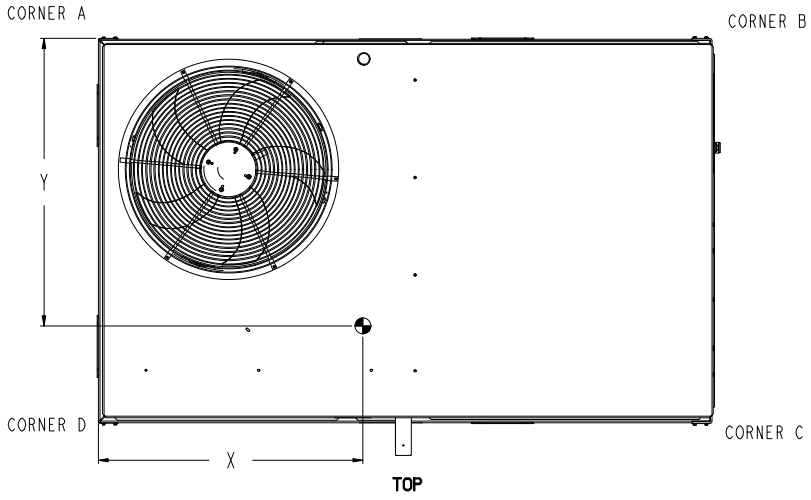
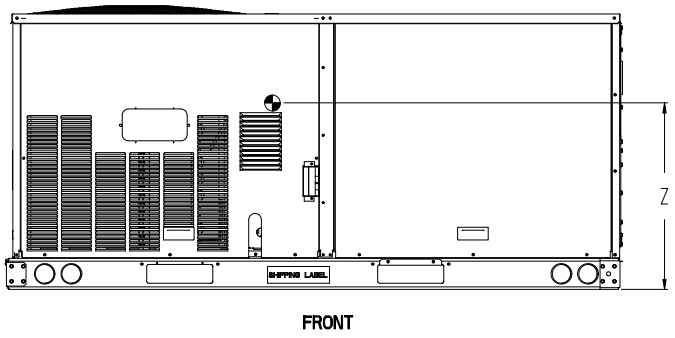
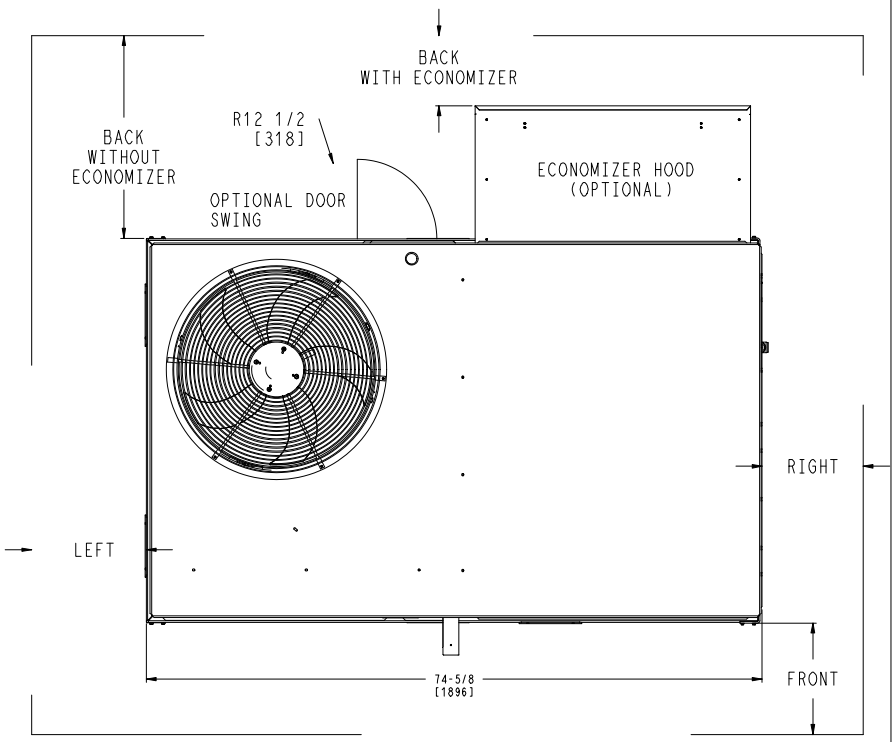
SUBMISSION OF THESE DRAWINGS OR DOCUMENTS DOES NOT CONSTITUTE PART PERFORMANCE OR ACCEPTANCE OF CONTRACT.
UNIT | J | K
48GC**04 | 33 3/8 [847] | 18 5/8 [472]
48GC**05 | 33 3/8 [847] | 14 7/8 [377]
48GC**06 | 41 3/8 [1051] | 18 5/8 [472]
CONNECTION SIZES
A | 1 3/8" [35] DIA FIELD POWER SUPPLY HOLE
B | 2" [50] DIA POWER SUPPLY KNOCKOUT
C | 1 3/4" [51] DIA GAUGE ACCESS PLUG
D | 7/8" [22] DIA FIELD CONTROL WIRING HOLE
E | 3/4"-14 NPT CONDENSATE DRAIN
F | 1/2"-14 NPT GAS CONNECTION
G | 2 1/2 " [64] DIA POWER SUPPLY KNOCK-OUT
THRU-THE-BASE CHART
THESE HOLES REQUIRED FOR USE CRBTWR008A00, 009A00
THREADED CONDUIT SIZE | WIRE USE | REQ'D HOLE SIZES (MAX.)
W | 1/2" | 115V | 7/8" [22.2]
X | 1/2" | 24V | 7/8" [22.2]
Y | 3/4" | POWER | 1-1/8" [28.6]
Z* | (009A00) 1/2" FPT | GAS | 1-1/8" [28.6]
FOR "THRU-THE-BASEPAN" FACTORY OPTION, FITTINGS FOR ONLY X, Y, & Z ARE PROVIDED
* (008A00) PROVIDES 3/4" FPT THRU CURB FLANGE & FITTING.
33-3/8 [848]
32-1/8 [817]
ECONOMIZER HOOD (OPTIONAL)
25-5/8 [652] RETURN AIR
16 [407]
10-7/8 [277]
RETURN AIR
44-1/8 [1121]
E ALT. CONDENSATE DRAIN OPENING IN BASEPAN
17-3/4 [451] SUPPLY AIR
29-1/2 [748]
26-5/8 [675]
SUPPLY AIR
14-1/2 [369]
12-1/2 [318]
SEE THRU THE BASE CHART
11-1/2 [293]
10-1/8 [256]
3-1/4 [81]
6-1/4 [158]
12-1/8 [307]
4 [101]
FLUE HOOD
2X 23-3/4 [603]
2X 25 [635]
18-3/8 [466]
TOP
K
2X 4-5/8 [118]
ELECTRICAL DISCONNECT LOCATION
A,B,G
CONDENSER COIL
OPTIONAL FACTORY INSTALLED CONVENIENCE OUTLET
D
19-1/2 [494]
11-1/4 [287]
6-5/8 [168]
3-3/4 [95]
46-5/8 [1186]
LEFT
OPTIONAL FACTORY INSTALLED DISCONNECT
CONTROL BOX ACCESS PANEL
INDOOR BLOWER ACCESS PANEL
J
HANDLE
30-1/8 [766]
8-3/8 [214]
HANDLE
74-3/8 [1889]
FRONT
E STD. CONDENSATE DRAIN
10-7/8 [275]
1 [25]
FILTER
17-3/8 [441] SUPPLY AIR
25-3/4 [653] RETURN AIR
11-7/8 [302]
21-1/4 OUTSIDE [539] AIR
5-3/4 [146]
6-3/8 [161]
7 [177]
5-3/4 [146]
26-7/8 [682]
31 [786]
RETURN AIR
BAROMETRIC RELIEF FLOW
SUPPLY AIR
RIGHT
ITC CLASSIFICATION: U.S. ECCN:NSR
SHEET: 1 OF 3
DATE: 09/07/18
SUPERCEDES: 08/03/18
48GC 04-06 SINGLE PACKAGE ELECTRICAL COOLING WITH GAS HEAT
48TC003099
REV: B

UNIT	STD. UNIT WEIGHT *		CORNER WEIGHT (A)		CORNER WEIGHT (B)		CORNER WEIGHT (C)		CORNER WEIGHT (D)		C.G.		HEIGHT
	LBS.	KG.	LBS.	KG.	LBS.	KG.	LBS.	KG.	LBS.	KG.	X	Y	Z
48GC**04	513	233	131	59	127	58	125	57	130	59	36 1/2 [927]	23 1/4 [591]	18 1/4 [464]
48GC**05	555	252	142	64	137	62	135	61	141	64	36 1/2 [927]	23 1/4 [591]	18 [457]
48GC**06	600	272	161	73	151	68	140	64	149	68	36 [914]	22 1/2 [572]	19 3/8 [492]

*- STANDARD UNIT WEIGHT IS WITH LOW GAS HEAT AND WITHOUT PACKAGING.
FOR OTHER OPTINS AND ACCESSORIES REFER TO THE PRODUCT DATA CATALOG.





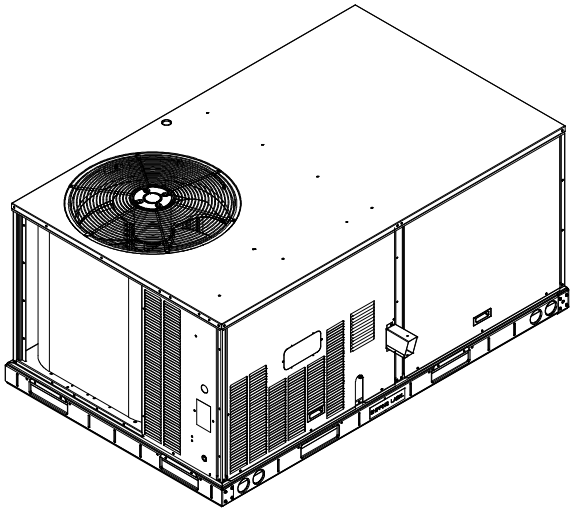


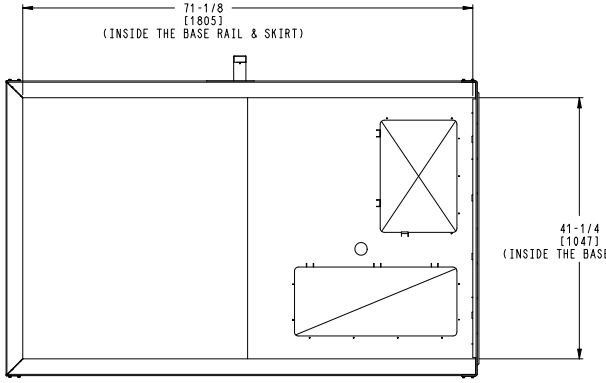
NOTES:

1. FOR ALL MINIMUM CLEARANCES LOCAL CODES OR JURISDICTIONS MAY PREVAIL.

	CLEARANCE		
	SERVICE WITH:	SERVICE WITH:	OPERATING
SURFACE	CONDUCTIVE BARRIER	NONCONDUCTIVE BARRIER	CLEARANCE
FRONT	48 [1219mm]	36 [914mm]	18 [457mm]
LEFT	48 [1219mm]	42 [1067mm]	18 [457mm]
BACK	48 [1219mm]	42 [1067mm]	18 [457mm]
BACK W/HOOD	36 [914mm]	36 [914mm]	18 [457mm]
RIGHT	36 [914mm]	36 [914mm]	18 [457mm]
TOP	72 [1829mm]	72 [1829mm]	72 [1829mm]

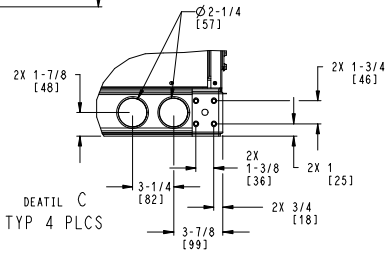
ITC CLASSIFICATION	SHEET	DATE	SUPERCEDES			REV
U.S. ECCN:NSR	2 OF 3	09/07/18	08/03/18	48GC 04-06 SINGLE PACKAGE ELECTRICAL COOLING WITH GAS HEAT	48TC003099	B

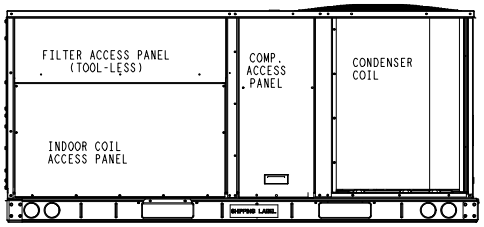




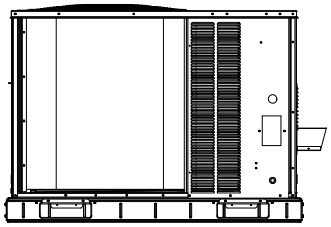
INSIDE BASERAIL DIMENSIONS

BOTTOM

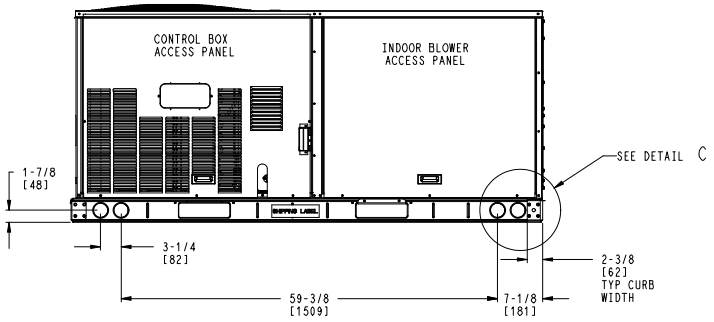




BACK



LEFT

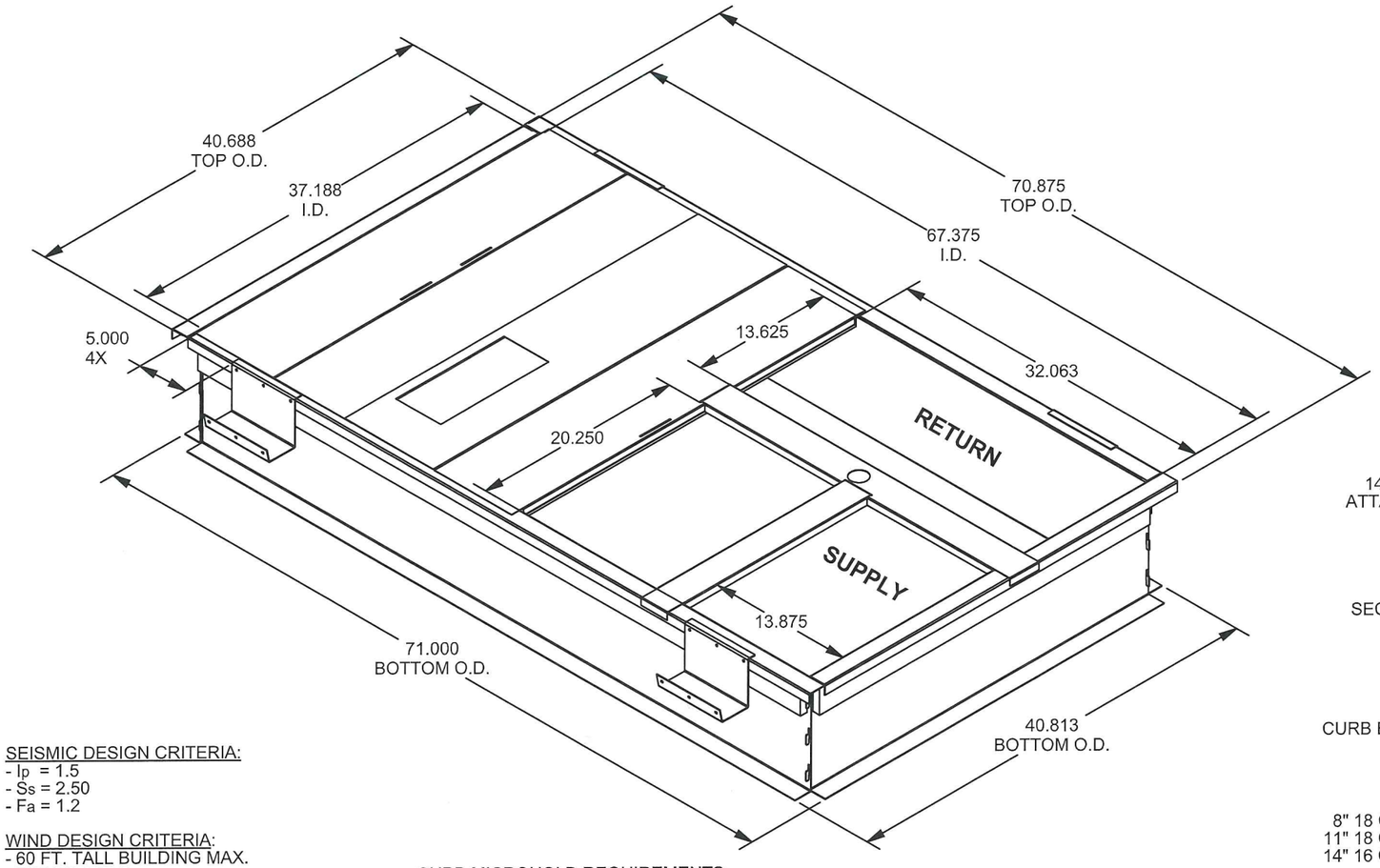


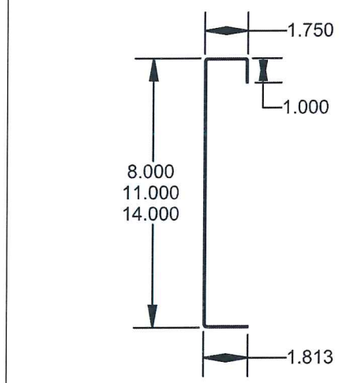
FRONT

ITC CLASSIFICATION	SHEET	DATE	SUPERCEDES			REV
U.S. ECCN:NSR	3 OF 3	09/07/18	08/03/18	48GC 04-06 SINGLE PACKAGE ELECTRICAL COOLING WITH GAS HEAT	48TC003099	B

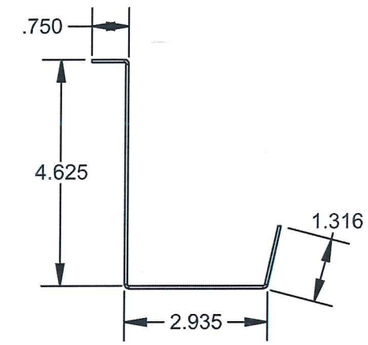
RTU-60

FORM NO.: _____





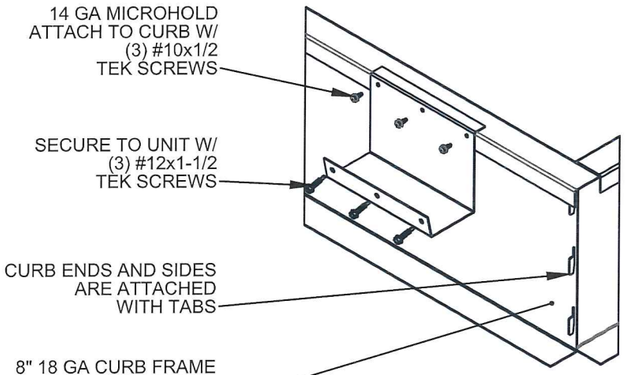
CURB END DETAIL

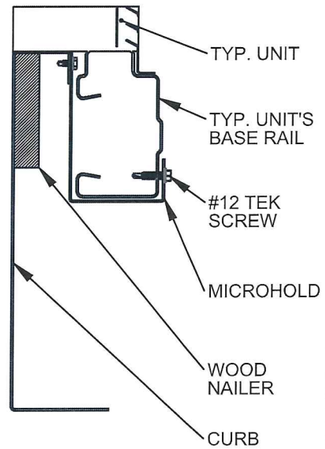


MICROHOLD DETAIL

KNOCK DOWN CURB CORNER DETAIL

UNIT TO CURB ATTACHMENT DETAIL





SEISMIC DESIGN CRITERIA:
- I_p = 1.5
- S_s = 2.50
- F_a = 1.2

WIND DESIGN CRITERIA:
- 60 FT. TALL BUILDING MAX.
- EXPOSURE C
- 155 MPH, 3-SECOND GUST WIND SPEED
- RISK CATEGORY III & IV

CURB MICROHOLD REQUIREMENTS:
- (2) MICROHOLDS PER LONG SIDE
- (0) MICROHOLDS PER SHORT SIDE

THE STANDARD PRODUCT DOES NOT INCLUDE THROUGH THE SIDE SERVICE HOLES

MicroMetl Corporation

CRBK-SRT12GA-08 Series	08" TALL	69 LBS.
CRBK-SRT12GA-11 Series	11" TALL	87 LBS.
CRBK-SRT12GA-14 Series	14" TALL	98 LBS.

STRUCTURALLY CALCULATED KNOCK DOWN CURB

MAX UNIT WEIGHT 1099 lbs.

Indianapolis, IN. : (800) 662-4822

Sparks, NV. (800) 884-4662

Longview, TX. (903) 248-4800

DRAWN BY: IR | DATE 08/20/2019

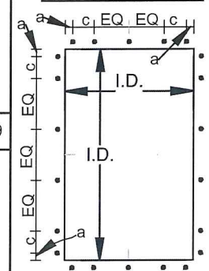
MEETS SEISMIC REQUIREMENTS FOR 2019 CBC & 2018 IBC

MEETS REQUIREMENTS FOR 155 MPH, 60' BUILDING HEIGHT MAX. 3 SEC. GUST, EXP C

ANCHORAGE DETAILS TO ROOF:

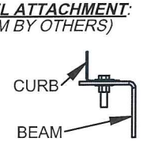
ALL DETAILS ARE CALCULATED USING THE SEISMIC DESIGN CRITERIA INDICATED ABOVE. FOR ANY OTHER TYPE OF ANCHORAGE THE EOR HAS THE OPTION TO CALCULATE THE ANCHORAGE USING SITE SPECIFIC PARAMETERS AND LOADS.

TYPICAL PLAN VIEW:

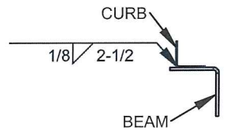


c = SPACING @ CORNER ANCHORS

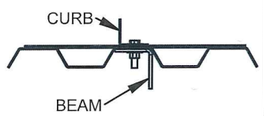
STEEL ATTACHMENT:
(BEAM BY OTHERS)



(12) A307 1/2" DIA. BOLTS, W/ WASHER CENTERED ON FLANGE
(1) EACH LONG SIDE
(1) EACH SHORT SIDE
(2) EACH CORNER
a = 2"
c = 6"



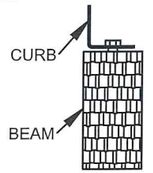
WELD OPTION:
(2.5") LONG 1/8" FILLET WELDS ARE PERMITTED TO BE USED IN PLACE OF EACH BOLT INDICATED BY THE STEEL ATTACHMENT DETAIL, EQUALLY SPACED



(12) A307 1/2" DIA. BOLTS, W/ WASHER CENTERED ON FLANGE
(1) EACH LONG SIDE
(1) EACH SHORT SIDE
(2) EACH CORNER
a = 2"
c = 6"

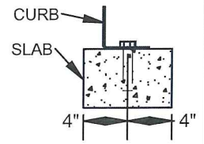
WOOD ATTACHMENT:
(REF. DOUGLAS FIR)

(34) 1/4" x 3" SIMPSON SDS W/ WASHER, CENTERED ON CURB FLANGE
(6) EACH LONG SIDE
(3) EACH SHORT SIDE
(4) EACH CORNER
a = 1"
c = 3"



CONCRETE ATTACHMENT:
(3000 PSI MINIMUM, 6" MINIMUM THICKNESS)
(4" MIN EDGE DISTANCE, 3-3/4" EMBEDDED)

(12) 1/2" SIMPSON TITEN HD CENTERED ON CURB FLANGE, 8" MINIMUN SPACING
(1) EACH LONG SIDE
(1) EACH SHORT SIDE
(2) EACH CORNER
a = 3"
c = 8"



REGISTERED PROFESSIONAL ENGINEER
CLIFFORD H. JOHNSON
No. 2802
Exp. 6-30-21
STRUCTURAL
STATE OF CALIFORNIA
8/27/19

BJG# 20190065

ENGS03A

Created: 1/6/2011 7:01:04 AM

PRINTED: 8/27/2019

Unit Report For RTU-72A,72B

Project: ~Untitled35 03/26/2020
Prepared By: Richard Medina 08:33AM

Unit Parameters

Unit Model: **48HCDD07A2A5-0A0G0**
Unit Size: **07 (6 Tons)**
Volts-Phase-Hertz: **208-3-60**
Heating Type: **Gas**
Duct Cfg: **Vertical Supply / Vertical Return**
Low Heat
Two stage cooling models

Dimensions (ft. in.) & Weight (lb.) ***

Unit Length: **7' 4.125"**
Unit Width: **4' 11.5"**
Unit Height: **3' 5.25"**
*** Total Operating Weight: **780** lb

*** Weights and Dimensions are approximate. Weight does not include unit packaging. Approximate dimensions are provided primarily for shipping purposes. For exact dimensions and weights, refer to appropriate product data catalog.

Lines and Filters

Gas Line Size: **1/2**
Condensate Drain Line Size: **3/4**
Return Air Filter Type: **Throwaway**
Return Air Filter Quantity: **4**
Return Air Filter Size: **16 x 20 x 2**

Unit Configuration

Medium Static Option - Belt Drive
Al/Cu - Al/Cu
Base Electromechanical Controls
Standard Packaging
2-Speed indoor fan motor controlled by VFD

Warranty Information

1-Year parts
5-Year compressor parts
10-Year heat exchanger - Aluminized
Complete Unit 1st Year Carrier CCS Labor
Complete Unit Year 2 Parts Only

NOTE: Please see Warranty Catalog 500-089 for explanation of policies and ordering methods.

Ordering Information

Part Number	Description	Quantity
48HCDD07A2A5-0A0G0	Rooftop Unit	2
	Base Unit	
	Medium Static Option - Belt Drive	
	None	
	2-Speed Indoor Fan (VFD) Controller	

Part Number:48HCDD07A2A5-0A0G0

ARI EER:	**12.00**	
IEER:	**16.0**	

Base Unit Dimensions

Unit Length:	**88.1**	in
Unit Width:	**59.5**	in
Unit Height:	**41.3**	in

Operating Weight

Base Unit Weight:	**765**	lb
Medium Static Option - Belt Drive:	**15**	lb
Total Operating Weight:	**780**	lb

Unit

Unit Voltage-Phase-Hertz:	**208-3-60**	
Air Discharge:	**Vertical**	
Fan Drive Type:	**Belt**	
Actual Airflow:	**2400**	CFM
Site Altitude:	**0**	ft

Cooling Performance

Condenser Entering Air DB:	**95.0**	F
Evaporator Entering Air DB:	**80.0**	F
Evaporator Entering Air WB:	**67.0**	F
Entering Air Enthalpy:	**31.44**	BTU/lb
Evaporator Leaving Air DB:	**58.1**	F
Evaporator Leaving Air WB:	**57.2**	F
Evaporator Leaving Air Enthalpy:	**24.52**	BTU/lb
Gross Cooling Capacity:	**74.74**	MBH
Gross Sensible Capacity:	**56.79**	MBH
Compressor Power Input:	**4.43**	kW
Coil Bypass Factor:	**0.112**	

Heating Performance

Heating Airflow:	**2400**	CFM
Entering Air Temp:	**70.0**	F
Leaving Air Temp:	**92.8**	F
Gas Heating Input Capacity:	**50.0 / 72.0**	MBH
Gas Heating Output Capacity:	**41.0 / 59.0**	MBH
Temperature Rise:	**22.8**	F
Thermal Efficiency (%):	**82.0**	

Supply Fan

External Static Pressure:	**0.50**	in wg
Fan RPM:	**650**	
Fan Power:	**0.98**	BHP
NOTE:	**The Selected Indoor Fan Motor requires a Field-Supplied Drive (RPM Range: 733 - 949).**	

Electrical Data

Voltage Range:	**187 - 253**
Compressor #1 RLA:	**17.5**
Compressor #1 LRA:	**136**
Indoor Fan Motor Type:	**MED**
Indoor Fan Motor FLA:	**8.4**
Combustion Fan Motor FLA (ea):	**0.48**
Power Supply MCA:	**34**
Power Supply MOCP (Fuse or HACR):	**50**
Disconnect Size FLA:	**33**

Disconnect Size LRA: **195**
Electrical Convenience Outlet: **None**
Outdoor Fan [Qty / FLA (ea)]: **2 / 1.5**

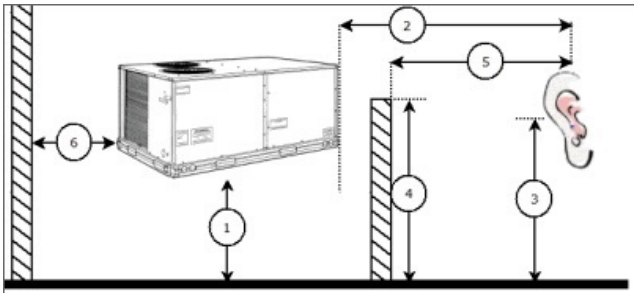
Control Panel SCCR: 5kA RMS at Rated Symmetrical Voltage

Acoustics

Sound Power Levels, db re 10E-12 Watts

	Discharge	Inlet	Outdoor
63 Hz	83.2	84.0	90.1
125 Hz	70.6	69.7	82.6
250 Hz	63.4	56.5	81.0
500 Hz	62.6	56.3	79.4
1000 Hz	56.8	56.1	77.0
2000 Hz	51.5	51.3	73.0
4000 Hz	49.6	45.4	70.4
8000 Hz	42.7	39.9	66.7
A-Weighted	64.4	62.4	82.0

Advanced Acoustics



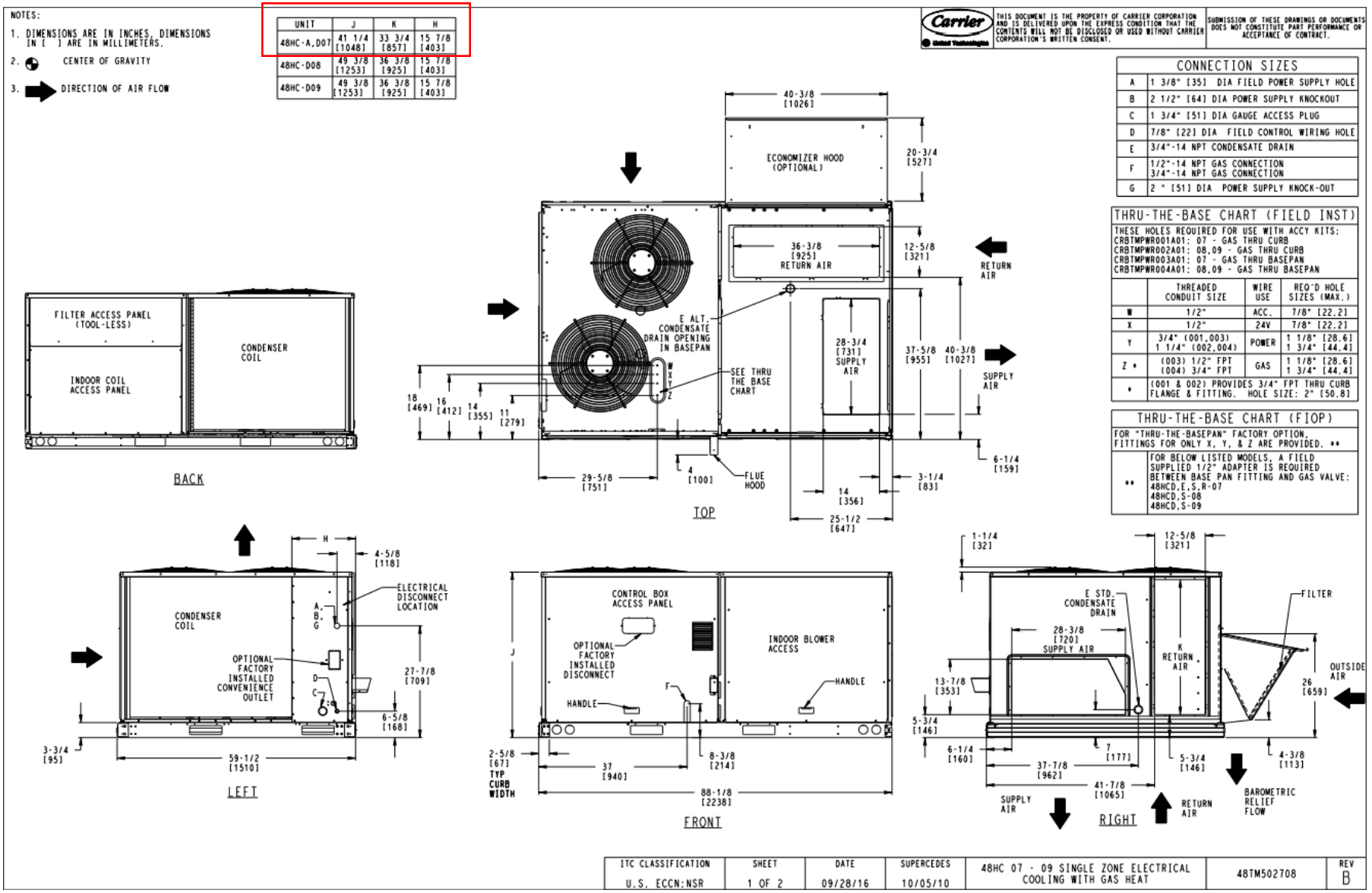
Advanced Accoustics Parameters

1. Unit height above ground: **30.0** ft
2. Horizontal distance from unit to receiver: **50.0** ft
3. Receiver height above ground: **5.7** ft
4. Height of obstruction: **0.0** ft
5. Horizontal distance from obstruction to receiver: **0.0** ft
6. Horizontal distance from unit to obstruction: **0.0** ft

Detailed Acoustics Information

Octave Band Center Freq. Hz	63	125	250	500	1k	2k	4k	8k	Overall
A	90.1	82.6	81.0	79.4	77.0	73.0	70.4	66.7	91.8 Lw
B	63.9	66.5	72.4	76.2	77.0	74.2	71.4	65.6	82.0 LwA
C	57.7	50.2	48.6	47.0	44.6	40.6	38.0	34.3	59.4 Lp
D	31.5	34.1	40.0	43.8	44.6	41.8	39.0	33.2	49.6 LpA

Legend
A Sound Power Levels at Unit's Acoustic Center, Lw
B A-Weighted Sound Power Levels at Unit's Acoustic Center, LwA
C Sound Pressure Levels at Specific Distance from Unit, Lp
D A-Weighted Sound Pressure Levels at Specific Distance from Unit, LpA


NOTES:
1. DIMENSIONS ARE IN INCHES, DIMENSIONS IN [ ] ARE IN MILLIMETERS.
2. CENTER OF GRAVITY
3. DIRECTION OF AIR FLOW
UNIT | J | K | H
48HC-A,D07 | 41 1/4 [1048] | 33 3/4 [857] | 15 7/8 [403]
48HC-D08 | 49 3/8 [1253] | 36 3/8 [925] | 15 7/8 [403]
48HC-D09 | 49 3/8 [1253] | 36 3/8 [925] | 15 7/8 [403]
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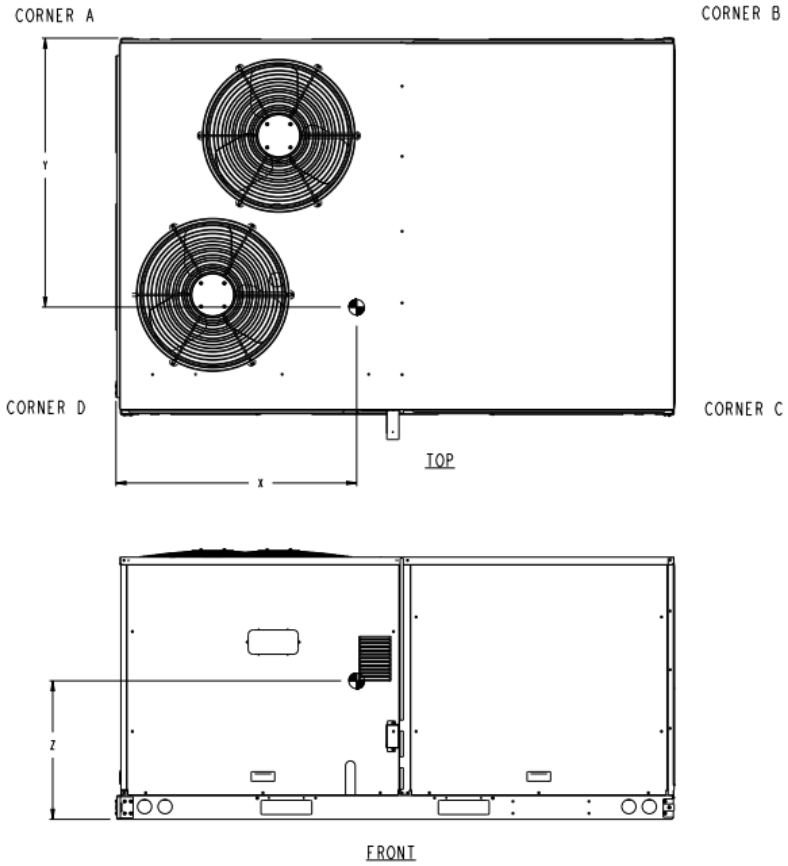
SUBMISSION OF THESE DRAWINGS OR DOCUMENTS DOES NOT CONSTITUTE PART PERFORMANCE OR ACCEPTANCE OF CONTRACT.
CONNECTION SIZES
A | 1 3/8" [35] DIA FIELD POWER SUPPLY HOLE
B | 2 1/2" [64] DIA POWER SUPPLY KNOCKOUT
C | 1 3/4" [51] DIA GAUGE ACCESS PLUG
D | 7/8" [22] DIA FIELD CONTROL WIRING HOLE
E | 3/4"-14 NPT CONDENSATE DRAIN
F | 1/2"-14 NPT GAS CONNECTION 3/4"-14 NPT GAS CONNECTION
G | 2 " [51] DIA POWER SUPPLY KNOCK-OUT
THRU-THE-BASE CHART (FIELD INST)
THESE HOLES REQUIRED FOR USE WITH ACCY KITS:
CRBTMPWR001A01: 07 - GAS THRU CURB
CRBTMPWR002A01: 08,09 - GAS THRU CURB
CRBTMPWR003A01: 07 - GAS THRU BASEPAN
CRBTMPWR004A01: 08,09 - GAS THRU BASEPAN
THREADED CONDUIT SIZE | WIRE USE | REQ'D HOLE SIZES (MAX.)
W | 1/2" | ACC. | 7/8" [22.2]
X | 1/2" | 24V | 7/8" [22.2]
Y | 3/4" (001,003) 1 1/4" (002,004) | POWER | 1 1/8" [28.6] 1 3/4" [44.4]
Z * | (003) 1/2" FPT (004) 3/4" FPT | GAS | 1 1/8" [28.6] 1 3/4" [44.4]
* | (001 & 002) PROVIDES 3/4" FPT THRU CURB FLANGE & FITTING. HOLE SIZE: 2" [50.8]
THRU-THE-BASE CHART (FIOP)
FOR "THRU-THE-BASEPAN" FACTORY OPTION, FITTINGS FOR ONLY X, Y, & Z ARE PROVIDED. **
** | FOR BELOW LISTED MODELS, A FIELD SUPPLIED 1/2" ADAPTER IS REQUIRED BETWEEN BASE PAN FITTING AND GAS VALVE: 48HCD,E,S,R-07 48HCD,S-08 48HCD,S-09
FILTER ACCESS PANEL (TOOL-LESS)
CONDENSER COIL
INDOOR COIL ACCESS PANEL
BACK
ECONOMIZER HOOD (OPTIONAL)
40-3/8 [1026]
20-3/4 [527]
36-3/8 [925] RETURN AIR
12-5/8 [321]
RETURN AIR
E ALT. CONDENSATE DRAIN OPENING IN BASEPAN
SEE THRU THE BASE CHART
28-3/4 [731] SUPPLY AIR
37-5/8 [955]
40-3/8 [1027]
SUPPLY AIR
18 [469]
16 [412]
14 [355]
11 [279]
29-5/8 [751]
4 [100]
FLUE HOOD
6-1/4 [159]
3-1/4 [83]
14 [356]
25-1/2 [647]
TOP
H
4-5/8 [118]
ELECTRICAL DISCONNECT LOCATION
CONDENSER COIL
OPTIONAL FACTORY INSTALLED CONVENIENCE OUTLET
27-7/8 [709]
6-5/8 [168]
3-3/4 [95]
59-1/2 [1510]
LEFT
CONTROL BOX ACCESS PANEL
OPTIONAL FACTORY INSTALLED DISCONNECT
INDOOR BLOWER ACCESS
HANDLE
HANDLE
J
2-5/8 [67] TYP CURB WIDTH
37 [940]
8-3/8 [214]
88-1/8 [2238]
FRONT
1-1/4 [32]
12-5/8 [321]
E STD. CONDENSATE DRAIN
FILTER
28-3/8 [720] SUPPLY AIR
K RETURN AIR
OUTSIDE AIR
26 [659]
13-7/8 [353]
5-3/4 [146]
6-1/4 [160]
7 [177]
37-7/8 [962]
41-7/8 [1065]
5-3/4 [146]
4-3/8 [113]
SUPPLY AIR
RETURN AIR
BAROMETRIC RELIEF FLOW
RIGHT
ITC CLASSIFICATION: U.S. ECCN:NSR
SHEET: 1 OF 2
DATE: 09/28/16
SUPERCEDES: 10/05/10
48HC 07 - 09 SINGLE ZONE ELECTRICAL COOLING WITH GAS HEAT
48TM502708
REV: B

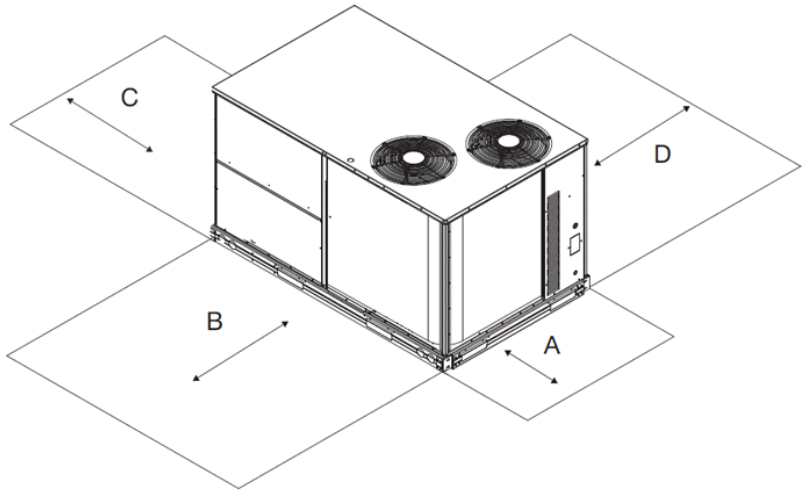
UNIT	STD. UNIT WEIGHT *		CORNER WEIGHT (A)		CORNER WEIGHT (B)		CORNER WEIGHT (C)		CORNER WEIGHT (D)		C.G.		
	LBS.	KG.	LBS.	KG.	LBS.	KG.	LBS.	KG.	LBS.	KG.	X	Y	Z
48HC-A,D07	765	347	165.3	75	152.7	69.3	214.7	97.4	232.3	105.4	42 3/8 [1076]	34 3/4 [882.6]	19 7/8 [505]
48HC-D08	925	419.5	204.1	92.6	190.9	86.6	256.1	116.2	273.9	124.2	42 5/8 [1082]	34 1/8 [867]	22 7/8 [581]
48HC-D09	925	419.5	204.1	92.6	190.9	86.6	256.1	116.2	273.9	124.2	42 5/8 [1082]	34 1/8 [867]	22 7/8 [581]

* STANDARD UNIT WEIGHT IS WITH LOW GAS HEAT AND WITHOUT PACKAGING.
FOR OTHER OPTIONS AND ACCESSORIES, REFER TO THE PRODUCT DATA CATALOG.



ITC CLASSIFICATION	SHEET	DATE	SUPERCEDES			REV
U.S. ECCN:NSR	2 OF 2	09/28/16	10/05/10	48HC 07 - 09 SINGLE ZONE ELECTRICAL COOLING WITH GAS HEAT	48TM502708	B

Service Clearance



C11247

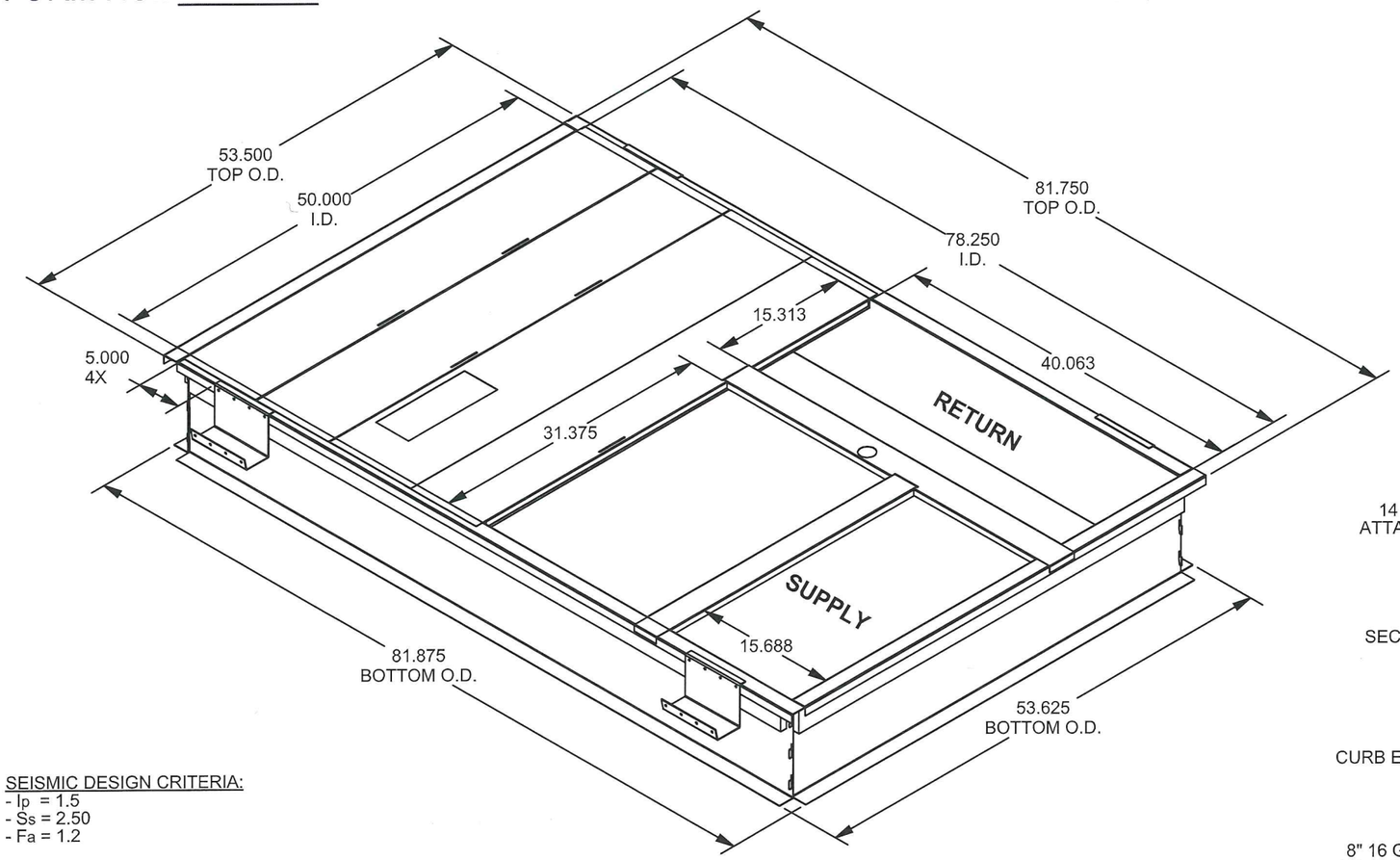
LOCATION	DIMENSION	CONDITION
A	48-in (1219 mm)	• Unit disconnect is mounted on panel
	36-in (914 mm)	• If dimension-B is 12-in (305 mm)
	18-in (457 mm)	• No disconnect, convenience outlet option • Recommended service clearance (use electric screwdriver)
	12-in (305 mm)	• Minimum clearance (use manual ratchet screwdriver)
B	36-in (914 mm)	• Unit has economizer
	12-in (305 mm)	• If dimension-A is 36-in (914 mm)
	Special	• Check for sources of flue products within 10-ft of unit fresh air intake hood
C	36-in (914 mm)	• Side condensate drain is used
	18-in (457 mm)	• Minimum clearance
D	48-in (1219 mm)	• No flue discharge accessory installed, surface is combustible material
	42-in (1067 mm)	• Surface behind servicer is grounded (e.g., metal, masonry wall, another unit)
	36-in (914 mm)	• Surface behind servicer is electrically non-conductive (e.g., wood, fiberglass)
	Special	• Check for adjacent units or building fresh air intakes within 10-ft of this unit's flue outlet

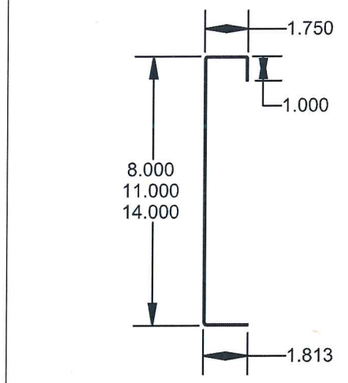
NOTE: Unit not designed to have overhead obstruction. Contact Application Engineering for guidance on any application planning overhead obstruction or vertical clearances.

Chassis 3-4a

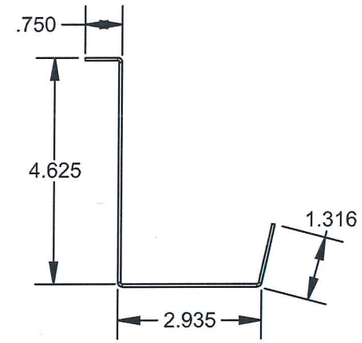
RTU-72A, 72B

FORM NO.: _____





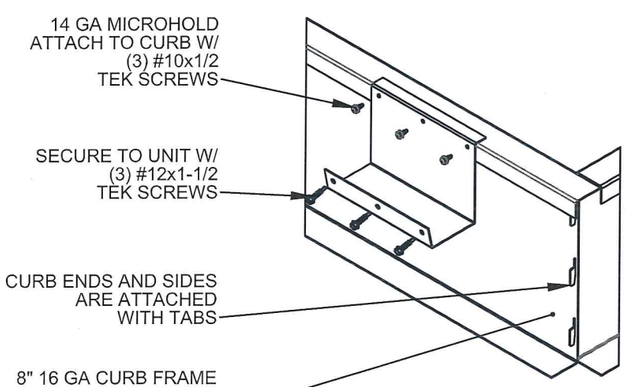
CURB END DETAIL

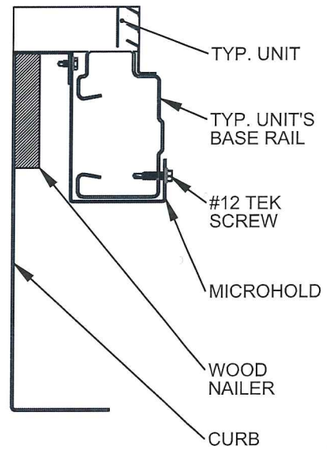


MICROHOLD DETAIL

KNOCK DOWN CURB CORNER DETAIL

UNIT TO CURB ATTACHMENT DETAIL





SEISMIC DESIGN CRITERIA:
- Ip = 1.5
- Ss = 2.50
- Fa = 1.2

WIND DESIGN CRITERIA:
- 60 FT. TALL BUILDING MAX.
- EXPOSURE C
- 155 MPH, 3-SECOND GUST WIND SPEED
- RISK CATEGORY III & IV

CURB MICROHOLD REQUIREMENTS:
- (2) MICROHOLDS PER LONG SIDE
- (0) MICROHOLDS PER SHORT SIDE

THE STANDARD PRODUCT DOES NOT INCLUDE THROUGH THE SIDE SERVICE HOLES

MicroMetl Corporation

CRBK-SRT34GA-08 Series	08" TALL	96 LBS.
CRBK-SRT34GA-11 Series	11" TALL	110 LBS.
CRBK-SRT34GA-14 Series	14" TALL	123 LBS.

STRUCTURALLY CALCULATED KNOCK DOWN CURB

MAX UNIT WEIGHT 1786 lbs.

Indianapolis, IN. : (800) 662-4822

Sparks, NV. (800) 884-4662

Longview, TX. (903) 248-4800

DRAWN BY: IR | DATE 08/20/2019

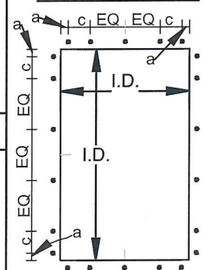
MEETS SEISMIC REQUIREMENTS FOR 2019 CBC & 2018 IBC

MEETS REQUIREMENTS FOR 155 MPH, 60' BUILDING HEIGHT MAX. 3 SEC. GUST, EXP C

ANCHORAGE DETAILS TO ROOF:

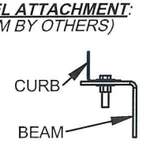
ALL DETAILS ARE CALCULATED USING THE SEISMIC DESIGN CRITERIA INDICATED ABOVE. FOR ANY OTHER TYPE OF ANCHORAGE THE EOR HAS THE OPTION TO CALCULATE THE ANCHORAGE USING SITE SPECIFIC PARAMETERS AND LOADS.

TYPICAL PLAN VIEW:

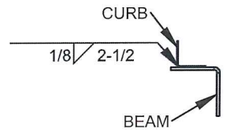


c = SPACING @ CORNER ANCHORS

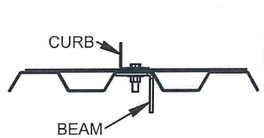
STEEL ATTACHMENT:
(BEAM BY OTHERS)



(12) A307 1/2" DIA. BOLTS, W/ WASHER CENTERED ON FLANGE
(1) EACH LONG SIDE
(1) EACH SHORT SIDE
(2) EACH CORNER
a = 2"
c = 6"



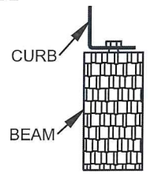
WELD OPTION:
(2.5") LONG 1/8" FILLET WELDS ARE PERMITTED TO BE USED IN PLACE OF EACH BOLT INDICATED BY THE STEEL ATTACHMENT DETAIL, EQUALLY SPACED



(12) A307 1/2" DIA. BOLTS, W/ WASHER CENTERED ON FLANGE
(1) EACH LONG SIDE
(1) EACH SHORT SIDE
(2) EACH CORNER
a = 2"
c = 6"

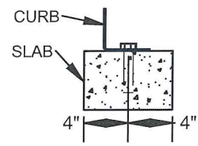
WOOD ATTACHMENT:
(REF. DOUGLAS FIR)

(38) 1/4" x 3" SIMPSON SDS W/ WASHER, CENTERED ON CURB FLANGE
(7) EACH LONG SIDE
(4) EACH SHORT SIDE
(4) EACH CORNER
a = 1"
c = 3"



CONCRETE ATTACHMENT:
(3000 PSI MINIMUM, 6" MINIMUM THICKNESS)
(4" MIN EDGE DISTANCE, 3-3/4" EMBEDDED)

(14) 1/2" SIMPSON TITEN HD CENTERED ON CURB FLANGE, 8" MINIMUN SPACING
(2) EACH LONG SIDE
(1) EACH SHORT SIDE
(2) EACH CORNER
a = 3"
c = 8"



REGISTERED PROFESSIONAL ENGINEER
CLIFFORD H. JOHNSON
No. 2602
Exp. 6-30-21
STRUCTURAL
STATE OF CALIFORNIA

8/27/19

BJG# 20190065

ENGS03A

Created: 1/6/2011 7:01:04 AM

PRINTED: 8/27/2019

Unit Report For RTU-60,90

Project: ~Untitled35 03/26/2020
Prepared By: Richard Medina 08:33AM

Unit Parameters

Unit Model: **48HCDD08A2A5-0A0G0**
Unit Size: **08 (7.5 Tons)**
Volts-Phase-Hertz: **208-3-60**
Heating Type: **Gas**
Duct Cfg: **Vertical Supply / Vertical Return**
Low Heat
Two stage cooling models

Dimensions (ft. in.) & Weight (lb.) ***

Unit Length: **7' 4.125"**
Unit Width: **4' 11.5"**
Unit Height: **4' 1.375"**
*** Total Operating Weight: **960** lb

*** Weights and Dimensions are approximate. Weight does not include unit packaging. Approximate dimensions are provided primarily for shipping purposes. For exact dimensions and weights, refer to appropriate product data catalog.

Lines and Filters

Gas Line Size: **1/2**
Condensate Drain Line Size: **3/4**
Return Air Filter Type: **Throwaway**
Return Air Filter Quantity: **4**
Return Air Filter Size: **20 x 20 x 2**

Unit Configuration

Medium Static Option - Belt Drive
Al/Cu - Al/Cu
Base Electromechanical Controls
Standard Packaging
2-Speed indoor fan motor controlled by VFD

Warranty Information

1-Year parts
5-Year compressor parts
10-Year heat exchanger - Aluminized
Complete Unit 1st Year Carrier CCS Labor
Complete Unit Year 2 Parts Only

NOTE: Please see Warranty Catalog 500-089 for explanation of policies and ordering methods.

Ordering Information

Part Number	Description	Quantity
48HCDD08A2A5-0A0G0	Rooftop Unit	2
	Base Unit	
	Medium Static Option - Belt Drive	
	None	
	2-Speed Indoor Fan (VFD) Controller	

Performance Summary For RTU-60,90

Project: ~Untitled35 03/26/2020
Prepared By: Richard Medina 08:33AM

Part Number:48HCDD08A2A5-0A0G0

ARI EER:	**12.00**	
IEER:	**13.8**	

Base Unit Dimensions

Unit Length:	**88.1**	in
Unit Width:	**59.5**	in
Unit Height:	**49.4**	in

Operating Weight

Base Unit Weight:	**925**	lb
Medium Static Option - Belt Drive:	**15**	lb
2-Speed Indoor Fan (VFD) Controller:	**20**	lb
Total Operating Weight:	**960**	lb

Unit

Unit Voltage-Phase-Hertz:	**208-3-60**	
Air Discharge:	**Vertical**	
Fan Drive Type:	**Belt**	
Actual Airflow:	**3000**	CFM
Site Altitude:	**0**	ft

Cooling Performance

Condenser Entering Air DB:	**95.0**	F
Evaporator Entering Air DB:	**80.0**	F
Evaporator Entering Air WB:	**67.0**	F
Entering Air Enthalpy:	**31.44**	BTU/lb
Evaporator Leaving Air DB:	**57.7**	F
Evaporator Leaving Air WB:	**57.2**	F
Evaporator Leaving Air Enthalpy:	**24.53**	BTU/lb
Gross Cooling Capacity:	**93.30**	MBH
Gross Sensible Capacity:	**72.19**	MBH
Compressor Power Input:	**6.24**	kW
Coil Bypass Factor:	**0.198**	

Heating Performance

Heating Airflow:	**3000**	CFM
Entering Air Temp:	**70.0**	F
Leaving Air Temp:	**101.8**	F
Gas Heating Input Capacity:	**90.0 / 125.0**	MBH
Gas Heating Output Capacity:	**73.0 / 103.0**	MBH
Temperature Rise:	**31.8**	F
Thermal Efficiency (%):	**82.0**	

Supply Fan

External Static Pressure:	**0.60**	in wg
Fan RPM:	**757**	
Fan Power:	**1.16**	BHP
NOTE:	**Selected IFM RPM Range: 690 - 936**	

Electrical Data

Voltage Range:	**187 - 253**
Compressor #1 RLA:	**13.6**
Compressor #1 LRA:	**83**
Compressor #2 RLA:	**13.6**
Compressor #2 LRA:	**83**
Indoor Fan Motor Type:	**MED**
Indoor Fan Motor FLA:	**7.1**
Combustion Fan Motor FLA (ea):	**0.48**

Power Supply MCA: **41**
Power Supply MOCP (Fuse or HACR): **50**
Disconnect Size FLA: **43**
Disconnect Size LRA: **199**
Electrical Convenience Outlet: **None**
Outdoor Fan [Qty / FLA (ea)]: **2 / 1.5**

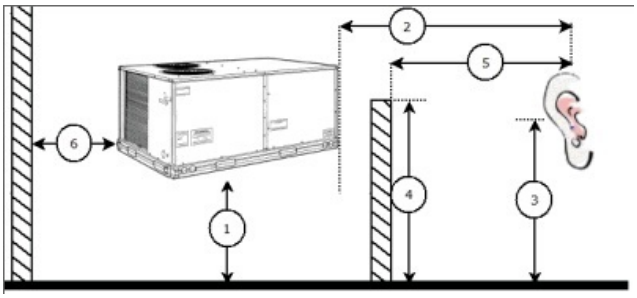
Control Panel SCCR: 5kA RMS at Rated Symmetrical Voltage

Acoustics

Sound Power Levels, db re 10E-12 Watts

	Discharge	Inlet	Outdoor
63 Hz	96.6	93.7	90.6
125 Hz	90.6	83.9	84.3
250 Hz	75.1	67.7	80.2
500 Hz	68.8	63.8	79.3
1000 Hz	64.0	61.2	77.1
2000 Hz	62.0	56.3	72.2
4000 Hz	64.8	55.5	67.4
8000 Hz	65.1	55.0	63.7
A-Weighted	77.7	72.1	82.0

Advanced Acoustics



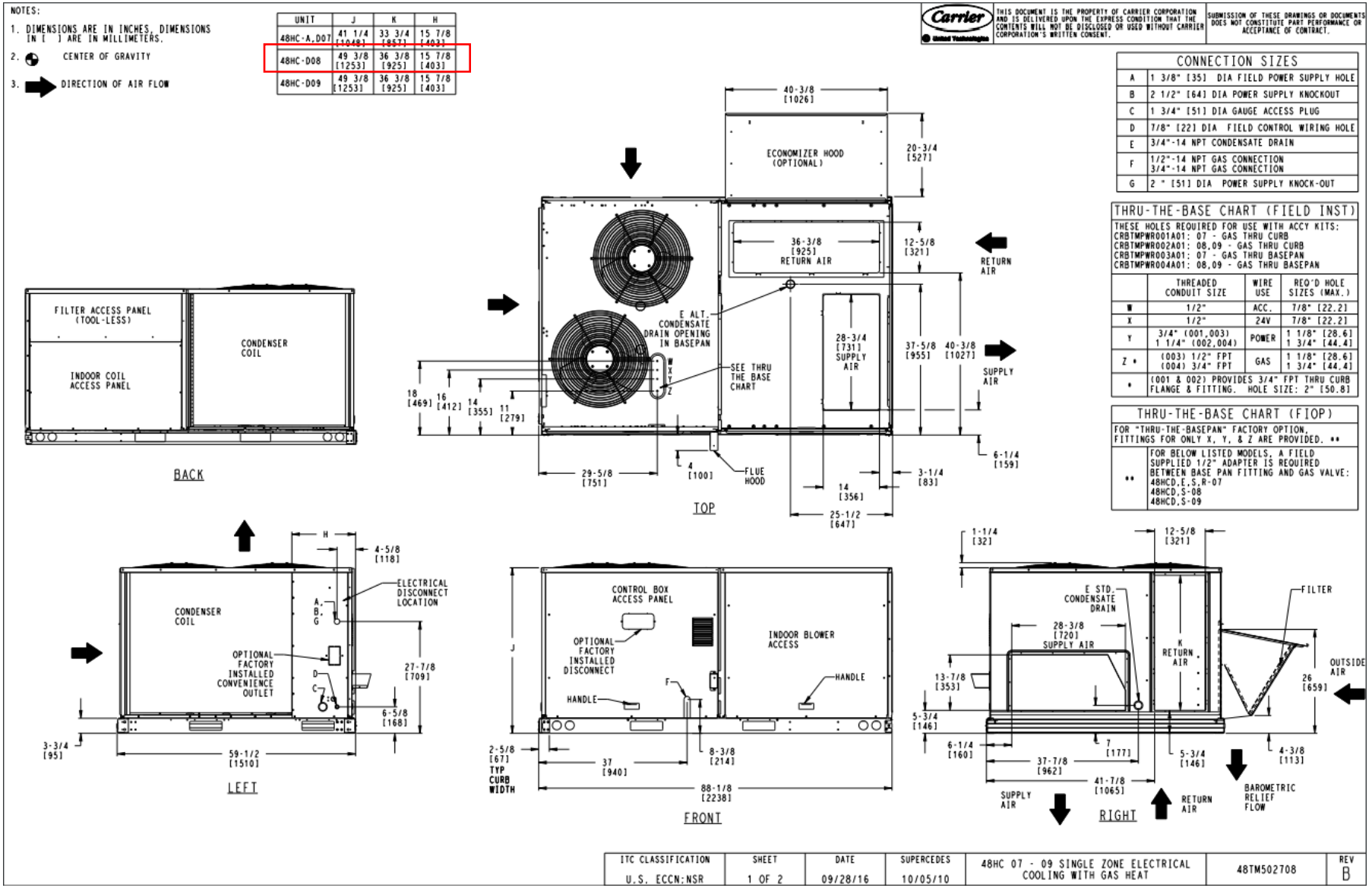
Advanced Accoustics Parameters

1. Unit height above ground: **30.0** ft
2. Horizontal distance from unit to receiver: **50.0** ft
3. Receiver height above ground: **5.7** ft
4. Height of obstruction: **0.0** ft
5. Horizontal distance from obstruction to receiver: **0.0** ft
6. Horizontal distance from unit to obstruction: **0.0** ft

Detailed Acoustics Information

Octave Band Center Freq. Hz	63	125	250	500	1k	2k	4k	8k	Overall
A	90.6	84.3	80.2	79.3	77.1	72.2	67.4	63.7	92.3 Lw
B	64.4	68.2	71.6	76.1	77.1	73.4	68.4	62.6	81.7 LwA
C	58.2	51.9	47.8	46.9	44.7	39.8	35.0	31.3	59.9 Lp
D	32.0	35.8	39.2	43.7	44.7	41.0	36.0	30.2	49.3 LpA

Legend
A Sound Power Levels at Unit's Acoustic Center, Lw


NOTES:
1. DIMENSIONS ARE IN INCHES. DIMENSIONS IN [ ] ARE IN MILLIMETERS.
2. CENTER OF GRAVITY
3. DIRECTION OF AIR FLOW
UNIT J K H
48HC-A,D07 41 1/4 [1048] 33 3/4 [857] 15 7/8 [403]
48HC-D08 49 3/8 [1253] 36 3/8 [925] 15 7/8 [403]
48HC-D09 49 3/8 [1253] 36 3/8 [925] 15 7/8 [403]
Carrier
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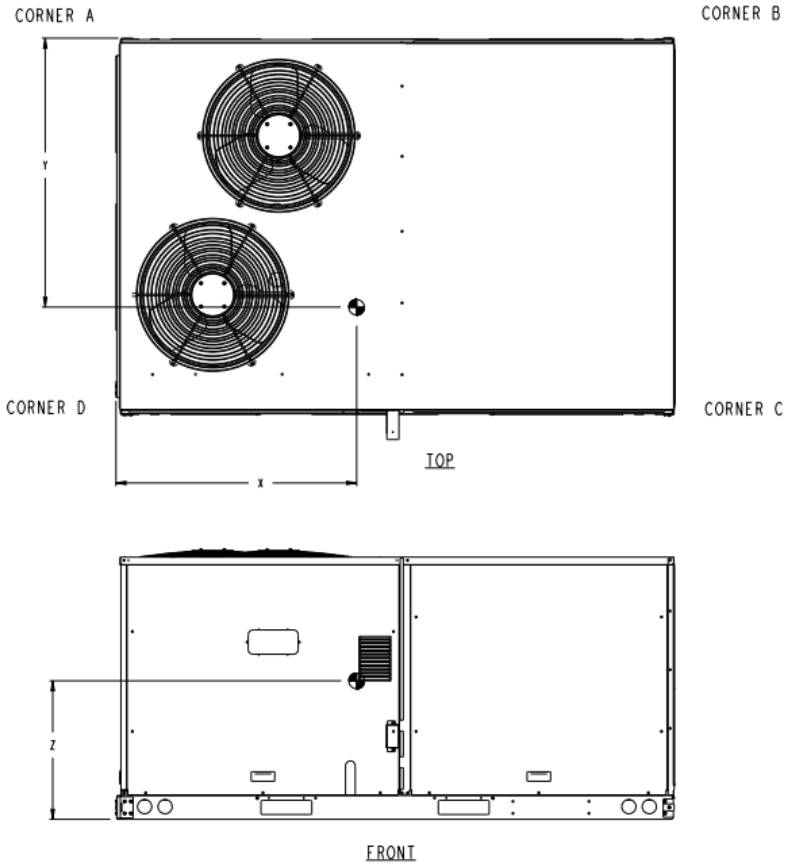
SUBMISSION OF THESE DRAWINGS OR DOCUMENTS DOES NOT CONSTITUTE PART PERFORMANCE OR ACCEPTANCE OF CONTRACT.
CONNECTION SIZES
A 1 3/8" [35] DIA FIELD POWER SUPPLY HOLE
B 2 1/2" [64] DIA POWER SUPPLY KNOCKOUT
C 1 3/4" [51] DIA GAUGE ACCESS PLUG
D 7/8" [22] DIA FIELD CONTROL WIRING HOLE
E 3/4"-14 NPT CONDENSATE DRAIN
F 1/2"-14 NPT GAS CONNECTION 3/4"-14 NPT GAS CONNECTION
G 2 " [51] DIA POWER SUPPLY KNOCK-OUT
THRU-THE-BASE CHART (FIELD INST)
THESE HOLES REQUIRED FOR USE WITH ACCY KITS:
CRBTMPWR001A01: 07 - GAS THRU CURB
CRBTMPWR002A01: 08,09 - GAS THRU CURB
CRBTMPWR003A01: 07 - GAS THRU BASEPAN
CRBTMPWR004A01: 08,09 - GAS THRU BASEPAN
THREADED CONDUIT SIZE
WIRE USE
REQ'D HOLE SIZES (MAX.)
W 1/2" ACC. 7/8" [22.2]
X 1/2" 24V 7/8" [22.2]
Y 3/4" (001,003) 1 1/4" (002,004) POWER 1 1/8" [28.6] 1 3/4" [44.4]
Z * (003) 1/2" FPT (004) 3/4" FPT GAS 1 1/8" [28.6] 1 3/4" [44.4]
* (001 & 002) PROVIDES 3/4" FPT THRU CURB FLANGE & FITTING. HOLE SIZE: 2" [50.8]
THRU-THE-BASE CHART (FIOP)
FOR "THRU-THE-BASEPAN" FACTORY OPTION, FITTINGS FOR ONLY X, Y, & Z ARE PROVIDED. **
** FOR BELOW LISTED MODELS, A FIELD SUPPLIED 1/2" ADAPTER IS REQUIRED BETWEEN BASE PAN FITTING AND GAS VALVE:
48HCD,E,S,R-07
48HCD,S-08
48HCD,S-09
FILTER ACCESS PANEL (TOOL-LESS)
CONDENSER COIL
INDOOR COIL ACCESS PANEL
BACK
ECONOMIZER HOOD (OPTIONAL)
40-3/8 [1026]
20-3/4 [527]
36-3/8 [925] RETURN AIR
12-5/8 [321]
RETURN AIR
E ALT. CONDENSATE DRAIN OPENING IN BASEPAN
SEE THRU THE BASE CHART
28-3/4 [731] SUPPLY AIR
37-5/8 [955]
40-3/8 [1027]
SUPPLY AIR
18 [469]
16 [412]
14 [355]
11 [279]
29-5/8 [751]
4 [100]
FLUE HOOD
6-1/4 [159]
3-1/4 [83]
14 [356]
25-1/2 [647]
TOP
H
4-5/8 [118]
ELECTRICAL DISCONNECT LOCATION
CONDENSER COIL
OPTIONAL FACTORY INSTALLED CONVENIENCE OUTLET
27-7/8 [709]
6-5/8 [168]
3-3/4 [95]
59-1/2 [1510]
LEFT
CONTROL BOX ACCESS PANEL
OPTIONAL FACTORY INSTALLED DISCONNECT
INDOOR BLOWER ACCESS
HANDLE
HANDLE
2-5/8 [67] TYP CURB WIDTH
37 [940]
8-3/8 [214]
88-1/8 [22381]
FRONT
1-1/4 [32]
12-5/8 [321]
E STD. CONDENSATE DRAIN
FILTER
28-3/8 [720] SUPPLY AIR
K RETURN AIR
OUTSIDE AIR
13-7/8 [353]
26 [659]
5-3/4 [146]
6-1/4 [160]
7 [177]
37-7/8 [962]
5-3/4 [146]
4-3/8 [113]
41-7/8 [1065]
SUPPLY AIR
RETURN AIR
BAROMETRIC RELIEF FLOW
RIGHT
ITC CLASSIFICATION U.S. ECCN:NSR
SHEET 1 OF 2
DATE 09/28/16
SUPERCEDES 10/05/10
48HC 07 - 09 SINGLE ZONE ELECTRICAL COOLING WITH GAS HEAT
48TM502708
REV B

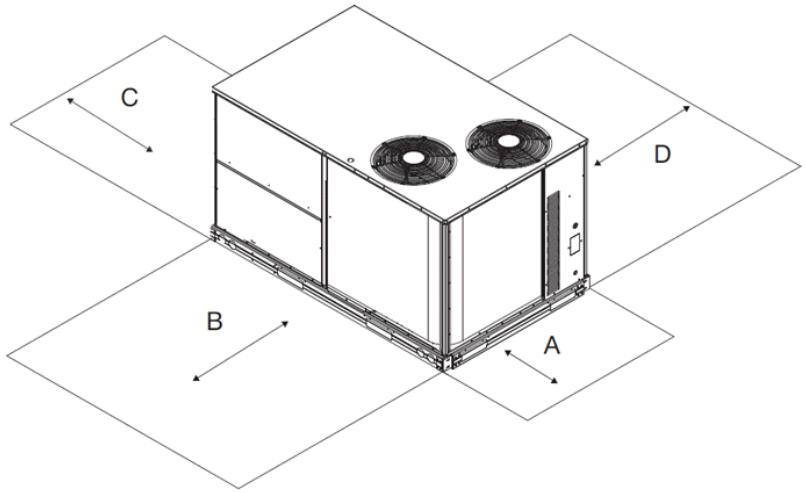
UNIT	STD. UNIT WEIGHT *		CORNER WEIGHT (A)		CORNER WEIGHT (B)		CORNER WEIGHT (C)		CORNER WEIGHT (D)		C.G.		
	LBS.	KG.	LBS.	KG.	LBS.	KG.	LBS.	KG.	LBS.	KG.	X	Y	Z
48HC-A,D07	765	347	165.3	75	152.7	69.3	214.7	97.4	232.3	105.4	42 3/8 [1076]	34 3/4 [882.6]	19 7/8 [505]
48HC-D08	925	419.5	204.1	92.6	190.9	86.6	256.1	116.2	273.9	124.2	42 5/8 [1082]	34 1/8 [867]	22 7/8 [581]
48HC-D09	925	419.5	204.1	92.6	190.9	86.6	256.1	116.2	273.9	124.2	42 5/8 [1082]	34 1/8 [867]	22 7/8 [581]

* STANDARD UNIT WEIGHT IS WITH LOW GAS HEAT AND WITHOUT PACKAGING.
FOR OTHER OPTIONS AND ACCESSORIES, REFER TO THE PRODUCT DATA CATALOG.



ITC CLASSIFICATION	SHEET	DATE	SUPERCEDES			REV
U.S. ECCN:NSR	2 OF 2	09/28/16	10/05/10	48HC 07 - 09 SINGLE ZONE ELECTRICAL COOLING WITH GAS HEAT	48TM502708	B

Service Clearance



C11247

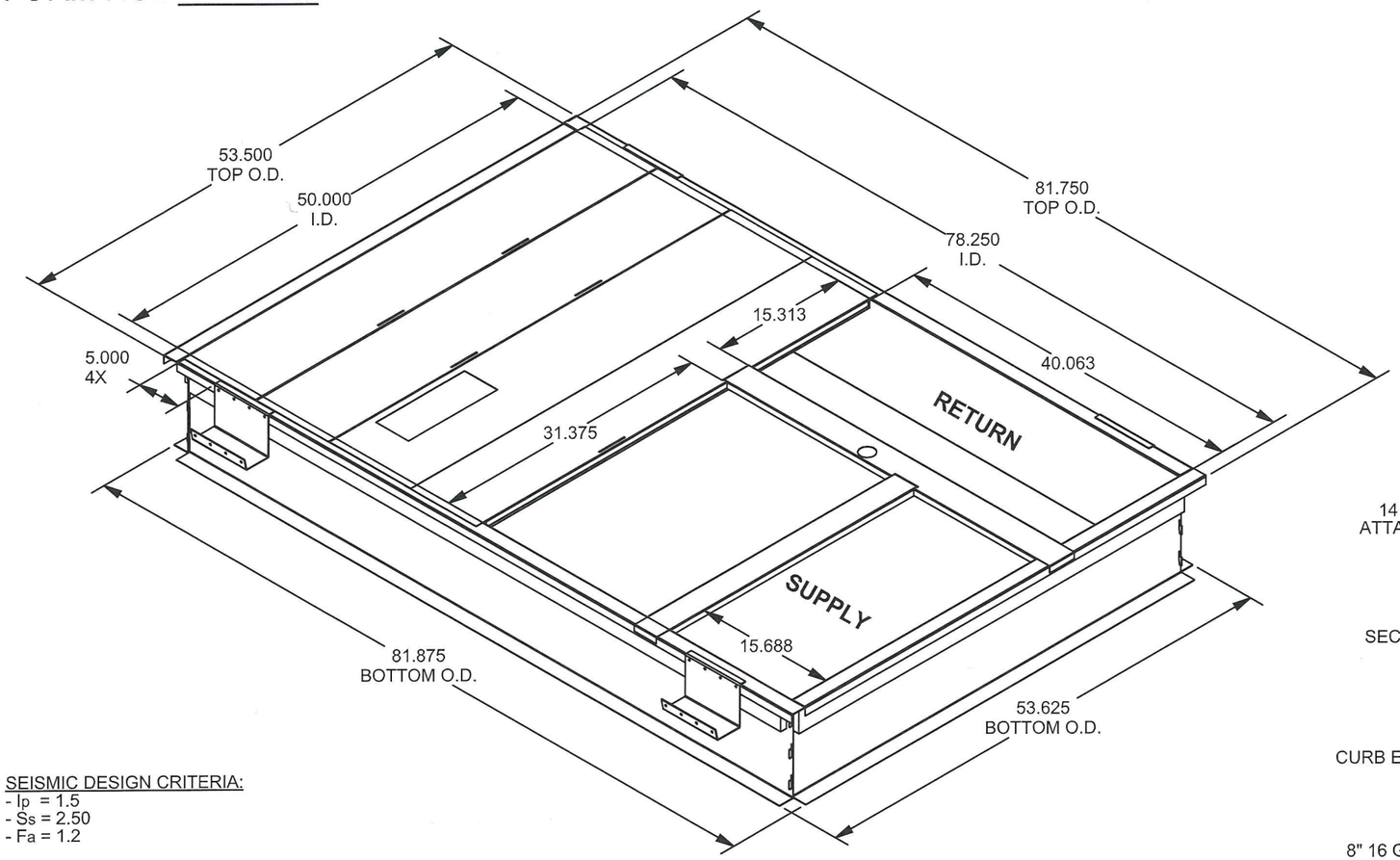
LOCATION	DIMENSION	CONDITION
A	48-in (1219 mm)	• Unit disconnect is mounted on panel
	36-in (914 mm)	• If dimension-B is 12-in (305 mm)
	18-in (457 mm)	• No disconnect, convenience outlet option • Recommended service clearance (use electric screwdriver)
	12-in (305 mm)	• Minimum clearance (use manual ratchet screwdriver)
B	36-in (914 mm)	• Unit has economizer
	12-in (305 mm)	• If dimension-A is 36-in (914 mm)
	Special	• Check for sources of flue products within 10-ft of unit fresh air intake hood
C	36-in (914 mm)	• Side condensate drain is used
	18-in (457 mm)	• Minimum clearance
D	48-in (1219 mm)	• No flue discharge accessory installed, surface is combustible material
	42-in (1067 mm)	• Surface behind servicer is grounded (e.g., metal, masonry wall, another unit)
	36-in (914 mm)	• Surface behind servicer is electrically non-conductive (e.g., wood, fiberglass)
	Special	• Check for adjacent units or building fresh air intakes within 10-ft of this unit's flue outlet

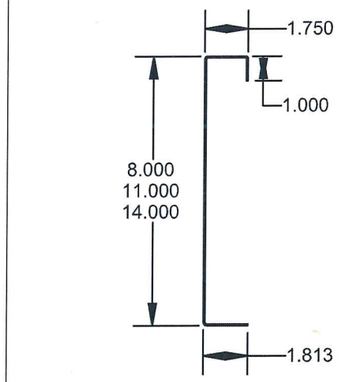
NOTE: Unit not designed to have overhead obstruction. Contact Application Engineering for guidance on any application planning overhead obstruction or vertical clearances.

Chassis 3-4a

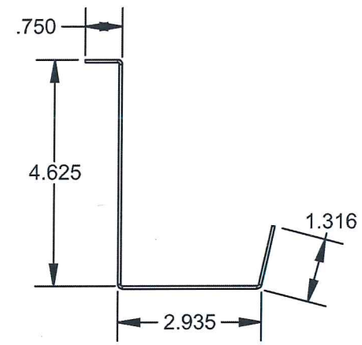
RTU - 60, 90

FORM NO.: _____





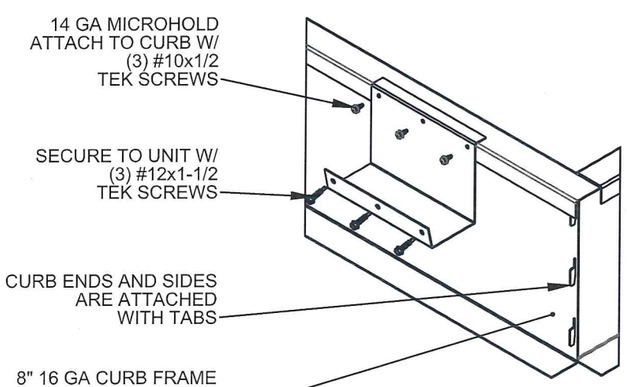
CURB END DETAIL

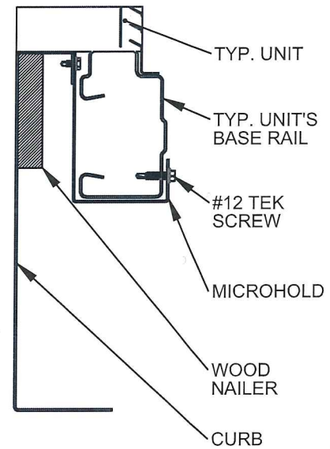


MICROHOLD DETAIL

KNOCK DOWN CURB CORNER DETAIL

UNIT TO CURB ATTACHMENT DETAIL





SEISMIC DESIGN CRITERIA:
- Ip = 1.5
- Ss = 2.50
- Fa = 1.2

WIND DESIGN CRITERIA:
- 60 FT. TALL BUILDING MAX.
- EXPOSURE C
- 155 MPH, 3-SECOND GUST WIND SPEED
- RISK CATEGORY III & IV

CURB MICROHOLD REQUIREMENTS:
- (2) MICROHOLDS PER LONG SIDE
- (0) MICROHOLDS PER SHORT SIDE

THE STANDARD PRODUCT DOES NOT INCLUDE THROUGH THE SIDE SERVICE HOLES

MicroMetl Corporation

CRBK-SRT34GA-08 Series	08" TALL	96 LBS.
CRBK-SRT34GA-11 Series	11" TALL	110 LBS.
CRBK-SRT34GA-14 Series	14" TALL	123 LBS.

STRUCTURALLY CALCULATED KNOCK DOWN CURB

MAX UNIT WEIGHT 1786 lbs.

Indianapolis, IN. : (800) 662-4822

Sparks, NV. (800) 884-4662

Longview, TX. (903) 248-4800

DRAWN BY: IR | DATE 08/20/2019

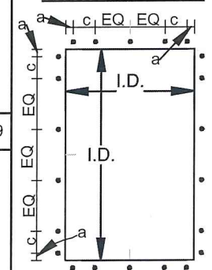
MEETS SEISMIC REQUIREMENTS FOR 2019 CBC & 2018 IBC

MEETS REQUIREMENTS FOR 155 MPH, 60' BUILDING HEIGHT MAX. 3 SEC. GUST, EXP C

ANCHORAGE DETAILS TO ROOF:

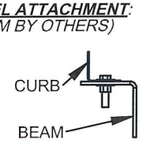
ALL DETAILS ARE CALCULATED USING THE SEISMIC DESIGN CRITERIA INDICATED ABOVE. FOR ANY OTHER TYPE OF ANCHORAGE THE EOR HAS THE OPTION TO CALCULATE THE ANCHORAGE USING SITE SPECIFIC PARAMETERS AND LOADS.

TYPICAL PLAN VIEW:

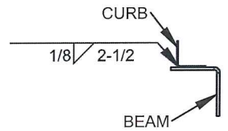


c = SPACING @ CORNER ANCHORS

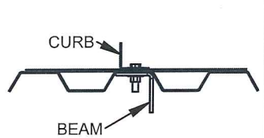
STEEL ATTACHMENT:
(BEAM BY OTHERS)



(12) A307 1/2" DIA. BOLTS, W/ WASHER CENTERED ON FLANGE
(1) EACH LONG SIDE
(1) EACH SHORT SIDE
(2) EACH CORNER
a = 2"
c = 6"



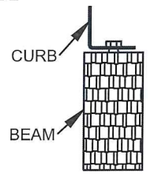
WELD OPTION:
(2.5") LONG 1/8" FILLET WELDS ARE PERMITTED TO BE USED IN PLACE OF EACH BOLT INDICATED BY THE STEEL ATTACHMENT DETAIL, EQUALLY SPACED



(12) A307 1/2" DIA. BOLTS, W/ WASHER CENTERED ON FLANGE
(1) EACH LONG SIDE
(1) EACH SHORT SIDE
(2) EACH CORNER
a = 2"
c = 6"

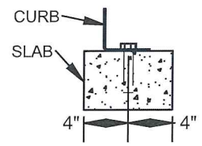
WOOD ATTACHMENT:
(REF. DOUGLAS FIR)

(38) 1/4" x 3" SIMPSON SDS W/ WASHER, CENTERED ON CURB FLANGE
(7) EACH LONG SIDE
(4) EACH SHORT SIDE
(4) EACH CORNER
a = 1"
c = 3"



CONCRETE ATTACHMENT:
(3000 PSI MINIMUM, 6" MINIMUM THICKNESS)
(4" MIN EDGE DISTANCE, 3-3/4" EMBEDDED)

(14) 1/2" SIMPSON TITEN HD CENTERED ON CURB FLANGE, 8" MINIMUN SPACING
(2) EACH LONG SIDE
(1) EACH SHORT SIDE
(2) EACH CORNER
a = 3"
c = 8"



REGISTERED PROFESSIONAL ENGINEER
CLIFFORD H. JOHNSON
No. 2602
Exp. 6-30-21
STRUCTURAL
STATE OF CALIFORNIA

8/27/19

BJG# 20190065