



APPENDIX D

Energy Calculations

Table 1. Summary of Energy Use During Construction	
Fuel Type	Quantity
Diesel	
Off-Road Construction Equipment	103,875 Gallons
On-Road Motor Vehicles	218,089 Gallons
Total	321,964 Gallons
Gasoline	
Off-Road Construction Equipment	0 Gallons
On-Road Motor Vehicles	111,786 Gallons
Total	111,786 Gallons
Total Transportation	433,750 Gallons
Electricity	
Total	8,283.9 kWh

Table 2. Summary of Annual Energy Use During Operation			
Source	Units	Site 1 Buildout	Site 2 Buildout
Electricity			
Office	kWh/yr	89,400	284,988
Apartment (Mid-Rise)	kWh/yr	417,137	-
Apartment (High-Rise)	kWh/yr	1,046,570	893,864
Restaurant	kWh/yr	1,512,852	321,972
Parking	kWh/yr	705,600	235,008
Water Conveyance	kWh/yr	574,099	358,881
Total Electricity	kWh/yr	4,345,658	2,094,713
Natural Gas			
Office	kBTU/yr	73,737	235,058
Apartment (Mid-Rise)	kBTU/yr	1,009,210	-
Apartment (High-Rise)	kBTU/yr	2,532,030	2,162,590
Restaurant	kBTU/yr	8,053,030	1,713,890
Total Natural Gas	kBTU/yr	11,668,007	4,111,538
Transportation/On-Site Sources			
Diesel	gallons	76,602	43,350
Gasoline	gallons	409,405	231,686
Total	gallons	486,007	275,035

Table 3. Water by Land Use				
Land Use	Units	Indoor/Outdoor Use	Indoor Use	Outdoor Use
Site 1 Buildout	Mgal	29.99027 / 16.525289	29.99027	16.525289
Site 2 Buildout	Mgal	17.55809 / 11.724273	17.55809	11.724273

Water and Wastewater Electricity Intensity (kWh/gallon)

Supply Water	0.009727
Treat Water	0.000111
Distribute Water	0.001272
Wastewater Treatment	0.001911

Source: CalEEMod User's Guide, Appendix D, Table 9.2 Los Angeles

Indoor Water Factor	0.013021 kWh/gallon (supply, treat, distribute, wastewater treatment)
Outdoor Water Factor	0.01111 kWh/gallon (supply, treat, and distribute)

Notes:

Electricity and Natural Gas for the Proposed Project is total operational usage. Electricity, natural gas, and mobile usage was calculated from CalEEMod. Indoor water factor used for entire Project Site for conservative analysis.

Table 4. Off-Road Equipment Fuel Usage During Construction

Phase Name	Off-road Equipment Type	Amount	Hours per Day	Horsepower	Load Factor	Number of Days	Diesel Fuel Usage
							(Gallons per Project)
Site 1							
Demolition	Concrete/Industrial Saws	1	8	81	0.73	10	237
Demolition	Rubber Tired Dozers	1	8	247	0.4	10	395
Demolition	Tractors/Loaders/Backhoes	3	8	97	0.37	10	431
Grading	Graders	1	8	187	0.41	163	4999
Grading	Rubber Tired Dozers	1	8	247	0.4	163	6442
Grading	Tractors/Loaders/Backhoes	2	7	97	0.37	163	4095
Building Construction	Cranes	1	6	231	0.29	456	9164
Building Construction	Forklifts	1	6	89	0.2	456	2435
Building Construction	Generator Sets	1	8	84	0.74	456	11338
Building Construction	Tractors/Loaders/Backhoes	1	6	97	0.37	456	4910
Building Construction	Welders	3	8	46	0.45	456	11327
Paving	Cement and Mortar Mixers	1	6	9	0.56	23	35
Paving	Pavers	1	6	130	0.42	23	377
Paving	Paving Equipment	1	8	132	0.36	23	437
Paving	Rollers	1	7	80	0.38	23	245
Paving	Tractors/Loaders/Backhoes	1	8	97	0.37	23	330
Architectural Coating	Air Compressors	1	6	78	0.48	65	730
Site 1 Total							57926
Site 2							
Demolition	Concrete/Industrial Saws	1	8	81	0.73	10	237
Demolition	Rubber Tired Dozers	1	8	247	0.4	10	395
Demolition	Tractors/Loaders/Backhoes	3	8	97	0.37	10	431
Grading	Graders	1	8	187	0.41	119	3,649
Grading	Rubber Tired Dozers	1	8	247	0.4	119	4,703
Grading	Tractors/Loaders/Backhoes	2	7	97	0.37	119	2,990
Building Construction	Cranes	1	6	231	0.29	369	7,416
Building Construction	Forklifts	1	6	89	0.2	369	1,970
Building Construction	Generator Sets	1	8	84	0.74	369	9,175
Building Construction	Tractors/Loaders/Backhoes	1	6	97	0.37	369	3,973
Building Construction	Welders	3	8	46	0.45	369	9,166

Paving	Cement and Mortar Mixers	1	6	9	0.56	22	33
Paving	Pavers	1	6	130	0.42	22	360
Paving	Paving Equipment	1	8	132	0.36	22	418
Paving	Rollers	1	7	80	0.38	22	234
Paving	Tractors/Loaders/Backhoes	1	8	97	0.37	22	316
Architectural Coating	Air Compressors	1	6	78	0.48	43	483
						Site 2 Total	45,949
Project Total							103,875

Notes:

Equipment assumptions from CalEEMod.

Fuel usage estimate of 0.05 gallons per horsepower-hour is from the SCAQMD CEQA Air Quality Handbook, Table A9-3 E.

Table 5. On-Road Vehicle Fuel Usage During Construction

Sub Area 1	Days	Daily Trips		Total			Trip Length (Miles)			Total Length (Miles)			Fuel Consumption (Gallons)	
		Worker	Vendor	Worker Trips	Vendor Trips	Haul Trips	Worker	Vendor	Hauling	Worker	Vendor	Hauling	Gasoline	Diesel
Site 1														
Demolition	10	13	0	130	0	133	14.7	6.9	20	1,911	0	2,660	71	488
Grading	163	10	0	1,630	0	8,200	14.7	6.9	20	23,961	0	164,000	885	27,205
Building Construction	456	292	71	133,152	32,376	7,200	14.7	6.9	20	1,957,334	223,394	144,000	72,297	119,962
Architectural Coating	65	71	0	4,615	0	0	14.7	6.9	20	67,841	0	0	2,506	2,103
Paving	23	13	0	299	0	0	14.7	6.9	20	4,395	0	0	162	136
Site 1 Total	717	399	71	139,826	32,376	15,533	n/a	n/a	n/a	2,055,442	223,394	310,660	75,920	149,894
Site 2														
Demolition	10	13	0	130	0	126	14.7	6.9	20	1,911	0	2,520	71	466
Grading	119	10	0	1,190	0	2,840	14.7	6.9	20	17,493	0	56,800	646	9,707
Building Construction	369	170	38	62,730	14,022	4,000	14.7	6.9	20	922,131	96,752	80,000	34,060	57,108
Architectural Coating	43	40	0	1,720	0	0	14.7	6.9	20	25,284	0	0	934	784
Paving	22	13	0	286	0	0	14.7	6.9	20	4,204	0	0	155	130
Site 2 Total	563	246	38	66,056	14,022	6,966	n/a	n/a	n/a	971,023	96,752	139,320	35,866	68,195
Project Total												111,786	218,089	

Fuel Efficiency	Gas	DSL
Workers	27.07	32.26
Vendor/Haul Trucks	0	6.20

Notes:
 Fuel efficiency calculated in **Table 7: EMFAC2021 Results - Construction.**

Table 6. Water Usage for Control of Fugitive Dust During Construction

Phase Name	Total Acres	Gallons for Project	Electricity (kWh)
Site 1	163	492,260	4,788.2
Site 2	119	359,380	3,495.7
Total	282	851,640	8,283.9

Notes:

Total acres graded based on CalEEMod output sheets.

Water Usage

3,020 gallons per acre per day

Source: Air & Waste Management Association, Air Pollution Engineering Manual

Supply Water Electricity Intensity

0.009727 kWh/gallons (CalEEMod default)

Table 7. EMFAC2021 Results - Construction								
Vehicle Class	Fuel	VMT (miles per day)	Fuel (1,000 gal per day)	Fuel Efficiency (miles per gallon)	Fuel	VMT (miles per day)	Fuel (1,000 gal per day)	Fuel Efficiency (miles per gallon)
LDA	GAS	132,004,234	4,457.06	29.62	DSL	246,778	6.05	40.77
LDT1	GAS	11,445,443	463.65	24.69	DSL	2,176	0.09	23.10
LDT2	GAS	67,107,095	2,753.10	24.38	DSL	67,107,095	2,753.10	24.38
Average (LDA, LDT1, LDT2)				27.07				32.26
T7 Tractor Construction	DSL	1,128,795	182.13	6.20				

Construction Worker Fleet Mix

LDA	50%
LDT1	25%
LDT2	25%

Vendor and Delivery/Haul Truck Fleet Mix

HHDT	100%
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Source: EMFAC2021 (v1.0.1) Emissions Inventory

Region Type: County

Region: Los Angeles

Calendar Year: 2025

Season: Annual

Vehicle Classification: EMFAC202x Categories

Units: miles/day for VMT, trips/day for Trips, tons/day for Emissions, 1000 gallons/day for Fuel Consumption.

Region	CalYr	VehClass	MdYr	Speed	Fuel	Population	VMT	Trips	Fuel_Consumption
Los Angeles	2025	LDA	Aggregate	Aggregate	Gasoline	3337440.433	132004234	15494312.44	4457.058985
Los Angeles	2025	LDA	Aggregate	Aggregate	Diesel	8388.612851	246778.3811	34377.62305	6.052721754
Los Angeles	2025	LDA	Aggregate	Aggregate	Electricity	196100.505	9570341.042	976769.6239	0
Los Angeles	2025	LDT1	Aggregate	Aggregate	Gasoline	313468.9775	11445443.39	1380697.821	463.6453307
Los Angeles	2025	LDT1	Aggregate	Aggregate	Diesel	110.6654953	2175.901799	310.4912204	0.094175691
Los Angeles	2025	LDT1	Aggregate	Aggregate	Electricity	1056.523519	46083.15975	5037.302681	0
Los Angeles	2025	LDT2	Aggregate	Aggregate	Gasoline	1623396.817	67107094.54	7642462.406	2753.099179
Los Angeles	2025	LDT2	Aggregate	Aggregate	Diesel	5270.982587	227598.8752	25409.9418	7.061296711
Los Angeles	2025	T7 Tractor Class	Aggregate	Aggregate	Diesel	15293.8656	1128795.345	222219.8671	182.1339301
									7869.145619
									7869145.619
		Gas	7673.803495	7673803.495	2800938276	35,378,625.00			2,872,238,150.92
		Diesel	195.3421243	195342.1243	71299875.37	10,548,851.00			
						45,927,476.00			

Table 8. On road Vehicles - Operational				
Scenario	Annual VMT	Fuel Consumption (gal)		
		Gasoline	Diesel	Total
Site 1	11,329,677	409,405	76,602	486,007
Site 2	6,411,550	231,686	43,350	275,035

Table 9. Fuel Consumption Summary		
Fuel	Fuel Efficiency (MPG)	%Fleet
Gasoline	26.0	94.0%
Diesel	8.9	6.0%

Notes:

Percent fleet and fuel efficiency based on

Table 10: EMFAC2021 Emissions

Inventory-Operations

Annual VMT obtained from the CalEEMod Output files.

Table 10. EMFAC2021 Emissions Inventory - Operations				
Fuel	VMT (miles/day)	Fuel Consumption (1,000 gal/day)	Fuel Efficiency (miles per gallon)	Fuel Percentage
GAS	253,547,733	9,747	26.0	94
DSL	15,132,427	1,705	8.9	6

Note: Fuel percentage based on VMT.
Fuel efficiency calculated using fuel consumption and VMT from EMFAC2021.

Buildout

Source: EMFAC2021 (v1.0.1) Emissions Inventory
Region Type: County
Region: Los Angeles
Calendar Year: 2027
Season: Annual
Vehicle Classification: EMFAC202x Categories
Units: miles/day for VMT, trips/day for Trips, tons/day for Emissions, 1000 gallons/day for Fuel Consumption.

Region	CalYr	VehClass	MdlYr	Speed	Fuel	Population	VMT	Trips	Fuel_Consump
Los Angeles	2027	All Other Buses	Aggregate	Aggregate	Diesel	1599.016922	83424.00229	14231.251	8.76495021
Los Angeles	2027	LDA	Aggregate	Aggregate	Diesel	6767.856667	201833.5552	28082.931	4.79953465
Los Angeles	2027	LDT1	Aggregate	Aggregate	Diesel	46.31412876	915.8440894	129.76935	0.03801334
Los Angeles	2027	LDT2	Aggregate	Aggregate	Diesel	5724.008731	241831.3231	27452.658	7.21891164
Los Angeles	2027	LHD1	Aggregate	Aggregate	Diesel	66210.8642	2872082.695	832849.38	138.132154
Los Angeles	2027	LHD2	Aggregate	Aggregate	Diesel	30543.23938	1291571.379	384195.53	73.2478107
Los Angeles	2027	MDV	Aggregate	Aggregate	Diesel	11636.58936	445305.215	54488.968	17.8304804
Los Angeles	2027	MH	Aggregate	Aggregate	Diesel	6106.799638	64332.90122	610.67996	6.45264657
Los Angeles	2027	Motor Coach	Aggregate	Aggregate	Diesel	699.24111	87406.95341	16068.561	15.2977372
Los Angeles	2027	PTO	Aggregate	Aggregate	Diesel	0	112257.5491	0	21.8148666
Los Angeles	2027	SBUS	Aggregate	Aggregate	Diesel	1772.30207	36021.23954	25662.934	4.83470287
Los Angeles	2027	T6 CAIRP Class 4	Aggregate	Aggregate	Diesel	34.60765146	2268.198197	795.28383	0.23990863
Los Angeles	2027	T6 CAIRP Class 5	Aggregate	Aggregate	Diesel	45.27788876	3122.416846	1040.4859	0.33095857
Los Angeles	2027	T6 CAIRP Class 6	Aggregate	Aggregate	Diesel	161.5787872	8052.427316	3713.0805	0.83994292
Los Angeles	2027	T6 CAIRP Class 7	Aggregate	Aggregate	Diesel	259.8750677	51646.87365	5971.9291	4.95383819
Los Angeles	2027	T6 Instate Delivery	Aggregate	Aggregate	Diesel	4000.037015	133383.8523	57080.528	14.8465754
Los Angeles	2027	T6 Instate Delivery	Aggregate	Aggregate	Diesel	4132.493968	137978.7395	58970.689	15.4836341
Los Angeles	2027	T6 Instate Delivery	Aggregate	Aggregate	Diesel	12639.67179	421463.6594	180368.12	47.1206759
Los Angeles	2027	T6 Instate Delivery	Aggregate	Aggregate	Diesel	3268.308085	172252.9767	46638.756	18.9499509
Los Angeles	2027	T6 Instate Other Cl	Aggregate	Aggregate	Diesel	5099.705469	207967.5087	58952.595	23.192584
Los Angeles	2027	T6 Instate Other Cl	Aggregate	Aggregate	Diesel	11502.9852	480858.8337	132974.51	53.8843158
Los Angeles	2027	T6 Instate Other Cl	Aggregate	Aggregate	Diesel	10301.14964	427663.9117	119081.29	47.7938442
Los Angeles	2027	T6 Instate Other Cl	Aggregate	Aggregate	Diesel	5008.558032	216408.428	57898.931	23.831845
Los Angeles	2027	T6 Instate Tractor C	Aggregate	Aggregate	Diesel	141.9746149	7032.876064	1641.2265	0.77955262

Los Angeles	2027 T6 Instate Tractor C	Aggregate	Aggregate	Diesel	1911.830955	106054.6059	22100.766	10.9899353
Los Angeles	2027 T6 OOS Class 4	Aggregate	Aggregate	Diesel	20.6737132	1350.783705	475.08193	0.13913331
Los Angeles	2027 T6 OOS Class 5	Aggregate	Aggregate	Diesel	26.87629762	1853.032341	617.61732	0.19160302
Los Angeles	2027 T6 OOS Class 6	Aggregate	Aggregate	Diesel	97.26491803	4842.026522	2235.1478	0.48899667
Los Angeles	2027 T6 OOS Class 7	Aggregate	Aggregate	Diesel	139.5714825	35207.55382	3207.3527	3.32810136
Los Angeles	2027 T6 Public Class 4	Aggregate	Aggregate	Diesel	688.5913442	24252.79223	3532.4736	2.80232293
Los Angeles	2027 T6 Public Class 5	Aggregate	Aggregate	Diesel	476.464627	16866.16999	2444.2635	1.97077333
Los Angeles	2027 T6 Public Class 6	Aggregate	Aggregate	Diesel	569.4379486	20244.3948	2921.2167	2.3496698
Los Angeles	2027 T6 Public Class 7	Aggregate	Aggregate	Diesel	2500.018482	111487.6798	12825.095	12.680367
Los Angeles	2027 T6 Utility Class 5	Aggregate	Aggregate	Diesel	625.1887561	25099.75563	8002.4161	2.67827815
Los Angeles	2027 T6 Utility Class 6	Aggregate	Aggregate	Diesel	118.0723739	4726.797244	1511.3264	0.50256885
Los Angeles	2027 T6 Utility Class 7	Aggregate	Aggregate	Diesel	132.3013351	6532.222049	1693.4571	0.68911917
Los Angeles	2027 T7 CAIRP Class 8	Aggregate	Aggregate	Diesel	7231.334465	1461343.126	166176.07	224.917371
Los Angeles	2027 T7 NNOOS Class 8	Aggregate	Aggregate	Diesel	6573.68892	1791228.38	151063.37	263.197057
Los Angeles	2027 T7 NOOS Class 8	Aggregate	Aggregate	Diesel	2821.745846	650414.1816	64843.72	98.7386578
Los Angeles	2027 T7 POAK Class 8	Aggregate	Aggregate	Diesel	1.413150415	116.5885753	23.119141	0.02089984
Los Angeles	2027 T7 POLA Class 8	Aggregate	Aggregate	Diesel	9885.566451	1267216.636	161727.87	211.343815
Los Angeles	2027 T7 Public Class 8	Aggregate	Aggregate	Diesel	3348.608117	134380.0474	17178.36	23.0970075
Los Angeles	2027 T7 Single Concrete/	Aggregate	Aggregate	Diesel	733.1076141	49502.86701	6905.8737	7.90743559
Los Angeles	2027 T7 Single Dump Cla	Aggregate	Aggregate	Diesel	2236.85898	120679.5656	21071.212	19.8753802
Los Angeles	2027 T7 Single Other Cla	Aggregate	Aggregate	Diesel	7022.543842	355342.9743	66152.363	58.021041
Los Angeles	2027 T7 SWCV Class 8	Aggregate	Aggregate	Diesel	846.3010337	54850.03474	3892.9848	20.8348861
Los Angeles	2027 T7 Tractor Class 8	Aggregate	Aggregate	Diesel	16727.3708	1158955.776	243048.7	184.088863
Los Angeles	2027 T7 Utility Class 8	Aggregate	Aggregate	Diesel	478.6528847	20432.22894	6126.7569	3.27444108
Los Angeles	2027 UBUS	Aggregate	Aggregate	Diesel	14.34866314	2363.510755	57.394653	0.41301156
Los Angeles	2027 LDA	Aggregate	Aggregate	Gasoli	3252972.868	127411268.6	15084514	4134.43086
Los Angeles	2027 LDT1	Aggregate	Aggregate	Gasoli	305004.155	11091280.07	1345171.5	432.899059
Los Angeles	2027 LDT2	Aggregate	Aggregate	Gasoli	1690654.952	69171014.47	7955024	2709.65533
Los Angeles	2027 LHD1	Aggregate	Aggregate	Gasoli	126122.2747	5037761.844	1879034	349.870245
Los Angeles	2027 LHD2	Aggregate	Aggregate	Gasoli	18986.19599	708229.2229	282866.03	56.5744315
Los Angeles	2027 MCY	Aggregate	Aggregate	Gasoli	160831.8787	1042272.874	321663.76	25.0570567
Los Angeles	2027 MDV	Aggregate	Aggregate	Gasoli	995506.8199	37949923.61	4626267.5	1826.10978
Los Angeles	2027 MH	Aggregate	Aggregate	Gasoli	14694.27766	151088.1543	1470.0155	31.2027473
Los Angeles	2027 OBUS	Aggregate	Aggregate	Gasoli	3402.812669	127437.7026	68083.476	24.5731296
Los Angeles	2027 SBUS	Aggregate	Aggregate	Gasoli	1518.749108	69457.45034	6074.9964	7.62436157
Los Angeles	2027 T6TS	Aggregate	Aggregate	Gasoli	13816.7581	755094.268	276445.7	141.804025
Los Angeles	2027 T7IS	Aggregate	Aggregate	Gasoli	28.51963201	2421.965475	570.6208	0.55632226
Los Angeles	2027 UBUS	Aggregate	Aggregate	Gasoli	433.2360292	30482.51385	1732.9441	6.572381

	VMT Sum	Fuel Sum	Fuel Sum/Year
Diesel	15132427.09	1705.220169	622,405,362
Gas	253547732.7	9746.929733	3,557,629,353
			4,180,034,714