Appendix C

Energy Calculations

Construction Water Energy

Daily Soil Disturbance[1]	1.0	acres
Days of Soil Disturbance[2]	31	days
Water Concentration[3]	3,020	gallons/acre
Water Energy Intensity[4]	5,306	kWh/million gallons/year
Water Usage	0.09	million gallons/year
Water Energy	497	kWh/year
	0.0005	GWh/year
Orange County Annual Electricity[5]	19,225	GWh/year
% Consumption	0.000003%	

NOTES:

1. Total daily acres disturbed from off-road equipment per CalEEMod (3.0 Construction Emissions Detail) and maximum SCAQMD LST values for soil-disturbing equipment.
2. Number of days of construction with soil disturbing equipment per CalEEMod (5.1 Construction Schedule).
3. Water application rate per Air and Waste Management Association's Air Pollution Engineering Manual (1992).
4. Water energy intensity factor per CalEEMod User Guide, Appendix G, Tab G-32 for the supply, distribution, and treatment of water within the South Coast Hydrologic Region.
5. Orange County electricity usage in 2024 (most recent data available).

Source: California Energy Commission, Electricity Consumption, https://www.energy.ca.gov/data-reports/energy-almanac/california-electricity-data/california-energy-consumption-dashboards-0.

Construction Fuel

On-site Diesel[1] (off-road construction equipment)	$MTCO_2e$	Gallons of Fuel[2]
Demolition	42	4,149
Site Preparation	24	2,376
Grading	28	2,787
Building Construction/Infrastructure Improvements	249	24,568
Paving	30	2,914
Architectural Coating	1	108
Total	**375**	**36,902**

Off-site Diesel[1] (on-road construction trips)	$MTCO_2e$	Gallons of Fuel[2]
Demolition	75	7,420
Site Preparation	0	0
Grading	4	369
Building Construction/Infrastructure Improvements	53	5,250
Paving	0	0
Architectural Coating	0	0
Total	**132**	**13,039**

Off-site Gasoline[3] (worker)	$MTCO_2e$	Gallons of Fuel[2]
Demolition	2	261
Site Preparation	1	113
Grading	2	203
Building Construction/Infrastructure Improvements	55	6,274
Paving	4	408
Architectural Coating	1	103
Total	**65**	**7,362**

Fuel	$MTCO_2e$	Gallons of Fuel[2]	2027 Orange Angeles County Fuel Use (Gallons)[4]	% Consumption
On-site Diesel (off-road construction equipment)	375	36,902	136,186,585	0.027%
Off-site Diesel (on-road construction trips)	132	13,039	136,186,585	0.010%
Total Diesel	507	49,941	136,186,585	0.037%
Gasoline	65	7,362	1,068,836,093	0.0007%

Construction Phase[5]	Demolition			Site Preparation			Grading		
	On-Site Diesel (Off-Road)	Off-Site Diesel (Hauling/Vendor)	Off-Site Gasoline (Worker)	On-Site Diesel (Off-Road)	Off-Site Diesel (Hauling/Vendor)	Off-Site Gasoline (Worker)	On-Site Diesel (Off-Road)	Off-Site Diesel (Hauling/Vendor)	Off-Site Gasoline (Worker)
2027	42.113261	75.3152992	2.298767655	24.11299819	-	0.993294666	28.2927883	3.748145473	1.787930398
2028	-	-	-	-	-	-	-	-	-
Total	**42**	**75**	**2**	**24**	**0**	**1**	**28**	**4**	**2**

Construction Phase[5]	Building Construction/ Infrastructure Improvements			Paving			Architectural Coating		
	On-Site Diesel (Off-Road)	Off-Site Diesel (Hauling/Vendor)	Off-Site Gasoline (Worker)	On-Site Diesel (Off-Road)	Off-Site Diesel (Hauling/Vendor)	Off-Site Gasoline (Worker)	On-Site Diesel (Off-Road)	Off-Site Diesel (Hauling/Vendor)	Off-Site Gasoline (Worker)
2027	40.818911	7.519347987	8.562181105	-	-	-	-	-	-
2028	208.54992	45.76347589	46.71152004	29.57302161	-	3.59623818	1.093863806	-	0.909211441
Total	**249**	**53**	**55**	**30**	**0**	**4**	**1**	**0**	**1**

NOTES:

1. Fuel used for off-road, hauling, and vendor trips assumed to be diesel.
2. CO_2e emissions per Conversion Ratios: Climate Registry, General Reporting Protocol, Chapter 13, Page 94, 2016.
3. Fuel used for worker trips assumed to be gasoline.
4. The anticipated Orange County fuel usage in 2027 (the first construction year).
Source: California Air Resources Board, EMFAC2021, Emissions Inventory, 2022, https://arb.ca.gov/emfac/emissions-inventory/cd60f29daaedd924a75a9316202d7f56a9b573e5.
5. $MTCO_2e$ rates per CalEEMod (3.0 Construction Emissions Details).

Operational Elecricity

Source	Energy Usage	Annual Orange County Electricity[1]	% Consumption
Electricity (kWh/yr)	721,160	-	-
(GWh/yr)	0.721	19,225	0.0038%
Water Energy (GWh/yr)	0.171	19,225	0.00089%
Solar Energy (GWh/yr)	0.062	19,225	0.00032%
Total Electricity (GWh/yr)	0.830	19,225	0.0043%

Operational Building Electricity

Land Use	Electricity[2] (kWh/yr)
Unrefrigerated Warehouse-No Rail	469122.1422
General Office Building	178202.863
Parking Lot	73835.41057
Total Energy	**721,160.42**

NOTES:
1. Orange County energy usage in 2024 (most recent data available).
Source: California Energy Commission, California Energy Consumption Dashboards, https://www.energy.ca.gov/data-reports/energy-almanac/california-electricity-data/california-energy-consumption-dashboards.
2. Electricity use per CalEEMod (5.11 Operational Energy Consumption).

Operational Water Electricity

Indoor Water Usage	24.96	million gallons
Indoor Energy Intensity Factor[1]	6,807	kWh/MG/year
Outdoor Water Usage	0.25	million gallons
Outdoor Energy Intensity Factor[2]	5,306	kWh/MG/year
Water Energy	171,189	kWh/year
	0.17	GWh/year

Land Use	Water Usage (gal/year)[3]	
	Indoor	Outdoor
Unrefrigerated Warehouse-No Rail	23,178,650	247,660
General Office Building	1,777,337	0
Total	24,955,987	247,660

NOTES:
1. Indoor water energy intensity factor per CalEEMod User Guide, Appendix G, Tab G-32 and includes supply, treatment, distribution, and wastewater within the South Coast Hydrologic Region.
2. Outdoor water energy intensity factor per CalEEMod User Guide, Appendix G, Tab G-32 and includes supply, treatment, and distribution within the South Coast Hydrologic Region.
4. Operational water use values per CalEEMod (5.12 Operational Water and Wastewater Consumption).

Solar Panel Electricity Reduction

AC System Size	34.1	kW/hr
AC System Size	0.0341	MW
Average Sun exposure per day	5	hr/day
Number of Days in a year	365	day/year
kWh generated per year	62,233	kWh/yr
MWh generated per year	0.0622325	GWh/yr

Operational Fuel

Warehouse Truck Fuel

Vehicle Type	Percent	Annual VMT[1]	MPG[2]	Annual Fuel Use (Gallons)	Fuel Type	2028 Orange County Fuel Use (Gallons)	% Consumption
Passenger Cars	0.00%	0	21.6	0	Gas	1,048,783,959.65	0.000%
Light/Medium Trucks	39.60%	316,716	17.2	18,414	Diesel	135,357,141.84	0.014%
Heavy Trucks/Other	60.40%	483,072	6.1	79,192	Diesel	135,357,141.84	0.059%
			Total Truck	97,606	Diesel	135,357,141.84	0.072%

Passanger Vehicle Fuel

Vehicle Type	Percent	Annual VMT[1]	MPG[2]	Annual Fuel Use (Gallons)	Fuel Type	2028 Orange County Fuel Use (Gallons)	% Consumption
Passenger Cars	93.76%	520,809	21.6	24,112	Gas	1,048,783,959.65	0.0023%
Light/Medium Trucks	5.66%	31,414	17.2	1,826	Diesel	135,357,141.84	0.0013%
Heavy Trucks/Other	0.59%	3,261	6.1	535	Diesel	135,357,141.84	0.0004%
			Total Truck	2,361	Diesel	135,357,141.84	0.0017%

Total Fuel

Vehicle Type	Annual Fuel Use (Gallons)	Fuel Type	2028 Orange County Fuel Use (Gallons)	% Consumption
Passenger Cars	24,112	Gas	1,048,783,959.65	0.0023%
Light/Medium Trucks	20,240	Diesel	135,357,141.84	0.0150%
Heavy Trucks/Other	79,727	Diesel	135,357,141.84	0.0589%
Total Truck	99,967	Diesel	135,357,141.84	0.0739%

Fleet Mix and VMT

Land Use[5]	LDA	LDT1	LDT2	MCY	MDV	LHD1	LHD2	MHD	OBUS	UBUS	SBUS	MH	HHD	VMT/year[4]
Unrefrigerated Warehouse-No Rail	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	16.9000	22.7000	0.0000	0.0000	0.0000	0.0000	60.4000	799,787.99
General Office Building	49.2386	3.9326	23.7988	2.2354	14.5523	2.8075	0.7436	1.5613	0.0598	0.0354	0.0965	0.3511	0.5871	555,484.00

NOTES:
1. Annual VMT is based on the fleet mix and total annual VMT
2. Average fuel economy derived from Department of Transportation.
3. The anticipated Orange County fuel usage in 2028 (the first operational year).
Source: California Air Resources Board, EMFAC2021, Emissions Inventory, 2022, https://arb.ca.gov/emfac/emissions-inventory/cd60f29daaedd924a75a9316202d7f56a9b573e5.
4. Total annual operational VMT based on annual VMT from CalEEMod (5.9 Operational Mobile Sources).