

Appendix M

Energy Calculations

Modera Argyle

Summary of Energy Use During Construction

Project Construction

Electricity	
Water Consumption	6,263 kWh
Temporary Power (lighting, tools)	21,370 kWh
Total:	27,632 kWh
Gasoline	
On Road	29,604 Gallons
Off Road	0
Total:	29,604 Gallons
Diesel	
On Road	149,533 Gallons
Off Road	55,732 Gallons
Total:	205,265 Gallons

Summary of Energy Use During Operations

	Baseline (Buildout)	Project Without Project Features	Project With Project Features	Percent Reduction	Net (Project - Baseline (Buildout))
Electricity					
Electricity (building)	619,087	2,256,596	2,108,495 kWh/year	-7%	1,489,408
Electricity (water)	63,767	374,874	299,898 kWh/year	-20%	236,131
Electricity Total	682,854	2,631,470	2,408,393 kWh/year	-8%	1,725,539
Natural Gas	236,460	5,733,371	5,555,690 cu ft/year	-3%	5,319,230
Mobile					
Gasoline	27,650	400,589	137,402 Gallons/year	-66%	109,753
Diesel	5,001	72,454	24,852 Gallons/year	-66%	19,851

Calculation of Diesel Usage During Construction (Offroad Equipment):

Phase Name	Off Road Equipment Type	Units	Hours	HP	Load Factor	Avg. Daily Factor	Number of Days	Diesel Fuel Usage	
Demolition	Air Compressors	2	8	78	0.48	0.6	44	791	
Demolition	Concrete/Industrial Saws	1	8	81	0.73	0.6	44	624	
Demolition	Cranes	1	8	231	0.29	0.6	44	707	
Demolition	Rubber Tired Loaders	1	8	203	0.36	0.6	44	772	
Demolition	Tractors/Loaders/Backhoes	1	8	97	0.37	0.6	44	379	
Grading	Bore/Drill Rigs	1	8	221	0.5	0.6	130	3,448	
Grading	Cranes	1	8	231	0.29	0.6	130	2,090	
Grading	Excavators	2	8	158	0.38	0.6	130	3,746	
Grading	Plate Compactors	1	8	8	0.43	0.6	130	107	
Foundation / Concrete	Air Compressors	1	8	78	0.48	0.6	55	494	
Foundation / Concrete	Cement and Mortar Mixers	1	8	9	0.56	0.6	55	67	
Foundation / Concrete	Concrete/Industrial Saws	1	8	81	0.73	0.6	55	781	
Foundation / Concrete	Cranes	2	8	231	0.29	0.6	55	1,769	
Foundation / Concrete	Plate Compactors	1	8	8	0.43	0.6	55	45	
Foundation / Concrete	Pumps	2	8	84	0.74	0.6	55	1,641	
Foundation / Concrete	Welders	1	8	46	0.45	0.6	55	273	
Building Construction	Aerial Lifts	1	8	63	0.31	0.6	424	1,987	
Building Construction	Air Compressors	2	8	78	0.48	0.6	424	7,620	
Building Construction	Cranes	2	7	231	0.29	0.6	424	11,930	
Building Construction	Forklifts	2	8	89	0.2	0.6	424	3,623	
Building Construction	Tractors/Loaders/Backhoes	1	7	97	0.37	0.6	424	3,196	
Building Construction	Welders	2	8	46	0.45	0.6	424	4,213	
Paving	Cement and Mortar Mixers	1	8	9	0.56	0.6	109	132	
Paving	Cranes	1	8	231	0.29	0.6	109	1,752	
Paving	Paving Equipment	1	8	132	0.36	0.6	109	1,243	
Paving	Skid Steer Loaders	1	8	65	0.37	0.6	109	629	
Paving	Tractors/Loaders/Backhoes	1	8	97	0.37	0.6	109	939	
Architectural Coating	Air Compressors	1	6	78	0.48	0.6	109	735	
Total Diesel Usage for Construction (Offr								55,732.2	gallons of diesel fuel

gallons of diesel fuel per horsepower-hour= 0.05

Notes: Equipment assumptions are provide in the CalEEMod output files and fuel usage estimate of 0.05 gallons of diesel fuel per horsepower-hour is from the SCAQMD CEQA Air Quality Handbook, Table A9-3E.

EMFAC2014 Emissions Inventory

Region Type: Air Basin

Region: South Coast

Calendar Year: 2020

Season: Annual

Vehicle Classification: EMFAC2011 Categories

Region	Veh_Class	Fuel	Speed (miles/hr)	Population (vehicles)	VMT (miles/day)	Trips (trips/day)	Fuel_Gas (1000 gallons/day)	Fuel_DSL (1000 gallons/day)	Miles per Gallon
South Coast	LDA	GAS	Aggregate	6057423.59	209765905.1	38222995.08	7586.347458	0	27.7
South Coast	LDT1	GAS	Aggregate	513376.136	17335871.67	3118562.249	746.5340341	0	23.2
South Coast	LDT2	GAS	Aggregate	2127118.46	79246264.35	13460775.55	3828.123041	0	20.7
						Construction Worker Trip (Composite LDA/LDT1/LDT2):			24.8
South Coast	T7 tractor cnstruction	DSL	Aggregate	3315.44367	297497.7758	0	0	49.06718655	6.1

Notes: Consistent with CalEEMod, a construction worker trip is assumed to be a composite of 50% LDA , 25% for LDT1, and 25% for LDT2. Used EMFAC 2011 Categories for construction as EMFAC2011 has specific categories for vehicle class T7.

Calculation of Gasoline and Diesel Usage During Phase 1 Construction (Onroad Vehicles):

Phase Name	Daily Woker Trips	Daily Vendor Trips	Days	Total Worker Trips	Total Vendor Trips	Total Haul Trips	Trip Length (miles)			Total Length (miles)			Avg. Daily Factor (worker and vendor)	Gallons of Fuel	
							Worker	Vendor	Haul	Worker	Vendor	Haul		Gasoline	Diesel
Demolition	15	5	44	660	220	226	14.7	6.9	40	9702	1518	9040	0.6	234.7	1,641.2
Grading	20	5	130	2600	650	16250	14.7	6.9	50	38220	4485	812500	0.6	924.5	134,451.9
Foundation / Concrete Pouring	100	30	55	5500	1650	0	14.7	20	20	80850	33000	0	0.6	1,955.6	3,265.7
Building Construction	150	30	424	63600	12720	0	14.7	6.9	20	934920	87768	0	0.6	22,613.6	8,685.5
Paving	50	10	109	5450	1090	0	14.7	6.9	20	80115	7521	0	0.6	1,937.8	744.3
Architectural Coating	50	10	109	5450	1090	0	14.7	6.9	20	80115	7521	0	0.6	1,937.8	744.3
Total:													29,603.9	149,532.8	

Worker Miles per gallon= 24.81 gasoline
 Vedor/Haul miles per gallon= 6.06 diesel

Notes: Consistent with CalEEMod worker vehicles are assumed to be gasoline and 50% LDA, 25%LDT1, and 25% LDT2. Vendor and haul trips are assumed to be 100% diesel Heavy Duty Trucks (T7)

Construction Electricity Usage

Construction Electricity Usage

Caterpillar 40-C4.4 Generator^a

Peak Power Rating - Prime (kW)	36
Typical Load	70%
Average Output (kW)	25.2
Hours per Day	2
Average Daily Output (kWh)	50.4
Building Construction Phase Duration (days)	424
Total Construction (kWh)	21,370
Total Construction (MWh)	21.4

^a<https://www.albancat.com/content/uploads/2014/06/40-C4.4-Spec-Sheet.pdf>

Water Usage for Control of Fugitive Dust during Construction:

Phase	Days	Average Daily AVERAGE Distrubed	Gallons Per Year	Electricity (kWhr)
Demolition	44	1	146,168	1,422
Grading	130	1	431,860	4,201
Foundation / Concrete Pourin	55	0	0	0
Building Construction	424	0	0	0
Paving	109	0	0	0
Architectural Coating	109	0.2	65,836	640
Total:			643,864	6,263

Water application rate= 3020 gal/acre/day
 kWhr equivalent= 0.01 kWhr

Notes: 1) Gallons per year of water usage for dust control is calculated based on a minimum control efficiency of 66% (three times daily) with an application rate of 3,020 gal/acre/day (Air & Waste Management Association Air Pollution Engineering Manual (1992 Edition)) and average of 26 construction days per month.
 2) CalEEMod Default: Each gallon of delivered potable water in Southern California is associated with 0.009727 kWhr of electricity).

Peak Electricity Demand Calculations

Electrical Load Factor Equation

$$f_{Load} = \frac{\text{Average load}}{\text{Maximum load in given time period}}$$

Load Factor (%)¹ **52%**

Project Electricity Demand (Operational)

Annual Demand

Building (MWh)	1,489
Water (MWh)	236
Total (MWh)	1,726

Average Daily Demand

Building (kWh)	4,081
Water (kWh)	647
Total (kWh)	4,728

Average Load

Building (kW)	170
Water (kW)	27
Total (kW)	197

Peak Load Calculation

Peak Load (kW)	354
Systemwide Peak Load (MWh)	5,854
Percent of Peak	0.006%

¹2017 Report: System Efficiency of California's Electric Grid. California Public Utilities Commission. 2017

Modera Argyle - Baseline (Buildout)
Los Angeles-South Coast County, Annual

Land Use Details

<i>Land Uses</i>	<i>Size</i>	<i>Metric</i>	<i>Lot Acreage</i>	<i>Floor Surface Area</i>	<i>Population</i>
General Office Building	15.18	1000sqft	0.35	15,182.00	0
Unrefrigerated Warehouse-No Rail	32.63	1000sqft	0.75	32,634.00	0
Parking Lot	43.00	Space	0.39	17,200.00	0
Strip Mall	14.00	1000sqft	0.32	14,000.00	0

Trip Summary Information

<i>Land Uses</i>	<i>Average Daily Trip Rate</i>			
	<i>Weekday</i>	<i>Saturday</i>	<i>Sunday</i>	<i>Annual VMT</i>
General Office Building	148.01	32.94	14.12	130,736
Unrefrigerated Warehouse-No Rail	57.10	57.10	57.10	88,328
Parking Lot	0.00	0.00	0.00	
Strip Mall	529.06	501.76	243.88	332,650
Total	734.17	591.80	315.10	551,714

Unmitigated Gasoline and Diesel Usage

	<i>Gasoline</i>	<i>Diesel</i>
<i>Miles/Gallon</i>	18.6	7.4
<i>% Fleet Mix</i>	93.3%	6.7%
Total (Gallons):	27,650	5,001

Energy by Land Use - Natural Gas

<i>Land Uses</i>	<i>kBTU/yr</i>	<i>cu ft/year</i>
General Office Building	188,864	179,870
Unrefrigerated Warehouse-No Rail	33,939	32,323
Parking Lot	0	0
Strip Mall	25,480	24,267
Total	248,283	236,460

Energy by Land Use - Electricity

<i>Land Uses</i>	<i>kWH/yr</i>
General Office Building	231,374
Unrefrigerated Warehouse-No Rail	149,137
Parking Lot	15,136
Strip Mall	223,440
Total	619,087

Water Detail (Unmitigated)

<i>Land Uses</i>	<i>Indoor Use (Mgal)</i>	<i>Outdoor Use (Mgal)</i>	<i>Electricity Use (kWh/yr)</i>
General Office Building	2.698	1.65361	46,062
Unrefrigerated Warehouse-No Rail	7.54569	0	
Parking Lot	0	0	0
Strip Mall	1.03702	0.63559	17,705
Total	11.28	2.29	63,767

Notes: Indoor water results in 0.0111 kWhr of electricity usage per gallon from delivery, treatment, and distribution of water within Southern California (CalEEMod). Outdoor water results in 0.009727 kWhr of electricity usage per gallon from delivery and distribution of water within Southern California (CalEEMod).

**Modera Argyle - Project Without Project Features
Los Angeles-South Coast County, Annual**

Land Use Details

<i>Land Uses</i>	<i>Size</i>	<i>Metric</i>	<i>Lot Acreage</i>	<i>Floor Surface Area</i>	<i>Population</i>
Enclosed Parking With Elevator	412.00	Space	3.28	164,800.00	0
High Turnover (Sit Down Restaurant)	15.00	1000sqft	0.34	15,000.00	0
Apartments Mid Rise	276.00	Dwelling Unit	7.26	236,250.00	789
Strip Mall	9.00	1000sqft	0.21	9,000.00	0

Trip Summary Information

<i>Land Uses</i>	<i>Average Daily Trip Rate</i>			
	<i>Weekday</i>	<i>Saturday</i>	<i>Sunday</i>	<i>Annual VMT</i>
Enclosed Parking With Elevator	0	0	0	0
High Turnover (Sit Down Restaurant)	1,683.00	2,096.25	1745.10	2,386,190
Apartments Mid Rise	1,501.44	1,443.48	1322.04	5,014,778
Strip Mall	340.02	322.47	156.69	592,321
Total	3,524.46	3,862.20	3,223.83	7,993,289

Unmitigated Gasoline and Diesel Usage

	<i>Gasoline</i>	<i>Diesel</i>
<i>Miles/Gallon</i>	18.6	7.4
<i>% Fleet Mix</i>	93.3%	6.7%
Total (Gallons):	400,589	72,454

Energy by Land Use - Natural Gas (Unmitigated)

<i>Land Uses</i>	<i>kBTU/yr</i>	<i>cu ft/year</i>
Enclosed Parking With Elevator	0	0
High Turnover (Sit Down Restaurant)	3,461,400	3,296,571
Apartments Mid Rise	2,543,880	2,422,743
Strip Mall	14,760	14,057
Total	6,020,040	5,733,371

Energy by Land Use - Electricity (Unmitigated)

<i>Land Uses</i>	<i>kWH/yr</i>
Enclosed Parking With Elevator	380,016
High Turnover (Sit Down Restaurant)	662,100
Apartments Mid Rise	1,092,980
Strip Mall	121,500
Total	2,256,596

Water Detail (Unmitigated)

<i>Land Uses</i>	<i>Indoor Use (Mgal)</i>	<i>Outdoor Use (Mgal)</i>	<i>Electricity Use (kWh/yr)</i>
Enclosed Parking With Elevator	0	0	0
High Turnover (Sit Down Restaurant)	4.55	0.29	53,415
Apartments Mid Rise	17.98	11.34	310,077
Strip Mall	0.67	0.41	11,382
Total	23.20	12.04	374,874

Notes: Indoor water results in 0.0111 kWhr of electricity usage per gallon from delivery, treatment, and distribution of water within Southern California (CalEEMod). Outdoor water results in 0.009727 kWhr of electricity usage per gallon from delivery and distribution of water within Southern California (CalEEMod).

Modera Argyle - Project
Los Angeles-South Coast County, Annual

Land Use Details

<i>Land Uses</i>	<i>Size</i>	<i>Metric</i>	<i>Lot Acreage</i>	<i>Floor Surface Area</i>	<i>Population</i>
Enclosed Parking With Elevator	412	Space	3.28	164800	0
High Turnover (Sit Down Restaurant)	15	1000sqft	0.34	15000	0
Apartments Mid Rise	276	Dwelling Unit	7.26	236250	789
Strip Mall	9	1000sqft	0.21	9000	0

Trip Summary Information

<i>Land Uses</i>	<i>Average Daily Trip Rate</i>			
	<i>Weekday</i>	<i>Saturday</i>	<i>Sunday</i>	<i>Annual VMT</i>
Enclosed Parking With Elevator	0	0	0	0
High Turnover (Sit Down Restaurant)	1,683.00	2,096.25	1745.10	818,463
Apartments Mid Rise	1,501.44	1,443.48	1322.04	1,720,069
Strip Mall	340.02	322.47	156.69	203,166
Total	3,524.46	3,862.20	3,223.83	2,741,698

Mitigated Gasoline and Diesel Usage

	<i>Gasoline</i>	<i>Diesel</i>
<i>Miles/Gallon</i>	18.6	7.4
<i>% Fleet Mix</i>	93.3%	6.7%
Total (Gallons):	137,402	24,852

Energy by Land Use - Natural Gas (Mitigated)

<i>Land Uses</i>	<i>kBTU/yr</i>	<i>cu ft/year</i>
Enclosed Parking With Elevator	0	0
High Turnover (Sit Down Restaurant)	3,396,930	3,235,171
Apartments Mid Rise	2,422,820	2,307,448
Strip Mall	13,725	13,071
Total	5,833,475	5,555,690

Energy by Land Use - Electricity (Mitigated)

<i>Land Uses</i>	<i>kWH/yr</i>
Enclosed Parking With Elevator	346986
High Turnover (Sit Down Restaurant)	620,423
Apartments Mid Rise	1,037,280
Strip Mall	103,806
Total	2,108,495

Water Detail (Unmitigated)

<i>Land Uses</i>	<i>Indoor Use</i>	<i>Outdoor Use</i>	<i>Electricity Use</i>
	<i>(Mgal)</i>	<i>(Mgal)</i>	<i>(kWh/yr)</i>
Enclosed Parking With Elevator	0	0	0
High Turnover (Sit Down Restaurant)	3.6424	0.232494	42,732
Apartments Mid Rise	14.386	9.06944	248,061
Strip Mall	0.53322	0.326875	9,104
Total	18.56	9.63	299,898

Notes: Indoor water results in 0.0111 kWhr of electricity usage per gallon from delivery, treatment, and distribution of water within Southern California (CalEEMod). Outdoor water results in 0.009727 kWhr of electricity usage per gallon from delivery and distribution of water within Southern California (CalEEMod).

EMFAC Emission inventories for County

EMFAC2014 (v1.0.7) Emissions Inventory

Region Type: County

Region: Los Angeles

Calendar Year: 2016

Season: Annual

Vehicle Classification: EMFAC2011 Categories

Region	CalYr	VehClass	MdlYr	Speed	Fuel	Fuel_Gasoline (1000 gallons/day)	Fuel_DSL (1000 gallons/day)
Los Angeles	2016	All Other B	Aggregatec	Aggregatec	DSL	0.00	21.11
Los Angeles	2016	LDA	Aggregatec	Aggregatec	DSL	0.00	29.15
Los Angeles	2016	LDT1	Aggregatec	Aggregatec	DSL	0.00	0.63
Los Angeles	2016	LDT2	Aggregatec	Aggregatec	DSL	0.00	2.47
Los Angeles	2016	LHD1	Aggregatec	Aggregatec	DSL	0.00	82.60
Los Angeles	2016	LHD2	Aggregatec	Aggregatec	DSL	0.00	41.79
Los Angeles	2016	MDV	Aggregatec	Aggregatec	DSL	0.00	18.19
Los Angeles	2016	MH	Aggregatec	Aggregatec	DSL	0.00	4.04
Los Angeles	2016	Motor Coa	Aggregatec	Aggregatec	DSL	0.00	18.34
Los Angeles	2016	PTO	Aggregatec	Aggregatec	DSL	0.00	19.50
Los Angeles	2016	SBUS	Aggregatec	Aggregatec	DSL	0.00	15.18
Los Angeles	2016	T6 Ag	Aggregatec	Aggregatec	DSL	0.00	0.34
Los Angeles	2016	T6 CAIRP h	Aggregatec	Aggregatec	DSL	0.00	0.83
Los Angeles	2016	T6 CAIRP si	Aggregatec	Aggregatec	DSL	0.00	2.55
Los Angeles	2016	T6 instate c	Aggregatec	Aggregatec	DSL	0.00	13.42
Los Angeles	2016	T6 instate c	Aggregatec	Aggregatec	DSL	0.00	36.35
Los Angeles	2016	T6 instate f	Aggregatec	Aggregatec	DSL	0.00	94.70
Los Angeles	2016	T6 instate s	Aggregatec	Aggregatec	DSL	0.00	242.96
Los Angeles	2016	T6 OOS he	Aggregatec	Aggregatec	DSL	0.00	0.48
Los Angeles	2016	T6 OOS sm	Aggregatec	Aggregatec	DSL	0.00	1.46
Los Angeles	2016	T6 Public	Aggregatec	Aggregatec	DSL	0.00	7.76
Los Angeles	2016	T6 utility	Aggregatec	Aggregatec	DSL	0.00	1.91
Los Angeles	2016	T7 Ag	Aggregatec	Aggregatec	DSL	0.00	0.38
Los Angeles	2016	T7 CAIRP	Aggregatec	Aggregatec	DSL	0.00	165.01
Los Angeles	2016	T7 CAIRP ci	Aggregatec	Aggregatec	DSL	0.00	14.53
Los Angeles	2016	T7 NNOOS	Aggregatec	Aggregatec	DSL	0.00	196.09
Los Angeles	2016	T7 NOOS	Aggregatec	Aggregatec	DSL	0.00	66.49
Los Angeles	2016	T7 POLA	Aggregatec	Aggregatec	DSL	0.00	195.66
Los Angeles	2016	T7 Public	Aggregatec	Aggregatec	DSL	0.00	22.04
Los Angeles	2016	T7 Single	Aggregatec	Aggregatec	DSL	0.00	78.43
Los Angeles	2016	T7 single c	Aggregatec	Aggregatec	DSL	0.00	36.16
Los Angeles	2016	T7 SWCV	Aggregatec	Aggregatec	DSL	0.00	75.82
Los Angeles	2016	T7 tractor	Aggregatec	Aggregatec	DSL	0.00	212.42
Los Angeles	2016	T7 tractor c	Aggregatec	Aggregatec	DSL	0.00	27.15
Los Angeles	2016	T7 utility	Aggregatec	Aggregatec	DSL	0.00	1.63
Los Angeles	2016	UBUS	Aggregatec	Aggregatec	DSL	0.00	115.03
Los Angeles	2016	LDA	Aggregatec	Aggregatec	ELEC	0.00	0
Los Angeles	2016	LDT1	Aggregatec	Aggregatec	ELEC	0.00	0
Los Angeles	2016	LDA	Aggregatec	Aggregatec	GAS	5175.68	0
Los Angeles	2016	LDT1	Aggregatec	Aggregatec	GAS	530.59	0
Los Angeles	2016	LDT2	Aggregatec	Aggregatec	GAS	2524.56	0
Los Angeles	2016	LHD1	Aggregatec	Aggregatec	GAS	255.89	0
Los Angeles	2016	LHD2	Aggregatec	Aggregatec	GAS	59.34	0
Los Angeles	2016	MCY	Aggregatec	Aggregatec	GAS	30.30	0
Los Angeles	2016	MDV	Aggregatec	Aggregatec	GAS	2139.17	0
Los Angeles	2016	MH	Aggregatec	Aggregatec	GAS	27.02	0
Los Angeles	2016	OBUS	Aggregatec	Aggregatec	GAS	35.64	0
Los Angeles	2016	SBUS	Aggregatec	Aggregatec	GAS	3.56	0
Los Angeles	2016	T6TS	Aggregatec	Aggregatec	GAS	96.97	0
Los Angeles	2016	T7IS	Aggregatec	Aggregatec	GAS	14.35	0
Los Angeles	2016	UBUS	Aggregatec	Aggregatec	GAS	30.02	0
						3,986,927,263	679,846,446
Fuel Usage for Project Construction						29,604	205,265
Percentage of County for Construction						0.0007%	0.030%
Net Fuel Usage for Project Operation						109,753	19,851
Percentage of County for Operation						0.0028%	0.0029%