

# Appendix K-1: Energy Calculations

## Fuel and Energy Calculations

### Gasoline and Diesel Use

Existing Annual VMT: 32,282 miles			Fuel	
Fleet Mix	91% Auto	29,377 miles	20.4 mpg gas	1,440 gallons
	9% Other	2,905 miles	5.71 mpg diesel	509 gallons

Project Annual VMT: 32,263 miles			Fuel	
Fleet Mix	91% Auto	29,359 miles	20.4 mpg gas	1,439 gallons
	9% Other	2,904 miles	5.7 mpg diesel	509 gallons

### Worker Fuel (Gasoline, on-road)

Phase	Trips	Length (mi)	Days	Total (miles)	MPG	Gallons
Paving	20	14.7	22	6,468	20.4	4,814
Grading	15		20	4,410		
Building Construction	20		261	76,734		
Site Preparation	18		22	5,821		
Arch Coating	5		65	4,778		
<b>Total</b>	<b>78</b>	<b>14.7</b>	<b>390</b>	<b>98,211</b>	<b>20.4</b>	<b>4,814</b>

### Vendor Fuel (Diesel, on-road)

Phase	Trips	Length (mi)	Days	Total (miles)	MPG	Gallons
Paving	0	6.9	22	0	5.70	3,159
Grading	0		20	0		
Building Construction	10		261	18,009		
Site Preparation	0		22	0		
Arch Coating	0		65	0		
<b>Total</b>	<b>10</b>	<b>6.9</b>	<b>390</b>	<b>18,009</b>	<b>5.70</b>	<b>3,159</b>

### Construction Equipment (Diesel, off-road)

Phase	Equipment	Units	Hours	HP	Load Factor	Average Daily Load Factor	Days	HP-Hours
Architectural Coating	Air Compressor	1	6	78	0.48	1	65	14,602
Building Construction	Cranes	1	7	231	0.29	1	261	122,391
Building Construction	Forklifts	3	8	89	0.20	1	261	111,499
Building Construction	Tractors/Loaders/Backhoes	3	7	97	0.37	1	261	196,713
Building Construction	Generator Sets	1	8	84	0.74	1	261	129,790
Building Construction	Welders	1	8	46	0.45	1	261	43,222
Paving	Cement and Mortar Mixers	2	6	9	0.56	1	22	1,331
Paving	Pavers	1	8	130	0.42	1	22	9,610
Paving	Paving Equipment	2	6	132	0.36	1	22	12,545
Paving	Rollers	2	6	80	0.38	1	22	8,026
Paving	Tractors/Loaders/Backhoes	1	8	97	0.37	1	22	6,317
Grading	Excavators	1	8	158	0.38	1	20	9,606
Grading	Rubber Tired Dozers	1	8	247	0.40	1	20	15,808
Grading	Tractors/Loaders/Backhoes	3	8	97	0.37	1	20	17,227
Grading	Graders	1	8	187	0.41	1	20	12,267
Site Preparation	Tractors/Loaders/Backhoes	4	8	97	0.37	1	22	25,267
Site Preparation	Rubber Tired Dozers	3	8	247	0.40	1	22	52,166

Total	788,387
-------	---------

HP = horsepower gallons of diesel fuel per HP-hour= 0.05 Equipment assumptions are provided in the CalEEMod output files (refer to Appendix D) 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.
---

788,387 hp-hours = 39,419 gallons diesel

**Water Usage for fugitive dust control during construction**

Water application rate = 3,020 gallons/acre/day

Each gallon of delivered potable water in Southern California is associated with 0.009727 kWhr of electricity).

Grading 20 days x 4.53 acres x 3,020 gallons = 273,612 gallons x 0.009727 = 2,661 kWhr