

Appendix C: Energy Calculations

Ohlone Parkway Industrial Project

Watsonville, CA

Fuel Consumption Spreadsheets

Prepared by: MIG, Inc.

April 2023

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Energy Appendix: Fuel Consumption Estimations
100 Manabe Ow Road Warehouse Project
Watsonville, CA
Prepared by MIG, Inc. March 2023

Sheet 1: Construction and Operational Fuel Consumption Summary

Construction Fuel Consumption (Total)

Activity	Gasoline	Diesel	Electricity
Mar-23	-	50,818	-
Off-site	10,286	9,015	2,858
Total	10,286	59,833	2,858

Operational Fuel Consumption (Annual)

Trip Type	Gasoline	Diesel	Electricity
Employees / Visitors	40,089	37	147,934
Trucks; LHDT1/LHDT2	4,248	2,129	-
Trucks; MHDT	0	0	-
Trucks; HHDT	574	298,043	-
Total	44,911	300,209	147,934

Sheet 2: Construction On-site Fuel Consumption Estimations

Phase	Days	Equipment	# of Pieces	Hr/Day	Horsepower	Load Factor	Runtime (bhp-hr)	Consumption (bhp-hr/gal) ¹	Gallons of Diesel	
Site Preparation	10	Rubber Tired Dozers	3	8	367	0.40	35,232	18.5	1,904	
		Tractors/Loaders/Backhoes	4	8	84	0.37	9,946		538	
Grading	30	Excavators	2	8	36	0.38	6,566		355	
		Graders	1	8	148	0.41	14,563		787	
		Rubber Tired Dozers	1	8	367	0.40	35,232		1,904	
		Scrapers	2	8	423	0.48	97,459		5,268	
		Tractors/Loaders/Backhoes	2	8	84	0.37	14,918		806	
Building Construction	343	Cranes	1	7	367	0.29	255,538		13,813	
		Forklifts	3	8	82	0.20	135,005		7,298	
		Generator Sets	1	8	14	0.74	28,428		1,537	
		Tractors/Loaders/Backhoes	3	7	84	0.37	223,869		12,101	
		Welders	1	8	46	0.45	56,801		3,070	
Paving	20	Pavers	2	8	81	0.42	10,886		588	
		Paving Equipment	2	8	89	0.36	10,253		554	
		Rollers	2	8	36	0.38	4,378		237	
Architectural Coating	10	Air Compressors	1	6	37	0.48	1,066		58	
Total									50,818	

¹ The Carl Moyer Program Guidelines 2017 Revisions. Table D-21. Approved by the Board April 27, 2017.

Sheet 3: Construction Off-site Fuel Consumption Estimates

Phase	Days	Number of Trips	Dist (mi)	Total VMT	Vehicle Class	Percent of Workers by Vehcile Class	Gasoline Average Fuel Economy (MPG)	Gasoline Fuel Split	Gasoline Fuel Consumption by Class (gal)	Diesel Average Fuel Economy (MPG)	Diesel Fuel Split	Diesel Fuel Consumption by Class (gal)	Electric Average Fuel Economy (Mi / KWh)	Electric Fuel Split	Electric Fuel Consumption by Class (KWh)	Hybrid Average Fuel Economy (MPG)	Hybrid Average Fuel Economy (Mi / KWh)	Hybrid Fuel Split	Hybrid Fuel Consumption by Class (gal)	Hybrid Fuel Consumption by Class (KWh)	Gasoline Fuel Consumption by Phase (gal)	Diesel Fuel Consumption by Phase (gal)	Hybrid Fuel Consumption by Phase (KWh)
Worker Trips																							
Site Preparation	10	17.5	9.71	1699.3	LDA	0.5	28.7	92.3%	27	40.0	0.9%	0	2.6	4.8%	15.8	53.9	6.8	2.0%	0	3	64	0	19
					LDT1	0.25	23.7	99.7%	18	22.7	0.1%	0	2.6	0.2%	0.3	59.3	6.2	0.0%	0	0			
					LDT2	0.25	23.0	98.9%	18	30.4	0.4%	0	2.6	0.3%	0.4	56.5	6.4	0.4%	0	0			
Grading	30	20	9.71	5826	LDA	0.5	28.7	92.3%	94	40.0	0.9%	1	2.6	4.8%	54.1	53.9	6.8	2.0%	1	9	219	1	65
					LDT1	0.25	23.7	99.7%	61	22.7	0.1%	0	2.6	0.2%	1.1	59.3	6.2	0.0%	0	0			
					LDT2	0.25	23.0	98.9%	63	30.4	0.4%	0	2.6	0.3%	1.5	56.5	6.4	0.4%	0	0			
Building Construction	343	72.8	9.71	242463	LDA	0.5	28.7	92.3%	3,893	40.0	0.9%	26	2.6	4.8%	2253.3	53.9	6.8	2.0%	45	361	9,101	37	2,725
					LDT1	0.25	23.7	99.7%	2,553	22.7	0.1%	3	2.6	0.2%	45.1	59.3	6.2	0.0%	0	4			
					LDT2	0.25	23.0	98.9%	2,609	30.4	0.4%	8	2.6	0.3%	62.1	56.5	6.4	0.4%	0	0			
Paving	20	15	9.71	2913	LDA	0.5	28.7	92.3%	47	40.0	0.9%	0	2.6	4.8%	27.1	53.9	6.8	2.0%	1	4	109	0	33
					LDT1	0.25	23.7	99.7%	31	22.7	0.1%	0	2.6	0.2%	0.5	59.3	6.2	0.0%	0	0			
					LDT2	0.25	23.0	98.9%	31	30.4	0.4%	0	2.6	0.3%	0.7	56.5	6.4	0.4%	0	0			
Architectural Coating	10	14.6	9.71	1417.7	LDA	0.5	28.7	92.3%	23	40.0	0.9%	0	2.6	4.8%	13.2	53.9	6.8	2.0%	0	2	53	0	16
					LDT1	0.25	23.7	99.7%	15	22.7	0.1%	0	2.6	0.2%	0.3	59.3	6.2	0.0%	0	0			
					LDT2	0.25	23.0	98.9%	15	30.4	0.4%	0	2.6	0.3%	0.4	56.5	6.4	0.4%	0	0			
Sub-Total Worker Trips Energy Consumption																					9,546	39	2,858
Vendor Trips																							
Building Construction	343	28.8	6.06	59863	MHDT	0.5	4.6	11.4%	739	8.5	88.6%	3,139	N/A								739	8,966	0
					HHDT	0.5	N/A	0.0%	N/A	5.1	100.0%	5,827											
Hauling Trips																							
Grading	N/A	102	0.5	51	HHDT	1.0	N/A	0.0%	N/A	5.1	100.0%	10	N/A								0	10	0

Total On-Road Construction Trips Genergy Usage							Gasoline (gal)		10,286	Diesel (gal)		9,015	Electricity (KWh)			2,858
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Sheet 4: Operational Fuel Consumption

Trip Type	Vehicle Class	Annual VMT	Gasoline Average Fuel Economy (MPG)	Gasoline Fuel Split	Gasoline Fuel Consumption by Class (gal)	Diesel Average Fuel Economy (MPG)	Diesel Fuel Split	Diesel Fuel Consumption by Class (gal)	Electric Average Fuel Economy (Mi / KWh)	Electric Fuel Split	Electric Fuel Consumption by Class (KWh)	Hybrid Average Fuel Economy (MPG Gas)	Hybrid Average Fuel Economy (Mi / KWh)	Hybrid Fuel Split	Hybrid Fuel Consumption by Class (gal Gas)	Hybrid Fuel Consumption by Class (KWh)
Employee / Visitor	LDA / LDT1 / LDT2	1,092,705	26.07	95.0%	39,817	36.97	0.7%	193	2.59	3.0%	12,613	54.24	6.72	1.3%	272	135,321
Trucks	LHDT1/LHDT2	70,221	8.98	54.3%	4,248	15.07	45.7%	2,129	0	0.0%	0	0	0	0.0%	0	0
	MHDT	-	4.60	11.4%	0	8.45	88.6%	0	0	0.0%	0	0	0	0.0%	0	0
	HHDT	1,533,000	3.41	0.1%	574	5.14	99.9%	298,043	0	0.0%	0	0	0	0.0%	0	0

Sub-total Employee / Visitor Consumption Without TDM	Gasoline	40,089	Diesel	37	Electricity	147,934
Sub-total Truck Consumption	Gasoline	4,822	Diesel	300,172	Electricity	0
Total	Gasoline (Gal)	44,911	Diesel (Gal)	300,209	Electricity	147,934

Sub-total Employee / Visitor Consumption With 15% TDM	Gasoline	34,076	Diesel	31	Electricity	125,744
Sub-total Truck Consumption	Gasoline	4,822	Diesel	300,172	Electricity	0
Total	Gasoline (Gal)	38,897	Diesel (Gal)	300,203	Electricity	125,744