

Appendix C

Energy Calculations

2539 East Garvey Ave Project

Last Updated: 9/2/2020

Compression-Ignition Engine Brake-Specific Fuel Consumption (BSFC) Factors [1]:

HP: 0 to 100	0.0588	HP: Greater than 100	0.0529
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Values above are expressed in gallons per horsepower-hour/BSFC.

CONSTRUCTION EQUIPMENT

Construction Equipment	#	Hours per		Load Factor	Construction Phase	Fuel Used (gallons)
		Day	Horsepower			
Rubber tired dozers	1	8	247	0.4	Demolition	1,169.83
Aerial Lifts	1	8	63	0.31	Demolition	257.08
Tractors/Loaders/Backhoes	1	8	97	0.37	Demolition	472.43
Forklifts	1	8	89	0.2	Demolition	234.30
Dumpers/tenders	1	8	16	0.38	Site Prep	77.17
Tractors/Loaders/Backhoes	1	7	97	0.37	Site Prep	398.61
Rubber tired dozers	1	8	247	0.4	Site Prep	1,128.05
Trenchers	1	8	78	0.50	Grading	733.38
Graders	1	8	187	0.41	Grading	1,296.86
Excavator	1	8	158	0.38	Grading	1,015.57
Tractors/Loaders/Backhoes	1	7	97	0.37	Grading	590.53
Plate Compactor	1	8	8	0.43	Grading	64.69
Cranes	1	8	231	0.29	Building Construction	4,447.53
Forklifts	3	7	89	0.20	Building Construction	3,448.67
Aerial Lifts	3	7	63	0.31	Building Construction	3,783.85
Tractors/Loaders/Backhoes	1	6	97	0.37	Building Construction	1,986.72
Air Compressors	2	8	78	0.48	Building Construction	5,526.73
Welders	2	8	46	0.45	Building Construction	3,055.65
Pavers	1	8	130	0.42	Paving	300.15
Paving Equipment	1	8	132	0.36	Paving	261.23
Total Fuel Used						28,115.41

(Gallons)

Construction Phase	Days of Operation
Demolition	28
Site Preparation Phase	27
Grading Phase	40
Building Construction Phase	157
Architectural Coating Phase	65
Paving Phase	13

WORKER TRIPS

Construction Phase	MPG [2]	Trips	Trip Length (miles)	Fuel Used (gallons)
Demolition	24.4	280	14.7	168.69
Site Prep Phase	24.4	216	14.7	130.13
Grading Phase	24.4	520	14.7	313.28
Building Phase	24.4	7693	14.7	4634.72
Paving Phase	24.4	65	14.7	39.16
Architectural Coating Phase	24.4	650	14.7	391.60
Fuel Used				5677.57

HAULING AND VENDOR TRIPS

Trip Class	MPG [2]	Trips	Trip Length (miles)	Fuel Used
Vendor Trips	7.5	3297	6.9	3033.24
Hauling Trips	7.5	543	5	362.00
Fuel Used				3395.24

Total Gasoline Consumption (gallons) 5677.57

Total Diesel Consumption (gallons) 31510.65

Sources:

[1] United States Environmental Protection Agency. 2018. Exhaust and Crankcase Emission Factors for Nonroad Compression-Ignition Engines in MOVES2014b. July 2018.

Available at: <https://nepis.epa.gov/Exe/ZyPDF.cgi?Dockey=P100UXEN.pdf>.

[2] United States Department of Transportation, Bureau of Transportation Statistics. 2019. National Transportation Statistics 2019. Available at:

<https://www.bts.gov/topics/national-transportation-statistics>.

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Populate one of the following tables (Leave the other blank):

Annual VMT	OR	Daily Vehicle Trips
Annual VMT: 3,440,348		Daily Vehicle Trips: Average Trip: Distance:

Fleet Class	Fleet Mix	Fuel Economy (MPG)
Light Duty Auto (LDA)	0.552111	Passenger Vehicles 24.4
Light Duty Truck 1 (LDT1)	0.043066	Light-Med Duty Trucks 17.9
Light Duty Truck 2 (LDT2)	0.201891	Heavy Trucks/Other 7.5
Medium Duty Vehicle (MDV)	0.118512	Motorcycles 44
Light Heavy Duty 1 (LHD1)	0.015605	
Light Heavy Duty 2 (LHD2)	0.005863	
Medium Heavy Duty (MHD)	0.021387	
Heavy Heavy Duty (HHD)	0.031253	
Other Bus (OBUS)	0.002087	
Urban Bus (UBUS)	0.001818	
School Bus (SBUS)	0.000708	
Motorhome (MH)	0.000896	
Motorcycle (MCY)	0.004803	

Fleet Mix					
Vehicle Type	Percent	Fuel Type	Annual VMT: VMT	Vehicle Trips: VMT	Fuel Consumption (Gallons)
Passenger Vehicles	55.21%	Gasoline	1899454	0.00	77846
Light-Medium Duty Trucks	36.35%	Gasoline	1250460	0.00	69858
Heavy Trucks/Other	7.96%	Diesel	273910	0.00	36521
Motorcycle	0.48%	Gasoline	16524	0.00	376
Total Gasoline Consumption (gallons)					148080.11
Total Diesel Consumption (gallons)					36521.36

Sources:

[1] United States Department of Transportation, Bureau of Transportation Statistics. 2019. National Transportation Statistics 2019. Available at: <https://www.bts.gov/topics/national-transportation-statistics>.