

Appendix D

Energy Demand Calculations

The Salvation Army Bell Oasis Apartments II

5/9/2023

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	Horsepower	Load	Construction Phase	Fuel Used (gallons)
		Day		Factor		
Graders	1	8	187	0.41	Site Preparation Phase	973
Rubber Tired Dozers	1	7	247	0.4	Site Preparation Phase	1,097
Tractors/Loaders/Backhoes	1	8	97	0.37	Site Preparation Phase	506
Graders	1	8	187	0.41	Grading Phase	519
Rubber Tired Dozers	1	8	247	0.4	Grading Phase	668
Tractors/Loaders/Backhoes	2	8	97	0.37	Grading Phase	540
Cranes	1	6	231	0.29	Building Construction Phase	6,416
Forklifts	1	6	89	0.2	Building Construction Phase	1,895
Generator Sets	1	8	84	0.74	Building Construction Phase	8,825
Tractors/Loaders/Backhoes	1	6	97	0.37	Building Construction Phase	3,822
Welders	3	8	46	0.45	Building Construction Phase	8,817
Air Compressors	1	6	78	0.48	Architectural Coating Phase	779
Cement and Mortar Mixers	1	6	9	0.56	Paving Phase	105
Pavers	1	6	130	0.42	Paving Phase	1,022
Paving Equipment	1	8	132	0.36	Paving Phase	1,186
Rollers	1	7	80	0.38	Paving Phase	738
Tractors/Loaders/Backhoes	1	8	97	0.37	Paving Phase	995
Total Fuel Used						38,902
						(Gallons)

Construction Phase	Days of Operation
Site Preparation Phase	30
Grading Phase	16
Building Construction Phase	302
Paving Phase	59
Architectural Coating Phase	59
Total Days	466

WORKER TRIPS

Constuction Phase	MPG [2]	Trips	Trip Length (miles)	Fuel Used (gallons)
Site Preparation Phase	24.1	8	18.5	184.23
Grading Phase	24.1	10	18.5	122.82
Building Construction Phase	24.1	42	18.5	9736.68
Paving Phase	24.1	13	18.5	588.78
Architectural Coating Phase	24.1	8	18.5	362.32
Total				10,994.83

HAULING AND VENDOR TRIPS

				Fuel Used
Trip Class	MPG [2]	Trips	Trip Length (miles)	(gallons)
HAULING TRIPS				
Site Preparation Phase	7.5	0	20.0	0.00
Grading Phase	7.5	102	20.0	272.00
Building Construction Phase	7.5	0	20.0	0.00
Paving Phase	7.5	0	20.0	0.00
Architectural Coating Phase	7.5	0	20.0	0.00

				Total	272.00
VENDOR TRIPS					
Site Preparation Phase	7.5	0	10.2		0.00
Grading Phase	7.5	0	10.2		0.00
Building Construction Phase	7.5	6	10.2		2464.32
Paving Phase	7.5	0	10.2		0.00
Architectural Coating Phase	7.5	0	10.2		0.00
				Total	2,464.32

Total Gasoline Consumption (gallons)		10,995
Total Diesel Consumption (gallons)		41,638

Sources:

[1] United States Environmental Protection Agency. 2021. *Exhaust and Crankcase Emission Factors for Nonroad Compression-Ignition Engines in MOVES3.0.2*. September. Available at: <https://www.epa.gov/system/files/documents/2021-08/420r21021.pdf>.

[2] United States Department of Transportation, Bureau of Transportation Statistics. 2021. *National Transportation Statistics*. Available at: <https://www.bts.gov/topics/national-transportation-statistics>.

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Last Updated: 5/9/23

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

Annual VMT	OR	Daily Vehicle Trips
Annual VMT: 461,511		Daily Vehicle Trips: Average Trip: Distance:

Fleet Class	Fleet Mix	Fuel Economy (MPG) [1]
Light Duty Auto (LDA)	0.540893	Passenger Vehicles 24.1
Light Duty Truck 1 (LDT1)	0.062748	Light-Med Duty Trucks 17.6
Light Duty Truck 2 (LDT2)	0.186142	Heavy Trucks/Other 7.5
Medium Duty Vehicle (MDV)	0.127786	Motorcycles 44
Light Heavy Duty 1 (LHD1)	0.023768	
Light Heavy Duty 2 (LHD2)	0.006610	
Medium Heavy Duty (MHD)	0.012333	
Heavy Heavy Duty (HHD)	0.009205	
Other Bus (OBUS)	0.000817	
Urban Bus (UBUS)	0.000491	
Motorcycle (MCY)	0.024860	
School Bus (SBUS)	0.000754	
Motorhome (MH)	0.003594	

Fleet Mix					
Vehicle Type	Percent	Fuel Type	Annual VMT:		Fuel Consumption (Gallons)
			VMT	Vehicle Trips: VMT	
Passenger Vehicles	54.09%	Gasoline	249,628	0.00	10,358
Light-Medium Duty Trucks	37.67%	Gasoline	173,840	0.00	9,877
Heavy Trucks/Other	5.76%	Diesel	26,570	0.00	3,543
Motorcycle	2.49%	Gasoline	11,473	0.00	261

Total Gasoline Consumption (gallons)	20,496
Total Diesel Consumption (gallons)	3,543

Sources:

[1] United States Department of Transportation, Bureau of Transportation Statistics. 2021. National Transportation Statistics. Available at: <https://www.bts.gov/topics/national-transportation-statistics>.