

Appendix F

Energy Calculations

Sywest Industrial Development Project

Last Updated: August 27 2024

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 Horsepower	Factor	Construction Phase	Fuel Used (gallons)
		Day					
Rubber Tired Dozers	2	8		367	0.4	Demolition Phase	2,483
Excavators	3	8		36	0.38	Demolition Phase	386
Concrete/Industrial Saws	1	8		33	0.73	Demolition Phase	227
Rubber Tired Dozers	3	8		367	0.4	Site Preparation Phase	1,862
Tractors/Loaders/Backhoes	4	8		84	0.37	Site Preparation Phase	584
Graders	1	8		148	0.41	Grading Phase	1,565
Excavators	1	8		36	0.38	Grading Phase	392
Tractors/Loaders/Backhoes	3	8		84	0.37	Grading Phase	2,674
Rubber Tired Dozers	1	8		367	0.4	Grading Phase	3,787
Forklifts	3	8		82	0.2	Building Construction Phase	4,418
Generator Sets	1	8		14	0.74	Building Construction Phase	930
Cranes	1	7		367	0.29	Building Construction Phase	7,522
Welders	1	8		46	0.45	Building Construction Phase	1,859
Tractors/Loaders/Backhoes	3	7		84	0.37	Building Construction Phase	7,326
Air Compressors	1	6		37	0.48	Architectural Coating Phase	125
Pavers	2	8		81	0.42	Paving Phase	640
Paving Equipment	2	8		89	0.36	Paving Phase	602
Rollers	2	8		36	0.38	Paving Phase	257
Total Fuel Used							37,639 (Gallons)

Construction Phase	Days of Operation
Demolition Phase	20
Site Preparation Phase	10
Grading Phase	61
Building Construction Phase	191
Paving Phase	20
Architectural Coating Phase	20
Total Days	322

WORKER TRIPS

Constuction Phase	MPG [2]	Trips	Trip Length (miles)	Fuel Used (gallons)
Demolition Phase	24.1	15	8.8	109.54
Site Preparation Phase	24.1	18	8.8	63.90
Grading Phase	24.1	15	8.8	334.11
Building Construction Phase	24.1	30	8.8	2064.39
Paving Phase	24.1	15	8.8	109.54
Architectural Coating Phase	24.1	6	8.8	43.31
Total				2,724.79

HAULING AND VENDOR TRIPS

Trip Class	MPG [2]	Trips	Trip Length (miles)	Fuel Used (gallons)
HAULING TRIPS				
Demolition Phase	7.5	2	18.8	5.39
Site Preparation Phase	7.5	0	20.0	0.00
Grading Phase	7.5	36	20.0	96.27
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				101.66
VENDOR TRIPS				
Demolition Phase	7.5	0	14.7	0.00
Site Preparation Phase	7.5	0	14.7	0.00
Grading Phase	7.5	0	14.7	0.00
Building Construction Phase	7.5	12	5.3	1565.69
Paving Phase	7.5	0	14.7	0.00
Architectural Coating Phase	7.5	0	14.7	0.00
Total				1,565.69

Total Gasoline Consumption (gallons)	2,725
Total Diesel Consumption (gallons)	39,306

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

Annual VMT	OR	Daily Vehicle Trips
Annual VMT: 378,127		Daily Vehicle Trips: Trips: Average Trip Distance:

Fleet Class	Fleet Mix	Fuel Economy (MPG) [1]	
Light Duty Auto (LDA)	0.890000	Passenger Vehicles	24.1
Light Duty Truck 1 (LDT1)	0.000000	Light-Med Duty Trucks	17.6
Light Duty Truck 2 (LDT2)	0.000000	Heavy Trucks/Other	7.5
Medium Duty Vehicle (MDV)	0.000000	Motorcycles	44
Light Heavy Duty 1 (LHD1)	0.000000		
Light Heavy Duty 2 (LHD2)	0.000000		
Medium Heavy Duty (MHD)	0.000000		
Heavy Heavy Duty (HHD)	0.110000		
Other Bus (OBUS)	0.000000		
Urban Bus (UBUS)	0.000000		
Motorcycle (MCY)	0.000000		
School Bus (SBUS)	0.000000		
Motorhome (MH)	0.000000		

Fleet Mix					
Vehicle Type	Percent	Fuel Type	Annual VMT: VMT	Vehicle Trips: VMT	Fuel Consumption (Gallons)
Passenger Vehicles	89.00%	<i>Gasoline</i>	336,533	0.00	13,964
Light-Medium Duty Trucks	0.00%	<i>Gasoline</i>	0	0.00	0
Heavy Trucks/Other	11.00%	<i>Diesel</i>	41,594	0.00	5,546
Motorcycle	0.00%	<i>Gasoline</i>	0	0.00	0

Total Gasoline Consumption (gallons)	13,964
Total Diesel Consumption (gallons)	5,546

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>.