

# Appendix E

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Energy Calculation Worksheets

# Clawiter Road Industrial Project - Buildings 1-4

Last Updated: August 26, 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			
Excavators	3	8	158	0.38	Demolition	1,523.35
Tractors/Loaders/Backhoes	2	8	97	0.37	Demolition	674.90
Graders	1	8	187	0.41	Site Preparation	324.22
Pavers	1	8	130	0.42	Site Preparation	230.89
Tractors/Loaders/Backhoes	4	8	97	0.37	Site Preparation	674.90
Excavators	1	8	158	0.38	Grading	761.68
Graders	1	8	187	0.41	Grading	972.65
Pavers	1	8	130	0.42	Grading	692.66
Tractors/Loaders/Backhoes	1	8	97	0.37	Grading	506.17
Cranes	2	7	231	0.29	Building Construction	13,137.20
Forklifts	3	8	89	0.2	Building Construction	6,652.58
Tractors/Loaders/Backhoes	3	7	97	0.37	Building Construction	11,736.85
Air Compressors	1	6	78	0.48	Architectural Coating	264.02
Pavers	1	8	130	0.42	Paving	3,001.55
Rollers	1	8	80	0.38	Paving	1,857.89
Tractors/Loaders/Backhoes	1	8	97	0.37	Paving	2,193.41
<b>Total Fuel Used</b>						<b>45,204.90</b>
						(Gallons)

Construction Phase	Days of Operation
Demolition Phase	20
Site Preparation Phase	10
Grading Phase	30
Building Construction Phase	265
Paving Phase	130
Architectural Coating Phase	20
<b>Total Days</b>	<b>475</b>

WORKER TRIPS				
Constuction Phase	MPG [2]	Trips	Trip Length (miles)	Fuel Used (gallons)
Demolition	24.0	13	10.8	117.00
Site Prep Phase	24.0	15	10.8	67.50
Grading Phase	24.0	10	10.8	135.00
Building Phase	24.0	194	10.8	23134.50
Paving Phase	24.0	39	10.8	2281.50
Architectural Coating Phase	24.0	8	10.8	72.00
<b>Total</b>				<b>25,807.50</b>

### HAULING AND VENDOR TRIPS

Trip Class	MPG [2]	Trips	Trip Length (miles)	Fuel Used (gallons)
<b>HAULING TRIPS</b>				
Demolition	7.4	1139	20.0	3078.38
Site Prep Phase	7.4	0	20.0	0.00
Grading Phase	7.4	3634	20.0	9821.62
Building Phase	7.4	0	20.0	0.00
Paving Phase	7.4	0	20.0	0.00
Architectural Coating Phase	7.4	0	20.0	0.00
<b>Total</b>				<b>12,900.00</b>
<b>VENDOR TRIPS</b>				
Demolition	7.4	0	7.3	0.00
Site Prep Phase	7.4	0	7.3	0.00
Grading Phase	7.4	0	7.3	0.00
Building Phase	7.4	76	7.3	19867.84
Paving Phase	7.4	0	7.3	0.00
Architectural Coating Phase	7.4	0	7.3	0.00
<b>Total</b>				<b>19,867.84</b>

<b>Total Gasoline Consumption (gallons)</b>	<b>25,807.50</b>
<b>Total Diesel Consumption (gallons)</b>	<b>77,972.74</b>

**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. 2018. *National Transportation Statistics 2018*. Available at: <https://www.bts.gov/sites/bts.dot.gov/files/docs/browse-statistical-products-and-data/national-transportation-statistics/223001/ntsentire2018q4.pdf>.

# Clawiter Road Industrial Project - Building 4 (BC and AC Trips Only)

Last Updated: August 26, 2020

Construction Phase	Days of Operation
Demolition Phase	20
Site Preparation Phase	10
Grading Phase	30
Building Construction Phase	265
Paving Phase	130
Architectural Coating Phase	20
<b>Total Days</b>	<b>475</b>

### WORKER TRIPS

Constuction Phase	MPG [2]	Trips	Trip Length (miles)	Fuel Used (gallons)
Demolition	24.0	0	10.8	0.00
Site Prep Phase	24.0	0	10.8	0.00
Grading Phase	24.0	0	10.8	0.00
Building Phase	24.0	123	10.8	14667.75
Paving Phase	24.0	0	10.8	0.00
Architectural Coating Phase	24.0	25	10.8	225.00
<b>Total</b>				<b>14,892.75</b>

### HAULING AND VENDOR TRIPS

Trip Class	MPG [2]	Trips	Trip Length (miles)	Fuel Used (gallons)
<b>HAULING TRIPS</b>				
Demolition	7.4	0	20.0	0.00
Site Prep Phase	7.4	0	20.0	0.00
Grading Phase	7.4	0	20.0	0.00
Building Phase	7.4	0	20.0	0.00
Paving Phase	7.4	0	20.0	0.00
Architectural Coating Phase	7.4	0	20.0	0.00
<b>Total</b>				<b>-</b>
<b>VENDOR TRIPS</b>				
Demolition	7.4	0	7.3	0.00
Site Prep Phase	7.4	0	7.3	0.00
Grading Phase	7.4	0	7.3	0.00
Building Phase	7.4	48	7.3	12548.11
Paving Phase	7.4	0	7.3	0.00
Architectural Coating Phase	7.4	0	7.3	0.00
<b>Total</b>				<b>12,548.11</b>

<b>Total Gasoline Consumption (gallons)</b>	<b>14,892.75</b>
<b>Total Diesel Consumption (gallons)</b>	<b>12,548.11</b>

**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. 2018. *National Transportation Statistics 2018* . Available at: <https://www.bts.gov/sites/bts.dot.gov/files/docs/browse-statistical-products-and-data/national-transportation-statistics/223001/ntsntire2018q4.pdf>.

# Clawiter Road Industrial Project - Buildings 1-4

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

<b>Annual VMT</b>	<b>OR</b>	<b>Daily Vehicle Trips</b>
Annual VMT: 4,288,917		Daily Vehicle Trips: Average Trip Distance:

Fleet Class	Fleet Mix	Fuel Economy (MPG)	
Light Duty Auto (LDA)	0.578638	Passenger Vehicles	24.0
Light Duty Truck 1 (LDT1)	0.038775	Light-Med Duty Trucks	17.4
Light Duty Truck 2 (LDT2)	0.193686	Heavy Trucks/Other	7.4
Medium Duty Vehicle (MDV)	0.110919	Motorcycles	43.9
Light Heavy Duty 1 (LHD1)	0.015677		
Light Heavy Duty 2 (LHD2)	0.005341		
Medium Heavy Duty (MHD)	0.018293		
Heavy Heavy Duty (HHD)	0.026358		
Other Bus (OBUS)	0.002641		
Urban Bus (UBUS)	0.002200		
School Bus (SBUS)	0.000891		
Motorhome (MH)	0.000749		
Motorcycle (MCY)	0.005832		

Fleet Mix					
Vehicle Type	Percent	Fuel Type	Annual VMT: VMT	Vehicle Trips: VMT	Fuel Consumption (Gallons)
Passenger Vehicles	57.86%	Gasoline	2481730	0.00	103405.43
Light-Medium Duty Trucks	34.34%	Gasoline	1472728	0.00	84639.56
Heavy Trucks/Other	7.22%	Diesel	309445	0.00	41816.94
Motorcycle	0.58%	Gasoline	25013	0.00	569.77

<b>Total Gasoline Consumption (gallons)</b>	<b>188614.76</b>
<b>Total Diesel Consumption (gallons)</b>	<b>41816.94</b>