

Appendix NRG

Energy Fuel Consumption Calculations

Belmont Housing Element Update

Last Updated: 12/21/2021

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 Dozer	2	8	247	0.40	Demo	8,355.95
Excavators	3	8	158	0.38	Demo	7,616.77
Concrete/Industrial Saws	1	8	78	0.48	Demo	1,760.11
Rubber Tired Dozer	3	8	247	0.40	Site Prep	7,520.35
Tractors/Loaders/Backhoes	4	8	97	0.37	Site Prep	4,049.37
Graders	1	8	187	0.41	Grading	5,187.45
Excavators	2	8	158	0.38	Grading	8,124.55
Rubber Tired Dozer	1	8	247	0.40	Grading	6,684.76
Tractors/Loaders/Backhoes	2	8	97	0.37	Grading	5,399.16
Scrapers	2	8	367	0.48	Grading	23,837.80
Cranes	1	7	231	0.29	Building	38,544.05
Forklifts	3	8	89	0.20	Building	39,036.84
Generator Sets	1	8	84	0.74	Building	45,440.63
Tractors/Loaders/Backhoes	3	7	97	0.37	Building	68,870.96
Welders	1	8	46	0.45	Building	15,132.26
Air Compressors	1	6	78	0.48	Arch Coating	1,386.08
Pavers	2	8	130	0.42	Paving	4,848.65
Paving Equipment	2	8	132	0.36	Paving	4,219.92
Rollers	2	8	80	0.38	Paving	3,001.21
Total Fuel Used						299,016.89
						(Gallons)

Construction Phase Days of Operation

Demolition Phase	100
Site Preparation Phase	60
Grading Phase	160
Building Construction Phase	1555
Paving Phase	105
Architectural Coating Phase	105
Total Days	2085

WORKER TRIPS

Constuction Phase	MPG [2]	Trips	Trip Length (miles)	Fuel Used (gallons)
Demolition	24.1	15	10.8	672.20

Site Prep Phase	24.1	18	10.8	483.98
Grading Phase	24.1	20	10.8	1434.02
Building Phase	24.1	2376	10.8	1655707.22
Paving Phase	24.1	15	10.8	705.81
Architectural Coating Phase	24.1	475	10.8	22350.62
			Total	1,681,353.86

HAULING AND VENDOR TRIPS

Trip Class	MPG [2]	Trips	Trip Length (miles)	Fuel Used (gallons)
HAULING TRIPS				
Demolition	7.5	6701	20.0	17869.33
Site Prep Phase	7.5	0	20.0	0.00
Grading Phase	7.5	0	20.0	0.00
Building 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	17,869.33
VENDOR TRIPS				
Demolition	7.5	0	7.3	0.00
Site Prep Phase	7.5	0	7.3	0.00
Grading Phase	7.5	0	7.3	0.00
Building Phase	7.5	353	7.3	534277.27
Paving Phase	7.5	0	7.3	0.00
Architectural Coating Phase	7.5	0	7.3	0.00
			Total	534,277.27

Total Gasoline Consumption (gallons)	1,681,353.86
Total Diesel Consumption (gallons)	851,163.49

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*. Available at: <https://www.bts.dot.gov/topics/national-transportation-statistics>.