

Appendix D

Energy Calculations

Bell Gardens JAFP Project

Last Updated: March 19, 2019

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			
Concrete/Industrial Saws	1	8	81	0.73	Demo	833.93
Rubber Tired Dozers	2	8	247	0.40	Demo	2,506.78
Excavators	3	8	158	0.38	Demo	2,285.03
Dozers	3	8	247	0.40	Site Prep	3,760.18
Tractors/Loaders/Backhoes	4	8	97	0.37	Site Prep	2,024.69
Excavators	1	8	158	0.38	Grading	16,579.17
Graders	1	8	187	0.41	Grading	21,171.30
Rubber Tired Dozers	1	8	247	0.40	Grading	27,282.18
Tractors/Loaders/Backhoes	3	8	97	0.37	Grading	33,053.00
Cranes	1	7	231	0.29	System Installation	16,186.02
Forklifts	3	8	89	0.20	System Installation	16,392.96
Generator Sets	1	8	84	0.74	System Installation	19,082.14
Tractors/Loaders/Backhoes	3	7	97	0.37	System Installation	28,921.37
Welders	1	8	46	0.45	System Installation	6,354.58
Paving Equipment	2	8	132	0.36	Paving	1,205.69
Pavers	2	8	130	0.42	Paving	1,385.33
Rollers	2	8	80	0.38	Paving	857.49
Total Fuel Used						199,881.84
						(Gallons)

Construction Phase	Days of Operation
Demolition Phase	30
Site Preparation Phase	30
Grading Phase	653
System Installation Phase	653
Paving Phase	30

WORKER TRIPS

Constuction Phase	MPG [2]	Trips	Trip Length (miles)	Fuel Used (gallons)
Demolition	24.0	15	14.7	9.19
Site Prep Phase	24.0	18	14.7	11.03
Grading Phase	24.0	15	14.7	9.19
System Installation	24.0	118	14.7	72.28
Paving Phase	24.0	15	14.7	9.19

Total	110.86
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HAULING AND VENDOR TRIPS

Trip Class	MPG [2]	Trips	Trip Length (miles)	Fuel Used (gallons)
Vendor Trips	7.4	46	6.9	42.89
Hauling Trips	7.4	33826	20.0	91421.62
Total				91464.51

Total Gasoline Consumption (gallons)	110.86
Total Diesel Consumption (gallons)	291346.36

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>.