

APPENDIX E
CONSTRUCTION AND OPERATIONAL ENERGY CONSUMPTION
CALCULATIONS

Phase	Equipment	Quantity	Hours Each Day	Total Number of Days Worked	Horse Power	Load Factor	Fuel Consumption Rate (Gallons per Hour)	Duration (Total Hours)	Total Fuel Consumption
Phase 1									
1. Demolition	Rubber Tired Dozers	1	8	8	247	0.4	3.952	64	252.93
	Concrete/Industrial Saws	1	8	8	81	0.73	2.9565	64	189.22
	Tractors/Loaders/Backhoes	3	8	8	97	0.37	1.7945	192	344.54
2. Site Preparation	Crushing/Proc. Equipment	1	4	8	475	0.78	18.525	32	592.80
	Bore/Drill Rigs	1	6	22	362	0.5	5.525	132	729.30
	Cranes	1	6	22	231	0.29	3.3495	132	442.13
3. Grading	Excavators	1	4	27	158	0.38	3.002	108	324.22
	Scrapers	1	6	27	367	0.48	8.808	162	1,426.90
	Rubber Tired Loaders	1	6	27	203	0.36	3.952	162	640.22
4. Paving	Pavers	1	8	168	130	0.42	2.73	1,344	3,669.12
	Cement and Mortar Mixers	1	8	168	9	0.56	0.252	1,344	338.69
	Rollers	2	8	168	80	0.38	1.52	2,688	4,085.76
5. Building Construction	Tractors/Loaders/Backhoes	1	8	168	97	0.37	1.7945	1,344	2,411.81
	Paving Equipment	1	8	168	132	0.36	2.376	1,344	3,193.34
	Cranes	1	4	520	147	0.29	3.3495	2,080	6,966.96
6. Architectural Coating	Forklifts	3	8	520	89	0.2	0.89	12,480	11,107.20
	Tractors/Loaders/Backhoes	3	8	520	97	0.37	1.7945	12,480	22,395.36
	Welders	1	8	520	46	0.45	1.035	4,160	4,305.60
7. Demolition	Generator Sets	1	8	520	84	0.74	3.108	4,160	12,929.28
	Air Compressors	1	6	228	78	0.48	1.872	1,368	2,560.90
	Rubber Tired Dozers	1	8	26	247	0.4	3.952	208	822.02
8. Grading	Concrete/Industrial Saws	1	8	26	81	0.73	2.9565	208	614.95
	Tractors/Loaders/Backhoes	3	8	26	97	0.37	1.7945	624	1,119.77
	Crushing/Proc. Equipment	1	4	26	475	0.78	18.525	104	1,926.60
8. Grading	Excavators	1	4	23	158	0.38	3.002	92	276.18
	Rollers	1	8	23	80	0.38	1.52	184	279.68
	Rubber Tired Loaders	1	6	23	203	0.36	3.952	138	545.38
Total Fuel Consumption for Phase 1 Construction Equipment									84,490.85
Phase 2									
9. Demolition	Rubber Tired Dozers	1	8	21	247	0.40	3.952	168	663.94
	Concrete/Industrial Saws	1	8	21	81	0.73	2.9565	168	496.69
	Tractors/Loaders/Backhoes	3	8	21	165	0.37	1.7945	504	904.43
10. Grading	Crushing/Proc. Equipment	1	4	21	475	0.78	18.525	84	1,556.10
	Excavators	1	4	27	158	0.38	3.002	108	324.22
	Scrapers	1	6	27	367	0.48	8.808	162	1,426.90
11. Paving	Rubber Tired Loaders	1	6	27	203	0.36	3.952	162	640.22
	Pavers	1	8	191	130	0.42	2.73	1,528	4,171.44
	Cement and Mortar Mixers	1	8	191	9	0.56	0.252	1,528	385.06
12. Building Construction	Rollers	2	8	191	80	0.38	1.52	3,056	4,645.12
	Tractors/Loaders/Backhoes	1	8	191	97	0.37	1.7945	1,528	2,742.00
	Paving Equipment	1	8	191	132	0.36	2.376	1,528	3,630.53
13. Architectural Coating	Cranes	1	4	467	147	0.29	3.3495	1,868	6,256.87
	Forklifts	2	6	467	89	0.20	0.89	5,604	4,987.56
	Tractors/Loaders/Backhoes	2	8	467	97	0.37	1.7945	7,472	13,408.50
14. Building Construction	Air Compressors	1	6	191	78	0.48	1.872	1,146	2,145.31
	Cranes	1	4	599	147	0.29	3.3495	2,396	8,025.40
	Forklifts	2	6	599	89	0.20	0.89	7,188	6,397.32
14. Building Construction	Tractors/Loaders/Backhoes	2	8	599	97	0.37	1.7945	9,584	17,198.49
	Total Fuel Consumption for Phase 2 Construction Equipment								
Total Fuel Consumption for Phase 1 and Phase 2 Construction Equipment									164,496.93

Phase	Category	Vehicle Type	Number of Trips	Trip Length	Number of Days	VMT	Total Trips	Fuel	Total Fuel Consumption
								Consumption Rate (Gallons per Hour)	
Phase 1									
1. Demolition	Worker Trips	Light-duty vehicle	15	14.7	8	1,764.0	120	21	84.00
	Vendor Trips	Heavy-duty vehicle	0	6.9	8	0.0	0	8	0.00
	Haul Trips	Heavy-heavy-duty vehicle	1,150	20	8	184,000.0	9,200	6.2	29,677.42
2. Site Preparation	Worker Trips	Light-duty vehicle	5	14.7	22	1,617.0	110	21	77.00
	Vendor Trips	Heavy-duty vehicle	0	6.9	22	0.0	0	8	0.00
	Haul Trips	Heavy-heavy-duty vehicle	0	20	22	0.0	0	6.2	0.00
3. Grading	Worker Trips	Light-duty vehicle	8	14.7	27	3,175.2	216	21	151.20
	Vendor Trips	Heavy-duty vehicle	0	6.9	27	0.0	0	8	0.00
	Haul Trips	Heavy-heavy-duty vehicle	2,500	20	27	1,350,000.0	67,500	6.2	217,741.94
4. Paving	Worker Trips	Light-duty vehicle	15	14.7	168	37,044.0	2,520	21	1,764.00
	Vendor Trips	Heavy-duty vehicle	2	6.9	168	2,318.4	336	8	289.80
	Haul Trips	Heavy-heavy-duty vehicle	0	20	168	0.0	0	6.2	0.00
5. Building Construction	Worker Trips	Light-duty vehicle	183	14.7	520	1,398,852.0	95,160	21	66,612.00
	Vendor Trips	Heavy-duty vehicle	34	6.9	520	121,992.0	17,680	8	15,249.00
	Haul Trips	Heavy-heavy-duty vehicle	0	20	520	0.0	0	6.2	0.00
6. Architectural Coating	Worker Trips	Light-duty vehicle	37	14.7	228	124,009.2	8,436	21	5,905.20
	Vendor Trips	Heavy-duty vehicle	0	6.9	228	0.0	0	8	0.00
	Haul Trips	Heavy-heavy-duty vehicle	0	20	228	0.0	0	6.2	0.00
7. Demolition	Worker Trips	Light-duty vehicle	15	14.7	26	5,733.0	390	21	273.00
	Vendor Trips	Heavy-duty vehicle	0	6.9	26	0.0	0	8	0.00
	Haul Trips	Heavy-heavy-duty vehicle	4,000	20	26	2,080,000.0	104,000	6.2	335,483.87
8. Grading	Worker Trips	Light-duty vehicle	8	14.7	23	2,704.8	184	21	128.80
	Vendor Trips	Heavy-duty vehicle	0	6.9	23	0.0	0	8	0.00
	Haul Trips	Heavy-heavy-duty vehicle	1,750	20	23	805,000.0	40,250	6.2	129,838.71
Total Fuel Consumption for Phase 1 Construction Vehicle Trips									803,275.94
Phase 2									
9. Demolition	Worker Trips	Light-duty vehicle	15	14.7	72	15,876.0	1080	21	756.00
	Vendor Trips	Heavy-duty vehicle	0	6.9	72	0.0	0	8	0.00
	Haul Trips	Heavy-heavy-duty vehicle	1944	20	72	2,799,360.0	139,968	6.2	451,509.68
10. Grading	Worker Trips	Light-duty vehicle	8	14.7	27	3,175.2	216	21	151.20
	Vendor Trips	Heavy-duty vehicle	0	6.9	27	0.0	0	8	0.00
	Haul Trips	Heavy-heavy-duty vehicle	1375	20	27	742,500.0	37,125	6.2	119,758.06
11. Paving	Worker Trips	Light-duty vehicle	15	14.7	165	36,382.5	2,475	21	1,732.50
	Vendor Trips	Heavy-duty vehicle	2	6.9	165	2,277.0	330	8	284.63
	Haul Trips	Heavy-heavy-duty vehicle	0	20	165	0.0	0	6.2	0.00
12. Building Construction	Worker Trips	Light-duty vehicle	177	14.7	466	1,212,485.4	82,482	21	57,737.40
	Vendor Trips	Heavy-duty vehicle	71	6.9	466	228,293.4	33,086	8	28,536.68
	Haul Trips	Heavy-heavy-duty vehicle	0	20	466	0.0	0	6.2	0.00
13. Architectural Coating	Worker Trips	Light-duty vehicle	35	14.7	190	97,755.0	6,650	21	4,655.00
	Vendor Trips	Heavy-duty vehicle	0	6.9	190	0.0	0	8	0.00
	Haul Trips	Heavy-heavy-duty vehicle	0	20	190	0.0	0	6.2	0.00
14. Building Construction	Worker Trips	Light-duty vehicle	177	14.7	466	1,212,485.4	82,482	21	57,737.40
	Vendor Trips	Heavy-duty vehicle	71	6.9	466	228,293.4	33,086	8	28,536.68
	Haul Trips	Heavy-heavy-duty vehicle	0	20	466	0.0	0	6.2	0.00
15. Architectural Coating	Worker Trips	Light-duty vehicle	35	14.7	190	97,755.0	6,650	21	4,655.00
	Vendor Trips	Heavy-duty vehicle	0	6.9	190	0.0	0	8	0.00
	Haul Trips	Heavy-heavy-duty vehicle	0	20	190	0.0	0	6.2	0.00
16. Building Construction	Worker Trips	Light-duty vehicle	177	14.7	387	1,006,935.3	68,499	21	47,949.30
	Vendor Trips	Heavy-duty vehicle	71	6.9	387	189,591.3	27,477	8	23,698.91
	Haul Trips	Heavy-heavy-duty vehicle	0	20	387	0.0	0	6.2	0.00
17. Architectural Coating	Worker Trips	Light-duty vehicle	35	14.7	190	97,755.0	6,650	21	4,655.00
	Vendor Trips	Heavy-duty vehicle	0	6.9	190	0.0	0	8	0.00
	Haul Trips	Heavy-heavy-duty vehicle	0	20	190	0.0	0	6.2	0.00
18. Building Construction	Worker Trips	Light-duty vehicle	177	14.7	598	1,555,936.2	105,846	21	74,092.20
	Vendor Trips	Heavy-duty vehicle	71	6.9	598	292,960.2	42,458	8	36,620.03
	Haul Trips	Heavy-heavy-duty vehicle	0	20	598	0.0	0	6.2	0.00
Total Fuel Consumption for Phase 2 Construction Vehicle Trips									943,065.65
Total Fuel Consumption for Phase 1 and Phase 2 Construction Vehicle Trips									1,746,341.59