

Appendix F1
**Construction Worksheets and
Calculations**

Energy - Construction Calculations

Summary of Energy Use During Project Construction

Energy Type	Annual Average Quantity During Construction ^b	
Electricity		
Existing Onsite	5,095	MWh
Offroad Equipment	2,212	MWh
Construction Office	65	MWh
Total Electricity	7,372	MWh
Natural Gas		
Existing Onsite	8,842	MMBtu
Total Construction Natural Gas	0	MMBtu
Offroad Equipment	0	MMBtu
Total Natural Gas	8,842	MMBtu
Gasoline		
Existing Onsite	1,751,600	gallons
On-Road Construction Equipment	202,756	gallons
Off-Road Construction Equipment	0	gallons
Total Gasoline	1,954,356	gallons
Diesel		
Existing Onsite	313,704	gallons
On-Road Construction Equipment	212,448	gallons
Off-Road Construction Equipment	487,007	gallons
Total Diesel	1,013,160	gallons

Energy - Construction Calculations

**Construction Energy Analysis
Off-Road Equipment - Diesel**

Equipment ≤ 100 hp

lbs diesel fuel/hp-hr (lb/hp-hr): ¹	0.408 lb/hp-hr
diesel density (lb/gal): ¹	7.11 lb/gal
diesel gallons/hp-hr:	0.0574 gal/hp-hr
Less than or equal to 100 HP:	22,900,118 hp-hr
Total diesel gallons:	1,314,303 gal

Equipment > 100 hp

lbs diesel fuel/hp-hr (lb/hp-hr): ¹	0.367 lb/hp-hr
diesel density (lb/gal): ¹	7.11 lb/gal
diesel gallons/hp-hr:	0.0516 gal/hp-hr
Greater than 100 HP:	40,786,867 hp-hr
Total diesel gallons:	2,105,639 gal

total diesel gallons (off-road equipment): 3,419,942 gal
 7.02 years
487,007 average annual gallons

Phase/Block	Phase Name	Equipment	Number	Hours/Day	HP	Load	Days	Total hp-hr
Phase 1	Demolition	Crushing/Proc. Equipment	4	4	85	0.78	391	414,773
Phase 1	Demolition	Excavators	4	6	158	0.38	391	563,415
Phase 1	Demolition	Forklifts	2	2	89	0.2	391	27,839
Phase 1	Demolition	Generator Sets	4	4	84	0.74	391	388,873
Phase 1	Demolition	Off-Highway Trucks	2	0.5	402	0.38	391	59,729
Phase 1	Demolition	Off-Highway Trucks	4	1	402	0.38	391	238,917
Phase 1	Demolition	Off-Highway Trucks	2	4	402	0.38	391	477,833
Phase 1	Demolition	Pressure Washers	2	1	13	0.3	391	3,050
Phase 1	Demolition	Rubber Tired Dozers	2	4	247	0.4	391	309,046
Phase 1	Demolition	Skid Steer Loaders	4	6	65	0.37	391	225,685
Phase 1	Demolition	Tractors/Loaders/Backhoes	4	6	97	0.37	391	336,792
Bridge Construction	Demolition	Cranes	1	8	231	0.29	106	56,808
Bridge Construction	Demolition	Excavators	2	8	158	0.38	106	101,828
Bridge Construction	Demolition	Generator Sets	2	8	84	0.74	106	105,423
Bridge Construction	Demolition	Tractors/Loaders/Backhoes	2	8	97	0.37	106	60,869
Bridge Construction	Abutment/Bent Construction	Bore/Drill Rigs	1	8	221	0.5	106	93,704
Bridge Construction	Abutment/Bent Construction	Cranes	1	8	231	0.29	106	56,808
Bridge Construction	Abutment/Bent Construction	Generator Sets	2	8	84	0.74	106	105,423
Bridge Construction	Abutment/Bent Construction	Pumps	1	8	84	0.74	106	52,712
Bridge Construction	Abutment/Bent Construction	Tractors/Loaders/Backhoes	2	8	97	0.37	106	60,869
Bridge Construction	Superstructure	Cranes	1	8	231	0.29	156	83,604
Bridge Construction	Superstructure	Forklifts	2	8	89	0.2	156	44,429
Bridge Construction	Superstructure	Generator Sets	2	8	84	0.74	156	155,151
Bridge Construction	Superstructure	Pumps	1	8	84	0.74	156	77,576
Bridge Construction	Superstructure	Tractors/Loaders/Backhoes	1	8	97	0.37	156	44,791

Energy - Construction Calculations

Phase/Block	Phase Name	Equipment	Number	Hours/Day	HP	Load	Days	Total hp-hr
Phase 1	Excavation Phase 1	Bore/Drill Rigs	3	6	350	0.5	940	2,961,000
Phase 1	Excavation Phase 1	Excavators	1	6	270	0.2	940	304,560
Phase 1	Excavation Phase 1	Excavators	5	3	270	0.38	940	1,446,660
Phase 1	Excavation Phase 1	Generator Sets	3	6	84	0.74	940	1,051,747
Phase 1	Excavation Phase 1	Graders	2	6	187	0.41	940	864,838
Phase 1	Excavation Phase 1	Off-Highway Trucks	1	8	300	0.38	940	857,280
Phase 1	Excavation Phase 1	Off-Highway Trucks	3	8	300	0.38	940	2,571,840
Phase 1	Excavation Phase 1	Other Construction Equipment	3	4	215	0.3	940	727,560
Phase 1	Excavation Phase 1	Plate Compactors	1	8	8	0.43	940	25,869
Phase 1	Excavation Phase 1	Pressure Washers	1	1	13	0.3	940	3,666
Phase 1	Excavation Phase 1	Pressure Washers	3	1	13	0.3	940	10,998
Phase 1	Excavation Phase 1	Pumps	3	10	84	0.74	940	1,752,912
Phase 1	Excavation Phase 1	Pumps	1	4	350	0.4	940	526,400
Phase 1	Excavation Phase 1	Rubber Tired Dozers	1	6	170	0.4	940	383,520
Phase 1	Excavation Phase 1	Rubber Tired Dozers	5	6	170	0.4	940	1,917,600
Phase 1	Excavation Phase 1	Skid Steer Loaders	2	6	103	0.37	940	429,881
Phase 1	Excavation Phase 1	Tractors/Loaders/Backhoes	3	6	103	0.37	940	644,821
Phase 1	Excavation Phase 1	Trenchers	1	6	78	0.5	940	219,960
D5-D6	Site Preparation	Excavator	1	3	158	1	57	26,977
D5-D6	Site Preparation	Water Trucks	1	6	402	1	57	137,277
D5-D6	Site Preparation	Tractors/Loaders/Backhoes	1	3	97	1	57	16,562
D5-D6	Site Preparation	Off-Highway Trucks	1	6	402	1	57	137,277
D5-D6	Site Preparation	Pressure Washer	1	2	13	1	57	1,480
D5-D6	Site Preparation	Rollers	1	2	80	1	57	9,106
D5-D6	Site Preparation	Skid-Steer Loaders	1	2	65	1	57	7,399
D5-D6	Site Preparation	Pumps	1	2	84	1	57	9,562
D5-D6	Site Preparation	Plate Compactors	1	2	8	1	57	911
D5-D6	Site Preparation	Pile Drivers	1	4	231	0.50	57	26,294
D5-D6	Building Construction	Cranes	1	3	231	1	569	394,416
D5-D6	Building Construction	Forklifts	1	4	89	1	569	202,615
D5-D6	Building Construction	Generator Sets	1	4	84	1	569	191,232
D5-D6	Building Construction	Cement and Mortar Mixers	1	4	9	1	569	20,489
D5-D6	Building Construction	Concrete Pumps	2	2	84	1	569	191,232
D5-D6	Paving	Pavers	1	2	130	1	43	11,098
D5-D6	Paving	Rollers	1	2	80	1	43	6,830
D5-D6	Paving	Off-Highway Trucks	1	4	402	1	43	68,639
D5-D6	Paving	Tractors/Loaders/Backhoes	1	5	97	1	43	20,703
D7	Site Preparation	Excavator	2	3	158	1	59	55,905
D7	Site Preparation	Water Trucks	1	6	402	1	59	142,239
D7	Site Preparation	Tractors/Loaders/Backhoes	2	3	97	1	59	34,321
D7	Site Preparation	Off-Highway Trucks	2	6	402	1	59	284,478
D7	Site Preparation	Pressure Washer	2	2	13	1	59	3,067
D7	Site Preparation	Rollers	1	2	80	1	59	9,435
D7	Site Preparation	Skid-Steer Loaders	1	2	65	1	59	7,666

Energy - Construction Calculations

Phase/Block	Phase Name	Equipment	Number	Hours/Day	HP	Load	Days	Total hp-hr
D7	Site Preparation	Pumps	2	2	84	1	59	19,814
D7	Site Preparation	Plate Compactors	1	2	8	1	59	944
D7	Site Preparation	Pile Drivers	2	4	231	0.50	59	54,490
D7	Building Construction	Cranes	2	3	231	1	590	817,344
D7	Building Construction	Forklifts	2	4	89	1	590	419,877
D7	Building Construction	Generator Sets	1	4	84	1	590	198,144
D7	Building Construction	Cement and Mortar Mixers	1	4	9	1	590	21,230
D7	Building Construction	Concrete Pumps	2	2	84	1	590	198,144
D7	Paving	Pavers	1	2	130	1	44	11,499
D7	Paving	Rollers	1	2	80	1	44	7,077
D7	Paving	Off-Highway Trucks	1	4	402	1	44	71,120
D7	Paving	Tractors/Loaders/Backhoes	1	5	97	1	44	21,451
D8-D13	Site Preparation	Excavator (Small 150 HP)	3	6	150	1	111	300,117
D8-D13	Site Preparation	Water Trucks	1	6	402	1	111	268,104
D8-D13	Site Preparation	Tractors/Loaders/Backhoes	1	3	97	1	111	32,346
D8-D13	Site Preparation	Pressure Washer	1	2	13	1	111	2,890
D8-D13	Site Preparation	Trench Roller (25 HP)	3	4	25	1	111	33,346
D8-D13	Site Preparation	Skid-Steer Loaders	3	2	65	1	111	43,350
D8-D13	Site Preparation	Plate Compactors	3	2	8	1	111	5,335
D8-D13	Building Construction	Cranes (220 HP mobile crane)	2	2	220	1	1112	978,158
D8-D13	Building Construction	Forklifts	3	4	89	1	1112	1,187,128
D8-D13	Building Construction	Generator Sets	1	4	84	1	1112	373,478
D8-D13	Building Construction	Concrete Pumps	2	1	84	1	1112	186,739
D8-D13	Paving	Pavers	1	2	130	1	83	21,675
D8-D13	Paving	Rollers	1	2	80	1	83	13,339
D8-D13	Paving	Off-Highway Trucks	1	4	402	1	83	134,052
D8-D13	Paving	Tractors/Loaders/Backhoes	1	5	97	1	83	40,432
E1.1	Site Preparation	Excavator	4	3	158	1	46	88,018
E1.1	Site Preparation	Water Trucks	2	6	402	1	46	223,944
E1.1	Site Preparation	Tractors/Loaders/Backhoes	3	3	97	1	46	40,527
E1.1	Site Preparation	Off-Highway Trucks	3	6	402	1	46	335,916
E1.1	Site Preparation	Pressure Washer	3	2	13	1	46	3,621
E1.1	Site Preparation	Rollers	1	2	80	1	46	7,428
E1.1	Site Preparation	Skid-Steer Loaders	1	2	65	1	46	6,035
E1.1	Site Preparation	Pumps	1	2	84	1	46	7,799
E1.1	Site Preparation	Plate Compactors	1	2	8	1	46	743
E1.1	Site Preparation	Pile Drivers	3	4	231	0.50	46	64,342
E1.1	Building Construction	Cranes	3	3	231	1	464	965,131
E1.1	Building Construction	Forklifts	2	4	89	1	464	330,531
E1.1	Building Construction	Generator Sets	1	4	84	1	464	155,981
E1.1	Building Construction	Cement and Mortar Mixers	3	4	9	1	464	50,137
E1.1	Building Construction	Concrete Pumps	3	2	84	1	464	233,971
E1.1	Paving	Pavers	2	2	130	1	35	18,105
E1.1	Paving	Rollers	1	2	80	1	35	5,571

Energy - Construction Calculations

Phase/Block	Phase Name	Equipment	Number	Hours/Day	HP	Load	Days	Total hp-hr
E1.1	Paving	Off-Highway Trucks	1	4	402	1	35	55,986
E1.1	Paving	Tractors/Loaders/Backhoes	1	5	97	1	35	16,886
E1.2	Site Preparation	Excavator	4	6	158	1	59	223,880
E1.2	Site Preparation	Water Trucks	2	6	402	1	59	284,809
E1.2	Site Preparation	Tractors/Loaders/Backhoes	4	6	97	1	59	137,445
E1.2	Site Preparation	Off-Highway Trucks	3	6	402	1	59	427,213
E1.2	Site Preparation	Pressure Washer	3	2	13	1	59	4,605
E1.2	Site Preparation	Rollers	2	2	80	1	59	18,893
E1.2	Site Preparation	Skid-Steer Loaders	2	2	65	1	59	15,350
E1.2	Site Preparation	Pumps	3	2	84	1	59	29,756
E1.2	Site Preparation	Plate Compactors	3	2	8	1	59	2,834
E1.2	Site Preparation	Pile Drivers	3	4	231	0.50	59	81,829
E1.2	Building Construction	Cranes	5	3	231	1	590	2,045,736
E1.2	Building Construction	Forklifts	4	4	89	1	590	840,730
E1.2	Building Construction	Generator Sets	3	4	84	1	590	595,123
E1.2	Building Construction	Cement and Mortar Mixers	3	4	9	1	590	63,763
E1.2	Building Construction	Concrete Pumps	4	2	84	1	590	396,749
E1.2	Paving	Pavers	3	5	130	1	44	86,346
E1.2	Paving	Rollers	3	5	80	1	44	53,136
E1.2	Paving	Off-Highway Trucks	3	4	402	1	44	213,607
E1.2	Paving	Tractors/Loaders/Backhoes	3	5	97	1	44	64,427
F1-F2	Site Preparation	Excavator	5	6	158	1	61	289,275
F1-F2	Site Preparation	Off-Highway Trucks	4	6	402	1	61	588,804
F1-F2	Site Preparation	Pile Drivers	4	4	231	0.50	61	112,781
F1-F2	Site Preparation	Plate Compactors	3	2	8	1	61	2,929
F1-F2	Site Preparation	Pressure Washer	4	2	13	1	61	6,347
F1-F2	Site Preparation	Pumps	5	2	84	1	61	51,264
F1-F2	Site Preparation	Rollers	2	2	80	1	61	19,529
F1-F2	Site Preparation	Skid-Steer Loaders	2	2	65	1	61	15,867
F1-F2	Site Preparation	Tractors/Loaders/Backhoes	5	6	97	1	61	177,593
F1-F2	Site Preparation	Water Trucks	3	6	402	1	61	441,603
F1-F2	Building Construction	Cement and Mortar Mixers	3	4	9	1	610	65,911
F1-F2	Building Construction	Concrete Pumps	4	2	84	1	610	410,112
F1-F2	Building Construction	Cranes	7	3	231	1	610	2,960,496
F1-F2	Building Construction	Forklifts	7	4	89	1	610	1,520,832
F1-F2	Building Construction	Generator Sets	4	4	84	1	610	820,224
F1-F2	Paving	Off-Highway Trucks	4	4	402	1	46	294,402
F1-F2	Paving	Pavers	4	5	130	1	46	119,006
F1-F2	Paving	Rollers	4	5	80	1	46	73,234
F1-F2	Paving	Tractors/Loaders/Backhoes	4	5	97	1	46	88,797
F3	Site Preparation	Excavator	1	3	158	1	53	24,962
F3	Site Preparation	Off-Highway Trucks	1	6	402	1	53	127,023
F3	Site Preparation	Pile Drivers	1	4	231	0.50	53	24,330
F3	Site Preparation	Plate Compactors	1	2	8	1	53	843

Energy - Construction Calculations

Phase/Block	Phase Name	Equipment	Number	Hours/Day	HP	Load	Days	Total hp-hr
F3	Site Preparation	Pressure Washer	1	2	13	1	53	1,369
F3	Site Preparation	Pumps	1	2	84	1	53	8,847
F3	Site Preparation	Rollers	1	2	80	1	53	8,426
F3	Site Preparation	Skid-Steer Loaders	1	2	65	1	53	6,846
F3	Site Preparation	Tractors/Loaders/Backhoes	1	3	97	1	53	15,325
F3	Site Preparation	Water Trucks	1	6	402	1	53	127,023
F3	Building Construction	Cement and Mortar Mixers	1	4	9	1	527	18,959
F3	Building Construction	Concrete Pumps	2	2	84	1	527	176,947
F3	Building Construction	Cranes	1	3	231	1	527	364,954
F3	Building Construction	Forklifts	1	4	89	1	527	187,480
F3	Building Construction	Generator Sets	1	4	84	1	527	176,947
F3	Paving	Off-Highway Trucks	1	4	402	1	39	63,511
F3	Paving	Pavers	1	2	130	1	39	10,269
F3	Paving	Rollers	1	2	80	1	39	6,320
F3	Paving	Tractors/Loaders/Backhoes	1	5	97	1	39	19,156
F4	Site Preparation	Excavator	2	3	158	1	61	57,855
F4	Site Preparation	Off-Highway Trucks	2	6	402	1	61	294,402
F4	Site Preparation	Pile Drivers	2	4	231	0.50	61	56,390
F4	Site Preparation	Plate Compactors	1	2	8	1	61	976
F4	Site Preparation	Pressure Washer	1	2	13	1	61	1,587
F4	Site Preparation	Pumps	1	2	84	1	61	10,253
F4	Site Preparation	Rollers	1	2	80	1	61	9,765
F4	Site Preparation	Skid-Steer Loaders	1	2	65	1	61	7,934
F4	Site Preparation	Tractors/Loaders/Backhoes	1	3	97	1	61	17,759
F4	Site Preparation	Water Trucks	1	6	402	1	61	147,201
F4	Building Construction	Cement and Mortar Mixers	1	4	9	1	610	21,970
F4	Building Construction	Concrete Pumps	2	2	84	1	610	205,056
F4	Building Construction	Cranes	2	3	231	1	610	845,856
F4	Building Construction	Forklifts	2	4	89	1	610	434,523
F4	Building Construction	Generator Sets	1	4	84	1	610	205,056
F4	Paving	Off-Highway Trucks	1	4	402	1	46	73,600
F4	Paving	Pavers	1	2	130	1	46	11,901
F4	Paving	Rollers	1	2	80	1	46	7,323
F4	Paving	Tractors/Loaders/Backhoes	1	5	97	1	46	22,199
F5	Site Preparation	Excavator	1	3	158	1	71	33,868
F5	Site Preparation	Off-Highway Trucks	1	6	402	1	71	172,341
F5	Site Preparation	Pile Drivers	1	4	231	0.50	71	33,011
F5	Site Preparation	Plate Compactors	1	2	8	1	71	1,143
F5	Site Preparation	Pressure Washer	1	2	13	1	71	1,858
F5	Site Preparation	Pumps	1	2	84	1	71	12,004
F5	Site Preparation	Rollers	1	2	80	1	71	11,432
F5	Site Preparation	Skid-Steer Loaders	1	2	65	1	71	9,289
F5	Site Preparation	Tractors/Loaders/Backhoes	1	3	97	1	71	20,792
F5	Site Preparation	Water Trucks	1	6	402	1	71	172,341

Energy - Construction Calculations

Phase/Block	Phase Name	Equipment	Number	Hours/Day	HP	Load	Days	Total hp-hr
F5	Building Construction	Cement and Mortar Mixers	1	4	9	1	715	25,723
F5	Building Construction	Concrete Pumps	1	2	84	1	715	120,038
F5	Building Construction	Cranes	1	3	231	1	715	495,158
F5	Building Construction	Forklifts	1	4	89	1	715	254,367
F5	Building Construction	Generator Sets	1	4	84	1	715	240,077
F5	Paving	Off-Highway Trucks	1	4	402	1	54	86,170
F5	Paving	Pavers	1	2	130	1	54	13,933
F5	Paving	Rollers	1	2	80	1	54	8,574
F5	Paving	Tractors/Loaders/Backhoes	1	5	97	1	54	25,990
F6	Site Preparation	Excavator	1	3	158	1	71	33,868
F6	Site Preparation	Off-Highway Trucks	1	6	402	1	71	172,341
F6	Site Preparation	Pile Drivers	1	4	231	0.50	71	33,011
F6	Site Preparation	Plate Compactors	1	2	8	1	71	1,143
F6	Site Preparation	Pressure Washer	1	2	13	1	71	1,858
F6	Site Preparation	Pumps	1	2	84	1	71	12,004
F6	Site Preparation	Rollers	1	2	80	1	71	11,432
F6	Site Preparation	Skid-Steer Loaders	1	2	65	1	71	9,289
F6	Site Preparation	Tractors/Loaders/Backhoes	1	3	97	1	71	20,792
F6	Site Preparation	Water Trucks	1	6	402	1	71	172,341
F6	Building Construction	Cement and Mortar Mixers	1	4	9	1	715	25,723
F6	Building Construction	Concrete Pumps	1	2	84	1	715	120,038
F6	Building Construction	Cranes	1	3	231	1	715	495,158
F6	Building Construction	Forklifts	1	4	89	1	715	254,367
F6	Building Construction	Generator Sets	1	4	84	1	715	240,077
F6	Paving	Off-Highway Trucks	1	4	402	1	54	86,170
F6	Paving	Pavers	1	2	130	1	54	13,933
F6	Paving	Rollers	1	2	80	1	54	8,574
F6	Paving	Tractors/Loaders/Backhoes	1	5	97	1	54	25,990
G1	Site Preparation	Excavator	2	3	158	1	59	55,775
G1	Site Preparation	Off-Highway Trucks	1	6	402	1	59	141,908
G1	Site Preparation	Pile Drivers	1	4	231	0.50	59	27,181
G1	Site Preparation	Plate Compactors	1	2	8	1	59	941
G1	Site Preparation	Pressure Washer	1	2	13	1	59	1,530
G1	Site Preparation	Pumps	1	2	84	1	59	9,884
G1	Site Preparation	Rollers	1	2	80	1	59	9,413
G1	Site Preparation	Skid-Steer Loaders	1	2	65	1	59	7,648
G1	Site Preparation	Tractors/Loaders/Backhoes	2	3	97	1	59	34,242
G1	Site Preparation	Water Trucks	1	6	402	1	59	141,908
G1	Building Construction	Cement and Mortar Mixers	1	4	9	1	588	21,180
G1	Building Construction	Concrete Pumps	2	2	84	1	588	197,683
G1	Building Construction	Cranes	4	3	231	1	588	1,630,886
G1	Building Construction	Forklifts	2	4	89	1	588	418,900
G1	Building Construction	Generator Sets	1	4	84	1	588	197,683
G1	Paving	Off-Highway Trucks	1	4	402	1	44	70,954

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Phase/Block	Phase Name	Equipment	Number	Hours/Day	HP	Load	Days	Total hp-hr
G1	Paving	Pavers	1	2	130	1	44	11,473
G1	Paving	Rollers	1	2	80	1	44	7,060
G1	Paving	Tractors/Loaders/Backhoes	1	5	97	1	44	21,401
H1	Site Preparation	Excavator	2	3	158	1	59	55,905
H1	Site Preparation	Off-Highway Trucks	1	6	402	1	59	142,239
H1	Site Preparation	Pile Drivers	1	4	231	0.50	59	27,245
H1	Site Preparation	Plate Compactors	1	2	8	1	59	944
H1	Site Preparation	Pressure Washer	1	2	13	1	59	1,533
H1	Site Preparation	Pumps	1	2	84	1	59	9,907
H1	Site Preparation	Rollers	1	2	80	1	59	9,435
H1	Site Preparation	Skid-Steer Loaders	1	2	65	1	59	7,666
H1	Site Preparation	Tractors/Loaders/Backhoes	2	3	97	1	59	34,321
H1	Site Preparation	Water Trucks	1	6	402	1	59	142,239
H1	Building Construction	Cement and Mortar Mixers	1	4	9	1	590	21,230
H1	Building Construction	Concrete Pumps	1	2	84	1	590	99,072
H1	Building Construction	Cranes	2	3	231	1	590	817,344
H1	Building Construction	Forklifts	2	4	89	1	590	419,877
H1	Building Construction	Generator Sets	1	4	84	1	590	198,144
H1	Paving	Off-Highway Trucks	1	4	402	1	44	71,120
H1	Paving	Pavers	1	2	130	1	44	11,499
H1	Paving	Rollers	1	2	80	1	44	7,077
H1	Paving	Tractors/Loaders/Backhoes	1	5	97	1	44	21,451
H3	Site Preparation	Excavator	4	3	158	1	63	119,741
H3	Site Preparation	Off-Highway Trucks	2	6	402	1	63	304,656
H3	Site Preparation	Pile Drivers	3	4	231	0.50	63	87,532
H3	Site Preparation	Plate Compactors	2	2	8	1	63	2,021
H3	Site Preparation	Pressure Washer	3	2	13	1	63	4,926
H3	Site Preparation	Pumps	3	2	84	1	63	31,830
H3	Site Preparation	Rollers	1	2	80	1	63	10,105
H3	Site Preparation	Skid-Steer Loaders	1	2	65	1	63	8,210
H3	Site Preparation	Tractors/Loaders/Backhoes	4	3	97	1	63	73,512
H3	Site Preparation	Water Trucks	1	6	402	1	63	152,328
H3	Building Construction	Cement and Mortar Mixers	5	4	9	1	632	113,678
H3	Building Construction	Concrete Pumps	3	2	84	1	632	318,298
H3	Building Construction	Cranes	4	3	231	1	632	1,750,637
H3	Building Construction	Forklifts	4	4	89	1	632	899,317
H3	Building Construction	Generator Sets	3	4	84	1	632	636,595
H3	Paving	Off-Highway Trucks	2	4	402	1	47	152,328
H3	Paving	Pavers	2	2	130	1	47	24,630
H3	Paving	Rollers	2	2	80	1	47	15,157
H3	Paving	Tractors/Loaders/Backhoes	2	5	97	1	47	45,945
150 SM	Site Preparation	Excavator (Small 150 HP)	2	6	150	1	53	94,793
150 SM	Site Preparation	Water Trucks	1	6	402	1	53	127,023
150 SM	Site Preparation	Tractors/Loaders/Backhoes	1	3	97	1	53	15,325

Energy - Construction Calculations

Phase/Block	Phase Name	Equipment	Number	Hours/Day	HP	Load	Days	Total hp-hr
150 SM	Site Preparation	Pressure Washer	1	2	13	1	53	1,369
150 SM	Site Preparation	Trench Roller (25 HP)	1	4	25	1	53	5,266
150 SM	Site Preparation	Skid-Steer Loaders	1	2	65	1	53	6,846
150 SM	Site Preparation	Plate Compactors	1	2	8	1	53	843
150 SM	Building Construction	Cranes (220 HP mobile crane)	1	2	220	1	527	231,717
150 SM	Building Construction	Forklifts	1	4	89	1	527	187,480
150 SM	Building Construction	Generator Sets	1	4	84	1	527	176,947
150 SM	Building Construction	Concrete Pumps	1	1	84	1	527	44,237
150 SM	Paving	Pavers	1	2	130	1	39	10,269
150 SM	Paving	Rollers	1	2	80	1	39	6,320
150 SM	Paving	Off-Highway Trucks	1	4	402	1	39	63,511
150 SM	Paving	Tractors/Loaders/Backhoes	1	5	97	1	39	19,156
40 SM	Site Preparation	Excavator (Small 150 HP)	2	6	150	1	46	83,561
40 SM	Site Preparation	Water Trucks	1	6	402	1	46	111,972
40 SM	Site Preparation	Tractors/Loaders/Backhoes	1	3	97	1	46	13,509
40 SM	Site Preparation	Pressure Washer	1	2	13	1	46	1,207
40 SM	Site Preparation	Trench Roller (25 HP)	1	4	25	1	46	4,642
40 SM	Site Preparation	Skid-Steer Loaders	1	2	65	1	46	6,035
40 SM	Site Preparation	Plate Compactors	1	2	8	1	46	743
40 SM	Building Construction	Cranes (220 HP mobile crane)	1	2	220	1	464	204,261
40 SM	Building Construction	Forklifts	1	4	89	1	464	165,265
40 SM	Building Construction	Generator Sets	1	4	84	1	464	155,981
40 SM	Building Construction	Concrete Pumps	1	1	84	1	464	38,995
40 SM	Paving	Pavers	1	2	130	1	35	9,052
40 SM	Paving	Rollers	1	2	80	1	35	5,571
40 SM	Paving	Off-Highway Trucks	1	4	402	1	35	55,986
40 SM	Paving	Tractors/Loaders/Backhoes	1	5	97	1	35	16,886
LTA B1-1	Paving	Cement and Mortar Mixers	1	8	9	1	4	309
LTA B1-1	Paving	Pressure Washer	1	2	13	1	4	111
LTA B1-2	Paving	Cement and Mortar Mixers	1	8	9	1	4	309
LTA B1-2	Paving	Pressure Washer	1	2	13	1	4	111
LTA B1-3	Paving	Pile Drivers	1	8	231	0.50	24	22,176
LTA B1-3	Paving	Generator Sets	1	8	84	1	24	16,128
LTA B1-3	Paving	Cranes (220 HP mobile crane)	1	5	220	1	24	26,400
LTA B1-4	Paving	Tractors/Loaders/Backhoes	1	6	97	1	9	4,989
LTA B1-4	Paving	Pavers	1	6	130	1	9	6,686
LTA B1-4	Paving	Generator Sets	1	8	84	1	9	5,760
LTA B1-4	Paving	Excavator (Small 150 HP)	1	8	150	1	9	10,286
LTA B1-4	Paving	Pavers	1	6	130	1	9	6,686
LTA B1-4	Paving	Generator Sets	1	8	84	1	9	5,760
							Greater than 100 HP:	40,786,867
							Less than or equal to 100 HP:	22,900,118

Assumptions and Sources:

- Emissions factors for offroad vehicles taken from OFFROAD2017 Emission Factor Documentation. https://www.arb.ca.gov/msei/ordiesel/ordas_ef_fcf_2017.pdf

- Offroad vehicle types, load factors, hours of operation, days of operation, and associated phases taken from Air Quality section construction assumptions and default CalEEMod emission factors

Energy - Construction Calculations

Construction Energy Analysis
Off-Road Equipment - Electric

15,534.83 Total MWh
7.02 years
2,212 average annual MWh

Phase/Block	Phase Name	Equipment	Number	Hours/Day	HP	KW	Load	Total Days	Total kWh	Fuel Type	kW/hp
Phase 1	Demolition	Aerial Lifts	4	2	63	47	0.31	391	45,555	Electric	0.7457
Phase 1	Demolition	Air Compressors	4	2	78	58	0.48	391	87,331	Electric	
Phase 1	Demolition	Concrete/Industrial Saws	8	2	81	60	0.73	391	275,847	Electric	
Phase 1	Demolition	Sweepers/Scrubbers	2	3	64	48	0.46	391	51,503	Electric	
Phase 1	Demolition	Welders	4	4	46	34	0.45	391	96,568	Electric	
Phase 1	Excavation Phase 1	Aerial Lifts	3	2	63	47	0.31	940	82,138	Electric	
Phase 1	Excavation Phase 1	Air Compressors	3	2	78	58	0.48	940	157,463	Electric	
Phase 1	Excavation Phase 1	Sweepers/Scrubbers	1	8	64	48	0.46	940	165,090	Electric	
Phase 1	Tunnel Boring	Tunnel Boring Machine	1	8	5,699	4,250	1	60	2,040,000	Electric	
Bridge Construction	Demolition	Air Compressors	1	8	78	58	1	106	49,324	Electric	
Bridge Construction	Abutment/Bent Construction	Air Compressors	1	8	78	58	1	105	48,858	Electric	
Bridge Construction	Superstructure	Air Compressors	1	8	78	58	1	157	73,055	Electric	
D5-D6	Site Preparation	Concrete/Industrial Saws	1	6	81	60	1	57	20,626	Electric	
D5-D6	Site Preparation	Sweepers/Scrubbers	1	2	64	48	1	57	5,432	Electric	
D5-D6	Building Construction	Aerial Lifts	1	6	63	47	1	569	160,427	Electric	
D5-D6	Building Construction	Welders	2	1	46	34	1	569	39,046	Electric	
D5-D6	Paving	Concrete Saw	2	6	81	60	1	43	30,939	Electric	
D5-D6	Arc. Coating	Air Compressors	1	4	78	58	1	43	9,931	Electric	
D7	Site Preparation	Concrete/Industrial Saws	2	6	81	60	1	59	42,744	Electric	
D7	Site Preparation	Sweepers/Scrubbers	1	2	64	48	1	59	5,629	Electric	
D7	Building Construction	Aerial Lifts	3	6	63	47	1	590	498,676	Electric	
D7	Building Construction	Welders	6	1	46	34	1	590	121,371	Electric	
D7	Paving	Concrete Saw	2	6	81	60	1	44	32,058	Electric	
D7	Arc. Coating	Air Compressors	1	4	78	58	1	44	10,290	Electric	
D8-D13	Site Preparation	Concrete/Industrial Saws	1	6	81	60	1	111	40,283	Electric	
D8-D13	Site Preparation	Sweepers/Scrubbers	1	2	64	48	1	111	10,610	Electric	
D8-D13	Building Construction	Aerial Lifts	5	6	63	47	1	1112	1,566,578	Electric	
D8-D13	Building Construction	Cement and Mortar Mixers - E	3	4	9	7	1	1112	89,519	Electric	
D8-D13	Building Construction	Welders	2	1	46	34	1	1112	76,257	Electric	
D8-D13	Paving	Concrete Saw	2	6	81	60	1	83	60,425	Electric	
D8-D13	Arc. Coating	Air Compressors	1	4	78	58	1	83	19,396	Electric	
E1.1	Site Preparation	Concrete/Industrial Saws	3	6	81	60	1	46	50,472	Electric	
E1.1	Site Preparation	Sweepers/Scrubbers	2	2	64	48	1	46	8,862	Electric	
E1.1	Building Construction	Aerial Lifts	5	6	63	47	1	464	654,271	Electric	
E1.1	Building Construction	Welders	8	1	46	34	1	464	127,392	Electric	
E1.1	Paving	Concrete Saw	3	6	81	60	1	35	37,854	Electric	
E1.1	Arc. Coating	Air Compressors	1	4	78	58	1	35	8,101	Electric	
E1.2	Site Preparation	Concrete/Industrial Saws	4	6	81	60	1	59	85,587	Electric	
E1.2	Site Preparation	Sweepers/Scrubbers	3	2	64	48	1	59	16,906	Electric	
E1.2	Building Construction	Aerial Lifts	8	6	63	47	1	590	1,331,350	Electric	
E1.2	Building Construction	Welders	6	1	46	34	1	590	121,512	Electric	
E1.2	Paving	Concrete Saw	3	6	81	60	1	44	48,143	Electric	
E1.2	Arc. Coating	Air Compressors	5	4	78	58	1	44	51,511	Electric	
F1-F2	Site Preparation	Concrete/Industrial Saws	4	6	81	60	1	61	88,470	Electric	
F1-F2	Site Preparation	Sweepers/Scrubbers	3	2	64	48	1	61	17,475	Electric	
F1-F2	Building Construction	Aerial Lifts	10	6	63	47	1	610	1,720,240	Electric	
F1-F2	Building Construction	Welders	3	1	46	34	1	610	62,802	Electric	

Energy - Construction Calculations

Phase/Block	Phase Name	Equipment	Number	Hours/Day	HP	KW	Load	Total Days	Total kWh	Fuel Type	kW/hp
F1-F2	Paving	Concrete Saw	4	6	81	60	1	46	66,352	Electric	
F1-F2	Arc. Coating	Air Compressors	5	4	78	58	1	46	53,246	Electric	
F3	Site Preparation	Concrete/Industrial Saws	1	6	81	60	1	53	19,086	Electric	
F3	Site Preparation	Sweepers/Scrubbers	1	2	64	48	1	53	5,027	Electric	
F3	Building Construction	Aerial Lifts	1	6	63	47	1	527	148,443	Electric	
F3	Building Construction	Welders	2	1	46	34	1	527	36,129	Electric	
F3	Paving	Concrete Saw	2	6	81	60	1	39	28,628	Electric	
F3	Arc. Coating	Air Compressors	1	4	78	58	1	39	9,189	Electric	
F4	Site Preparation	Concrete/Industrial Saws	1	6	81	60	1	61	22,117	Electric	
F4	Site Preparation	Sweepers/Scrubbers	1	2	64	48	1	61	5,825	Electric	
F4	Building Construction	Aerial Lifts	3	6	63	47	1	610	516,072	Electric	
F4	Building Construction	Welders	2	1	46	34	1	610	41,868	Electric	
F4	Paving	Concrete Saw	2	6	81	60	1	46	33,176	Electric	
F4	Arc. Coating	Air Compressors	1	4	78	58	1	46	10,649	Electric	
F5	Site Preparation	Concrete/Industrial Saws	1	6	81	60	1	71	25,895	Electric	
F5	Site Preparation	Sweepers/Scrubbers	1	2	64	48	1	71	6,820	Electric	
F5	Building Construction	Aerial Lifts	1	6	63	47	1	715	201,403	Electric	
F5	Building Construction	Welders	2	1	46	34	1	715	49,019	Electric	
F5	Paving	Concrete Saw	2	6	81	60	1	54	38,842	Electric	
F5	Arc. Coating	Air Compressors	1	4	78	58	1	54	12,468	Electric	
F6	Site Preparation	Concrete/Industrial Saws	1	6	81	60	1	71	25,895	Electric	
F6	Site Preparation	Sweepers/Scrubbers	1	2	64	48	1	71	6,820	Electric	
F6	Building Construction	Aerial Lifts	1	6	63	47	1	715	201,403	Electric	
F6	Building Construction	Welders	2	1	46	34	1	715	49,019	Electric	
F6	Paving	Concrete Saw	2	6	81	60	1	54	38,842	Electric	
F6	Arc. Coating	Air Compressors	1	4	78	58	1	54	12,468	Electric	
G1	Site Preparation	Concrete/Industrial Saws	2	6	81	60	1	59	42,644	Electric	
G1	Site Preparation	Sweepers/Scrubbers	1	2	64	48	1	59	5,616	Electric	
G1	Building Construction	Aerial Lifts	2	6	63	47	1	588	331,678	Electric	
G1	Building Construction	Welders	3	1	46	34	1	588	60,544	Electric	
G1	Paving	Concrete Saw	2	6	81	60	1	44	31,983	Electric	
G1	Arc. Coating	Air Compressors	1	4	78	58	1	44	10,266	Electric	
H1	Site Preparation	Concrete/Industrial Saws	2	6	81	60	1	59	42,744	Electric	
H1	Site Preparation	Sweepers/Scrubbers	1	2	64	48	1	59	5,629	Electric	
H1	Building Construction	Aerial Lifts	2	6	63	47	1	590	332,451	Electric	
H1	Building Construction	Welders	3	1	46	34	1	590	60,685	Electric	
H1	Paving	Concrete Saw	2	6	81	60	1	44	32,058	Electric	
H1	Arc. Coating	Air Compressors	1	4	78	58	1	44	10,290	Electric	
H3	Site Preparation	Concrete/Industrial Saws	5	6	81	60	1	63	114,439	Electric	
H3	Site Preparation	Sweepers/Scrubbers	3	2	64	48	1	63	18,084	Electric	
H3	Building Construction	Aerial Lifts	6	6	63	47	1	632	1,068,095	Electric	
H3	Building Construction	Welders	3	1	46	34	1	632	64,990	Electric	
H3	Paving	Concrete Saw	2	6	81	60	1	47	34,332	Electric	
H3	Arc. Coating	Air Compressors	4	4	78	58	1	47	44,080	Electric	
150 SM	Site Preparation	Concrete/Industrial Saws	2	6	81	60	1	53	38,171	Electric	
150 SM	Site Preparation	Sweepers/Scrubbers	1	2	64	48	1	53	5,027	Electric	
150 SM	Building Construction	Aerial Lifts	3	6	63	47	1	527	445,330	Electric	
150 SM	Building Construction	Cement and Mortar Mixers - E	2	4	9	7	1	527	28,275	Electric	
150 SM	Building Construction	Welders	2	1	46	34	1	527	36,129	Electric	
150 SM	Paving	Concrete Saw	2	6	81	60	1	39	28,628	Electric	
150 SM	Arc. Coating	Air Compressors	1	4	78	58	1	39	9,189	Electric	
40 SM	Site Preparation	Concrete/Industrial Saws	2	6	81	60	1	46	33,648	Electric	

Energy - Construction Calculations

Phase/Block	Phase Name	Equipment	Number	Hours/Day	HP	KW	Load	Total Days	Total kWh	Fuel Type	kW/hp
40 SM	Site Preparation	Sweepers/Scrubbers	1	2	64	48	1	46	4,431	Electric	8356.114
40 SM	Building Construction	Aerial Lifts	3	6	63	47	1	464	392,563	Electric	
40 SM	Building Construction	Cement and Mortar Mixers - E	2	4	9	7	1	464	24,925	Electric	
40 SM	Building Construction	Welders	2	1	46	34	1	464	31,848	Electric	
40 SM	Paving	Concrete Saw	2	6	81	60	1	35	25,236	Electric	
40 SM	Arc. Coating	Air Compressors	1	4	78	58	1	35	8,101	Electric	
LTA B1-1	Paving	Concrete/Industrial Saws	1	3	81	60	1	4	777	Electric	
LTA B1-1	Paving	Sweepers/Scrubbers	1	2	64	48	1	4	409	Electric	
LTA B1-2	Paving	Concrete/Industrial Saws	1	3	81	60	1	4	777	Electric	
LTA B1-2	Paving	Sweepers/Scrubbers	1	2	64	48	1	4	409	Electric	
LTA B1-3	Paving	Cement and Mortar Mixers - E	1	5	9	7	1	24	805	Electric	
LTA B1-4	Paving	Cement and Mortar Mixers - E	1	8	9	7	1	9	460	Electric	
LTA B1-4	Paving	Cement and Mortar Mixers - E	1	8	9	7	1	9	460	Electric	
Total									15,534,825	Electric	

Energy - Construction Calculations

Downtown West San Jose Mixed Use Development

Total On-Road Fuel Consumption

EMFAC2017 Emission Factors			
EMFAC Year/Class	Vehicle Type	gal/mile	gal/min
2021Hauling	Hauling	0.15951222	4.90209E-05
2021Vendor	Vendor	0.13369922	4.70229E-05
2021Worker	Worker	0.0352901	8.09971E-07
2022Hauling	Hauling	0.15552366	4.91667E-05
2022Vendor	Vendor	0.13013726	4.70802E-05
2022Worker	Worker	0.03432732	7.87874E-07
2023Hauling	Hauling	0.14773116	4.7999E-05
2023Vendor	Vendor	0.12423016	4.62554E-05
2023Worker	Worker	0.03336361	7.65755E-07
2024Hauling	Hauling	0.14543513	4.84964E-05
2024Vendor	Vendor	0.12241903	4.68228E-05
2024Worker	Worker	0.03240615	7.43779E-07
2025Hauling	Hauling	0.14261298	4.84918E-05
2025Vendor	Vendor	0.12029309	4.69628E-05
2025Worker	Worker	0.03145114	7.2186E-07
2026Hauling	Hauling	0.13963922	4.80847E-05
2026Vendor	Vendor	0.11807423	4.67064E-05
2026Worker	Worker	0.03058569	7.01996E-07
2027Hauling	Hauling	0.13639857	4.748E-05
2027Vendor	Vendor	0.11565838	4.62794E-05
2027Worker	Worker	0.02979614	6.83875E-07
2028Hauling	Hauling	0.13314046	4.69658E-05
2028Vendor	Vendor	0.11330439	4.59623E-05
2028Worker	Worker	0.02908565	6.67568E-07
2029Hauling	Hauling	0.12917047	4.61568E-05
2029Vendor	Vendor	0.11064523	4.55074E-05
2029Worker	Worker	0.02844704	6.52911E-07
2030Hauling	Hauling	0.12604862	4.561E-05
2030Vendor	Vendor	0.10844309	4.51877E-05
2030Worker	Worker	0.02787608	6.39806E-07
2031Hauling	Hauling	0.12334151	4.4856E-05
2031Vendor	Vendor	0.1064834	4.46014E-05
2031Worker	Worker	0.02736642	6.28108E-07
2032Hauling	Hauling	0.12098529	4.42167E-05
2032Vendor	Vendor	0.10476653	4.40932E-05
2032Worker	Worker	0.02691491	6.17746E-07

All Phases	Total Gallons	Fuel Type
Hauling	854,080	Diesel
Vendor	637,807	Diesel
Worker	1,423,826	Gasoline

All Phases	Total Gallons	Fuel Type
Hauling	121,623	Diesel
Vendor	90,825	Diesel
Worker	202,756	Gasoline

Energy - Construction Calculations

Construction Phase	Daily One-Way Trips	Haul Days per Phase (days)	Work Hours per Day (hours/day)	One-Way Trip Distance per Day (miles)	Idling per Day (minutes)	(gallons)		Regional Emissions	
						gal/mile	gal/min	gal/day	Total Gallons/yr
<u>Excavation - Class I Haz</u>	2021								
Total Haul Trips	2957								
Hauling	19	157	8	170	15	0.16	4.90E-05	515	80,890
Vendor	0	157	8	6.9	15	0.13	4.70E-05	0	0
Worker	123	157	8	14.7	0	0.04	8.10E-07	64	10,018
<u>Excavation - Class I Haz</u>	2022								
Total Haul Trips	5914								
Hauling	19	313	8	170	15	0.16	4.92E-05	502	157,233
Vendor	0	313	8	6.9	15	0.13	4.71E-05	0	0
Worker	123	313	8	14.7	0	0.03	7.88E-07	62	19,427
<u>Excavation - Class I Haz</u>	2023								
Total Haul Trips	5914								
Hauling	19	313	8	170	15	0.15	4.80E-05	477	149,355
Vendor	0	313	8	6.9	15	0.12	4.63E-05	0	0
Worker	123	313	8	14.7	0	0.03	7.66E-07	60	18,882
<u>Excavation - Class I Haz</u>	2024								
Total Haul Trips	2957								
Hauling	19	157	8	170	15	0.15	4.85E-05	470	73,752
Vendor	0	157	8	6.9	15	0.12	4.68E-05	0	0
Worker	123	157	8	14.7	0	0.03	7.44E-07	59	9,199
<u>Excavation - Class II Non-Haz</u>	2021								
Total Haul Trips	28251								
Hauling	180	157	8	15	15	0.16	4.90E-05	431	67,617
Vendor	0	157	8	6.9	15	0.13	4.70E-05	0	0
Worker	0	157	8	14.7	0	0.04	8.10E-07	0	0
<u>Excavation - Class II Non-Haz</u>	2022								
Total Haul Trips	56502								
Hauling	181	313	8	15	15	0.16	4.92E-05	422	132,163
Vendor	0	313	8	6.9	15	0.13	4.71E-05	0	0
Worker	0	313	8	14.7	0	0.03	7.88E-07	0	0

Energy - Construction Calculations

Construction Phase	Daily One-Way Trips	Haul Days per Phase (days)	Work Hours per Day (hours/day)	One-Way Trip Distance per Day (miles)	Idling per Day (minutes)	(gallons)		Regional Emissions	
						gal/mile	gal/min	gal/day	Total Gallons/yr
<u>Excavation - Class II Non-Haz</u>	2023								
Total Haul Trips	56502								
Hauling	181	313	8	15	15	0.15	4.80E-05	401	125,541
Vendor	0	313	8	6.9	15	0.12	4.63E-05	0	0
Worker	0	313	8	14.7	0	0.03	7.66E-07	0	0
<u>Excavation - Class II Non-Haz</u>	2024								
Total Haul Trips	28251								
Hauling	180	157	8	15	15	0.15	4.85E-05	393	61,650
Vendor	0	157	8	6.9	15	0.12	4.68E-05	0	0
Worker	0	157	8	14.7	0	0.03	7.44E-07	0	0

Energy - Construction Calculations

Construction Phase	Daily One-Way Trips	Haul Days per Phase (days)	Work Hours per Day (hours/day)	One-Way Trip Distance per Day (miles)	Idling per Day (minutes)	(gallons)		Regional Emissions	
						gal/mile	gal/min	gal/day	Total Gallons/yr
<u>D5-D6- Site Preparation</u>	2023								
Total Haul Trips	0								
Hauling	0	57	8	15	15	0.15	4.80E-05	0	0
Vendor	0	57	8	6.9	15	0.12	4.63E-05	0	0
Worker	30	57	8	14.7	0	0.03	7.66E-07	15	839
<u>D5-D6- Building Construction</u>	2023								
Total Haul Trips	0								
Hauling	0	22	8	15	15	0.15	4.80E-05	0	0
Vendor	9	22	8	6.9	15	0.12	4.63E-05	8	170
Worker	24	22	8	14.7	0	0.03	7.66E-07	12	259
<u>D5-D6- Building Construction</u>	2024								
Total Haul Trips	0								
Hauling	0	313	8	15	15	0.15	4.85E-05	0	0
Vendor	9	313	8	6.9	15	0.12	4.68E-05	8	2,379
Worker	24	313	8	14.7	0	0.03	7.44E-07	11	3,578
<u>D5-D6- Building Construction</u>	2025								
Total Haul Trips	0								
Hauling	0	234	8	15	15	0.14	4.85E-05	0	0
Vendor	9	234	8	6.9	15	0.12	4.70E-05	7	1,748
Worker	24	234	8	14.7	0	0.03	7.22E-07	11	2,596

Energy - Construction Calculations

Construction Phase	Daily One-Way Trips	Haul Days per Phase (days)	Work Hours per Day (hours/day)	One-Way Trip Distance per Day (miles)	Idling per Day (minutes)	(gallons)		Regional Emissions	
						gal/mile	gal/min	gal/day	Total Gallons/yr
<u>D5-D6- Paving</u>	2025								
Total Haul Trips	0								
Hauling	0	43	8	15	15	0.14	4.85E-05	0	0
Vendor	0	43	8	6.9	15	0.12	4.70E-05	0	0
Worker	15	43	8	14.7	0	0.03	7.22E-07	7	298
<u>D5-D6- Architectural Coating</u>	2025								
Total Haul Trips	0								
Hauling	0	37	8	15	15	0.14	4.85E-05	0	0
Vendor	0	37	8	6.9	15	0.12	4.70E-05	0	0
Worker	5	37	8	14.7	0	0.03	7.22E-07	2	86
<u>D5-D6- Architectural Coating</u>	2026								
Total Haul Trips	0								
Hauling	0	6	8	15	15	0.14	4.81E-05	0	0
Vendor	0	6	8	6.9	15	0.12	4.67E-05	0	0
Worker	5	6	8	14.7	0	0.03	7.02E-07	2	13
<u>D7- Site Preparation</u>	2025								
Total Haul Trips	0								
Hauling	0	59	8	15	15	0.14	4.85E-05	0	0
Vendor	0	59	8	6.9	15	0.12	4.70E-05	0	0
Worker	48	59	8	14.7	0	0.03	7.22E-07	22	1,309

Energy - Construction Calculations

Construction Phase	Daily One-Way Trips	Haul Days per Phase (days)	Work Hours per Day (hours/day)	One-Way Trip Distance per Day (miles)	Idling per Day (minutes)	(gallons)		Regional Emissions	
						gal/mile	gal/min	gal/day	Total Gallons/yr
<u>D7- Building Construction</u>	2025								
Total Haul Trips	0								
Hauling	0	99	8	15	15	0.14	4.85E-05	0	0
Vendor	96	99	8	6.9	15	0.12	4.70E-05	80	7,889
Worker	245	99	8	14.7	0	0.03	7.22E-07	113	11,214
<u>D7- Building Construction</u>	2026								
Total Haul Trips	0								
Hauling	0	313	8	15	15	0.14	4.81E-05	0	0
Vendor	96	313	8	6.9	15	0.12	4.67E-05	78	24,480
Worker	245	313	8	14.7	0	0.03	7.02E-07	110	34,478
<u>D7- Building Construction</u>	2027								
Total Haul Trips	0								
Hauling	0	178	8	15	15	0.14	4.75E-05	0	0
Vendor	96	178	8	6.9	15	0.12	4.63E-05	77	13,637
Worker	245	178	8	14.7	0	0.03	6.84E-07	107	19,101
<u>D7- Paving</u>	2027								
Total Haul Trips	0								
Hauling	0	44	8	15	15	0.14	4.75E-05	0	0
Vendor	0	44	8	6.9	15	0.12	4.63E-05	0	0
Worker	15	44	8	14.7	0	0.03	6.84E-07	7	289

Energy - Construction Calculations

Construction Phase	Daily One-Way Trips	Haul Days per Phase (days)	Work Hours per Day (hours/day)	One-Way Trip Distance per Day (miles)	Idling per Day (minutes)	(gallons)		Regional Emissions	
						gal/mile	gal/min	gal/day	Total Gallons/yr
<u>D7- Architectural Coating</u>	2027								
Total Haul Trips	0								
Hauling	0	44	8	15	15	0.14	4.75E-05	0	0
Vendor	0	44	8	6.9	15	0.12	4.63E-05	0	0
Worker	49	44	8	14.7	0	0.03	6.84E-07	21	944
<u>D8-D13- Site Preparation</u>	2023								
Total Haul Trips	0								
Hauling	0	111	8	15	15	0.15	4.80E-05	0	0
Vendor	0	111	8	6.9	15	0.12	4.63E-05	0	0
Worker	43	111	8	14.7	0	0.03	7.66E-07	21	2,341
<u>D8-D13- Building Construction</u>	2023								
Total Haul Trips	0								
Hauling	0	72	8	15	15	0.15	4.80E-05	0	0
Vendor	9	72	8	6.9	15	0.12	4.63E-05	8	555
Worker	24	72	8	14.7	0	0.03	7.66E-07	12	847
<u>D8-D13- Building Construction</u>	2024								
Total Haul Trips	0								
Hauling	0	313	8	15	15	0.15	4.85E-05	0	0
Vendor	9	313	8	6.9	15	0.12	4.68E-05	8	2,379
Worker	24	313	8	14.7	0	0.03	7.44E-07	11	3,578

Energy - Construction Calculations

Construction Phase	Daily One-Way Trips	Haul Days per Phase (days)	Work Hours per Day (hours/day)	One-Way Trip Distance per Day (miles)	Idling per Day (minutes)	Regional Emissions			
						(gallons) gal/mile	gal/min	gal/day	Total Gallons/yr
<u>D8-D13- Building Construction</u>	2025								
Total Haul Trips	0								
Hauling	0	313	8	15	15	0.14	4.85E-05	0	0
Vendor	9	313	8	6.9	15	0.12	4.70E-05	7	2,338
Worker	24	313	8	14.7	0	0.03	7.22E-07	11	3,473
<u>D8-D13- Building Construction</u>	2026								
Total Haul Trips	0								
Hauling	0	313	8	15	15	0.14	4.81E-05	0	0
Vendor	9	313	8	6.9	15	0.12	4.67E-05	7	2,295
Worker	24	313	8	14.7	0	0.03	7.02E-07	11	3,377
<u>D8-D13- Building Construction</u>	2027								
Total Haul Trips	0								
Hauling	0	101	8	15	15	0.14	4.75E-05	0	0
Vendor	9	101	8	6.9	15	0.12	4.63E-05	7	725
Worker	24	101	8	14.7	0	0.03	6.84E-07	11	1,062
<u>D8-D13- Paving</u>	2027								
Total Haul Trips	0								
Hauling	0	83	8	15	15	0.14	4.75E-05	0	0
Vendor	0	83	8	6.9	15	0.12	4.63E-05	0	0
Worker	15	83	8	14.7	0	0.03	6.84E-07	7	545

Energy - Construction Calculations

Construction Phase	Daily One-Way Trips	Haul Days per Phase (days)	Work Hours per Day (hours/day)	One-Way Trip Distance per Day (miles)	Idling per Day (minutes)	(gallons)		Regional Emissions	
						gal/mile	gal/min	gal/day	Total Gallons/yr
<u>D8-D13- Architectural Coating</u>	2027								
Total Haul Trips	0								
Hauling	0	83	8	15	15	0.14	4.75E-05	0	0
Vendor	0	83	8	6.9	15	0.12	4.63E-05	0	0
Worker	5	83	8	14.7	0	0.03	6.84E-07	2	182
<u>E1.1- Site Preparation</u>	2024								
Total Haul Trips	0								
Hauling	0	46	8	15	15	0.15	4.85E-05	0	0
Vendor	0	46	8	6.9	15	0.12	4.68E-05	0	0
Worker	68	46	8	14.7	0	0.03	7.44E-07	32	1,490
<u>E1.1- Building Construction</u>	2024								
Total Haul Trips	0								
Hauling	0	267	8	15	15	0.15	4.85E-05	0	0
Vendor	98	267	8	6.9	15	0.12	4.68E-05	83	22,102
Worker	630	267	8	14.7	0	0.03	7.44E-07	300	80,130
<u>E1.1- Building Construction</u>	2025								
Total Haul Trips	0								
Hauling	0	197	8	15	15	0.14	4.85E-05	0	0
Vendor	98	197	8	6.9	15	0.12	4.70E-05	81	16,024
Worker	630	197	8	14.7	0	0.03	7.22E-07	291	57,380

Energy - Construction Calculations

Construction Phase	Daily One-Way Trips	Haul Days per Phase (days)	Work Hours per Day (hours/day)	One-Way Trip Distance per Day (miles)	Idling per Day (minutes)	(gallons)		Regional Emissions	
						gal/mile	gal/min	gal/day	Total Gallons/yr
<u>E1.1- Paving</u>	2025								
Total Haul Trips	0								
Hauling	0	35	8	15	15	0.14	4.85E-05	0	0
Vendor	0	35	8	6.9	15	0.12	4.70E-05	0	0
Worker	20	35	8	14.7	0	0.03	7.22E-07	9	324
<u>E1.1- Architectural Coating</u>	2025								
Total Haul Trips	0								
Hauling	0	35	8	15	15	0.14	4.85E-05	0	0
Vendor	0	35	8	6.9	15	0.12	4.70E-05	0	0
Worker	126	35	8	14.7	0	0.03	7.22E-07	58	2,039
<u>E1.2- Site Preparation</u>	2023								
Total Haul Trips	0								
Hauling	0	59	8	15	15	0.15	4.80E-05	0	0
Vendor	0	59	8	6.9	15	0.12	4.63E-05	0	0
Worker	75	59	8	14.7	0	0.03	7.66E-07	37	2,170
<u>E1.2- Building Construction</u>	2023								
Total Haul Trips	0								
Hauling	0	20	8	15	15	0.15	4.80E-05	0	0
Vendor	184	20	8	6.9	15	0.12	4.63E-05	158	3,154
Worker	470	20	8	14.7	0	0.03	7.66E-07	231	4,610
<u>E1.2- Building Construction</u>	2024								

Energy - Construction Calculations

Construction Phase	Daily One-Way Trips	Haul Days per Phase (days)	Work Hours per Day (hours/day)	One-Way Trip Distance per Day (miles)	Idling per Day (minutes)	Regional Emissions			
						(gallons) gal/mile	gal/min	gal/day	Total Gallons/yr
Total Haul Trips	0								
Hauling	0	313	8	15	15	0.15	4.85E-05	0	0
Vendor	184	313	8	6.9	15	0.12	4.68E-05	155	48,647
Worker	470	313	8	14.7	0	0.03	7.44E-07	224	70,079
<u>E1.2- Building Construction</u>	2025								
Total Haul Trips	0								
Hauling	0	257	8	15	15	0.14	4.85E-05	0	0
Vendor	184	257	8	6.9	15	0.12	4.70E-05	153	39,250
Worker	470	257	8	14.7	0	0.03	7.22E-07	217	55,845
<u>E1.2- Paving</u>	2025								
Total Haul Trips	0								
Hauling	0	44	8	15	15	0.14	4.85E-05	0	0
Vendor	0	44	8	6.9	15	0.12	4.70E-05	0	0
Worker	38	44	8	14.7	0	0.03	7.22E-07	18	773
<u>E1.2- Architectural Coating</u>	2025								
Total Haul Trips	0								
Hauling	0	12	8	15	15	0.14	4.85E-05	0	0
Vendor	0	12	8	6.9	15	0.12	4.70E-05	0	0
Worker	94	12	8	14.7	0	0.03	7.22E-07	43	522

Energy - Construction Calculations

Construction Energy Analysis

Temporary Construction Trailer - Electricity

Land Use	Square Feet	kWh/sq ft			Total kWh
		Title 24 Electricity	Non-Title 24 Electricity	Lighting Electricity	
General Office	5,000	4.60	4.62	3.77	64,950

Assumptions and Sources:

- CalEEMod 2016.3.2 default emission factors used to estimate energy use for temporary construction office
- Construction offices assumed to total 5,000 square feet