Appendix F
Energy Calculation Worksheets

Harvard-Westlake River Park Project

Energy Worksheets

1. Energy Calculation Worksheets

a) Construction

b) Operations

c) Existing

2. LADWP Will-Serve Letter

Harvard Westlake
Construction Energy Analysis

Annual Fuel Summary

	Heavy-Duty Construction Equipment
751,499	Total Project Consumption
299,124	Annual Consumption
	Haul Trucks
322,896	Total Project Consumption
128,525	Annual Consumption
	Vendor Trucks
44,887	Total Project Consumption
17,866	Annual Consumption
	Workers
169,155	Total Project Consumption
67,330	Annual Consumption
367,782	Project Consumption of diesel for Haul Trucks and Vendors
146,391	Annual Consumption
1,119,281	Total Gallons Diesel
169,155	Total Gallons Gasoline

2.5 Estimated Project Construction Duration (years)

445,515 Annual Average Gallons Diesel
67,330 Annual Average Gallons Gasoline

Los Angeles County			Percent of Annual Project Compared to Los Angeles County
Source	**Fuel Type**	**Gallons**	
Workers	Gasoline	3,559,000,000	0.0019%
Off-Road/Vendor/Haul Trucks	Diesel	563,265,306	0.079%

Notes:

1 Gasoline and diesel amounts from CEC, 2010-2020. Available: https://www.energy.ca.gov/media/3874. Diesel is adjusted to account for retail (49 percent) and non-retail (51 percent) diesel sales.

Annual Electricity Summary

Temporary Construction Trailer - Electricity	12,990	kWh/year
Construction Water Energy Estimates	151,054	kWh/year
Total	**164,044**	**kWh/year**

Harvard Westlake
Construction Energy Analysis

Off-Road Equipment

Equipment ≤ 100 hp		
pounds 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
Total <100	7,891,030	hp-hr
Total diesel gallons:	452,889	gal
Equipment > 100 hp		
pounds 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
Total >100	5,784,170	hp-hr
Total diesel gallons:	298,610	gal
diesel density (lb/gal):1	**751,499**	**gal**

1. OFFROAD2017 Emission Factor Documentation

Construction Phase	Equipment	Number	Hours/Day	HP	Load	Days	Total hp-hr
Site Preparation-1	#VALUE!	1	8	158	0.38	27	12,969
Site Preparation-1	Off-Highway Trucks	1	4.4	402	0.38	27	18,148
Site Preparation-1	Skid Steer Loaders	2	8	65	0.37	27	10,390
Site Preparation-1	Tractors/Loaders/Backhoes	4	8	97	0.37	27	31,009
Demolition	Air Compressors	1	8	78	0.48	53	15,875
Demolition	Concrete/Industrial Saws	2	8	81	0.73	53	50,142
Demolition	Excavators	3	8	158	0.38	53	76,371
Demolition	Off-Highway Trucks	1	4.4	402	0.38	53	35,624
Demolition	Rough Terrain Forklifts	2	8	100	0.4	53	33,920
Demolition	Skid Steer Loaders	4	8	65	0.37	53	40,789
Demolition	Sweepers/Scrubbers	1	8	64	0.46	53	12,483
Demolition	Tractors/Loaders/Backhoes	5	8	97	0.37	53	76,087
Grading	Air Compressors	2	8	78	0.48	132	79,073
Grading	Bore/Drill Rigs	2	8	221	0.5	132	233,376
Grading	Excavators	2	8	158	0.38	132	126,804
Grading	Off-Highway Trucks	2	4.4	402	0.38	132	177,446
Grading	Pumps	2	8	84	0.74	132	131,282
Grading	Sweepers/Scrubbers	1	8	64	0.46	132	31,089
Grading	Tractors/Loaders/Backhoes	2	8	97	0.37	132	75,800
Foundations	Air Compressors	3	8	78	0.48	283	254,292
Foundations	Bore/Drill Rigs	3	8	221	0.5	283	750,516
Foundations	Cranes	2	8	231	0.29	283	303,331
Foundations	Excavators	1	8	158	0.38	283	135,931
Foundations	Off-Highway Trucks	1	4.4	402	0.38	260	174,757
Foundations	Plate Compactors	2	8	8	0.43	283	15,576
Foundations	Pumps	3	8	84	0.74	283	422,191
Foundations	Rough Terrain Forklifts	2	8	100	0.4	283	181,120
Foundations	Skid Steer Loaders	4	8	65	0.37	283	217,797
Foundations	Tractors/Loaders/Backhoes	6	8	97	0.37	283	487,530
Utilities	Air Compressors	1	8	78	0.48	368	110,223
Utilities	Dumpers/Tenders	3	8	16	0.38	368	53,699
Utilities	Excavators	2	8	158	0.38	368	353,516
Utilities	Off-Highway Trucks	2	4.4	402	0.38	368	494,698
Utilities	Plate Compactors	2	8	8	0.43	368	20,255
Utilities	Rough Terrain Forklifts	2	8	100	0.4	368	235,520
Utilities	Rubber Tired Loaders	2	8	203	0.36	368	430,295
Utilities	Skid Steer Loaders	4	8	65	0.37	368	283,213
Utilities	Sweepers/Scrubbers	1	8	64	0.46	368	86,671
Utilities	Tractors/Loaders/Backhoes	2	8	97	0.37	368	211,320
Building Construction	Air Compressors	1	8	78	0.48	444	132,987
Building Construction	Cement and Mortar Mixers	3	8	9	0.56	444	53,706
Building Construction	Cranes	1	8	231	0.29	444	237,948

Construction Phase	Equipment	Number	Hours/Day	HP	Load	Days	Total hp-hr
Building Construction	Generator Sets	4	8	84	0.74	444	883,169
Building Construction	Rough Terrain Forklifts	2	8	100	0.4	444	284,160
Site Preparation-2	Excavators	1	8	158	0.38	26	12,488
Site Preparation-2	Graders	1	8	187	0.41	26	15,947
Site Preparation-2	Off-Highway Trucks	1	4.4	402	0.38	26	17,476
Site Preparation-2	Scrapers	2	8	367	0.48	26	73,283
Site Preparation-2	Skid Steer Loaders	4	8	65	0.37	26	20,010
Site Preparation-2	Tractors/Loaders/Backhoes	4	8	97	0.37	26	29,860
Site Preparation-2	Trenchers	1	8	78	0.5	26	8,112
Landscape	Cement and Mortar Mixers	1	8	9	0.56	394	15,886
Landscape	Cranes	2	8	231	0.29	394	422,305
Landscape	Forklifts	1	8	89	0.2	394	56,106
Landscape	Graders	1	8	187	0.41	394	241,664
Landscape	Off-Highway Trucks	1	4.4	402	0.38	394	264,825
Landscape	Rollers	2	8	80	0.38	394	191,642
Landscape	Rough Terrain Forklifts	3	8	100	0.4	394	378,240
Landscape	Rubber Tired Loaders	3	8	203	0.36	394	691,044
Landscape	Skid Steer Loaders	7	8	65	0.37	394	530,639
Landscape	Tractors/Loaders/Backhoes	5	8	97	0.37	394	565,626
Landscape	Trenchers	2	8	78	0.5	394	245,856
Pool Area	Air Compressors	1	8	78	0.48	367	109,924
Pool Area	Cranes	1	8	231	0.29	367	196,683
Pool Area	Off-Highway Trucks	1	4.4	402	0.38	367	246,677
Pool Area	Plate Compactors	1	8	8	0.43	367	10,100
Pool Area	Pumps	1	8	84	0.74	367	182,502
Pool Area	Rough Terrain Forklifts	1	8	100	0.4	367	117,440
Pool Area	Skid Steer Loaders	1	8	65	0.37	367	70,611
Pool Area	Tractors/Loaders/Backhoes	1	8	97	0.37	367	105,373
Architectural Coating	Concrete/Industrial Saws	2	8	81	0.73	310	293,285
Architectural Coating	Forklifts	2	8	89	0.2	310	88,288
Architectural Coating	Rough Terrain Forklifts	3	8	100	0.4	310	297,600
Paving	Air Compressors	1	8	78	0.48	28	8,387
Paving	Graders	1	8	187	0.41	28	17,174
Paving	Pavers	1	8	130	0.42	28	12,230
Paving	Paving Equipment	1	8	132	0.36	28	10,644
Paving	Plate Compactors	1	8	8	0.43	28	771
Paving	Pumps	1	8	84	0.74	28	13,924
Paving	Rollers	1	8	80	0.38	28	6,810
Paving	Sweepers/Scrubbers	1	8	64	0.46	28	6,595
Paving	Tractors/Loaders/Backhoes	2	8	97	0.37	28	16,079

Total >100	5,784,170
Total <100	7,891,030

Harvard Westlake
Construction Energy Analysis

Temporary Construction Trailer - Electricity			
Land Use	**Square Feet**	**Energy Use per year (kWh)**	**Total Energy Use (kWh)**
General Office	1,000	12,990	32,635
Note: CalEEMod 2016.3.2 used to estimate energy use for temporary construction office			

Harvard Westlake
Construction Energy Analysis

Construction Water Energy Estimates

Project Acres	16.75
Construction Duration	2.51

Source	**Construction Water Use per Day (Mgal)**	**Total Construction Water Use (Mgal)**	**Total Electricity Demand from water Demand (kWh)**	**Annual Electricity Demand from water Demand (kWh)**
Project	0.050	29.145	379,497	151,054
CalEEMod Water Electricity Factors	**Electricity Intensity Factor To Supply (kWh/Mgal)**	**Electricity Intensity Factor To Treat (kWh/Mgal)**	**Electricity Intensity Factor To Distribute (kWh/Mgal)**	**Electricity Intensity Factor For Wastewater Treatment (kWh/Mgal)**
Project	9727	111	1272	1911

Sources:

Electricity Intensity Factors - California Emissions Estimator Model (CalEEMod).

Estimated construction water use assumed to be generally equivalent to landscape irrigation, based on a factor of 20.94 gallons per year per square foot of landscaped area within the Los Angeles area (Mediterranean climate), which assumes high water demand landscaping materials and an irrigation system efficiency of 85%. Factor is therefore (20.94 GAL/SF/year) x (43,560 SF/acre) / (365 days/year) / (0.85) = 2,940 gallons/acre/day, rounded up to 3,000 gallons/acre/day. (U.S. Department of Energy, Energy Efficiency & Renewable Energy, Federal Energy Management Program. “Guidelines for Estimating Unmetered Landscaping Water Use." July 2010. Page 12, Table 4 - Annual Irrigation Factor – Landscaped Areas with High Water Requirements).

Harvard Westlake
Operational Energy Demand

Electricity	kWh/yr	GWh/yr
Fields and Open Space	161,760	0.162
Multi Purpose Gym and Locker Rooms	998,620	0.999
Sheds/Storage/Water Storage Tanks	97,359	0.097
Swimming Pool	0	-
Tennis Courts/Pool Deck/Bleacher Seats	49,022	0.049
Security Kiosk	2,250	0.002
Parking Structure	1,173,800	1.174
Parking Lot	12,959	0.013
Pole and LED Lighting	185,994	0.186
EV Charging (see worksheet)	85,440	0.085
Solar PV (estimated by Gensler)	(339,000)	(0.339)
Total Building Energy	**2,495,770**	**2.496**
Total	**2,428,204**	**2.428**
Total (including water, see below)	**2,617,043**	**2.617**

Source: California Air Resources Board, CalEEMod, Version 2016.3.2.

Electricity	GWh/yr
LADWP 2025-2026 Total Energy Sales	26,748
Project Annual	2.617
Existing Annual	0.806
Net Project Annual	1.811215
Percent Net Project of LADWP	0.0068%

Source: Los Angeles Department of Water and Power, 2017 Long-Term Resource Plan, Appendix A, 2017.

Water	Mgal/yr	MWh/yr
Fields and Open Space	3.30	42.97
Multi Purpose Gym and Locker Rooms	9.18	119.56
Sheds/Storage/Water Storage Tanks	0.03	0.34
Swimming Pool	0.18	2.33
Tennis Courts/Pool Deck/Bleacher Seats	0.00	-
Security Kiosk	0.00	0.03
Parking Structure	1.81	23.61
Parking Lot	0.00	-
Pole and LED Lighting	0.00	-
Total	**14.503**	188.84

Electricity Intensity Factors	kWh/Mgal
Electricity Factor - Supply	9,727
Electricity Factor - Treat	111
Electricity Factor - Distribute	1,272
Electricity Factor - Wastewater Treatment	1,911

Electricity from Water Demand	kWh/yr	GWh/yr
Total	**188,838.82**	**0.189**

Source: California Air Resources Board, CalEEMod, Version 2016.3.2.
Water Demand based on Project Water supply Assessment
Sewage Facilities Charge, Sewage Generation Factor for Residential and Commercial Categories, 2012.

Natural Gas	kBtu/yr	cubic foot (cf)
Fields and Open Space	0	-
Multi Purpose Gym and Locker Rooms	1,651,490	1,595,643
Sheds/Storage/Water Storage Tanks	21,861	21,122
Swimming Pool	56,390	54,483
Tennis Courts/Pool Deck/Bleacher Seats	0	-
Security Kiosk	1,856	1,793
Parking Structure	0	-
Parking Lot	0	-
Pole and LED Lighting	0	-
Mobile Sources	156	151
Total	**1,731,754**	**1,673,192**

Source: California Air Resources Board, CalEEMod, Version 2016.3.2.
Conversion factor of 1,035 Btu per cubic foot based on United States Energy Information Administration data (see: USEIA, Natural Gas, Heat Content of Natural Gas Consumed, February 28, 2018, https://www.eia.gov/dnav/ng/ng_cons_heat_a_EPG0_VGTH_btucf_a.htm. Accessed March 2020.)

Natural Gas	million cubic foot (cf)
SoCalGas 2025	854,830
Project Annual	1.673
Existing Annual	0.010
Net Project Annual	1.663510
Percent Net Project of SoCalGas	0.0002%

Source: California Gas and Electric Utilities, 2020 California Gas Report, p. 145,2020.

Harvard Westlake
Operational Energy Analysis

Estimated Electricity demand from Electric Vehicle Supply Equipment (EVSE)

Land Use Type	Number of EVSE Charging Spaces	Percent of Spaces with EV Chargers	Average Charge (kWh/day) [a]	Days/Year	Electricity Demand (kWh/yr)	Electricity Demand (MWh/yr)
Total	**532**	**10.0%**	**4.4**	**365**	85,440	85.44

Notes:

a. Estimated based on reference sources listed below.

b. Project would install EV charing spaces for 10 percent of its parking capacity for immediate use

c. Project would install pre-wiring for EV charging spaces for 30 percent of its parking capacity for future use (so 20% in addition to the immediate use).

Sources:

US Department of Energy. Alternative Fuels Data Center, 2016. Hybrid and Plug-In Electric Vehicle Emissions Data Sources and Assumptions.
Available at: https://www.afdc.energy.gov/vehicles/electric_emissions_sources.html.

US Department of Energy. Smith, Margaret, 2016. Level 1 Electric Vehicle Charging Stations at the Workplace.
Available at: https://www.afdc.energy.gov/uploads/publication/WPCC_L1ChargingAtTheWorkplace_0716.pdf.

UCLA Luskin Center for Innovation. Williams, Brett and JR deShazo, 2013. Pricing Workplace Charging: Financial Viability and Fueling Costs.
Available at: http://luskin.ucla.edu/sites/default/files/Luskin-WPC-TRB-13-11-15d.pdf.

Harvard Westlake
Pole Lighting and LED Screens

Pole Lighting
Based on Illuminance Calculations From Lighting Analysis

Circuit Summary

Circuit	Description	Load (kW)	Fixture Qty
A	Track and Field	31.36	29
B	Tennis 1	6.96	12
C	Tennis 2	6.96	12
D	Tennis 3	6.96	12
E	Tennis 4	6.96	12
F	Athletic Fields	66.75	46
G	Pool	10.41	19
H	Track	2.67	26
I	Ball Tracking Fixtures	3.45	6
		142.480	

Assumptions	Weekdays+Sundays/Year	313	
	Saturdays (when facilities will be used)	10	
	Lighting # hours per day	4	
	hours operating per year	1292	
	Energy usage per year	184084.2	kwh/year

LED Screens

LED Screen	**Dimensions (ft)**		**Diagonal**	**Power Usage Watts**
Field A	25	18	30.8	739.2
Field B	25	18	30.8	739.2
			Total	1478.4

Assumptions	Weekdays+Sundays/Year	313	
	Saturdays (when facilities will be used)	10	
	Screens # hours per day	4	
	hours operating per year	1292	
	Energy usage per year	1910093	wh/year
		1910	kwh/year

LED scaled from 50 inches diameter screen using 100 W
http://energyusecalculator.com/electricity_lcdleddisplay.htm
Assumes LED no used on sundays since no events

Harvard Westlake
Operational Energy Analysis
Fuel Usage from VMT

Annual VMT (Traffic Study)[4]: 3,958,345 miles/year

Fuel Type:[1]	GAS	DSL	ELEC	NG
Percent:	93.5%	4.2%	2.2%	0.1%
Miles per Gallon Fuel:	27.8	11.3	-	3.42
Annual VMT by Fuel Type (miles):	3,699,421	166,771	88,445	3,708
Annual Fuel Usage (gallons):	132,955	14,756	-	156
Annual Fuel Savings from Electric Vehicles:[2]	-	-	3,179	

	Los Angeles County Fuel Consumption [3]	
	Gasoline	Diesel
Los Angeles County:	3,559,000,000	563,265,306
Project Annual:	132,955	14,756
Existing Annual:	86,535	8,319
Net Annual:	46,419	6,437
Percent Net Project of Los Angeles County:	0.0013%	0.0011%

Notes:

1. California Air Resources Board, EMFAC2017 (South Coast Air Basin; Annual; 2024', Aggregate Fleet).
2. Assumes electric vehicles would replace traditional gasoline-fueled vehicles.
3. California Energy Commission, California Retail Fuel Outlet Annual Reporting (CEC-A15) Results, 2010-2020, https://www.energy.ca.gov/media/3874, accessed January 28, 2022. Diesel is adjusted to account for retail (49 percent) and non-retail (51 percent) diesel sales.
4. Fehr & Peers, Transportation Assessment for the Harvard-Westlake River Park Project, December 2020.

Harvard Westlake
Existing Energy Demand

Electricity	kWh/yr	GWh/yr
Tennis House	12,177	0.012
Tennis Courts	112,640	0.113
Golf-Related Land Uses	492,678	0.493
Parking lot	33,792	0.034
Parcel	0	-
Total Building Energy	**651,287**	**0.651**
Total	**651,287**	**0.651**
Total (including water, see below)	**805,828**	**0.806**

Source: California Air Resources Board, CalEEMod, Version 2016.3.2.

Electricity	GWh/yr
LADWP 2025-2026 Total Energy Sales	23,537
Existing Annual	0.806

Source: Los Angeles Department of Water and Power,
2017 Long-Term Resource Plan, Appendix A, 2017.

Water	Mgal/yr	
Tennis House	0.05	0.62
Tennis Courts	0.00	-
Golf-Related Land Uses	11.33	147.56
Parking lot	0.49	6.36
Parcel	0.00	-
Total	**11.869**	154.54

Electricity Intensity Factors	kWh/Mgal
Electricity Factor - Supply	9,727
Electricity Factor - Treat	111
Electricity Factor - Distribute	1,272
Electricity Factor - Wastewater Treatment	1,911

Electricity from Water Demand	kWh/yr	GWh/yr
Total	**154,541.20**	**0.155**

Source: California Air Resources Board, CalEEMod, Version 2016.3.2.
Water Demand based on Project Water supply Assessment
Sewage Facilities Charge, Sewage Generation Factor for Residential and Commercial Categories, 2012.

Natural Gas	kBtu/yr	cubic foot (cf)
Tennis House	9,940	9,603
Tennis Courts	0	-
Golf-Related Land Uses	0	-
Parking lot	0	-
Parcel	0	-
Mobile Sources	81	78
Total	**10,021**	**9,682**

Natural Gas	million cubic foot (cf)
SoCalGas 2025	854,830
Existing Annual	0.010

Source: California Gas and Electric Utilities, 2020 California Gas
Report, p. 145,2020.

Source: California Air Resources Board, CalEEMod, Version 2016.3.2.
Conversion factor of 1,035 Btu per cubic foot based on United States Energy Information Administration data
(see: USEIA, Natural Gas, Heat Content of Natural Gas Consumed, February 28, 2018,
https://www.eia.gov/dnav/ng/ng_cons_heat_a_EPG0_VGTH_btucf_a.htm. Accessed March 2020.)

Harvard Westlake
Existing Energy Analysis
Fuel Usage from VMT

6,030 Daily VMT - Project

Annual VMT (Traffic Study)[4]: 2,200,950 miles/year

Fuel Type:[1]	GAS	DSL	ELEC	NG
Percent:	95.3%	3.6%	1.0%	0.1%
Miles per Gallon Fuel:	24.2	9.6	-	3.45
Annual VMT by Fuel Type (miles):	2,098,268	79,626	21,114	1,942
Annual Fuel Usage (gallons):	86,535	8,319	-	81
Emergency Generator				
Annual Fuel Savings from Electric Vehicles:[2]	-	-	871	

	Los Angeles County Fuel Consumption [3]	
	Gasoline	Diesel
Los Angeles County:	3,559,000,000	563,265,306
Existing Annual:	86,535	8,319
Percent Net Project of Los Angeles County:	0.0024%	0.0014%

Notes:

1. California Air Resources Board, EMFAC2017 (South Coast Air Basin; Annual; 2024', Aggregate Fleet).
2. Assumes electric vehicles would replace traditional gasoline-fueled vehicles.
3. California Energy Commission, California Retail Fuel Outlet Annual Reporting (CEC-A15) Results, 2010-2020, https://www.energy.ca.gov/media/3874, accessed January 28, 2022. Diesel is adjusted to account for retail (49 percent) and non-retail (51 percent) diesel sales.
4. Fehr & Peers, Transportation Assessment for the Harvard-Westlake River Park Project, December 2020.

January 7, 2021

Ms. Charlotte Harrop, Project Engineer
KPPF
700 S. Flower Street, Suite 2100
Los Angeles, CA 90017

Subject: Harvard-Westlake River Park
4141 Whitsett, Sherman Oaks

Dear Ms. Harrop:

This is in response to your submittal regarding electric service for the proposed project located at the above address.

Electric Service is available and will be provided in accordance with the Los Angeles Department of Water and Power's Rules Governing Water and Electric Service. The availability of electricity is dependent upon adequate generating capacity and adequate fuel supplies. The estimated power requirement for this proposed project is part of the total load growth forecast for the City of Los Angeles and has been taken into account in the planned growth of the City's power system.

If you have any questions regarding this matter, please contact me at (213) 367-4290.

Sincerely,

Ralph Jaramillo

Ralph Jaramillo
Engineer of Customer Station Design

RJ:gr

C/enc:
FileNet