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HARE CREEK CENTER

Hare Creek Center Landscape Plan  
Rainwater Harvest System Sizing Calculator - TWDB

Catchment Area (sq. ft.)	29,500
Monthly Indoor Demand (gals)	
Outdoor Demand (gals)	0
Water in Storage to Begin (gal)	0
Tank Size (gal)	60,000

*Indoor Water Use*

Water useage per person/day	0
Number of Persons in House Hold	0
Household - annual	0
Household - monthly	0

*Water Usage for Landscapes*

Landscape Area (acres)	0.36
Annual Water Use	0
Monthly Water Use	0
Number of Months Requiring Irrigation	
low water usage (gal/sq.ft./year)	
high water usage (gal/sq.ft./year)	
turf usage (gal/sq.ft./year)	

acre-inch per gallon

3.68266E-05

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Hare Creek Center Landscape Plan

	Indoor demand	Irrigation Cultural	Irrigation Native	Winter Discharge	Total demand	Average rainfall
January	0	2,038	647	40,000	42,685	8.50
February	0	3,286	1,042	40,000	44,329	6.81
March	0	6,282	1,992	20,000	28,274	5.44
April	0	9,651	3,061	20,000	32,712	2.76
May	0	12,438	3,945		16,384	1.37
June	0	14,560	4,618		19,178	0.59
July	0	16,598	5,265		21,863	0.08
August	0	14,622	4,638		19,260	0.15
September	0	10,774	3,417		14,192	0.63
October	0	6,989	2,217	30,000	39,206	2.36
November	0	2,954	937	30,000	33,890	5.19
December	0	1,914	607	20,000	22,521	6.86
<b>Totals</b>	<b>0</b>	<b>102,107</b>	<b>32,387</b>	<b>200,000</b>	<b>334,494</b>	<b>40.74</b>

	Winter Discharge gallons	Winter Discharge inches
January	40,000	4.1
February	40,000	4.1
March	20,000	2.1
April	20,000	2.1
May	0	0.0
June	0	0.0
July	0	0.0
August	0	0.0
September	0	0.0
October	30,000	3.1
November	30,000	3.1
December	20,000	2.1
		<b>20.7</b>

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Collection surface size	Gallons/ft <sup>2</sup> collection coefficient	Runoff Coefficient	Safety Factor	Rainfall collected	Surplus or deficit	End of month storage (starting with water in storage)	missed runoff
29,500	0.62	0.90	0.95	132,923	150,238	60,000	90,238
29,500	0.62	0.90	0.95	106,494	122,166	60,000	62,166
29,500	0.62	0.90	0.95	85,070	116,796	60,000	56,796
29,500	0.62	0.90	0.95	43,161	70,448	60,000	10,448
29,500	0.62	0.90	0.95	21,424	65,040	60,000	5,040
29,500	0.62	0.90	0.95	9,226	50,048	50,048	0
29,500	0.62	0.90	0.95	1,251	29,436	29,436	0
29,500	0.62	0.90	0.95	2,346	12,521	12,521	0
29,500	0.62	0.90	0.95	9,852	8,181	8,181	0
29,500	0.62	0.90	0.95	36,906	5,882	5,882	0
29,500	0.62	0.90	0.95	81,161	47,271	47,271	0
29,500	0.62	0.90	0.95	107,276	132,026	60,000	72,026

**637,090** **296,715**

Percent capture and used **53%**  
 Percent discharge to stormwater system **47%**

Percentage of Irrigation for Cultural Landscape **100%**  
 Percentage of Irrigation for Native Landscape **100%**

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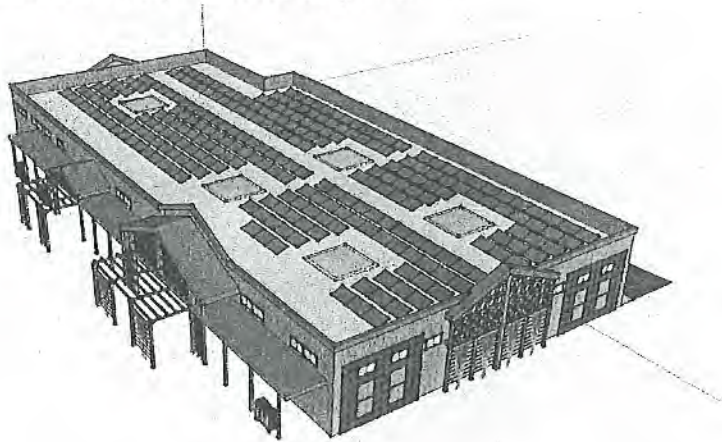
HARE CREEK  
CENTER

## Hare Creek Photovoltaic Solar Production Estimate:

-Production estimates made using NREL PVWatts Calculator

### Bldg. A (180degree azimuth):

(232) Solar Modules @ 270w each = 62,640 watts DC power



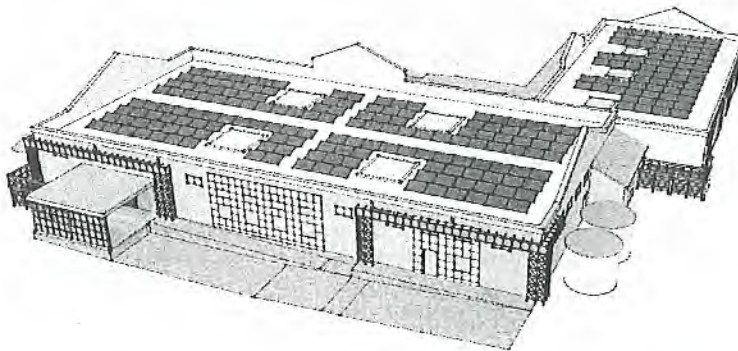
At 20 degrees tilt on flat roof:

85,945 kWh AC Energy per year

(\$12,559/year value at \$0.15/kWh local electricity rates)

### Bldgs. B&C (180degree azimuth):

(222) Solar Modules @ 270w each = 59,940 watts DC power



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At 20 degrees tilt on flat roof:

82,241 kWh AC Energy per year

(\$12,018/year value at \$0.15/kWh local electricity rates)

**Total Estimated Yearly Production of Both Buildings = 168,186 kWh/year**

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BLDG B/2

H.C.C.



RESULTS

82,241 kWh per Year

Caution: Photovoltaic system performance predictions calculated by PVWatts® include many inherent assumptions and uncertainties and do not reflect variations between PV technologies nor site-specific characteristics except as represented by PVWatts® inputs. For example, PV modules with better performance are not differentiated within PVWatts® from lesser performing modules. Both NREL and private companies provide more sophisticated PV modeling tools (such as the System Advisor Model at <http://sam.nrel.gov>) that allow for more precise and complex modeling of PV systems.

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Month	Solar Radiation ( kWh / m <sup>2</sup> / day )	AC Energy ( kWh )	Energy Value ( \$ )
January	2.79	3,708	542
February	3.25	3,785	553
March	5.28	7,032	1,028
April	6.47	8,175	1,195
May	7.45	9,639	1,409
June	7.76	9,567	1,398
July	8.03	9,980	1,458
August	7.49	9,370	1,369
September	6.22	7,533	1,101
October	4.67	6,045	883
November	2.97	3,714	543
December	2.84	3,691	539
Annual	5.43	82,241	\$ 12,018

Location and Station Identification

Requested Location	95437
Weather Data Source	UKIAH MUNICIPAL AP, CALIFORNIA (TMY3)
Latitude	39.13° N
Longitude	123.2° W

PV System Specifications (Residential)

DC Rating	59.94 kW
DC to AC Derate Factor	0.77
Array Type	Fixed (open rack)
Array Tilt	20°
Array Azimuth	180°

Initial Economic Comparison

Average Cost of Electricity Purchased from Utility	0.15 \$/kWh
Cost of Electricity Generated by System	0.22 \$/kWh

These values can be compared to get an idea of the cost-effectiveness of this system. However, system costs, system financing options (including 3rd party ownership) and complex utility rates can significantly change the relative value of the PV system.

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B.L.G.A.

H.C.C.



RESULTS

85,945 kWh per Year

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Month	Solar Radiation ( kWh / m <sup>2</sup> / day )	AC Energy ( kWh )	Energy Value ( \$ )
January	2.79	3,875	566
February	3.25	3,956	578
March	5.28	7,348	1,074
April	6.47	8,544	1,248
May	7.45	10,074	1,472
June	7.76	9,998	1,461
July	8.03	10,429	1,524
August	7.49	9,792	1,431
September	6.22	7,873	1,150
October	4.67	6,317	923
November	2.97	3,882	567
December	2.84	3,858	564
Annual	5.43	85,945	\$ 12,559

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