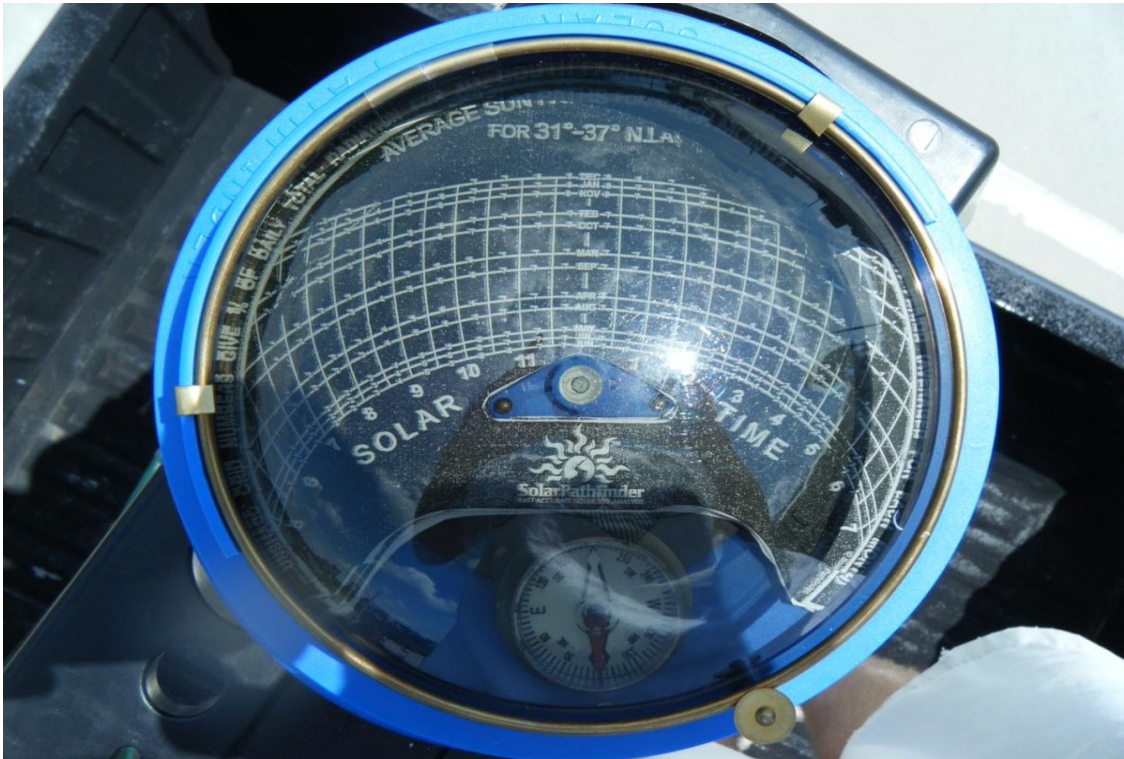


University of Tennessee Solar Pathfinder Site Analysis

July 2010



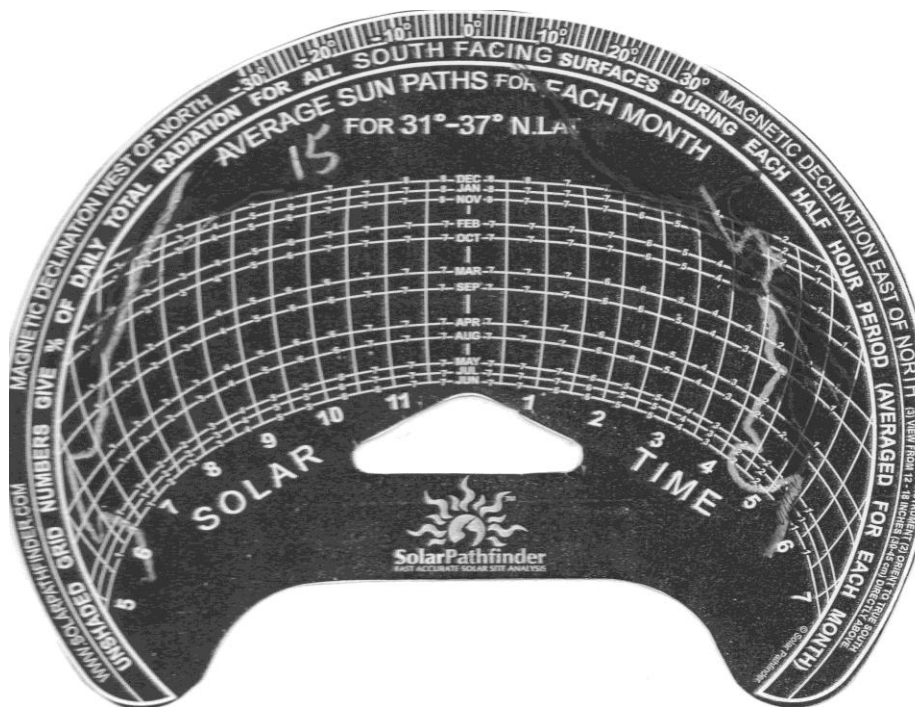
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Introduction

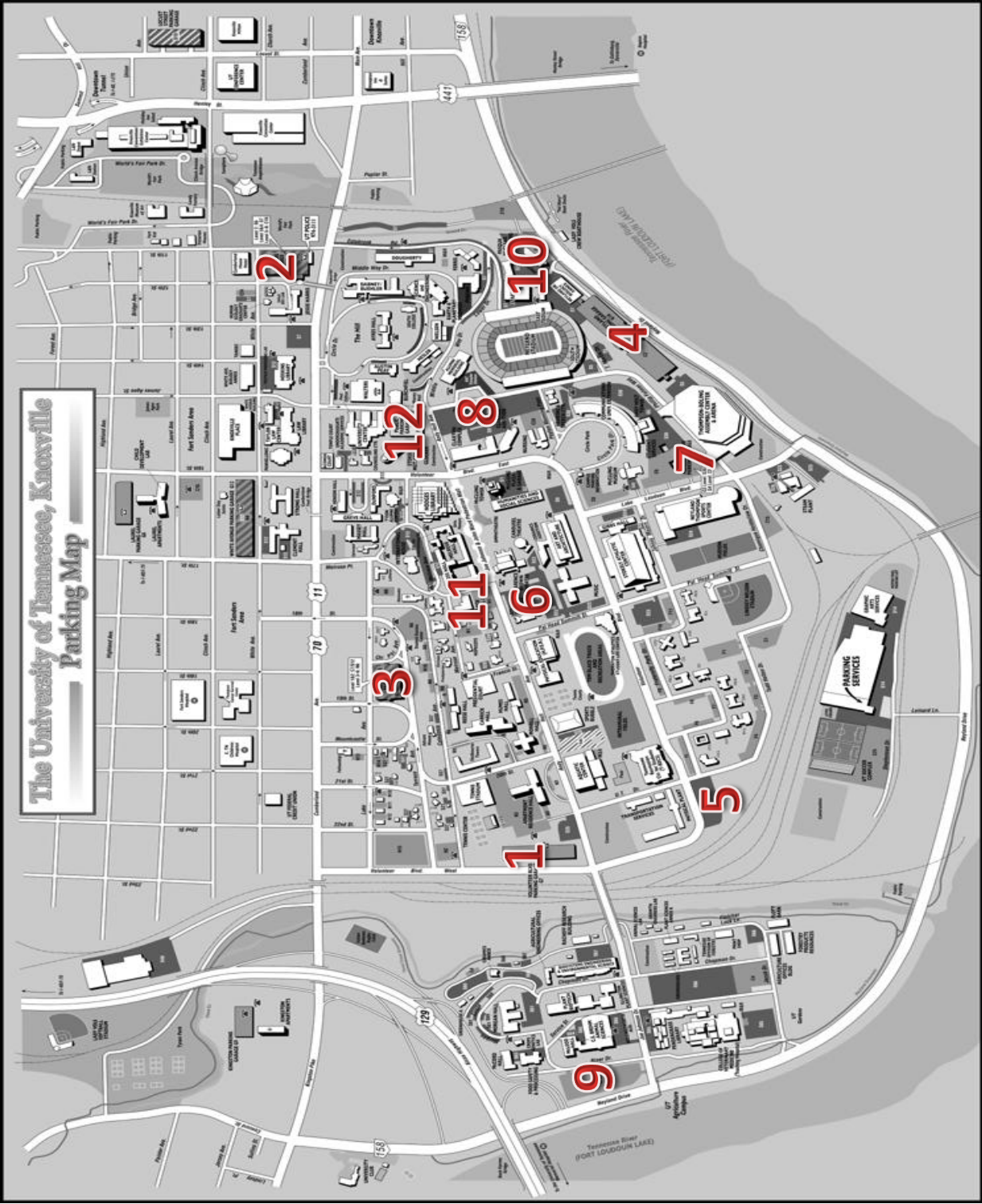
This report contains an analysis of open sites on the University of Tennessee-Knoxville Campus, mainly parking lots and garages, for solar energy potential. The analysis was performed using a solar pathfinder at three to five locations within each site. A total of 49 readings were taken at 12 different sites. All readings, except for UC plaza, were taken with the solar pathfinder at a height of eight feet above the parking surface. UC plaza readings were taken at a height of four feet. A list of the 12 sites where readings were taken can be found in the table of contents. Other sites, including the S9 lot to the East of the Arts and Architecture Building, the C9 lot directly across the street and the S14 lot near parking services and the warehouse, were also considered. These sites were found to be lacking in solar potential upon initial visual analysis.

The outlines of all shade producing objects were traced on the solar pathfinder template for 31 degrees to 37 degrees North Latitude as shown below. A magnetic declination of 5 degrees West of North was used when orienting the pathfinder to South. This information was then transferred to excel to compute the percentage of solar radiation available at each reading for each month. ***The unweighted yearly average was calculated giving equal weight to each month's solar radiation potential.*** This number reflects the percentage of available sun light that may be captured year round but not the actual percentage of available solar radiation. This is due to the fact that 95% of June's potential solar radiation is greater than 95% percent of January's solar radiation.

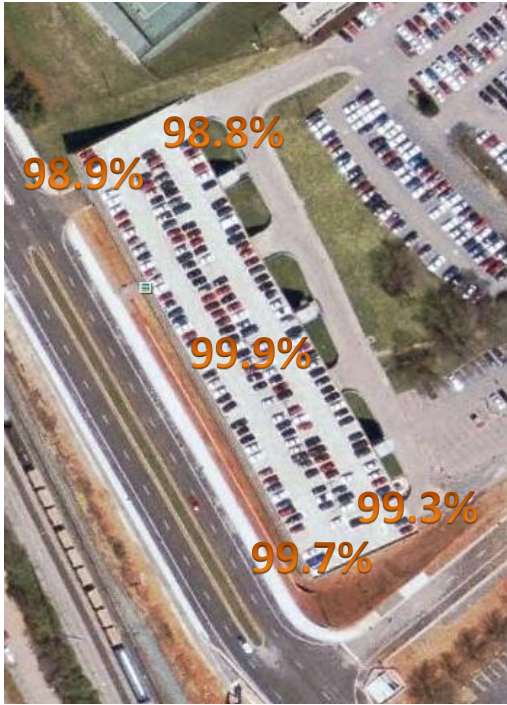


Reading 15 - staff lot at Andy Holt and Melrose found on p.24

Map of Sites



VOLUNTEER BLVD PARKING GARAGE



unweighted yearly averages



South Facing View

This potential site is on the top of the Volunteer Blvd. Parking Garage. The unweighted yearly sun exposure is around 99% or higher across the entire parking surface. The top of the garage is flat with five light poles at intervals down the center.

Approximate Lot Size

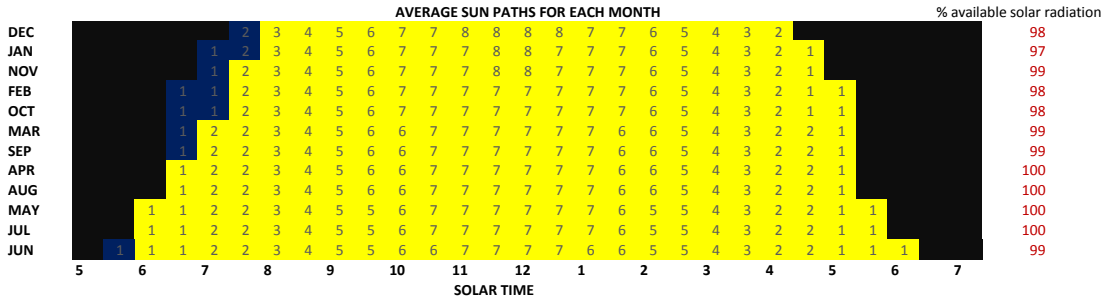
480ft x 105 ft	160yds x 35 yds
50,000 sq ft	5,600 sq yds

VOLUNTEER BLVD PARKING GARAGE

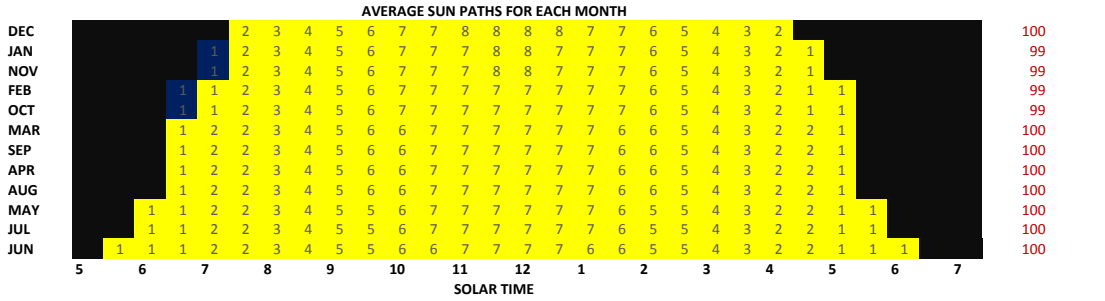
Solar radiation available during this time
 Solar radiation potentially available but shaded
 No solar radiation available

All readings taken at a height of 8 ft above the parking surface

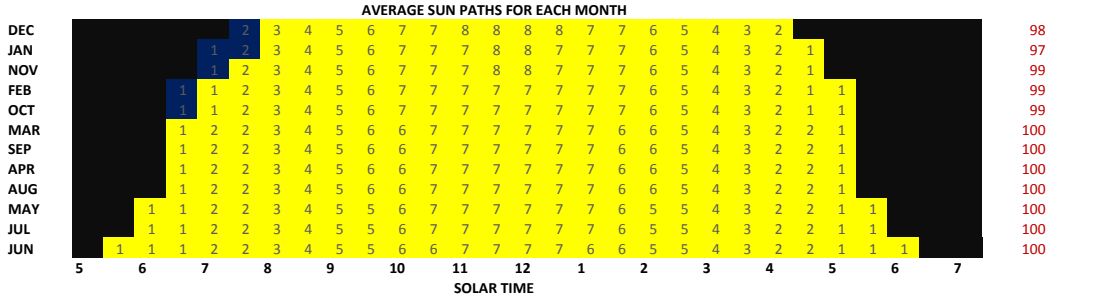
Grid Numbers give % of daily total radiation for all south facing surfaces during each half hour period (averaged for each month)



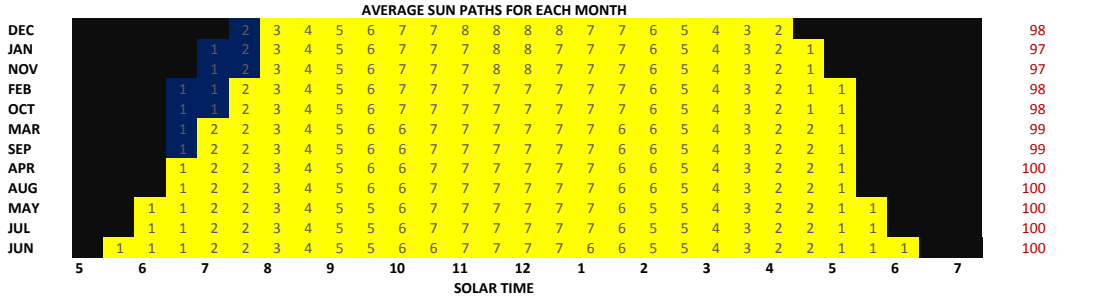
18 VOLUNTEER GARAGE NW CORNER UNWEIGHTED YEARLY AVERAGE 98.9 %



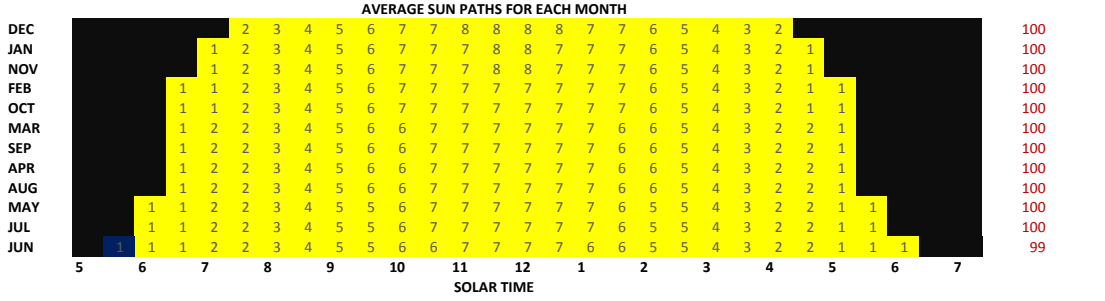
19 VOLUNTEER GARAGE SW CORNER UNWEIGHTED YEARLY AVERAGE 99.7 %



20 VOLUNTEER GARAGE SE CORNER UNWEIGHTED YEARLY AVERAGE 99.3 %



21 VOLUNTEER GARAGE NE CORNER UNWEIGHTED YEARLY AVERAGE 98.8 %



22 VOLUNTEER GARAGE CENTER UNWEIGHTED YEARLY AVERAGE 99.9 %

11TH STREET PARKING GARAGE



unweighted yearly averages



South Facing View

This potential site is on the top of the 11th Street Parking Garage. The unweighted yearly sun exposure is 99% and above across the parking surface. The perimeter of the surface is flat while the center third is on a decline. There are elevated structures on the Southwest and Northeast corners and light poles along the edges of the flat surface.

Approximate Lot Size

350 ft x 200 ft 115yds x 65 yds

70,000 sq ft 7,400 sq yds

LAKE AVE PARKING GARAGE



unweighted yearly averages



South Facing View

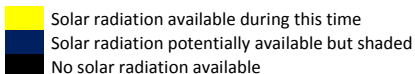
This potential site is on the top of the Lake Ave parking garage. The unweighted yearly sun exposure is 99% or greater across the parking surface. The perimeter of the surface is flat while the center third is on a decline. There are lights along the edge of the flat surface and elevated structures in the center of the East West and South sides of the garage.

Approximate Lot Size

275 ft x 160 ft 90yds x 50 yds

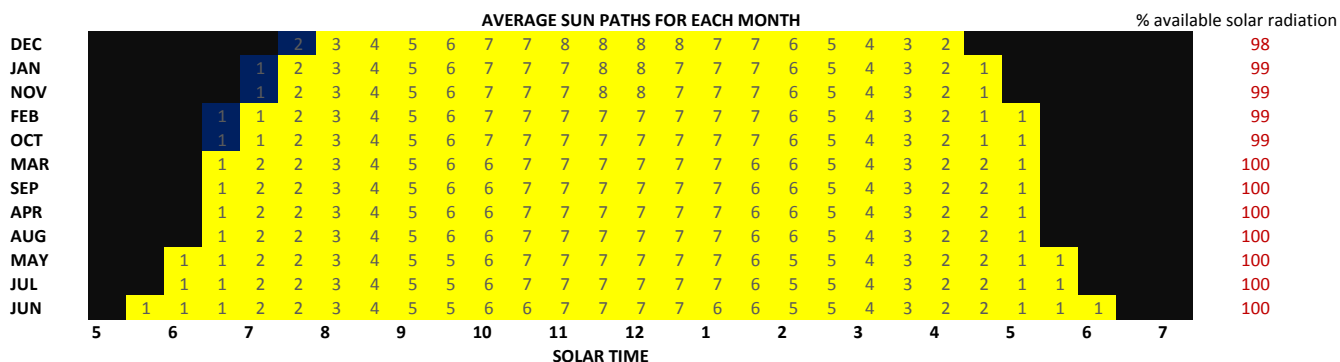
44,000 sq ft 4,500 sq yds

LAKE AVE PARKING GARAGE

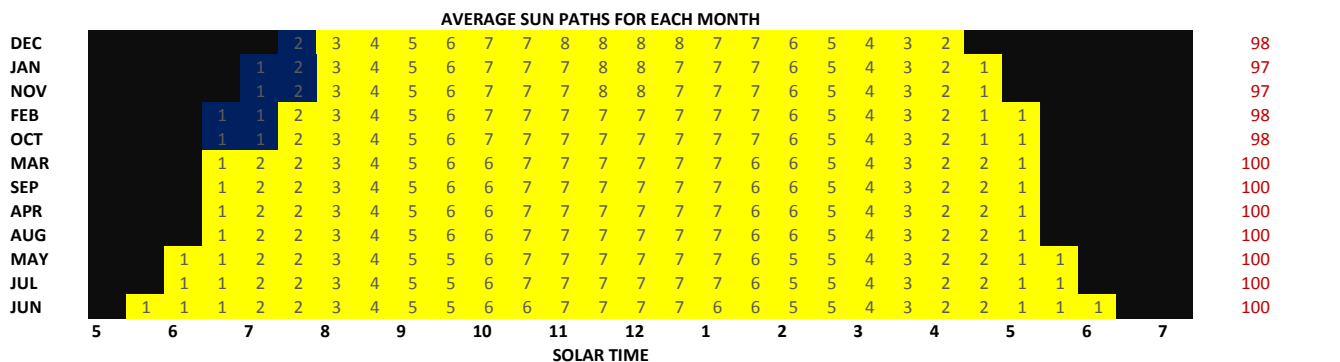


All readings taken at a height of 8 ft above the parking surface

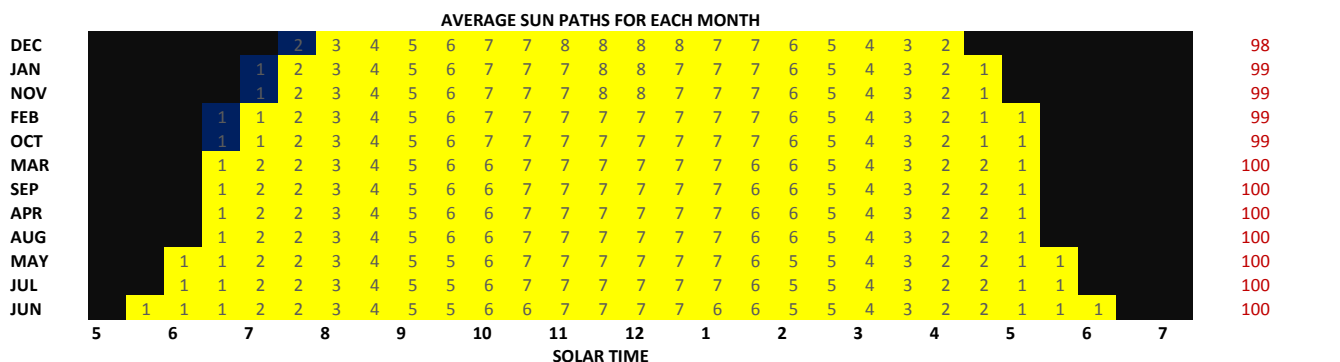
Grid Numbers give % of daily total radiation for all south facing surfaces during each half hour period (averaged for each month)



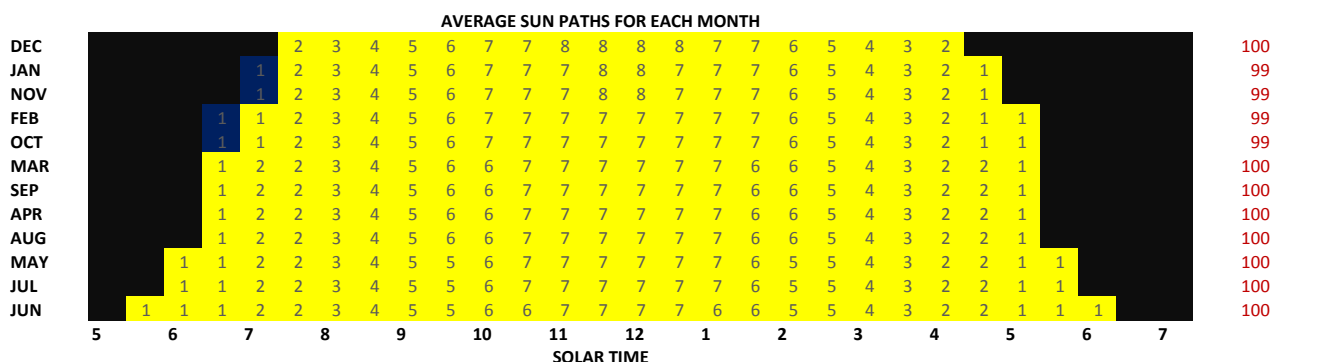
46 LAKE AVE SW CORNER UNWEIGHTED YEARLY AVERAGE **99.5 %**



47 LAKE AVE SE CORNER UNWEIGHTED YEARLY AVERAGE **99.0 %**

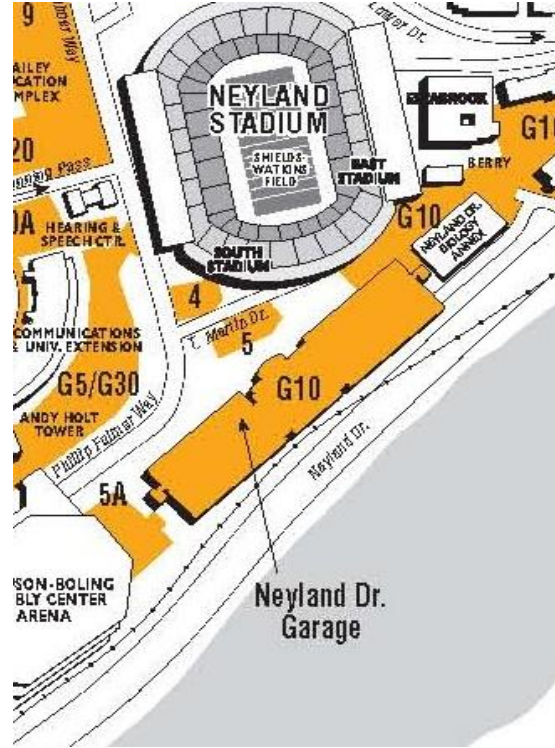


48 LAKE AVE NE CORNER UNWEIGHTED YEARLY AVERAGE **99.5 %**



49 LAKE AVE NW CORNER UNWEIGHTED YEARLY AVERAGE **99.7 %**

Neyland Drive Garage



unweighted yearly averages



South Facing View

This potential site is on the top of the Neyland Drive Parking Garage. The unweighted yearly sun exposure is 98% to 99% across the parking surface with the exception of the Northwest corner which receives substantial shade from Neyland Stadium. The center and east side of the garage are flat while the northwest and southwest corners are on an incline. There are four stair cases one on each end and two in the middle that protrude one story above the parking surface

Approximate Lot Size

790ft x 170 ft 263yds x 56 yds

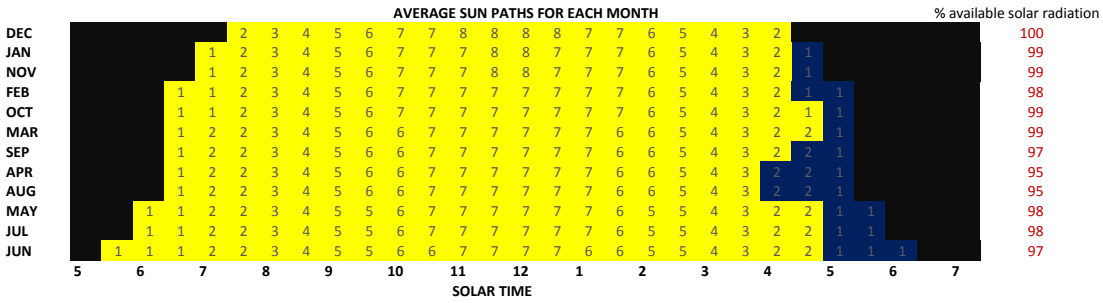
130,000 sq ft 14,900 sq yds

NEYLAND STADIUM PARKING GARAGE

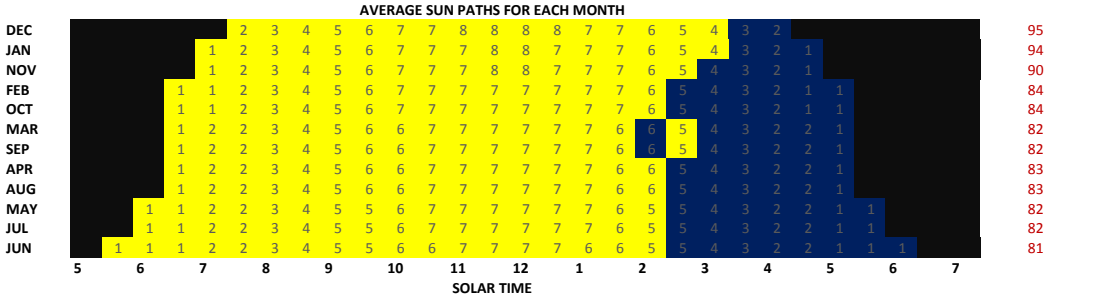
Solar radiation available during this time
 Solar radiation potentially available but shaded
 No solar radiation available

All readings taken at a height of 8 ft above the parking surface

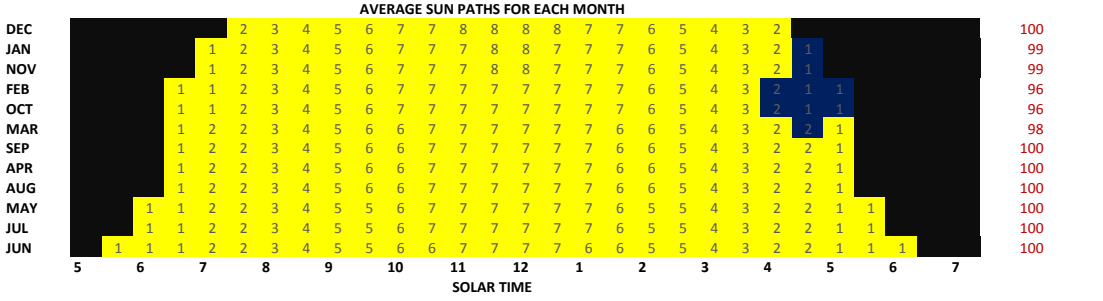
Grid Numbers give % of daily total radiation for all south facing surfaces during each half hour period (averaged for each month)



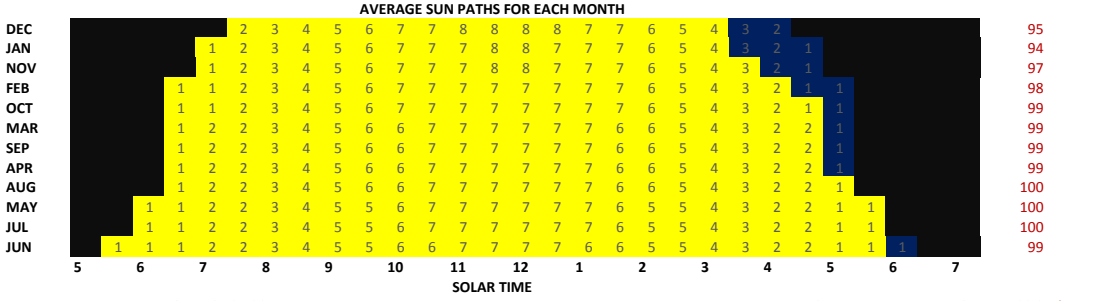
1 NEYLAND GARAGE NE CORNER **UNWEIGHTED YEARLY AVERAGE 97.8 %**



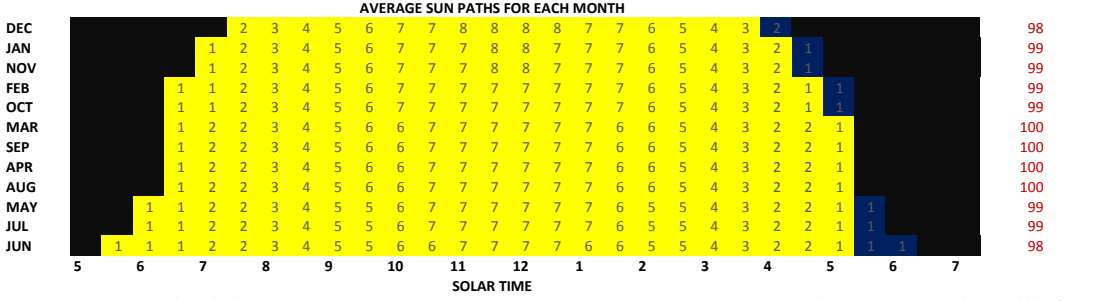
2 NEYLAND GARAGE NW CORNER **UNWEIGHTED YEARLY AVERAGE 85.2 %**



3 NEYLAND GARAGE SW CORNER **UNWEIGHTED YEARLY AVERAGE 99.0 %**



4 NEYLAND GARAGE SE CORNER **UNWEIGHTED YEARLY AVERAGE 98.3 %**

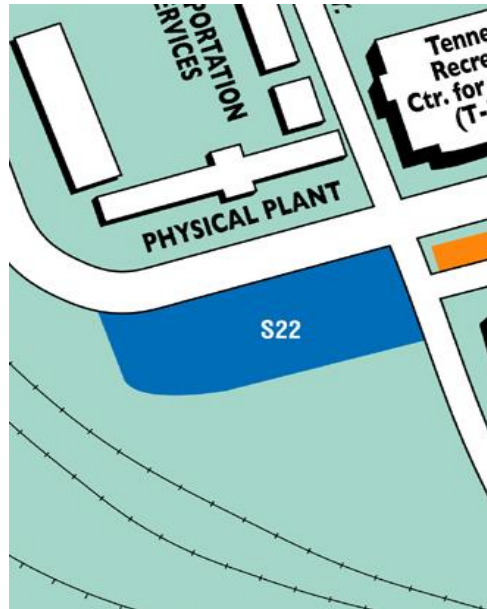


5 NEYLAND GARAGE CENTER **UNWEIGHTED YEARLY AVERAGE 99.2 %**

STAFF LOT VOLUNTEER AND TODD HELTON



unweighted yearly averages



South Facing View

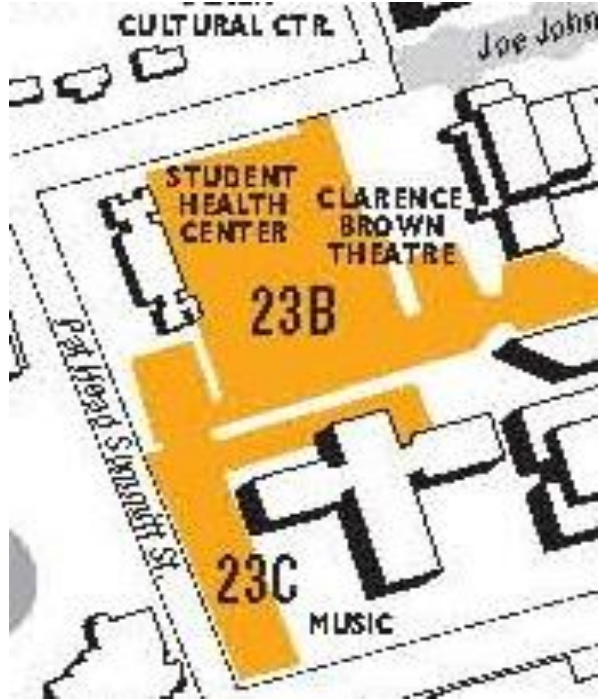
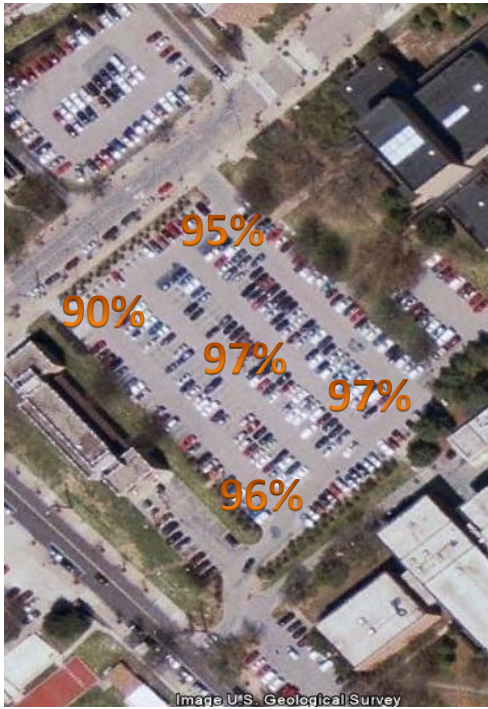
This potential site is on the staff lot south of the physical plant at the corner of Volunteer and Todd Helton. The unweighted yearly sun exposure is around 99% across the parking surface. There is a large antenna facility just southeast of the lot.

Approximate Lot Size

300 ft x 190 ft 100yds x 60 yds

57,000 sq ft 6,000 sq yds

S23 LOT BEHIND MUSIC AND A&A



unweighted yearly averages



South Facing View

This potential site is on the S23 parking lot off Andy Holt Ave between the Student Health Center and Clarence Brown Theater. The unweighted yearly sun exposure is 95% to 97% across the parking surface with the exception of the Northwest corner which receives only 90% of available solar energy. Measurements were taken 50' from corners as there are trees and buildings surrounding the lot.

Approximate Lot Size

310ft x 210 ft 103yds x 70 yds

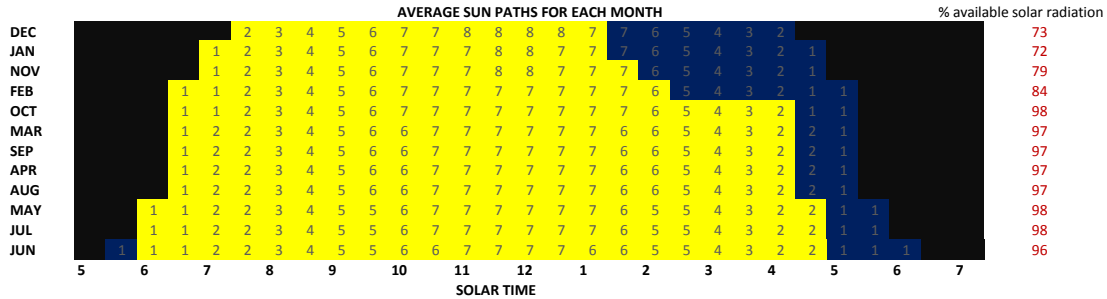
65,000 sq ft 7,200 sq yds

S23 LOT BEHIND MUSIC AND A&A

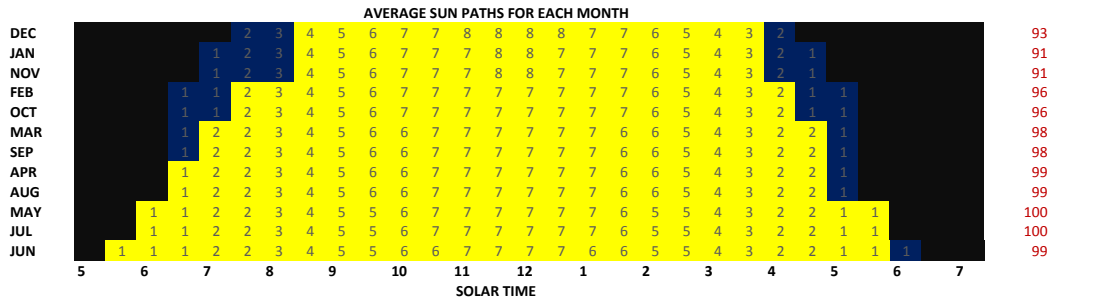
Solar radiation available during this time
 Solar radiation potentially available but shaded
 No solar radiation available

All readings taken at a height of 8 ft above the parking surface

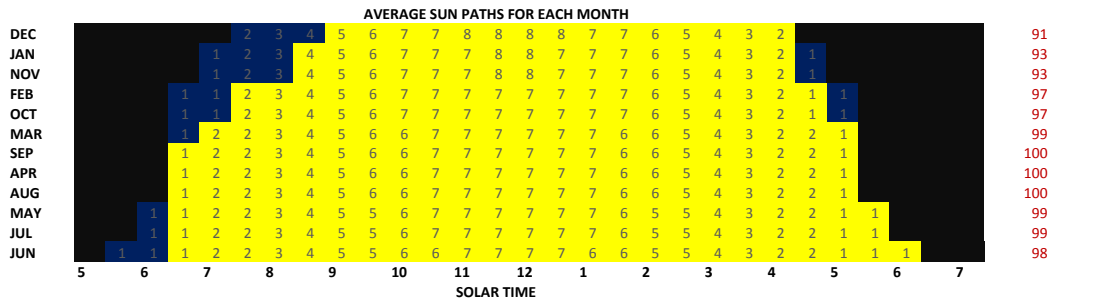
Grid Numbers give % of daily total radiation for all south facing surfaces during each half hour period (averaged for each month)



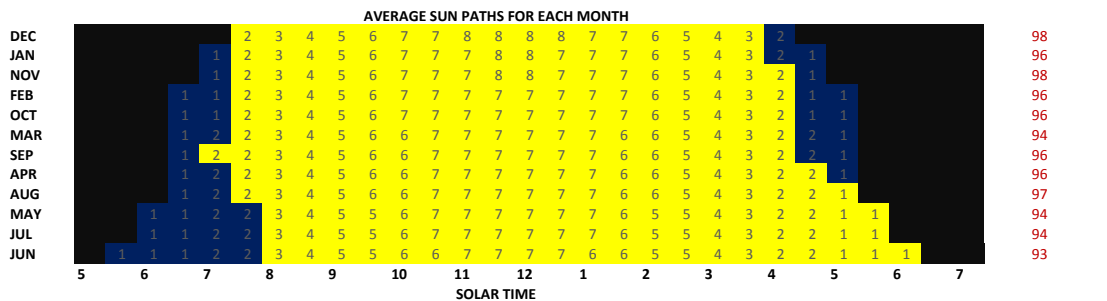
10 A&A LOT W UNWEIGHTED YEARLY AVERAGE 90.5 %



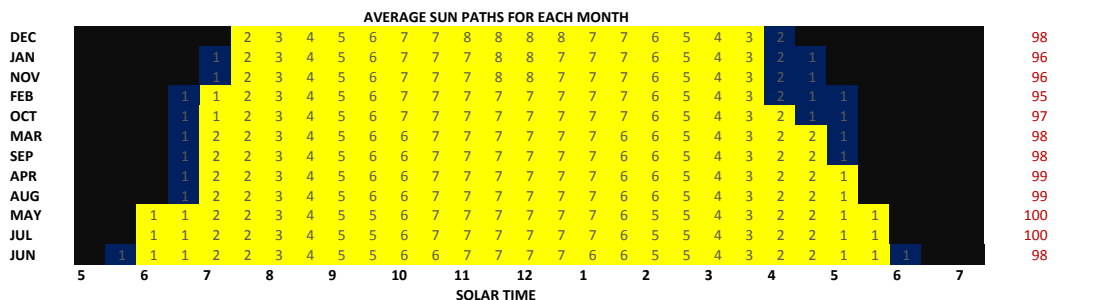
11 A&A LOT S UNWEIGHTED YEARLY AVERAGE 96.7 %



12 A&A LOT E UNWEIGHTED YEARLY AVERAGE 97.2 %

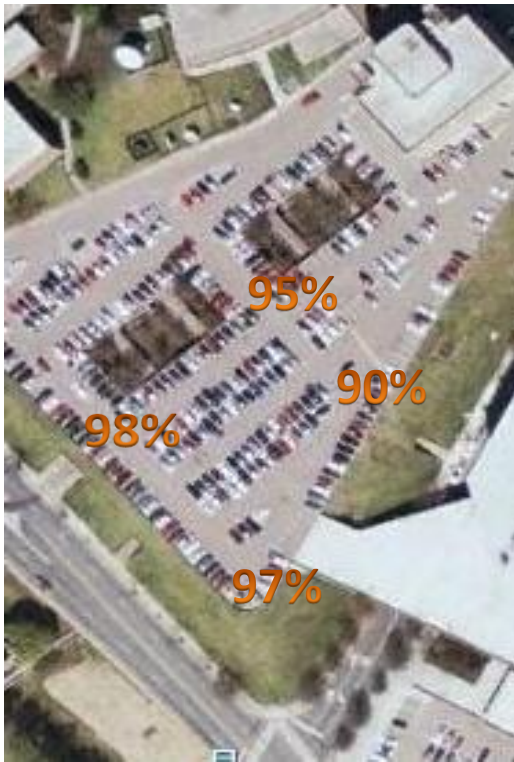


13 A&A LOT N UNWEIGHTED YEARLY AVERAGE 95.7 %

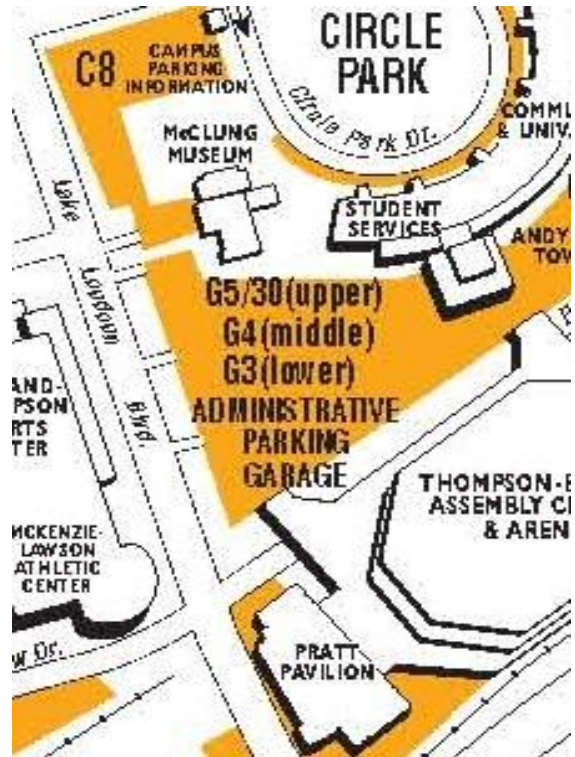


14 A&A LOT CENTER UNWEIGHTED YEARLY AVERAGE 97.8 %

Administrative Parking Garage Thompson-Boling Arena



unweighted yearly averages



South Facing View

This potential site is on the top of the Administrative Parking Garage NW of Thompson-Boling Arena. The unweighted yearly sun exposure is 95% to 98% across the parking surface with the exception of the West corner which receives substantial shade from Thompson Boling Arena. The entire lot is flat. Only sites with percentages shown were tested as the rest of the lot is often shaded by the arena or trees.

Approximate Lot Size

210ft x 170 ft 70yds x 56 yds

35000 sq ft 3,900 sq yds

PHILIP FULMER WAY LOT



unweighted yearly averages



South Facing View

This potential site is on the parking lot on Philip Fulmer Way. The unweighted yearly sun exposure ranges from 95% on the north end to 84% towards the middle and southeast. The southwest corner only receives 42% of available solar radiation.

Approximate Lot Size

700ft x 140 ft 230yds x 45 yds

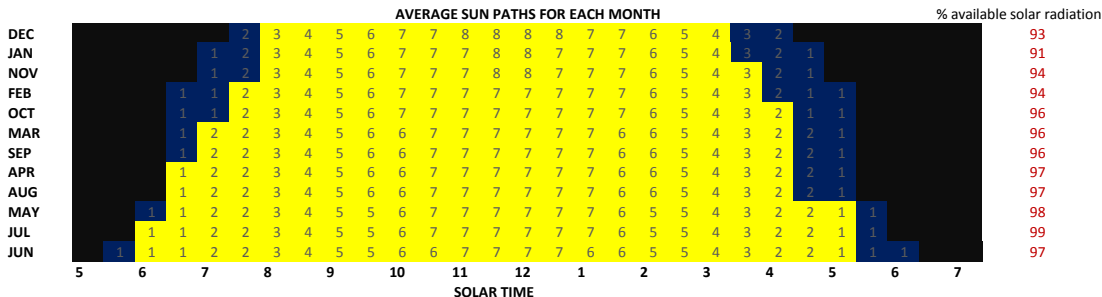
98,000 sq ft 10,300 sq yds

PHILIP FULMER WAY LOT

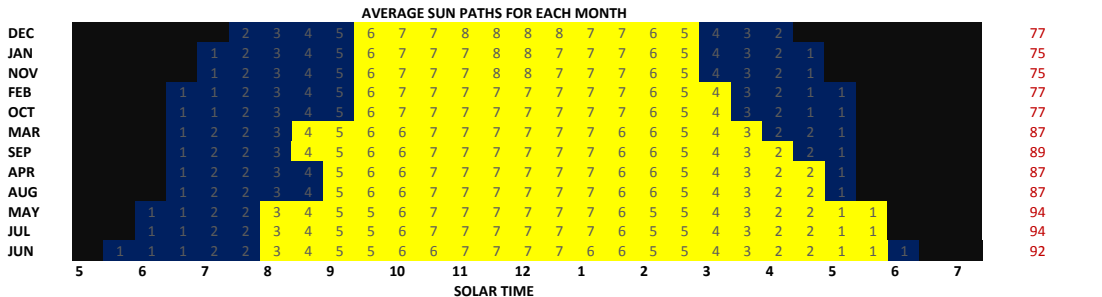
■ Solar radiation available during this time
■ Solar radiation potentially available but shaded
■ No solar radiation available

All readings taken at a height of 8 ft above the parking surface

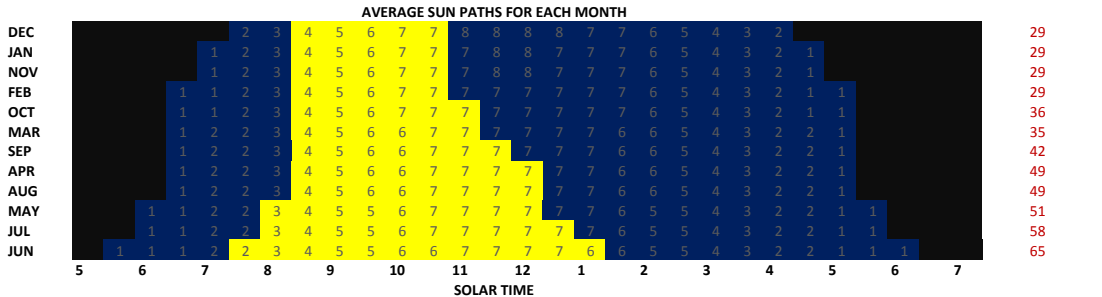
Grid Numbers give % of daily total radiation for all south facing surfaces during each half hour period (averaged for each month)



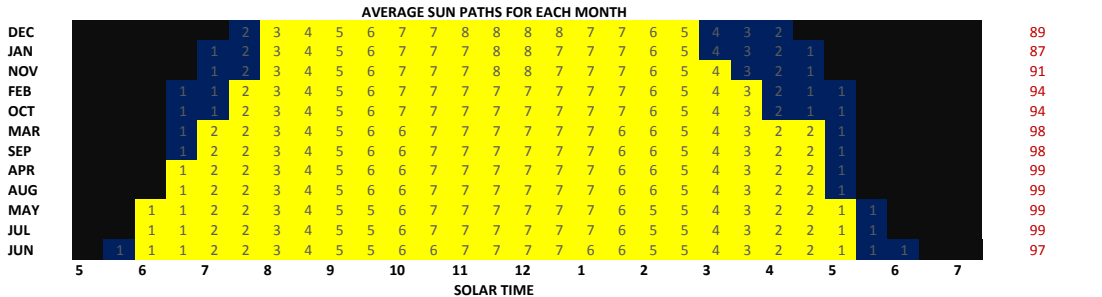
23 FULMER LOT NE CORNER UNWEIGHTED YEARLY AVERAGE 95.7 %



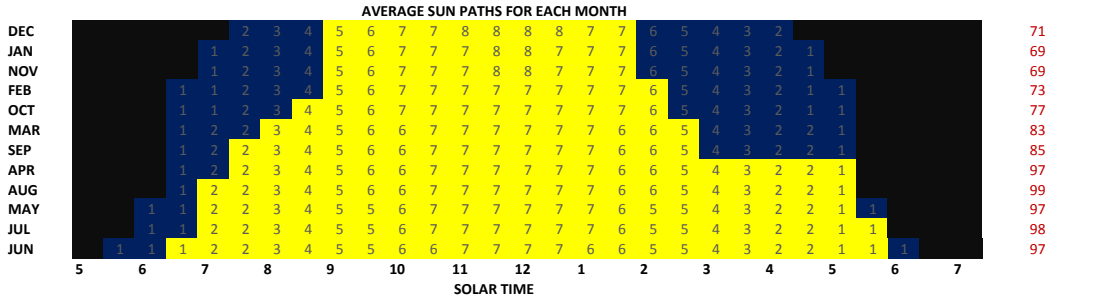
24 FULMER LOT SE CORNER UNWEIGHTED YEARLY AVERAGE 84.3 %



25 FULMER LOT SW CORNER UNWEIGHTED YEARLY AVERAGE 41.8 %



26 FULMER LOT NW CORNER UNWEIGHTED YEARLY AVERAGE 95.3 %



27 FULMER LOT CENTER UNWEIGHTED YEARLY AVERAGE 84.6 %

AG CAMPUS LOT RIVER DR AND JOE JOHNSON



unweighted yearly averages



South Facing View

This potential site is on the Ag. campus on the corner of Joe Johnson and Neyland. The unweighted yearly sun exposure is around 95% across the parking surface.

Approximate Lot Size

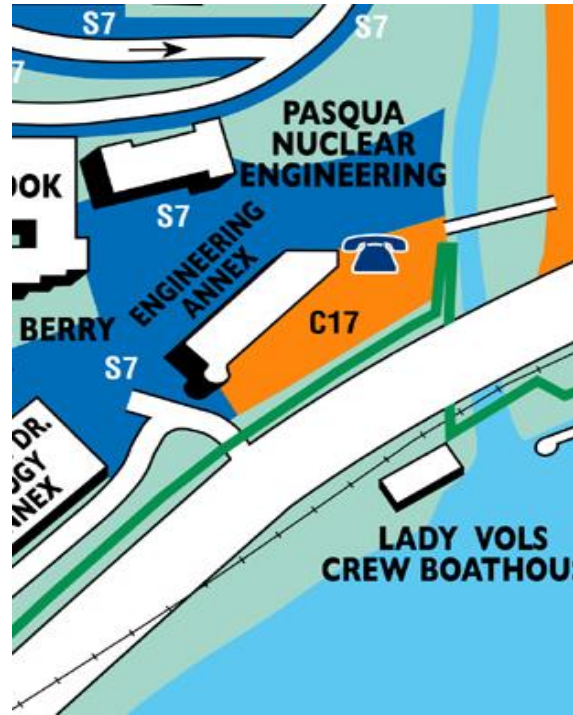
540ft x 180 ft 180yds x 60 yds

97,000 sq ft 10,800 sq yds

NEYLAND DR LOTS AND PLAZA



unweighted yearly averages



South Facing View

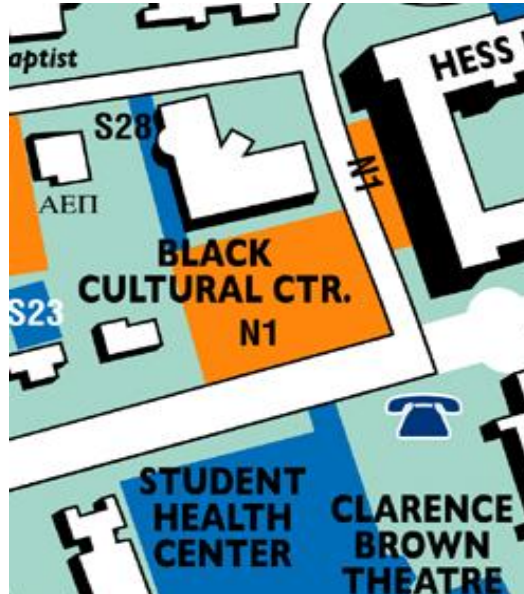
This potential site is on the parking lots and pavillion on Neyland Drive east of the Neyland Drive Garage. The unweighted yearly sun exposure is around 95% across the site. The site is tiered with a parking lot and pavillion on top and another lot below.

Approximate Lot Size

270 ft x 200 ft 90yds x 65 yds

54,000 sq ft 5,800 sq yds

STAFF LOT ANDY HOLT AND MELROSE



unweighted yearly averages



South Facing View

This potential site is on the staff lot on the corner of Andy Holt and Melrose . The unweighted yearly sun exposure is around 90% across the parking surface with the exception of the Northwest corner which receives substantial shade from deciduous trees.

Approximate Lot Size

170ft x 120 ft 55yds x 40 yds

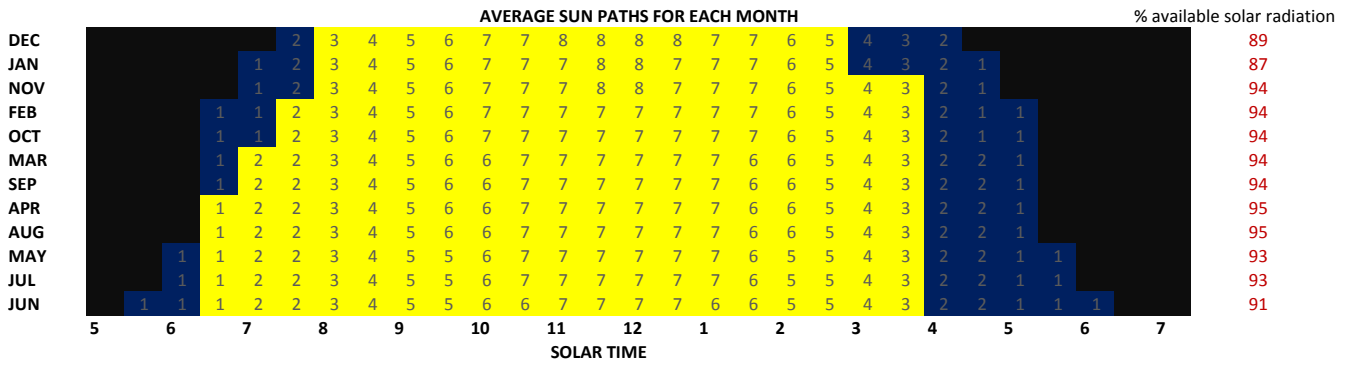
20,000 sq ft 2,250 sq yds

STAFF LOT ANDY HOLT AND MELROSE

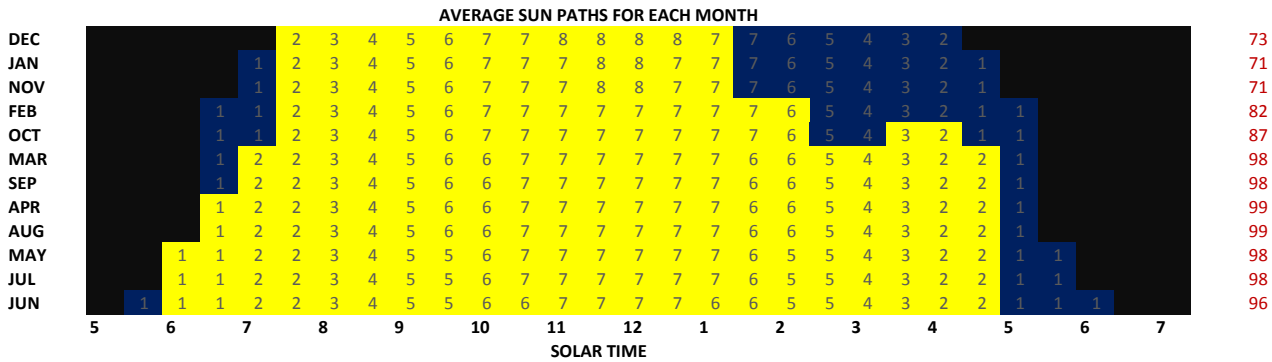
- Solar radiation available during this time
- Solar radiation potentially available but shaded
- No solar radiation available

All readings taken at a height of 8 ft above the parking surface

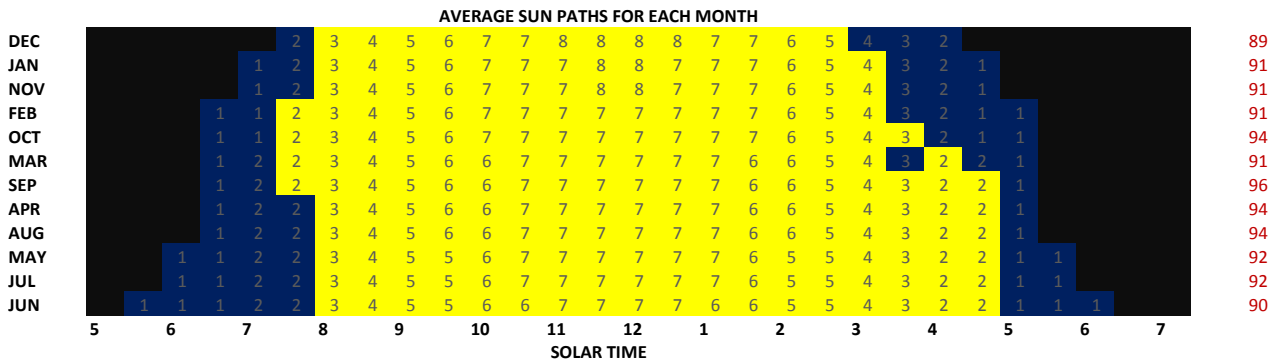
Grid Numbers give % of daily total radiation for all south facing surfaces during each half hour period (averaged for each month)



15 STAFF LOT CENTER **UNWEIGHTED YEARLY AVERAGE 92.8 %**



16 STAFF LOT SW **UNWEIGHTED YEARLY AVERAGE 89.2 %**



17 STAFF LOT NE **UNWEIGHTED YEARLY AVERAGE 92.1 %**

UC PLAZA



unweighted yearly averages



South Facing View

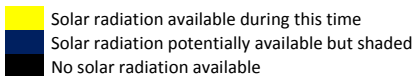
This potential site is on the plaza behind the University Center. The unweighted yearly sun exposure is just over 90% across surface. The plaza is relatively small in size with existing overhangs on the west side.

Approximate Lot Size

170ft x 50 ft 55yds x 15 yds

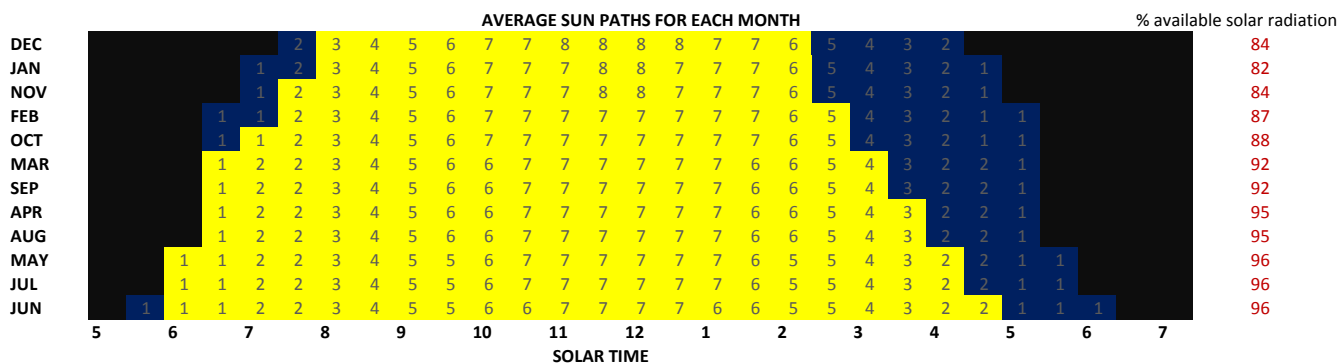
8,500 sq ft 850 sq yds

UC PLAZA



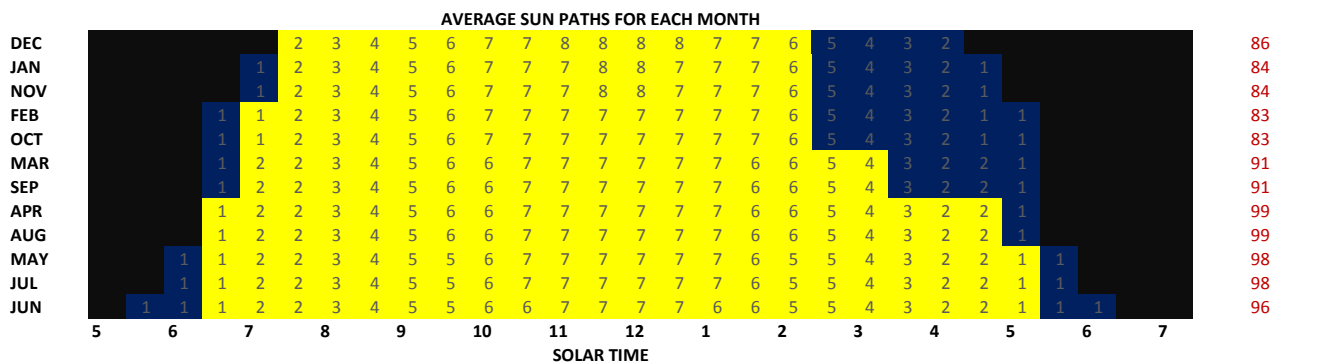
All readings taken at a height of 4 ft above the parking surface

Grid Numbers give % of daily total radiation for all south facing surfaces during each half hour period (averaged for each month)



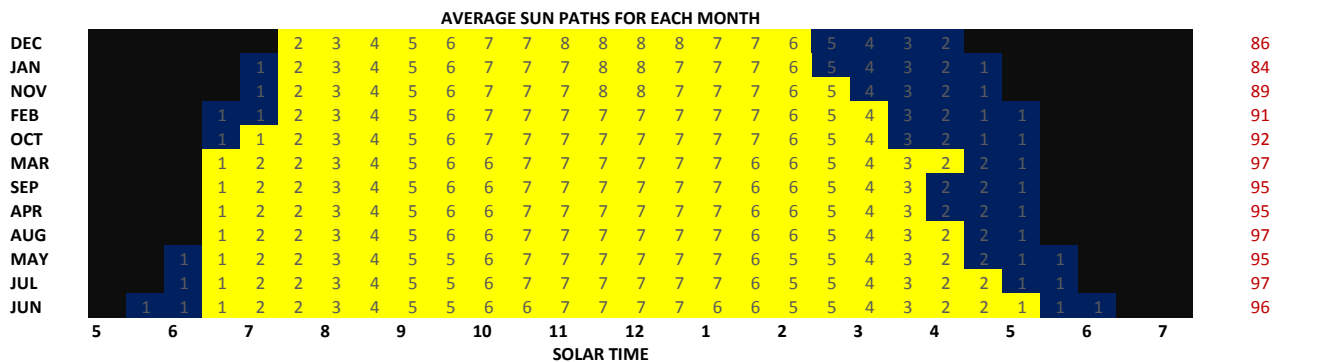
28 UC PLAZA S

UNWEIGHTED YEARLY AVERAGE 90.6 %



29 UC PLAZA N

UNWEIGHTED YEARLY AVERAGE 91.0 %



30 UC PLAZA CENTER

UNWEIGHTED YEARLY AVERAGE 92.8 %