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Also admitted in District of
Columbia and Massachusetts

Via Hand Delivery and Electronic Mail

January 4, 2013

Linda Roberts
Executive Director
Connecticut Siting Council
10 Franklin Square
New Britain, CT 06051

Re: **Petition No. 1042: Somers Solar Center, LLC Petition for a Declaratory Ruling that No Certificate of Environmental Compatibility and Public Need is Required for the Construction and Operation of a 5.0 MWac Solar Photovoltaic Project located at 458 & 488 South Road, Somers, Connecticut**

Dear Ms. Roberts:

Enclosed please find an original and twenty (20) copies of the Responses of Somers Solar Center, LLC to Connecticut Siting Council Pre-Hearing Interrogatories. The petitioner will seek to have these responses admitted as a full exhibit in the proceeding.

Please feel free to contact me if you have any questions or require additional information. Thank you.

Sincerely,


Joey Lee Miranda

Enclosures



Law Offices

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STATE OF CONNECTICUT
CONNECTICUT SITING COUNCIL

IN RE:	:	
	:	
SOMERS SOLAR CENTER, LLC PETITION	:	PETITION NO. 1042
FOR A DECLARATORY RULING THAT NO	:	
CERTIFICATE OF ENVIRONMENTAL	:	
COMPATIBILITY AND PUBLIC NEED IS	:	
REQUIRED FOR THE CONSTRUCTION	:	
AND OPERATION OF A 5.0 MWAC SOLAR	:	
PHOTOVOLTAIC PROJECT LOCATED AT	:	
458 & 488 SOUTH ROAD, SOMERS,	:	JANUARY 4, 2013
CONNECTICUT	:	

**RESPONSES OF SOMERS SOLAR CENTER, LLC TO
CONNECTICUT SITING COUNCIL PRE-HEARING INTERROGATORIES**

On December 13, 2012, the Connecticut Siting Council (“Council”) issued Pre-Hearing Interrogatories to Somers Solar Center, LLC (“SSC”) in connection with the above-captioned proceeding. Below are SSC’s responses.

Question No. 1

What were the results of SSC's mailing of notices to abutting property owners? How many return receipts did SSC receive? If some receipts were not returned, did SSC make additional efforts to notify abutters?

Response

SSC provided notice of its intent to file the Petition to those adjacent property owners listed on Exhibit B to the petition. SSC received the return receipts from all property owners to whom notice was sent via certified mail.

Question No. 2

Did SSC provide copies of its petition to town officials in Ellington?

Response

No. However, before filing the petition, SSC met with the Town of Ellington Town Planner and Assistant Town Planner to discuss the project and provided notice of the petition to Town of Ellington municipal officials. *See* Certification, dated November 30, 2012.

Question No. 3

Did SSC provide notification of its petition to state and federal officials?

Response

Yes. SSC provided notice of the petition to state and federal officials. *See* Certification, dated November 30, 2012.

Question No. 4

Did SSC publish a legal notice of its intent to file this petition?

Response

No. However, as indicated in the petition, SSC developed a good working relationship with the Town of Somers' officials and local community by pursuing a multi-faceted and inclusive public outreach approach that included a public information meeting of which notice was published.

Question No. 5

Where was the July 2, 2012 public informational meeting described in the petition held?

Response

The public information meeting was held at Somers Town Hall, 600 Main Street, Somers, Connecticut.

Question No. 6

How did SSC become aware of the Pleasant View Farms property on which its project is proposed to be located?

Response

SSC became aware of the Pleasant View Farm by searching the State of Connecticut for large areas of relatively flat, cleared, and previously-disturbed land located near existing utility infrastructure suitable for interconnecting a solar photovoltaic project of this size. Initial review and screening for potential sites included the utilization of software such as Google Earth, GIS, and other mapping and modeling programs.

Question No. 7

Did SSC investigate any other properties as potential locations for its project? If so, identify these properties.

Response

SSC reviewed and screened approximately 20 sites across the State of Connecticut. Of the screened sites, only three (3) were deemed suitable for a proposed project: (1) the Pleasant View Farms property; (2) Pratt & Whitney Solar Center in East Hartford, Connecticut; and (3) Goshen Solar Center on North Street in Goshen, Connecticut. Projects at each of these sites were submitted to the Department of Energy and Environmental Protection (“DEEP”) in response to its December 9, 2011 Notice of Acceptance of Proposals from Private Developers DEEP Implementation of Section 127. However, the DEEP only selected the project at the Pleasant View Farms property.

Question No. 8

What were the factors that led SSC to choose the Pleasant View Farms property over

any other properties it may have considered?

Response

As indicated in the petition, the site selection for the project was based on a detailed evaluation of the following key criteria: (a) site suitability (solar resource size, grade and surrounding topography); (b) site availability (ability to lease or purchase land); and (c) proximity to critical infrastructure (suitable electrical grid access). The Pleasant View Farms property was previously disturbed, cleared, and on relatively level ground with ideal soil conditions for an economically feasible project installation. The location of the project and surrounding area (i.e., located next to the Town of Somers landfill and gravel pit) provide for only very limited visual impacts. A 23 kV distribution line, which voltage is ideal for a 5MWac solar project, is located in close proximity to the property. *See also* SSC Response to Question No. 7.

Question No. 9

Provide a cost estimate for the proposed project; total cost and itemized by different component costs.

Response

The total estimated cost of the project is \$19,915,000. This estimate includes:

- | | | |
|-----|--|------------------|
| (1) | Solar PV panels of approximately | \$ 8.1 million |
| (2) | Balance of Plant of approximately | \$10.8 million |
| (3) | Associated/ancillary equipment costs of approximately | \$ 0.25 million |
| (4) | Miscellaneous costs (including site preparation and installation) of approximately | \$ 0.765 million |

Question No. 10

What is the National Renewable Energy Laboratory's PVWatts calculator?

Response

NREL's PVWatts™ calculator determines the energy production and cost savings of grid-connected photovoltaic (“PV”) energy systems throughout the world. It allows homeowners, installers, manufacturers, and researchers to easily develop estimates of the performance of hypothetical PV installations.

The PVWatts calculator works by creating hour-by-hour performance simulations that provide estimated monthly and annual energy production in kilowatts and energy value. Users can select a location and choose to use default values or their own system parameters for size, electric cost, array type, tilt angle, and azimuth angle. In addition, the PVWatts calculator can provide hourly performance data for the selected location.

Question No. 11

Provide PVWatts simulation results for the potential annual output for the proposed project.

Response

PVWatts simulation results are attached hereto as Exhibit A.

Question No. 12

What is a DC-to-AC derate factor?

Response

The DC to AC derate factor is the loss of power efficiency due to all the factors that interfere with a perfect system, including the DC to AC factor (from inverter), age, shading, sun tracking, etc. Further, converting DC to AC requires additional devices including an inverter,

transformer, DC and AC wiring, connections, etc. Each of these features will create a loss in efficiency between the DC power generated and the AC power to the grid.

Question No. 13

Provide a DC-to-AC derate calculation for the proposed project.

Response

SSC is still evaluating whether it will install a fixed tilt or single axis tracker solution at the site. However, for both solutions, the DC-to-AC derate factor is expected to be approximately 0.7407 (5MWac/6.75MWdc).

Question No. 14

Has SSC conducted a Shading Analysis of the project property? If so, provide the results.

Response

Yes, a Shade Study Analysis was completed at the site on November 1, 2012. A copy of the results of that analysis is attached hereto as Exhibit B.

Question No. 15

What is insolation?

Response

Insolation is a measure of solar radiation energy received on a given surface area and recorded during a given time. It is also called solar irradiation and expressed as hourly irradiation if recorded during an hour, daily irradiation if recorded during a day, for example.

Question No. 16

Provide measurements of the insolation that could be expected at the project site over the course of a year.

Response

The measurement of the insolation is expressed as hourly irradiation, which is calculated as follows: $1,439\text{kWh/m}^2 * 46,185\text{m}^2 = 66,460,215\text{kWh}$.

Question No. 17

What is a capacity factor?

Response

The capacity factor of a power plant is the ratio of the actual output of a power plant over a period of time and its potential output if it had operated at full nameplate capacity the entire time. Capacity factors vary greatly depending on the type of fuel that is used and the design of the plant.

Question No. 18

What is the capacity factor SSC expects the proposed project to achieve?

Response

SSC is still evaluating whether it will install a fixed tilt or single axis tracker solution at the site. If the fixed tilt solution is installed, the capacity factor is expected to be 14.38%. If the single axis tracker design is installed, the capacity factor is expected to be 17.29%.

Question No. 19

What is the capacity factor SSC must achieve for its project to be economically feasible?

Response

There are many factors that are project specific that alter this calculation. However, the capacity factors shown in Response to Question No. 18 allow the project to be economically feasible.

Question No. 20

What is the efficiency of the photovoltaic module technology that would be employed by SSC at the proposed project?

Response

SSC is still evaluating whether it will install 240W or 315W PV panels at the site. The 240W panels are 14.50% efficient and the 315W are 14.35% efficient.

Question No. 21

Would the angles of the project's solar panels be adjusted during the year to maintain optimal alignment with the sun's changing path?

Response

There are a number of factors that are evaluated as it relates to optimal performance of a solar asset. It is generally understood that production yields from projects utilizing trackers can improve a PV system's output by up to 40% over a fixed-tilt array. However, the increment of production improvement over a fixed system depends heavily on the project's latitude and the type of tracker. Trackers also always come at an added cost relative to fixed systems. Thus, in order for a tracker to make economic sense, the increased energy harvest must exceed the added cost of installing and maintaining trackers over the lifetime of the system. An additional factor to consider in the decision to use trackers or fixed systems is land use; tracking systems tend to use additional land because they must be spaced out in order to avoid shading one another as they track the sun. The other downside to trackers is the operations and maintenance ("O&M") cost, which tends to be higher for this category of systems relative to fixed-tilt systems.

The choice between a fixed system and a tracking system is by no means simple and panel positioning is one key factor. Cost, utility rate structure, conversion efficiency, land

availability and geographic factors all must be taken into account. SSC is still evaluating whether it will install a fixed tilt or single axis tracker solution at the site. If a fixed tilt design is selected for the SSC project, the panels would not be adjusted once initially installed but rather would remain in a fixed position throughout the design life of the project.

Question No. 22

Approximately what percentage of the proposed project's maximum possible output would occur during those times of the year when Connecticut normally experiences its peak demand for electricity?

Response

Often, PV plants operate as peak shaving where they not only reduce the total energy consumption but also the peak demand, which typically has additional charges associated with it. The system has been designed to harvest the most production (85.9%) during the hours of 9:00 am and 5:00 pm during the spring, summer, and fall months.

Question No. 23

Does SSC have a contract to sell the electricity it expects to generate with the proposed project?

Response

As indicated in the petition, Section 127 of Public Act 11-80, *An Act Concerning the Establishment of the Department of Energy and Environmental Protection and Planning for Connecticut's Energy Future*,¹ required the DEEP to review proposals by private developers to build, own or operate zero emission Class I renewable energy source generation facilities. Pursuant to this requirement, in December 2011, the DEEP conducted a request for proposals

¹ Section 127 of the Act was subsequently codified at CGS § 16-244v.

("RFP") for projects from private developers for up to ten (10) megawatts ("MW") of renewable generation. The SSC project was one of two selected by DEEP pursuant to the RFP. After being selected, the project entered into a power purchase agreement with The Connecticut Light and Power Company ("CL&P") to sell the energy, capacity and renewable energy credits from the project.

Question No. 24

Has SSC determined if any trees need to be removed to avoid potential shading of its project? If so, how many trees will it remove?

Response

A Shade Study Analysis was conducted for the proposed SSC project on November 1, 2012. The results of that analysis (see Exhibit B) indicate that between the hours of 9:00 am and 3:00 pm, the average available solar insolation will be greater than 97% year-round on the land currently designated for the facility. There are areas on the available parcels in which the shading is greater and the insolation is less; however, the facility will be designed to avoid those areas to the greatest extent possible. Although a final design for the proposed project has not yet been selected, under either a fixed tilt or single axis tracker design, SSC anticipates that it may need to remove no more than ten (10) trees with a diameter at breast height of six inches or larger from the center of the site.

Question No. 25

Is SSC's proposed project located near any Important Bird Areas designated by the Connecticut Audubon Society?

Response

No. The SSC project is not located near any Important Bird Areas designated by the

Connecticut Audubon Society.

Question No. 26

What would be the construction timeline of the project from groundbreaking to full operation?

Response

Assuming the Council issues a decision in this proceeding by March 31, 2013 and depending on weather and site conditions, SSC hopes to start construction between April 1, 2013 and May 15, 2013 in which case the proposed commercial operation date would be expected to occur between October 1, 2013 and December 15, 2013.

Question No. 27

Describe how the project would be decommissioned at the end of its useful life.

Response

SSC anticipates that the project will generate energy for nearly 30 years at which point modules, etc. could be refitted to extend the plant life. At the time the plant is decommissioned, SSC is required by the terms of its lease to remove the project and return the site to its original condition (except for ordinary wear and tear). In order to fulfill that requirement, SSC anticipates that:

- All equipment (e.g., PV panels, racking systems and posts, wiring, fencing, concrete pads, combiner boxes, inverters, transformers, and switchgear) will be removed and useable components will be sold, recyclable components (e.g., copper, aluminum and other conductive metals, concrete pads, etc.) will be recycled, and non-recyclable materials will be taken to the nearest approved landfill for disposal.
- Depressions, voids and excavation areas will be backfilled, graded to the proper elevation and, re-vegetated in an effort to return the landscape of the property as close to its previous state as possible.

EXHIBIT A

PVWatts 2 Model



AC Energy
&
Cost Savings



(Type comments here to appear on printout: maximum 1 row of 90 characters.)

Station Identification		Results			
Cell ID:	0271367	Month	Solar Radiation (kWh m ² day)	AC Energy (kWh)	Energy Value (\$)
State:	Connecticut	1	2.56	423373	73023.37
Latitude:	41.9 ° N	2	3.44	517475	89254.08
Longitude:	72.5 ° W	3	4.54	735843	126918.19
PV System Specifications		4	4.87	734389	126667.41
DC Rating:	6752.0 kW	5	5.39	805521	138936.26
DC to AC Derate Factor:	0.770	6	5.66	795515	137210.42
AC Rating:	5199.0 kW	7	5.47	786978	135737.96
Array Type:	Fixed Tilt	8	5.30	763846	131748.15
Array Tilt:	25.0 °	9	4.74	682594	117733.81
Array Azimuth:	180.0 °	10	3.75	575992	99347.10
Energy Specifications		11	2.58	390138	67291.00
Cost of Electricity:	17.2 ¢/kWh	12	2.26	367262	63345.35
		Year	4.22	7578926	1307213.10

Output Hourly Performance Data

Output Results as Text

(Gridded data is monthly, hourly output not available.)

[Saving Text from a Browser](#)

Run PVWATTS v.2 for another location

Run PVWATTS v.1

EXHIBIT B



November 13, 2012
RAL12R0435

CleanPath Ventures
Attn: Mr. Craig Wetmore
3 Embarcadero Center, Suite 1420
San Francisco, CA 94111

Reference: Result of Shade Study Analysis
Proposed Somers Solar Site
430 South Road
Somers, Connecticut

Dear Mr. Wetmore:

CleanPath Ventures is proposing to develop a 6.75MWdc photovoltaic solar farm on approximately 75 acres in Somers, Connecticut (Figure 1). Given topographic variances and proximity of the array to near-by trees, on November 8, 2012 Kleinfelder engineers conducted a shading analysis of the Somers, CT PV solar array site to more fully understand the potential effects of shading on the proposed project. The purpose of the study was to determine areas on the site where potential shading of the arrays from adjacent obstructions may be present (i.e., topography and trees).

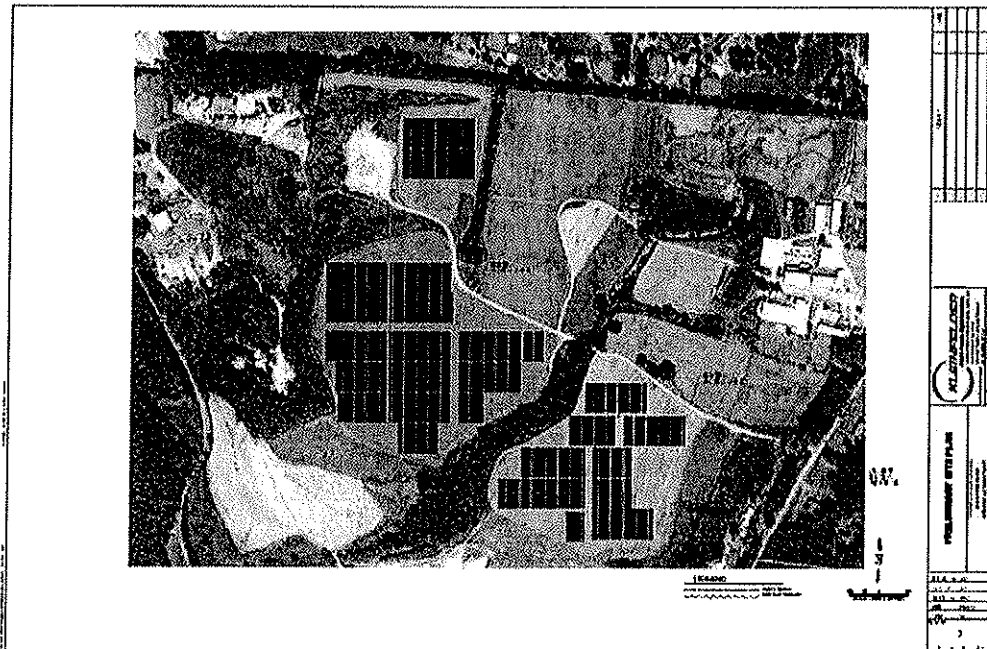


Figure 1 – Somers Solar Center

Our methodology for completing this analysis was to both collect shading data around the preliminary layout for the 6.75MWdc site that was prepared by us as well as to analyze the potential effect of the tree lines adjacent to and within Abbey Brook as well as trees adjacent to and within the site.

Site Description and Analysis:

The equipment used to conduct the analysis was the Solmetric Suneye optical data collector. All of the readings were collected facing south on a 0° plane, and a 1-axis tracking system with a 45° maximum panel tilt. As indicated on Attachment A, the site was divided into six areas as follows:

- Somers 1 is designated as the large field immediately south of the access road and east of Abbey Brook,
- Somers 2 is the large field west of Abbey Brook,
- Somers 3 is the "cornfield" north of the access road and immediately west of Abbey Brook,
- Somers 4 is the field north of Somers 3,
- Somers 5 is the hill east of the rock pit, and
- Somers 6 is the rock pit itself.

For the analysis, shading data was collected along the perimeter of these areas, with the exception of Somers 5 which does not appear to have development value due to topography.

The following are the results of our data collection activities:

- Somers 1:
Shading data was collected at 7 locations along the perimeter of this area. The average annual solar access for this development area is 96% with a low of 93% occurring in February. All of the readings indicated an annual solar access exceeding 95% with the exception of the southwest corner which had an annual access of 93%. All of the data collection points showed solar access percentages that were fairly constant throughout the year. Please see Attachment A.
- Somers 2:
Shading data was collected at 9 locations around the perimeter of this area. The average annual solar access to the area is 91% with a high of 93% in May through October and a low of 86% in November through April. The annual access results vary from a high of 94% to a low of 79%. The low numbers are the result of data collected at the southwestern and southeastern corners of the site and midway up the eastern side adjacent to Abbey Brook. In these areas, annual access is as low as 73%, with very unevenly distributed monthly access. Data point number 9 in this series, located adjacent to Abbey Brook showed solar access numbers as low as 14% during the months of November through February.
- Somers 3:

Data was collected at 5 locations around the perimeter of this development area. The average annual access is 88% with the exception of locations 1 and 2, which were immediately adjacent to Abbey Brook. Location 2 results indicated a maximum monthly access of 73% in December, and a minimum of 55% in August.

- Somers 4:

This area is located immediately north of Somers 3 and consisted of 4 data collection locations. The average annual solar access for this area is 96%. All of the data collection locations showed 97% average annual solar access or greater with the exception of the northwest corner of the site which indicated an average annual access of 93%.

- Somers 5:

This area is located immediately east of the tree line separating the rock pit from the remainder of the site. The topography of this area is steep, with only a small amount of level area at the top of the knoll available for development. We did not collect data in this area due to the limited amount of developable area available.

- Somers 6:

This area is the rock pit in the northwestern corner of the site, immediately west of the tree line. Four data collection locations resulted in an average annual access of 97%. All of the data collection locations reported fairly constant monthly rates.

Following collection of perimeter shading data, we collected data to determine the distance from the tree lines along Abbey Brook and along the western side of the property that must be maintained in order to receive an average annual solar access of at least 90%.

Beginning along the tree line on the western side of the property, collection point 3 was located 50' from the tree line and resulted in an annual solar access of 94%. Point 5, located 50' from the tree line resulted in an annual access of 91%. Point 6, also 50' from the tree line resulted in a 92% average annual access. This data indicates that placing arrays no closer than 50' from the tree line should result in an average annual solar access of at least 91% along this side of the property.

Along the western side of Abbey Brook, collection point 7 resulted in an average access of 96% a distance of 70' from the tree line. Point 8, also 70' from the tree line resulted in a 91% average solar access. These points were specifically chosen due their proximity to large stands of evergreen trees along Abbey Brook. Placing arrays no closer to the tree line than 70' should result in an average access in excess of 91% along the tree line.

Along the eastern side of Abbey Brook, point 10 indicated 95% average annual access a distance of 40' from the tree line. Point 12 indicated 94% at 40', and point 14 indicated 95% at 60'. Placing arrays no closer than 40' to the tree line, except in the area of point 14 where a 60' distance should be maintained, should result in an average annual access of greater than 94% along the tree line.

Conclusions:

The data collected on the site generally indicates very good annual solar access for the layout provided. It is important to note that the layout that was provided by Kleinfelder

was based on a particular type of equipment at a 42% ground coverage ratio, and was prepared for the sole purpose of indicating in the RFP documents that a 6.75MWdc name-plate capacity was feasible on the land area provided. Using that layout as a base map for collecting solar access data is consistent both with the intention of the layout provided and with the data collected for shading.

Each bidding EPC contractor will be responsible for collecting independent shading data and for the preparing independent solar development layouts that meet the purpose and need of the project. By providing solar access and setback data along Abbey Brook and the western tree line each bidding EPC contractor will have some ability to understand the effect of existing obstructions on the placement of arrays adjacent to these areas. In the case of the western tree line, it is evident that arrays located closer than 50' to the tree line will be adversely effected from reduced solar access. For arrays placed adjacent to Abbey Brook, those located closer than 70' from the western side, and 40' to 60' from the eastern side will also be adversely effected by reduced solar access. Of course, these numbers do not reflect the effect of removal of these obstructions since the clearing of trees is not permitted within Abbey Brook or within 100-feet of the ordinary high-water mark.

Attachment A shows the location of each solar access data collection point and the average annual solar access for that point. In addition, setback lines have been shown along Abbey Brook and the western tree line to illustrate the minimum average access location for arrays adjacent to these obstructions as described above.

This information is provided for reference only as an aid to the client and to bidding EPC contractors in developing independent alternative layouts. Weather conditions, equipment, seasonal variations and other factors may affect the results of this or any subsequent shading analyses performed on the site. Use of this data by prospective EPC bidders is encouraged, but should be utilized where practicable relating to independent layouts.

CLOSURE

We appreciate the opportunity to assist CleanPath Ventures on this exciting project. We welcome the opportunity to answer any questions or comments you may have after reviewing this report.

Respectfully submitted,
KLEINFELDER SOUTHEAST, INC.



Josh Crumpler, PE
Project Manager
jcrumpler@kleinfelder.com



Michael Crowley, PE
Client Account Manager
mcrowley@kleinfelder.com

Solar Access and Shade Report

11/8/2012

For:

Clean Path Ventures, Somers, CT site

By:

Kleinfelder
3500 Gateway Centre Blvd.
Suite 200
Morrisville, NC 27587
919-755-5011

Measurements made by Solmetric SunEye™ - www.solmetric.com

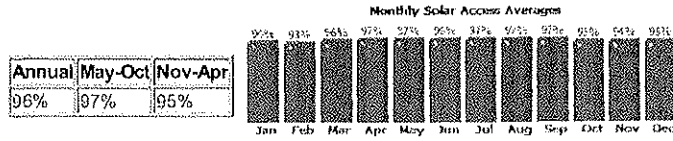
Solmetric

Session Properties

Name	somers 1
Creation Date	11/8/2012 9:01
Note	(none)
Location	42.0°N, 72.4°W Mag Dec: 14.2°W Time Zone: GMT-05:00

Solar access averages of 7 skylines in this session

Skylines Averaged: Sky01, Sky02, Sky03, Sky04, Sky05, Sky06, Sky07



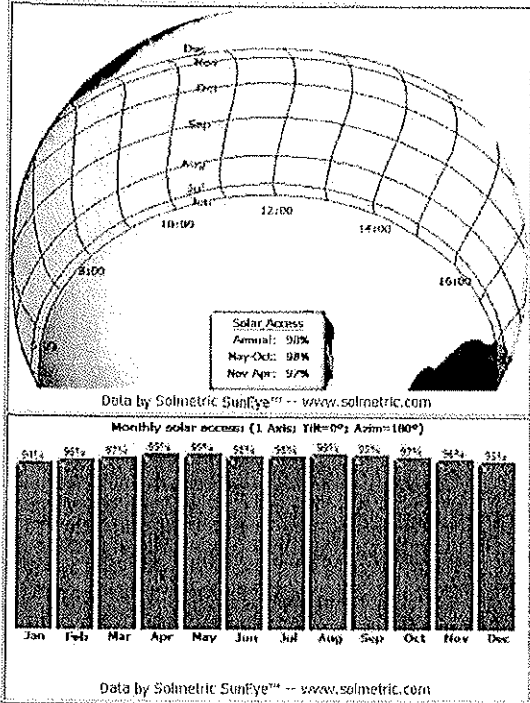
TSRF averages of 7 skylines in this session: 106%

Skylines

- Sky01 - (no skyline note)
- Sky02 - (no skyline note)
- Sky03 - (no skyline note)
- Sky04 - (no skyline note)
- Sky05 - (no skyline note)
- Sky06 - (no skyline note)
- Sky07 - (no skyline note)

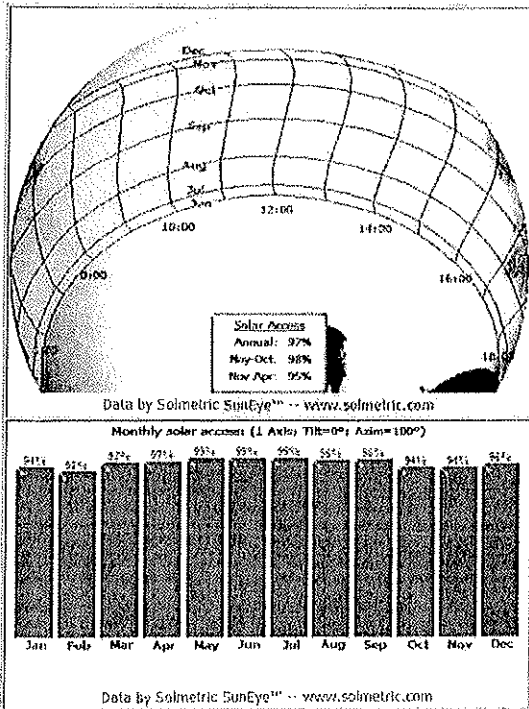
Sky01 -- 11/8/2012 9:03 -- (no skyline note)

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GPS Location: Latitude=41.95474°N -- Longitude=72.44866°W
Solar Access: Annual: 98% -- Summer (May-Oct): 98% -- Winter (Nov-Apr): 97%
TSRF: 107% -- **TOF:** 110%



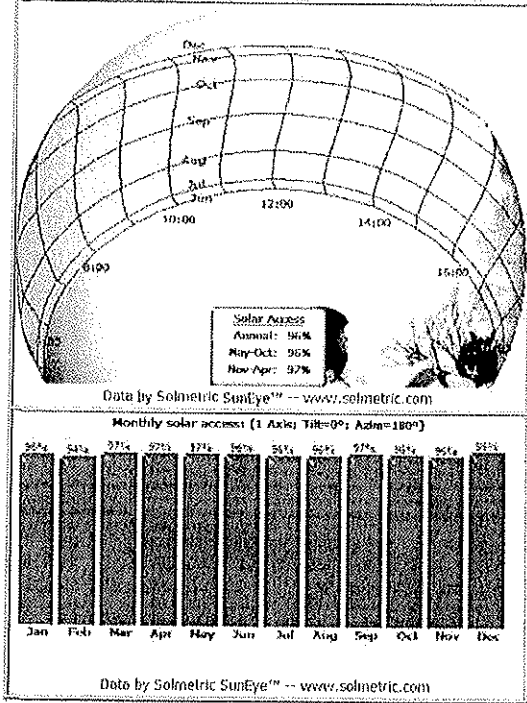
Sky02 -- 11/8/2012 9:06 -- (no skyline note)

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GPS Location: Latitude=41.95556°N -- Longitude=72.45016°W
Solar Access: Annual: 97% -- Summer (May-Oct): 98% -- Winter (Nov-Apr): 95%
TSRF: 107% -- **TOF:** 110%



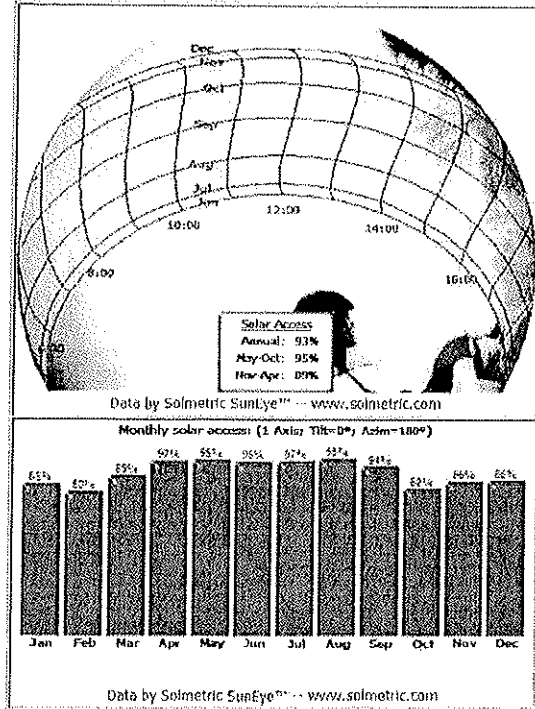
Sky03 -- 11/8/2012 9:07 -- (no skyline note)

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 Solar Access: Annual: 96% -- Summer (May-Oct): 96% -- Winter (Nov-Apr): 97%
 TSRF: 106% -- TOF: 110%



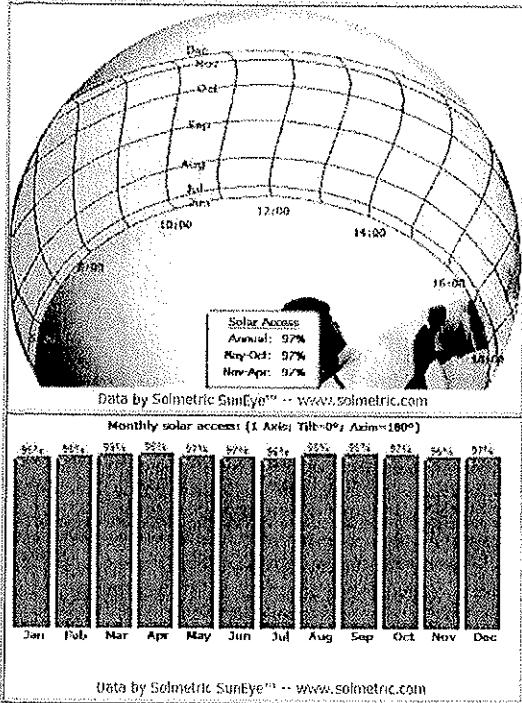
Sky04 -- 11/8/2012 9:10 -- (no skyline note)

Panel Orientation: 1 Axis -- Tilt=0° -- Azimuth=180° -- Tracking Limit=45° -- Skyline Heading=181°
 GPS Location: Latitude=41.95348°N -- Longitude=72.45244°W
 Solar Access: Annual: 93% -- Summer (May-Oct): 95% -- Winter (Nov-Apr): 89%
 TSRF: 102% -- TOF: 110%



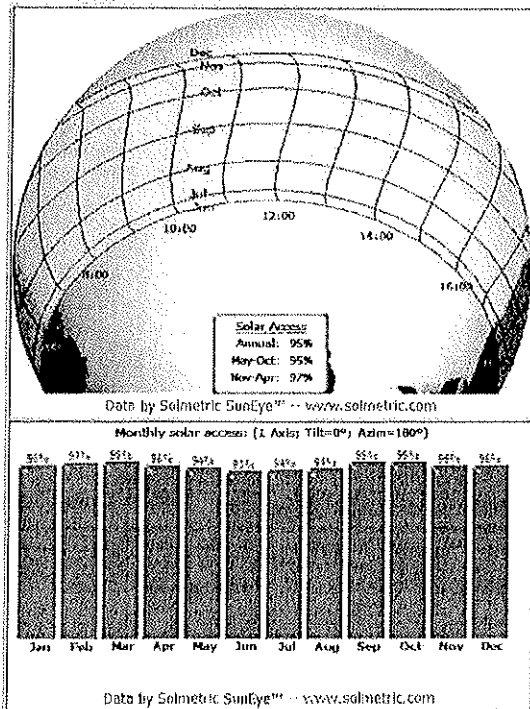
Sky05 -- 11/8/2012 9:12 -- (no skyline note)

Panel Orientation: 1 Axis -- Tilt=0° -- Azimuth=180° -- Tracking Limit=45° -- Skyline Heading=179°
 GPS Location: Latitude=41.95326°N -- Longitude=72.45196°W
 Solar Access: Annual: 97% -- Summer (May-Oct): 97% -- Winter (Nov-Apr): 97%
 TSRF: 107% -- TOF: 110%



Sky06 -- 11/8/2012 9:15 -- (no skyline note)

Panel Orientation: 1 Axis -- Tilt=0° -- Azimuth=180° -- Tracking Limit=45° -- Skyline Heading=180°
 GPS Location: Latitude=41.95278°N -- Longitude=72.45060°W
 Solar Access: Annual: 95% -- Summer (May-Oct): 95% -- Winter (Nov-Apr): 97%
 TSRF: 105% -- TOF: 110%



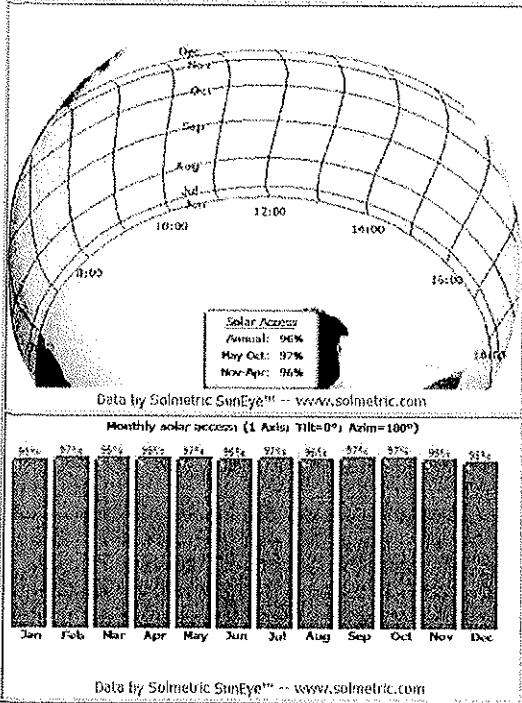
Sky07 -- 11/8/2012 9:17 -- (no skyline note)

Panel Orientation: 1 Axis -- Tilt=0° -- Azimuth=180° -- Tracking Limit=45° -- Skyline Heading=181°

GPS Location: Latitude=41.95348°N -- Longitude=72.44950°W

Solar Access: Annual: 96% -- Summer (May-Oct): 97% -- Winter (Nov-Apr): 96%

SRF: 106% -- TOF: 110%



Solar Access and Shade Report

11/8/2012

For:

Clean Path Ventures, Somers, CT site

By:

Kleinfelder
3500 Gateway Centre Blvd.
Suite 200
Morrisville, NC 27587
919-755-5011

Measurements made by Solmetric SunEye™ -- www.solmetric.com

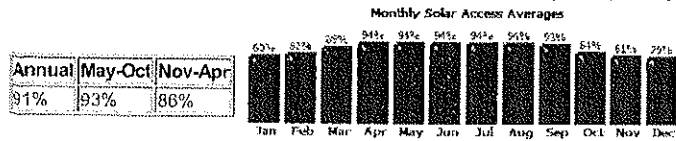
Solmetric

Session Properties

Name	somors 2
Creation Date	11/8/2012 10:54
Note	(none)
Location	42.0°N, 72.5°W Mag Dec: 14.2°W Time Zone: GMT-05:00

Solar access averages of 9 skylines in this session

Skylines Averaged: Sky01, Sky02, Sky03, Sky04, Sky05, Sky06, Sky07, Sky08, Sky09



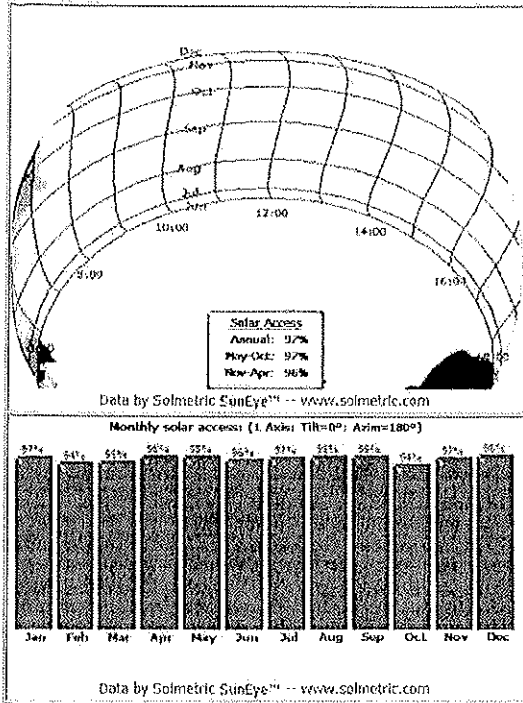
TSRF averages of 9 skylines in this session: 99%

Skylines

- Sky01 - (no skyline note)
- Sky02 - (no skyline note)
- Sky03 - (no skyline note)
- Sky04 - (no skyline note)
- Sky05 - (no skyline note)
- Sky06 - (no skyline note)
- Sky07 - (no skyline note)
- Sky08 - (no skyline note)
- Sky09 - (no skyline note)

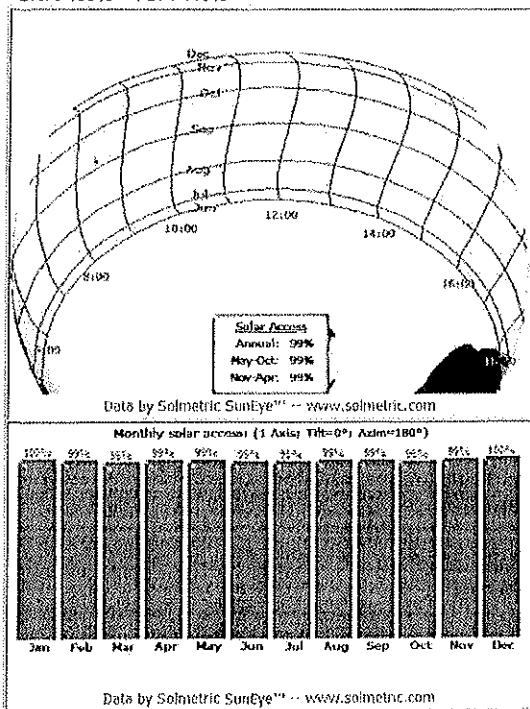
Sky01 -- 11/8/2012 10:55 -- (no skyline note)

Panel Orientation: 1 Axis -- Tilt=0° -- Azimuth=180° -- Tracking Limit=45° -- Skyline Heading=180°
 GPS Location: Latitude=41.95592°N -- Longitude=72.45126°W
 Solar Access: Annual: 97% -- Summer (May-Oct): 97% -- Winter (Nov-Apr): 96%
 TSRF: 106% -- TOF: 110%



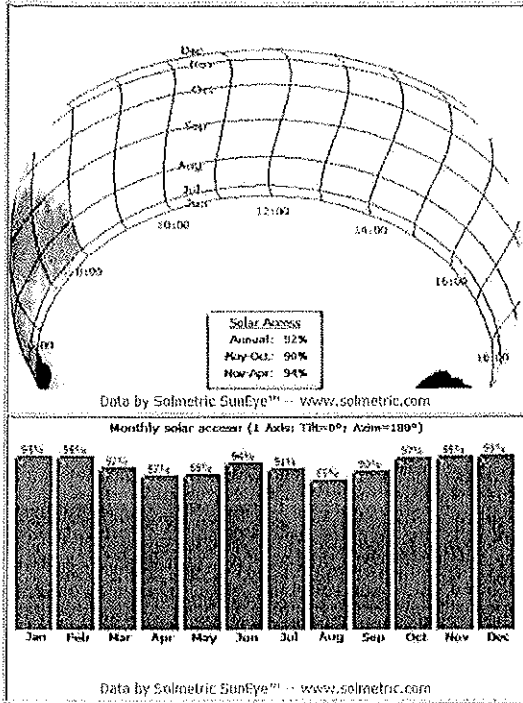
Sky02 -- 11/8/2012 10:58 -- (no skyline note)

Panel Orientation: 1 Axis -- Tilt=0° -- Azimuth=180° -- Tracking Limit=45° -- Skyline Heading=180°
 GPS Location: Latitude=41.95652°N -- Longitude=72.45306°W
 Solar Access: Annual: 99% -- Summer (May-Oct): 99% -- Winter (Nov-Apr): 99%
 TSRF: 108% -- TOF: 110%



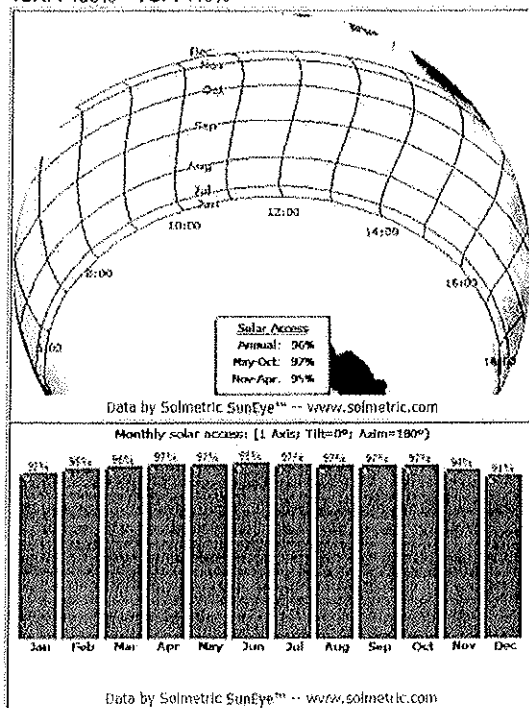
Sky03 -- 11/8/2012 11:00 -- (no skyline note)

Panel Orientation: 1 Axis -- Tilt=0° -- Azimuth=180° -- Tracking Limit=45° -- Skyline Heading=180°
 GPS Location: Latitude=41.95720°N -- Longitude=72.45352°W
 Solar Access: Annual: 92% -- Summer (May-Oct): 90% -- Winter (Nov-Apr): 94%
 TSRF: 100% -- TOF: 110%



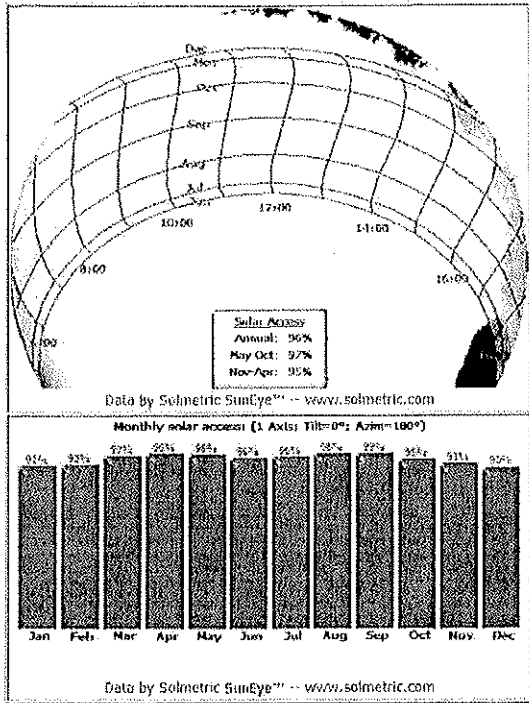
Sky04 -- 11/8/2012 11:04 -- (no skyline note)

Panel Orientation: 1 Axis -- Tilt=0° -- Azimuth=180° -- Tracking Limit=45° -- Skyline Heading=180°
 GPS Location: Latitude=41.95712°N -- Longitude=72.45522°W
 Solar Access: Annual: 96% -- Summer (May-Oct): 97% -- Winter (Nov-Apr): 95%
 TSRF: 106% -- TOF: 110%



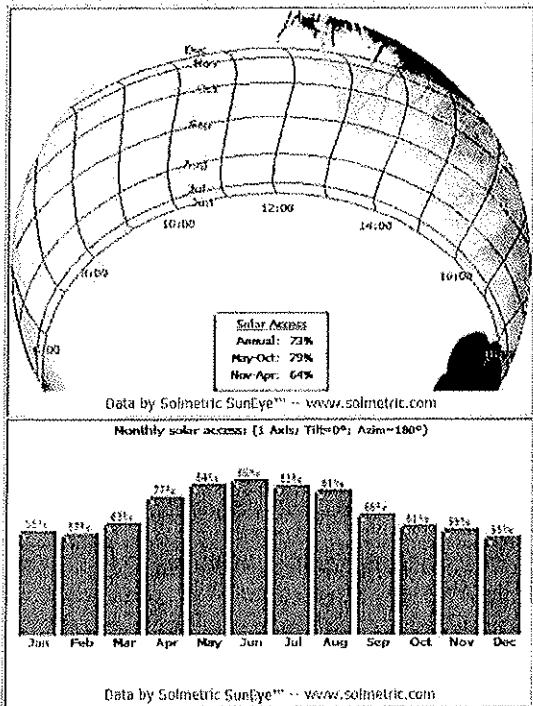
Sky05 -- 11/8/2012 11:06 -- (no skyline note)

Panel Orientation: 1 Axis -- Tilt=0° -- Azimuth=180° -- Tracking Limit=45° -- Skyline Heading=180°
GPS Location: Latitude=41.95806°N -- Longitude=72.45558°W
Solar Access: Annual: 96% -- Summer (May-Oct): 97% -- Winter (Nov-Apr): 95%
TSRF: 106% -- **TOF:** 110%



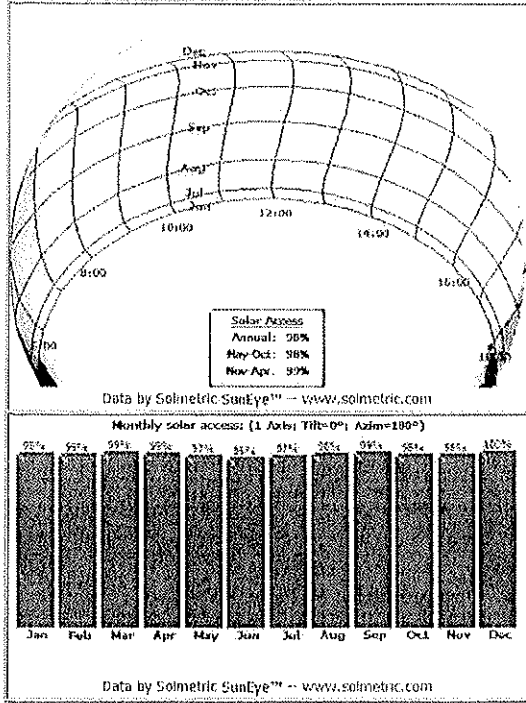
Sky06 -- 11/8/2012 11:08 -- (no skyline note)

Panel Orientation: 1 Axis -- Tilt=0° -- Azimuth=180° -- Tracking Limit=45° -- Skyline Heading=181°
GPS Location: Latitude=41.95522°N -- Longitude=72.45558°W
Solar Access: Annual: 73% -- Summer (May-Oct): 79% -- Winter (Nov-Apr): 64%
TSRF: 81% -- **TOF:** 110%



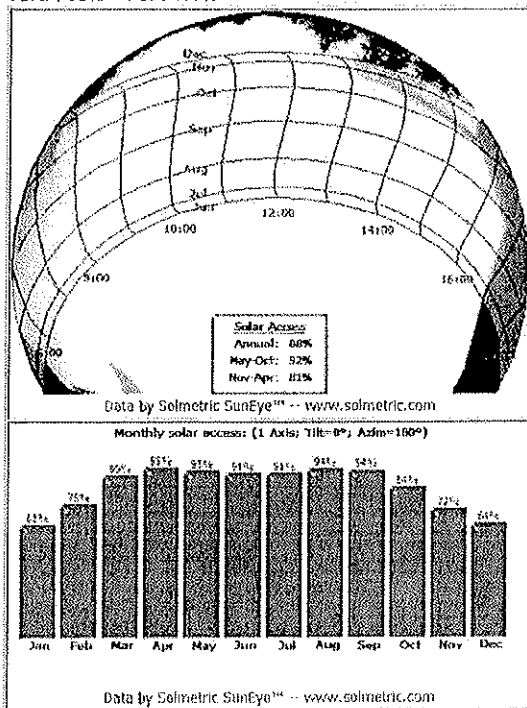
Sky07 -- 11/8/2012 11:12 -- (no skyline note)

Panel Orientation: 1 Axis -- Tilt=0° -- Azimuth=180° -- Tracking Limit=45° -- Skyline Heading=180°
 GPS Location: Latitude=41.95460°N -- Longitude=72.45547°W
 Solar Access: Annual: 98% -- Summer (May-Oct): 98% -- Winter (Nov-Apr): 99%
 TSRF: 108% -- TOF: 110%



Sky08 -- 11/8/2012 11:15 -- (no skyline note)

Panel Orientation: 1 Axis -- Tilt=0° -- Azimuth=180° -- Tracking Limit=45° -- Skyline Heading=181°
 GPS Location: Latitude=41.95412°N -- Longitude=72.45368°W
 Solar Access: Annual: 88% -- Summer (May-Oct): 92% -- Winter (Nov-Apr): 81%
 TSRF: 96% -- TOF: 110%



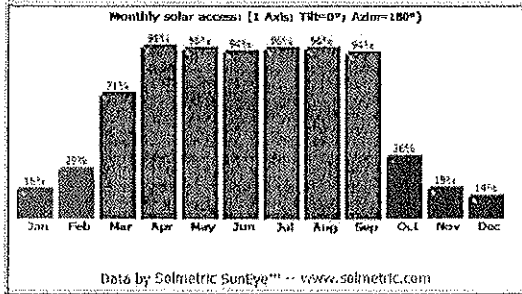
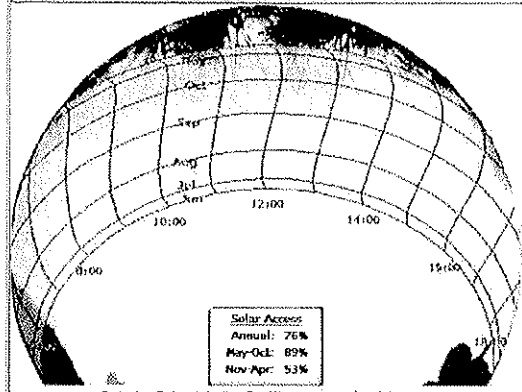
Sky09 -- 11/8/2012 11:17 -- (no skyline note)

Panel Orientation: 1 Axis -- Tilt=0° -- Azimuth=180° -- Tracking Limit=45° -- Skyline Heading=182°

GPS Location: Latitude=41.95460°N -- Longitude=72.45284°W

Solar Access: Annual: 76% -- Summer (May-Oct): 89% -- Winter (Nov-Apr): 53%

TSRF: 83% -- TOF: 110%



Solar Access and Shade Report

11/8/2012

For:

Clean Path Ventures, Somers, CT site

By:

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3500 Gateway Centre Blvd.
Suite 200
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919-755-5011

Measurements made by Solmetric SunEye™ -- www.solmetric.com

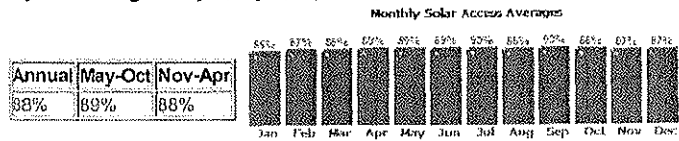
Solmetric

Session Properties

Name	somers 3
Creation Date	11/8/2012 11:32
Note	(none)
Location	42.0°N, 72.5°W Mag Dec: 14.2°W Time Zone: GMT-05:00

Solar access averages of 5 skylines in this session

Skylines Averaged: Sky01, Sky02, Sky03, Sky04, Sky05



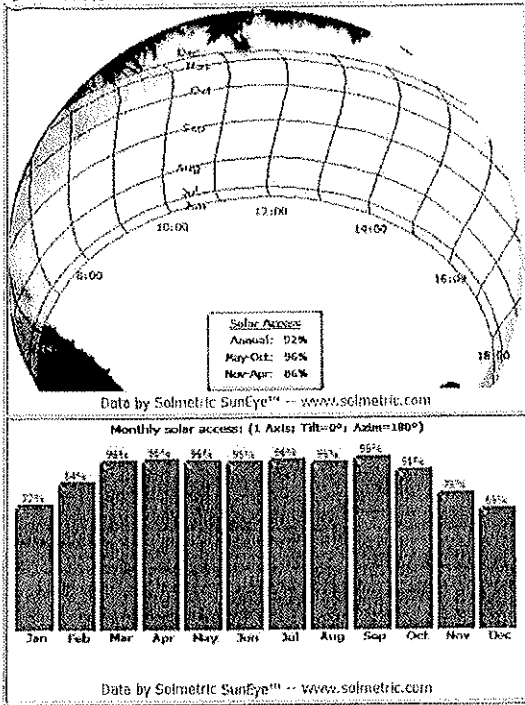
TSRF averages of 5 skylines in this session: 97%

Skylines

- Sky01 - (no skyline note)
- Sky02 - (no skyline note)
- Sky03 - (no skyline note)
- Sky04 - (no skyline note)
- Sky05 - (no skyline note)

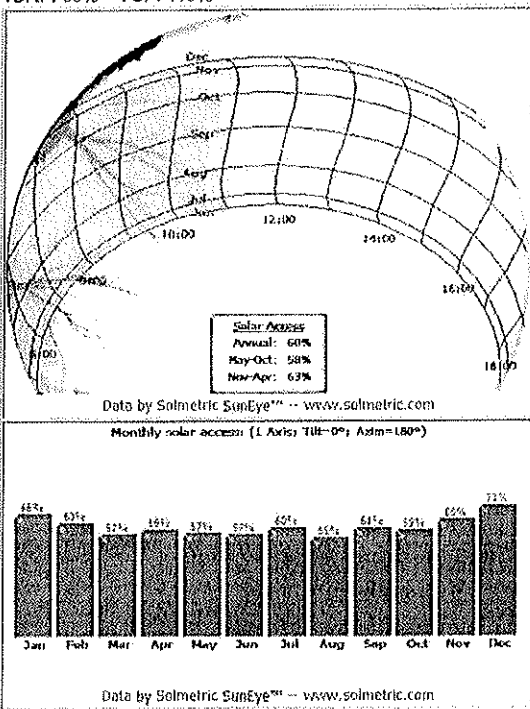
Sky01 -- 11/8/2012 11:34 -- (no skyline note)

Panel Orientation: 1 Axis -- Tilt=0° -- Azimuth=180° -- Tracking Limit=45° -- Skyline Heading=180°
 GPS Location: Latitude=41.95600°N -- Longitude=72.45096°W
 Solar Access: Annual: 92% -- Summer (May-Oct): 96% -- Winter (Nov-Apr): 86%
 TSRF: 101% -- TOF: 110%



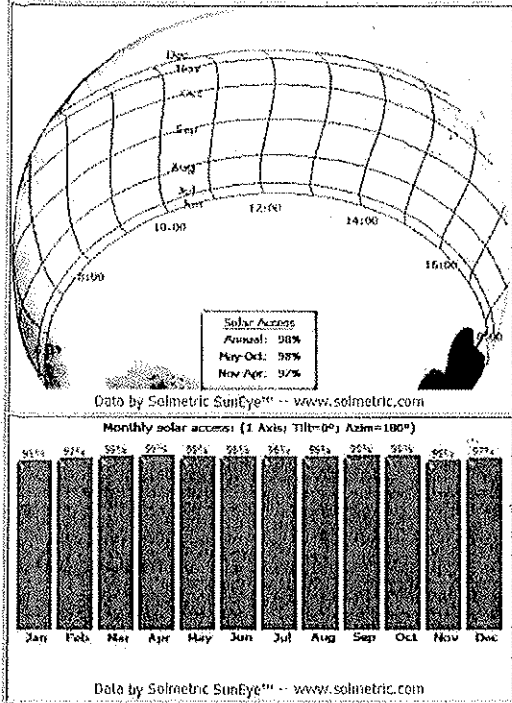
Sky02 -- 11/8/2012 11:38 -- (no skyline note)

Panel Orientation: 1 Axis -- Tilt=0° -- Azimuth=180° -- Tracking Limit=45° -- Skyline Heading=180°
 GPS Location: Latitude=41.95742°N -- Longitude=72.44980°W
 Solar Access: Annual: 60% -- Summer (May-Oct): 58% -- Winter (Nov-Apr): 63%
 TSRF: 66% -- TOF: 110%



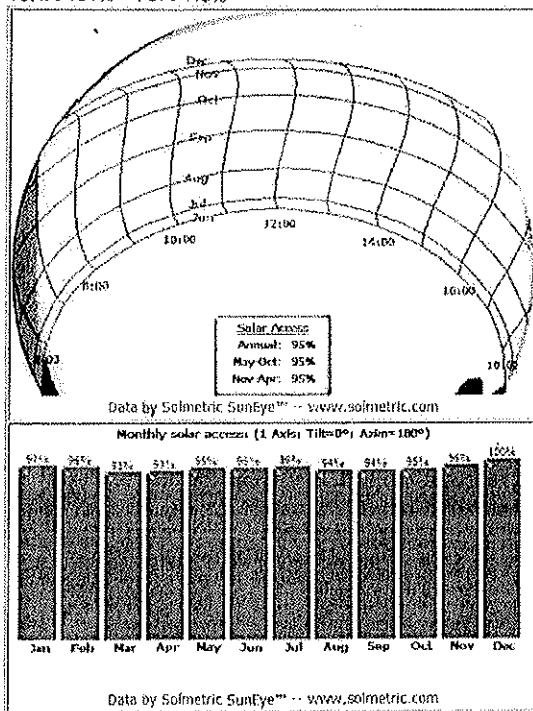
Sky03 -- 11/8/2012 11:41 -- (no skyline note)

Panel Orientation: 1 Axis -- Tilt=0° -- Azimuth=180° -- Tracking Limit=45° -- Skyline Heading=183°
 GPS Location: Latitude=41.95772°N -- Longitude=72.45032°W
 Solar Access: Annual: 98% -- Summer (May-Oct): 98% -- Winter (Nov-Apr): 97%
 TSRF: 107% -- TOF: 110%



Sky04 -- 11/8/2012 11:43 -- (no skyline note)

Panel Orientation: 1 Axis -- Tilt=0° -- Azimuth=180° -- Tracking Limit=45° -- Skyline Heading=181°
 GPS Location: Latitude=41.95774°N -- Longitude=72.45110°W
 Solar Access: Annual: 95% -- Summer (May-Oct): 95% -- Winter (Nov-Apr): 95%
 TSRF: 104% -- TOF: 110%



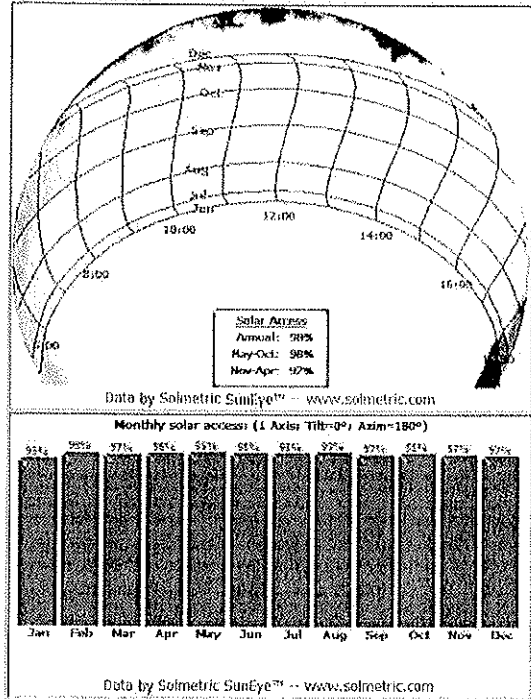
Sky05 -- 11/8/2012 11:50 -- (no skyline note)

Panel Orientation: 1 Axis -- Tilt=0° -- Azimuth=180° -- Tracking Limit=45° -- Skyline Heading=180°

GPS Location: Latitute=41.95612°N -- Longitude=72.45126°W

Solar Access: Annual: 98% -- Summer (May-Oct): 98% -- Winter (Nov-Apr): 97%

TSRF: 107% -- TOF: 110%



Solar Access and Shade Report

11/8/2012

For:

Clean Path Centures, Somers, CT site

By:

Kleinfelder
3500 Gateway Centre Blvd.
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919-755-5011

Measurements made by Solmetric SunEye™ - www.solmetric.com

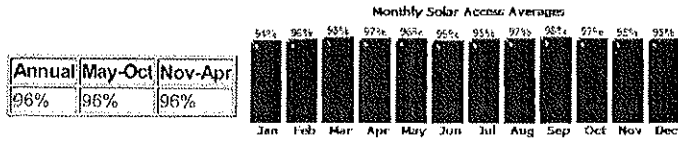
Solmetric

Session Properties

Name	somers 4
Creation Date	11/8/2012 11:56
Note	(none)
Location	42.0°N, 72.5°W Mag Dec: 14.2°W Time Zone: GMT-05:00

Solar access averages of 4 skylines in this session

Skylines Averaged: Sky01, Sky02, Sky03, Sky04



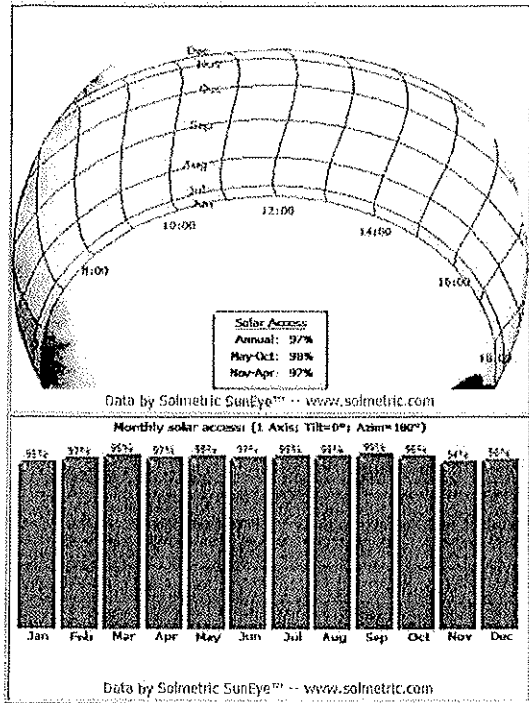
TSRF averages of 4 skylines in this session: 106%

Skylines

- Sky01 - (no skyline note)
- Sky02 - (no skyline note)
- Sky03 - (no skyline note)
- Sky04 - (no skyline note)

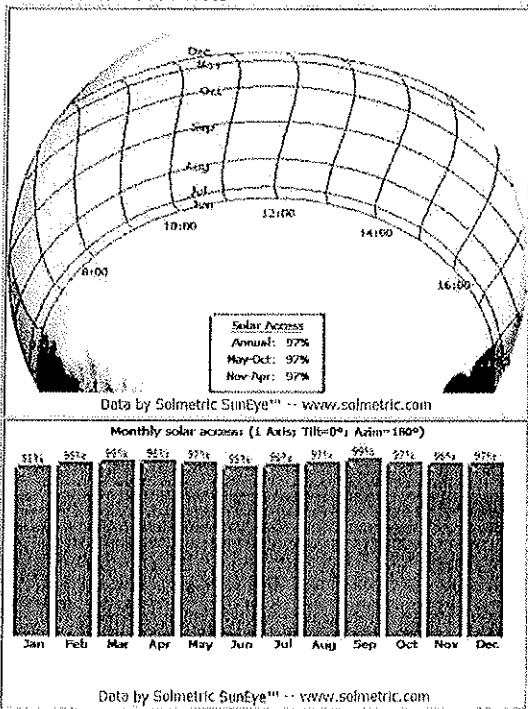
Sky01 -- 11/8/2012 12:08 -- (no skyline note)

Panel Orientation: 1 Axis -- Tilt=0° -- Azimuth=180° -- Tracking Limit=45° -- Skyline Heading=180°
 GPS Location: Latitude=41.95778°N -- Longitude=72.45029°W
 Solar Access: Annual: 97% -- Summer (May-Oct): 98% -- Winter (Nov-Apr): 97%
 TSRF: 107% -- TOF: 110%



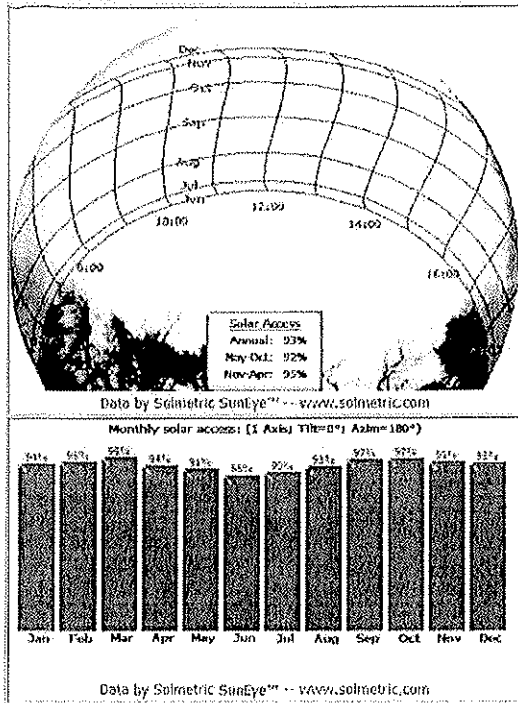
Sky02 -- 11/8/2012 12:11 -- (no skyline note)

Panel Orientation: 1 Axis -- Tilt=0° -- Azimuth=180° -- Tracking Limit=45° -- Skyline Heading=179°
 GPS Location: Latitude=41.95930°N -- Longitude=72.45010°W
 Solar Access: Annual: 97% -- Summer (May-Oct): 97% -- Winter (Nov-Apr): 97%
 TSRF: 106% -- TOF: 110%



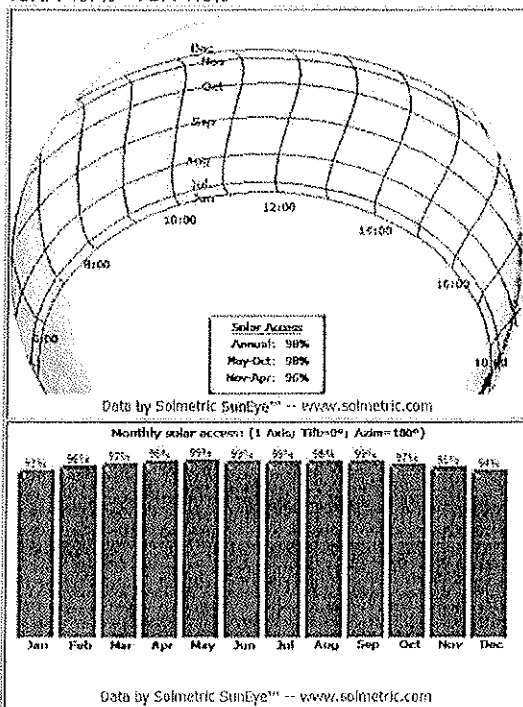
Sky03 -- 11/8/2012 12:13 -- (no skyline note)

Panel Orientation: 1 Axis -- Tilt=0° -- Azimuth=180° -- Tracking Limit=45° -- Skyline Heading=180°
 GPS Location: Latitude=41.95950°N -- Longitude=72.45138°W
 Solar Access: Annual: 93% -- Summer (May-Oct): 92% -- Winter (Nov-Apr): 95%
 TSRF: 102% -- TOF: 110%



Sky04 -- 11/8/2012 12:16 -- (no skyline note)

Panel Orientation: 1 Axis -- Tilt=0° -- Azimuth=180° -- Tracking Limit=45° -- Skyline Heading=178°
 GPS Location: Latitude=41.95800°N -- Longitude=72.45144°W
 Solar Access: Annual: 98% -- Summer (May-Oct): 98% -- Winter (Nov-Apr): 96%
 TSRF: 107% -- TOF: 110%



Solar Access and Shade Report

11/8/2012

For:

Clean Path Ventures, Somers, CT Site

By:

Kleinfelder
3500 Gateway Centre Blvd.
Suite 200
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919-755-6011

Measurements made by Solmetric SunEye™ -- www.solmetric.com

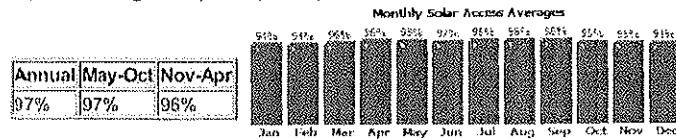
Solmetric

Session Properties

Name	somers 6
Creation Date	11/8/2012 12:20
Note	(none)
Location	42.0°N, 72.5°W Mag Dec: 14.2°W Time Zone: GMT-05:00

Solar access averages of 4 skylines in this session

Skylines Averaged: Sky01, Sky02, Sky03, Sky04



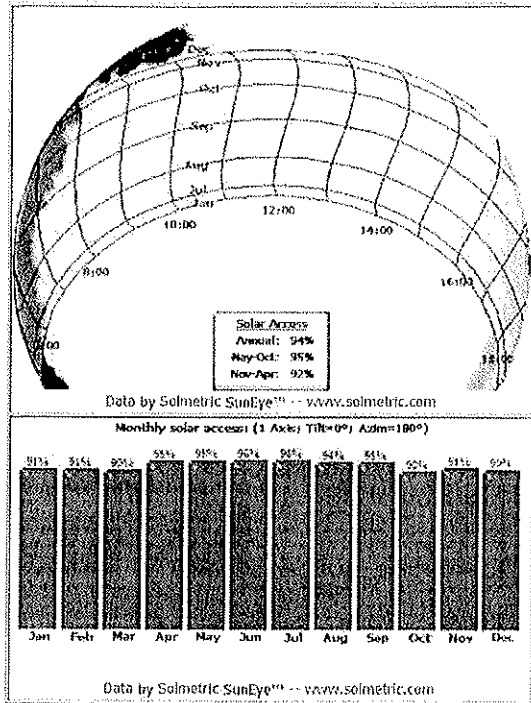
TSRF averages of 4 skylines in this session: 106%

Skylines

- Sky01 - (no skyline note)
- Sky02 - (no skyline note)
- Sky03 - (no skyline note)
- Sky04 - (no skyline note)

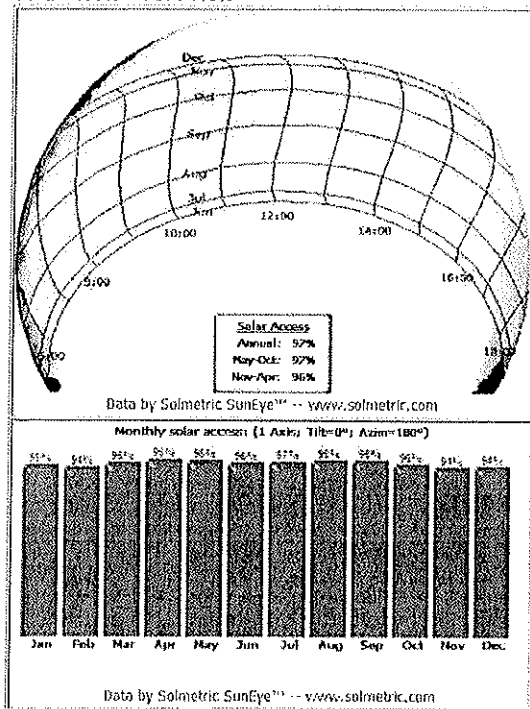
Sky01 -- 11/8/2012 12:21 -- (no skyline note)

Panel Orientation: 1 Axis -- Tilt=0° -- Azimuth=180° -- Tracking Limit=45° -- Skyline Heading=180°
 GPS Location: Latitude=41.95760°N -- Longitude=72.45344°W
 Solar Access: Annual: 94% -- Summer (May-Oct): 95% -- Winter (Nov-Apr): 92%
 TSRF: 103% -- TOF: 110%



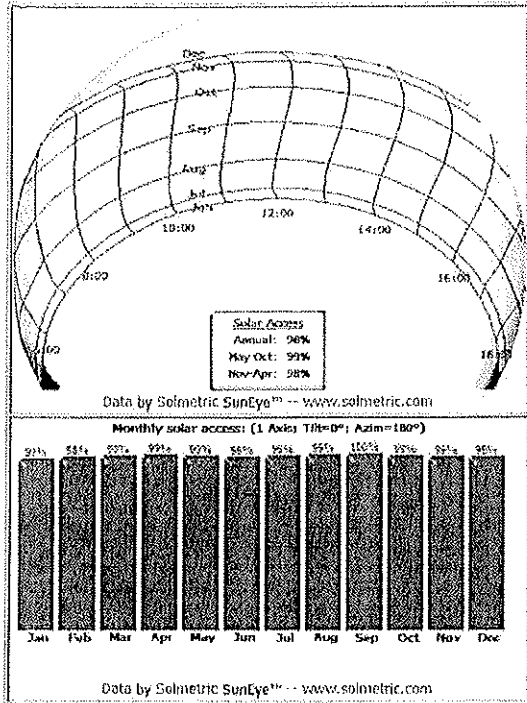
Sky02 -- 11/8/2012 12:24 -- (no skyline note)

Panel Orientation: 1 Axis -- Tilt=0° -- Azimuth=180° -- Tracking Limit=45° -- Skyline Heading=182°
 GPS Location: Latitude=41.95924°N -- Longitude=72.45322°W
 Solar Access: Annual: 97% -- Summer (May-Oct): 97% -- Winter (Nov-Apr): 96%
 TSRF: 106% -- TOF: 110%



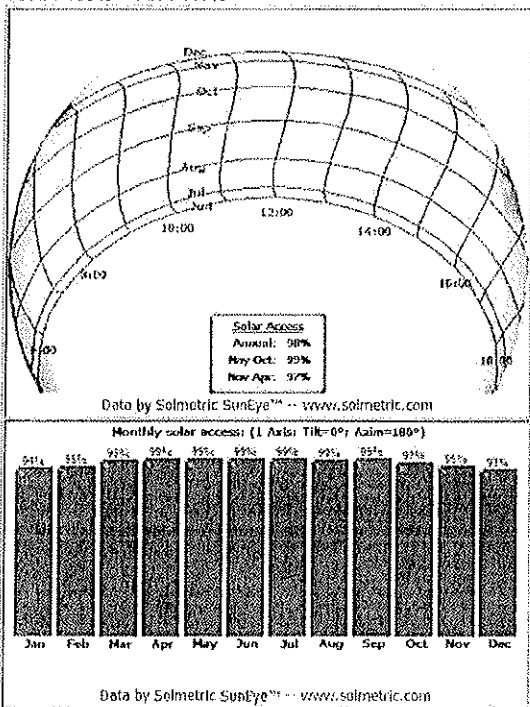
Sky03 -- 11/8/2012 12:26 -- (no skyline note)

Panel Orientation: 1 Axis -- Tilt=0° -- Azimuth=180° -- Tracking Limit=45° -- Skyline Heading=181°
 GPS Location: Latitude=41.95024°N -- Longitude=72.45434°W
 Solar Access: Annual: 98% -- Summer (May-Oct): 99% -- Winter (Nov-Apr): 98%
 TSRF: 108% -- TOF: 110%



Sky04 -- 11/8/2012 12:29 -- (no skyline note)

Panel Orientation: 1 Axis -- Tilt=0° -- Azimuth=180° -- Tracking Limit=45° -- Skyline Heading=180°
 GPS Location: Latitude=41.95784°N -- Longitude=72.45432°W
 Solar Access: Annual: 98% -- Summer (May-Oct): 99% -- Winter (Nov-Apr): 97%
 TSRF: 108% -- TOF: 110%



Solar Access and Shade Report

11/13/2012

For:

Clean Path Ventures, Somers, CT site

By:

Kleinfelder
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Measurements made by Solmetric SunEye™ – www.solmetric.com

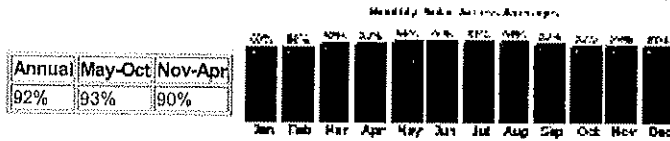


Session Properties

Name	somers treelines
Creation Date	11/8/2012 12:32
Note	(none)
Location	42.0°N, 72.5°W Mag Dec: 14.2°W Time Zone: GMT-05:00

Solar access averages of 14 skylines in this session

Skylines Averaged: Sky01, Sky02, Sky03, Sky04, Sky05, Sky06, Sky07, Sky08, Sky09, Sky10, Sky11, Sky12, Sky13, Sky14



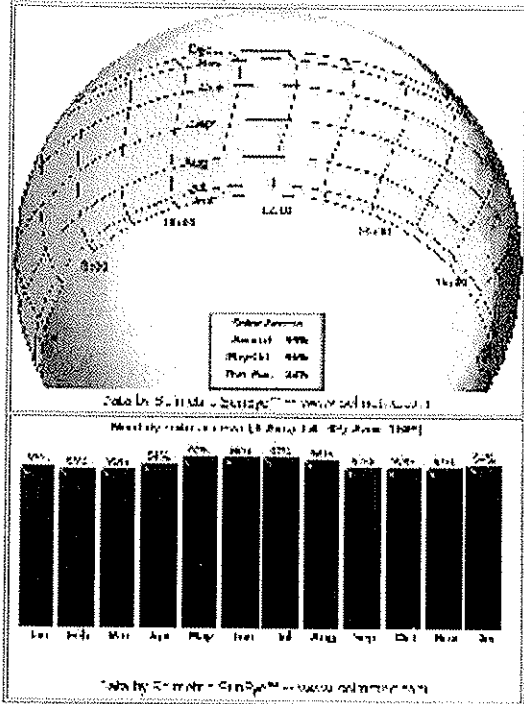
TSRF averages of 14 skylines in this session: 97%

Skylines

- Sky01 - (no skyline note)
- Sky02 - (no skyline note)
- Sky03 - (no skyline note)
- Sky04 - (no skyline note)
- Sky05 - (no skyline note)
- Sky06 - (no skyline note)
- Sky07 - (no skyline note)
- Sky08 - (no skyline note)
- Sky09 - (no skyline note)
- Sky10 - (no skyline note)
- Sky11 - (no skyline note)
- Sky12 - (no skyline note)
- Sky13 - (no skyline note)
- Sky14 - (no skyline note)

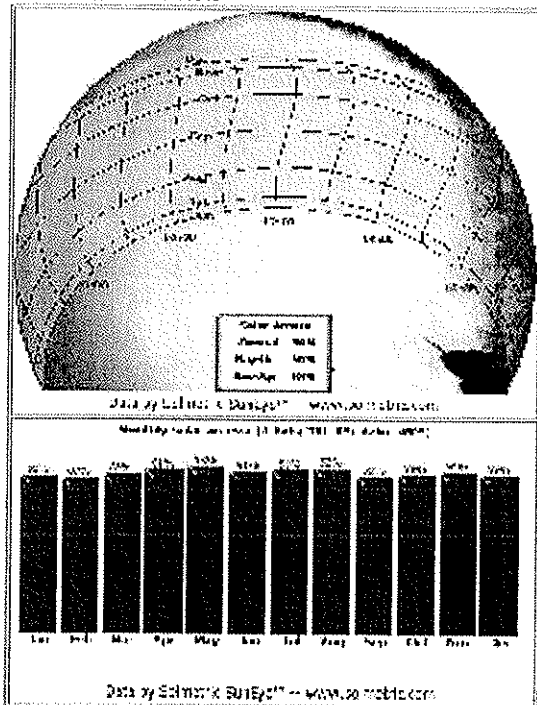
Sky03 – 11/8/2012 12:38 – (no skyline note)

Panel Orientation: 1 Axis – Tilt=0° – Azimuth=180° – Tracking Limit=45° – Skyline Heading=179°
 GPS Location: Latitude=41.95706°N – Longitude=72.45531°W
 Solar Access: Annual: 94% – Summer (May-Oct): 96% – Winter (Nov-Apr): 92%
 TSRF: 104% – TOF: 110%



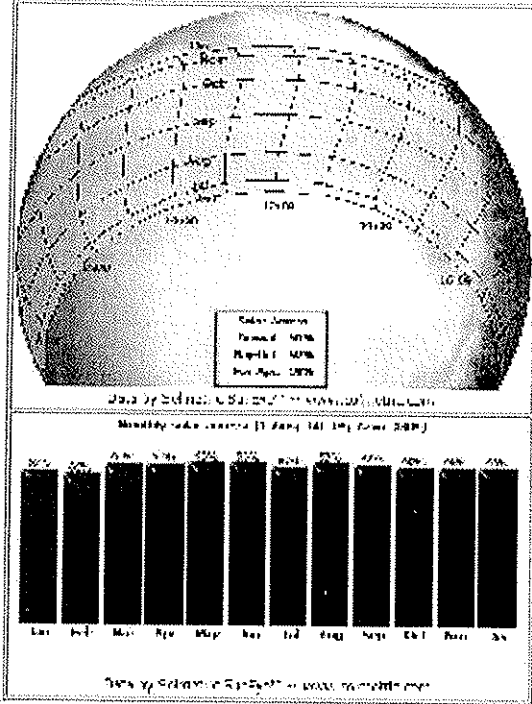
Sky04 – 11/8/2012 12:42 – (no skyline note)

Panel Orientation: 1 Axis – Tilt=0° – Azimuth=180° – Tracking Limit=45° – Skyline Heading=181°
 GPS Location: Latitude=41.95650°N – Longitude=72.45568°W
 Solar Access: Annual: 91% – Summer (May-Oct): 91% – Winter (Nov-Apr): 89%
 TSRF: 99% – TOF: 110%



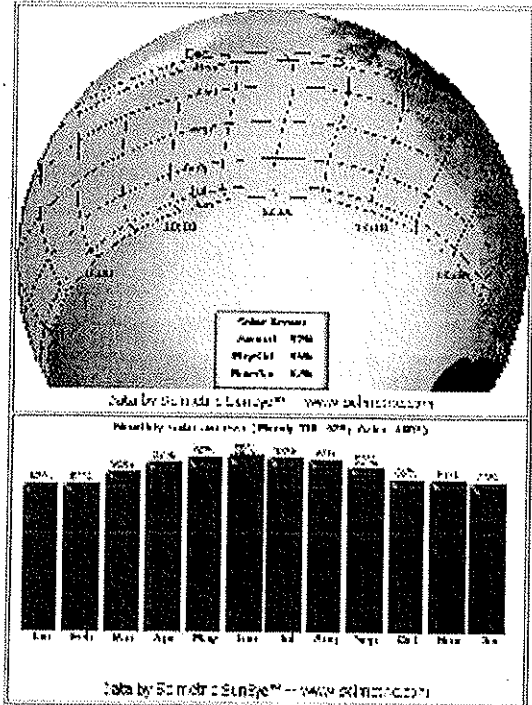
Sky05 – 11/8/2012 12:43 – (no skyline note)

Panel Orientation: 1 Axis – Tilt=0° – Azimuth=180° – Tracking Limit=45° – Skyline Heading=180°
 GPS Location: Latitude=41.95648°N – Longitude=72.45560°W
 Solar Access: Annual: 91% – Summer (May-Oct): 92% – Winter (Nov-Apr): 90%
 TSRF: 100% – TOF: 110%



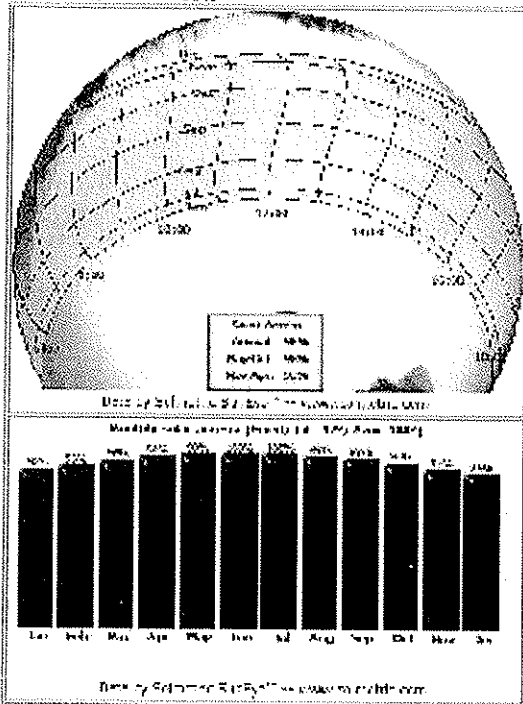
Sky06 – 11/8/2012 12:47 – (no skyline note)

Panel Orientation: Tilt=42° – Azimuth=180° – Skyline Heading=182°
 GPS Location: Latitude=41.95554°N – Longitude=72.45554°W
 Solar Access: Annual: 92% – Summer (May-Oct): 95% – Winter (Nov-Apr): 87%
 TSRF: 91% – TOF: 100%



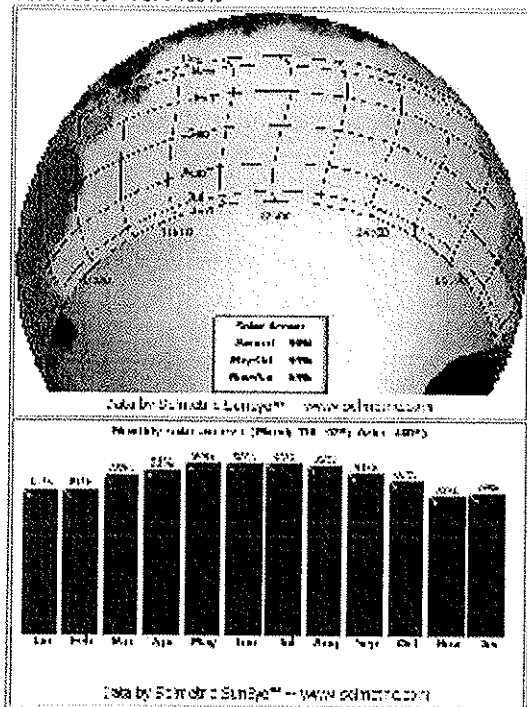
Sky07 – 11/8/2012 12:52 – (no skyline note)

Panel Orientation: Tilt=42° – Azimuth=180° – Skyline Heading=181°
 GPS Location: Latitude=41.95454°N – Longitude=72.45350°W
 Solar Access: Annual: 96% – Summer (May-Oct): 98% – Winter (Nov-Apr): 93%
 TSRF: 96% – TOF: 100%



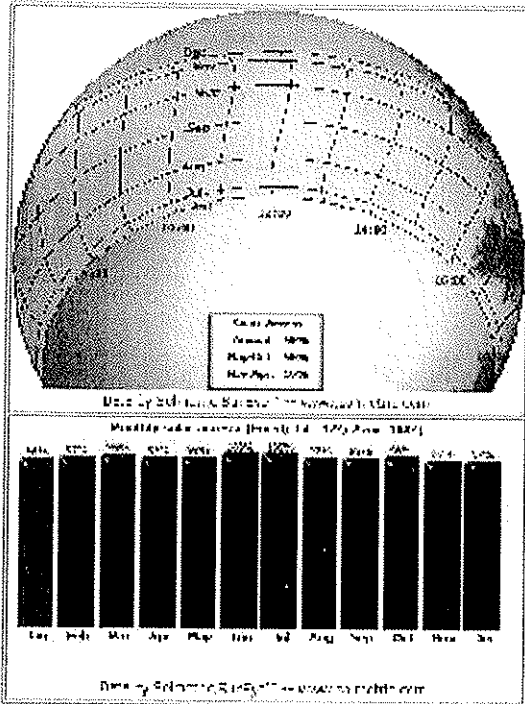
Sky08 – 11/8/2012 12:57 – (no skyline note)

Panel Orientation: Tilt=42° – Azimuth=180° – Skyline Heading=182°
 GPS Location: Latitude=41.95526°N – Longitude=72.45184°W
 Solar Access: Annual: 90% – Summer (May-Oct): 94% – Winter (Nov-Apr): 84%
 TSRF: 90% – TOF: 100%



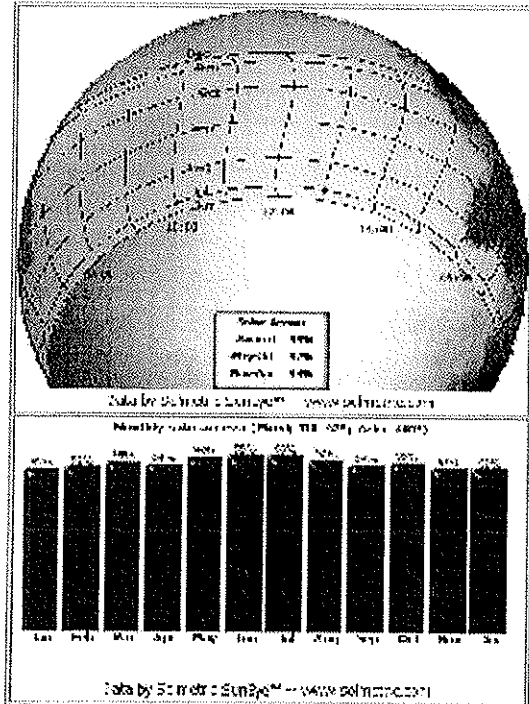
Sky09 -- 11/8/2012 13:05 -- (no skyline note)

Panel Orientation: Tilt=42° -- Azimuth=180° -- Skyline Heading=181°
 GPS Location: Latitude=41.95552°N -- Longitude=72.45044°W
 Solar Access: Annual: 98% -- Summer (May-Oct): 98% -- Winter (Nov-Apr): 97%
 TSRF: 98% -- TOF: 100%



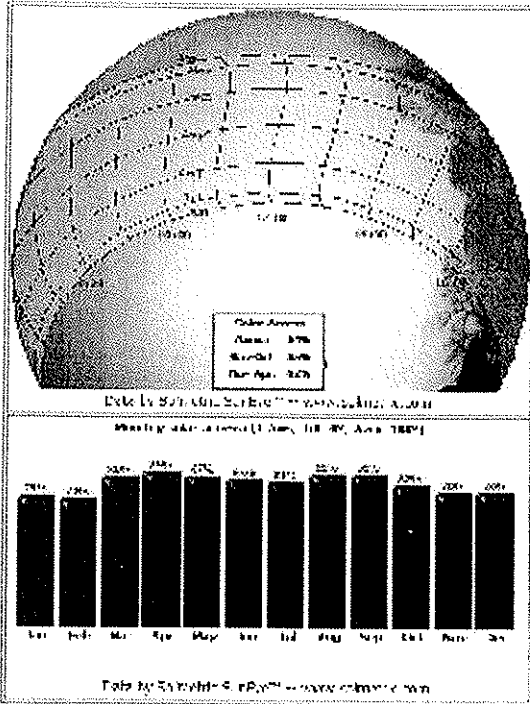
Sky10 -- 11/8/2012 13:06 -- (no skyline note)

Panel Orientation: Tilt=42° -- Azimuth=180° -- Skyline Heading=181°
 GPS Location: Latitude=41.95556°N -- Longitude=72.45052°W
 Solar Access: Annual: 95% -- Summer (May-Oct): 97% -- Winter (Nov-Apr): 93%
 TSRF: 95% -- TOF: 100%



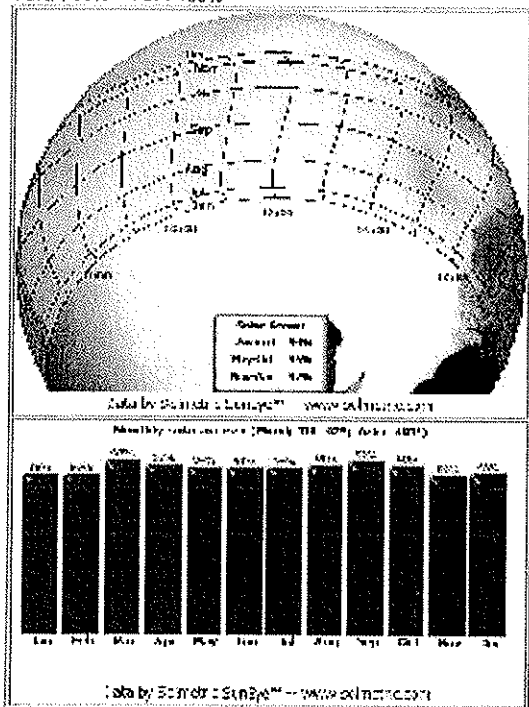
Sky11 – 11/8/2012 13:09 – (no skyline note)

Panel Orientation: 1 Axis – Tilt=0° – Azimuth=180° – Tracking Limit=45° – Skyline Heading=182°
 GPS Location: Latitude=41.95518°N – Longitude=72.45080°W
 Solar Access: Annual: 84% – Summer (May-Oct): 86% – Winter (Nov-Apr): 82%
 TSRF: 93% – TOF: 110%



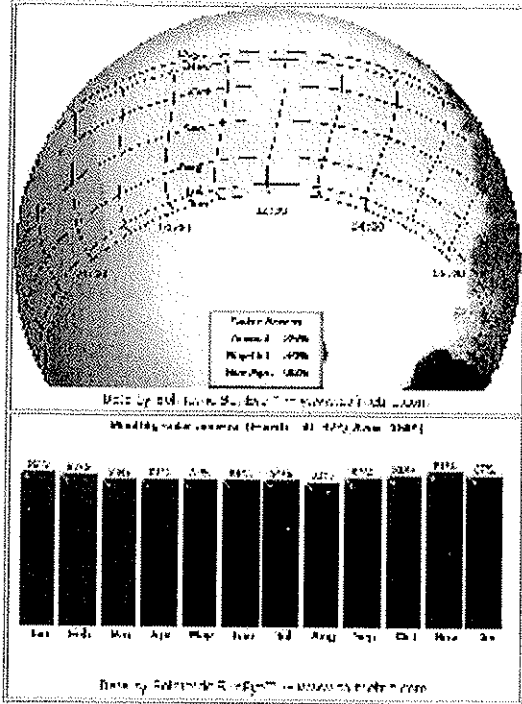
Sky12 – 11/8/2012 13:10 – (no skyline note)

Panel Orientation: Tilt=42° – Azimuth=180° – Skyline Heading=181°
 GPS Location: Latitude=41.95514°N – Longitude=72.45072°W
 Solar Access: Annual: 94% – Summer (May-Oct): 95% – Winter (Nov-Apr): 92%
 TSRF: 93% – TOF: 100%



Sky13 -- 11/8/2012 13:14 -- (no skyline note)

Panel Orientation: Tilt=42° -- Azimuth=180° -- Skyline Heading=182°
 GPS Location: Latitude=41.95430°N -- Longitude=72.45174°W
 Solar Access: Annual: 85% -- Summer (May-Oct): 84% -- Winter (Nov-Apr): 86%
 TSRF: 85% -- TOF: 100%



Sky14 -- 11/8/2012 13:16 -- (no skyline note)

Panel Orientation: 1 Axis -- Tilt=0° -- Azimuth=180° -- Tracking Limit=45° -- Skyline Heading=179°
 GPS Location: Latitude=41.95426°N -- Longitude=72.45172°W
 Solar Access: Annual: 93% -- Summer (May-Oct): 93% -- Winter (Nov-Apr): 93%
 TSRF: 102% -- TOF: 110%

