Mid-Winter Shadow Length: 18˚S

When Installing a solar array behind or generally to the south of an object, such as another solar array, you may need to know how far to the south of the object the new solar array may need to be in order to not be shaded. Since mid winter is when the longest shadows occur, the table below gives the direction of the shadow for each 15 minute interval. The horizontal distance of the shadow can then be calculated by multiplying the height of the object (eg solar array) by the shadow length multipliers provided in the table. It is recommended that these calculations be performed for both the eastern and the western end of the obstacle.

Local Time	Sun Azimuth	Sun Altitude	Cast Shadow					
			Direction	Length			South	East/West
6:49	65.414˚	RISE	245.414˚	Sunrise				West
7:00	64.549˚	1.953˚	244.549˚	29.332			12.605	26.485 West
7:15	63.293˚	5.156˚	243.293˚	11.083			4.981	9.901 West
7:30	61.940˚	8.322˚	241.940˚	6.836			3.216	6.032 West
7:45	60.482˚	11.447˚	240.482˚	4.938			2.433	4.297 West
8:00	58.908˚	14.526˚	238.908˚	3.859			1.993	3.305 West
8:15	57.206˚	17.552˚	237.206˚	3.161			1.712	2.657 West
8:30	55.364˚	20.519˚	235.364˚	2.672			1.519	2.198 West
8:45	53.366˚	23.417˚	233.366˚	2.309			1.378	1.853 West
9:00	51.198˚	26.239˚	231.198˚	2.029			1.271	1.581 West
9:15	48.840˚	28.971˚	228.840˚	1.806			1.189	1.360 West
9:30	46.275˚	31.603˚	226.275˚	1.625			1.123	1.174 West
9:45	43.483˚	34.120˚	223.483˚	1.476			1.071	1.016 West
10:00	40.445˚	36.505˚	220.445˚	1.351			1.028	0.876 West
10:15	37.144˚	38.740˚	217.144˚	1.246			0.993	0.752 West
10:30	33.563˚	40.804˚	213.563˚	1.158			0.965	0.640 West
10:45	29.694˚	42.675˚	209.694˚	1.085			0.943	0.537 West
11:00	25.535˚	44.329˚	205.535˚	1.024			0.924	0.441 West
11:15	21.095˚	45.741˚	201.095˚	0.974			0.909	0.351 West
11:30	16.399˚	46.888˚	196.399˚	0.936			0.898	0.264 West
11:45	11.486˚	47.748˚	191.486˚	0.908			0.890	0.181 West
12:00	6.409˚	48.303˚	186.409˚	0.891			0.885	0.099 West
12:15	1.237˚	48.541˚	181.237˚	0.883			0.883	0.019 West
12:30	356.047˚	48.457˚	176.047˚	0.886			0.884	0.061 East
12:45	350.916˚	48.051˚	170.916˚	0.899			0.888	0.142 East
13:00	345.917˚	47.335˚	165.917˚	0.922			0.894	0.224 East
13:15	341.111˚	46.322˚	161.111˚	0.955			0.904	0.309 East
13:30	336.546˚	45.033˚	156.546˚	0.999			0.916	0.398 East
13:45	332.252˚	43.491˚	152.252˚	1.054			0.933	0.491 East
14:00	328.244˚	41.721˚	148.244˚	1.122			0.954	0.591 East
14:15	324.527˚	39.746˚	144.527˚	1.203			0.980	0.698 East
14:30	321.094˚	37.589˚	141.094˚	1.299			1.011	0.816 East
14:45	317.932˚	35.273˚	137.932˚	1.414			1.050	0.947 East
15:00	315.025˚	32.817˚	135.025˚	1.551			1.097	1.096 East
15:15	312.355˚	30.238˚	132.355˚	1.716			1.156	1.268 East
15:30	309.901˚	27.552˚	129.901˚	1.917			1.230	1.471 East
15:45	307.645˚	24.771˚	127.645˚	2.167			1.324	1.716 East
16:00	305.568˚	21.908˚	125.568˚	2.487			1.447	2.023 East
16:15	303.654˚	18.973˚	123.654˚	2.909			1.612	2.421 East
16:30	301.887˚	15.974˚	121.887˚	3.493			1.845	2.966 East
16:45	300.254˚	12.920˚	120.254˚	4.359			2.196	3.765 East
17:00	298.742˚	9.816˚	118.742˚	5.780			2.779	5.068 East
17:15	297.340˚	6.668˚	117.340˚	8.553			3.928	7.598 East
17:30	296.038˚	3.482˚	116.038˚	16.434			7.214	14.766 East
17:45	294.829˚	0.262˚	114.829˚	218.946			91.938	198.708 East
17:48:00	294.521˚	SET	114.521˚	Sunset				East

The length is in the direction indicated in the previous column. The shadow length is a multiplier. For example, if the height of the object is 0.75 metres, then multiply the multiplier in each line by 0.75 to give the horizontal shadow length in metres.

The south and east/west components of the shadow show how far south of the object the shadow will be cast and how far east or west of the object the shadow will be cast on a horizontal plane. The south and east/west components are multipliers as for length.

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