

TO:
Nadine R.

FOR:
Solar Shading Report

Project Scope – Perform a solar shading analysis on the neighboring adjacent homes to see the impact of adding a penthouse on the roof at 828 12 ST NE, Washington DC. There are 3 adjacent homes with existing solar pv systems installed which need to be analyzed.

Summary – We looked at the solar path and the azimuth angles for Dec 20, the shortest day of the year. The shadows will be the longest on this day. We measured the distances and angles to the neighboring homes with solar installed. We built a solar pv model in Aurora Solar. We ran the shading report as a baseline. We added the penthouse and ran the shading report again for comparison.

There is no added shading from the penthouse addition

Location - 828 12 ST NE, Washington DC

Bing Maps

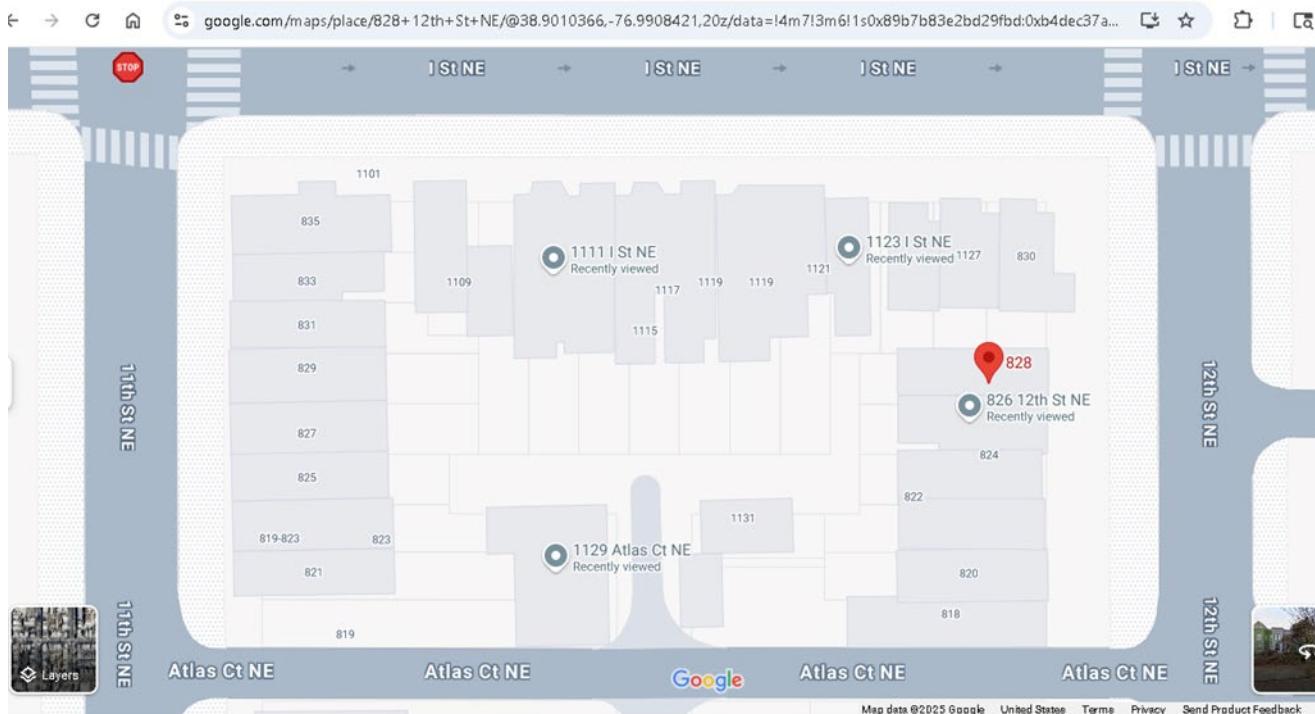
<https://www.bing.com/maps?cp=38.900997%7E-76.990681&lvl=20.0>

Neighbor Solar Installations



Street Map

Roof Heights



Existing Structure – 828 12 ST NE**Proposed Penthouse addition**

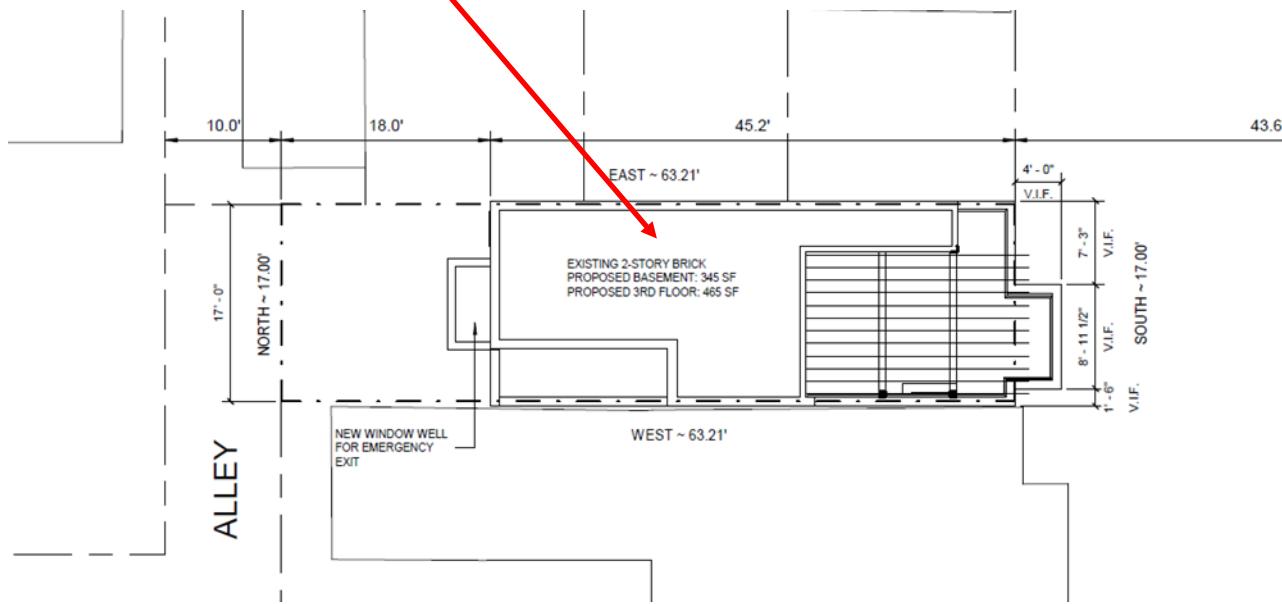
Rendering – Penthouse Addition

New Roof Height = 30 ft Maximum

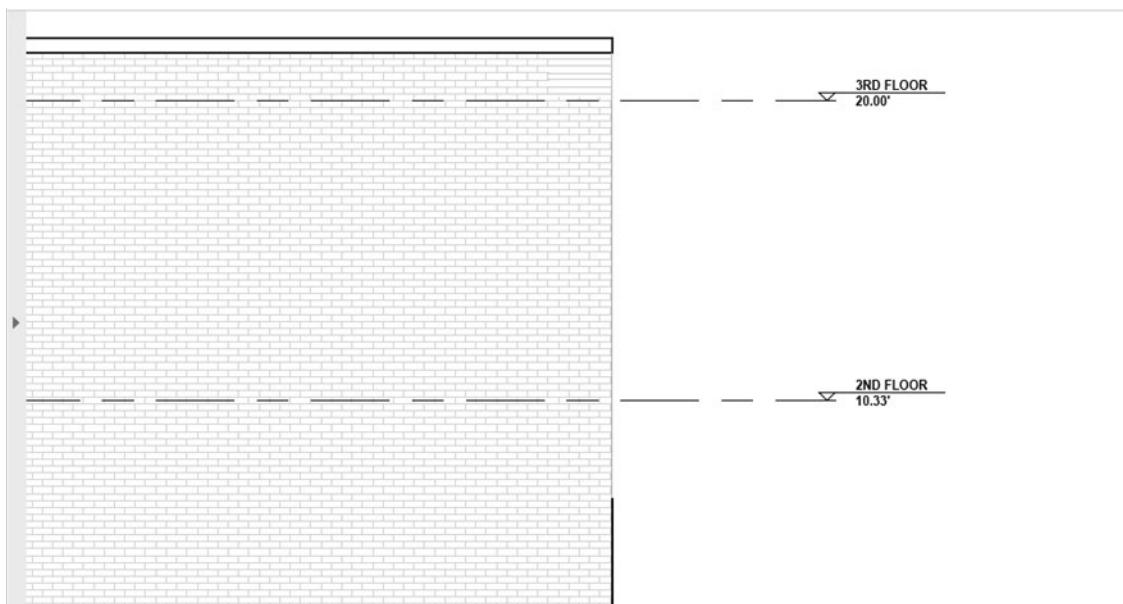


Proposed Penthouse addition

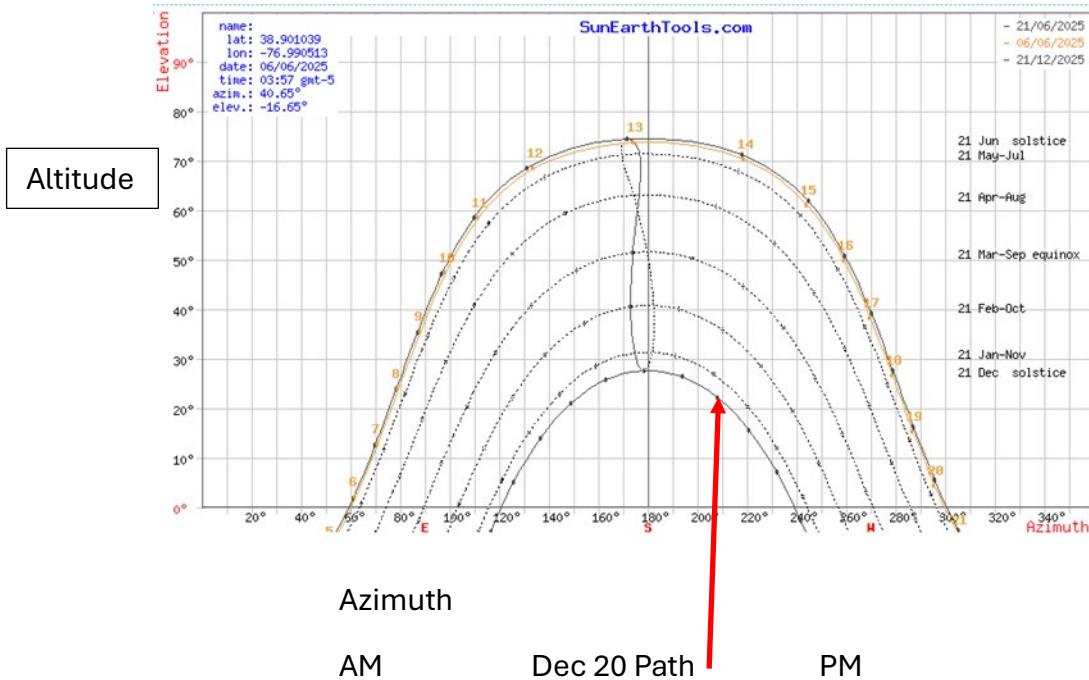
Drawing – Penthouse Addition



Existing North Elevation

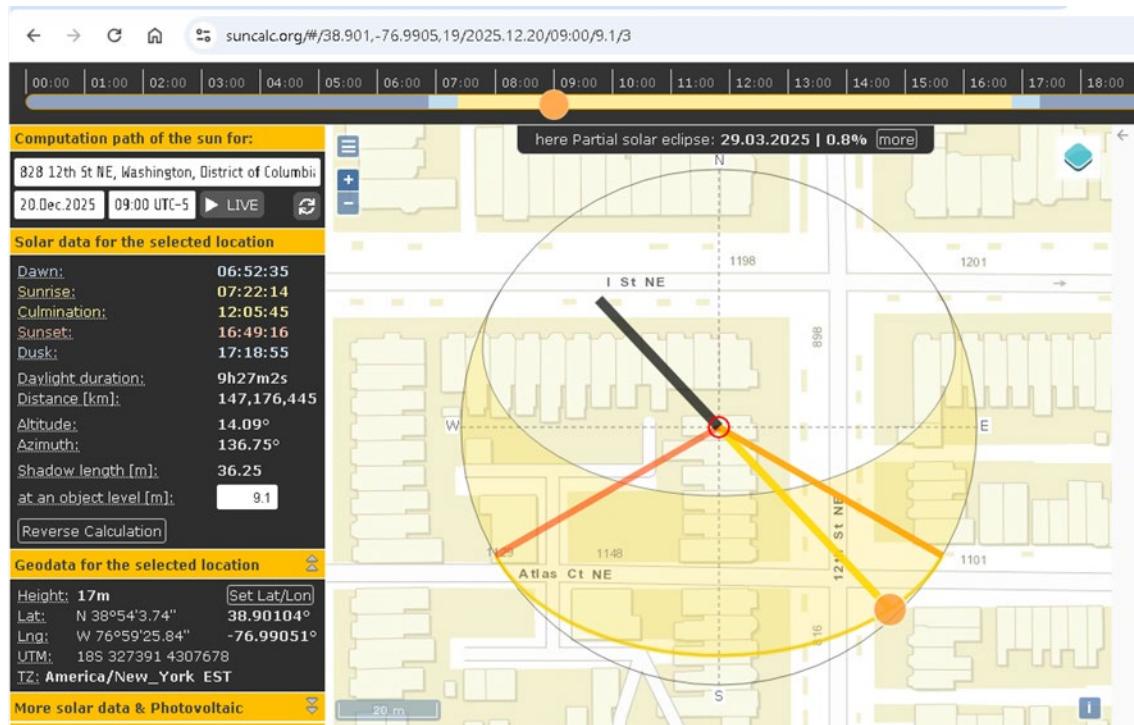


Sun path annual curves

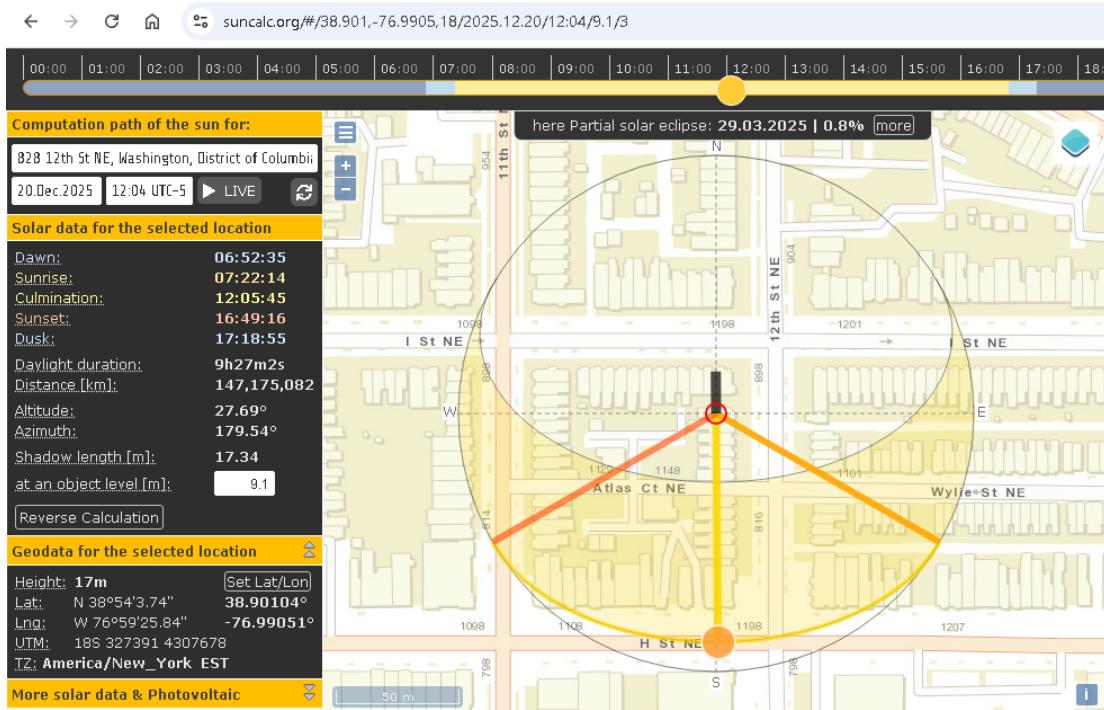


Sun path – shadow length

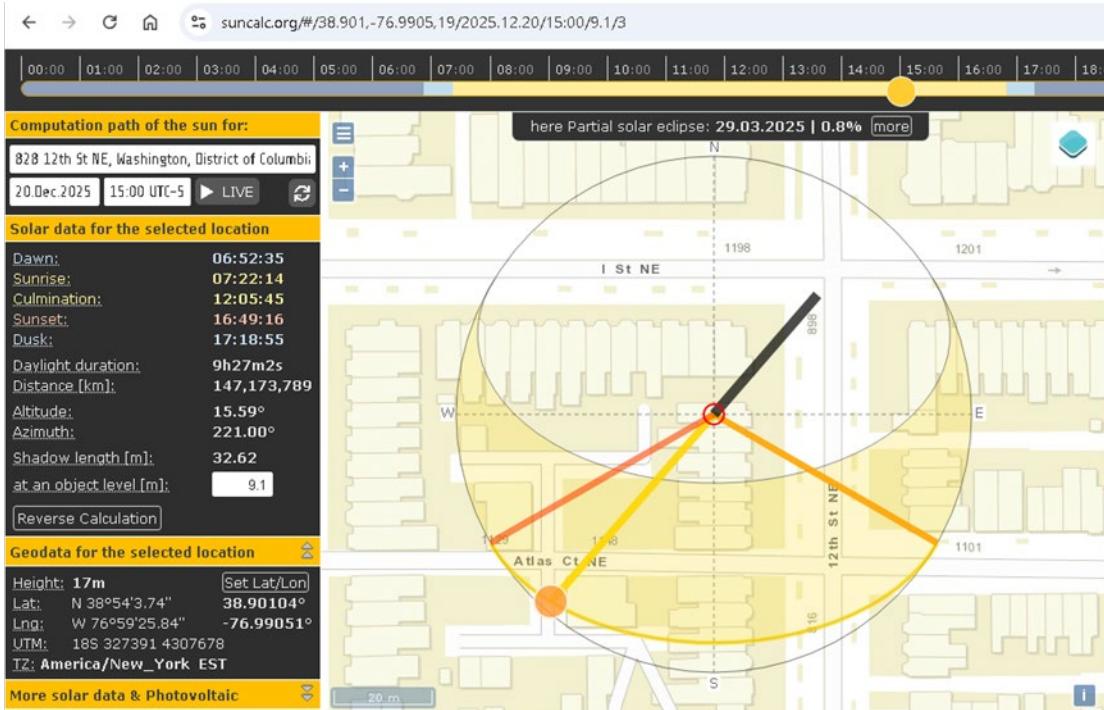
Dec 20 , 9 AM shadow - building 30 ft high = 9.1 m – shadow = 36.25 M = 118.9 ft – 317 degrees



Dec 20, 12 noon shadow - building 30 ft high = 9.1 m – shadow = 17.3 m = 56.7 ft – 0 degrees



Dec 20, 3 PM shadow - building 30 ft high = 9.1 m – shadow = 32.6 M = 106.9 ft – 41 degrees

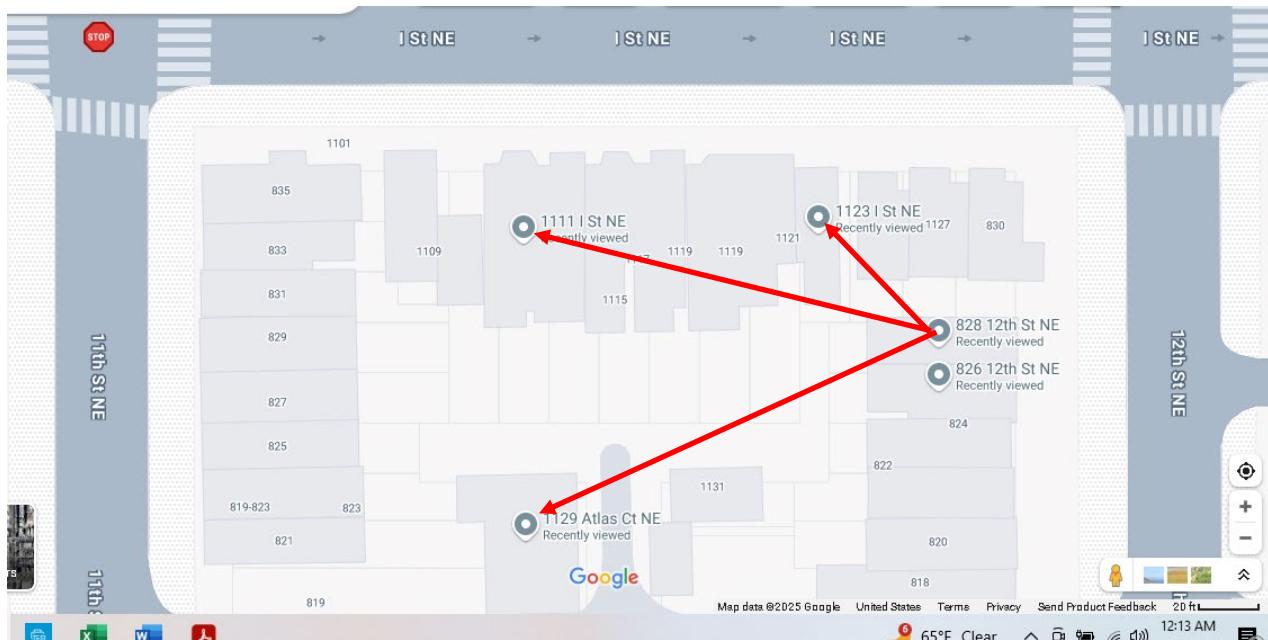


Shadow Chart

Roof Height - ft	Date	Time	Sun Azimuth - deg	Shadow Direction - deg	Shadow Length - ft	Comments
22	20-Dec	9:00 AM	137.3	317	84.9	Original height
22	20-Dec	Noon	178	0	41.6	Original height
22	20-Dec	3:00 PM	221.6	41	80.7	Original height
30	20-Dec	9:00 AM	137.3	317	118.9	Penthouse Addition
30	20-Dec	Noon	178	0	97.2	Penthouse Addition
30	20-Dec	3:00 PM	221.6	41	106.9	Penthouse Addition

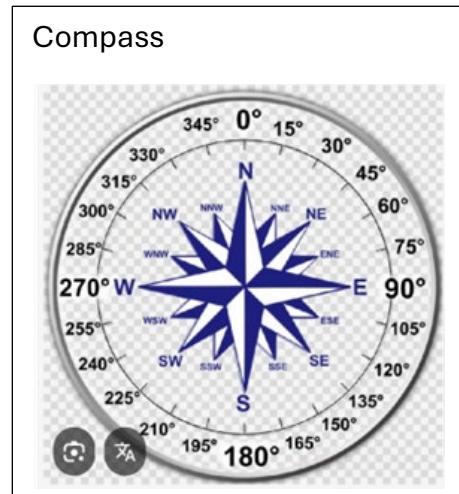
Measurements / Angles

Measurements are made from satellite images and are approximate



Solar pv existing installations – distances chart

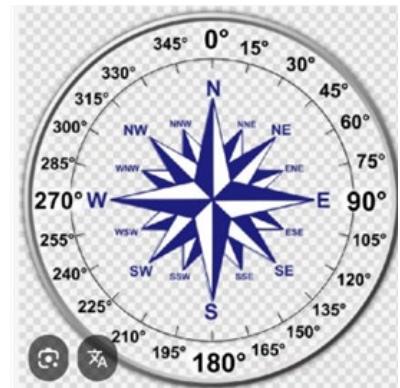
Shadow Analysis					
828 12 ST NE Washington DC 20002					
Neighbor Addresses - Distances					
Address	Street	Distance from 828 12 ST NE - ft	Direction from 828 12 ST NE - deg	Comments	
1111	1 ST NE	137	286	Solar installed	
1123	1 ST NE	42	316	Solar installed	
1129	Atlas CT NE	146	240	Solar installed	



All adjacent home distances – angles chart

Shadow Analysis				
828 12 ST NE Washington DC 20002				
Neighbor Addresses - Distances				
Address	Street	Distance from 828 12 ST NE - ft	Direction from 828 12 ST NE - deg	Comments
1107	1 ST NE	167	282	
1109	1 ST NE	153	284	
1111	1 ST NE	137	286	Solar installed
1113	1 ST NE	119	290	
1115	1 ST NE	100	298	
1117	1 ST NE	89	302	
1119	1 ST NE	71	308	
1121	1 ST NE	50	312	
1123	1 ST NE	42	316	Solar installed
1125	1 ST NE	35	328	
1127	1 ST NE	31	348	
1129	Atlas CT NE	146	240	Solar installed
818	12 ST NE	82	180	
820	12 ST NE	66	180	
822	12 ST NE	50	180	
824	12 ST NE	34	180	
826	12 ST NE	14	180	
830	12 ST NE	40	0	
821	11 ST NE	208	250	
835	11 ST NE	204	283	

Compass

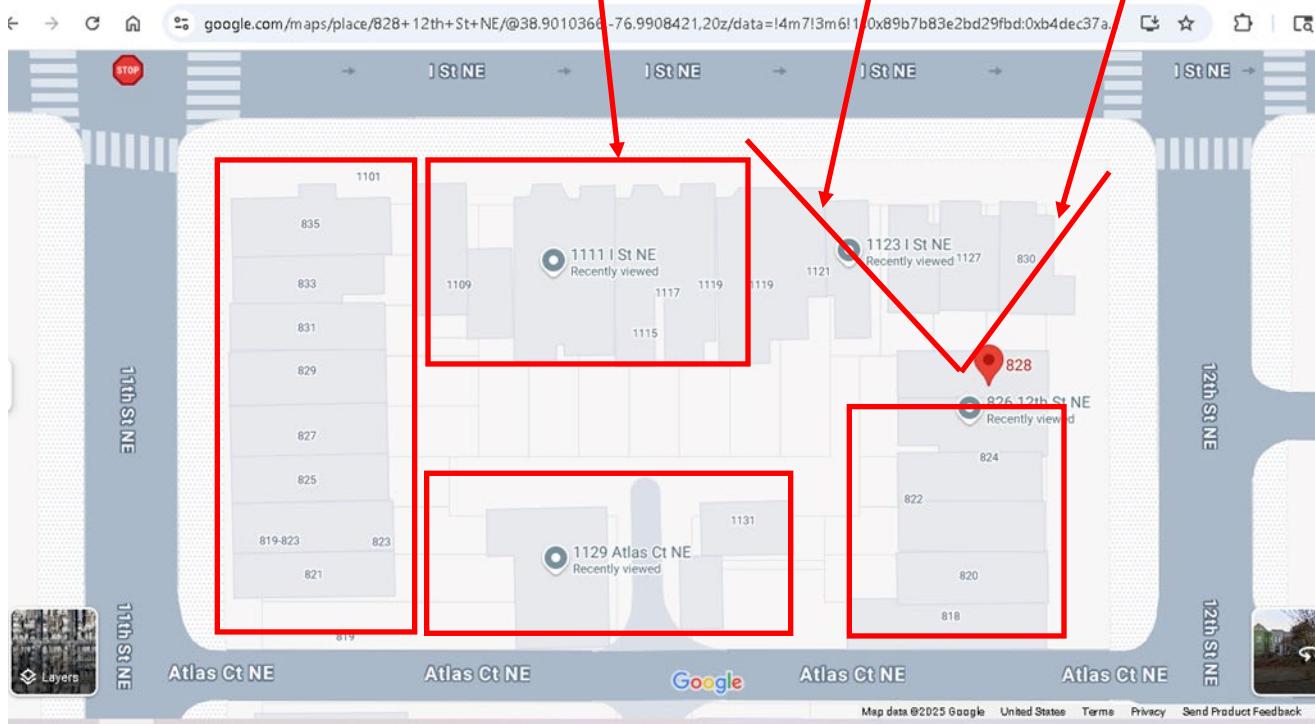


Solar Shadow – Comments

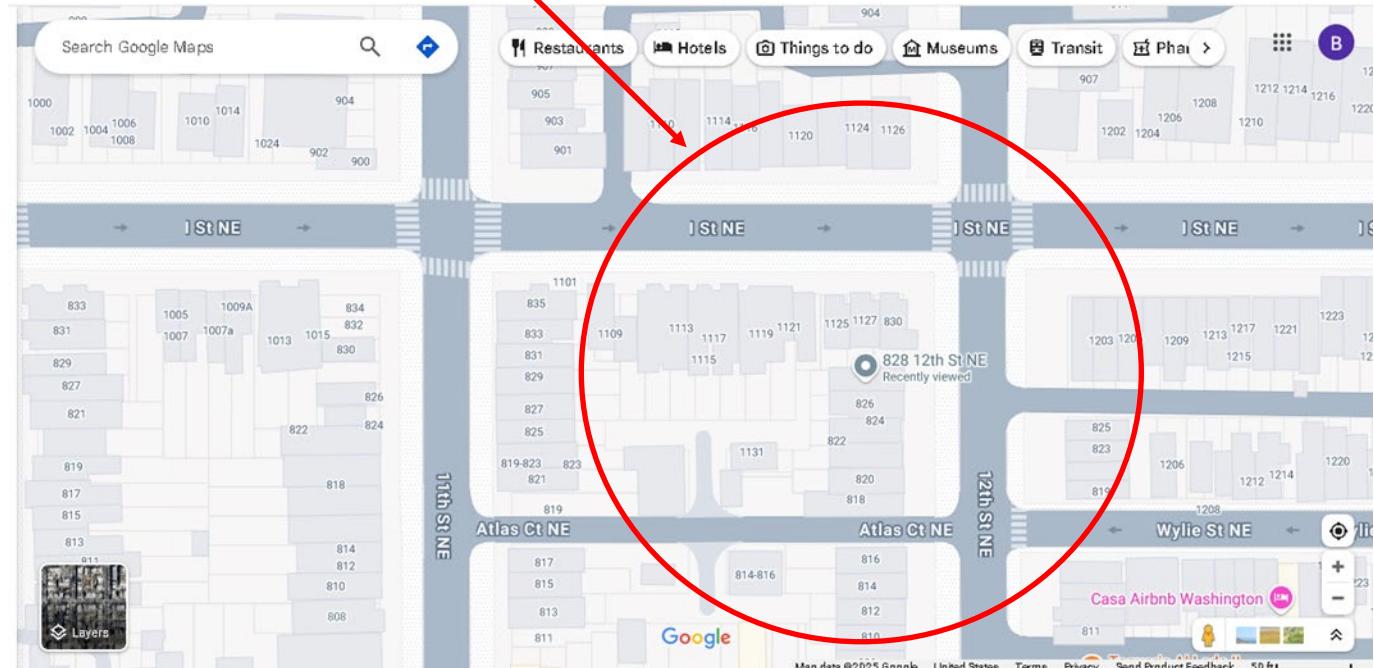
Squares = Areas not affected by addition

Shadow 9 AM

Shadow 3 PM

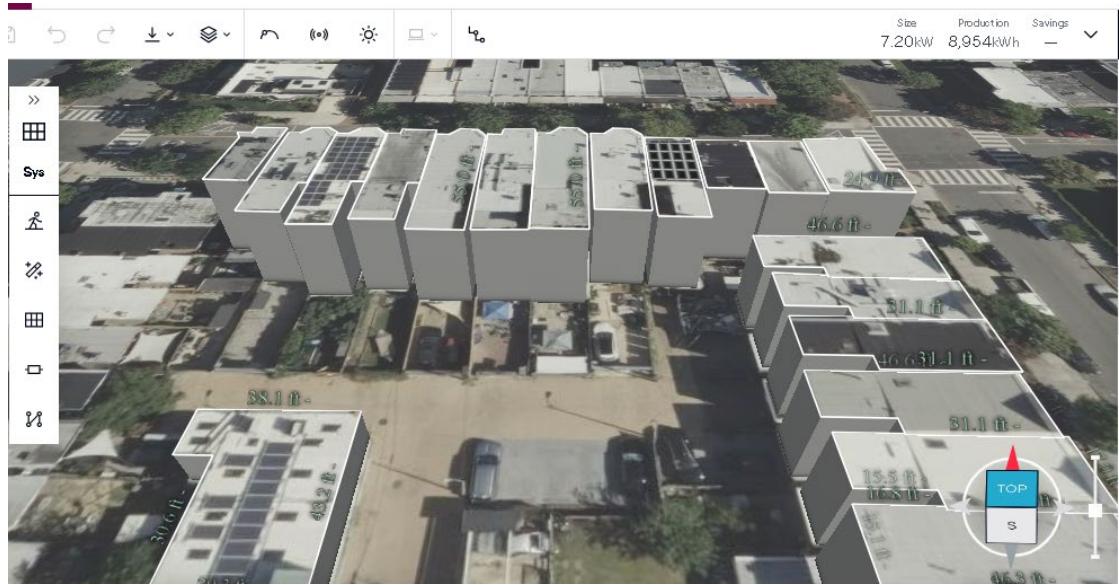


Neighbors within 200 feet radius

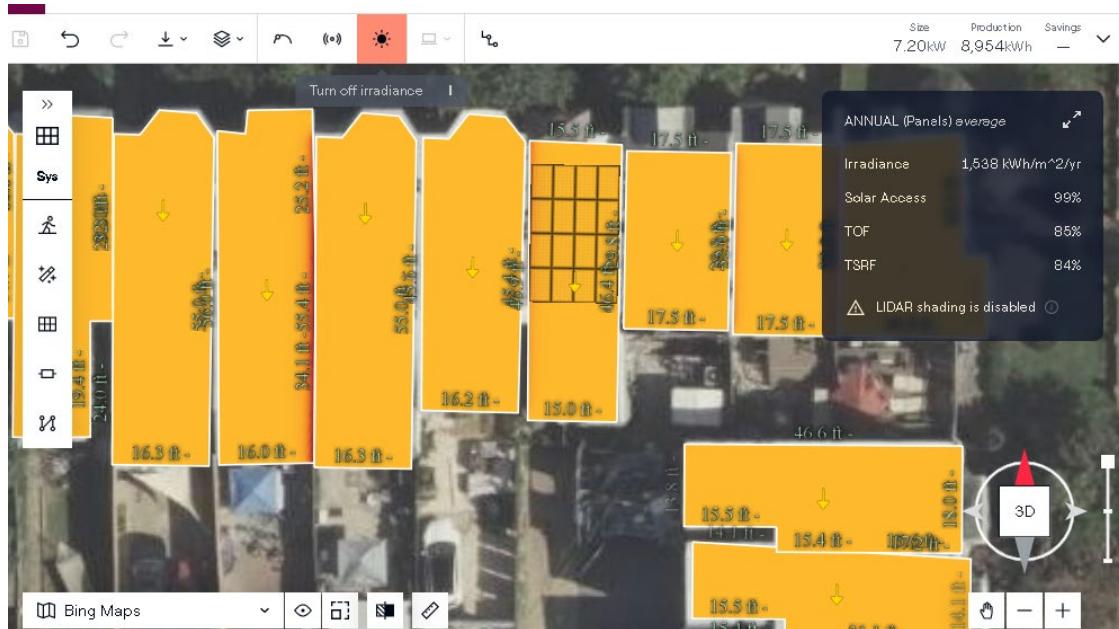


Aurora Solar Model

Aurora Solar Model

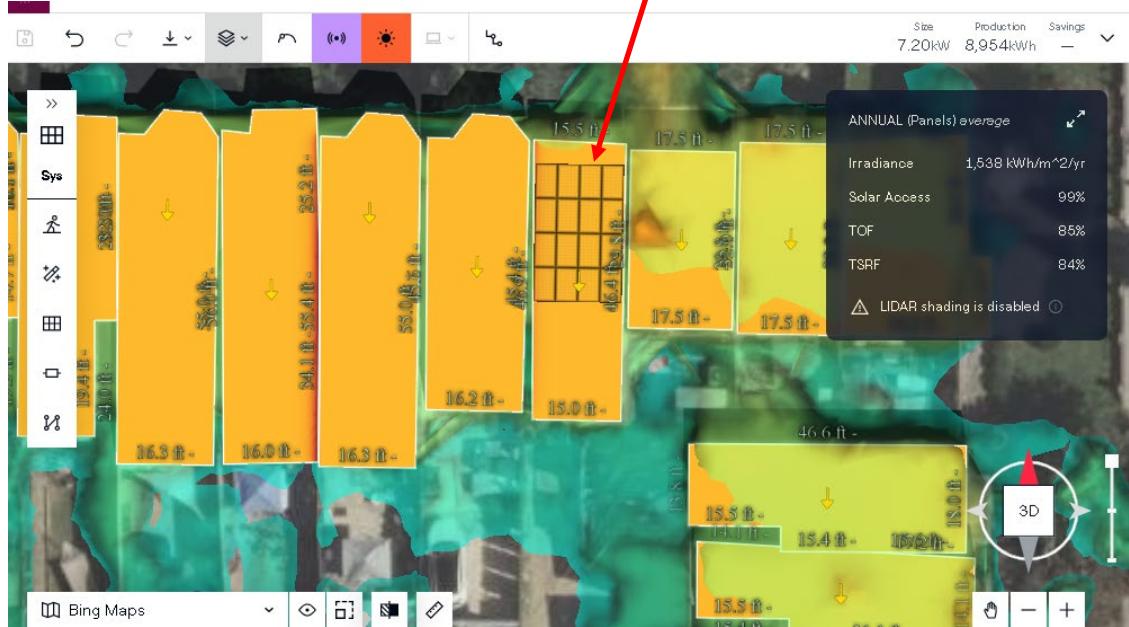
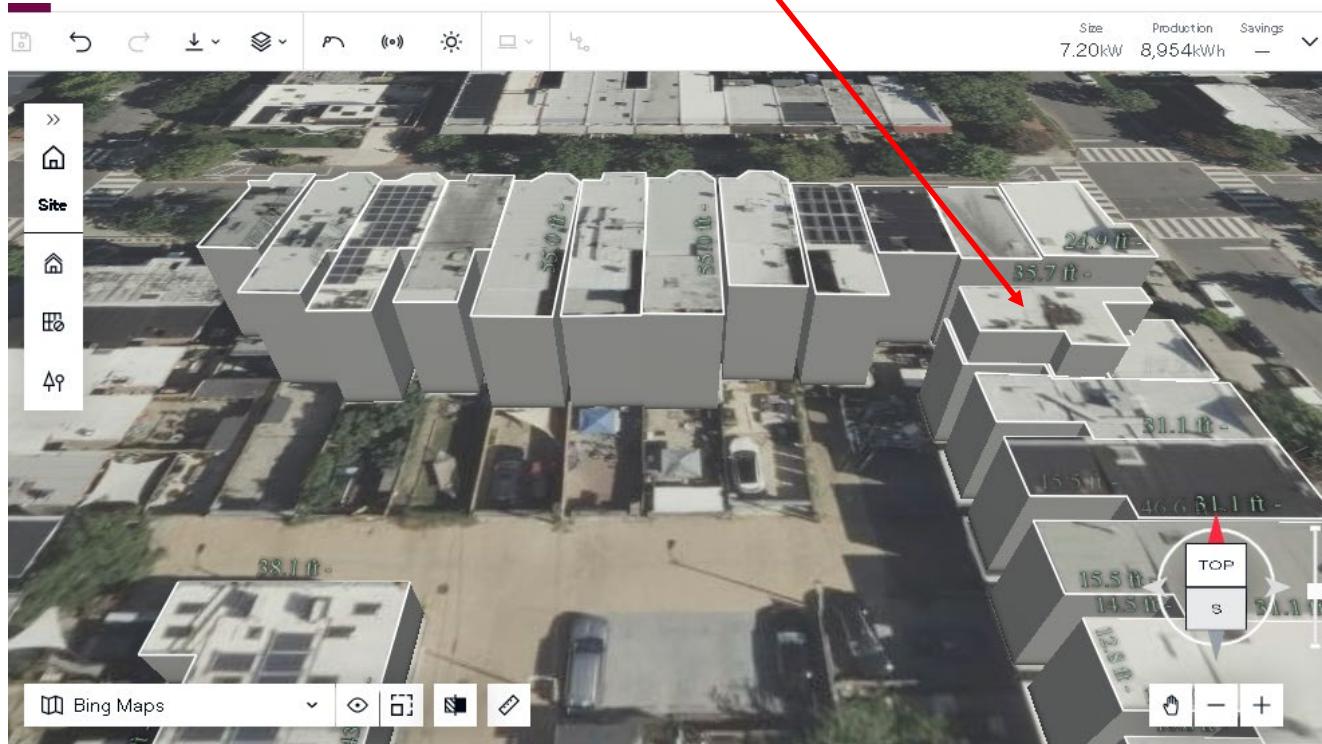


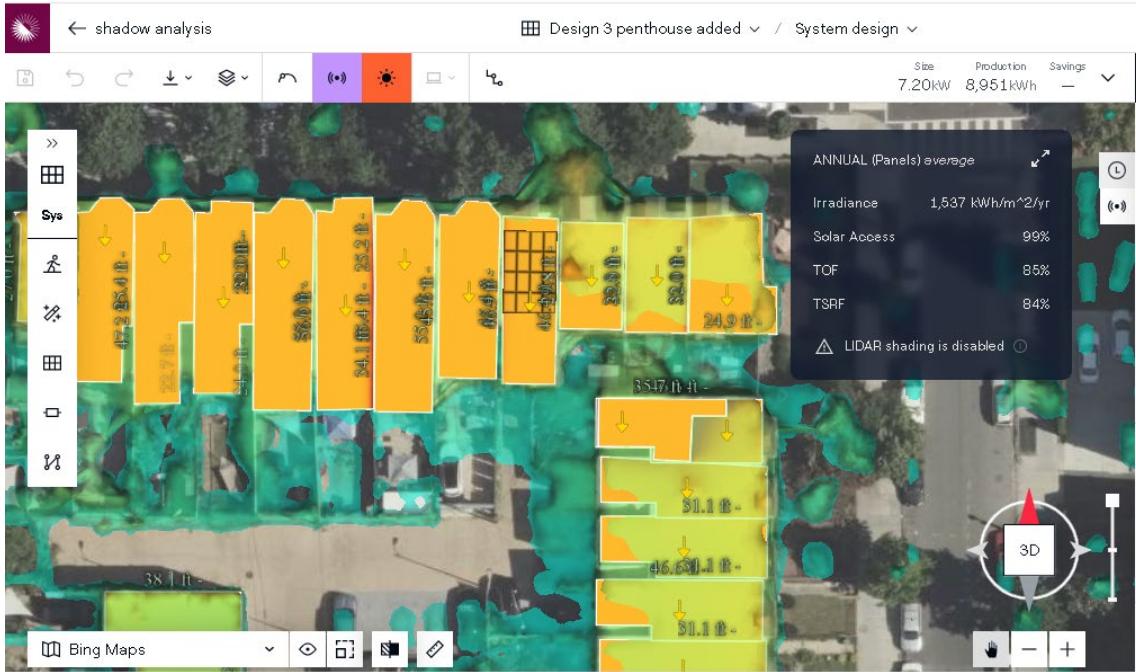
Solar Irradiance



Existing Building - Aurora Solar Shading Report – Full report sent as a separate document

No shading from 828 12ST NE to 1123 1 ST NE

**Aurora Solar – 828 12 ST NE with Penthouse Addition**

Solar Irradiance – Shading with penthouse addition

There is no added shading from the penthouse addition

