

William Batina

Solar Shading Report

Beacon Energy Consulting

PO Box 1234 | Carmel, NY 10512 | 914 224 5070

6/5/2025

Lighting Design / Photometric Analysis/ Solar PV /Data Analysis

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

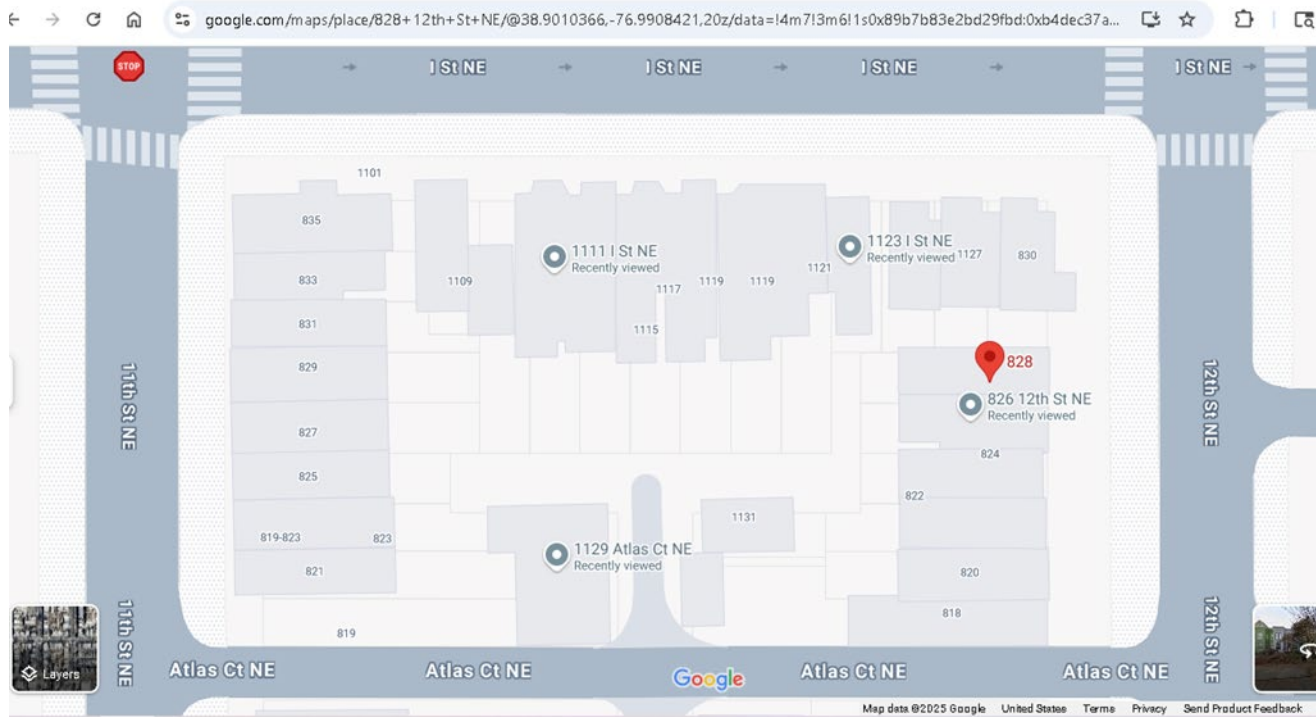
Location - 828 12 ST NE, Washington DC

Bing Maps

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

Neighbor Solar Installations



Street Map**Roof Heights**

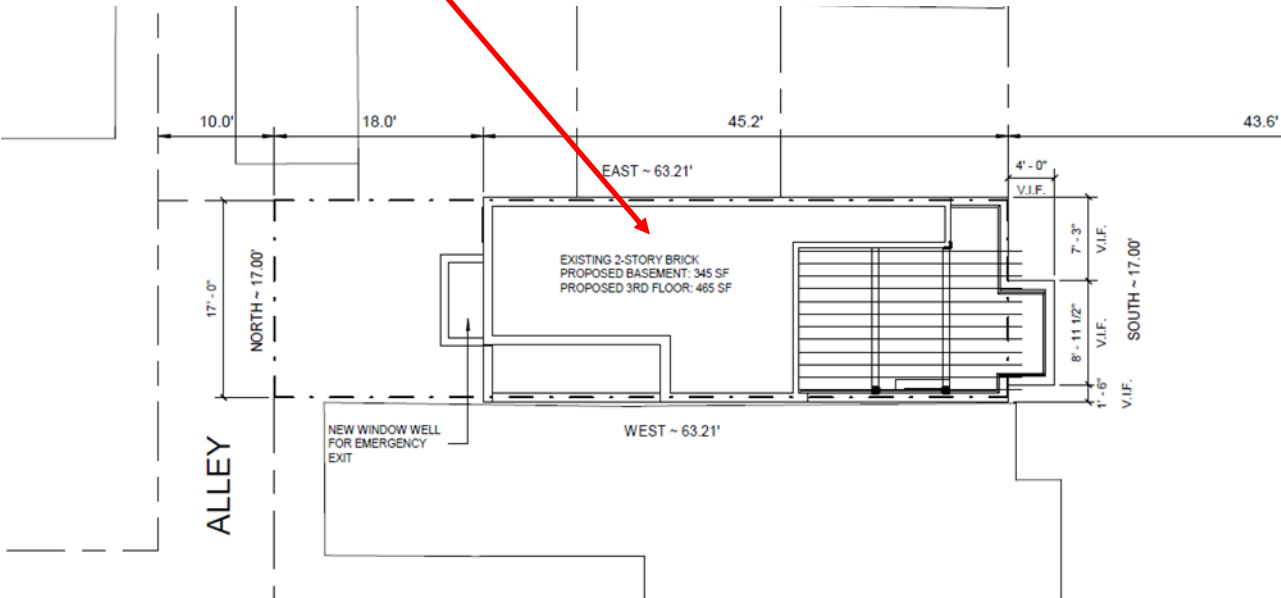
Existing Structure – 828 12 ST NE**Proposed Penthouse addition**

Rendering – Penthouse Addition New Roof Height = 30 ft Maximum

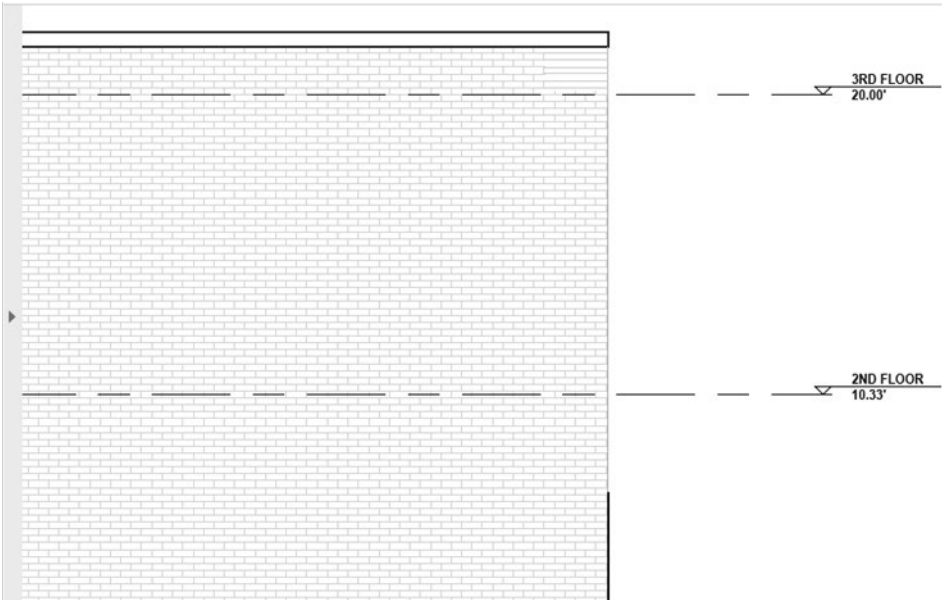


Proposed Penthouse addition

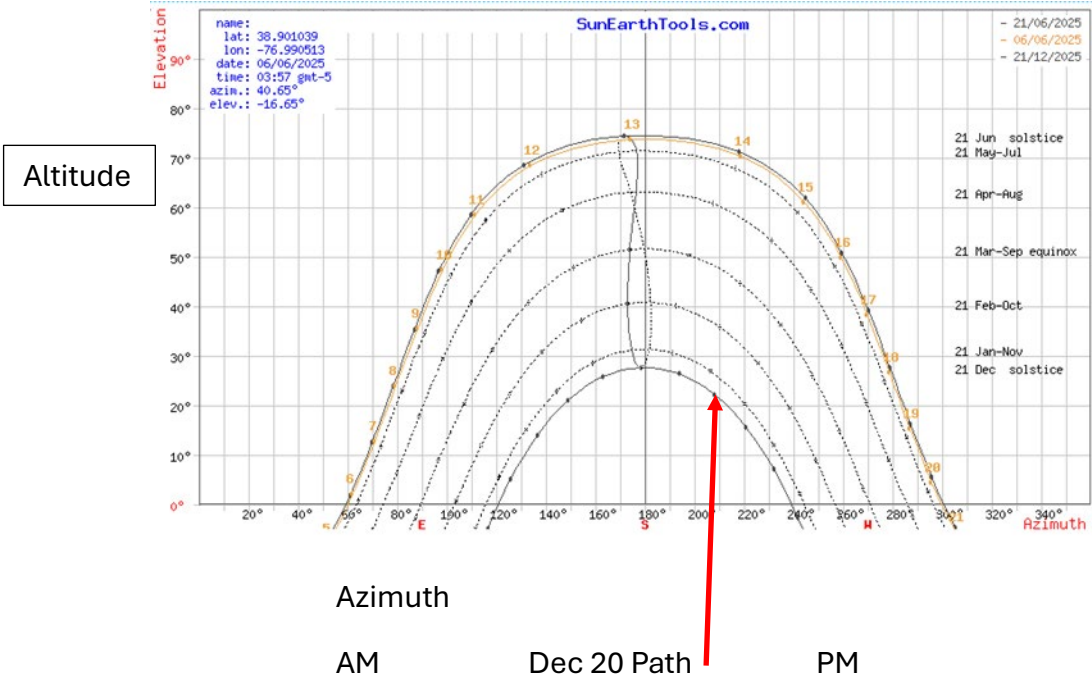
Drawing – Penthouse Addition



Existing North Elevation

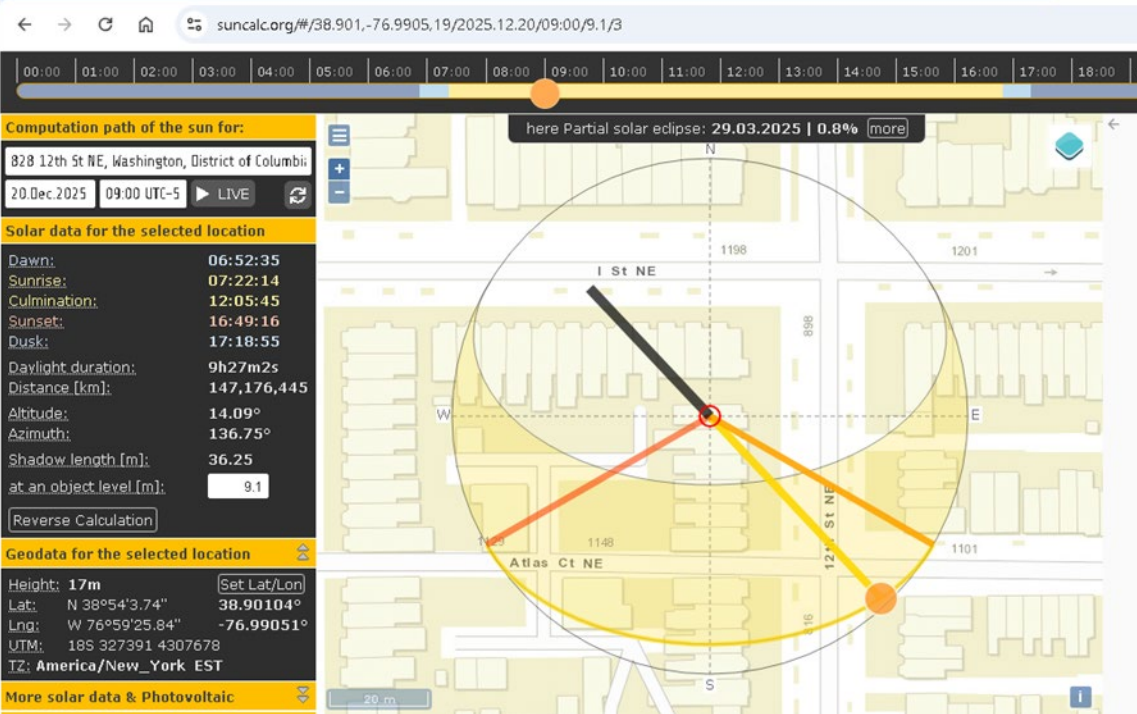


Sun path annual curves

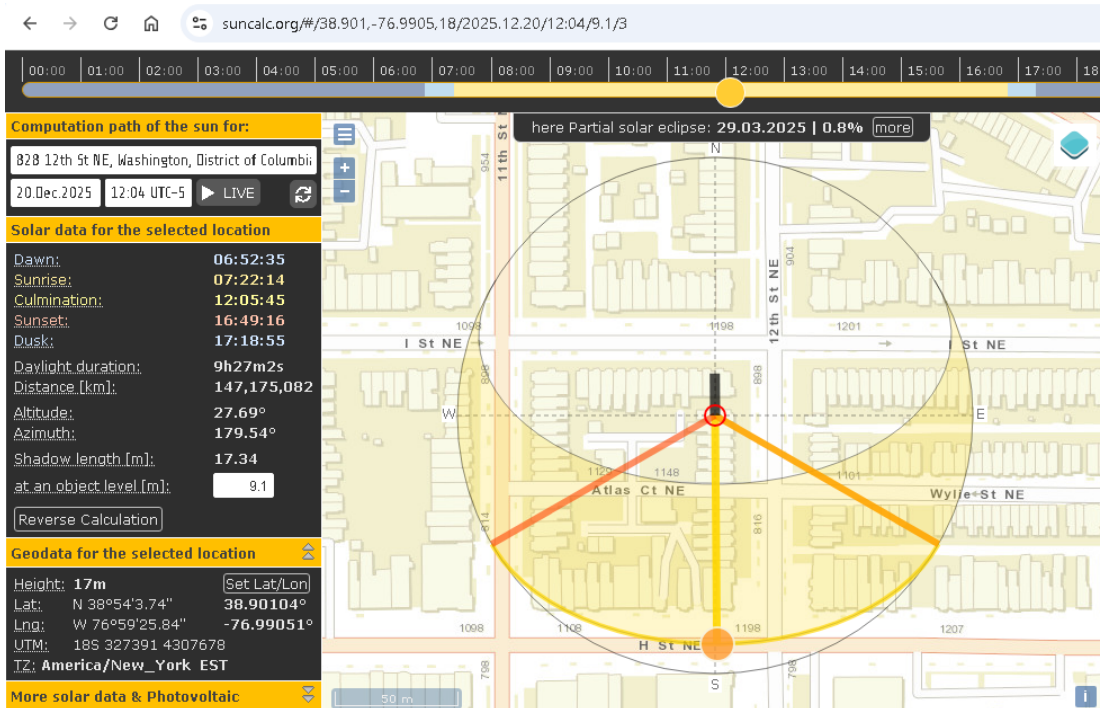


Sun path – shadow length

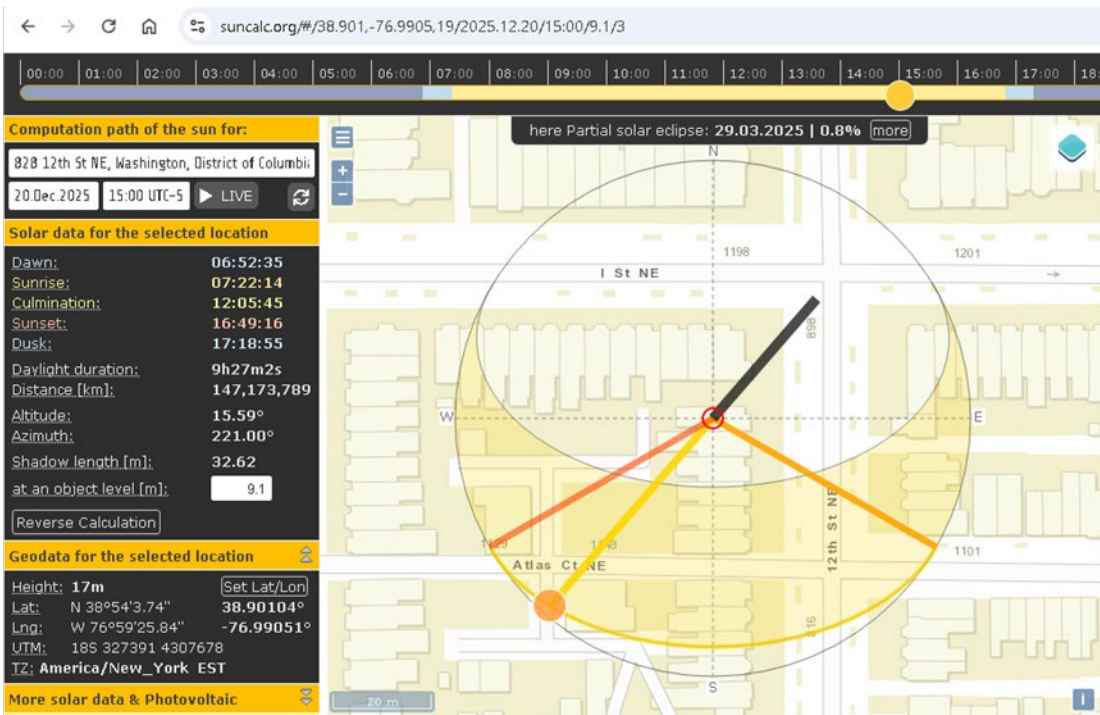
Dec 20 , 9 AM shadow - building 30 ft high = 9.1 m – shadow = 36.25 M = 118.9 ft – 317 degrees



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



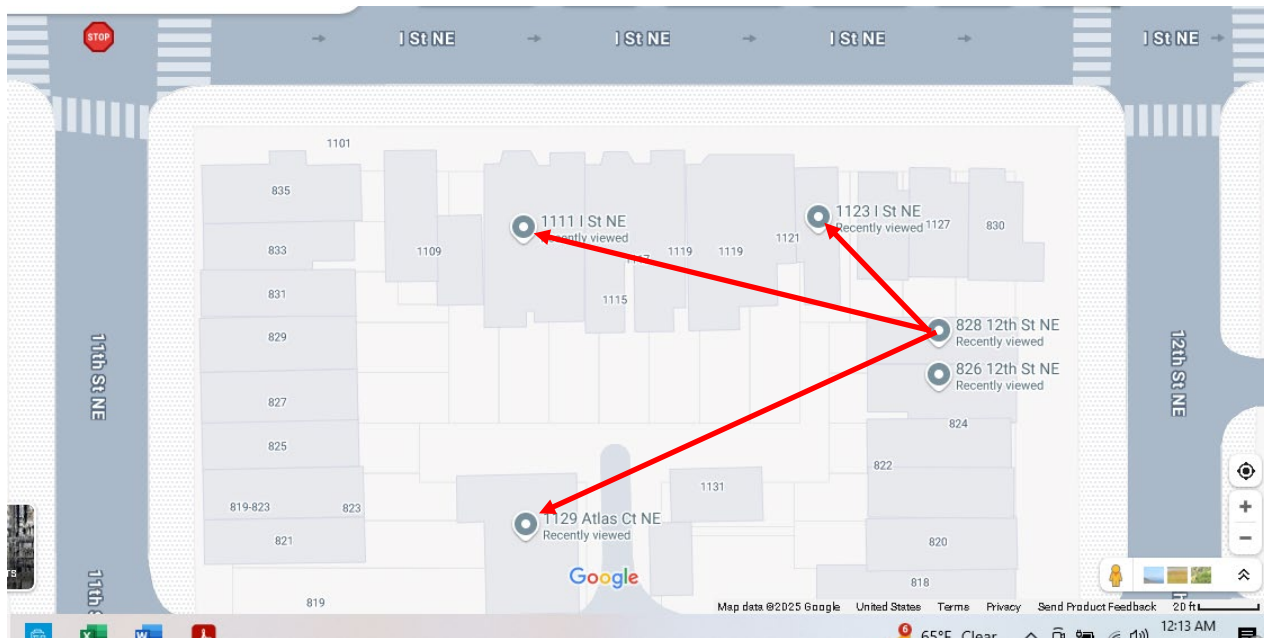
Dec 20 , 3 PM shadow - building 30 ft high = 9.1 m – shadow = 32.6 M = 106.9 ft – 41 degrees



Shadow Analysis - 828 12 ST NE Washington DC 20002							
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	

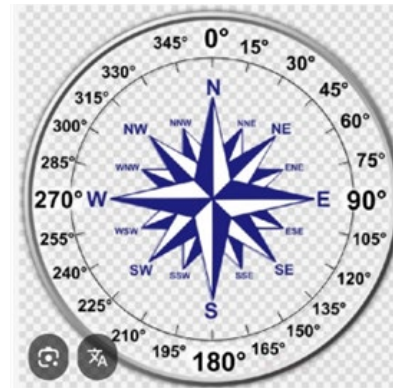
Compass



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

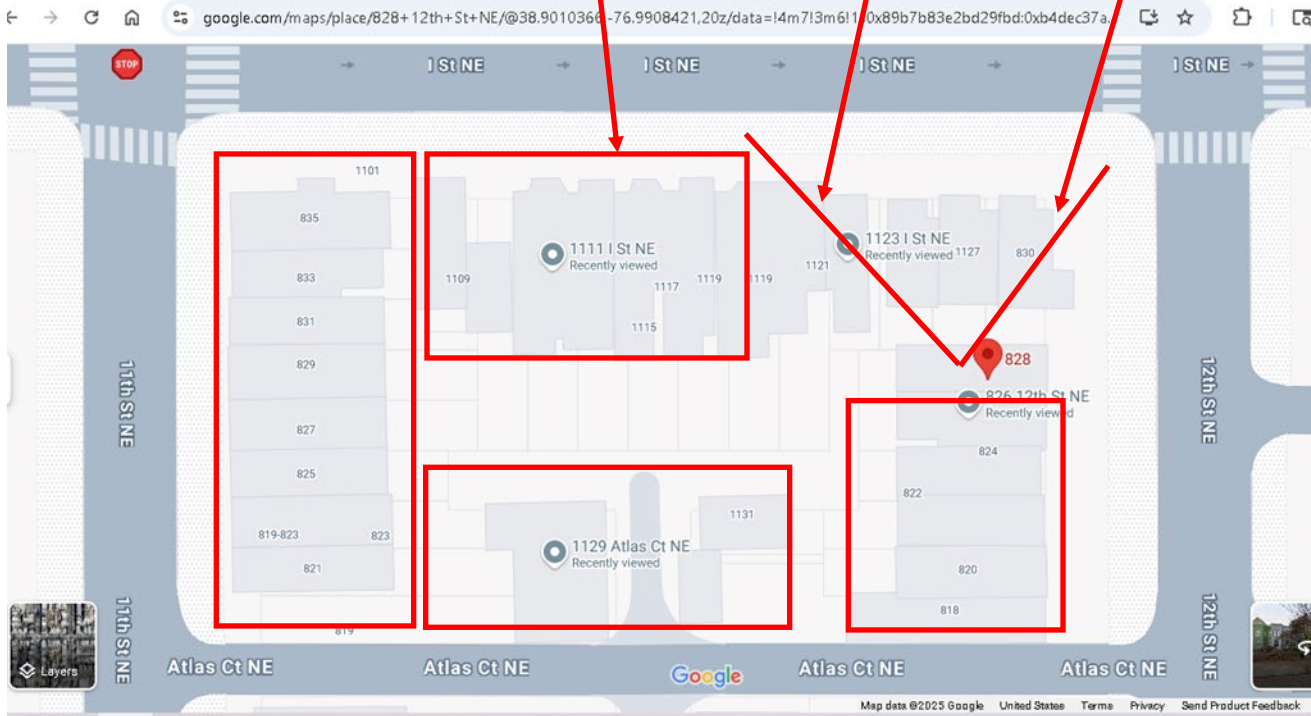
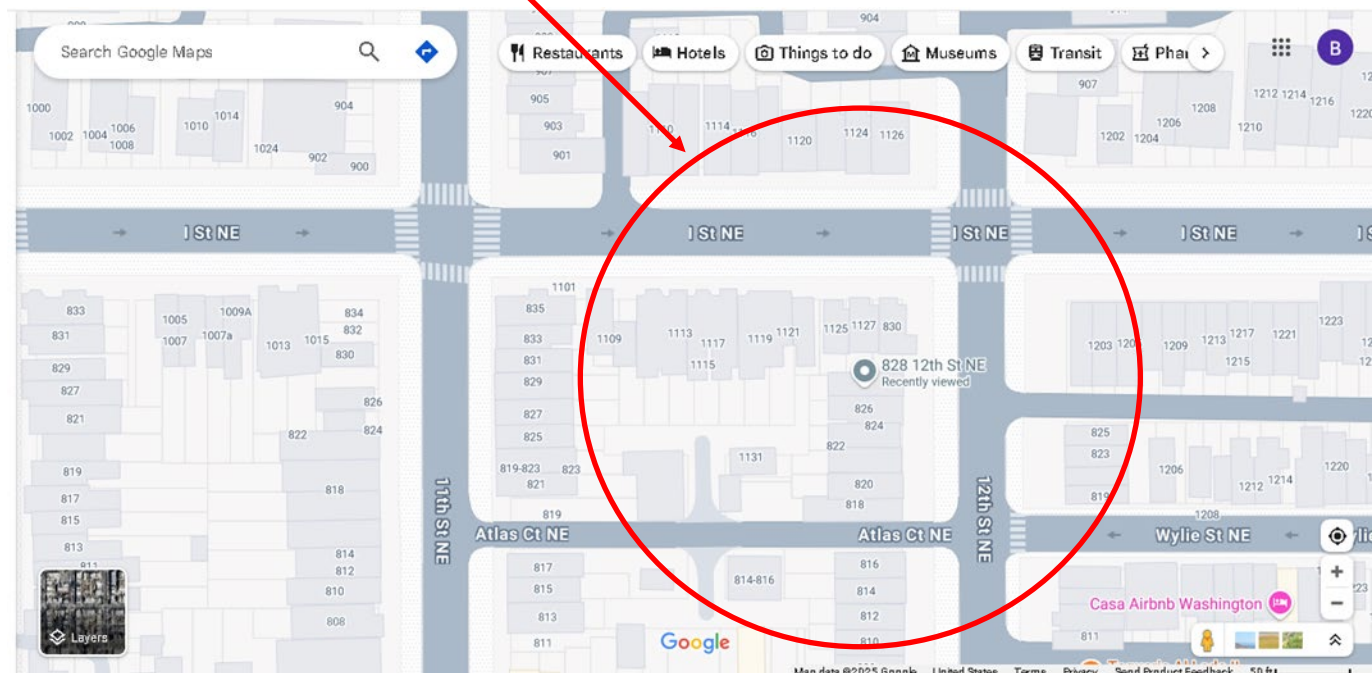


Solar Shadow – Comments

Squares = Areas not affected by addition

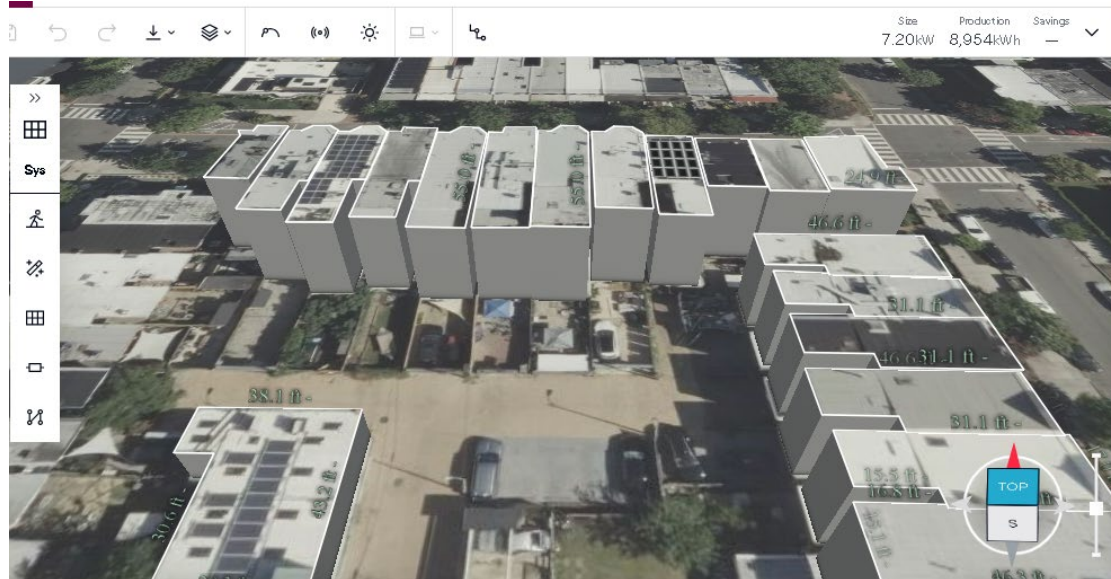
Shadow 9 AM

Shadow 3 PM

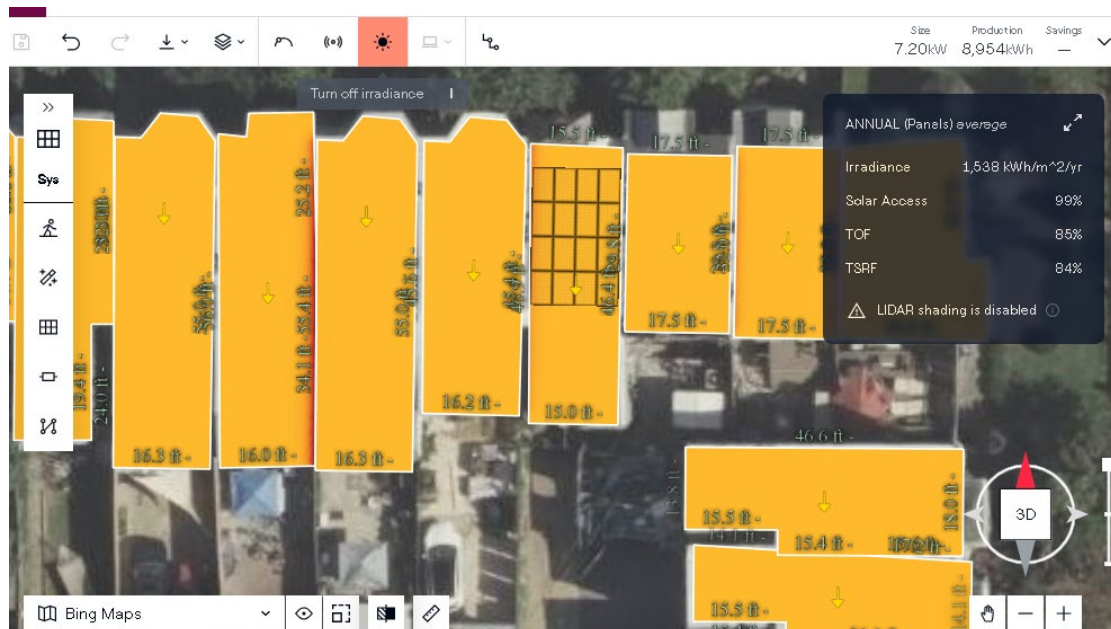
**Neighbors with in 200 feet radius**

Aurora Solar Model



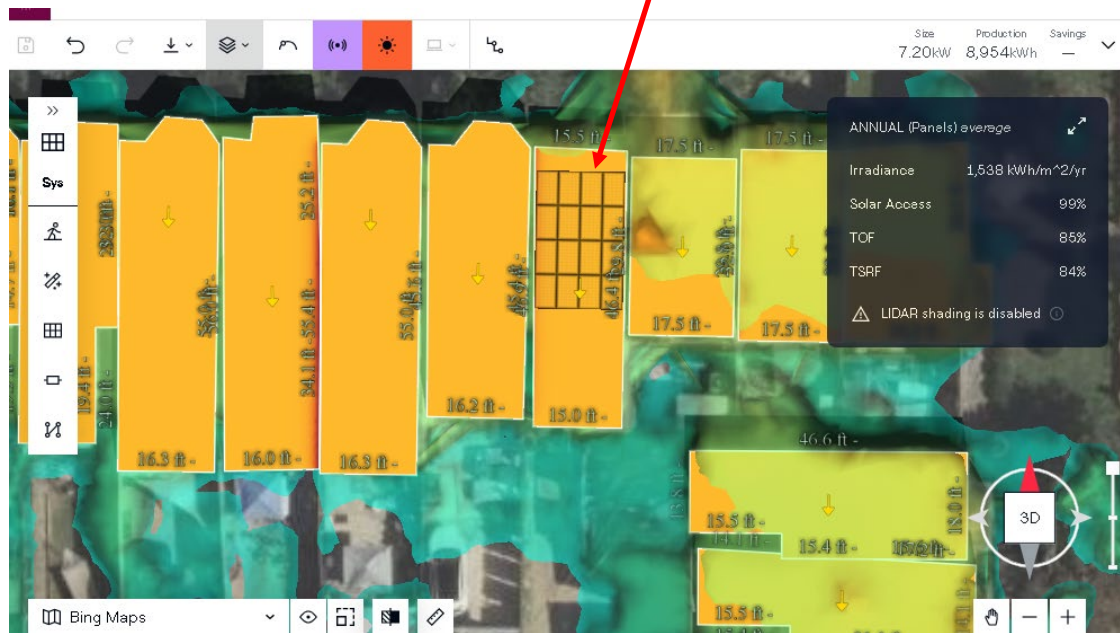
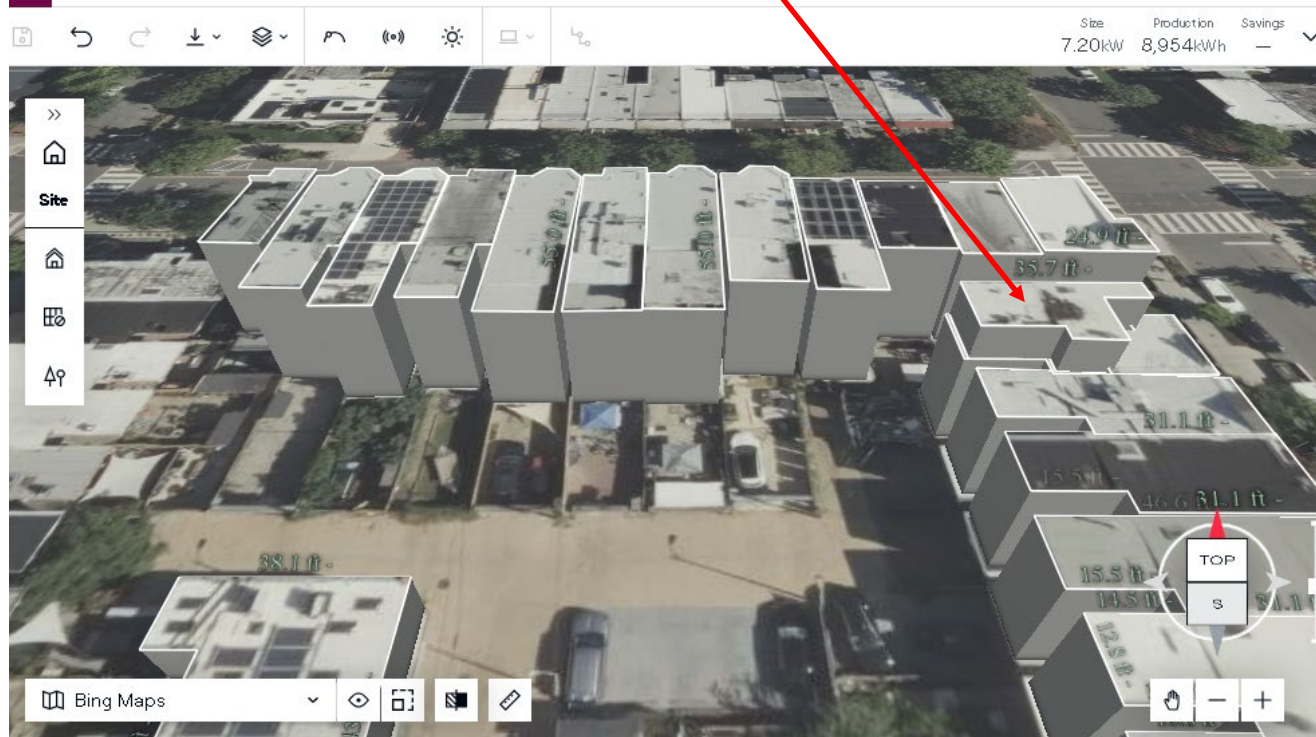


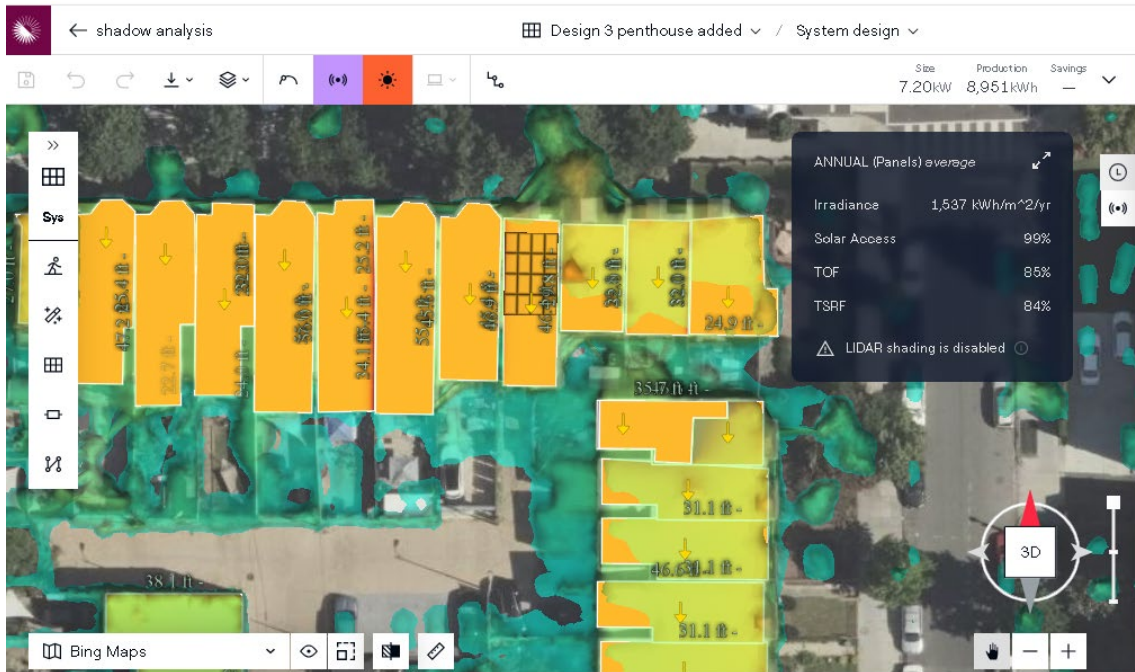
Solar Irradiance



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**



There is no added shading from the penthouse addition

