Charlotte Historic District Commission ***Application for a Certificate of Appropriateness***
Staff Review ***Date: March 11, 2015***
HDC 2015-034

LOCAL HISTORIC DISTRICT:	Fourth Ward
PROPERTY ADDRESS:	601 N. Pine Street
SUMMARY OF REQUEST:	Solar Panel Addition
OWNER:	Dave Broderdorp
APPLICANT:	Bob Kingery

Details of Proposed Request

Existing Conditions

The existing structure is a 1.5 story Victorian style home constructed in 1900. It is located on the corner of North Pine Street and West 9th Street in Fourth Ward.

Proposal

The proposal is the addition of 10-13 solar panels on three south facing roof planes. The applicant has stated a crape myrtle would be removed if "Array Deck 1" panels are approved. The panels are designed to be mounted flat on the roof.

The HDC Policy & Design Guidelines do not have explicit guidelines for solar panels on rooftops but considers this proposal an Addition. Ideally, solar panels should be located to the rear of a property and not substantially visible. The Secretary of Interior's Standards states solar panels can be installed in a sensitive manner and should conform to guidance regarding rooftop additions, i.e. that they be minimally visible to avoid altering the historic character of the building. See the National Park Service's *Technical Preservation Services* section on alternative energy (ITS Number 52).

Policy & Design Guidelines - Additions

Additions to existing structures in Local Historic Districts have a responsibility to complement the original structure. Additions should reflect the design, scale and architectural style of the original structure. The following guidelines are intended to encourage addition designs that are compatible with the existing structure, while not fully mimicking the original design.

1. All additions will be reviewed for compatibility by the following criteria:	
a. **Size**	the relationship of the project to its site
b. **Scale**	the relationship of the building to those around it
c. **Massing**	the relationship of the building's various parts to each other
d. **Fenestration**	the placement, style and materials of windows and doors
e. **Rhythm**	the relationship of fenestration, recesses and projections
f. **Setback**	in relation to setback of immediate surroundings
g. **Materials**	proper historic materials or approved substitutes
h. **Context**	the overall relationship of the project to its surroundings

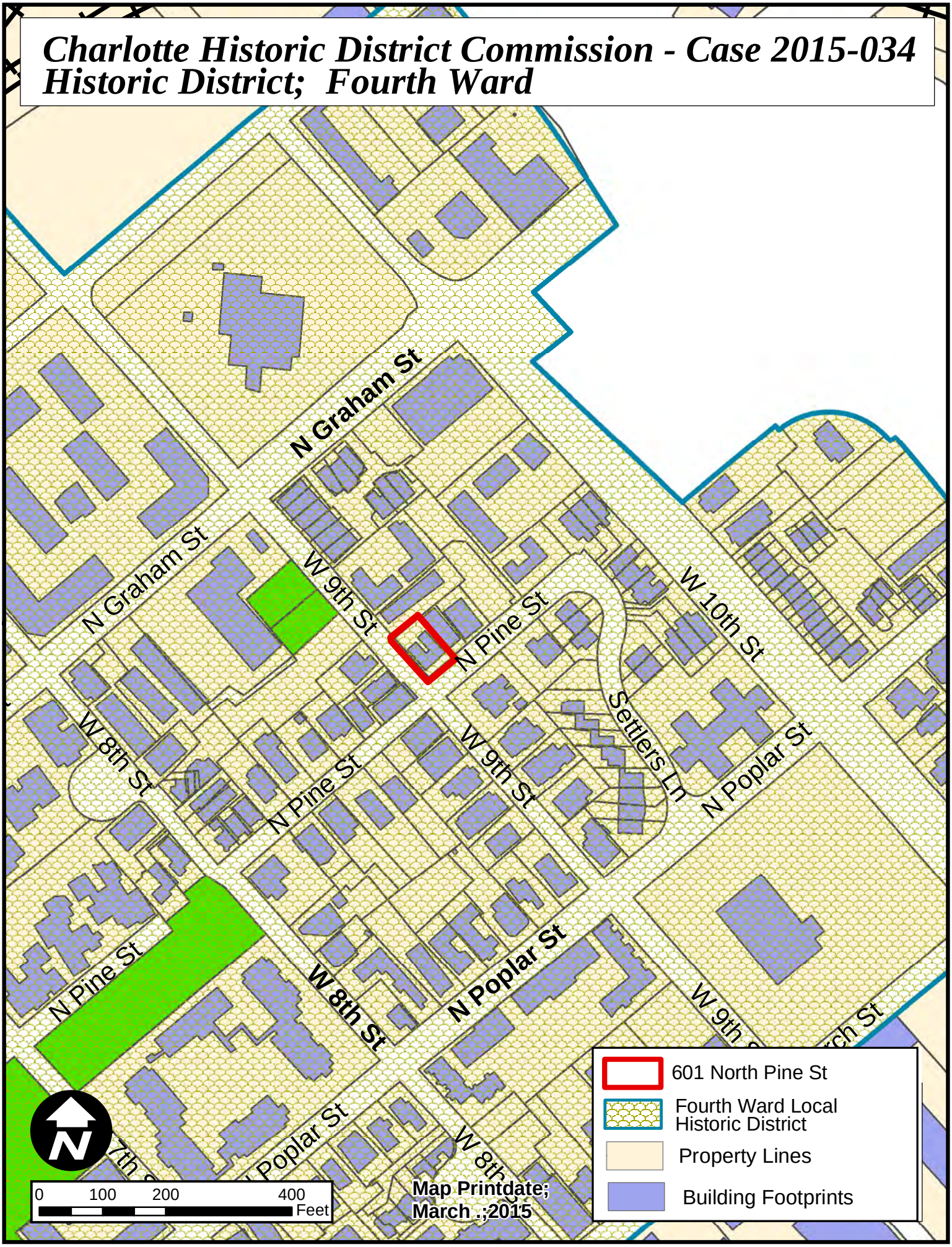
2. Additions must respect the original character of the property, but must be distinguishable from the original construction.

3. All additions to the front or side of existing properties must be of a design that is sensitive to the character and massing of the existing structure.

4. Additions to the front or side of existing structures that are substantially visible from a street must go before the full Commission.

Staff Analysis

The Commission will determine if the solar panel design and location meets the guidelines for additions. The guideline for setback does not apply.


Charlotte Historic District Commission - Case 2015-034
Historic District; Fourth Ward
N Graham St
N Graham St
W 9th St
N Pine St
W 10th St
W 8th St
N Pine St
W 9th St
Settlers Ln
N Poplar St
N Pine St
W 8th St
N Poplar St
W 9th St
Poplar St
W 8th St
601 North Pine St
Fourth Ward Local Historic District
Property Lines
Building Footprints
0 100 200 400 Feet
Map Printdate;
March .;2015

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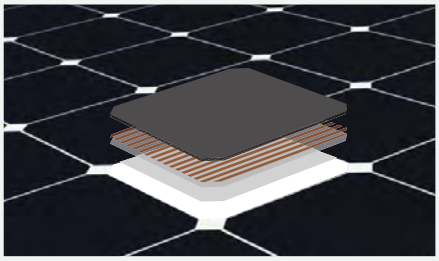
- **21.5% efficiency**
  Ideal for roofs where space is at a premium or where future expansion might be needed.
- **Maximum performance**
  Designed to deliver the most energy in demanding real world conditions, in partial shade and hot rooftop temperatures.[1, 2, 3]
- **Premium aesthetics**
  SunPower® Signature™ Black X-Series panels blend harmoniously into your roof. The most elegant choice for your home.



Maxeon® Solar Cells: Fundamentally better.
Engineered for performance, designed for durability.

Engineered for peace of mind

Designed to deliver consistent, trouble-free energy over a very long lifetime.[4,5]

Designed for durability

The SunPower Maxeon Solar Cell is the only cell built on a solid copper foundation. Virtually impervious to the corrosion and cracking that degrade Conventional Panels.[4,5]

Same excellent durability as E-Series panels.
#1 Ranked in Fraunhofer durability test.[10]
100% power maintained in Atlas 25+ comprehensive PVDI Durability test.[11]

UNMATCHED PERFORMANCE, RELIABILITY & AESTHETICS

SIGNATURE™ BLACK
X21 - 335 PANEL

X21 - 345 PANEL

X21 SERIES

HIGHEST EFFICIENCY[6]

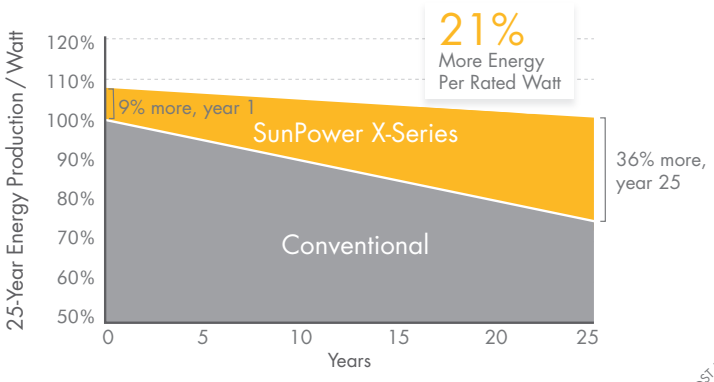
Generate more energy per square foot

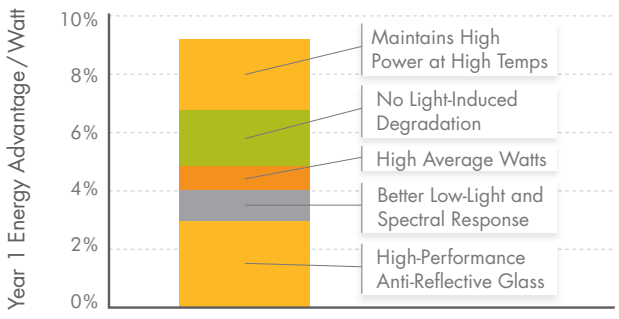
X-Series residential panels convert more sunlight to electricity producing 44% more power per panel,[1] and 75% more energy per square foot over 25 years.[3,4]

HIGHEST ENERGY PRODUCTION[7]

Produce more energy per rated watt

High year one performance delivers 8-10% more energy per rated watt.[3] This advantage increases over time, producing 21% more energy over the first 25 years to meet your needs.[4]





MOST ENERGY PER WATT
PHOTON
2012 FIELD TEST

Awarded to SunPower E-Series. X-Series delivers even more energy.[7]

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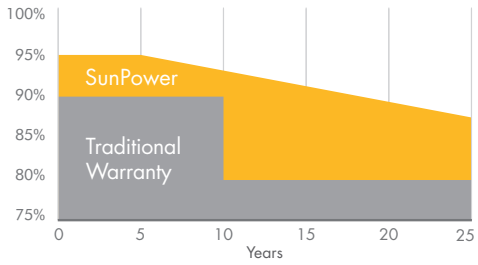
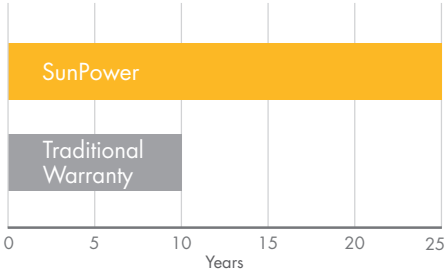
POWER WARRANTY



More guaranteed power: 95% for first 5 years, -0.4%/yr. to year 25. [8]

PRODUCT WARRANTY

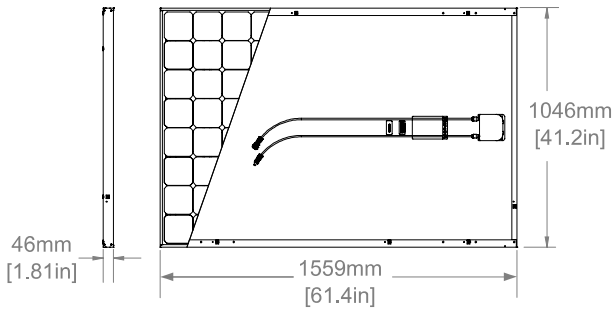


Combined Power and Product Defect 25 year coverage that includes panel replacement costs. [9]

ELECTRICAL DATA		
	X21-335-BLK	**X21-345**
Nominal Power[12] (Pnom)	335 W	345 W
Power Tolerance	+5/–0%	+5/–0%
Avg. Panel Efficiency[13]	21.1%	21.5%
Rated Voltage (Vmpp)	57.3 V	57.3 V
Rated Current (Impp)	5.85 A	6.02 A
Open-Circuit Voltage (Voc)	67.9 V	68.2 V
Short-Circuit Current (Isc)	6.23 A	6.39 A
Maximum System Voltage	600 V UL ; 1000 V IEC	
Maximum Series Fuse	20 A	
Power Temp Coef. (Pmpp)	–0.30% / °C	
Voltage Temp Coef. (Voc)	–167.4 mV / °C	
Current Temp Coef. (Isc)	3.5 mA / °C	

OPERATING CONDITION AND MECHANICAL DATA	
Temperature	– 40°F to +185°F (– 40°C to +85°C)
Max load	Wind: 50 psf, 2400 Pa, 245 kg/m² front & back Snow: 112 psf, 5400 Pa, 550kg/m² front
Impact resistance	1 inch (25 mm) diameter hail at 52 mph (23 m/s)
Appearance	Class A+
Solar Cells	96 Monocrystalline Maxeon Gen III Cells
Tempered Glass	High Transmission Tempered Anti-Reflective
Junction Box	IP-65 Rated
Connectors	MC4 Compatible
Frame	Class 1 black anodized, highest AAMA Rating
Weight	41 lbs (18.6 kg)

TESTS AND CERTIFICATIONS	
Standard tests	UL 1703, IEC 61215, IEC 61730
Quality tests	ISO 9001:2008, ISO 14001:2004
EHS Compliance	RoHS, OHSAS 18001:2007, lead-free
Ammonia test	IEC 62716
Salt Spray test	IEC 61701 (passed maximum severity)
PID test	Potential-Induced Degradation free: 1000V [10]
Available listings	CEC, UL, TUV, MCS



REFERENCES:

1 All comparisons are SPR-X21-345 vs. a representative conventional panel: 240W, approx. 1.6 m², 15% efficiency.
2 PVEvolution Labs "SunPower Shading Study," Feb 2013.
3 Typically 8-10% more energy per watt, BEW/DNV Engineering "SunPower Yield Report," Jan 2013, with CFV Solar Test Lab Report #12063, Jan 2013 temp. coef. calculation.
4 SunPower 0.25%/yr degradation vs. 1.0%/yr conv. panel. Campeau, Z. et al. "SunPower Module Degradation Rate," SunPower white paper, Feb 2013; Jordan, Dirk "SunPower Test Report," NREL, Oct 2012.
5 "SunPower Module 40-Year Useful Life" SunPower white paper, Feb 2013. Useful life is 99 out of 100 panels operating at more than 70% of rated power.
6 Higher than E Series which is highest of all 2600 panels listed in Photon Int'l, Feb 2012.
7 1% more energy than E-Series panels, 8% more energy than the average of the top 10 panel companies tested in 2012 (151 panels, 102 companies), Photon Int'l, Mar 2013.
8 Compared with the top 15 manufacturers. SunPower Warranty Review, Feb 2013.
9 Some exclusions apply. See warranty for details.
10 X-Series same as E-Series, 5 of top 8 panel manufacturers were tested by Fraunhofer ISE, "PV Module Durability Initiative Public Report," Feb 2013.
11 Compared with the non-stress-tested control panel. X-Series same as E-Series, tested in Atlas 25+ Durability test report, Feb 2013.
12 Standard Test Conditions (1000 W/m² irradiance, AM 1.5, 25° C).
13 Based on average of measured power values during production.

See http://www.sunpowercorp.com/facts for more reference information.
For further details, see extended datasheet: www.sunpowercorp.com/datasheets Read safety and installation instructions before using this product.

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