



CAMBRIDGE HISTORICAL COMMISSION

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MAR 15 2017

CAMBRIDGE HISTORICAL COMMISSION

APPLICATION FOR CERTIFICATE

1. The undersigned hereby applies to the Cambridge Historical Commission for a Certificate of (check one box): Appropriateness, Nonapplicability, or Hardship, in accordance with Chapter 40C of the Massachusetts General Laws and/or Chapter 2.78 of the Municipal Code.

2. Address of property: 21 Follen St. _____, Cambridge, Massachusetts

3. Describe the proposed alteration(s), construction or demolition in the space provided below: (An additional page can be attached, if necessary).

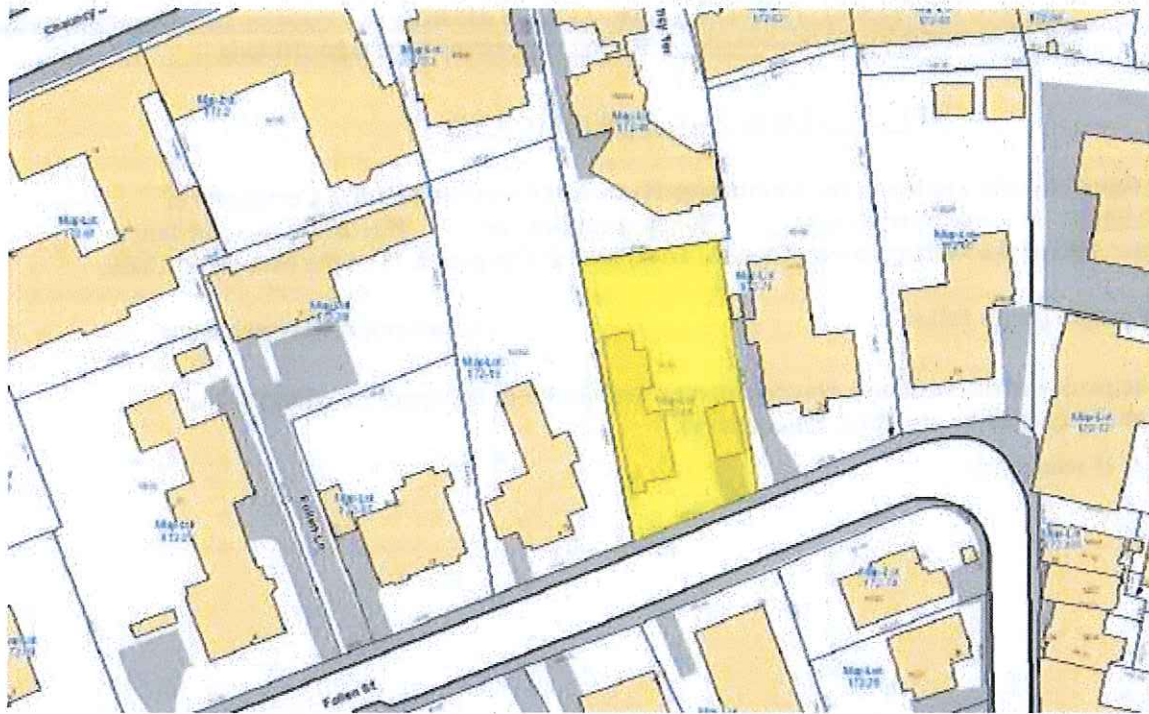
Installation of 18 solar panels.

I certify that the information contained herein is true and accurate to the best of my knowledge and belief. The undersigned also attests that he/she has read the statements printed on the reverse.

Name of Property Owner of Record: Gail Greenwald	
Mailing Address: 21 Follen St. Cambridge, MA	
Telephone/Fax: 617-257-7049	E-mail: gailgreenwald@gmail.com
Signature of Property Owner of Record: <u>Carl Greenwald</u> <i>CG</i>	
(Required field; application will not be considered complete without property owner's signature)	
Name of proponent, if not record owner:	
Mailing Address: <u>26 Parkridge Rd. Haverhill, MA 01835</u>	
Telephone/Fax: <u>978-360-4063</u>	E-mail: <u>svr@invaleantech.com</u>

(for office use only):			
Date Application Received: <u>3/15/17</u>	Case Number: <u>3763</u>	Hearing Date: <u>4/6/17</u>	
Type of Certificate Issued: _____	Date Issued: _____		

21 Follen St. Site Plan



Property info	
Property ID	172-16
PID	13356
Address	21 FOLLEN ST
Land Use	SINGLE-FAM-RES
Land Area	0.21 acres / 9115 sq ft
Living Area	3053 sq ft
Property Chart	
Recent Comparables	
Sales	
Parcel Block Map (PDF)	
Owner Information	
Name	GREENWALD, ROY F &
Address	21 FOLLEN ST
City	CAMBRIDGE
State	MA
Zip Code	02138



NE Layout: Panels are 4" above roof deck, no rails visible



SW Layout: Panels are 4" above roof deck, no rails visible



View from 21 Follen looking NW: Blue box indicates visible panel location



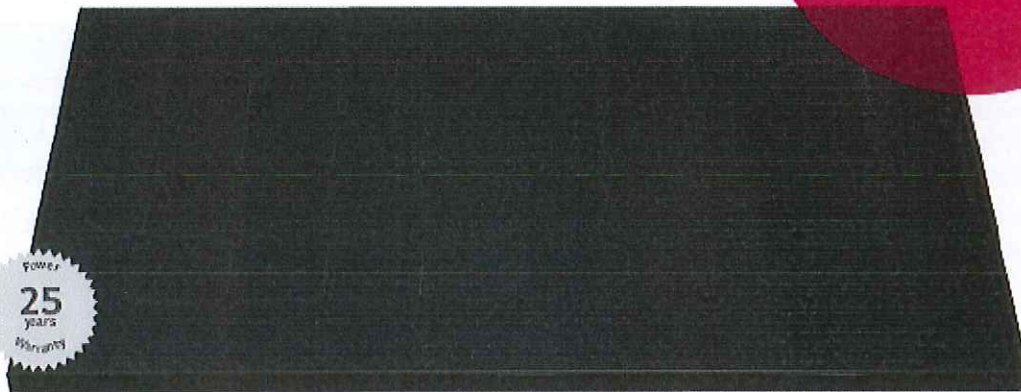
View from 21 Follen looking SE: No panels visible from street



Proposed inverter and AC disconnect placement per NEC 690.12c

Option 1: on house, Option2 : on fence





LG NeON™ 2 Black

LG300N1K-G4

60 cell

LG's new module, LG NeON™ 2 Black, adopts Cello technology. Cello technology replaces 3 busbars with 12 thin wires to enhance power output and reliability. LG NeON™ 2 Black demonstrates LG's efforts to increase customer's values beyond efficiency. It features enhanced warranty, durability, performance under real environment, and aesthetic design suitable for roofs.



Enhanced Performance Warranty

LG NeON™ 2 Black has an enhanced performance warranty. The annual degradation has fallen from -0.7%/yr to -0.6%/yr. Even after 25 years, the cell guarantees 24% more output than the previous LG NeON™ modules.



High Power Output

Compared with previous models, the LG NeON™ 2 Black has been designed to significantly enhance its output efficiency, thereby making it efficient even in limited space.



Aesthetic Roof

LG NeON™ 2 Black has been designed with aesthetics in mind; thinner wires that appear all black at a distance. The product may increase the value of a property with its modern design.



Outstanding Durability

With its newly reinforced frame design, LG has extended the warranty of the LG NeON™ 2 Black for an additional 2 years. Additionally, LG NeON™ 2 Black can endure a front load up to 6000 Pa, and a rear load up to 5400 Pa.



Better Performance on a Sunny Day

LG NeON™ 2 Black now performs better on sunny days thanks to its improved temperature coefficient.



Double-Sided Cell Structure

The rear of the cell used in LG NeON™ 2 Black will contribute to generation, just like the front; the light beam reflected from the rear of the module is reabsorbed to generate a great amount of additional power.

About LG Electronics

LG Electronics is a global player who has been committed to expanding its capacity, based on solar energy business as its future growth engine. We embarked on a solar energy source research program in 1985, supported by LG Group's rich experience in semi-conductor, LCD, chemistry, and materials industry. We successfully released first Mono X® series to the market in 2010 which were exported to 32 countries in the following 2 years, thereafter. In 2013, NeON™ (previously known as Mono X® NeON) & 2015 NeON2 with CELLO technology won "Intersolar Award", which proved LG is the leader of innovation in the industry.

Mechanical Properties

Cells	6 x 10
Cell Vendor	LG
Cell Type	Monocrystalline / N-type
Cell Dimensions	156.75 x 156.75 mm / 6 inches
# of Busbar	12 (Multi Wire Busbar)
Dimensions (L x W x H)	1640 x 1000 x 40 mm 64.57 x 39.37 x 1.57 inch
Front Load	6000 Pa / 125 psf
Rear Load	5400 Pa / 113 psf
Weight	17.0 ± 0.5 kg / 37.48 ± 1.1 lbs
Connector Type	MC4, MC4 Compatible IP67
Junction Box	IP67 with 3 Bypass Diodes
Length of Cables	2 x 1000 mm / 2 x 39.37 inch
Glass	High Transmission Tempered Glass
Frame	Anodized Aluminum

Certifications and Warranty

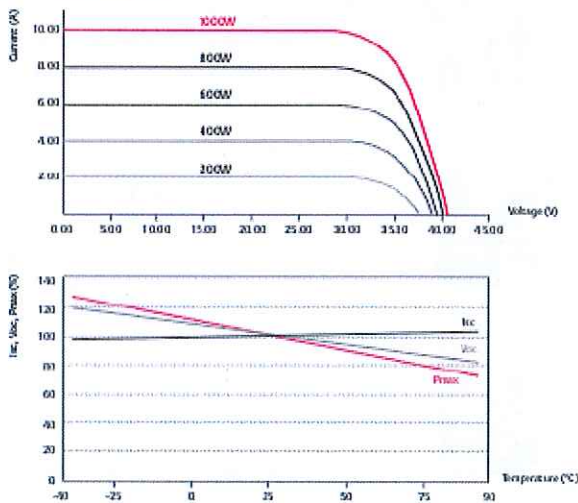
Certifications	IEC 61215, IEC 61730-1/-2 IEC 62716 (Ammonia Test) IEC 61701 (Salt Mist Corrosion Test) ISO 9001 UL 1703
Module Fire Performance (USA)	Type 2 (UL 1703)
Fire Rating (for CANADA)	Class C (ULC/ORDC 1703)
Product Warranty	12 years
Output Warranty of Pmax	Linear warranty*

* 1) 1st year 99%, 2) After 2nd year 0.6% annual degradation, 3) 8.36% for 25 years

Temperature Characteristics

NOCT	46 ± 3 °C
Pmpp	-0.38 %/°C
Voc	-0.28 %/°C
Isc	0.03 %/°C

Characteristic Curves



Electrical Properties (STC *)

Module Type	300 W
MPP Voltage (Vmpp)	32.5
MPP Current (Impp)	9.26
Open Circuit Voltage (Voc)	39.7
Short Circuit Current (Isc)	9.70
Module Efficiency (%)	18.3
Operating Temperature (°C)	-40 ~ +90
Maximum System Voltage (V)	1000
Maximum Series Fuse Rating (A)	20
Power Tolerance (%)	0 ~ +3

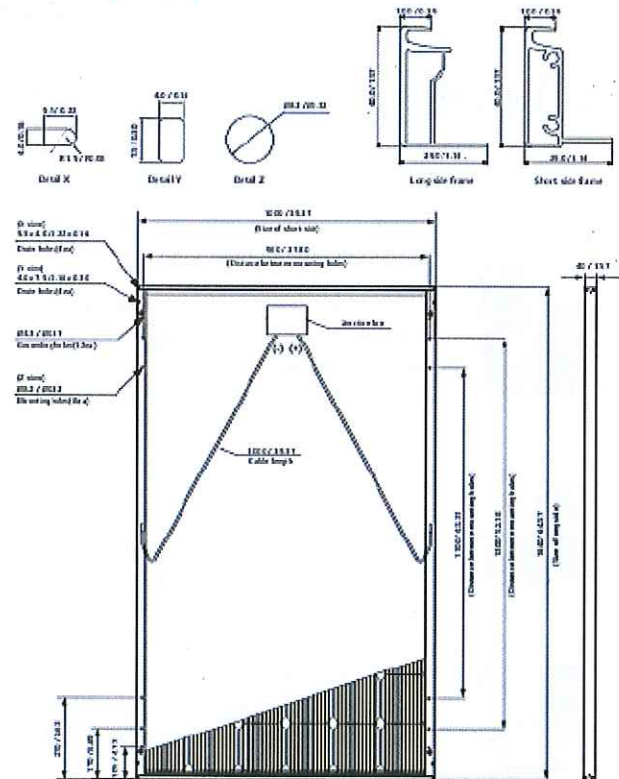
* STC (Standard Test Condition) Irradiance 1000 W/m², Module Temperature 25 °C, AM 1.5
* The maximum power output is measured and determined by LG Electronics at its sole and exclusive discretion.
* The typical change in module efficiency at 200 W/m² in relation to 1000 W/m² is -3.0%.

Electrical Properties (NOCT*)

Module Type	300 W
Maximum Power (Pmax)	218
MPP Voltage (Vmpp)	29.5
MPP Current (Impp)	7.38
Open Circuit Voltage (Voc)	36.5
Short Circuit Current (Isc)	7.83

* NOCT (Nominal Operating Cell Temperature) Irradiance 800 W/m², ambient temperature 20 °C, wind speed 1 m/s

Dimensions (mm/in)



* The distance between the center of the mounting/grounding holes



North America Solar Business Team
LG Electronics U.S.A. Inc.
1000 Sylvan Ave, Englewood Cliffs, NJ 07632

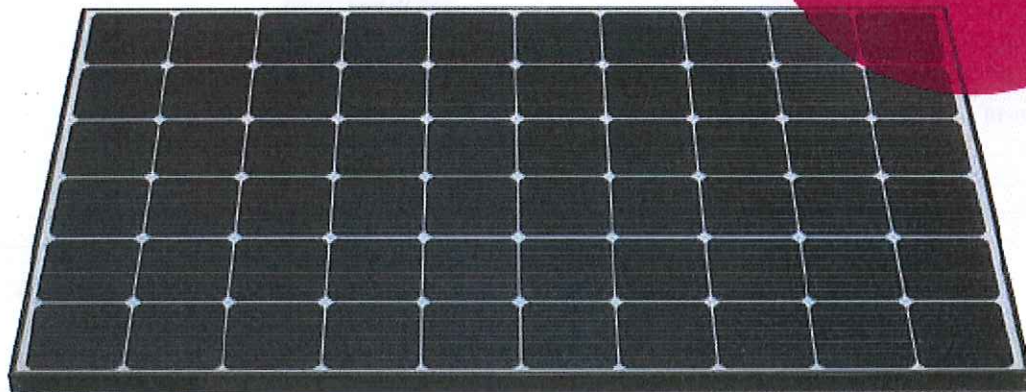
Contact: lg_solar@lge.com
www.lgsolarusa.com

Product specifications are subject to change without notice.
DS-N2-60-K-G-F-EN-50427

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01/01/2016

Innovation for a Better Life





LG NeON™ 2 LG320N1C-G4

60 cell

LG's new module, LG NeON™ 2, adopts Cello technology. Cello technology replaces 3 busbars with 12 thin wires to enhance power output and reliability. LG NeON™ 2 demonstrates LG's efforts to increase customer's values beyond efficiency. It features enhanced warranty, durability, performance under real environment, and aesthetic design suitable for roofs.



Enhanced Performance Warranty

LG NeON™ 2 has an enhanced performance warranty. The annual degradation has fallen from -0.7%/yr to -0.6%/yr. Even after 25 years, the cell guarantees 2.4% more output than the previous LG NeON™ modules.



High Power Output

Compared with previous models, the LG NeON™ 2 has been designed to significantly enhance its output efficiency, thereby making it efficient even in limited space.



Aesthetic Roof

LG NeON™ 2 has been designed with aesthetics in mind, thinner wires that appear all black at a distance. The product may help increase the value of a property with its modern design.



Outstanding Durability

With its newly reinforced frame design, LG has extended the warranty of the LG NeON™ 2 for an additional 2 years. Additionally, LG NeON™ 2 can endure a front load up to 6000 Pa, and a rear load up to 5400 Pa.



Better Performance on a Sunny Day

LG NeON™ 2 now performs better on sunny days thanks to its improved temperature coefficient.



Double-Sided Cell Structure

The rear of the cell used in LG NeON™ 2 will contribute to generation, just like the front; the light beam reflected from the rear of the module is reabsorbed to generate a great amount of additional power.

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Rear Load	5400 Pa / 113 psf
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Connector Type	MC4, MC4 Compatible, IP67
Junction Box	IP67 with 3 Bypass Diodes
Length of Cables	2 x 1000 mm / 2 x 39.37 inch
Glass	High Transmission Tempered Glass
Frame	Anodized Aluminum

Certifications and Warranty

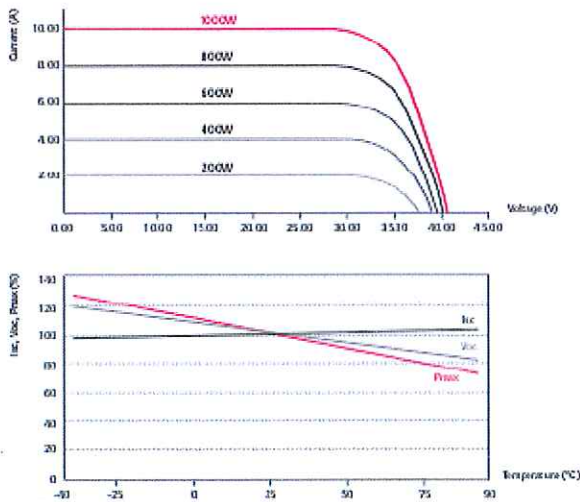
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Module Fire Performance (USA)	Type 2 (UL 1703)
Fire Rating (for CANADA)	Class C (ULC/ORD C 1703)
Product Warranty	12 years
Output Warranty of Pmax	Linear warranty*

* 1) 1st year 98%, 2) After 2nd year 0.6% per annual degradation, 3) 83% for 25 years

Temperature Characteristics

NOCT	46 ± 3 °C
Pmpp	-0.38%/°C
Voc	-0.28%/°C
Isc	0.03%/°C

Characteristic Curves



Electrical Properties (STC *)

Module Type	320 W
MPP Voltage (Vmpp)	33.6
MPP Current (Impp)	9.53
Open Circuit Voltage (Voc)	40.9
Short Circuit Current (Isc)	10.05
Module Efficiency (%)	19.5
Operating Temperature (°C)	-40 - +90
Maximum System Voltage (V)	1000
Maximum Series Fuse Rating (A)	20
Power Tolerance (%)	0 - +3

*STC (Standard Test Condition) Irradiance 1000 W/m², Module Temperature 25 °C, AM 1.5

*The nameplate power output is measured and determined by LG Electronics at its safe and absolute duration

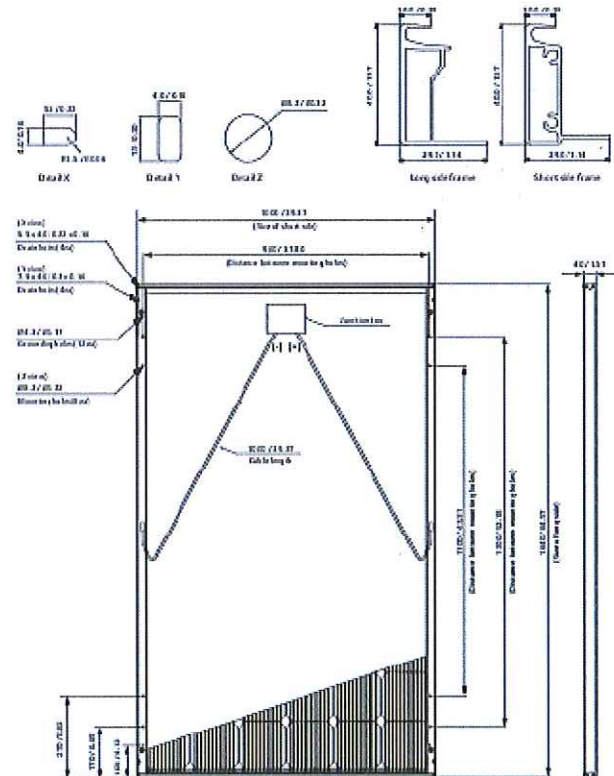
*The typical change in module efficiency at 200 W/m² in relation to 1000 W/m² is -2.0%

Electrical Properties (NOCT*)

Module Type	320 W
Maximum Power (Pmax)	234
MPP Voltage (Vmpp)	30.7
MPP Current (Impp)	7.60
Open Circuit Voltage (Voc)	37.9
Short Circuit Current (Isc)	8.10

*NOCT (Nominal Operating Cell Temperature) irradiance 800 W/m², ambient temperature 20 °C, wind speed 1 m/s

Dimensions (mm/in)



* The distance between the center of the mounting/grounding holes



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