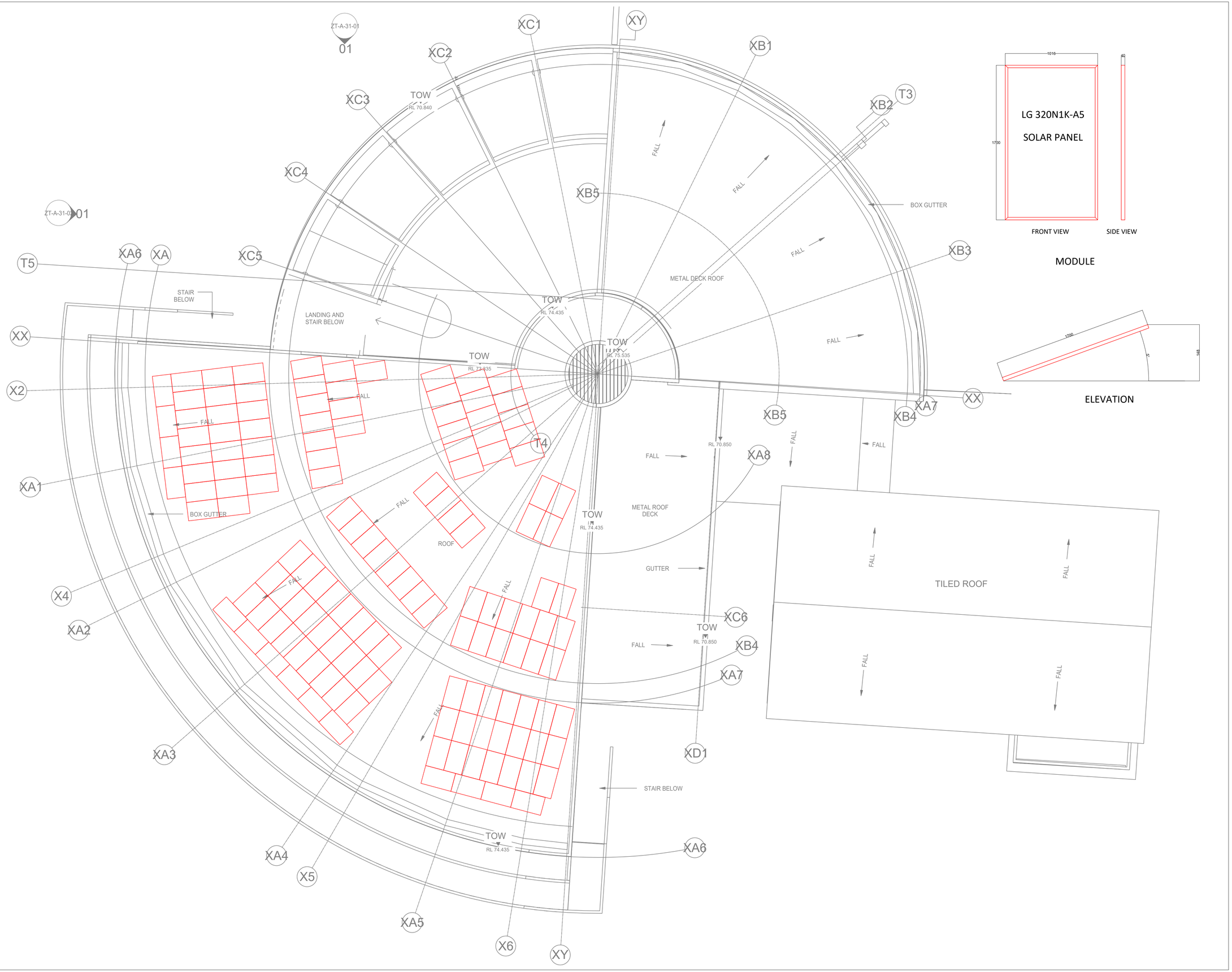

MODULE

ELEVATION

GENELEC Power Solutions

TOTAL SYSTEM SPECIFICATION

ITEM	SPECIFICATION	QTY
PANEL	LG 320N1K-A5	142
INVERTER	HUAWEI SUN2000-50KTL	1
TOTAL		45.44kWp

GENERAL NOTES

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4. ALL DIMENSION TO BE VERIFIED ON SITE
5. PV MODULES TO USE TEMPERED GLASS, BE SELF CLEANING AND ANTI-REFLECTIVE PV SERIES CONNECTIONS SHALL BE SECTIONALISED AT EACH PANEL SO Voc AT STC IS WITHIN ELV RANGE. IP67 SEGMENT CONNECTORS TO BE USED.
6. DOUBLE INSULATED PV1-F CABLES INSTALLED IN UV RESISTANT CABLE TRAY /CONDUIT SHALL BE USED IN ARRAY AREA.
7. THE MOST CURRENT VERSION OF THE FOLLOWING AUSTRALIAN STANDARDS ARE APPLICABLE AS A MINIMUM:
   - AS5033: INSTALLATION OF PHOTOVOLTIAC ARRAYS
   - AS4777: GRID CONNECTION OF ENERGY SYSTEMS VIA INVERTERS
   - AS3000: ELECTRICAL WIRING RULES
   - AS3008: ELECTRICAL INSTALLATION - SELECTION OF CABLES
8. INSTALLATION TO BE LABELLED IN ACCORDANCE WITH RELEVANT SERVICE AND INSTALLATION RULES AS WELL AS AS 5033.
9. ALL EXPOSED CONDUCTIVE METAL COMPONENTS MUST BE EQUIPOTENTIALLY BONDED AND CONNECTED TO MAIN EARTH.
10. EXACT LOCATION OF ALL PARTS OF THE INSTALLATION TO BE DETERMINED BY CONTRACTOR ONSITE.
11. ACCORDING TO SECTION 5.5.2 OF AS/NZS 5033:2014, WHERE THE MULTIPLE DC DISCONNECTION DEVICES ARE USED THAT ARE NOT GANGED THE FOLLOWING SIGN SHALL BE PLACE ADJACENT TO INVERTER - "WARNING:MULTIPLE DC SOURCES TURN OFF ALL DC ISOLATORS TO ISOLATE THE EQUIPMENT"
12. IN CASE THE INTERNAL ISOLATOR OF THE INVERTER IS BEING USED, THE INSTALLER NEEDS TO VERIFY THE CORRECT RATINGS FOR VOLTAGE & CURRENT AND COMPLAINCE WITH AS/NZS 5033:2014.

Rev	Description	Date	Checked
2	Module-Elevation	07/09/2018	E.B.
1	Pv Array Layout	03/09/2018	E.B.
0	Pv Array Layout	15/07/2018	E.B.

PROJECT

TARONGA ZOO

BRADLEYS HEAD ROAD, MOSMAN NSW 2088

GENELEC POWER SOLUTIONS PTY LTD

www.genelecps.com.au

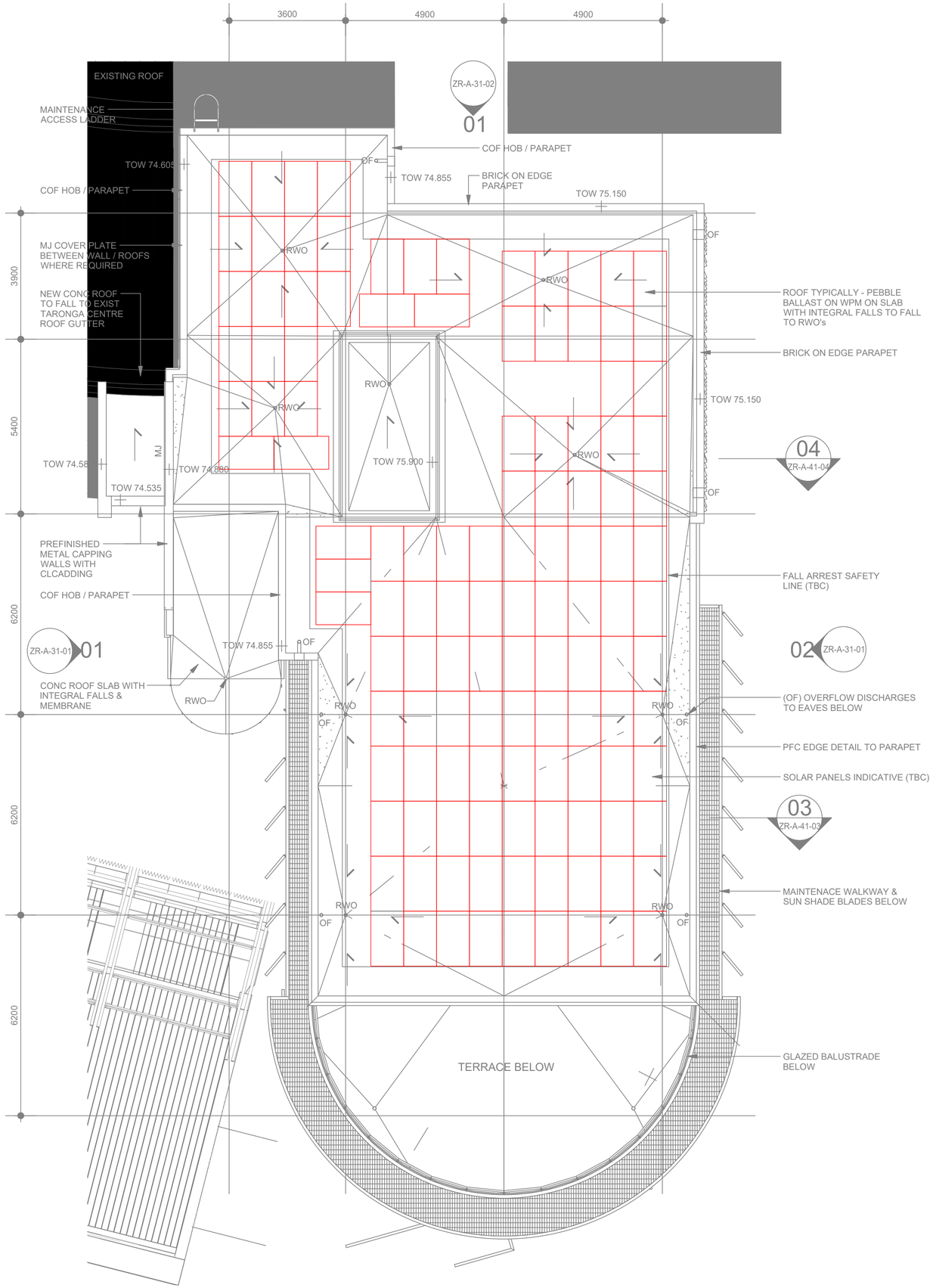
DRAWING TITLE

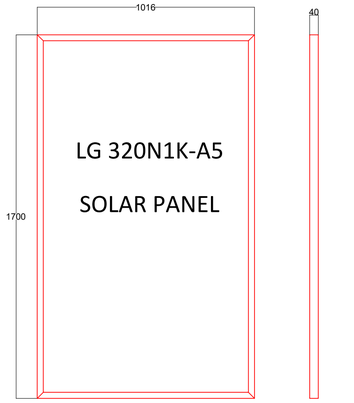
TARONGA ZOO WESTERN QUADRANT PV SYSTEM LAYOUT w/320W 45.44kWp

SCALE	DRAWN	CHECKED	SIZE
NTS		D.MCVERNON	
	DATE 07/09/2018	DATE 07/09/2018	

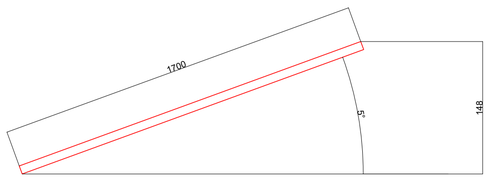
DRAWING No. GPS/western_quadrant

Rev 002





MODULE



ELEVATION

GENELEC Power Solutions

TOTAL SYSTEM SPECIFICATION

ITEM	SPECIFICATION	QTY
PANEL	LG 320N1K-A5	122
INVERTER	HUAWEI SUN2000-33KTL	1
TOTAL		39.04kWp

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Rev	Description	Date	Checked
2	Module-Elevation	07/09/2018	E.B.
1	Pv Array Layout	03/09/2018	E.B.
0	Pv Array Layout	15/07/2018	E.B.

PROJECT

TARONGA ZOO

BRADLEYS HEAD ROAD, MOSMAN NSW 2088

GENELEC POWER SOLUTIONS PTY LTD

www.genelecps.com.au

DRAWING TITLE

TARONGA ZOO RESTAURANT PV SYSTEM LAYOUT w/320W 39.04kWp

SCALE	DRAWN	CHECKED	SIZE
NTS		D.MCVERNON	
	DATE 07/09/2018	DATE 07/09/2018	

DRAWING No. GPS/ZR-A-21-03(B)

Rev 002

LG
Life's Good

NEW PRODUCT WARRANTY
25 YEAR
15 YEARS LONGER THAN INDUSTRY STANDARD OF 10 YEARS

LG NeON® 2 Black

LG315/320N1K-A5

HIGH PERFORMANCE - GREAT LOOKS

TOTALLY BLACK / UP TO 320 WATTS

EUPD RESEARCH TOP BRAND PV MODULES AUSTRALIA 2018
EUPD RESEARCH TOP BRAND PV MODULES AUSTRALIA 2017
EUPD RESEARCH TOP BRAND PV MODULES AUSTRALIA 2016
inter solar award 2013 WINNER
inter solar award 2015 WINNER

YOUR HOME DESERVES THE NeON® 2 Black

The LG NeON® 2 Black has seen many improvements that really matter, from longer warranties and higher efficiency to stronger frames and better wind loading as well as an excellent uniform looking panel. This panel is ideal for homes seeking a visually pleasing solar panel and for roofs where space is tight or where future system expansions are considered e.g. to incorporate battery storage.

The LG NeON® modules with their double sided cells and CELLO technology absorb light from the front and the back of the module. This technology sets a new standard for innovation and was recognised with the 2015 Photovoltaic Innovation Award at the Intersolar Industry Event in Germany. LG also won the 2016 Intersolar award for our new NeON® Bifacial range.

Great Visual Appearance

LG NeON® 2 Black panels with their black cells, black frames and black backsheet give an aesthetically pleasing uniform appearance. Standard competitor poly panels have blue cells and grey aluminium frames. Your home deserves the great looking LG NeON® 2 Black.

More Power per Square Metre

LG NeON® 2 Black's 320W panels are a similar physical size to many of the industries 260W panels. This means up to 23% more electricity per square metre with LG NeON® 2 Black. So you can get more power from your roof space with LG panels.

25 Years Product Warranty (Parts & Labour)

The LG product warranty is 15 years longer than the industry standard 10 years and covers 25 years. The Warranty is held by LG Electronics Australia and New Zealand. The warranty includes replacement labour and transport.

Improved 25 Year Performance Warranty

The initial degradation of cells has been improved from -3% to -2%, in the 1st year and the annual rate of degradation has fallen from -0.7%/year to -0.5%/ year thereafter. This brings an 86% warranted output after 25 years, compared to 80.2% for many standard panels.

Panels made in Korea

www.lgenergy.com.au

LG NeON® 2 Black

ABOUT LG SOLAR

LG Electronics embarked on a solar energy research programme in 1985, using our vast experience in semi-conductors, chemistry and electronics. LG Solar modules are now available in 32 countries. In 2013, 2015 and 2016 the LG NeON® range won the acclaimed Intersolar Award in Germany, which demonstrates LG Solar's lead in innovation and commitment to the renewable energy industry.

With over 200 lesser known brand panels selling in Australia, LG solar panels offer a peace of mind solution, as they are backed by a very large, diversified company with over 100 subsidiaries.

KEY FEATURES

Proven Field Performance

LG has been involved in a number of comparison tests of the LG panels against many other brand panels. LG NeON® 2 models are consistently among the best performing in these tests.

Low LID

The N-type doping of the NeON® cells results in extremely low Light Induced Degradation (LID) when compared with the standard P-type cells. This means more electricity generation over the life of the panel, as the panel degrades less.

Corrosion Resistance Certification

LG NeON® 2 Black panels can be installed confidently right up to the coastline. The panels have received certification for Salt Mist Corrosion to maximum severity 6 and Ammonia Resistance.

Extensive Testing Programme

LG solar panels are tested between 2 to 3 times the International Standards at our in-house testing laboratories, ensuring a very robust and longer lasting solar module.

Strict Quality Control Reliable for the Future

The quality control of LG world-class solar production is monitored and improved to Six Sigma quality control standards, which includes 500+ monitoring points to effectively maintain and improve our uncompromising quality.

Extreme Wind Load Resistance

LG modules have a strong double walled frame. When it comes to wind forces (rear load) many competitor modules are certified to 2400 Pascals. LG modules are certified to more than double - 5400 Pascals, which provides at least double the strength and durability to a standard module.

Multi Anti-reflective Coatings Increase Output

LG is using an anti-reflective coating on the panels glass as well as on the cell surface to ensure more light is absorbed in the panel and not reflected. More absorbed light means more electricity generation.

Positive Tolerance (0/+3%)

If we sell you a 320 Watt panel then the flash test of this panel will show somewhere between 320W and 329.6W. Some competitor panels have -/+ tolerance, so you could get a flash test result below the rated Watt, meaning you pay for Watts you never get.

Improved High Temperature Performance

Solar panels slowly lose ability to generate power as they get hotter. LG NeON® 2 Black, has an improved temperature co-efficient to standard modules, which means in hot weather LG NeON® 2 Black panels will deliver higher output.

Enhanced low light performance

LG NeON 2 panels will give better performance under low light, such as early morning or late afternoon compared to standard panels. At 200W/m2 LG Neon 2 panel efficiency drop is -2% while many conventional panels reduce by -4%.

"CELLO" Technology Increases Power

"CELLO" Multi wire busbar cell technology lowers electrical resistance and increases panel efficiency, giving more power per panel and provides a more uniform look to the panel.

Automated Production in South Korea

All LG solar panels are manufactured in a custom designed and fully automated production line by LG in Gumi, South Korea ensuring extremely low tolerances. This means great quality and build consistency between panels.

LG NeON® 2 BLACK – ELEGANT DESIGN. GREAT LOOKS.

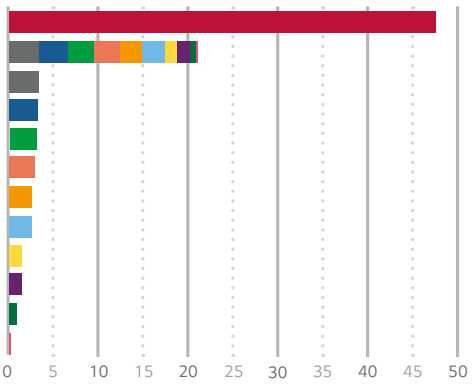
As its name suggests, the monocrystalline LG NeON® 2 Black solar module is completely black and will look great on your roof. Featuring the black CELLO look, it can withstand a static front load of 6,000 Pascals and a rear panel cyclone wind load of 5400 Pascals which is more than twice that of a standard panel. LG is also improving its linear performance guarantee to at least 86 % of nominal output after 25 years.

LOCAL WARRANTY, GLOBAL STRENGTH

LG Solar is part of LG Electronics Inc., a global and financially strong company, with over 50 years of experience in technology.

Good to know: LG Electronics Australia Pty Ltd is the warrantor in Australia and NZ for your solar modules. So LG support, via offices in every Australian mainland state and NZ and through our 70 strong, Australia wide dealer network, is only a phone call away.

The warrantor's 2016 sales in billions of US dollars

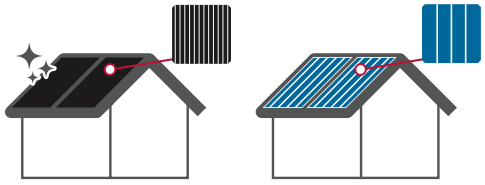


LG Electronics	**$47.91bn**
All below combined	$20.14bn
Jinko Solar*	$3.20bn
Trina Solar*	$3.15bn
Canadian Solar*	$2.85bn
Sunpower*	$2.70bn
Hanwha QCells*	$2.42bn
JA solar*	$2.41bn
Yingli*	$1.27bn
Suntech*	$1.24bn
REC Solar*	$0.82bn
Winaico/Win Win Precision Tech*	$0.08bn

*2016 Annual Financial Statements.

UNDERSTATED ELEGANCE FOR BEAUTIFUL ROOFS

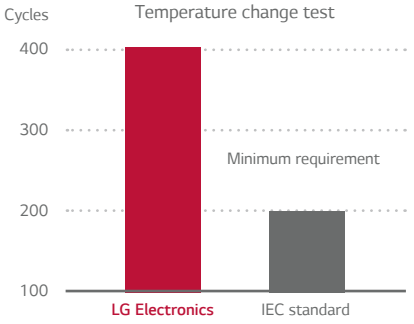
The LG NeON® 2 Black solar module featuring a black anodised frame and black backing sheet looks totally black. Its uniform design looks much more elegant than the blue colour cells and grey/silver frames of standard panels.

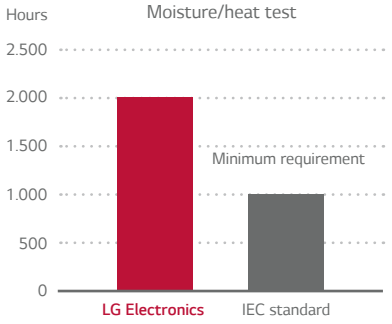


LG NeON® 2 Black Standard

EXCELLENT QUALITY, THOROUGHLY TESTED

You can rely on LG. We test our products with at least double the intensity specified in the IEC standard. (International Quality Solar Standard).

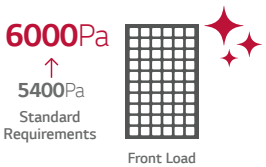


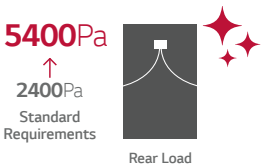


Our panel range have won a string of International Awards.

POWERFUL DESIGN, GUARANTEED ROBUST

With reinforced frame design, the LG NeON® 2 Black can endure a front load of 6000 Pa which is the equivalent of 1048 kg over the size of the module. The rear load/wind load of the module is 5400 Pa which is more than twice the wind load resistance of standard modules (2400 Pa).





Extended Product Warranty

10yrs +15yrs

LG offers a fifteen year longer product warranty for parts and labour than many competitors 10 years to an impressive 25 years.

LG315N1K-A5 | LG320N1K-A5

LG NeON® 2 Black

Mechanical Properties

Cells	6 x 10
Cell Vendor	LG
Cell Type	Monocrystalline / N-type
Cell Dimensions	161.7 x 161.7 mm
# of Busbar	12 (Multi Wire Busbar)
Dimensions (L x W x H)	1686 x 1016 x 40 mm
Front Load	6000 Pa
Rear Load	5400 Pa
Weight	18 kg
Connector Type	Genuine MC4, IP68 (Male: PV-KST4) (Female: PV-KBT4)
Junction Box	IP68 with 3 bypass diodes
Length of Cables	2 x 1000 mm
Front cover	High transmission tempered glass
Frame	Anodised aluminum with protective black coating

Certifications and Warranty

Certifications	ISO 9001
	IEC 61215, IEC 61730-1/-2
	IEC 61701(Salt Mist Corrosion Test)
	IEC 62716 (Ammonia Test)
Module Fire Rating	Class C
Product Warranty	25 Years (Manufactured after 1/10/2017)
Output Warranty of Pmax (Measurement Tolerance ± 3%)	Linear Warranty[1]

[1] 1) 1st year: 98%, 2) After 1st year: 0.5%p annual degradation, 3) 86% for 25 years

Temperature Characteristics

NOCT	45 ± 3 °C
Pmax	-0.37 %/°C
Voc	-0.27 %/°C
Isc	0.03 %/°C

Electrical Properties (STC[2])

Module Type	315 W	320 W
Maximum Power Pmax (W)	315	320
MPP Voltage Vmpp (V)	32.9	33.3
MPP Current Impp (A)	9.58	9.62
Open Circuit Voltage Voc (V)	40.7	40.8
Short Circuit Current Isc (A)	10.15	10.19
Module Efficiency (%)	18.4	18.7
Operating Temperature (°C)	-40 ~ +90	
Maximum System Voltage (V)	1000	
Maximum Series Fuse Rating (A)	20	
Power Tolerance (%)	0 ~ +3	

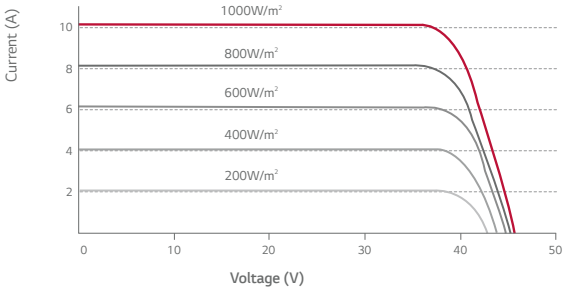
[2] STC (Standard Test Condition): Irradiance 1000 W/m², Module Temperature 25 °C, AM 1.5.
The nameplate power output is measured and determined by LG Electronics at its sole and absolute discretion.

Electrical Properties (NOCT[3])

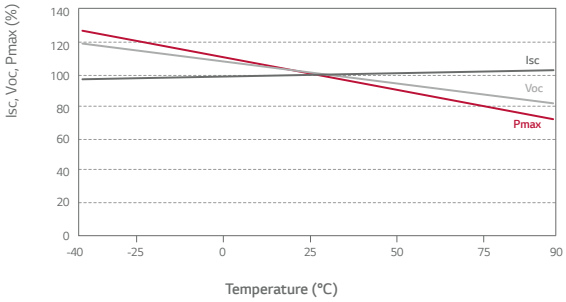
Module Type	315 W	320 W
Maximum Power Pmax (W)	232	236
MPP Voltage Vmpp (V)	30.4	30.8
MPP Current Impp (A)	7.63	7.67
Open Circuit Voltage Voc (V)	37.9	38.0
Short Circuit Current Isc (A)	8.17	8.20

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

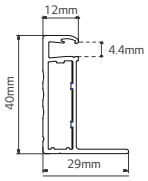
Current – Voltage characteristics at various irradiance levels



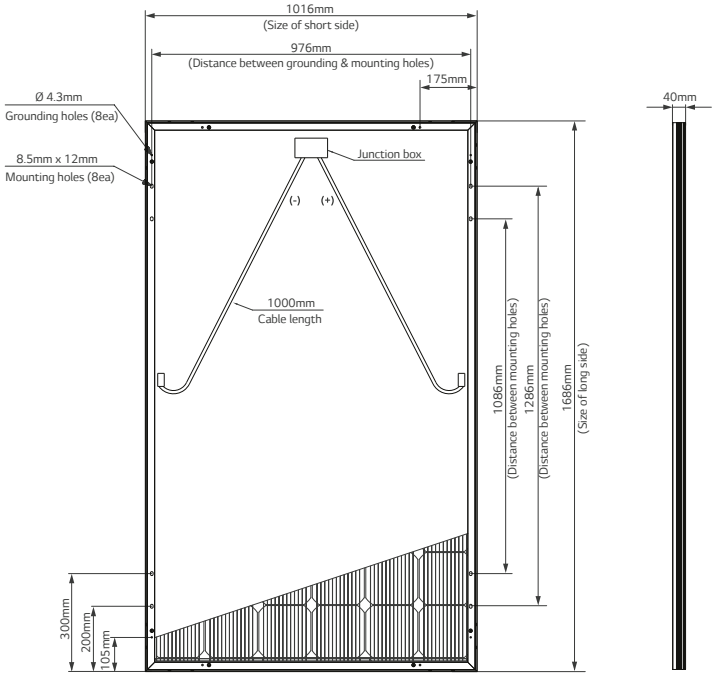
Current – Voltage characteristics at various cell temperatures



Dimensions (mm)



Frame Cross-section



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E-Mail: solar.sales@lge.com.au
Web:lgenergy.com.au

LG Electronics Inc.
Solar Business Division
Twin Building, Western Tower, 11F,
128, Yeoui-daero, Yeongdeungpo-gu,
Seoul, 07336, Korea
www.lg.com/global/business

Product specifications are subject to change without prior notice.
Date: 01/2018