

24/10/2019

To Whom It May Concern



Dear Sir/Madam:

Subject: Structural Adequate Certificate of the proposed solar panels installation on the new steel roof of Goold/Lecceto building extension at St Augustine's College, Federal Parade, Brookvale, NSW

Soar Engineers were instructed by client Mr. Rory Chenoweth (Solahart Industries) to perform a site inspection at St Augustine's College, Federal Parade, Brookvale, NSW on 17 October 2019 and reviewed the relevant information for the purpose of certificate of the proposed solar panels installation on the new steel roof of Goold/Lecceto building extension.

Based on the site inspection and detailed engineer calculations, I have no hesitation in certifying that the new steelroof structures (which consist of steel rafters, steel beams, column, purlin, bracings, etc) are structurally adequate to support the proposed Hanwha_Q_CELLS_QPLUS_L_G4.2_335-345 at the highlighted roof areas(highlighted in the picture below) based on AS1170.1-2002 "Permanent, imposed and other actions", AS1170.2-2011 "Wind Loads", AS4100-1998 "Steel Structures", Building Code Australia(NCC 2016) and related Australian Standards.

Yours Faithfully

Mr Lei Zhang MIEAust, CPEng, NER	 ENGINEERS AUSTRALIA	National Engineering Register
Signature 	Date	24 / 10 / 19
Registered on the NER in the area of practice of Structural Engineering		

Name: Lei Zhang



BEng, MEng, PhdEng, CPEng: 3130003 RPEQ: 11507, NPER

Email: L.Zhang@soarengineering.com.au

Mobile: **0414 521 755**



Mr Lei Zhang

MIEAust, CPEng, NER



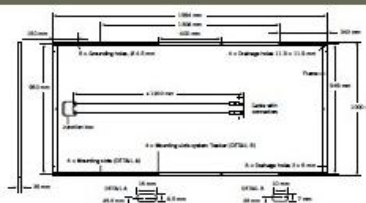
National
Engineering
Register

Signature

Date **24 / 10 / 19**

Registered on the NER in the area of
practice of **Structural Engineering**

MECHANICAL SPECIFICATION	
Format	1994mm x 1000mm x 35mm (including frame)
Weight	24kg
Front Cover	3.2mm thermally pre-stressed glass with anti-reflection technology
Back Cover	Composite film
Frame	Anodised aluminium
Cell	6 x 12 Q.ANTUM solar cells
Junction box	B5-115 x 60-80 x 15-19mm, Protection class ≥ IP67, with bypass diodes
Cable	4mm ² Solar cable; (L) ≥ 1200mm, ≥ (-)1200mm
Connector	MC4-EVO 2, IP65 and IP68



ELECTRICAL CHARACTERISTICS		335	340	345	
POWER CLASS					
MINIMUM PERFORMANCE AT STANDARD TEST CONDITIONS, STC ¹ (POWER TOLERANCE +5W / -0W)					
Minimum	Power at MPP ²	P _{MPP}	335	340	345
	Short Circuit Current ³	I _{sc}	9.54	9.59	9.64
	Open Circuit Voltage ⁴	V _{oc}	46.81	47.07	47.46
	Current at MPP ²	I _{MPP}	8.97	9.03	9.09
	Voltage at MPP ²	V _{MPP}	37.33	37.63	37.93
	Efficiency ⁵	η	≥ 16.8	≥ 17.1	≥ 17.3
MINIMUM PERFORMANCE AT NORMAL OPERATING CONDITIONS, NOC ³					
Minimum	Power at MPP ²	P _{MPP}	248.4	252.1	255.8
	Short Circuit Current ³	I _{sc}	7.69	7.73	7.77
	Open Circuit Voltage ⁴	V _{oc}	43.68	43.92	44.29
	Current at MPP ²	I _{MPP}	7.04	7.09	7.14
	Voltage at MPP ²	V _{MPP}	35.29	35.56	35.83

¹1000W/m², 25°C, spectrum AM 1.5G ²Measurement tolerance STC ±3%; NOC ±5% ³800W/m², NOCT, spectrum AM 1.5G ⁴typical values, actual values may differ

Q CELLS PERFORMANCE WARRANTY	PERFORMANCE AT LOW IRRADIANCE
<p>At least 97% of nominal power during first year. Thereafter max. 0.5% degradation per year. At least 92% of nominal power up to 10 years. At least 85% of nominal power up to 25 years.</p> <p>All data within measurement tolerances. Full warranties in accordance with the warranty terms of the Q CELLS sales organisation of your respective country.</p>	<p>Typical module performance under low irradiance conditions in comparison to STC conditions (25°C, 1000W/m²).</p>

Mr Lei Zhang

MIEAust, CPEng, NER

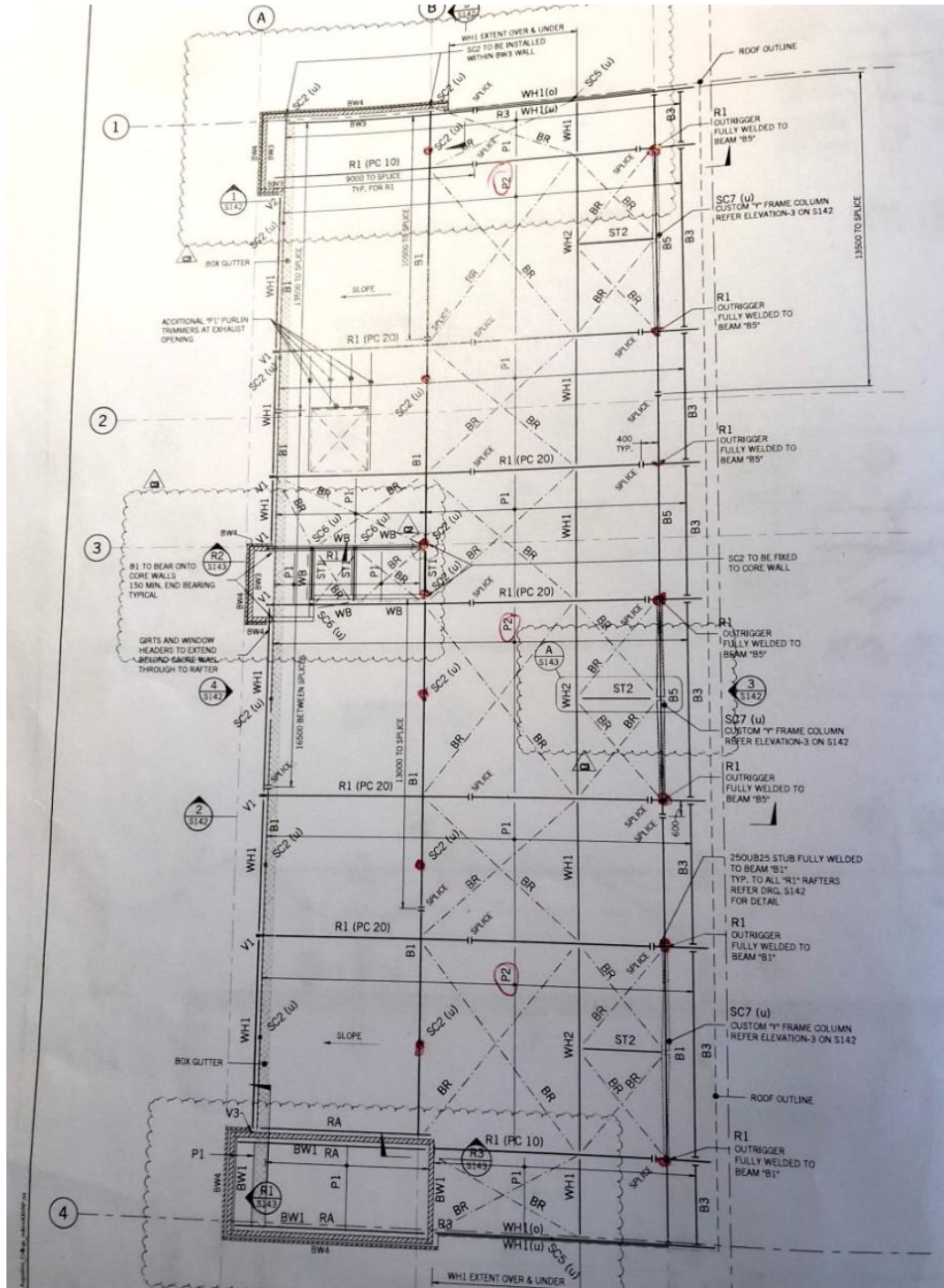




National
Engineering
Register

Signature

Date 24 / 10 / 19

Registered on the NER in the area of
practice of Structural Engineering



Mr Lei Zhang MIEAust, CPEng, NER	 ENGINEERS AUSTRALIA	National Engineering Register
Signature 	Date 24 / 10 / 19	
Registered on the NER in the area of practice of Structural Engineering		

