WORKING ENVIRONMENTS LTD
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TECHNICAL SUBMITTAL

Technical submittal no:	**E013**	**Revision no:**	-
Contract:	**Ruislip High School**	**Contract no:**	**00520**
Date:	**27 AUGUST 2019**		
Equipment:	**PV INSTALLATION PROPOSAL**		

General description of equipment offered for technical approval:

Please find attached roof layout showing 22kWp PV layout, assuming use of JA Solar 285W panels, and a Solis 25kW inverter.
"subject to ongoing purchase finalisation".

Drawing ref:	15017-WEL-V1-03-DR-E-0230	**Specification ref and pages:**	N/A

Documentation issued:

1) DRAWING 15017-WEL-V1-03-DR-E-0230 REV P1 (1 page)
2) JA Solar 285W Polychristaline panel JAP60S09 -285/SC data sheet highlighted (2 pages)
3) Solis-25 inverter data sheet highlighted (2 pages)

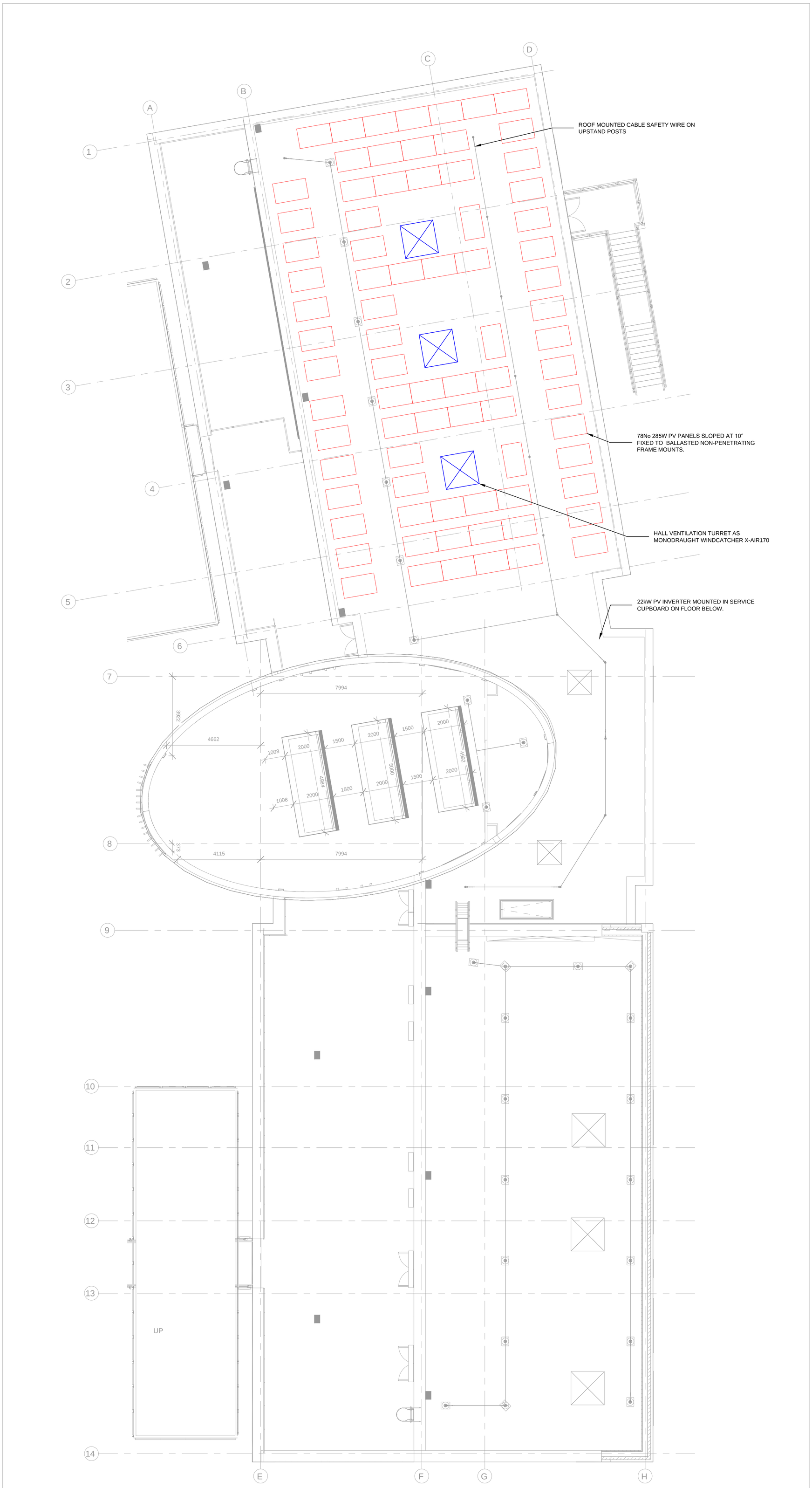
Signed for Working Environments	pp	**Date reply required:**	10 SEPTEMBER 2019

Response

Approved / not approved

Comments:

Signed:	On behalf of:	Date:



WEL DRAWING IS DERIVED FROM THE FOLLOWING DRAWINGS:

Drawing No.	Revision	Description
0000-0000	-	Description

NOTES:
1. THIS DRAWING TO BE READ IN CONJUNCTION WITH THE ARCHITECTS AND STRUCTURAL ENGINEERS DIMENSIONED LAYOUTS AND ALL OTHER RELEVANT CONTRACT DRAWINGS.
2. ANY GRID LINES, BUILDING LINES ETC. ARE TO BE SET OUT IN ACCORDANCE WITH THE RELEVANT ARCHITECTS PLAN.
3. DIMENSIONS ARE NOT TO BE SCALED FROM THIS DRAWING.
4. COMPLETE INSTALLATION TO BE FULLY IN ACCORDANCE WITH BUILDING REGULATIONS PART H
5. ITEMS IN COLOUR ARE PROPOSED ITEMS. ITEMS IN GREY ARE BACKGROUND BUILDING ELEMENTS

Rev	Date	Description
P1	27.08.19	PRELIMINARY ISSUE

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Drawing Status
PRELIMINARY

Client
FARRANS

Job Title
RUISLIP SCHOOL

Drawing Title
ELECTRICAL SERVICES
ROOF POWER LAYOUT

Drawn By	Checked By
KH	NC
Date	**Scale**
AUG 2019	1:100@A1

Drawing No.	Rev
15017-WEL-V1-03-DR-E-0230	P1

Harvest the Sunshine

Poly

290W Module

JAP60S09 270-290/SC Series

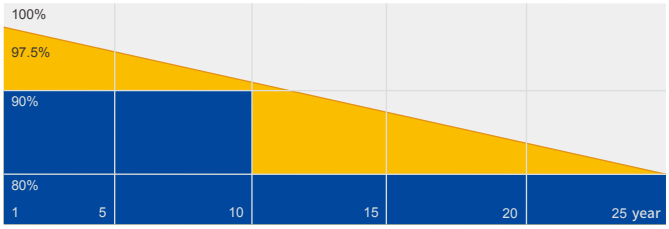
Introduction

This time-tested legacy module series has been proven to be one of the powerful and most reliable products offered by JA Solar and the most popular choice by PV system installers and customers around world.

- 5 busbar solar cell design
- Low cost
- Anti-PID
- Highly reliable due to strict quality control

Superior Warranty

- 12-year product warranty
- 25-year linear power output warranty



JA Linear Power Warranty Industry Warranty

Comprehensive Certificates

- IEC 61215, IEC 61730
- ISO 9001: 2015 Quality management systems
- ISO 14001: 2015 Environmental management systems
- OHSAS 18001: 2007 Occupational health and safety management systems
- IEC TS 62941: 2016 Terrestrial photovoltaic (PV) modules – Guidelines for increased confidence in PV module design qualification and type approval

JA SOLAR

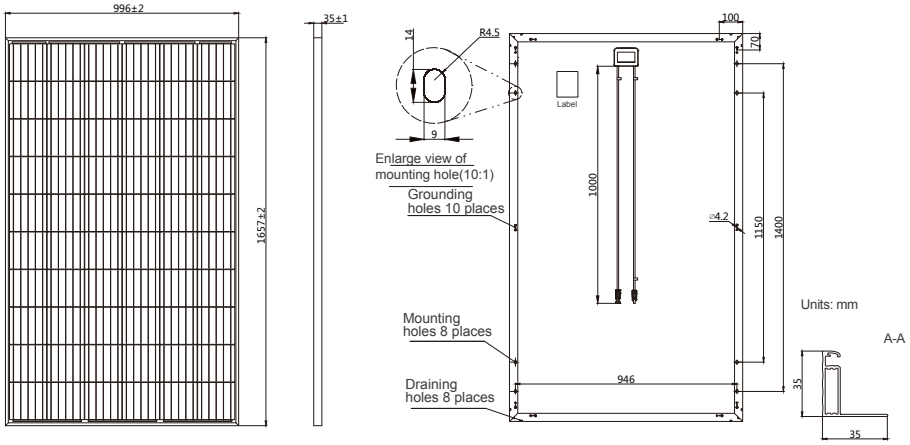
www.jasolar.com

Specifications subject to technical changes and tests.
JA Solar reserves the right of final interpretation.

JA SOLAR

JAP60S09 270-290/SC Series

MECHANICAL DIAGRAMS



SPECIFICATIONS

Cell	Poly
Weight	18.4kg±3%
Dimensions	1657±2mm×996±2mm×35±1mm
Cable Cross Section Size	4mm²
No. of cells	60(6x10)
Junction Box	IP67, 3 diodes
Connector	QC 4.10-35
Packaging Configuration	30 Per Pallet

Remark: customized frame color and cable length available upon request

ELECTRICAL PARAMETERS AT STC

TYPE	JAP60S09 -270/SC	JAP60S09 -275/SC	JAP60S09 -280/SC	JAP60S09 -285/SC	JAP60S09 -290/SC
Rated Maximum Power(Pmax) [W]	270	275	280	285	290
Open Circuit Voltage(Voc) [V]	37.92	38.18	38.43	38.69	38.95
Maximum Power Voltage(Vmp) [V]	30.72	30.94	31.19	31.43	31.70
Short Circuit Current(Isc) [A]	9.28	9.36	9.44	9.53	9.62
Maximum Power Current(Imp) [A]	8.79	8.89	8.98	9.07	9.15
Module Efficiency [%]	16.4	16.7	17.0	17.3	17.6
Power Tolerance	0~+5W				
Temperature Coefficient of Isc(α_Isc)	+0.058%/℃				
Temperature Coefficient of Voc(β_Voc)	-0.330%/℃				
Temperature Coefficient of Pmax(γ_Pmp)	-0.400%/℃				
STC	Irradiance 1000W/m², cell temperature 25°C, AM1.5G				

Remark: Electrical data in this catalog do not refer to a single module and they are not part of the offer.They only serve for comparison among different module types.

ELECTRICAL PARAMETERS AT NOCT

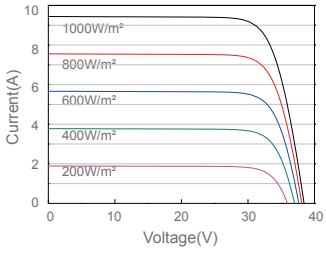
TYPE	JAP60S09 -270/SC	JAP60S09 -275/SC	JAP60S09 -280/SC	JAP60S09 -285/SC	JAP60S09 -290/SC
Rated Max Power(Pmax) [W]	200	204	208	212	216
Open Circuit Voltage(Voc) [V]	36.25	36.56	36.85	37.05	37.26
Max Power Voltage(Vmp) [V]	29.29	29.48	29.69	29.88	30.09
Short Circuit Current(Isc) [A]	7.31	7.40	7.48	7.56	7.64
Max Power Current(Imp) [A]	6.83	6.92	7.01	7.10	7.18
NOCT	Irradiance 800W/m², ambient temperature 20°C, wind speed 1m/s, AM1.5G				

OPERATING CONDITIONS

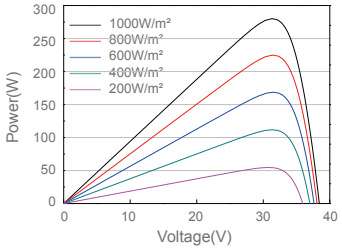
Maximum System Voltage	1000V/1500V DC(IEC)
Operating Temperature	-40°C~+85°C
Maximum Series Fuse	20A
Maximum Static Load,Front	5400Pa
Maximum Static Load,Back	2400Pa
NOCT	45±2°C
Application Class	Class A

CHARACTERISTICS

Current-Voltage Curve JAP60S09-280/SC



Power-Voltage Curve JAP60S09-280/SC



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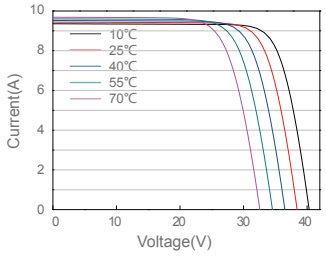

Solis-(20-33)K,Solis-30K-MX

Solis Three Phase Inverters

Features:

- Solis Three Phase Range
- Over 98.7% Max. effciency
- 200V-800V MPPT voltage range-ultra low startup
- 7.0" LCD color screen display
- Four MPPT design with precise MPPT algorithm
- Compact and light design, easy installation
- IP65 rated for outdoor installation
- Anti-resonance, single transformer can connect 6M+ in parallel
- RS485, WiFi/LAN/GPRS (optional) interface
- WiFi monitoring available-plus access to Android and Apple apps

Model:

Solis-25K Solis-25K Solis-30K

Solis-33K Solis-30K-MX

Datasheet

Model Name	Solis-20K	Solis-25K	Solis-30K	Solis-33K	Solis-30K-MX
Input DC					
Max. DC input power(kW)	27	33	40	44	40
Max. DC input voltage(V)			1000		
Nominal DC voltage(V)			600		
Start-up voltage(V)			350		
MPPT voltage range(V)			200-800		
Max. input current(A/B/C/D)			18A+18A+18A+18A		
Max. Short Circuit current for each MPPT			23.4A+23.4A+23.4A+23.4A		
MPPT number/Max input strings number			4/8		
Output AC					
Rated output power(kW)	20	25	30	33	29.99
Max. apparent output power(kVA)	22	27.5	33	33	29.99
Rated grid voltage(V)			400		
Rated grid frequency(Hz)			50/60		
Rated grid output current(A)	28.7	36.1	43.3	47.8	43.3
Max. output current(A)	33.3	41.7	50	50	50
Power Factor (at rated output power)			0.8leading ... 0.8lagging		
THDi (at rated output power)			<3%		
Efficiency					
Max. efficiency		98.6%		98.7%	98.6%
EU efficiency			98.3%		
MPPT efficiency			>99.9%		
Protection					
DC reverse-polarity protection			Yes		
Insulation resistance monitoring			Yes		
Residual current detection			Yes		
Surge protection			Yes		
Islanding protection			Yes		
Integrated DC switch			Optional		
General Data					
Dimensions(mm)			530W*700H*356.5D		
Weight (kg)	57.2		58.2		
Topology			Transformerless		
Self consumption (night)			<1W (Night)		
Operating ambient temperature range			-25~60°C		
Relative humidity			0~100%		
Ingress protection			IP65		
Noise emission(typical)			<30 dBA		
Cooling concept			Natural convection		
Max. operation altitude			4000m		
Grid connection standard			EN50438, AS4777, VDE0126-1-1, IEC61727, G99, IEC 62116		
Safety/EMC standard			IEC62109-1/-2, AS3100, EN61000-6-1, EN61000-6-2, EN61000-6-3, EN61000-6-4		
Features					
DC connection			MC4		
AC connection			Terminal connectors		
Display			7.0" LCD color screen display		
Communication connections			4 pins RS485 connector , 2 RJ45 connector		
Monitoring			WiFi or GPRS		
Warranty			5 years (extend to 20 years)		