



SOLAR INVERTERS TO BE LOCATED ON SPARE WALL WITHIN MAIN SWITCH ROOM

ROOF ACCESS MANHOLE

PURLINS AT 3000mm CENTRES

1200 (NOTE 9)

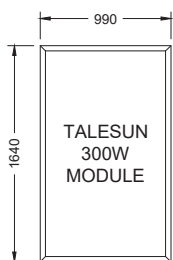
SOLAR SYSTEMS B1 AND B2

PURLINS AT 1500mm CENTRES

EXCLUDED AREA / ROOF OBSTRUCTIONS

SOLAR SYSTEMS A1 AND A2

ALL MODULES TO BE INSTALLED FLUSH MOUNTED TO THE ROOF IN LANDSCAPE ORIENTATION

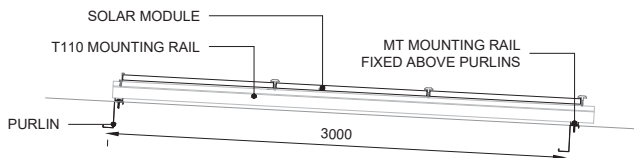


MODULE
NTS

SITE LAYOUT
NTS

LEGEND:

- EXISTING 600mm ALUMINIUM WALKWAY
- NEW 600mm FIBRE WALKWAY
- NEW 150mm DC CABLE TRAY



ELEVATION 01
NTS

SOLAR SYSTEM A1

ITEM	SPECIFICATION	QTY
MODULE	TALESUN SOLAR 300W	4032
INVERTER	SMA STP 60-10	16
TOTAL		1209.60kWp

SOLAR SYSTEM A2

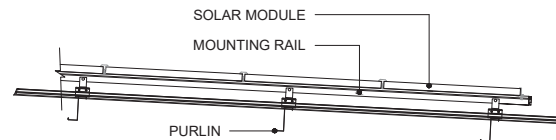
ITEM	SPECIFICATION	QTY
MODULE	TALESUN SOLAR 300W	756
INVERTER	SMA STP 60-10	3
TOTAL		226.80kWp

SOLAR SYSTEM B1

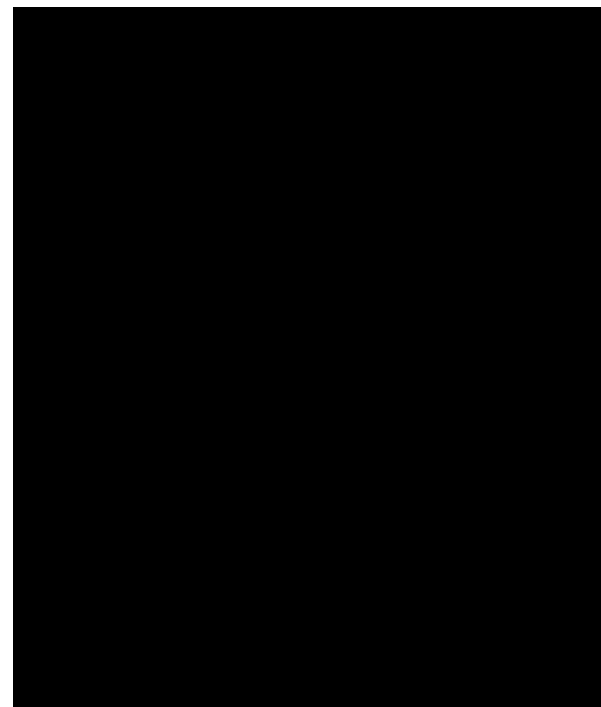
ITEM	SPECIFICATION	QTY
MODULE	TALESUN SOLAR 300W	1792
INVERTER	SMA STP 60-10	7
TOTAL		537.60kWp

SOLAR SYSTEM B2

ITEM	SPECIFICATION	QTY
MODULE	TALESUN SOLAR 300W	440
INVERTER	SMA STP 60-10	2
TOTAL		132.00kWp



ELEVATION 02
NTS



SATELLITE VIEW
NTS



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4. EXACT LOCATION OF ALL PARTS OF THE INSTALLATION TO BE DETERMINED ON SITE.
5. DETAILED SHADING ANALYSIS TO BE CONDUCTED ON SITE.
6. ALL CLAMPED ROOF FIXINGS MUST BE INSTALLED DIRECTLY ABOVE ROOF PURLINS.
7. SCREWED ROOF FIXINGS TO REPLACE EXISTING ROOF SCREWS.
8. SOLAR SYSTEMS A1 AND A2 TO CONNECT TO OLD MSB. SOLAR SYSTEMS B1 AND B2 TO CONNECT TO NEW MSB.
9. ROWS OF SOLAR MODULES INSTALLED WITHIN 12m OF A ROOF EDGE ARE TO BE SUPPORTED BY 3 RAILS. ALL OTHER ROWS TO BE SUPPORTED BY 2 RAILS.

Rev	Description	Date	Checked	Approved
D	CHANGED TO TALESUN PANELS	17.05.16		
C	INCREASED SYSTEM SIZE	18.04.17		
B	REVISED FOR RESUBMISSION	05.04.17		
A	PRELIMINARY DESIGN	17.02.17		

PROJECT:
[REDACTED]

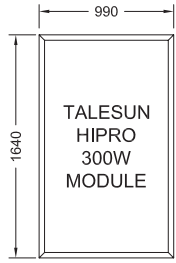
CLIENT:
[REDACTED]

SOLGEN ENERGY PTY LTD
[REDACTED]

DRAWING TITLE:
2.10MWP PHOTOVOLTAIC SYSTEM LAYOUT

SCALE	DRAWN	CHECKED	AUTHORISED	SIZE
AS SHOWN	[REDACTED]	[REDACTED]	[REDACTED]	A3
DRAWING No.	D-GE-34711P18-101			Rev D

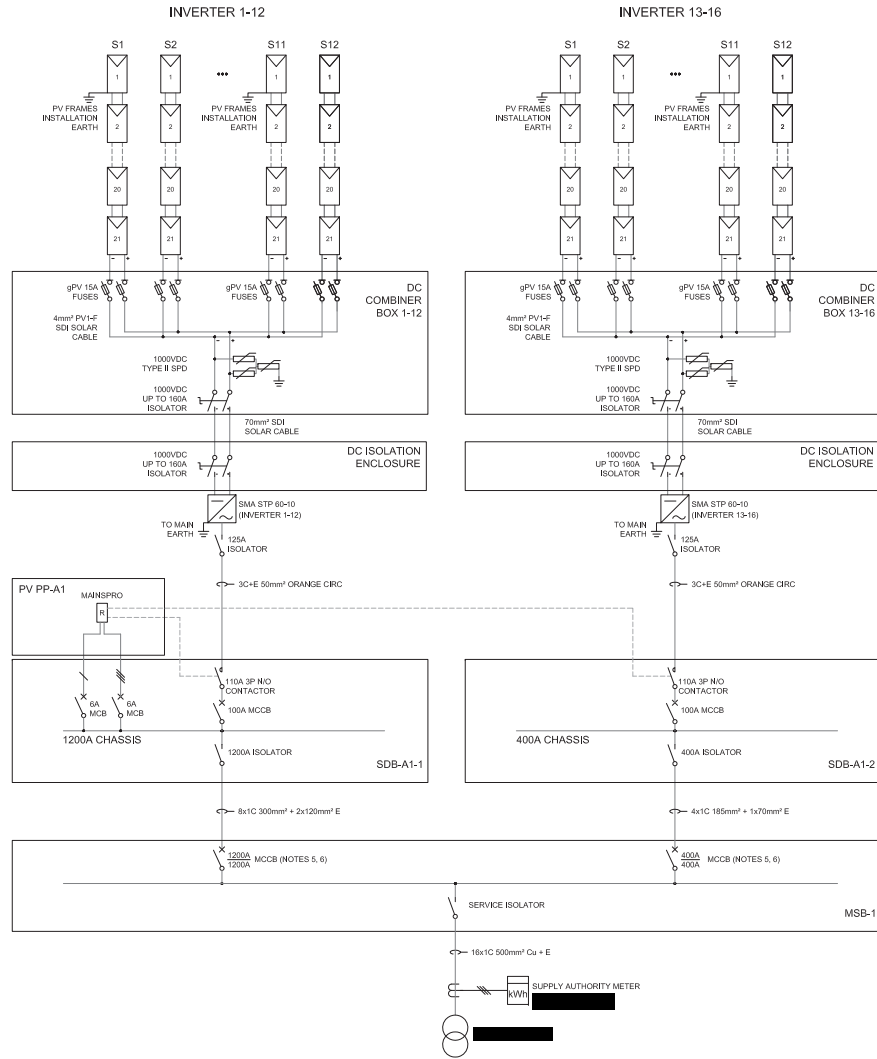
ITEM	SPECIFICATION	QTY
MODULE	TALESUN SOLAR 300W	4032
INVERTER	SMA STP 60-10	16
TOTAL		1209.60kWP



MODULE
NTS

SOLAR SYSTEM A1-1

SOLAR SYSTEM A1-2



SYSTEM SCHEMATIC
NTS

LEGEND:

	ISOLATOR		SINGLE PHASE CIRCUIT		MOULDED CASE CIRCUIT BREAKER 100A DENOTES 100AMPS RATING 200A DENOTES MINIMUM FRAME SIZE		300W MONOCRYSTALLINE SOLAR MODULE
	CIRCUIT BREAKER		THREE PHASE CIRCUIT		INTELIPRO RELAY		INVERTER
	ROTARY SWITCH		NEUTRAL CONDUCTOR SYMBOL		AC SUPPLY WIRING		MAIN METER
	EARTH POTENTIAL		EARTH CONDUCTOR SYMBOL		CONTROL WIRING		

INVERTER 1-16

Panel Type	Talesun Hipro 300M
Number of Panels in Series (N)	21
Number of Parallel Strings	12
Total Number of Panels	252
Inverter Type	SMA STP60-10
Rated Power (W)	75613
Panel Voc (V)	39.7
Panel Isc (A)	9.58
Panel Vmp (V)	32.9
Panel Imp (A)	9.12
Fill Factor	0.789
Input Voc (V)	833.7
Input Isc (A) - at max temp	114.96
PV Array Max Voltage (V)	891.97563
Distance to Junction Box (m)	80
DC Cable Resistance (Ohm*mm2/m)	0.0183
Min cable size (mm2)	3.87
Cable Size selected (mm2)	4
Voltage drop (%)	0.97
String Protection Needed	YES
String Protection Min Voltage (V)	891.98
String Protection Min Current (A)	14.37
String Protection Max Current (A)	15
Distance to inverter (m)	180
DC Cable Resistance (Ohm*mm2/m)	0.0183
Min cable size (mm2)	51.31
Cable Size selected (mm2)	70
Voltage drop (%)	1.49
Total voltage drop (panel-inverter) (%)	2.46
DC Isolation min voltage [per pole rating] (V)	891.98
DC Isolation min Current (A)	143.70
Phases output	3
Max AC current [per phase; line to neutral] (V)	87.00
AC Breaker min Current (A)	95.70
AC Breaker max Current (A)	174.00
AC Breaker chosen (A)	100
Distance to POC (m)	10
AC Cable size (mm2)	50



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- EXACT LOCATION OF ALL PARTS OF THE INSTALLATION TO BE DETERMINED ON SITE.
- MCCB TO MATCH MAKE AND FAULT CURRENT OF EXISTING CIRCUIT BREAKERS.
- MSB-1 REQUIRES MODIFICATION TO ALLOW FOR INSTALLATION OF NEW 1600A CIRCUIT BREAKER.

Rev	Description	Date	Checked	Authorised
D	REVISED FOR RESUBMISSION	26.10.17		
C	AMENDED CABLE SIZE	17.07.17		
B	SPLIT SYSTEM	24.07.17		
A	PRELIMINARY DESIGN	20.06.17		

PROJECT:
[Redacted]

CLIENT:
[Redacted]

SOLGEN ENERGY PTY LTD

DRAWING TITLE:
PHOTOVOLTAIC SYSTEM SCHEMATIC SYSTEM A1

SCALE	DRAWN	CHECKED	AUTHORISED	SIZE
AS SHOWN	[Redacted]	[Redacted]	[Redacted]	A3
DRAWING No.	D-EL-34711P18-203			Rev D

SOLAR DB COMPONENT SCHEDULE			
PART NR.	ID	MANUFACTURER	DESCRIPTION
1	MCCB 1	SCHNEIDER	1200A 3P MCCB (FEEDS SOLAR DISTRIBUTION BOARD-A1-1)
2	MCCB 2	SCHNEIDER	400A 3P MCCB (FEEDS SOLAR DISTRIBUTION BOARD-A1-2)
3	MCCB 3-18	SCHNEIDER	100A 3P MCCB (INV 1-16)
4	MCB 1	SCHNEIDER	6A 3P MCB (RELAY VOLTAGE REFERENCE)
5	MCB 2	SCHNEIDER	6A 1P MCB (RELAY POWER SUPPLY)
6	MCB 3	SCHNEIDER	6A 1P MCB (CONTROL SUPPLY)
7	CONTACTOR	BRIDEX	100A 3P N/O CONTACTOR
8	MAINSPRO	ComAP	MAINSPRO MAINS DECOUPLING RELAY
9			
10			
11			
12			
13			

MULTIFUNCTION RELAY TERMINAL SCHEDULE			
TERMINAL	FUNCTION	DEFAULT STATE	
RE 1	SPARE	/	
RE 2	SPARE	/	
RE 3	SPARE	/	
RE 4	ICommTrpPer	N/O	
RE 5	InternFail	N/O	

CABLE SCHEDULE	
INVERTER TO SOLAR DB-A1	3C + E 50mm ² Cu
SOLAR DB-A1-1 TO MSB-1	8x1C 300mm ² Cu + 2x1C 120mm ² Cu E
SOLAR DB-A1-2 TO MSB-1	4x1C 185mm ² Cu + 1C 75mm ² Cu E
AC CONTROL CIRCUITS	2,5mm ² COPPER
DC CONTROL CIRCUITS	1,5mm ² COPPER

O/U VOLTAGE SETTINGS

Protection Setting	Set Point	
	Value	Units
OV Pick Up	270	V
OV Timing	2,0	S
UV Pick Up	200	V
UV Timing	2,0	S

O/U FREQUENCY SETTINGS

Protection Setting	Set Point	
	Value	Units
OF Pick Up	52	Hz
OF Timing	2,0	S
UF Pick Up	48	Hz
UF Timing	2,0	S

ROCOF SETTINGS

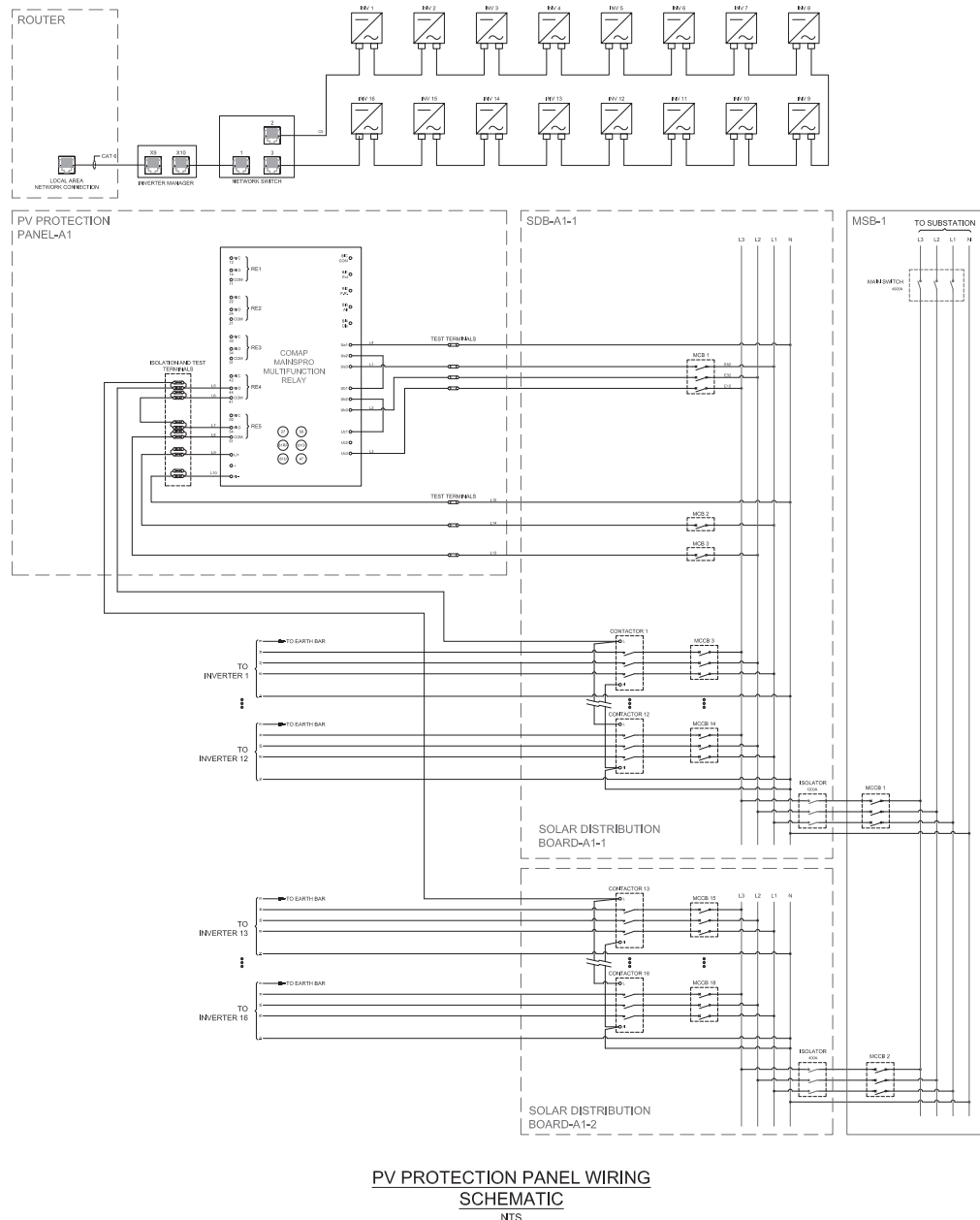
Protection Setting	Set Point	
	Value	Units
+ve ROCOF Pick Up	1,0	Hz/S
+ve ROCOF Timing	1,0	S
-ve ROCOF Pick Up	1,0	Hz/S
-ve ROCOF Timing	1,0	S

VECTOR SHIFT SETTINGS

Protection Setting	Set Point	
	Value	Units
+ve Vector Shift Pick Up	8	Degrees
-ve Vector Shift Pick Up	8	Degrees

INVERTER ANTI-ISLANDING SETTINGS

Protection Setting	Setpoint	Delay Time	Trip Time
Undervoltage (UV)	180 V	1 s	2 s
Overvoltage Stage 1 (Ov)	260 V	1 s	2 s
Overvoltage Stage 2 (Ov2)	265 V	-	0,2 s
Under-frequency (F<)	47 Hz	1 s	2 s
Over-frequency (F>)	52 Hz	-	0,2 s



PV PROTECTION PANEL WIRING SCHEMATIC
NTS

1. MAINS PRO DECOUPLING RELAY USES NORMALLY OPEN CONTACTS. WHEN A FAULT IS DETECTED A CIRCUIT IS BROKEN TO THE AC CONTROL CIRCUIT CAUSING IT TO TRIP THE MCCB.
2. AUTO RECONNECT SETTING: 60 SECONDS AFTER FAULT IS CLEARED.
3. START TRIP ACTIVATED ON RELAY.

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4. EXACT LOCATION OF ALL PARTS OF THE INSTALLATION TO BE DETERMINED ON SITE.
5. MCCB TO MATCH MAKE, MODEL AND FAULT CURRENT OF EXISTING CIRCUIT BREAKERS.

Rev	Description	Date	Checked	Authorised
C	REVISED FOR RESUBMISSION	10.10.17		
B	ADDED SDB-A1-2	03.06.17		
A	PRELIMINARY DESIGN	20.06.17		

PROJECT: [REDACTED]

CLIENT: [REDACTED]

SOLGEN ENERGY PTY LTD

DRAWING TITLE:
PROTECTION SCHEMATIC SYSTEM A1


SCALE	DRAWN	CHECKED	AUTHORISED	SIZE
AS SHOWN	[REDACTED]	[REDACTED]	[REDACTED]	A3
DRAWING No.	20.06.2017		20.06.2017	20.06.2017
D-EL-34711P18-213				Rev C

Library of Setpoints For Mainspro

Uin	230/400	
System	3PH	
DispT [min]	2 mins	
Auto FR	Enable	
Auto FR Del [s]		60
Start Trip	Enable	
Imp Len [s]		3
Bak Trp Del [s]		0.5
Ext	Enable	
F.R	Disabled	
Alt	Enable	
Disable	Disabled	
V> [V]		270
V> Del [s]		2
V> > [V]		0
V> > Del [s]		0
V< [V]		200
V< Del [s]		2
V< < [V]		0
V< < Del [s]		0
Avg V> [V]		0
RstV>, V> > [%V>]		0
RstV<, V< < [%V<]		0
V unb, A.V unb [V]		0
V< pos, A.V < pos [V]		0
V> neg, A.V > neg [V]		0
Du del, A.dU del [s]		0
F>		52
F> Del		2
F<		48
F< Del		2
F> >		0
F> > Del		0
Rstf>, F> > [%f>]		0
RSTF<, f< <		0
VS lim, A.VS lim [°]		8
ROCOF, A.ROCOF [Hz/s]	0.7 Hz	
ROCOF filt, A.ROCOF Filt [-]		50
LOM Init Del, A.LOM Init Del [s]	1 sec	
LOM Trip Del, A.LOM Trip Del [s]	1 sec	
BI1: Ext	BI1=Ext	
BI2: F.R	BI2 = N/A	
BI3: Alt	BI3=N/A	
BI4: Dis	BI4=N/A	
Default settings	RE1:Spare	
	RE2:Spare	

RE3:Spare
RE4:!CommTrpPer
RE5:!InternFail

VOLTAGE RISE CALCULATION

Project Name:		
Drawing Number:	D-EL-34711P18-VRC-A1-2	
Designer:		
Date:	24/07/2017	

SYSTEM PARAMETERS

	System Size (VA)	240000
	Phases Connected (1-3)	3
	Nominal Line Voltage (V)	230
	Max Current per Phase (A)	347.83

SERVICE MAINS

<i>None - Substation located on site</i>	Nr of Conductors per Phase	0
	Max Current per Phase / Conductor (A)	0.00
	Conductor Length (m)	0
	Conductor Cross Section (mm ²)	0
	Conductor Type	0
	Impedance (mV/Am)	0
	Voltage Rise (%)	0.00%

CONSUMER MAINS

<i>Substation 8290 to MSB-1</i>	Nr of Conductors per Phase	4
	Max Current per Phase / Conductor (A)	86.96
	Conductor Length (m)	10
	Conductor Cross Section (mm ²)	500
	Conductor Type	Underground Copper
	Impedance (mV/Am)	0.166
	Voltage Rise (%)	0.04%

SUBMAINS 1

<i>MSB-1 to Solar DB-A1</i>	System size (VA) for this section	240000
	Nr of Conductors per Phase	1
	Max Current per Phase / Conductor (A)	347.83
	Conductor Length (m)	45
	Conductor Cross Section (mm ²)	185
	Conductor Type	Flexible Cable
	Impedance (mV/Am)	0.279
	Voltage Rise (%)	1.09%

SUBMAINS 2

<i>Solar DB-A1 to Inverter</i>	System size (VA) for this section	60000
	Max Current per Phase / Conductor (A)	86.96
	Conductor Length (m)	10
	Conductor Cross Section (mm ²)	50
	Conductor Type	Multicore Copper
	Impedance (mV/Am)	0.79
	Voltage Rise (%)	0.17%

Service Mains Voltage Rise (%)	0.00%
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Consumer Mains Voltage Rise (%)	0.04%
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Sub Mains Voltage Rise (%)	1.26%
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RESULTANT LINE VOLTAGE		232.99
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VOLTAGE RISE (<=3%)		1.30%
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VOLTAGE RISE CALCULATION

Project Name:		
Drawing Number:	D-EL-34711P18-VRC-A1-1	
Designer:		
Date:	27/07/2017	

SYSTEM PARAMETERS

	System Size (VA)	720000
	Phases Connected (1-3)	3
	Nominal Line Voltage (V)	230
	Max Current per Phase (A)	1043.48

SERVICE MAINS

<i>None - Substation located on site</i>	Nr of Conductors per Phase	0
	Max Current per Phase / Conductor (A)	0.00
	Conductor Length (m)	0
	Conductor Cross Section (mm ²)	0
	Conductor Type	0
	Impedance (mV/Am)	0
	Voltage Rise (%)	0.00%

CONSUMER MAINS

<i>Substation 8290 to MSB-1</i>	Nr of Conductors per Phase	4
	Max Current per Phase / Conductor (A)	260.87
	Conductor Length (m)	10
	Conductor Cross Section (mm ²)	500
	Conductor Type	Underground Copper
	Impedance (mV/Am)	0.166
	Voltage Rise (%)	0.11%

SUBMAINS 1

<i>MSB-1 to Solar DB-A1</i>	System size (VA) for this section	720000
	Nr of Conductors per Phase	2
	Max Current per Phase / Conductor (A)	521.74
	Conductor Length (m)	45
	Conductor Cross Section (mm ²)	300
	Conductor Type	Flexible Cable
	Impedance (mV/Am)	0.219
	Voltage Rise (%)	1.29%

SUBMAINS 2

<i>Solar DB-A1 to Inverter</i>	System size (VA) for this section	60000
	Max Current per Phase / Conductor (A)	86.96
	Conductor Length (m)	10
	Conductor Cross Section (mm ²)	50
	Conductor Type	Multicore Copper
	Impedance (mV/Am)	0.79
	Voltage Rise (%)	0.17%

Service Mains Voltage Rise (%)	0.00%
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Consumer Mains Voltage Rise (%)	0.11%
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Sub Mains Voltage Rise (%)	1.46%
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RESULTANT LINE VOLTAGE		233.60
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VOLTAGE RISE (<=3%)		1.57%
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