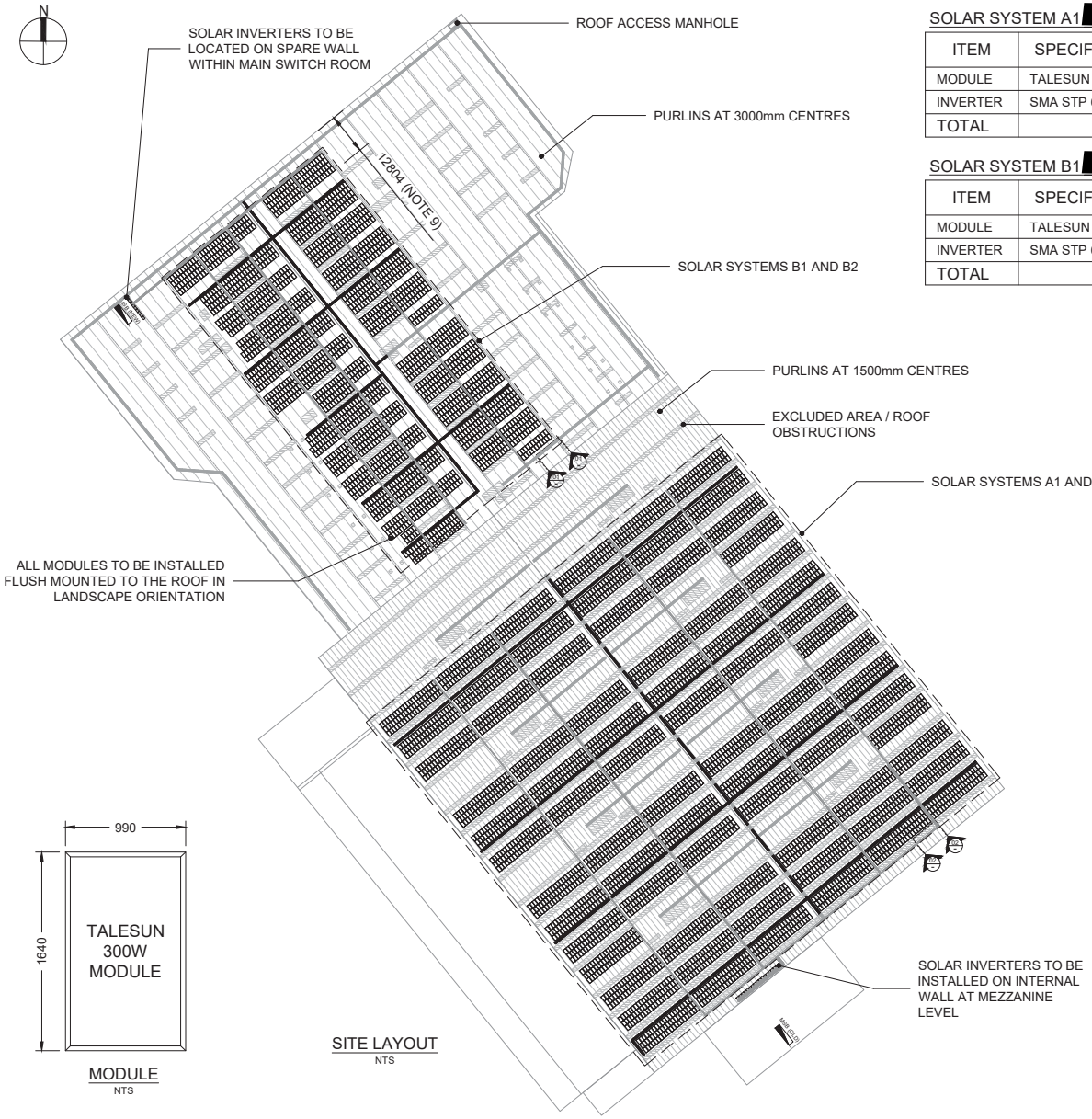


SITE LAYOUT
NTS

SOLAR SYSTEM A1 [redacted]

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

SOLAR SYSTEM A2 [redacted]

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

SOLAR SYSTEM B1 [redacted]

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

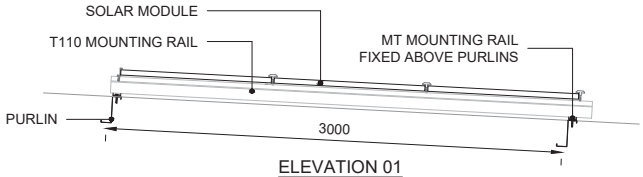
SOLAR SYSTEM B2 [redacted]

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

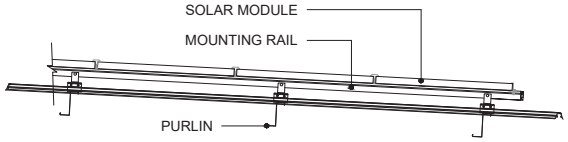
MODULE
NTS

LEGEND:

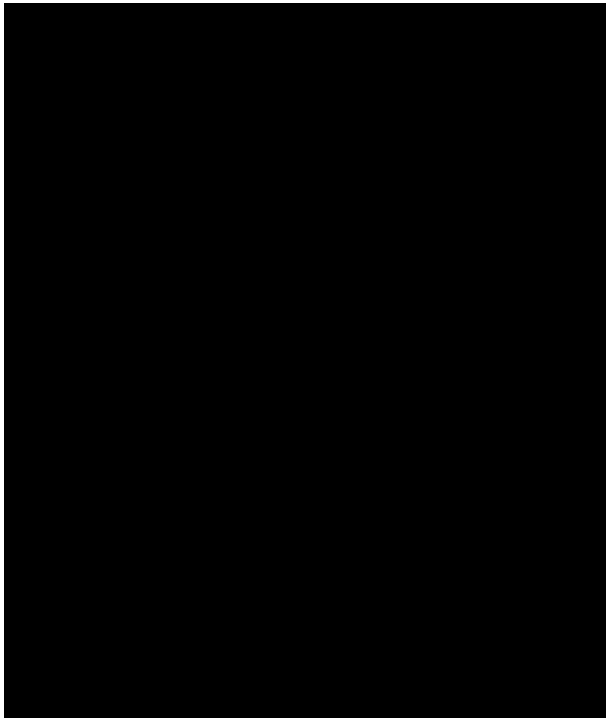
- EXISTING 600mm ALUMINIUM WALKWAY
- NEW 600mm FIBRE WALKWAY
- NEW 150mm DC CABLE TRAY



ELEVATION 01
NTS



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	Authorised
D	CHANGED TO TALESUN PANELS	17.05.16	[redacted]	
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:

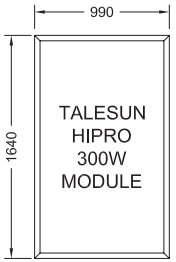
2.10MWP PHOTOVOLTAIC SYSTEM LAYOUT

SCALE	DRAWN	CHECKED	AUTHORISED	SIZE
AS SHOWN	[redacted] Date: 17.02.2017	[redacted] Date: 17.02.2017	[redacted] Date: 17.02.2017	A3

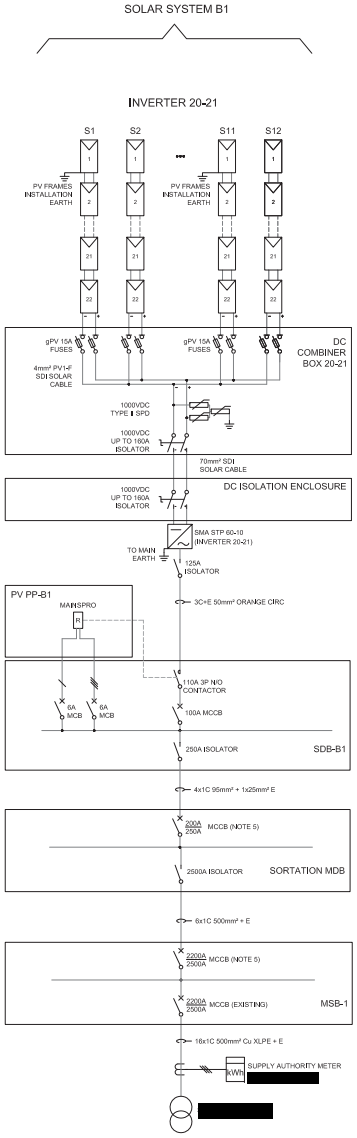
DRAWING No. D-GE-34711P18-101 | Rev D

[redacted]

ITEM	SPECIFICATION	QTY
MODULE	TALESUN SOLAR 300W	528
INVERTER	SMA STP 60-10	2
TOTAL		158.40kWP



MODULE
NTS



SYSTEM SCHEMATIC
NTS

INVERTERS 20-21

Panel Type	Talesun Hipro 300M
Number of Panels in Series (N)	22
Number of Parallel Strings	12
Total Number of Panels	264
Inverter Type	SMA STP60-10
Rated Power (W)	79213
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)	873.4
Input Isc (A) - at max temp	114.96
PV Array Max Voltage (V)	934.45066
Distance to Junction Box (m)	80
DC Cable Resistance (Ohm*mm2/m)	0.0183
Min cable size (mm2)	3.69
Cable Size selected (mm2)	4
Voltage drop (%)	0.92
String Protection Needed	YES
String Protection Min Voltage (V)	934.45
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)	47.94
Cable Size selected (mm2)	70
Voltage drop (%)	1.42
Total voltage drop (panel-inverter) (%)	2.35
DC Isolation min voltage [per pole rating] (V)	934.45
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

LEGEND:

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

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5. MCB TO MATCH MAKE, MODEL AND FAULT CURRENT OF EXISTING CIRCUIT BREAKERS.

Rev	Description	Date	Checked	Authorised
E	REVISED FOR RESUBMISSION	26.10.17	[redacted]	
D	REVISED FOR APPROVAL	07.09.17		
C	UPDATED WIRE SIZE	23.08.17		
B	INCREASED AC SUBMAINS SIZE	03.08.17		
A	PRELIMINARY DESIGN	20.06.17		

PROJECT: [redacted]

CLIENT: [redacted]

SOLGEN ENERGY PTY LTD [redacted]

DRAWING TITLE:

PHOTOVOLTAIC SYSTEM SCHEMATIC SYSTEM B1

SCALE	DRAWN	CHECKED	AUTHORISED	SIZE
AS SHOWN	[redacted] Date: 20.06.2017	Date: 20.06.2017	Date: 20.06.2017	A3

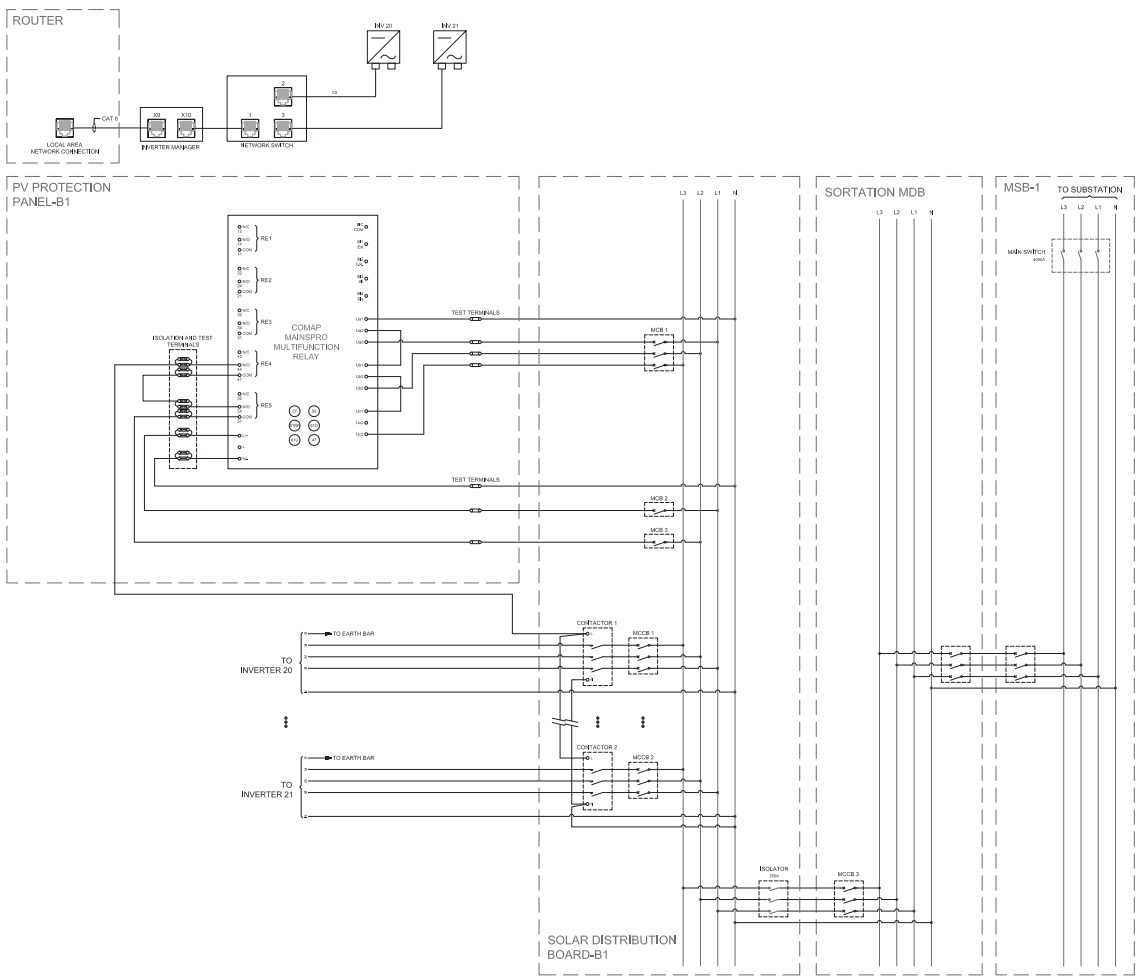
DRAWING No. D-EL-34711P18-205 Rev E

[redacted]

SOLAR DB COMPONENT SCHEDULE			
PART NR.	ID	MANUFACTURER	DESCRIPTION
1	MCCB 1	NHP	100A 3P MCCB (INV 20)
2	MCCB 2	NHP	100A 3P MCCB (INV 21)
3	MCCB 3	NHP	250A 3P MCCB (SDB-B1 TO SORTATION MDB)
4	MCB 1	NHP	6A 3P MCB (RELAY VOLTAGE REFERENCE)
5	MCB 2	NHP	6A 1P MCB (RELAY POWER SUPPLY)
6	MCB 3	NHP	6A 1P MCB (CONTROL SUPPLY)
7	CONTACTOR 1-2	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	!CommTrpPer	N/O
RE 5	!InternFail	N/O

CABLE SCHEDULE	
INVERTER TO SOLAR DB	3C + E 50mm² Cu
SOLAR DB-B1 TO SORTATION MDB	4x1C 950mm² Cu + 1C 25mm² Cu E
AC CONTROL CIRCUITS	2.5mm² COPPER
DC CONTROL CIRCUITS	1.5mm² COPPER



PV PROTECTION PANEL WIRING SCHEMATIC

NTS

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 (V<)	180 V	1 s	2 s
Overvoltage Stage 1 (V>)	260 V	1 s	2 s
Overvoltage Stage 2 (V>>)	265 V	-	0.2 s
Under-frequency (F<)	47 Hz	1 s	2 s
Over-frequency (F>)	52 Hz	-	0.2s

1. MAINSPRO 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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5. MCB TO MATCH MAKE, MODEL AND FAULT CURRENT OF EXISTING CIRCUIT BREAKERS.

Rev	Description	Date	Checked	Authorised
D	REVISED FOR RESUBMISSION	10.10.17	[redacted]	
C	REDUCED SYSTEM SIZE	18.09.17		
B	INCREASED AC SUBMAINS SIZE	03.08.17		
A	PRELIMINARY DESIGN	20.06.17		

PROJECT: [redacted]

CLIENT: [redacted]

SOLGEN ENERGY PTY LTD [redacted]

DRAWING TITLE:

PROTECTION SCHEMATIC SYSTEM B1

SCALE	DRAWN	CHECKED	AUTHORISED	SIZE
AS SHOWN	[redacted] Date: 20.06.2017	Date: 20.06.2017	Date: 20.06.2017	A3

DRAWING No. D-EL-34711P18-215 Rev D

[redacted]

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 [^{o}]		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:	[redacted]	
Drawing Number:	D-EL-34711P18-VRC-B1	
Designer:	[redacted]	
Date:	18/09/2017	
SYSTEM PARAMETERS		
	System Size (VA)	120000
	Phases Connected (1-3)	3
	Nominal Line Voltage (V)	230
	Max Current per Phase (A)	**173.91**
SERVICE MAINS		
None - Substation located on site	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		
Substation 64056 to MSB-1	Nr of Conductors per Phase	4
	Max Current per Phase / Conductor (A)	**43.48**
	Conductor Length (m)	33
	Conductor Cross Section (mm^2)	500
	Conductor Type	Underground Copper
	Impedance (mV/Am)	0.166
	Voltage Rise (%)	0.06%
SUBMAINS 1		
MSB-1 to Sortation MDB	System size (VA) for this section	120000
	Nr of Conductors per Phase	4
	Max Current per Phase / Conductor (A)	**43.48**
	Conductor Length (m)	35
	Conductor Cross Section (mm^2)	500
	Conductor Type	Single-core Copper
	Impedance (mV/Am)	0.19
	Voltage Rise (%)	0.07%
SUBMAINS 1.2		
Sortation MDB to Solar DB-B1-1	System size (VA) for this section	120000
	Nr of Conductors per Phase	1
	Max Current per Phase / Conductor (A)	**173.91**
	Conductor Length (m)	58
	Conductor Cross Section (mm^2)	95
	Conductor Type	Flexible Cable
	Impedance (mV/Am)	0.453
	Voltage Rise (%)	1.14%
SUBMAINS 2		
Solar DB-B1-1 to inverter	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%**
Consumer Mains Voltage Rise (%)		**0.06%**
Sub Mains Voltage Rise (%)		**1.39%**
RESULTANT LINE VOLTAGE		233.33
VOLTAGE RISE (<=3%)		1.45%