

[REDACTED]

1. Technology: Solar PV

2. Maximum Power: 40 kW

3. Contribution to fault levels: N/A

4. Size & rating of the relevant Transformer: N/A

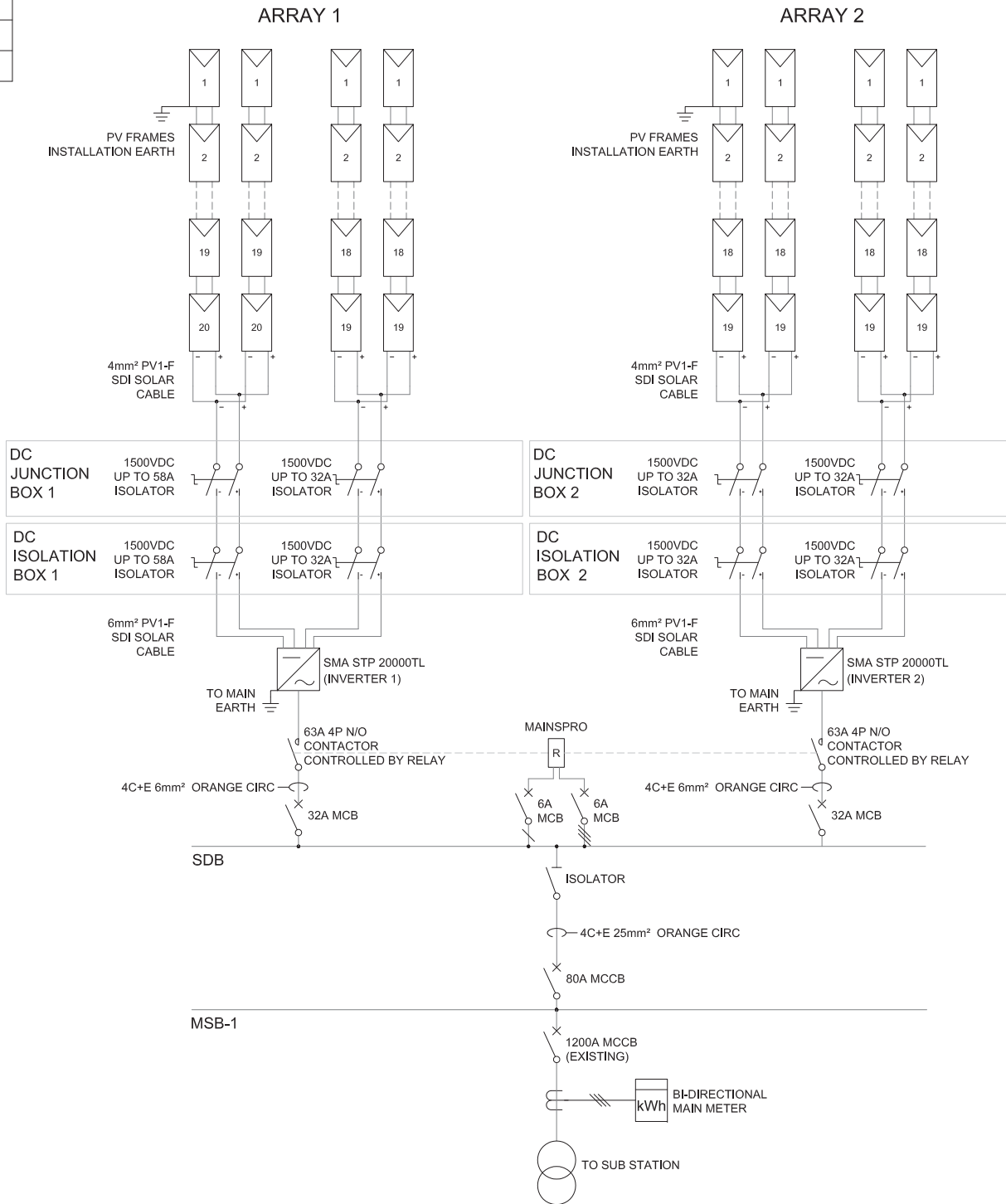
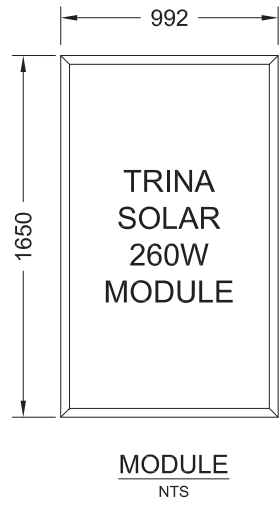
5. Single line diagram: refer to following page

6. Protection Systems & Communication Systems: refer to following page

7. Voltage Control and reactive power capability: N/A

8. Details specific to the location of facility: N/A

ITEM	SPECIFICATION	QTY
MODULE	TRINA SMART 260W	154
INVERTER	SMA STP 20000TL	2
TOTAL		40.04kWP



TYPICAL SYSTEM SCHEMATIC
NTS

LEGEND:

- ISOLATOR
- SINGLE PHASE CIRCUIT
- MOULDED CASE CIRCUIT BREAKER
100A DENOTES 100AMPS RATING
200A DENOTES MINIMUM FRAME SIZE
- 260W POLYCRYSTALLINE SOLAR MODULE
- CIRCUIT BREAKER
- THREE PHASE CIRCUIT
- MAINSPRO RELAY
- INVERTER
- ROTARY SWITCH
- NEUTRAL CONDUCTOR SYMBOL
- AC SUPPLY WIRING
- MAIN METER
- EARTH POTENTIAL
- AUXILIARY N/C CONTACTS FROM GENERATOR ATS
- CONTROL WIRING

ARRAY 1

	MPPT1	MPPT2
Panel Type	Trina-Honey 260P	Trina-Honey 260P
Number of Panels in Series (N)	20	19
Number of Parallel Strings	2	2
Total Number of Panels	78	
Inverter Type	SMA STP20000TL-30	
Number of Individual MPPT's	2	
Rated Power (W)	10404	9884
Total Rated Power (W)	20288	
Panel Voc (V)	38.2	38.2
Panel Isc (A)	9	9
Fill Factor	0.756544503	0.756544503
Input Voc (V)	764	725.8
Input Isc (A)	18	18
PV Array Min Voltage	489.76	465.272
PV Array Max Voltage	825.12	783.86
Distance to Junction Box (m)	50	
DC Cable Resistance (Ohm*mm2/m)	0.0172	
Min cable size (mm2)	2.03	2.13
Cable Size selected (mm2)	4	4
Voltage drop (%)	0.51	0.53
String Protection Needed	NO	NO
Distance to Inverter (m)	30	
DC Cable Resistance (Ohm*mm2/m)	0.0172	
Min cable size (mm2)	2.43	2.56
Cable Size selected (mm2)	6	6
Voltage drop (%)	0.41	0.43
DC Isolation min voltage [per pole rating] (V)	825.12	783.86
DC Isolation min Current (A)	22.50	22.50
Phases output	3	
Max AC current [per phase; line to neutral] (A)	29.00	
AC Breaker min Current (A)	29.00	
AC Breaker max Current (A)	58.00	
AC Breaker Chosen (A)	32	
Distance to POC (m)	5.00	
Cable Impedance (Ohm*mm2/m)	0.018	
Min cable size (mm2)	2.18	
AC Cable size (mm2)	6.00	

ARRAY 2

	MPPT1	MPPT2
Panel Type	Trina-Honey 260P	Trina-Honey 260P
Number of Panels in Series (N)	19	19
Number of Parallel Strings	2	2
Total Number of Panels	76	
Inverter Type	SMA STP20000TL-30	
Number of Individual MPPT's	2	
Rated Power (W)	9884	9884
Total Rated Power (W)	19768	
Panel Voc (V)	38.2	38.2
Panel Isc (A)	9	9
Fill Factor	0.756544503	0.756544503
Input Voc (V)	725.8	725.8
Input Isc (A)	18	18
PV Array Min Voltage	465.272	465.272
PV Array Max Voltage	783.86	783.86
Distance to Junction Box (m)	50	
DC Cable Resistance (Ohm*mm2/m)	0.0172	
Min cable size (mm2)	2.13	2.13
Cable Size selected (mm2)	4	4
Voltage drop (%)	0.53	0.53
String Protection Needed	NO	NO
Distance to Inverter (m)	30	
DC Cable Resistance (Ohm*mm2/m)	0.0172	
Min cable size (mm2)	2.56	2.56
Cable Size selected (mm2)	6	6
Voltage drop (%)	0.43	0.43
DC Isolation min voltage [per pole rating] (V)	783.86	783.86
DC Isolation min Current (A)	22.50	22.50
Phases output	3	
Max AC current [per phase; line to neutral] (A)	28.65	
AC Breaker min Current (A)	28.65	
AC Breaker max Current (A)	57.30	
AC Breaker Chosen (A)	32	
Distance to POC (m)	5.00	
Cable Impedance (Ohm*mm2/m)	0.018	
Min cable size (mm2)	2.15	
AC Cable size (mm2)	6.00	

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- ALL DIMENSIONS ARE IN MILLIMETERS AND LEVELS IN MILLIMETERS UNLESS NOTED OTHERWISE.
- EXACT LOCATION OF ALL PARTS OF THE INSTALLATION TO BE DETERMINED ON SITE.
- CIRCUIT BREAKER TO MATCH MAKE, MODEL AND FAULT CURRENT OF EXISTING CIRCUIT BREAKERS.
- 2C 1.5mm² CONTROL CABLE.

Rev	Description	Date	Checked	Authorised
A	PRELIMINARY DESIGN	11.09.15		

PROJECT:

CLIENT:

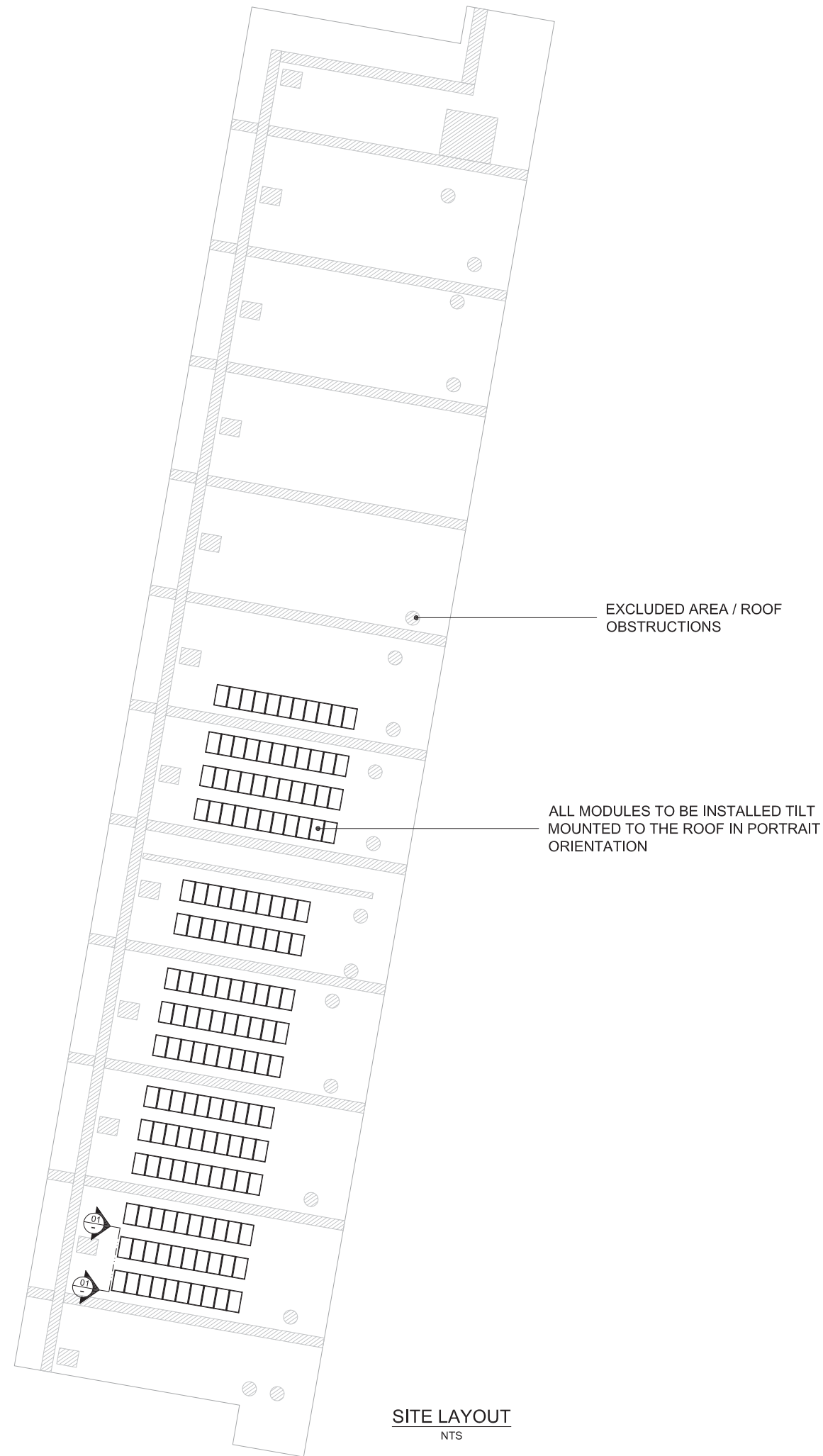
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DRAWING TITLE:

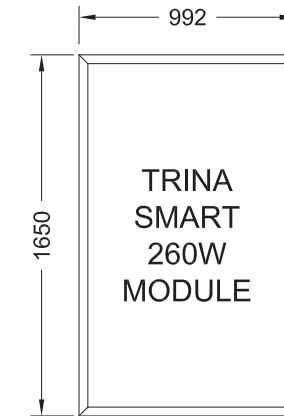
40.04kWP PHOTOVOLTAIC SYSTEM SCHEMATIC

SCALE	DRAWN	CHECKED	AUTHORISED	SIZE
AS SHOWN				A3

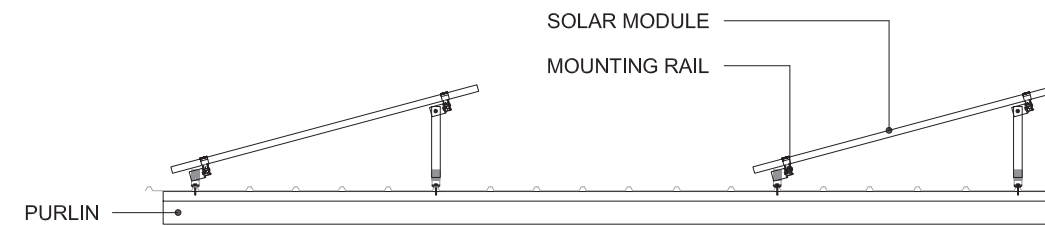
DRAWING No. D-EL-12628P5-201 Rev A



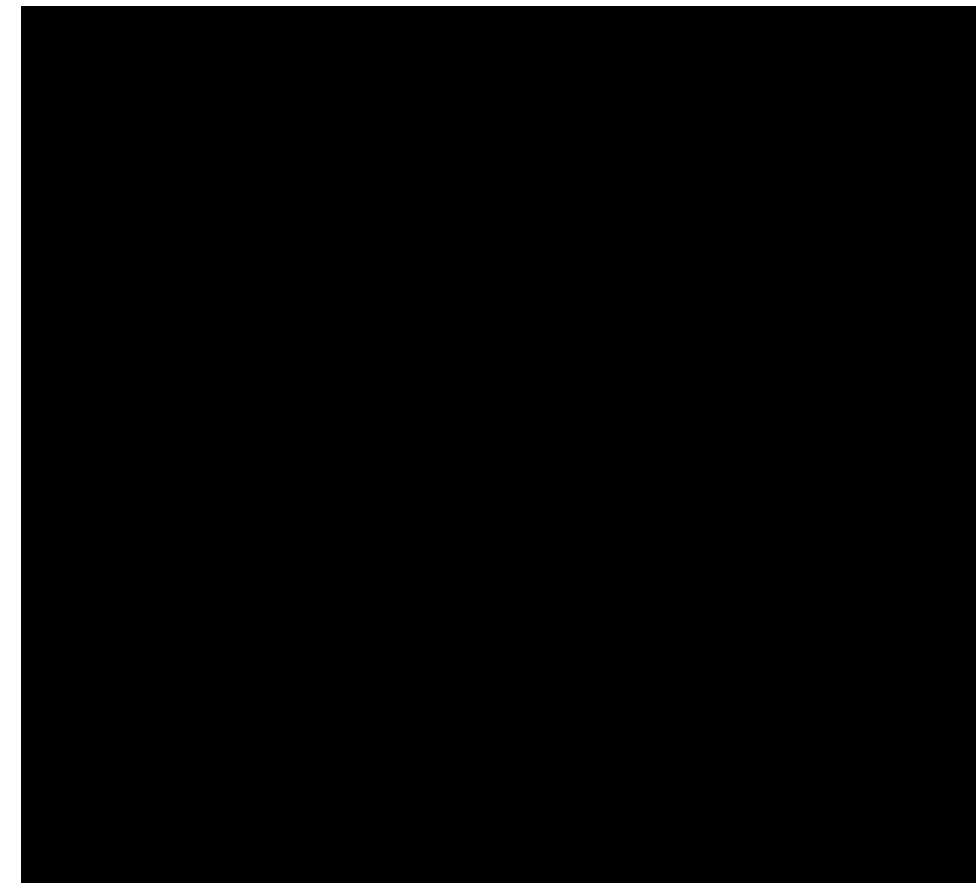
ITEM	SPECIFICATION	QTY
MODULE	TRINA SMART 260W	154
INVERTER	SMA STP 20000TL	2
TOTAL		40.04kWp



MODULE
NTS



ELEVATION 01
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SATELLITE VIEW
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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 REPLACED EXISTING ROOF SCREWS.

Rev	Description	Date	Checked	Authorised
A	PRELIMINARY DESIGN	06.05.15		

PROJECT:
[Redacted]

CLIENT:
[Redacted]

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[Redacted]

DRAWING TITLE:
40.04kWp PHOTOVOLTAIC SYSTEM LAYOUT

SCALE	DRAWN	CHECKED	AUTHORISED	SIZE
AS SHOWN	[Redacted]	[Redacted]	[Redacted]	A3

DRAWING No.	Rev
D-GE-12628P5-101	A

SOLAR DB COMPONENT SCHEDULE			
PART NR.	ID	MANUFACTURER	DESCRIPTION
1	MCB 1	GE	32A 3P MCB (INV 1 CONNECTION)
2	MCB 2	GE	32A 3P MCB (INV 2 CONNECTION)
3	MCB 3	GE	6A 1P MCB (CONTROL SUPPLY)
4	MCB 4	GE	6A 1P MCB (RELAY POWER SUPPLY)
5	MCB 5	GE	6A 3P MCB (RELAY VOLTAGE REFERENCE)
6	MAIN SWITCH	GE	250A 3P ISOLATOR
7	CONTACTOR 1	ELKO	63A 4P N/O CONTACTOR (INV 1 CONTROL)
8	CONTACTOR 2	ELKO	63A 4P N/O CONTACTOR (INV 2 CONTROL)
9	MAINSPRO	ComAP	MAINSPRO MAINS DECOUPLING RELAY

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	4C + E 6mm ² Cu
SOLAR DB TO MSB-1	4C + E 25mm ² Cu
AC CONTROL CIRCUITS	1.5mm ² COPPER

O/U VOLTAGE SETTINGS

Protection Setting	Set Point	
	Value	Units
OV Pick Up	270	V
OV Timing	1.0	S
UV Pick Up	200	V
UV Timing	1.0	S

O/U FREQUENCY SETTINGS

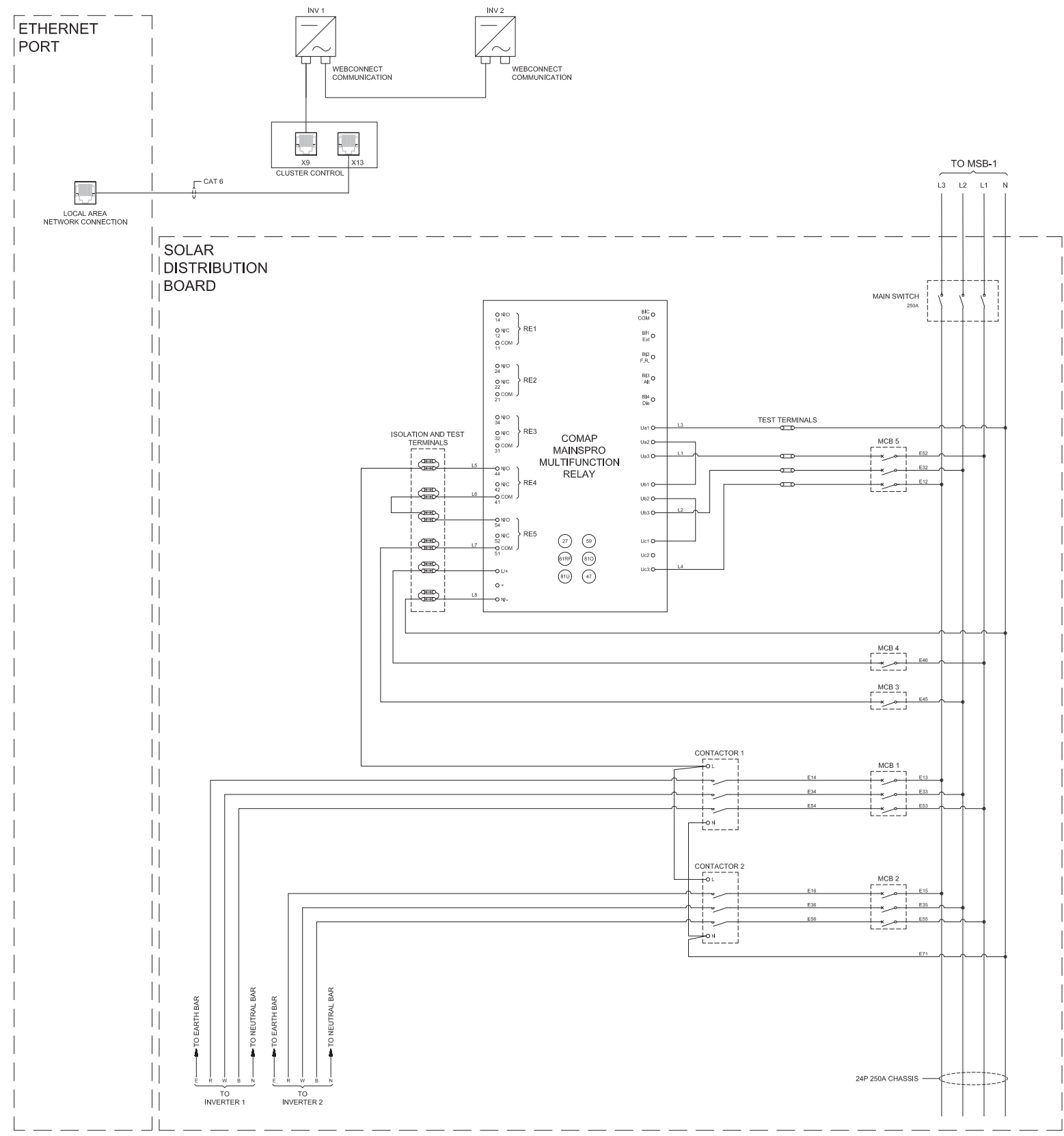
Protection Setting	Set Point	
	Value	Units
OF Pick Up	52	Hz
OF Timing	2.0	S
UF Pick Up	48	Hz
UF Timing	2.0	S

ROCOF SETTINGS

Protection Setting	Set Point	
	Value	Units
+ve ROCOF Pick Up	0.7	Hz/S
+ve ROCOF Timing	1.0	S
-ve ROCOF Pick Up	0.7	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 Timing	8	Degrees
-ve Vector Shift Pick Up	8	Degrees
-ve Vector Shift Timing	8	Degrees



SOLAR DISTRIBUTION BOARD WIRING SCHEMATIC
NTS

INVERTER O/U VOLTAGE SETTINGS

Protection Setting	Set Point	
	Value	Units
OV Pick Up	260	V
OV Timing	1.0	S
UV Pick Up	200	V
UV Timing	1.0	S

INVERTER O/U FREQUENCY SETTINGS

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

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 CONTACTORS.
2. AUTO RECONNECT SETTING: 60 SECONDS AFTER FAULT IS CLEARED.
3. START TRIP ACTIVATED ON RELAY.

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3. EARTH CABLE ROUTE NOT SHOWN FOR CLARITY
4. CABLE SIZED ACCORDINGLY FOR THE APPROPRIATE RATINGS.
5. SOLAR POWER SYSTEM COMPLIES WITH CLASS II INSTALLATION
6. INSTALLATION TO COMPLY WITH AS4777, AS5033, AS3000, AS3430, STATE SERVICE AND INSTALLATION RULES AND ENERGY AUTHORITY NETWORK RULES
7. SOLAR AC SWITCHGEAR SIZED FOR MAXIMUM INVERTER AC OUTPUT.

Rev	Description	Date	Checked	Authorised
A	PRELIMINARY DESIGN	11.09.15		

PROJECT: [REDACTED]
CLIENT: [REDACTED]

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DRAWING TITLE:

SOLAR DB WIRING AND PROTECTION SETTINGS

SCALE	DRAWN	CHECKED	AUTHORISED	SIZE
AS SHOWN	Date: 11.09.2015	Date: 11.09.2015	Date: 11.09.2015	A3
DRAWING No.	D-EL-12628P5-203			Rev A