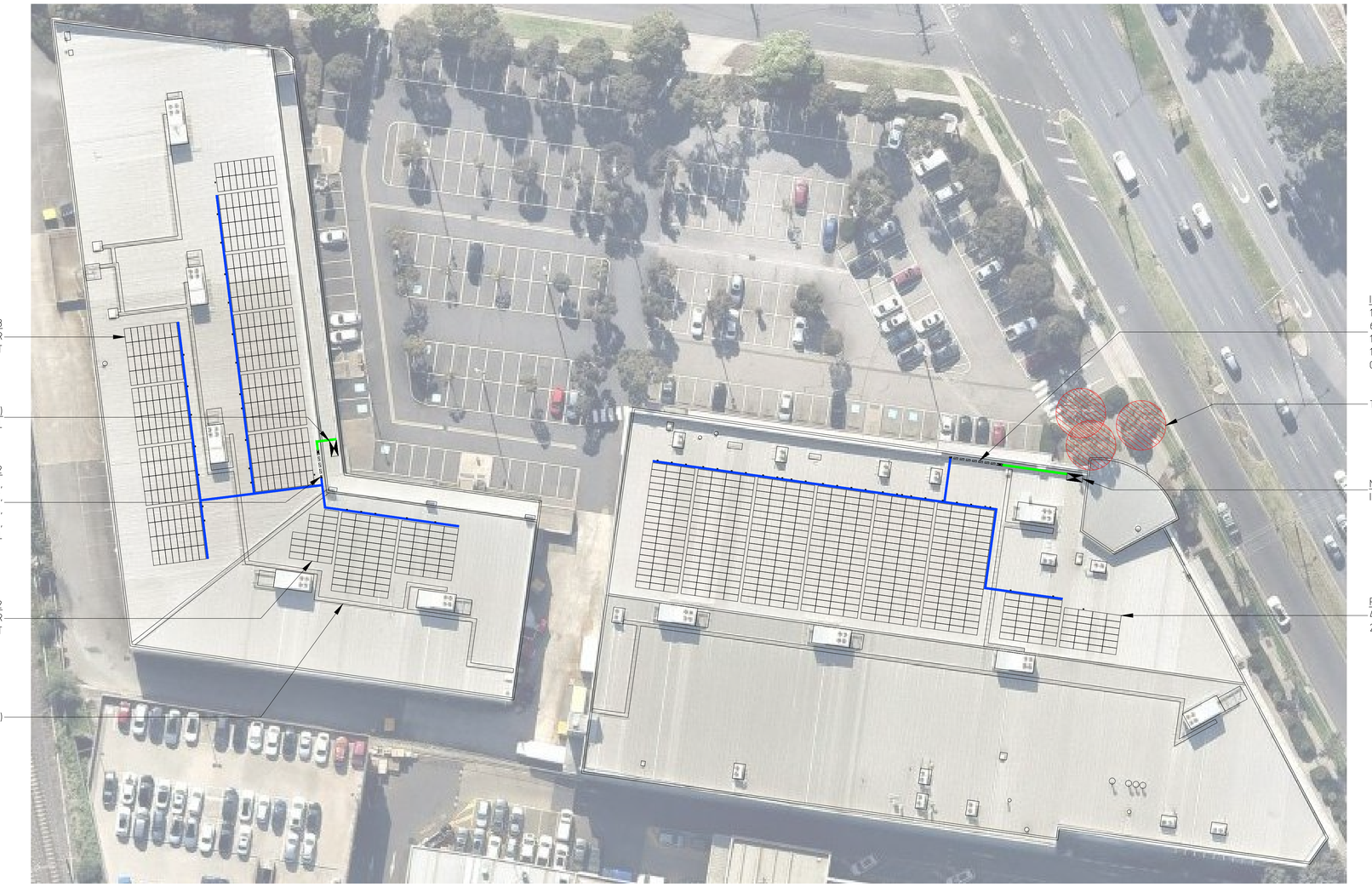


SITE PLAN

SCALE 1:400

OVERALL SYSTEM SPECIFICATION		
MODULE	914	JA SOLAR JAM78S10-440/MR
INVERTER	11	SMA STP 25000TL-30
	1	SMA STP 20000TL-30
	1	SMA STP 15000TL-30
DC CAPACITY	402.16	kWp
AC CAPACITY	310.00	kVA
DC/AC RATIO	1.30	

PERFORMANCE ESTIMATE		
PRODUCED ENERGY	574.34	MWh/YEAR
SPECIFIC PRODUCTION	1430	kWh/kWp/YEAR
PERFORMANCE RATIO PR	84.40	%

NOTES:

1. DO NOT SCALE FROM THIS DRAWING.
2. ALL DIMENSIONS ARE IN METRES AND LEVELS IN METRES UNLESS NOTED OTHERWISE. ALL DIMENSIONS TO BE VERIFIED ON SITE BY CONTRACTOR.
3. EXACT LOCATION OF ALL PARTS OF THE INSTALLATION TO BE DETERMINED BY CONTRACTOR ON SITE.
4. PRINT IN COLOUR.
5. THIS DRAWING IS BASED ON THE INFORMATION SUPPLIED TO THE DESIGNER FROM ITS CLIENTS OR SUBCONTRACTORS AND HAS BEEN PROVIDED IN ACCORDANCE WITH GSES' TERMS AND CONDITIONS.
6. ALL EXISTING EQUIPMENT LABELLED "EXISTING". ALL OTHER EQUIPMENT TO BE INSTALLED.

LEGEND:

- PV MODULE
- LOAD BREAK DISCONNECTOR
- DC FUSE ENCLOSURE
- INVERTER
- SWITCHBOARD
- OBSTACLE
- DC CABLE TRAY
- AC CABLE TRAY

DETAILED DESIGN ISSUE
NOT FOR CONSTRUCTION

REVISION PANEL

REV	DATE	DRN	DETAILS	APR'D
0	07/01/2021	S.Z	DETAILED DESIGN ISSUE	A.B

AUTHORISED 07/01/2021
A.BONANNO
SIGNATURE

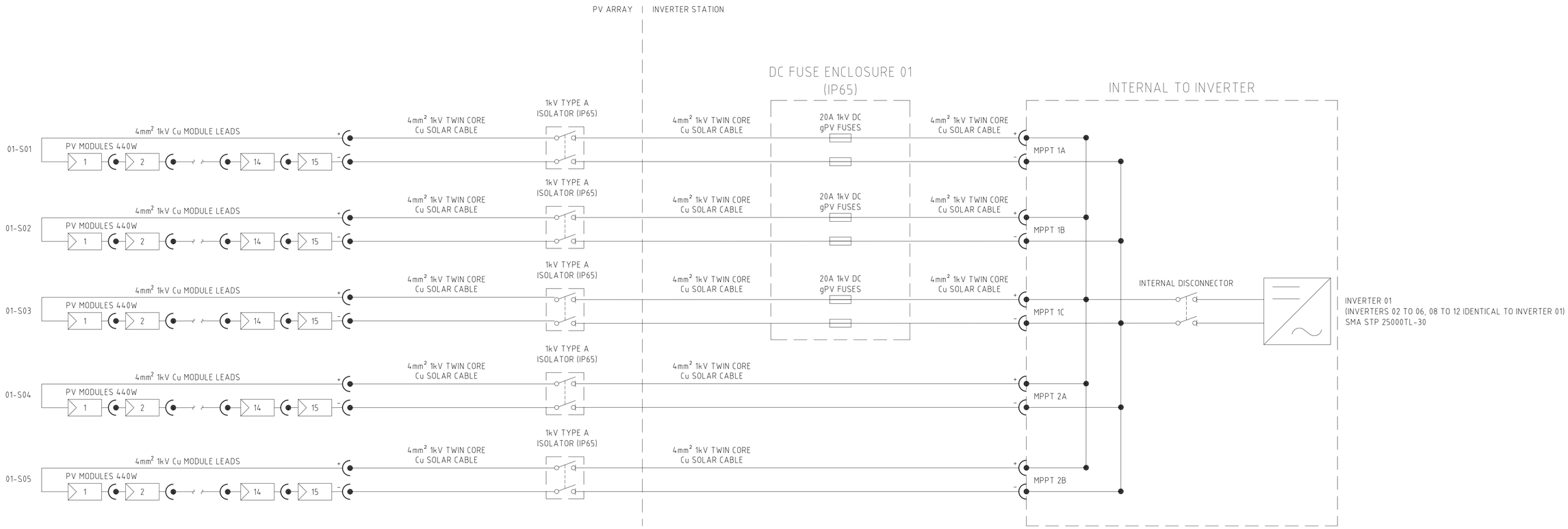
DESIGN PANEL

DESIGNED 07/01/2021 S.ZAIDI
DRAWN 07/01/2021 S.ZAIDI
REVIEWED 07/01/2021 H.SMITH
AUTHORISED 07/01/2021 A.BONANNO
SIGNATURE

GSES®
GLOBAL SUSTAINABLE ENERGY SOLUTIONS

MOORABIN
970 NEPEAN HWY
MOORABBIN VIC 3189
CIVIL/SITE
SITE PLAN

A1 SHT SIZE
TOTAL SHEETS:
PROJECT No: P1072
0 REVISION
SITE ID:
SUPERSEDES:
DRAWING NUMBER
P1072-01-001-01



LEGEND:

- PV MODULE
- LOAD BREAK DISCONNECTOR
- FUSE
- INVERTER
- STRING CONNECTOR
- ELECTRICAL JUNCTION

PV ARRAY (INVERTER 01)

MODULES:	75 x JA SOLAR JAM78S10-440/MR
MODULE RATING:	440 W
DC NOMINAL POWER:	33 kWp
SHORT CIRCUIT CURRENT:	31.32 A (MPPT 1)
	20.88 A (MPPT 2)
PV ARRAY MAX. VOLTAGE (AT -3.8°C):	861.169 V (MPPT 1, 2)
PV ARRAY MIN. VOLTAGE (AT 81.7°C):	539.483 V (MPPT 1, 2)

INVERTER 01

INVERTER:	SMA STP 25000TL-30
RATED AC OUTPUT:	25000 VA
RATED CURRENT OUTPUT:	36.2 A
MPP VOLTAGE RANGE:	390 V TO 800 V
MAX. INPUT VOLTAGE:	1000 V
MIN. INPUT VOLTAGE:	188 V

NAMING CONVENTION:

STRING: ##-S##

- ## : STRING NUMBER
- ## : INVERTER NUMBER

ISOLATOR TYPE	THERMAL CURRENT I_{the} (A)	OPERATIONAL CURRENT I_e (A) @V_e	FAULT MAKE/LOAD BREAK CURRENT I_{make}, I_{break} (A) @V_{fault}
A	14	14 @ 900V	14 @ 900V

NOTES:

1. PV MODULES TO USE TEMPERED GLASS, BE SELF CLEANING AND ANTI-REFLECTIVE.
2. THE MOST CURRENT VERSION OF THE FOLLOWING AUSTRALIAN STANDARDS ARE APPLICABLE AS A MINIMUM:
   - AS5033: INSTALLATION OF PHOTOVOLTAIC ARRAYS
   - AS4777: GRID CONNECTION OF ENERGY SYSTEMS VIA INVERTERS
   - AS3000: ELECTRICAL WIRING RULES
   - AS3008: ELECTRICAL INSTALLATION - SELECTION OF CABLES
   - SERVICE AND INSTALLATION RULES
3. ALL EXPOSED CONDUCTIVE METAL COMPONENTS MUST BE EQUIPOTENTIALLY BONDED AND CONNECTED TO MAIN EARTH.
4. THIS DRAWING IS BASED ON THE INFORMATION SUPPLIED TO THE DESIGNER FROM ITS CLIENTS OR SUBCONTRACTORS AND HAS BEEN PROVIDED IN ACCORDANCE WITH GSES' TERMS AND CONDITIONS.
5. EXACT LOCATION OF ALL PARTS OF THE INSTALLATION TO BE DETERMINED BY CONTRACTOR ONSITE.
6. ALL ELECTRICAL COMPONENT RATINGS TO BE VERIFIED BY INSTALLER.
7. ALL EXISTING EQUIPMENT LABELED "EXISTING". ALL OTHER EQUIPMENT TO BE INSTALLED.
8. ALL NEW EQUIPMENT TO BE INSTALLED AS PER MANUFACTURERS REQUIREMENTS.
9. DC ISOLATOR RATING SPECIFIED IN ACCORDANCE WITH DC-PV2 RATED OPERATIONAL CURRENT AND RATED MAKE AND BREAK CURRENT. UNLESS OTHERWISE NOTED INSTALLER TO SPECIFY PRODUCT THAT MEETS THESE ISOLATOR RATINGS.
10. PV CABLES RATED TO 0.9kV OR LESS SHALL BE PV1-F AS A MINIMUM. ALL PV CABLES WITH RATED VOLTAGE GREATER THAN 0.9kV AND UP TO 1.5kV SHALL COMPLY WITH EN 50618 AS A MINIMUM.

DETAILED DESIGN ISSUE
NOT FOR CONSTRUCTION

REVISION PANEL

REV	DATE	DRN	DETAILS	APR'D
0	07/01/2021	S.Z	DETAILED DESIGN ISSUE	A.B

AUTHORISED 07/01/2021
A.BONANNO
SIGNATURE

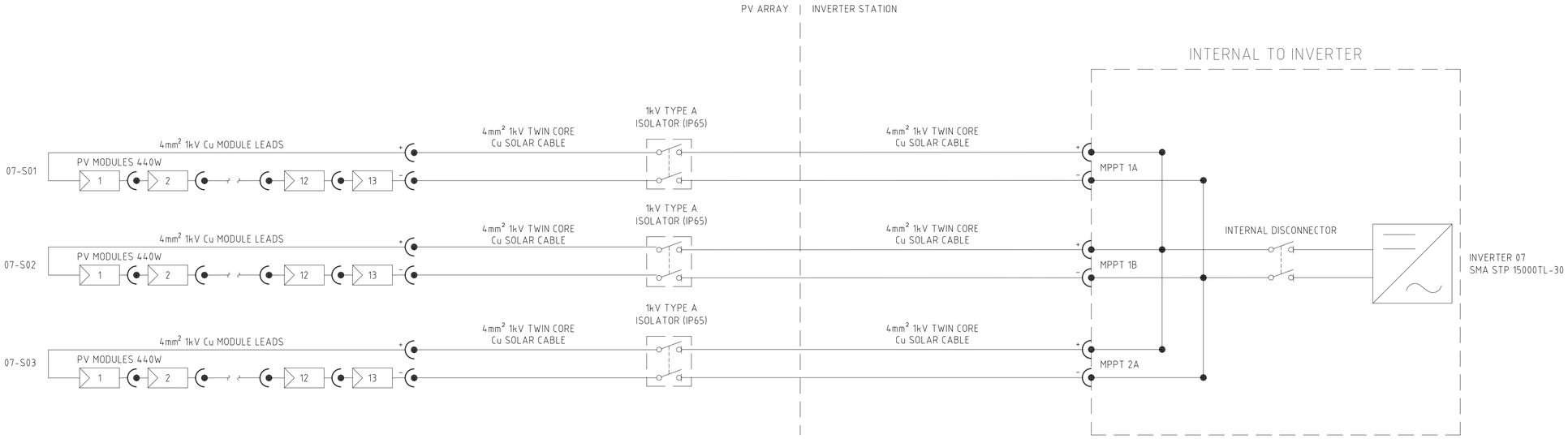
DESIGN PANEL

DESIGNED	07/01/2021	AUTHORISED	07/01/2021
S.ZAIDI		A.BONANNO	
DRAWN	07/01/2021	SIGNATURE	
S.ZAIDI			
REVIEWED	07/01/2021		
H.SMITH			

GSES®
GLOBAL SUSTAINABLE ENERGY SOLUTIONS

MOORABIN
970 NEPEAN HWY
MOORABBIN VIC 3189
DC ELECTRICAL
DC SINGLE LINE DIAGRAM (INVERTERS 01 TO 05, 07 TO 12)

A1 SHT SIZE	TOTAL SHEETS:	0 REVISION
	PROJECT No: P1072	
SITE ID:		
SUPERSEDES:		
DRAWING NUMBER	P1072-02-001-01	



LEGEND:

- PV MODULE
- LOAD BREAK DISCONNECTOR
- FUSE
- INVERTER
- STRING CONNECTOR
- ELECTRICAL JUNCTION

PV ARRAY (INVERTER 07)

MODULES:	39 x JA SOLAR JAM78S10-440/MR
MODULE RATING:	440 W
DC NOMINAL POWER:	17.16 kWp
SHORT CIRCUIT CURRENT:	20.88 A (MPPT 1)
	10.44 A (MPPT 2)
PV ARRAY MAX. VOLTAGE (AT -3.8°C):	746.347 V (MPPTs 1, 2)
PV ARRAY MIN. VOLTAGE (AT 81.7°C):	467.552 V (MPPTs 1, 2)

INVERTER 07

INVERTER:	SMA STP 15000TL-30
RATED AC OUTPUT:	15000 VA
RATED CURRENT OUTPUT:	21.7 A
MPP VOLTAGE RANGE:	240 V TO 800 V
MAX. INPUT VOLTAGE:	1000 V
MIN. INPUT VOLTAGE:	188 V

NAMING CONVENTION:

STRING: ##-S##

- ## : STRING NUMBER
- ## : INVERTER NUMBER

ISOLATOR TYPE	THERMAL CURRENT I_{the} (A)	OPERATIONAL CURRENT I_e (A) @V_e	FAULT MAKE/LOAD BREAK CURRENT I_{make}, I_{break} (A) @V_{fault}
A	14	14 @ 800V	14 @ 800V

NOTES:

1. PV MODULES TO USE TEMPERED GLASS, BE SELF CLEANING AND ANTI-REFLECTIVE.
2. THE MOST CURRENT VERSION OF THE FOLLOWING AUSTRALIAN STANDARDS ARE APPLICABLE AS A MINIMUM:
   - AS5033: INSTALLATION OF PHOTOVOLTAIC ARRAYS
   - AS4777: GRID CONNECTION OF ENERGY SYSTEMS VIA INVERTERS
   - AS3000: ELECTRICAL WIRING RULES
   - AS3008: ELECTRICAL INSTALLATION - SELECTION OF CABLES
   - SERVICE AND INSTALLATION RULES
3. ALL EXPOSED CONDUCTIVE METAL COMPONENTS MUST BE EQUIPOTENTIALLY BONDED AND CONNECTED TO MAIN EARTH.
4. THIS DRAWING IS BASED ON THE INFORMATION SUPPLIED TO THE DESIGNER FROM ITS CLIENTS OR SUBCONTRACTORS AND HAS BEEN PROVIDED IN ACCORDANCE WITH GSES' TERMS AND CONDITIONS.
5. EXACT LOCATION OF ALL PARTS OF THE INSTALLATION TO BE DETERMINED BY CONTRACTOR ONSITE.
6. ALL ELECTRICAL COMPONENT RATINGS TO BE VERIFIED BY INSTALLER.
7. ALL EXISTING EQUIPMENT LABELED "EXISTING". ALL OTHER EQUIPMENT TO BE INSTALLED.
8. ALL NEW EQUIPMENT TO BE INSTALLED AS PER MANUFACTURERS REQUIREMENTS.
9. DC ISOLATOR RATING SPECIFIED IN ACCORDANCE WITH DC-PV2 RATED OPERATIONAL CURRENT AND RATED MAKE AND BREAK CURRENT. UNLESS OTHERWISE NOTED INSTALLER TO SPECIFY PRODUCT THAT MEETS THESE ISOLATOR RATINGS.
10. PV CABLES RATED TO 0.9kV OR LESS SHALL BE PV1-F AS A MINIMUM. ALL PV CABLES WITH RATED VOLTAGE GREATER THAN 0.9kV AND UP TO 1.5kV SHALL COMPLY WITH EN 50618 AS A MINIMUM.

DETAILED DESIGN ISSUE
NOT FOR CONSTRUCTION

REVISION PANEL

REV	DATE	DRN	DETAILS	APR'D
0	07/01/2021	S.Z	DETAILED DESIGN ISSUE	A.B

AUTHORISED 07/01/2021
A.BONANNO
SIGNATURE

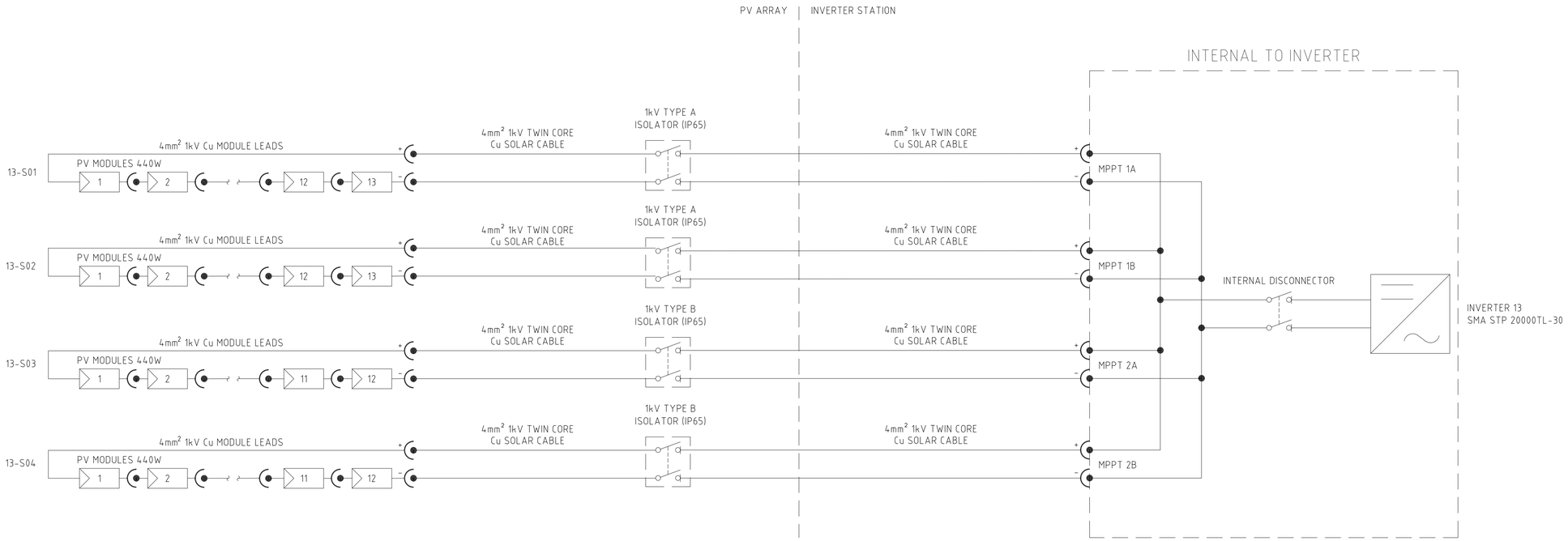
DESIGN PANEL

DESIGNED	07/01/2021	AUTHORISED	07/01/2021
S.ZAIDI		A.BONANNO	
DRAWN	07/01/2021	SIGNATURE	
S.ZAIDI			
REVIEWED	07/01/2021		
H.SMITH			

GSES®
GLOBAL SUSTAINABLE ENERGY SOLUTIONS

MOORABIN
970 NEPEAN HWY
MOORABBIN VIC 3189
DC ELECTRICAL
DC SINGLE LINE DIAGRAM (INVERTER 06)

A1 SHT SIZE	TOTAL SHEETS:	0 REVISION	
	PROJECT No: P1072		
SITE ID:			
SUPERSEDES:			
DRAWING NUMBER	P1072-02-002-01		



LEGEND:

- PV MODULE
- LOAD BREAK DISCONNECTOR
- FUSE
- INVERTER
- STRING CONNECTOR
- ELECTRICAL JUNCTION

PV ARRAY (INVERTER 13)

MODULES:	50 x JA SOLAR JAM78S10-440/MR
MODULE RATING:	440 W
DC NOMINAL POWER:	22 kWp
SHORT CIRCUIT CURRENT:	20.88 A (MPPTs 1, 2)
PV ARRAY MAX. VOLTAGE (AT -3.8°C):	746.347 V (MPPT 1)
	688.936 V (MPPT 2)
PV ARRAY MIN. VOLTAGE (AT 81.7°C):	467.552 V (MPPT 1)
	431.587 V (MPPT 2)

INVERTER 13

INVERTER:	SMA STP 20000TL-30
RATED AC OUTPUT:	20000 VA
RATED CURRENT OUTPUT:	29 A
MPP VOLTAGE RANGE:	320 V TO 800 V
MAX. INPUT VOLTAGE:	1000 V
MIN. INPUT VOLTAGE:	188 V

NAMING CONVENTION:

STRING: ##-S##

- STRING NUMBER
- INVERTER NUMBER

ISOLATOR TYPE	THERMAL CURRENT I_{the} (A)	OPERATIONAL CURRENT I_e (A) @V_e	FAULT MAKE/LOAD BREAK CURRENT I_{make}, I_{break} (A) @V_{fault}
A	14	14 @ 800V	14 @ 800V
B	14	14 @ 700V	14 @ 700V

NOTES:

1. PV MODULES TO USE TEMPERED GLASS, BE SELF CLEANING AND ANTI-REFLECTIVE.
2. THE MOST CURRENT VERSION OF THE FOLLOWING AUSTRALIAN STANDARDS ARE APPLICABLE AS A MINIMUM:
   - AS5033: INSTALLATION OF PHOTOVOLTAIC ARRAYS
   - AS4777: GRID CONNECTION OF ENERGY SYSTEMS VIA INVERTERS
   - AS3000: ELECTRICAL WIRING RULES
   - AS3008: ELECTRICAL INSTALLATION - SELECTION OF CABLES
   - SERVICE AND INSTALLATION RULES
3. ALL EXPOSED CONDUCTIVE METAL COMPONENTS MUST BE EQUIPOTENTIALLY BONDED AND CONNECTED TO MAIN EARTH.
4. THIS DRAWING IS BASED ON THE INFORMATION SUPPLIED TO THE DESIGNER FROM ITS CLIENTS OR SUBCONTRACTORS AND HAS BEEN PROVIDED IN ACCORDANCE WITH GSES' TERMS AND CONDITIONS.
5. EXACT LOCATION OF ALL PARTS OF THE INSTALLATION TO BE DETERMINED BY CONTRACTOR ONSITE.
6. ALL ELECTRICAL COMPONENT RATINGS TO BE VERIFIED BY INSTALLER.
7. ALL EXISTING EQUIPMENT LABELED "EXISTING". ALL OTHER EQUIPMENT TO BE INSTALLED.
8. ALL NEW EQUIPMENT TO BE INSTALLED AS PER MANUFACTURERS REQUIREMENTS.
9. DC ISOLATOR RATING SPECIFIED IN ACCORDANCE WITH DC-PV2 RATED OPERATIONAL CURRENT AND RATED MAKE AND BREAK CURRENT. UNLESS OTHERWISE NOTED INSTALLER TO SPECIFY PRODUCT THAT MEETS THESE ISOLATOR RATINGS.
10. PV CABLES RATED TO 0.9kV OR LESS SHALL BE PV1-F AS A MINIMUM. ALL PV CABLES WITH RATED VOLTAGE GREATER THAN 0.9kV AND UP TO 1.5kV SHALL COMPLY WITH EN 50618 AS A MINIMUM.

DETAILED DESIGN ISSUE
NOT FOR CONSTRUCTION

REVISION PANEL

REV	DATE	DRN	DETAILS	APR'D
0	07/01/2021	S.Z	DETAILED DESIGN ISSUE	A.B

AUTHORISED 07/01/2021 A.BONANNO SIGNATURE

DESIGN PANEL

DESIGNED	07/01/2021 S.ZAIDI	AUTHORISED	07/01/2021 A.BONANNO
DRAWN	07/01/2021 S.ZAIDI	SIGNATURE	
REVIEWED	07/01/2021 H.SMITH		

GSES®
GLOBAL SUSTAINABLE ENERGY SOLUTIONS

MOORABIN
970 NEPEAN HWY
MOORABBIN VIC 3189
DC ELECTRICAL
DC SINGLE LINE DIAGRAM (INVERTER 13)

A1 SHT SIZE	TOTAL SHEETS:	0 REVISION
	PROJECT No: P1072	
	SITE ID:	
	SUPERSEDES:	
	DRAWING NUMBER P1072-02-003-01	

DC STRING LAYOUT (ROOF 1)

SCALE 1:200

NOTES:

1. THE MOST CURRENT VERSION OF THE FOLLOWING AUSTRALIAN STANDARDS ARE APPLICABLE AS A MINIMUM:
   - AS5033: INSTALLATION OF PHOTOVOLTIAC ARRAYS
   - AS4777: GRID CONNECTION OF ENERGY SYSTEMS VIA INVERTERS
   - AS3000: ELECTRICAL WIRING RULES
   - AS3008: ELECTRICAL INSTALLATION – SELECTION OF CABLES
   - SERVICE AND INSTALLATION RULES
2. ALL EXPOSED CONDUCTIVE METAL COMPONENTS MUST BE EQUIPOTENTIALLY BONDED AND CONNECTED TO MAIN EARTH.
3. THIS DRAWING IS BASED ON THE INFORMATION SUPPLIED TO THE DESIGNER FROM ITS CLIENTS OR SUBCONTRACTORS AND HAS BEEN PROVIDED IN ACCORDANCE WITH GSES' TERMS AND CONDITIONS.
4. EXACT LOCATION OF ALL PARTS OF THE INSTALLATION TO BE DETERMINED BY CONTRACTOR ONSITE.
5. ALL EQUIPMENT TO BE INSTALLED AS PER MANUFACTURER REQUIREMENTS
6. DRAWING COLOUR CODED. PRINT IN COLOUR.

NAMING CONVENTION:

STRING: ##-S##

- ## – STRING NUMBER
- ## – INVERTER NUMBER

LEGEND:

- PV MODULE
- LOAD BREAK DISCONNECTOR

0 2000 4000 8000 12000
Full Size 1:200 ; Half Reduction 1:400
SCALE (mm)

DETAILED DESIGN ISSUE
NOT FOR CONSTRUCTION

REVISION PANEL

REV	DATE	DRN	DETAILS	APR'D
0	07/01/2021	S.Z	DETAILED DESIGN ISSUE	A.B

AUTHORISED 07/01/2021
A.BONANNO
SIGNATURE

DESIGN PANEL

DESIGNED	07/01/2021	S.ZAIDI
DRAWN	07/01/2021	S.ZAIDI
REVIEWED	07/01/2021	H.SMITH

AUTHORISED 07/01/2021
A.BONANNO
SIGNATURE

GSES®
GLOBAL SUSTAINABLE ENERGY SOLUTIONS

MOORABIN
970 NEPEAN HWY
MOORABBIN VIC 3189
DC ELECTRICAL
DC STRING LAYOUT (ROOF 1)

A1 SHT SIZE
TOTAL SHEETS:
PROJECT No: P1072
0 REVISION
SITE ID:
SUPERSEDES:
DRAWING NUMBER
P1072-02-004-01

NOTES:

1. THE MOST CURRENT VERSION OF THE FOLLOWING AUSTRALIAN STANDARDS ARE APPLICABLE AS A MINIMUM:
   - AS5033: INSTALLATION OF PHOTOVOLTIAC ARRAYS
   - AS4777: GRID CONNECTION OF ENERGY SYSTEMS VIA INVERTERS
   - AS3000: ELECTRICAL WIRING RULES
   - AS3008: ELECTRICAL INSTALLATION - SELECTION OF CABLES
   - SERVICE AND INSTALLATION RULES
2. ALL EXPOSED CONDUCTIVE METAL COMPONENTS MUST BE EQUIPOTENTIALLY BONDED AND CONNECTED TO MAIN EARTH.
3. THIS DRAWING IS BASED ON THE INFORMATION SUPPLIED TO THE DESIGNER FROM ITS CLIENTS OR SUBCONTRACTORS AND HAS BEEN PROVIDED IN ACCORDANCE WITH GSES' TERMS AND CONDITIONS.
4. EXACT LOCATION OF ALL PARTS OF THE INSTALLATION TO BE DETERMINED BY CONTRACTOR ONSITE.
5. ALL EQUIPMENT TO BE INSTALLED AS PER MANUFACTURER REQUIREMENTS
6. DRAWING COLOUR CODED. PRINT IN COLOUR.

NAMING CONVENTION:

STRING: ##-S##

- ## — INVERTER NUMBER
- S## — STRING NUMBER

LEGEND:

- PV MODULE
- LOAD BREAK DISCONNECTOR

DC STRING LAYOUT (ROOF 2)

SCALE 1:200

0 2000 4000 8000 12000
Full Size 1:200 ; Half Reduction 1:400
SCALE (mm)

DETAILED DESIGN ISSUE
NOT FOR CONSTRUCTION

REVISION PANEL

REV	DATE	DRN	DETAILS	APR'D
0	07/01/2021	S.Z	DETAILED DESIGN ISSUE	A.B

AUTHORISED 07/01/2021
A.BONANNO
SIGNATURE

DESIGN PANEL

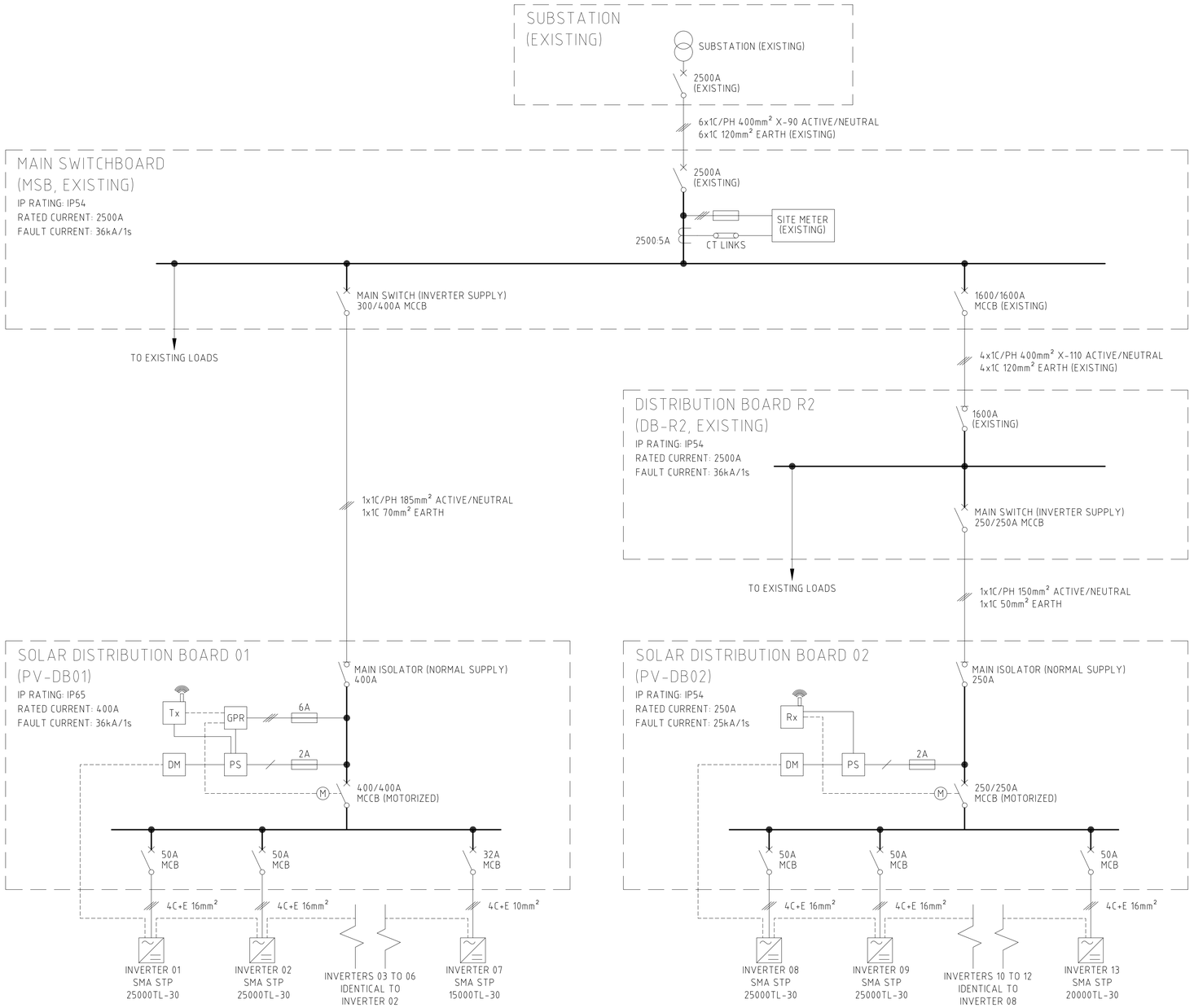
DESIGNED	07/01/2021	S.ZAIDI
DRAWN	07/01/2021	S.ZAIDI
REVIEWED	07/01/2021	H.SMITH

AUTHORISED 07/01/2021
A.BONANNO
SIGNATURE

GSES®
GLOBAL SUSTAINABLE ENERGY SOLUTIONS

MOORABIN
970 NEPEAN HWY
MOORABBIN VIC 3189
DC ELECTRICAL
DC STRING LAYOUT (ROOF 2)

A1 SHT SIZE
TOTAL SHEETS:
PROJECT No: P1072
0 REVISION
SITE ID:
SUPERSEDES:
DRAWING NUMBER
P1072-02-005-01



NOTES:

1. THE MOST CURRENT VERSION OF THE FOLLOWING AUSTRALIAN STANDARDS ARE APPLICABLE AS A MINIMUM:
   - AS5033: INSTALLATION OF PHOTOVOLTIAC ARRAYS
   - AS4777: GRID CONNECTION OF ENERGY SYSTEMS VIA INVERTERS
   - AS3000: ELECTRICAL WIRING RULES
   - AS3008: ELECTRICAL INSTALLATION – SELECTION OF CABLES
   - AS2067: SUBSTATION AND HIGH VOLTAGE INSTALLATIONS EXCEEDING 1KA AC
   - SERVICE AND INSTALLATION RULES
2. ALL EXPOSED CONDUCTIVE METAL COMPONENTS MUST BE EQUIPOTENTIALLY BONDED AND CONNECTED TO MAIN EARTH.
3. THIS DRAWING IS BASED ON THE INFORMATION SUPPLIED TO THE DESIGNER FROM ITS CLIENTS OR SUBCONTRACTORS AND HAS BEEN PROVIDED IN ACCORDANCE WITH GSES' TERMS AND CONDITIONS.
4. EXACT LOCATION OF ALL PARTS OF THE INSTALLATION TO BE DETERMINED BY CONTRACTOR ONSITE.
5. ALL ELECTRICAL COMPONENT RATINGS TO BE VERIFIED BY INSTALLER.
6. ALL NEW EQUIPMENT SHALL BE INSTALLED AS PER MANUFACTURERS REQUIREMENTS.
7. ALL NEW EQUIPMENT SHALL BE RATED TO 230/400V UNLESS OTHERWISE NOTED.
8. ALL NEW SWITCHGEAR SHALL BE THREE-POLE UNLESS OTHERWISE NOTED.
9. ALL NEW POWER CABLES (INCLUDING EARTH) WITH CROSS-SECTIONAL AREA GREATER THAN 6mm² SHALL BE Cu 0.6/1kV, X-90 XLPE/PVC UNLESS OTHERWISE NOTED.
10. ALL NEW POWER CABLES WITH CROSS-SECTIONAL AREA BETWEEN 1.5-6mm² SHALL BE Cu 450/750V, V-75 PVC/PVC UNLESS OTHERWISE NOTED.
11. ALL NEW DATA CABLES WILL CROSS-SECTIONAL AREA OF 0.22mm² SHALL BE CAT 6a SCREENED CABLE UNLESS OTHERWISE NOTED.
12. ALL EXISTING EQUIPMENT LABELLED "EXISTING". ALL OTHER EQUIPMENT TO BE INSTALLED.
13. REFER TO EXISTING DRAWING E-CD-54-L0-0-41 FOR CONFIGURATION OF EXISTING ELECTRICAL NETWORK.

LEGEND:

- TRANSFORMER
- INVERTER
- CIRCUIT BREAKER
- LOAD BREAK DISCONNECTOR
- FUSE
- TEST LINK
- (M) MOTORIZED TRIP UNIT
- PS POWER SUPPLY
- GPR MAINSPRO GRID PROTECTION RELAY
- DM SMA DATA MANAGER
- Tx WIRELESS TRANSMITTER
- Rx WIRELESS RECEIVER
- SINGLE PHASE CIRCUIT
- THREE PHASE CIRCUIT
- CONTROL CIRCUIT
- ELECTRICAL JUNCTION
- BUSBAR

DETAILED DESIGN ISSUE
NOT FOR CONSTRUCTION

REVISION PANEL					
REV	DATE	DRN	DETAILS	APR'D	AUTHORISED 07/01/2021
					A.BONANNO
					SIGNATURE
0	07/01/2021	S.Z	DETAILED DESIGN ISSUE	A.B	

DESIGN PANEL		
DESIGNED 07/01/2021	S.ZAIDI	AUTHORISED 07/01/2021
DRAWN 07/01/2021	S.ZAIDI	A.BONANNO
REVIEWED 07/01/2021	H.SMITH	SIGNATURE

GSES®
GLOBAL SUSTAINABLE ENERGY SOLUTIONS

MOORABIN
970 NEPEAN HWY
MOORABBIN VIC 3189
AC ELECTRICAL
AC SINGLE LINE DIAGRAM

A1 SHT SIZE	TOTAL SHEETS:	0 REVISION
	PROJECT No: P1072	
SITE ID:		
SUPERSEDES:		
DRAWING NUMBER	P1072-03-001-01	

AC VOLTAGE RISE CALCULATIONS (INVERTER 01 TO 06)

CABLE LOCATION	CABLE SIZE (mm^2)	CORE STRUCTURE	CONDUCTORS / PHASE	INSULATION	CONDUCTOR	L-L VOLTAGE (V)	INSTALLATION METHOD	CABLE ARRANGEMENT	NUMBER OF CIRCUITS PER TIER	POWER ON CIRCUIT (kVA)	CABLE LENGTH (m)	RATED CCC/ CONDUCTOR (A)	COMBINED DERATING	TOTAL DERATED CCC (A)	ACTUAL MAX. CURRENT (A)	PROTECTIVE DEVICE (A)	MAX. CURRENT/ CONDUCTOR (A)	Vc (mV/Am)	VOLTAGE RISE (%)
CONSUMER MAINS TRANSFORMER TO MSB (EXISTING)	400	SINGLE-CORE	6	X-90	Cu	400	UNDERGROUND WIRING ENCLOSURE	TOUCHING	1	165	45	554	0.82	2724	238	2500	40	0.205	0.16%
SUBMAINS 01 MSB TO PV-DB01	185	SINGLE-CORE	1	X-90	Cu	400	SPACED FROM SURFACE	TOUCHING	1	165	45	459	0.83	379	238	300	238	0.285	0.76%
SUBMAINS 02 PV-DB01 TO INVERTERS	16	MULTICORE	1	X-90	Cu	400	TOUCHING	TOUCHING	4	25	7	81	0.66	53	36	50	36	2.550	0.16%
																		TOTAL	1.08%

CABLE LOCATION	TABLE 22 BUNCHED CIRCUITS	TABLE 23 SINGLE-CORE IN CABLE TRAY	TABLE 24 MULTICORE IN CABLE TRAY	TABLE 26 UNDERGROUND WIRING ENCLOSURES	TABLE 27(1) AIR AMBIENT TEMPERATURE	TABLE 27(2) SOIL AMBIENT TEMPERATURE	TABLE 28 DEPTH OF LAYING	TABLE 29 SOIL THERMAL RESISTIVITY	COMBINED DERATING
	DERATING (ROW, COLUMN)	DERATING (ROW, COLUMN)	DERATING (ROW, COLUMN)	DERATING SUB-TABLE, (ROW, COLUMN)	DERATING (ROW, COLUMN)	DERATING (ROW, COLUMN)	DERATING SUB-TABLE, (ROW, COLUMN)	DERATING (ROW, COLUMN)	DERATING
CONSUMER MAINS TRANSFORMER TO MSB (EXISTING)	1 (2, 4)	-	-	0.82 26(2), (5, 3)	-	1 (2, 5)	1 28(2), (1, 2)	1 (4, 6)	0.82
SUBMAINS 01 MSB TO PV-DB01	-	0.94 (10, 6)	-	-	0.88 (3, 9)	-	-	-	0.827
SUBMAINS 02 PV-DB01 TO INVERTERS	0.75 (3, 7)	-	-	-	0.88 (3, 9)	-	-	-	0.66

NOTES:

1. THIS DRAWING IS BASED ON THE INFORMATION SUPPLIED TO THE DESIGNER FROM ITS CLIENTS OR SUBCONTRACTORS.
2. THE MOST CURRENT VERSION OF THE FOLLOWING AUSTRALIAN STANDARDS ARE APPLICABLE AS A MINIMUM:
   - AS5033: INSTALLATION OF PHOTOVOLTAIC ARRAYS
   - AS4777: GRID CONNECTION OF ENERGY SYSTEMS VIA INVERTERS
   - AS3000: ELECTRICAL WIRING RULES
   - AS3008: ELECTRICAL INSTALLATION - SELECTION OF CABLES
   - AS2067: SUBSTATION AND HIGH VOLTAGE INSTALLATIONS EXCEEDING 1kA AC
3. EXACT LOCATION OF ALL PARTS OF THE INSTALLATION TO BE DETERMINED BY CONTRACTOR ON SITE.
4. ALL ELECTRICAL COMPONENT RATINGS TO BE VERIFIED BY INSTALLER.
5. ALL EXISTING EQUIPMENT LABELLED "EXISTING". ALL OTHER EQUIPMENT TO BE INSTALLED.
6. EXISTING CONSUMER MAINS ASSUMED TO BE INSTALLED WITH ONE CIRCUIT PER CONDUIT, BURIED AT 0.5m DEPTH, WITH 0.3m SPACING BETWEEN CONDUITS.

DETAILED DESIGN ISSUE
NOT FOR CONSTRUCTION

REVISION PANEL

REV	DATE	DRN	DETAILS	APR'D
0	07/01/2021	S.Z	DETAILED DESIGN ISSUE	A.B

AUTHORISED 07/01/2021
A.BONANNO
SIGNATURE

DESIGN PANEL

DESIGNED 07/01/2021
S.ZAIDI

DRAWN 07/01/2021
S.ZAIDI

REVIEWED 07/01/2021
H.SMITH

AUTHORISED 07/01/2021
A.BONANNO
SIGNATURE

GSES®
GLOBAL SUSTAINABLE ENERGY SOLUTIONS

MOORABIN
970 NEPEAN HWY
MOORABBIN VIC 3189
DESIGN SPREADSHEET
AC DESIGN CALCULATIONS (INVERTERS 01 TO 06)

A1 SHT SIZE
TOTAL SHEETS:
PROJECT No: P1072
0 REVISION
SITE ID:
SUPERSEDES:
DRAWING NUMBER
P1072-05-001-01

AC VOLTAGE RISE CALCULATIONS (INVERTER 07)

CABLE LOCATION	CABLE SIZE (mm^2)	CORE STRUCTURE	CONDUCTORS / PHASE	INSULATION	CONDUCTOR	L-L VOLTAGE (V)	INSTALLATION METHOD	CABLE ARRANGEMENT	NUMBER OF CIRCUITS PER TIER	POWER ON CIRCUIT (kVA)	CABLE LENGTH (m)	RATED CCC/ CONDUCTOR (A)	COMBINED DERATING	TOTAL DERATED CCC (A)	ACTUAL MAX. CURRENT (A)	PROTECTIVE DEVICE (A)	MAX. CURRENT/ CONDUCTOR (A)	Vc (mV/Am)	VOLTAGE RISE (%)
CONSUMER MAINS TRANSFORMER TO MSB (EXISTING)	400	SINGLE-CORE	6	X-90	Cu	400	UNDERGROUND WIRING ENCLOSURE	TOUCHING	1	165	45	554	0.82	2724	238	2500	40	0.205	0.16%
SUBMAINS 01 MSB TO PV-DB01	185	SINGLE-CORE	1	X-90	Cu	400	SPACED FROM SURFACE	TOUCHING	1	165	45	459	0.83	379	238	300	238	0.285	0.76%
SUBMAINS 02 PV-DB01 TO INVERTERS	10	MULTICORE	1	X-90	Cu	400	TOUCHING	TOUCHING	4	15	7	61	0.66	40	22	32	22	4.050	0.15%
																		TOTAL	1.08%

CABLE LOCATION	TABLE 22 BUNCHED CIRCUITS	TABLE 23 SINGLE-CORE IN CABLE TRAY	TABLE 24 MULTICORE IN CABLE TRAY	TABLE 26 UNDERGROUND WIRING ENCLOSURES	TABLE 27(1) AIR AMBIENT TEMPERATURE	TABLE 27(2) SOIL AMBIENT TEMPERATURE	TABLE 28 DEPTH OF LAYING	TABLE 29 SOIL THERMAL RESISTIVITY	COMBINED DERATING
	DERATING (ROW, COLUMN)	DERATING (ROW, COLUMN)	DERATING (ROW, COLUMN)	DERATING SUB-TABLE, (ROW, COLUMN)	DERATING (ROW, COLUMN)	DERATING (ROW, COLUMN)	DERATING SUB-TABLE, (ROW, COLUMN)	DERATING (ROW, COLUMN)	DERATING
CONSUMER MAINS TRANSFORMER TO MSB (EXISTING)	1 (2, 4)	-	-	0.82 26(2), (5, 3)	-	1 (2, 5)	1 28(2), (1, 2)	1 (4, 6)	0.82
SUBMAINS 01 MSB TO PV-DB01	-	0.94 (10, 6)	-	-	0.88 (3, 9)	-	-	-	0.827
SUBMAINS 02 PV-DB01 TO INVERTERS	0.75 (3, 7)	-	-	-	0.88 (3, 9)	-	-	-	0.66

NOTES:

1. THIS DRAWING IS BASED ON THE INFORMATION SUPPLIED TO THE DESIGNER FROM ITS CLIENTS OR SUBCONTRACTORS.
2. THE MOST CURRENT VERSION OF THE FOLLOWING AUSTRALIAN STANDARDS ARE APPLICABLE AS A MINIMUM:
   - AS5033: INSTALLATION OF PHOTOVOLTAIC ARRAYS
   - AS4777: GRID CONNECTION OF ENERGY SYSTEMS VIA INVERTERS
   - AS3000: ELECTRICAL WIRING RULES
   - AS3008: ELECTRICAL INSTALLATION - SELECTION OF CABLES
   - AS2067: SUBSTATION AND HIGH VOLTAGE INSTALLATIONS EXCEEDING 1kA AC
3. EXACT LOCATION OF ALL PARTS OF THE INSTALLATION TO BE DETERMINED BY CONTRACTOR ON SITE.
4. ALL ELECTRICAL COMPONENT RATINGS TO BE VERIFIED BY INSTALLER.
5. ALL EXISTING EQUIPMENT LABELLED "EXISTING". ALL OTHER EQUIPMENT TO BE INSTALLED.
6. EXISTING CONSUMER MAINS ASSUMED TO BE INSTALLED WITH ONE CIRCUIT PER CONDUIT, BURIED AT 0.5m DEPTH, WITH 0.3m SPACING BETWEEN CONDUITS.

DETAILED DESIGN ISSUE
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REVISION PANEL

REV	DATE	DRN	DETAILS	APR'D
0	07/01/2021	S.Z	DETAILED DESIGN ISSUE	A.B

AUTHORISED 07/01/2021
A.BONANNO
SIGNATURE

DESIGN PANEL

DESIGNED	07/01/2021	S.ZAIDI
DRAWN	07/01/2021	S.ZAIDI
REVIEWED	07/01/2021	H.SMITH

AUTHORISED 07/01/2021
A.BONANNO
SIGNATURE

GSES®
GLOBAL SUSTAINABLE ENERGY SOLUTIONS

MOORABIN
970 NEPEAN HWY
MOORABBIN VIC 3189
DESIGN SPREADSHEET
AC DESIGN CALCULATIONS (INVERTER 07)

A1 SHT SIZE
TOTAL SHEETS:
PROJECT No: P1072
0 REVISION
SITE ID:
SUPERSEDES:
DRAWING NUMBER
P1072-05-002-01

AC VOLTAGE RISE CALCULATIONS (INVERTER 08 TO 12)

CABLE LOCATION	CABLE SIZE (mm^2)	CORE STRUCTURE	CONDUCTORS / PHASE	INSULATION	CONDUCTOR	L-L VOLTAGE (V)	INSTALLATION METHOD	CABLE ARRANGEMENT	NUMBER OF CIRCUITS PER TIER	POWER ON CIRCUIT (kVA)	CABLE LENGTH (m)	RATED CCC/ CONDUCTOR (A)	COMBINED DERATING	TOTAL DERATED CCC (A)	ACTUAL MAX. CURRENT (A)	PROTECTIVE DEVICE (A)	MAX. CURRENT/ CONDUCTOR (A)	Vc (mV/Am)	VOLTAGE RISE (%)
CONSUMER MAINS TRANSFORMER TO MSB (EXISTING)	400	SINGLE-CORE	6	X-90	Cu	400	UNDERGROUND WIRING ENCLOSURE	TOUCHING	1	145	45	554	0.82	2724	209	2500	35	0.205	0.14%
SUBMAINS 01 MSB TO DB-R2	400	SINGLE-CORE	4	X-90	Cu	400	UNDERGROUND WIRING ENCLOSURE	TOUCHING	1	145	150	554	0.79	1748	209	1600	52	0.205	0.40%
SUBMAINS 02 DB-R2 TO PV-DB02	150	SINGLE-CORE	1	X-90	Cu	400	SPACED FROM SURFACE	TOUCHING	1	145	15	400	0.83	330	209	250	209	0.330	0.26%
SUBMAINS 02 PV-DB02 TO INVERTERS	16	MULTICORE	1	X-90	Cu	400	SPACED	TOUCHING	6	25	7	87	0.64	55	36	50	36	2.55	0.16%
																		TOTAL	0.96%

CABLE LOCATION	TABLE 22 BUNCHED CIRCUITS	TABLE 23 SINGLE-CORE IN CABLE TRAY	TABLE 24 MULTICORE IN CABLE TRAY	TABLE 26 UNDERGROUND WIRING ENCLOSURES	TABLE 27(1) AIR AMBIENT TEMPERATURE	TABLE 27(2) SOIL AMBIENT TEMPERATURE	TABLE 28 DEPTH OF LAYING	TABLE 29 SOIL THERMAL RESISTIVITY	COMBINED DERATING
	DERATING (ROW, COLUMN)	DERATING (ROW, COLUMN)	DERATING (ROW, COLUMN)	DERATING SUB-TABLE, (ROW, COLUMN)	DERATING (ROW, COLUMN)	DERATING (ROW, COLUMN)	DERATING SUB-TABLE, (ROW, COLUMN)	DERATING (ROW, COLUMN)	DERATING
CONSUMER MAINS TRANSFORMER TO MSB (EXISTING)	1 (2, 4)	-	-	0.82 26(2), (5, 3)	-	1 (2, 5)	1 28(2), (1, 2)	1 (4, 6)	0.82
SUBMAINS 01 MSB TO DB-R2	1 (2, 4)	-	-	0.79 26(2), (3, 2)	-	1 (2, 5)	1 28(2), (1, 2)	1 (4, 6)	0.79
SUBMAINS 02 DB-R2 TO PV-DB02	-	0.94 (10, 6)	-	-	0.88 (3, 9)	-	-	-	0.827
SUBMAINS 02 PV-DB02 TO INVERTERS	-	-	0.73 (19, 9)	-	0.88 (3, 9)	-	-	-	0.642

NOTES:

1. THIS DRAWING IS BASED ON THE INFORMATION SUPPLIED TO THE DESIGNER FROM ITS CLIENTS OR SUBCONTRACTORS.
2. THE MOST CURRENT VERSION OF THE FOLLOWING AUSTRALIAN STANDARDS ARE APPLICABLE AS A MINIMUM:
   - AS5033: INSTALLATION OF PHOTOVOLTAIC ARRAYS
   - AS4777: GRID CONNECTION OF ENERGY SYSTEMS VIA INVERTERS
   - AS3000: ELECTRICAL WIRING RULES
   - AS3008: ELECTRICAL INSTALLATION - SELECTION OF CABLES
   - AS2067: SUBSTATION AND HIGH VOLTAGE INSTALLATIONS EXCEEDING 1kA AC
3. EXACT LOCATION OF ALL PARTS OF THE INSTALLATION TO BE DETERMINED BY CONTRACTOR ON SITE.
4. ALL ELECTRICAL COMPONENT RATINGS TO BE VERIFIED BY INSTALLER.
5. ALL EXISTING EQUIPMENT LABELLED "EXISTING". ALL OTHER EQUIPMENT TO BE INSTALLED.
6. EXISTING CONSUMER MAINS ASSUMED TO BE INSTALLED WITH ONE CIRCUIT PER CONDUIT, BURIED AT 0.5m DEPTH, WITH 0.3m SPACING BETWEEN CONDUITS.

DETAILED DESIGN ISSUE
NOT FOR CONSTRUCTION

REVISION PANEL

REV	DATE	DRN	DETAILS	APR'D
0	07/01/2021	S.Z	DETAILED DESIGN ISSUE	A.B

AUTHORISED 07/01/2021 A.BONANNO SIGNATURE

DESIGN PANEL

DESIGNED 07/01/2021 S.ZAIDI
DRAWN 07/01/2021 S.ZAIDI
REVIEWED 07/01/2021 H.SMITH

AUTHORISED 07/01/2021 A.BONANNO SIGNATURE

GSES® GLOBAL SUSTAINABLE ENERGY SOLUTIONS

MOORABIN
970 NEPEAN HWY
MOORABBIN VIC 3189
DESIGN SPREADSHEET
AC DESIGN CALCULATIONS (INVERTERS 08 TO 12)

A1 SHT SIZE | TOTAL SHEETS: | PROJECT No: P1072 | 0 REVISION
SITE ID:
SUPERSEDES:
DRAWING NUMBER
P1072-05-003-01

AC VOLTAGE RISE CALCULATIONS (INVERTER 13)

CABLE LOCATION	CABLE SIZE (mm^2)	CORE STRUCTURE	CONDUCTORS / PHASE	INSULATION	CONDUCTOR	L-L VOLTAGE (V)	INSTALLATION METHOD	CABLE ARRANGEMENT	NUMBER OF CIRCUITS PER TIER	POWER ON CIRCUIT (kVA)	CABLE LENGTH (m)	RATED CCC/ CONDUCTOR (A)	COMBINED DERATING	TOTAL DERATED CCC (A)	ACTUAL MAX. CURRENT (A)	PROTECTIVE DEVICE (A)	MAX. CURRENT/ CONDUCTOR (A)	Vc (mV/Am)	VOLTAGE RISE (%)
CONSUMER MAINS TRANSFORMER TO MSB (EXISTING)	400	SINGLE-CORE	6	X-90	Cu	400	UNDERGROUND WIRING ENCLOSURE	TOUCHING	1	145	45	554	0.82	2724	209	2500	35	0.205	0.14%
SUBMAINS 01 MSB TO DB-R2	400	SINGLE-CORE	4	X-90	Cu	400	UNDERGROUND WIRING ENCLOSURE	TOUCHING	1	145	150	554	0.79	1748	209	1600	52	0.205	0.40%
SUBMAINS 02 DB-R2 TO PV-DB02	150	SINGLE-CORE	1	X-90	Cu	400	SPACED FROM SURFACE	TOUCHING	1	145	15	400	0.83	330	209	250	209	0.330	0.26%
SUBMAINS 02 PV-DB02 TO INVERTER	16	MULTICORE	1	X-90	Cu	400	SPACED	TOUCHING	6	20	7	87	0.64	55	29	50	29	2.55	0.13%
																		TOTAL	0.93%

CABLE LOCATION	TABLE 22 BUNCHED CIRCUITS	TABLE 23 SINGLE-CORE IN CABLE TRAY	TABLE 24 MULTICORE IN CABLE TRAY	TABLE 26 UNDERGROUND WIRING ENCLOSURES	TABLE 27(1) AIR AMBIENT TEMPERATURE	TABLE 27(2) SOIL AMBIENT TEMPERATURE	TABLE 28 DEPTH OF LAYING	TABLE 29 SOIL THERMAL RESISTIVITY	COMBINED DERATING
	DERATING (ROW, COLUMN)	DERATING (ROW, COLUMN)	DERATING (ROW, COLUMN)	DERATING SUB-TABLE, (ROW, COLUMN)	DERATING (ROW, COLUMN)	DERATING (ROW, COLUMN)	DERATING SUB-TABLE, (ROW, COLUMN)	DERATING (ROW, COLUMN)	DERATING
CONSUMER MAINS TRANSFORMER TO MSB (EXISTING)	1 (2, 4)	-	-	0.82 26(2), (5, 3)	-	1 (2, 5)	1 28(2), (1, 2)	1 (4, 6)	0.82
SUBMAINS 01 MSB TO DB-R2	1 (2, 4)	-	-	0.79 26(2), (3, 2)	-	1 (2, 5)	1 28(2), (1, 2)	1 (4, 6)	0.79
SUBMAINS 02 DB-R2 TO PV-DB02	-	0.94 (10, 6)	-	-	0.88 (3, 9)	-	-	-	0.827
SUBMAINS 02 PV-DB02 TO INVERTERS	-	-	0.73 (19, 9)	-	0.88 (3, 9)	-	-	-	0.642

NOTES:

1. THIS DRAWING IS BASED ON THE INFORMATION SUPPLIED TO THE DESIGNER FROM ITS CLIENTS OR SUBCONTRACTORS.
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   - AS5033: INSTALLATION OF PHOTOVOLTAIC ARRAYS
   - AS4777: GRID CONNECTION OF ENERGY SYSTEMS VIA INVERTERS
   - AS3000: ELECTRICAL WIRING RULES
   - AS3008: ELECTRICAL INSTALLATION - SELECTION OF CABLES
   - AS2067: SUBSTATION AND HIGH VOLTAGE INSTALLATIONS EXCEEDING 1kA AC
3. EXACT LOCATION OF ALL PARTS OF THE INSTALLATION TO BE DETERMINED BY CONTRACTOR ON SITE.
4. ALL ELECTRICAL COMPONENT RATINGS TO BE VERIFIED BY INSTALLER.
5. ALL EXISTING EQUIPMENT LABELLED "EXISTING". ALL OTHER EQUIPMENT TO BE INSTALLED.
6. EXISTING CONSUMER MAINS ASSUMED TO BE INSTALLED WITH ONE CIRCUIT PER CONDUIT, BURIED AT 0.5m DEPTH, WITH 0.3m SPACING BETWEEN CONDUITS.

DETAILED DESIGN ISSUE
NOT FOR CONSTRUCTION

REVISION PANEL

REV	DATE	DRN	DETAILS	APR'D
0	07/01/2021	S.Z	DETAILED DESIGN ISSUE	A.B

AUTHORISED 07/01/2021
A.BONANNO
SIGNATURE

DESIGN PANEL

DESIGNED	07/01/2021	S.ZAIDI
DRAWN	07/01/2021	S.ZAIDI
REVIEWED	07/01/2021	H.SMITH

AUTHORISED 07/01/2021
A.BONANNO
SIGNATURE

GSES®
GLOBAL SUSTAINABLE ENERGY SOLUTIONS

MOORABIN
970 NEPEAN HWY
MOORABBIN VIC 3189
DESIGN SPREADSHEET
AC DESIGN CALCULATIONS (INVERTER 13)

A1 SHT SIZE
TOTAL SHEETS:
PROJECT No: P1072
0 REVISION
SITE ID:
SUPERSEDES:
DRAWING NUMBER
P1072-05-004-01

DC VOLTAGE DROP CALCULATIONS (INVERTER 01 TO 06)

CABLE LOCATION	CABLE SIZE (mm^2)	CORE STRUCTURE	CONDUCTOR	INSULATION	# PARALLEL STRINGS	CIRCUIT ISC (A)	INSTALLATION METHOD	NUMBER OF ADJACENT CIRCUITS	CABLE ARRANGEMENT	LENGTH (m)	RATED CCC/ CONDUCTOR (A)	COMBINED DERATING	DERATED CCC/ CONDUCTOR (A)	CIRCUIT IMP (A)	VOLTAGE DROP (V)	VOLTAGE DROP (%)
MODULE LEADS	4	SINGLE-CORE	Cu	X-90	1	10.44	TOUCHING	4	TOUCHING	18	36	0.572	20.592	9.81	1.94	0.29%
STRING CABLE FROM ROOFTOP ISOLATOR TO INVERTER	4	TWIN	Cu	X-90	1	10.44	WIRING ENCLOSURE IN AIR	16	TOUCHING	60	37	0.3608	13.3496	9.81	6.45	0.96%
	Modules in series: 15	Array Vmp: 673.05V	Module Isc: 10.44A	Module Imp: 9.81A											TOTAL	1.25%

CABLE LOCATION	TABLE 22 BUNCHED CIRCUITS	TABLE 23 SINGLE-CORE IN CABLE TRAY	TABLE 24 MULTICORE IN CABLE TRAY	TABLE 26 UNDERGROUND WIRING ENCLOSURES	TABLE 27(1) AIR AMBIENT TEMPERATURE	TABLE 27(2) SOIL AMBIENT TEMPERATURE	TABLE 28 DEPTH OF LAYING	TABLE 29 SOIL THERMAL RESISTIVITY	COMBINED DERATING
	DERATING (ROW, COLUMN)	DERATING (ROW, COLUMN)	DERATING (ROW, COLUMN)	DERATING SUB-TABLE, (ROW, COLUMN)	DERATING (ROW, COLUMN)	DERATING (ROW, COLUMN)	DERATING SUB-TABLE, (ROW, COLUMN)	DERATING (ROW, COLUMN)	DERATING
MODULE LEADS	0.65 (2, 7)	-	-	-	0.88 (3, 9)	-	-	-	0.572
STRING CABLE FROM ROOFTOP ISOLATOR TO INVERTER	0.41 (2, 16)	-	-	-	0.88 (3, 9)	-	-	-	0.361

NOTES:

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3. EXACT LOCATION OF ALL PARTS OF THE INSTALLATION TO BE DETERMINED BY CONTRACTOR ON SITE.
4. ALL ELECTRICAL COMPONENT RATINGS TO BE VERIFIED BY INSTALLER.

DETAILED DESIGN ISSUE
NOT FOR CONSTRUCTION

REVISION PANEL

REV	DATE	DRN	DETAILS	APR'D
0	07/01/2021	S.Z	DETAILED DESIGN ISSUE	A.B

AUTHORISED 07/01/2021
A.BONANNO
SIGNATURE

DESIGN PANEL

DESIGNED 07/01/2021
S.ZAIDI
DRAWN 07/01/2021
S.ZAIDI
REVIEWED 07/01/2021
H.SMITH

AUTHORISED 07/01/2021
A.BONANNO
SIGNATURE

GSES®
GLOBAL SUSTAINABLE ENERGY SOLUTIONS

MOORABIN
970 NEPEAN HWY
MOORABBIN VIC 3189
DESIGN SPREADSHEET
DC DESIGN CALCULATIONS (INVERTERS 01 TO 06, 08 TO 12)

A1 SHT SIZE
TOTAL SHEETS:
PROJECT No: P1072
0 REVISION
SITE ID:
SUPERSEDES:
DRAWING NUMBER
P1072-05-005-01

DC VOLTAGE DROP CALCULATIONS (INVERTER 07)

CABLE LOCATION	CABLE SIZE (mm^2)	CORE STRUCTURE	CONDUCTOR	INSULATION	# PARALLEL STRINGS	CIRCUIT ISC (A)	INSTALLATION METHOD	NUMBER OF ADJACENT CIRCUITS	CABLE ARRANGEMENT	LENGTH (m)	RATED CCC/ CONDUCTOR (A)	COMBINED DERATING	DERATED CCC/ CONDUCTOR (A)	CIRCUIT IMP (A)	VOLTAGE DROP (V)	VOLTAGE DROP (%)
MODULE LEADS	4	SINGLE-CORE	Cu	X-90	1	10.44	TOUCHING	3	TOUCHING	15	36	0.616	22.176	9.81	1.61	0.28%
STRING CABLE FROM ROOFTOP ISOLATOR TO INVERTER	4	TWIN	Cu	X-90	1	10.44	WIRING ENCLOSURE IN AIR	16	TOUCHING	80	37	0.3608	13.3496	9.81	8.61	1.48%
	Modules in series: 13	Array Vmp: 583.31V	Module Isc: 10.44A	Module Imp: 9.81A											TOTAL	1.75%

CABLE LOCATION	TABLE 22 BUNCHED CIRCUITS	TABLE 23 SINGLE-CORE IN CABLE TRAY	TABLE 24 MULTICORE IN CABLE TRAY	TABLE 26 UNDERGROUND WIRING ENCLOSURES	TABLE 27(1) AIR AMBIENT TEMPERATURE	TABLE 27(2) SOIL AMBIENT TEMPERATURE	TABLE 28 DEPTH OF LAYING	TABLE 29 SOIL THERMAL RESISTIVITY	COMBINED DERATING
	DERATING (ROW, COLUMN)	DERATING (ROW, COLUMN)	DERATING (ROW, COLUMN)	DERATING SUB-TABLE, (ROW, COLUMN)	DERATING (ROW, COLUMN)	DERATING (ROW, COLUMN)	DERATING SUB-TABLE, (ROW, COLUMN)	DERATING (ROW, COLUMN)	DERATING
MODULE LEADS	0.7 (2, 6)	-	-	-	0.88 (3, 9)	-	-	-	0.616
STRING CABLE FROM ROOFTOP ISOLATOR TO INVERTER	0.41 (2, 16)	-	-	-	0.88 (3, 9)	-	-	-	0.361

NOTES:

1. THIS DRAWING IS BASED ON THE INFORMATION SUPPLIED TO THE DESIGNER FROM ITS CLIENTS OR SUBCONTRACTORS.
2. THE MOST CURRENT VERSION OF THE FOLLOWING AUSTRALIAN STANDARDS ARE APPLICABLE AS A MINIMUM:
   - AS5033: INSTALLATION OF PHOTOVOLTAIC ARRAYS
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   - AS3008: ELECTRICAL INSTALLATION - SELECTION OF CABLES
   - AS2067: SUBSTATION AND HIGH VOLTAGE INSTALLATIONS EXCEEDING 1kA AC
3. EXACT LOCATION OF ALL PARTS OF THE INSTALLATION TO BE DETERMINED BY CONTRACTOR ON SITE.
4. ALL ELECTRICAL COMPONENT RATINGS TO BE VERIFIED BY INSTALLER.

DETAILED DESIGN ISSUE
NOT FOR CONSTRUCTION

REVISION PANEL

REV	DATE	DRN	DETAILS	APR'D
0	07/01/2021	S.Z	DETAILED DESIGN ISSUE	A.B

AUTHORISED 07/01/2021
A.BONANNO
SIGNATURE

DESIGN PANEL

DESIGNED	07/01/2021	AUTHORISED	07/01/2021
S.ZAIDI		A.BONANNO	
DRAWN	07/01/2021	SIGNATURE	
S.ZAIDI			
REVIEWED	07/01/2021		
H.SMITH			

GSES®
GLOBAL SUSTAINABLE ENERGY SOLUTIONS

MOORABIN
970 NEPEAN HWY
MOORABBIN VIC 3189
DESIGN SPREADSHEET
DC DESIGN CALCULATIONS (INVERTER 07)

A1 SHT SIZE	TOTAL SHEETS:	0 REVISION
	PROJECT No: P1072	
	SITE ID:	
	SUPERSEDES:	
	DRAWING NUMBER P1072-05-006-01	

DC VOLTAGE DROP CALCULATIONS (INVERTER 13)

CABLE LOCATION	CABLE SIZE (mm^2)	CORE STRUCTURE	CONDUCTOR	INSULATION	# PARALLEL STRINGS	CIRCUIT ISC (A)	INSTALLATION METHOD	NUMBER OF ADJACENT CIRCUITS	CABLE ARRANGEMENT	LENGTH (m)	RATED CCC/ CONDUCTOR (A)	COMBINED DERATING	DERATED CCC/ CONDUCTOR (A)	CIRCUIT IMP (A)	VOLTAGE DROP (V)	VOLTAGE DROP (%)
MODULE LEADS	4	SINGLE-CORE	Cu	X-90	1	10.44	TOUCHING	4	TOUCHING	13	36	0.572	20.592	9.81	1.40	0.24%
STRING CABLE FROM ROOFTOP ISOLATOR TO INVERTER	4	TWIN	Cu	X-90	1	10.44	WIRING ENCLOSURE IN AIR	16	TOUCHING	55	37	0.3608	13.3496	9.81	5.92	1.01%
	Modules in series: 13	Array Vmp: 583.31V	Module Isc: 10.44A	Module Imp: 9.81A											TOTAL	1.25%

CABLE LOCATION	TABLE 22 BUNCHED CIRCUITS	TABLE 23 SINGLE-CORE IN CABLE TRAY	TABLE 24 MULTICORE IN CABLE TRAY	TABLE 26 UNDERGROUND WIRING ENCLOSURES	TABLE 27(1) AIR AMBIENT TEMPERATURE	TABLE 27(2) SOIL AMBIENT TEMPERATURE	TABLE 28 DEPTH OF LAYING	TABLE 29 SOIL THERMAL RESISTIVITY	COMBINED DERATING
	DERATING (ROW, COLUMN)	DERATING (ROW, COLUMN)	DERATING (ROW, COLUMN)	DERATING SUB-TABLE, (ROW, COLUMN)	DERATING (ROW, COLUMN)	DERATING (ROW, COLUMN)	DERATING SUB-TABLE, (ROW, COLUMN)	DERATING (ROW, COLUMN)	DERATING
MODULE LEADS	0.65 (2, 7)	-	-	-	0.88 (3, 9)	-	-	-	0.572
STRING CABLE FROM ROOFTOP ISOLATOR TO INVERTER	0.41 (2, 16)	-	-	-	0.88 (3, 9)	-	-	-	0.361

NOTES:

1. THIS DRAWING IS BASED ON THE INFORMATION SUPPLIED TO THE DESIGNER FROM ITS CLIENTS OR SUBCONTRACTORS.
2. THE MOST CURRENT VERSION OF THE FOLLOWING AUSTRALIAN STANDARDS ARE APPLICABLE AS A MINIMUM:
   - AS5033: INSTALLATION OF PHOTOVOLTAIC ARRAYS
   - AS4777: GRID CONNECTION OF ENERGY SYSTEMS VIA INVERTERS
   - AS3000: ELECTRICAL WIRING RULES
   - AS3008: ELECTRICAL INSTALLATION - SELECTION OF CABLES
   - AS2067: SUBSTATION AND HIGH VOLTAGE INSTALLATIONS EXCEEDING 1kA AC
3. EXACT LOCATION OF ALL PARTS OF THE INSTALLATION TO BE DETERMINED BY CONTRACTOR ON SITE.
4. ALL ELECTRICAL COMPONENT RATINGS TO BE VERIFIED BY INSTALLER.

DETAILED DESIGN ISSUE
NOT FOR CONSTRUCTION

REVISION PANEL

REV	DATE	DRN	DETAILS	APR'D
0	07/01/2021	S.Z	DETAILED DESIGN ISSUE	A.B

AUTHORISED 07/01/2021
A.BONANNO
SIGNATURE

DESIGN PANEL

DESIGNED 07/01/2021
S.ZAIDI
DRAWN 07/01/2021
S.ZAIDI
REVIEWED 07/01/2021
H.SMITH

AUTHORISED 07/01/2021
A.BONANNO
SIGNATURE

GSES®
GLOBAL SUSTAINABLE ENERGY SOLUTIONS

MOORABIN
970 NEPEAN HWY
MOORABBIN VIC 3189
DESIGN SPREADSHEET
DC DESIGN CALCULATIONS (INVERTER 13)

A1 SHT SIZE
TOTAL SHEETS:
PROJECT No: P1072
0 REVISION
SITE ID:
SUPERSEDES:
DRAWING NUMBER
P1072-05-007-01