

Solar PV Installation Plan – Solar Carport and
Battery Storage.

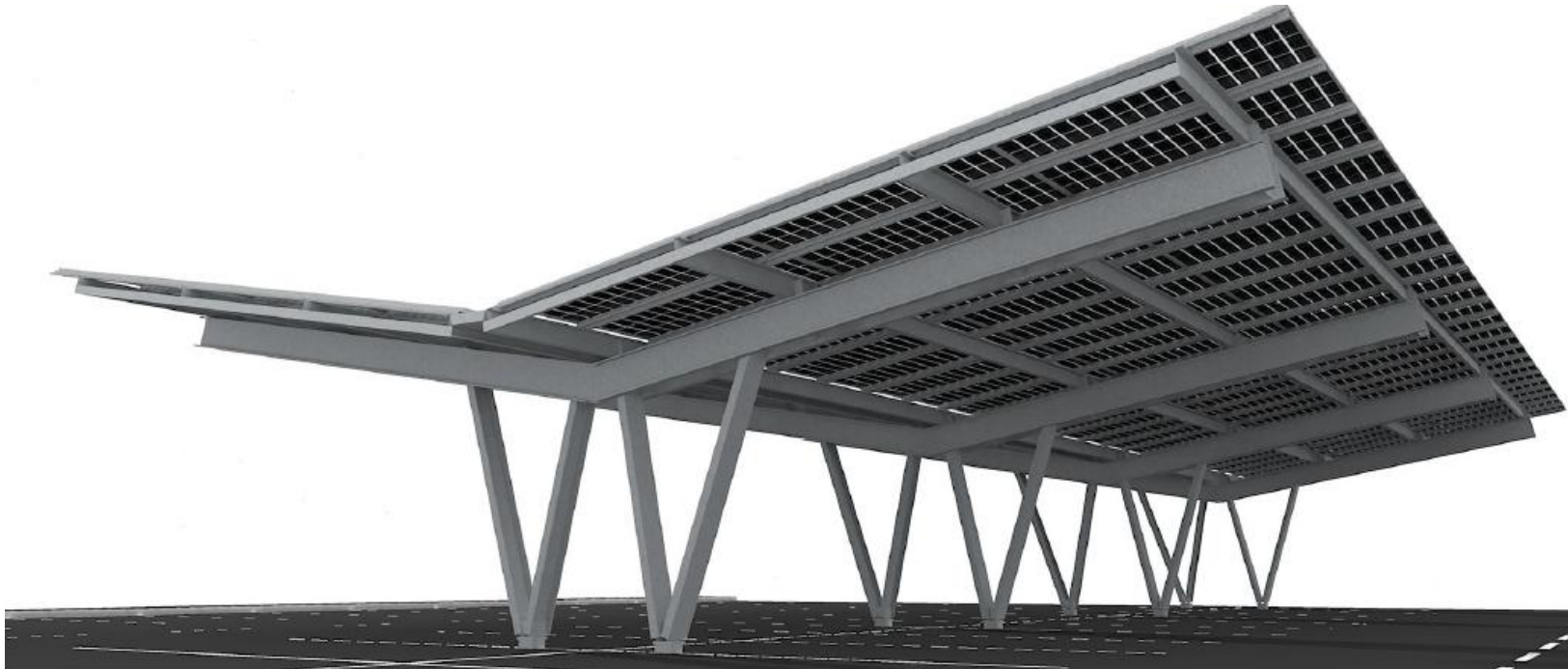
EV Installation – 4 x 11kW Evolve Posts.

Hinckley Leisure Centre, LE10 1BZ

T H WHITE
ENERGY, FIRE
& SECURITY

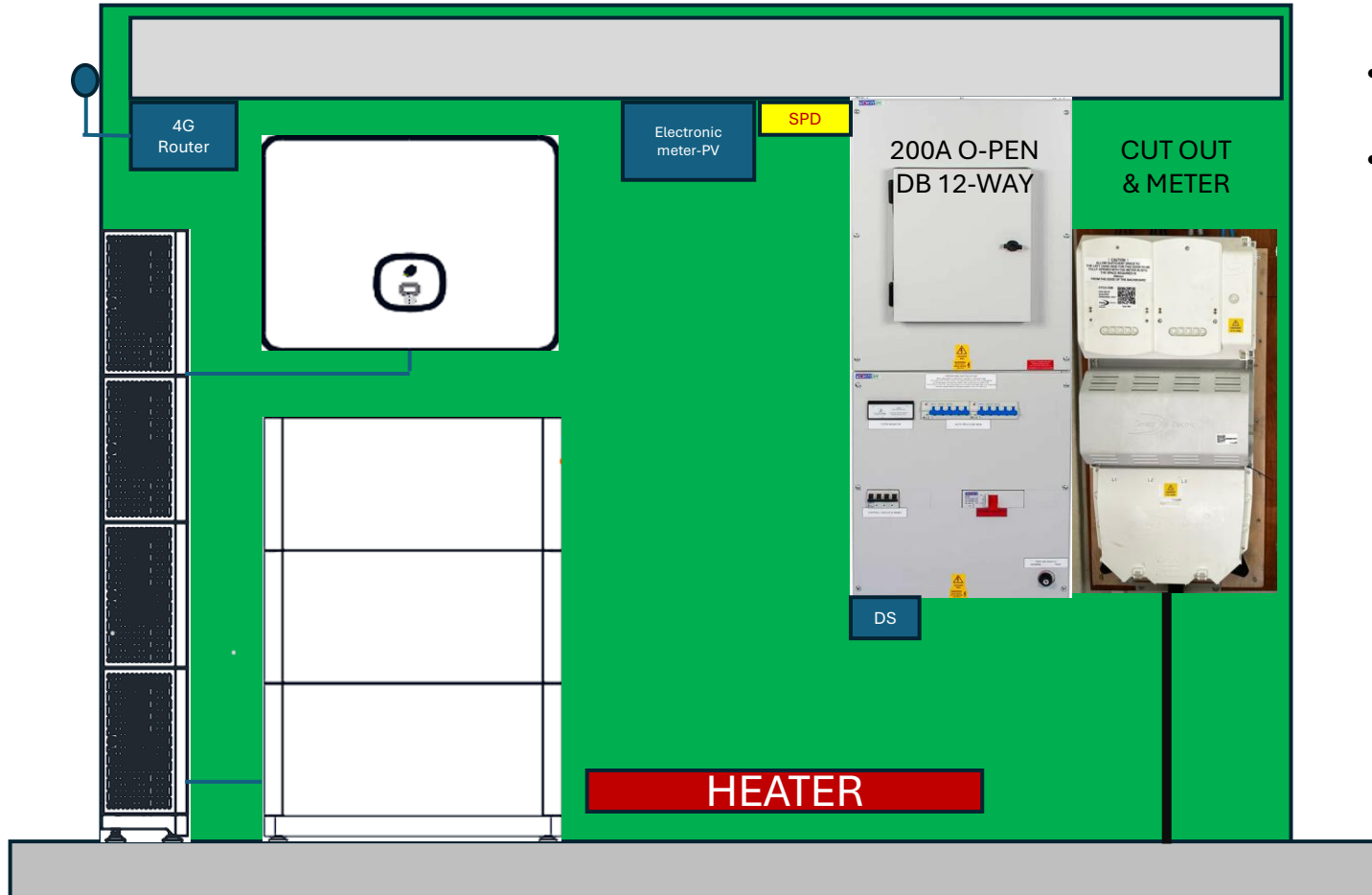
Double Gullwing Proposal Explained-Carport

- Double Gullwing canopy design will be chosen for all sites following in depth review.
- A double mono (south facing flat) carport reduces the number of panel rows to 5.
- Due to the shallow pitch of 10 degrees, the additional PV generation per panel is minimal and results in an overall reduction in price per kWh generated, due to the reduced number of panels per canopy.
- Carparks with south facing pitches will have the north elevation reduced to a 5-degree pitch for better yield.
- Increased aesthetics, removes the need for on show low pitch guttering.

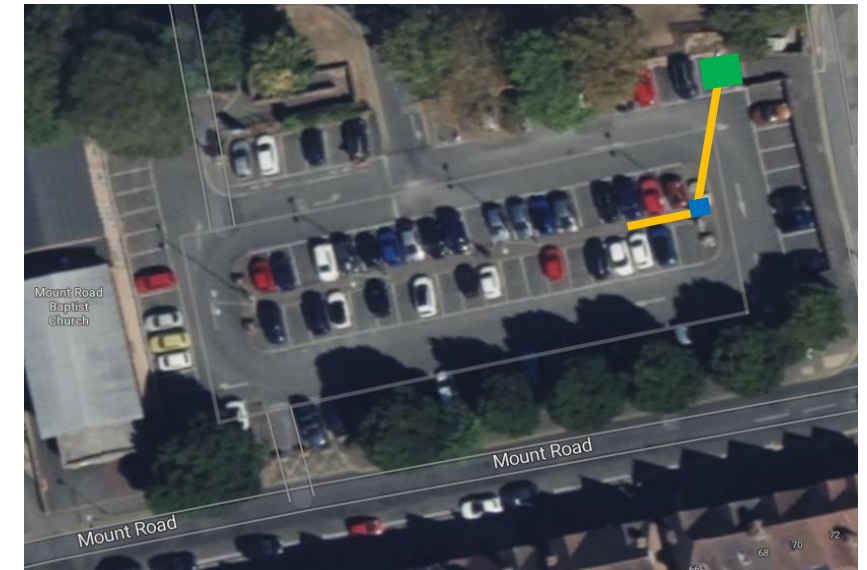


Project Overview-Electrical Works

Feeder Pillar-Bespoke VR15 GRP



- Feeder pillar will house all electrical switch gear, battery storage (BESS) and PV inverter.
- Feeder pillar size and internal layout will remain the same for both options of canopy and accompanying Inverter and BESS



Project Overview

A. Installation data

Installed capacity of PV system - kWp (stc)	39.600	kWp
Orientation of the PV system - degrees from South	Group 1: 33 panels with Orientation: 155 ° Group 2: 33 panels with Orientation: 25 °	°
Inclination of system - degrees from horizontal	Group 1: 33 panels with Tilt: 10° Group 2: 33 panels with Tilt: 10°	°

JAM 72D40 LB

39.600kW of Solar Power

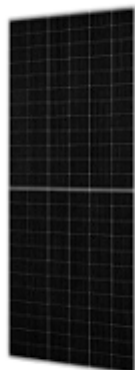
66 x JAM72D-40-600-LB-TS-MC4

600 Watt panels

12 Year Product Warranty &

30 Year Linear Performance
Warranty

30,340kWh per year



[Play](#) [Details](#) [Specs](#)

JA SOLAR

Inverter

Growatt New Energy Technology Co., Ltd.

30 kW Total Inverter Rating

1 x MID 30KTL3-XH [UK]

Battery

Growatt New Energy Technology Co., Ltd.

30.0 kWh Total Battery Storage

1 x APX 30.0P-S2

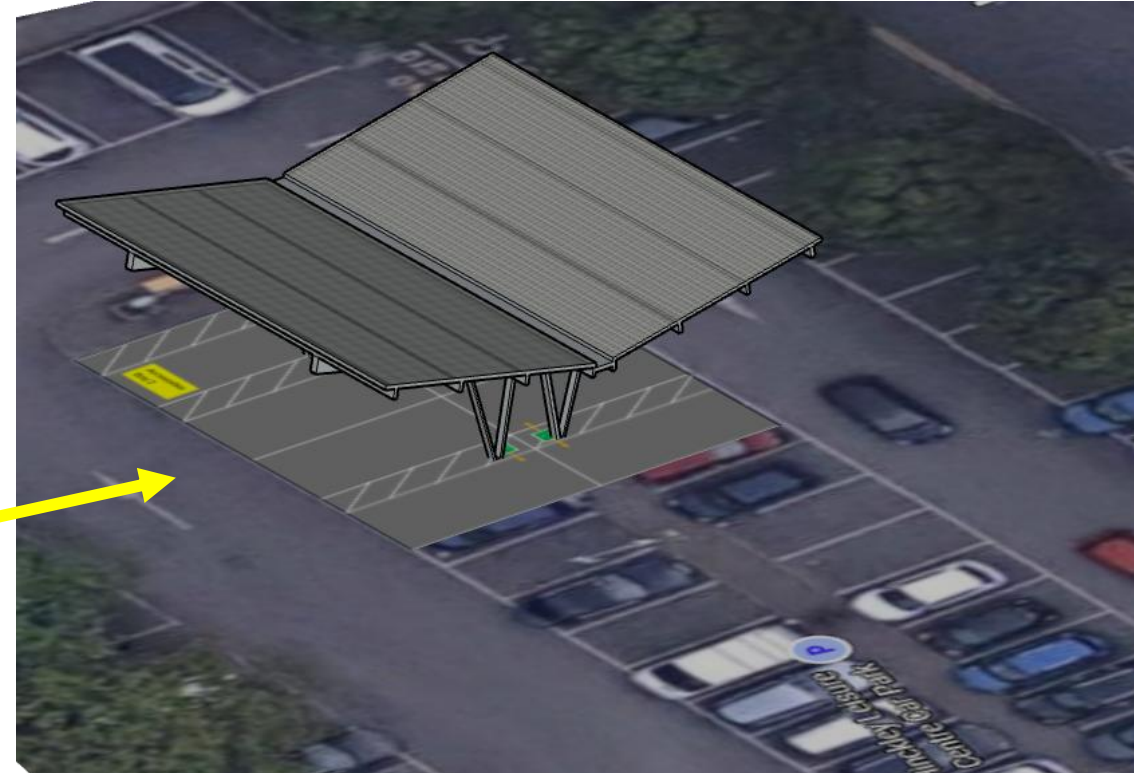
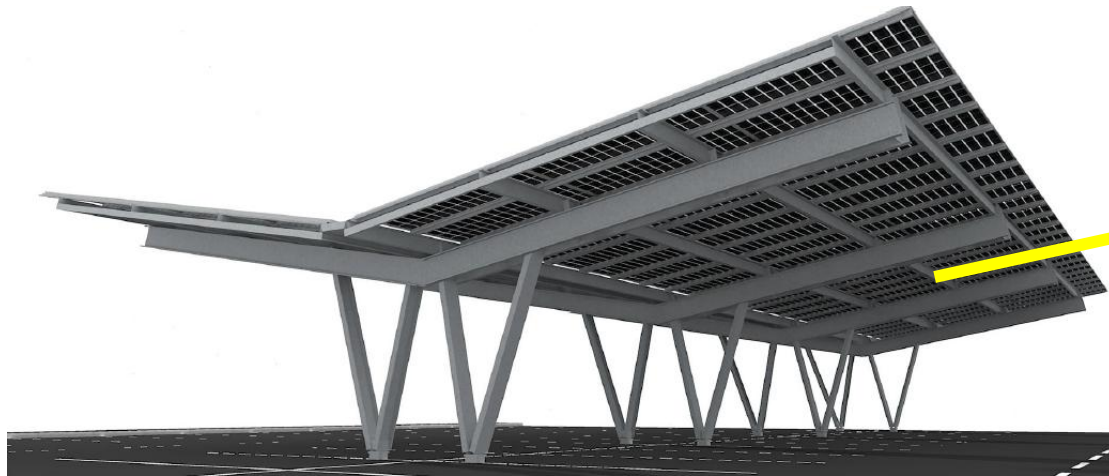
B. Performance calculations

kWh/kWp (Kk) from table	Group 1: 719 Group 2: 847	kWh/kWp
Shade Factor (SF)	0.703	
Estimated annual output (kWp x Kk x SF)	30,575	kWh
C. Estimated PV self-consumption - PV Only		
Assumed occupancy archetype	In Half Day	
Assumed annual electricity consumption, kWh	122,640.00	kWh
Assumed annual electricity generation from solar PV system, kWh	30,575	kWh
Expected solar PV self-consumption (PV Only)	27,777.31	kWh
Grid electricity independence / Self-sufficiency (PV Only)	22.65	%
D. Estimated PV self-consumption - with EESS		
Assumed usable capacity of electricity energy storage device, which is used for self-consumption, kWh	27.00	kWh
Expected solar PV self-consumption (with EESS)	30,555.04	kWh
Grid electricity independence / Self-sufficiency (with EESS)	25.0%	%

Project Overview-SIG Carpot

Installation of 1 x Cold Rolled Gull Wing Carport structures supporting 66 x Solar Panels for a total System size of 39.6kWp.

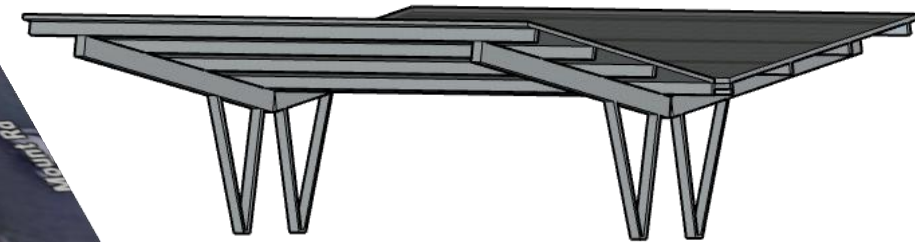
1. 12-year design collateral warranty (sample attached)
2. SIG - Solar Canopy - Cold Rolled Section Warranty – 24 months



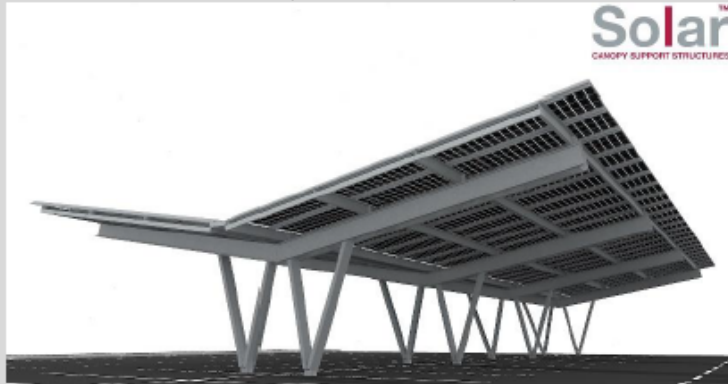
Project Overview-SIG Carpot

Installation of 1 x Cold Rolled Gull Wing Carport structures supporting 66 x Solar Panels for a total System size of 39.6kWp.

1. 12-year design collateral warranty (sample attached)
2. SIG - Solar Canopy - Cold Rolled Section Warranty – 24 months



Project Overview-SIG Carport Manufacturer

Cold Rolled Gullwing				Client : TH White					Project Name : Enderby Leisure Centre				Rev 01	Date 070525	
Panel Details Width 1.134m Length 2.333m Wattage 600W No of Rows 6															
Canopy Number		Bay size 1	No of 1	Bay size 2	No of 2	No of Spaces	No of Grids*	Structure length	Panel Columns	Add panels	Final Panel Columns	Total Panels	Canopy Length	Overhang	kWp
1		7.5	1	5	0	10	2	7.5	8	3	11	66	12.54	2.52	39.6
Totals:			1	0	10	2	7.5	8		11	66	12.54		39.6	

Project Overview-SIG Carport Manufacturer

Solar Support Structures - Benefits

FEATURE	BENEFIT	NOTE
Z600 or ZM600 Galvanized Steel	Maximum life of structure	Minimum maintenance over lifetime
Posts within Rafters	Assemble – lift – connect to base	Quick install of posts and rafters
Less steel than competitors	Less weight in structure	Lower cost
Watertight canopy with PV panels	No steel sheet on canopy structure No mounting rails/fixings required	PV panels are the canopy using SIG mounting solution
PV panels Installed from below from scissor lifts	No Scaffolding No working on top of canopy	Reduced install costs
Designed and manufactured in UK	Quick turnaround of projects with canopies virtually ready “Off the shelf”	Steel structure easily modified with no delays in deliveries

Project Overview-Solar Panels



JA Solar 600W n-type Bifacial Double Glass Half-Cell MBB Traceable LB MC4

Part No: JAM72D-40-600-LB-TS-MC4 Panels - Double Glass Bifacial

Rating: 600W

Efficiency: 22.7%

Width: 1,134mm

Height: 2,333mm

600W N-type Double Glass High Efficiency Mono Module.

Powered by the latest MBB n-type solar cell and half-cell configuration, these modules have higher output power, lower LID, better weak illumination response, and better temperature coefficient.

High Power Output (600W) : The JA Solar 600W module delivers an exceptional power output, making it an ideal choice for residential, commercial, and industrial applications.

N-Type Cell Technology: The use of N-type cells enhances the efficiency and longevity of the module.

Durable Double Glass Design: The double glass construction provides enhanced durability, improving resistance to environmental stresses such as moisture, dust, and temperature fluctuations.

Bifacial Technology: With bifacial panels, this solar module captures sunlight on both the front and rear sides.

Product Warranty: 12 year

Linear Power Output Warranty: 30 year

JA Solar Integrated Traceable System.

Project Overview-Solar Panels



ELECTRICAL PARAMETERS AT STC

TYPE	JAM72D40 -590/LB	JAM72D40 -595/LB	JAM72D40 -600/LB	JAM72D40 -605/LB	JAM72D40 -610/LB	JAM72D40 -615/LB
Rated Maximum Power(Pmax) [W]	590	595	600	605	610	615
Open Circuit Voltage (Voc) [V]	52.00	52.20	52.40	52.60	52.80	53.00
Maximum Power Voltage(Vmp) [V]	43.41	43.59	43.76	43.94	44.11	44.28
Short Circuit Current(Isc) [A]	14.35	14.42	14.48	14.53	14.57	14.61
Maximum Power Current(Imp) [A]	13.59	13.65	13.71	13.77	13.83	13.89
Module Efficiency [%]	22.3	22.5	22.7	22.9	23.1	23.2
Power Tolerance	0~+3%					
Temperature Coefficient of Isc(α_{Isc})	+0.045%/°C					
Temperature Coefficient of Voc (β_{Voc})	-0.250%/°C					
Temperature Coefficient of Pmax(γ_{Pmp})	-0.290%/°C					
STC	Irradiance 1000W/m ² , cell temperature 25°C, AM1.5G					

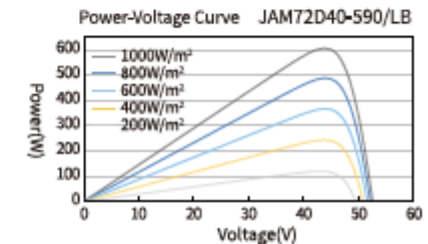
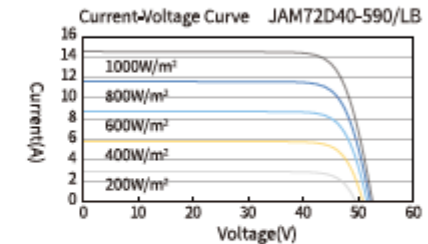
Remark: Electrical data in this catalog do not refer to a single module and they are not part of the offer. They only serve for comparison among different module types.

ELECTRICAL CHARACTERISTICS WITH 10% SOLAR IRRADIATION RATIO

TYPE	JAM72D40 -590/LB	JAM72D40 -595/LB	JAM72D40 -600/LB	JAM72D40 -605/LB	JAM72D40 -610/LB	JAM72D40 -615/LB
Rated Max Power(Pmax) [W]	637	643	648	653	659	664
Open Circuit Voltage(Voc) [V]	52.00	52.20	52.40	52.60	52.80	53.00
Max Power Voltage(Vmp) [V]	43.41	43.59	43.76	43.94	44.11	44.28
Short Circuit Current(Isc) [A]	15.50	15.57	15.64	15.69	15.74	15.78
Max Power Current(Imp) [A]	14.68	14.74	14.81	14.87	14.94	15.00
Irradiation Ratio (rear/front)	10%					

* For Nextracker installations, maximum static load please take compatibility approve letter between JA Solar and Nextracker for reference.

CHARACTERISTICS



OPERATING CONDITIONS

Maximum System Voltage	1500V DC
Operating Temperature	-40°C~+85°C
Maximum Series Fuse Rating	30A
Maximum Static Load, Front*	5400Pa(112 lb/ft ²)
Maximum Static Load, Back*	2400Pa(50 lb/ft ²)
NOCT	45±2°C
Bifaciality	80%±5%
Safety Class	Class II
Fire Performance	UL Type 29/Class C

Project Overview-Solar PV Inverter

Growatt MID 30kW 3ph Hybrid Inverter (inc DC switch) – MID TL3-XH

AC attributes

Max power:	30000W
Max current:	45.5A
Number of phases:	3

DC attributes

Number of MPPT	3
V range of MPPT	160 - 1000V
Max power	60000W
Max Isc current	40A
Max voltage	1000V
Start up voltage	200V

System

Max efficiency	98.8%
IP rating	IP66
Weight	31kg
Dimensions	580x435x230mm
Communication	USB/RS485 (Optional- WiFi/GPRS/LAN/RF)

Key features

- 3 independent MPPTs
- Built-in DC switch
- High maximum efficiency 98.8%
- Touch key and OLED display
- Optional AFCI (Arc-Fault Circuit Interrupter function)
- IP66 protection grade
- Type II SPD on DC and AC side



Project Overview-Solar PV Inverter

Growatt MID 30kW 3ph Hybrid Inverter (inc DC switch) – MID TL3-XH



Benefits Summary

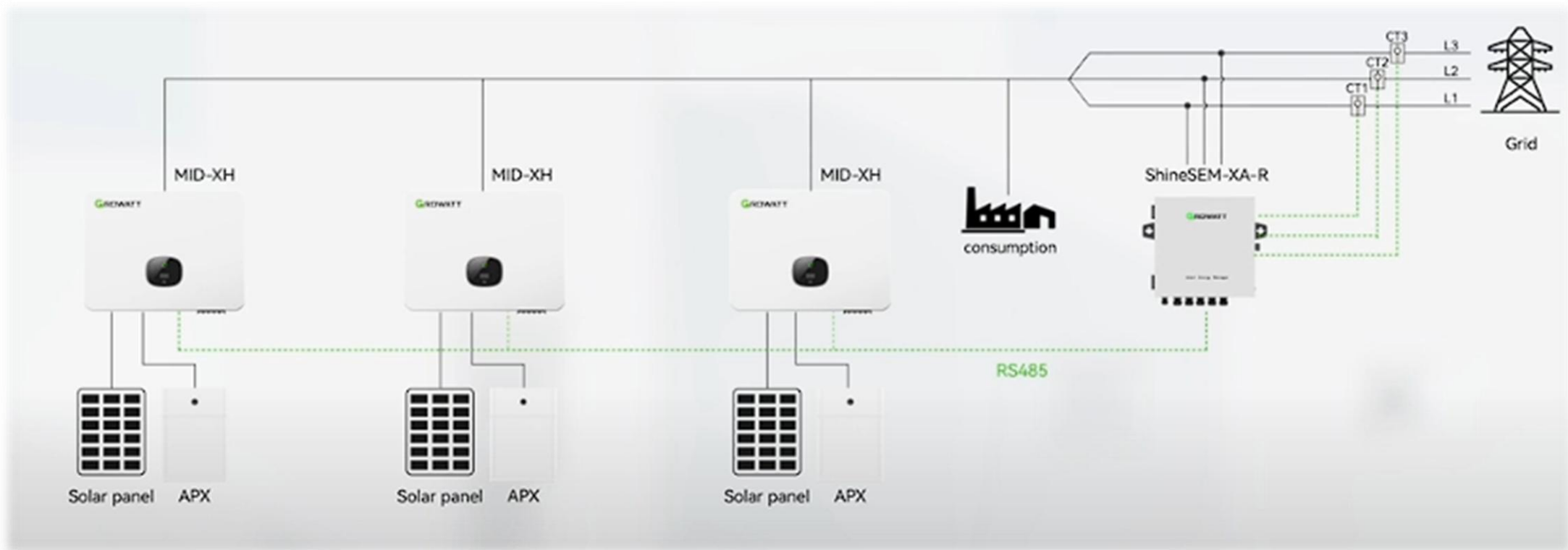
- G99/G100 approved for export limitation. Reduced risk of restrictions or rejection, particularly for future expansion.
- Expandable, allowing for additional inverters with battery storage to be added with operation and export limitations unified.
- Warranty periods matching that of higher priced competitors.
- User friendly online monitoring platform, allowing for remote control and monitoring of system, along with remote fault finding, temperature monitoring and remote fault alarms.
- Longstanding manufacturer with confidence in after service care.

Protection devices		
DC reverse polarity protection		Yes
DC Switch		Yes
AC/DC surge protection		Type II / Type II
Insulation resistance monitoring		Yes
AC short-circuit protection		Yes
Ground fault monitoring		Yes
Grid monitoring		Yes
Anti-islanding protection		Yes
Residual-current monitoring unit		Yes
String fault monitoring		Yes
AFCl protection*3		Optional
General data		
Dimensions (W / H / D)		580/435/230mm
Weight		31kg
Operating temperature range		- 25°C ... +60°C
Nighttime power consumption		<5.5W
Topology		Transformerless
Cooling		Smart air cooling
Protection degree		IP66
Relative humidity		0—100%
Altitude		4000m
DC connection		H4/MC4(Optional)
AC connection		Cable gland+OT terminal
Display		OLED+LED/WIFI+APP
Interfaces: USB/RS485/WIFI/ GPRS/LAN/RF		Yes/Yes/Optional/Optional/Optional/Optional
Warranty: 5years / 10 years		Yes/Optional

Project Overview-Solar PV Inverter

Growatt MID 30kW 3ph Hybrid Inverter (inc DC switch) – MID TL3-XH

With the addition of Growatt Shine SEM-XA-R, the system can be expanded in the future with parallel inverters with combined monitoring and export limitation.



Project Overview-Battery Storage System

Growatt APX HV 5kWh Battery Module– APX30.0P 6 Stack

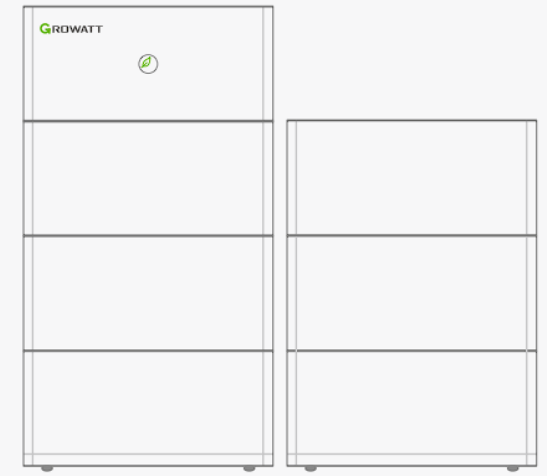


The 5kWh APX battery system adopts cobalt free LiFePO4 chemistry and four level protection BMS, modular energy optimizer, fuse, and aerosol to ensure its enhanced safety, reliability, and long lifespan.

GENERAL INFORMATION

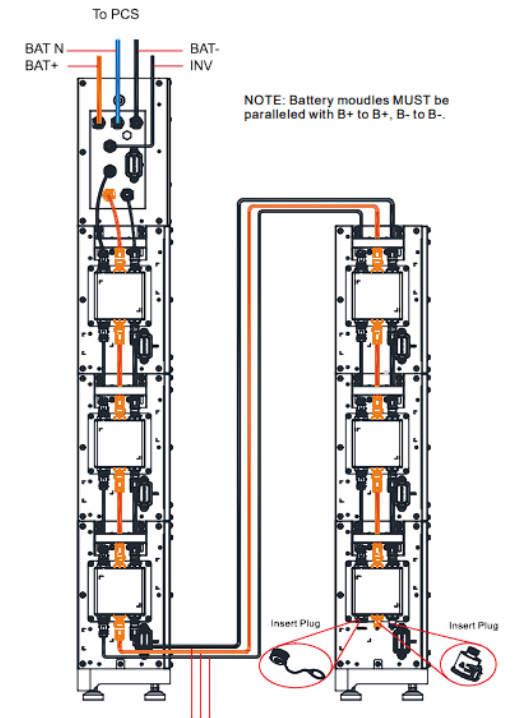
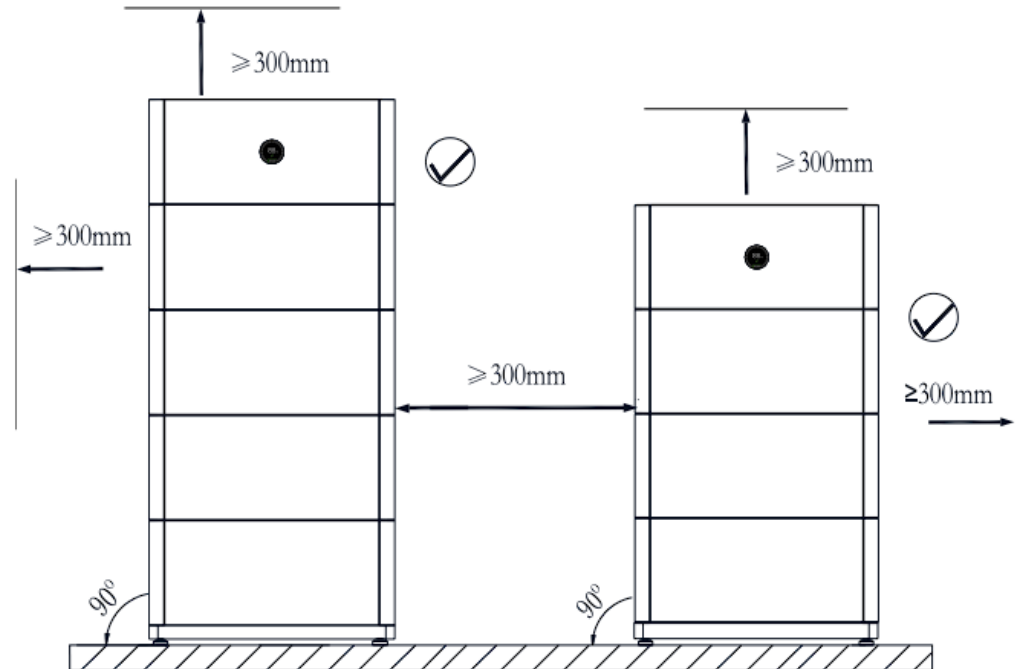
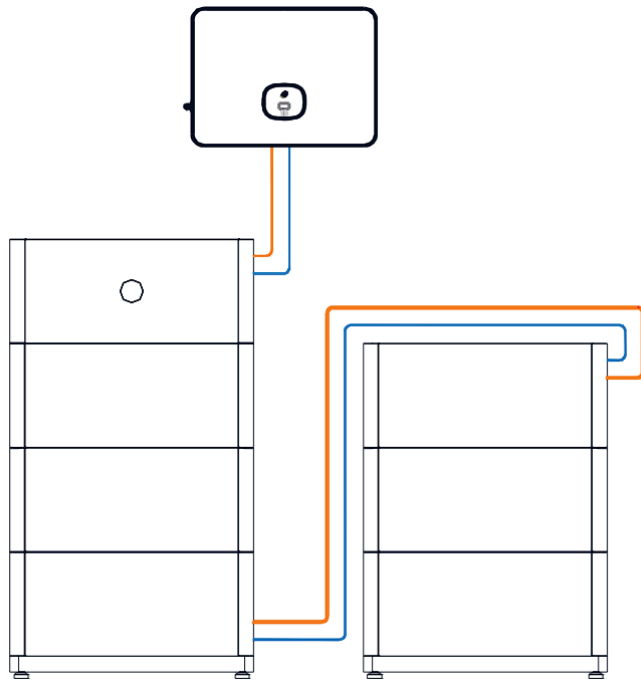
- Flexible capacity options, 5kWh to 30kWh
- Module level energy optimization
- Easy installation with modular and stacked design
- Long lifespan, 10 years warranty
- Cobalt free LiFePO4 battery
- Wall mounted or floor installation options
- Dimensions: 690 x 185 x 295mm

APX 30.0P



Project Overview-Battery Storage System

Growatt APX HV 5kWh Battery Module– APX30.0P 6 Stack



EV Installation – 4 x 11kW Evolve Posts –
Applicable to certain sites only.

Hinckley Leisure Centre, LE10 1BZ.

T H WHITE
ENERGY, FIRE
& SECURITY



VR15
Feeder
Pillar

- Feeder Pillar location as per the DNO POC Drawing.

Key



- Cable Route.



- Trench Route.

NEW Canopy Location



- As per the original position of the canopy the P&D Machine can stay and will be re-supplied from our Feeder Pillar as this is assumed its being supplied from the local lighting column which is to be removed.

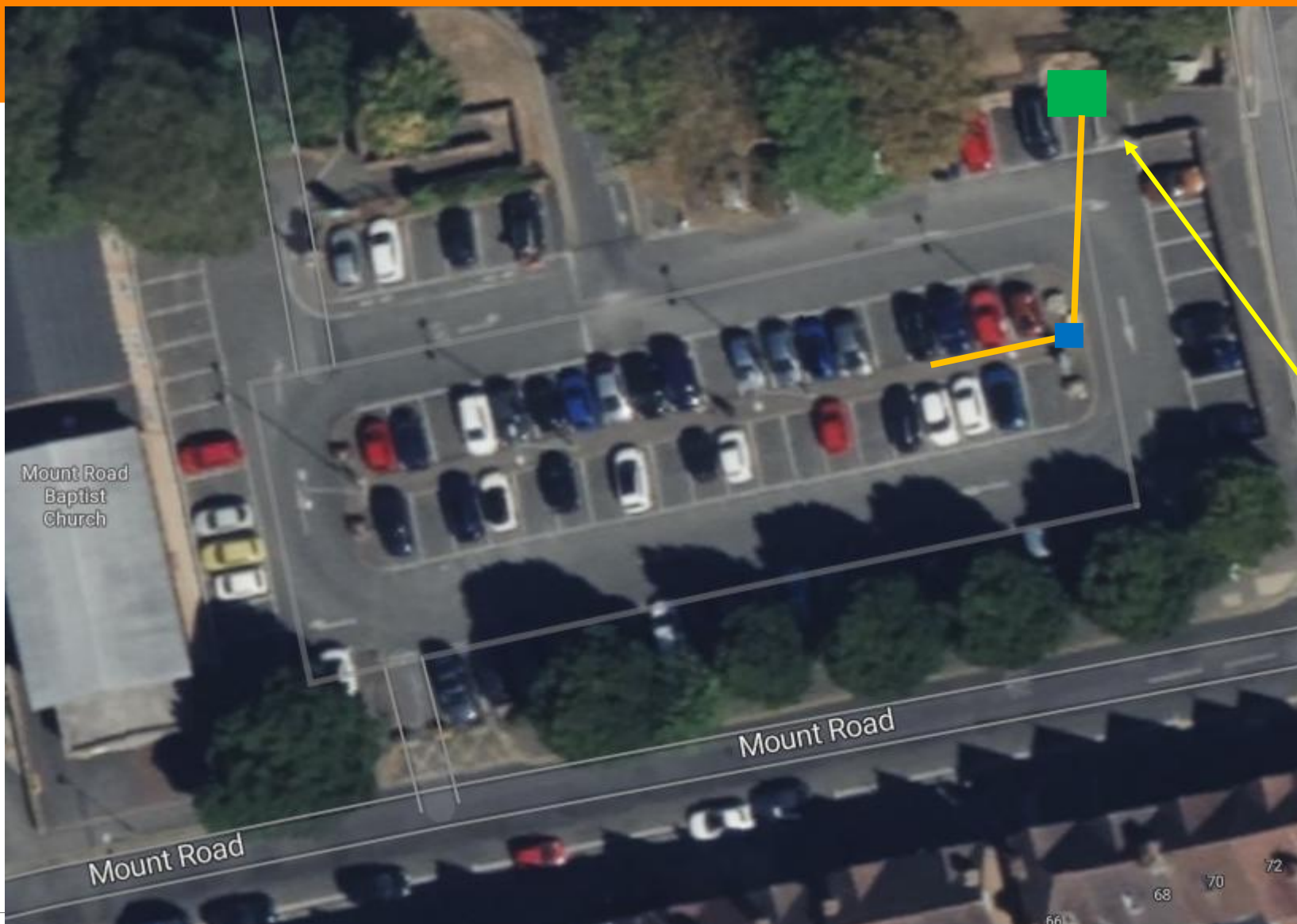
Key



- Cable Route.



- Trench Route.



- The lighting column next to the P&D Machine will need to be removed.
- An access chamber will be installed at the base of the closest leg of the PV Canopy.
- 4 x 100mm ducts to be installed from the Feeder Pillar to the Access Chamber.
- TH White quote based on the Feeder Pillar being installed here.

Key



- Cable Route.



- Trench Route.

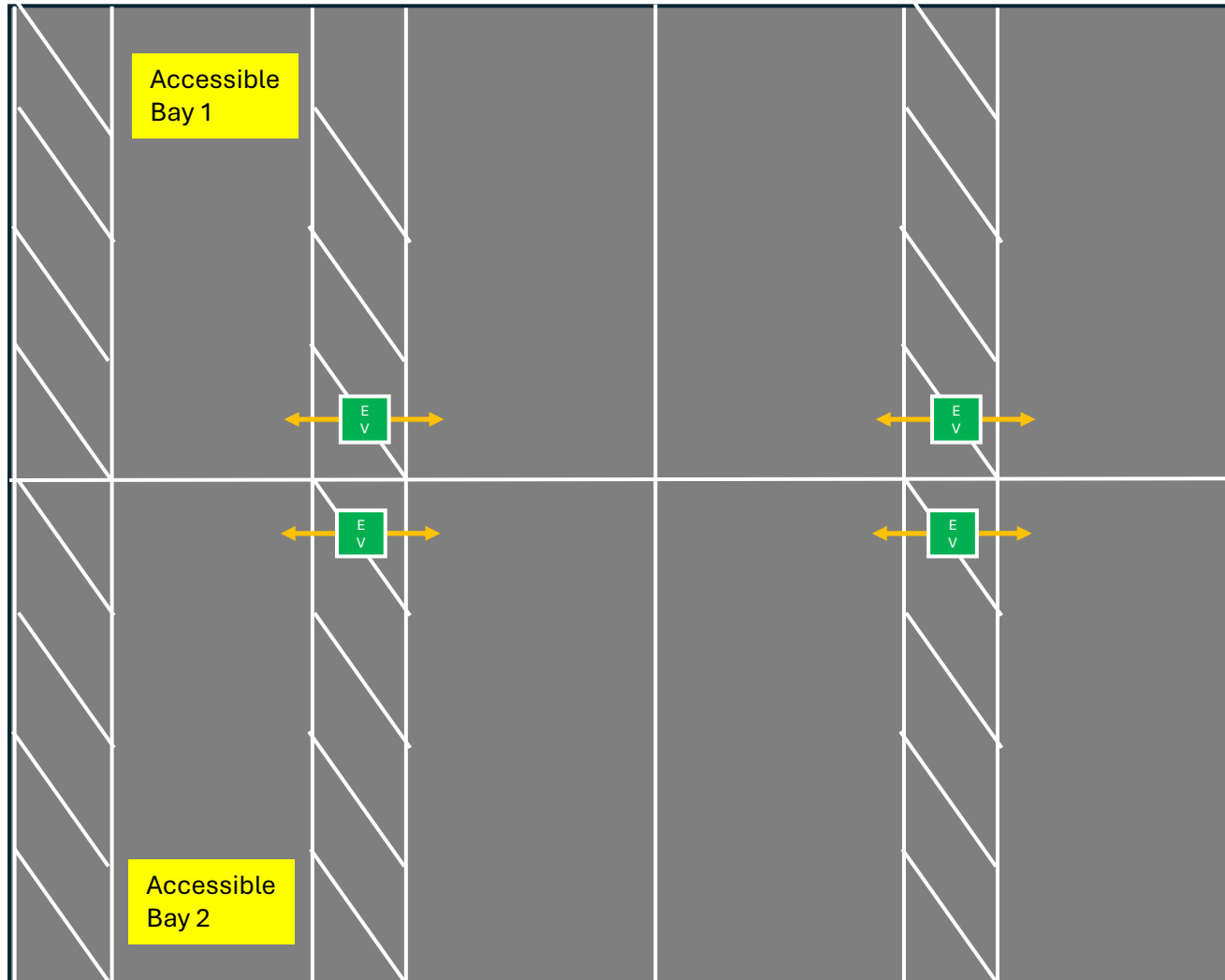


- VR15 Feeder Pillar



- Access Chamber

Option 1 Layout - 4 x EVCPs with SMALL Canopy.



VR 15
Feeder
Pillar

- **NOT to Scale.
- Hatching colour to be decided by Client.
- Not exact Feeder Pillar Location

Project Overview-Chosen Equipment



- EV Blocks have been included within our quote; they are a good option when thinking about future expansion. This is because you won't have to trench back to the feeder pillar location if additional EV Chargers are required.



- 200A 12 Way TP Distribution board has been chosen with future expansion in mind.

- Requirements:
- 6 TP Ways for 6 EVCPs.
- **OR**
- 4TP Ways for 4 EVCPs.
- SPD – 1 x TP Way.
- PV – 2 x TP Ways.
- Sockets & Heater 1 x SP Way.
- Lighting Circuit for Feeder Pillar 1 x SP Way.
- Spare – 4 x TP Ways for Future use.