SOLAR STRUCTURES AFRICA

SOLAR MOUNTING STRUCTURE MANUFACTURERS

We deliver on time

Solar Panels are now the preferred solution to the world's energy crises. The Light-weight Steel Support Structures, offered by SSA is the most cost-effective sub frame for Solar Ground Mount installations. The structures are offered in a Pre-Punched Kit form, or fully installed by our teams.

All our structures are Engineer approved.

Our core values.

Solar Structures Africa is committed to customer satisfaction as we provide ourselves on quality, cutting edge solar panel support structures. We have a team of dedicated and knowledgeable staff to assist in finding the best steel solution to suit your requirements.

- Professional service since 2008 [in the lightweight steel industry].
- The quality of our product used.
- Trustworthy work ethics.
- Speedy delivery on goods.

Our mission statement.

Our mission is to deliver sustainable, reliable, and cost-efficient solar structures to all our clients. Our lightweight steel frames are designed with state-of-the-art technology including the world's most advanced end-to-end cold form steel engineering design-and-manufacture software and roll forming machines, FRAMECAD.

FRAMECAD

DESIGN and MANUFACTURING

- **MANUFACTURING:**

- We use state-of-the-art technology, including the world's most advanced end-to-end cold form steel engineering design-and-build system, FRAMECAD, to design and manufacture our steel frames.

- This software allows us to create highly accurate and efficient designs that meet industry specifications.

- Panel alignment made easy with the correct sub-structures.

- All our designer have 10 plus years' experience in designing structures and roofs on the FRAMECAD software.

MATERIAL SPECIFICATIONS

Zinc-Aluminum-Magnesium (ZAM):

Corrosion Resistance

Superior corrosion resistance compared to hot-dip galvanized steel.
Adding **aluminum** increases the coating's resistance to high temperatures and oxidation, while **magnesium** improves its resistance to corrosion in harsh environments like coastal, industrial, and chemical settings. ZAM has **self-healing properties**—if the coating is damaged, the magnesium component reacts with moisture to help prevent further corrosion.

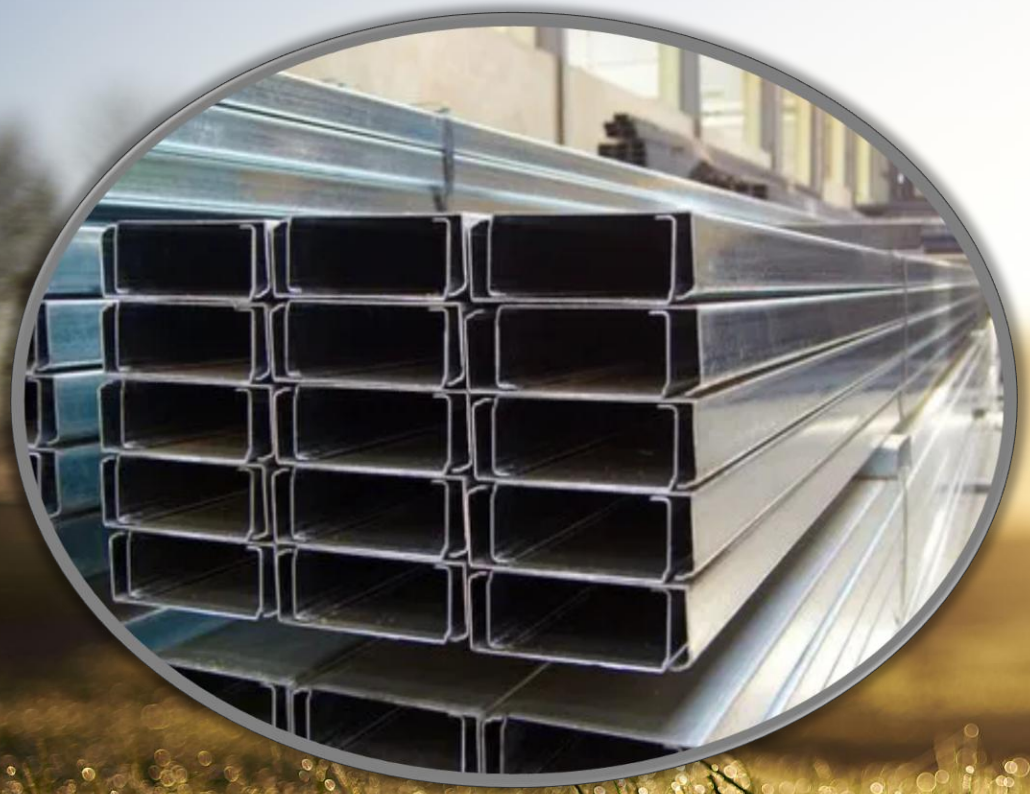
Durability and Longevity

Zinc-Aluminum-Magnesium (ZAM):
ZAM-coated products can last **2 to 4 times longer** than traditional galvanized steel in harsh environments (e.g., coastal areas, chemical plants, etc.). The coating's enhanced resistance to environmental factors contributes to a **longer service life**.

vs - Hot-Dip Galvanizing (HDG):
The lifespan of HDG products is **good** but generally shorter than ZAM, particularly in extreme conditions. HDG can last for many years in less corrosive environments (e.g., mild climates), but its protection may degrade faster in severe environments.

Durability and Longevity **2-4 times longer than HDG** (Hot-Dip Galvanizing) **in extreme environments**

MATERIAL SPECIFICATIONS



ZAM 150 G550 – Light Weight Steel

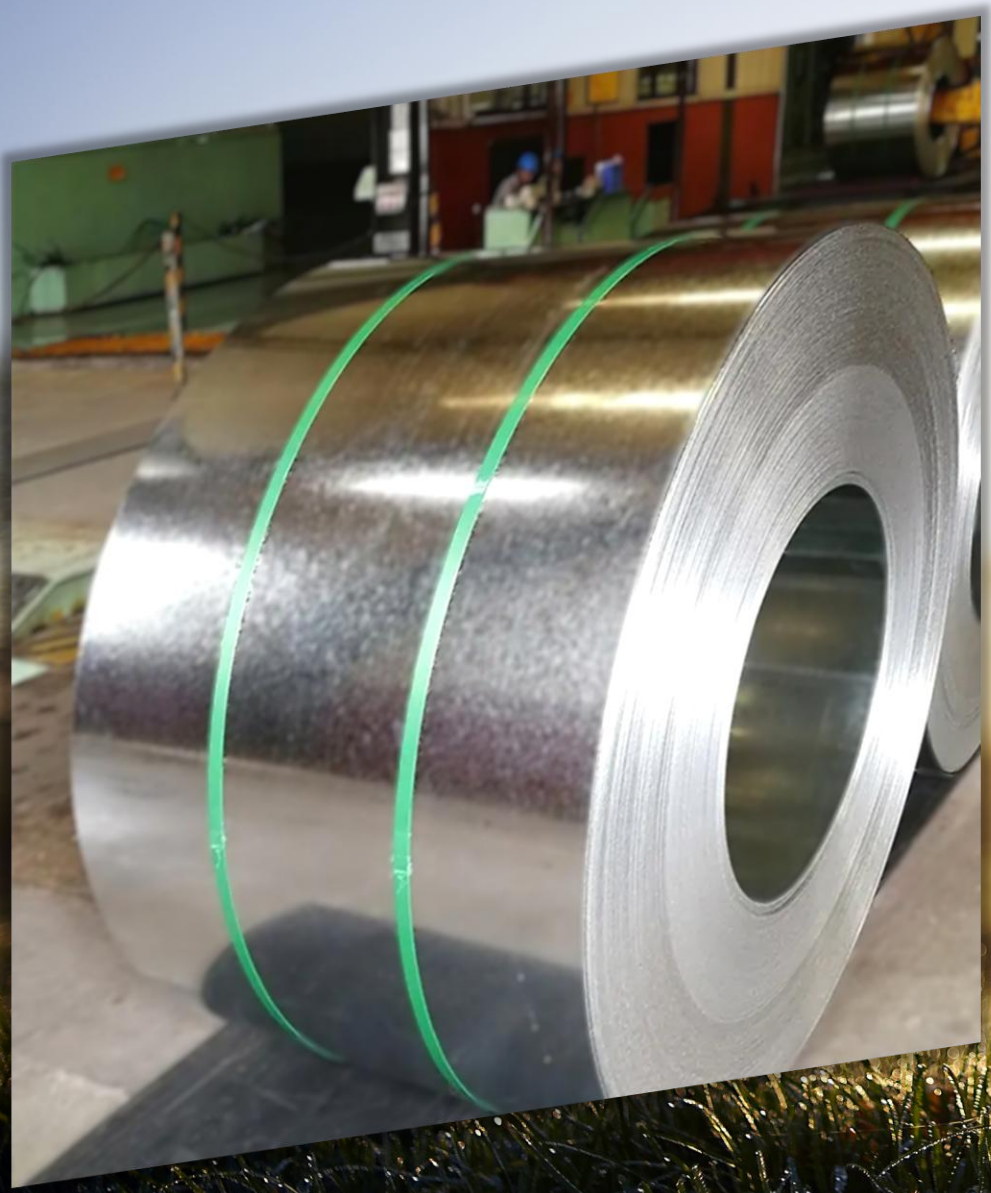
Superior Corrosion Resistance:

Research from sources like Sheffield Metals indicates galvalume's corrosion resistance is 2-4 times better than galvanized steel, thanks to the aluminum-zinc alloy, which forms a protective barrier against rust and environmental degradation. This is particularly evident in coastal or humid areas where galvanized steel may corrode faster.

Self-Healing Properties:

A unique advantage of ZAM150 is its ability to self-heal, where the magnesium zinc coating naturally slows or stops rust formation at cut or exposed edges. This is not a feature of galvanized steel, where once the coating is compromised, rust can spread, leading to structural integrity issues over time.

MATERIAL SPECIFICATIONS



BSi STEEL
Forging Partnerships

What is ZincalMag?

- The ZincalMag (ZAM) origins reach back to 2007, it is currently the fastest growing steel product group in the world.
- ZAM is the modern replacement for Pre-galvanized steel. Many mills are converting Galvanized and Aluzinc lines to ZAM lines due to the many benefits that the ZAM provides. These mills include Bluescope, Acelor Mittal Europe and many industry leading Chinese mills.
- Similar to Magnelis, ZAMs coating layer is made up of around 90% Zinc, 8% Aluminum and 2% Magnesium.
- The addition of Mg to the coating layer changes the micro-structure of the corrosion protection barrier, forming a Highly Stable layer

Benefits of ZAM?

- Significantly better corrosion resistance, up to 10x that of traditional galvanized steel.
- Improved bending performance (less likely to flake or peel).
- Improved self healing.
- Resistance to scratches.
- Less weld spatter.

How Available is ZAM?

- BSi Steel is stocking ZAM in the following thickness ranges: 0.90mm, 0.96mm, 1.16mm, 1.50mmn, 1.90mm and 2.0mm.
- Coating layers of ZAM120 and ZAM150 are available.
- BSi steel is offering lipped channel in both the traditional 250MPA steel as well as 450MPA high strength grades.
- Any grade and thickness of ZAM can be brought in on contract deals.

SALT SPRAY TEST 1200/2500h

Salt Spray Test

A **salt spray test** is a **corrosion resistance test** used to evaluate how well lightweight steel can withstand **harsh environments**, particularly exposure to **salt-laden moisture**. It is commonly used for **coated steels**, such as **galvanized, Aluzinc, and ZAM150**, to assess their durability.

Exposure Duration:

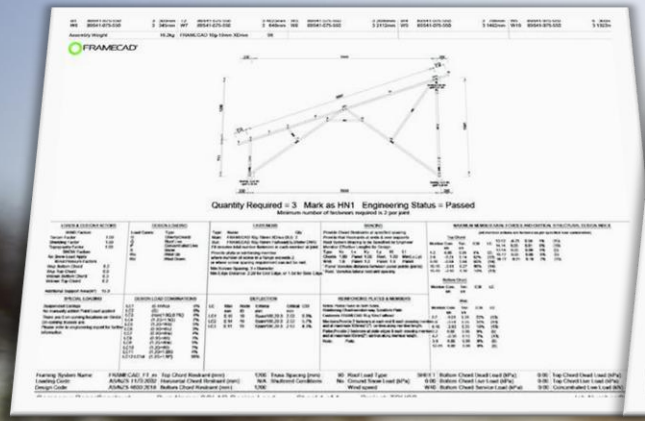
The test runs for **24 to 2500+ hours**, depending on the required durability assessment.

Salt Spray Test Performance

- **ZAM150** – **Superior resistance** to red rust, even after **2,500+ hours** of exposure. Its **self-healing properties** protect cut edges and bent sections.
- **AZ150 G550** – Performs well, but **red rust appears** earlier than ZAM150, especially on cut edges.
- **Z275 G550** – Shows **moderate resistance**, but red rust develops **faster** than AZ150 G550.

- **Standard Galvanizing** – **Least resistant**, with **visible red rust** forming **early in the test**.

ENGINEERED TO PERFECTION


FRAMECAD

Quantity Required = 3 Mark as HN1 Engineering Status = Passed

Minimum number of fasteners required in 2 per joint


	ZONE 5:	ZONE 4:	ZONE 3:	ZONE 2:	ZONE 1:
	Low cost residential buildings in cities, towns, peri-urban and rural areas Atmosphere is generally clean, hardly any acid rain from SO2/NOx – Includes most of Africa	Smaller commercial and mid-range residential buildings in medium Cities and Towns Inland conditions	Large commercial and industrial buildings and up-per end Residential buildings in me-dium Cities Mild Marine condi-tions – the coastal area 5 – kms from the sea.	Large commercial and industrial buildings in large cities. Moderate Industrial zones Marine zones less than 5 km from sea	Large Commercial and Industrial buildings in Mega Cities eg Shanghai. (None in Africa) Severe industrial zones, high pollu-tion, acid rain Severe marine zones less than 1 km from the sea, ie high rate of salt deposition Supplied on customer specification
AZ 100					
AZ 150					
AZ 200					

DESIGN CRITERIA

3.1. Structural Materials and Strength

The following represents the typical structural materials and strengths that will be used.

3.1.1. Light Weight Steel C Sections (Annex 3 – 5)

Lipped C Section: S8995 G550 Z200 – See attached Spec Sheet **MFT 89mm section Unboxed**

3.1.2. Wafer Tek Screw (Annex 6 – 9)

#10-16x22mm Zap Wafer Head Self-Drilling Screw Class 2 and 3 – **See attached Annex 6 & 7** (#10-16X22mm Zap Wafer Head Self-Drilling Class 2 and 3 data sheet.)

#12-14x20mm Zap Hex head Self-Drilling Screw Class 2 and 3 – **see Attached Annex 8 & 9** (#12-14x20 Zap Hex head Self-Drilling Screw Class 2 and 3 data sheet.)

3.3. Loading Data

The design loads were selected in accordance with the provisions of SANS 10160. The loads that were used for designing the various structural elements of the building are as follows:-

3.3.1. Load: PANEL HN1

The loading is shown on drawing attached **(Annex 1 & 2)**

Self-weight:	= The program incorporates the self-weight in real time at 1.17Kg/m of C Section member
Top Chord Dead Load	= 0.15kN/m
Bottom Chord Dead Load	= 0.00kN/m
Top Chord Live Load	= 0.25kN/m
Bottom Chord Live Load	= 0.00kN/m
Wind	= 40m/s

*Although live loads have been applied, the structure is not accessible and therefore Live Loads could be negligible

3.3.1. Load: Concrete Plinth

oading determined from factored reactions from frame structure HN1**(Annex 1 & 2)**

ximum uplift Load – 1.09KN

ximum Bearing Load – 2.22KN

4.1. Light Weight Steel Structure

4.1.1. HN1

Attached on drawing analysis and results

14 Load cases analysed

Worse case LC12-LC14 passing at 95% capacity

Reactions

Maximum uplift Load – 1.09KN

Maximum Bearing Load – 2.22KN

4.2. Concrete Plinth

Plinth Dimensions

300 mm Diameter

1100 mm Height – 850 mm below ground and 250 above ground

15 MPa Mass Concrete

Volume of concrete

$V = \pi r^2 h$

$= \pi \times 0.15^2 \times 1.1$

$= 0.0778 m^3$

Density of Concrete

2300Kg/m³

Mass of Plinth

$= 0.0778 m^3 \times 2300 Kg/m^3$

$= 178.94 Kg$

1Kg = 0.00980665 KN

$= 178.94 Kg \times 0.00980665$

$= \underline{1.754 KN}$ Load exerted downwards by plinth

Maximum uplift = 1.09KN therefore 1.753KN plinth load is adequate

Bearing Area

$A = \pi r^2$

$= \pi \times 0.15^2$

$= 0.070686 m^2$

Maximum Bearing load from structure

2.22KN

Total Bearing including plinth

$= 2.22 KN + 1.753 KN$

$= 3.973 KN$

Bearing Force

$= 3.973 KN / 0.070686 m^2$

$= \underline{56.2KPa}$

Ground Bearing Capacity must not be less than **100KPa**

oundation indicator tests to be carried out on the different sites prior to construction to etermine the bearing capacity of the different soil. If the bearing capacity is determined to be ess than 100KPa, Engineer to be consulted to advise on rectification.

4.3. Connections

Light weight Steel Structure to concrete Plinth

3 mm Footplate (as per detail attached– **Annex 10**)

2 x 12mm Threaded Rod chemical anchored in Concrete Plinth - 250mm embedment with 2mm thick washer 36mm diameter washer and nuts.

12 off #12-14x20mm Zap Hex head Self-Drilling Screw – 6 off in each plane

Boxing of C Section – used as Purlin

Boxing to be screw together with #10-16x22mm Zap Wafer Head Self-Drilling Screw every 300mm on both sides where the sides overlaps

Boxed C Section Purlins to Light weight Steel Structure

1.2mm Triple Grip Bracket (as per detail attached– **Annex 11**) – Two per connection (one oneach side)

12 off #10-16x22mm Zap Wafer Head Self-Drilling Screw – minimum 4 off in each plane

Slotted Panel bracket to Boxed Purlin

2mm Solar Panel Bracket (as per detail attached – **Annex 12**)

5 off #10-16x22mm Zap Wafer Head Self-Drilling Screw – fixed to the purlin

p-hat Bracing to Light weight Steel Structure (Annex 13)

4 off #10-16x22mm Zap Wafer Head Self-Drilling Screw per connection

Annex 3

Table 1: Mechanical properties specifications of the steel substrate

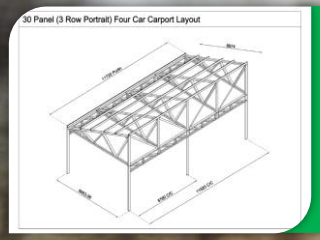
CLASS	DESCRIPTION	Thickness range (mm)		Mechanical Properties[1]			RELATED SPECIFICATIONS – STEEL SUBSTRATE[2]				
			AMSA	YS[3] MPa (min)	UTS[4] MPa (min)	%El[5] (min)	SANS	ASTM A653	EN 10346	JIS G3302	SAE /ASE
Commercial	For applications requiring strength combined with workability needed for moderate bending and -forming i.e. Roofing, Cladding, Roll forming and General purposes.	0.3 - 3.0	ISQ230	230[7]	270-500[7]	18≥0.5[7] 20≥0.7 22≥0.7	4998: Gr220	Gr230 CS type A	DX51D	SGCC	1006
		0.25 - 2.0	ISQ300	275≤0.6 300>0.6	-	16	4998: Gr260	Gr275	-	-	1012
		0.18 - 0.4	ISQ550	550[9,12]	570[9,12]	-	4998: Gr550	Gr550[9]	-	SGCH	1012
		0.47 - 0.8	ISQ550 (3T)	550[9,12]	570[9,12]	-	-	-	-	-	-
Forming[6]	Suitable for severe bending, lock forming and moderate drawing operations i.e. Roof Tiles	0.4 - 1.6	LFQ/ RTQ	140-300[8]	270-420[8]	22≥0.5[8] 24≤0.7 26>0.7	3575: 62/03	FS Type A	DX52D	-	-
Structural[10,11]	Suitable for load-bearing applications where specific mechanical properties are required for strength i.e. components for buildings. In general increasing yield strength levels have a corresponding decrease in ductility or formability.	0.4 - 3.0	-	220	300	20	4998: Gr220	Gr230	S220GD	-	-
		0.4 - 3.0	-	250	330	19	4998: Gr255	Gr255	S250GD	-	-
		0.5 - 3.0	-	280	360	18	4998: Gr280	Gr275	S280GD	-	-
		0.7 - 3.0[13]	-	350	420	16	4998: Gr350	Gr340	S350GD	-	-
		0.3 - 1.2	-	550	560	-	4998: Gr550	Gr550[9]	S550GD[14]	-	-
		1.6 - 3.0[13]	S450GD AMSA[14]	450	460	12	-	-	-	-	-

Coil mechanical properties will be specified on the associated test certificate.
For more detail consult the relevant specification.
YS=Yield strength, UTS= Tensile strength, %El= Elongation.
Chemical analysis only.
Expected value
For thickness ≤0.71 mm, no tensile test is required if the hardness is 85 Rockwell B or higher. The hardness will be 85 Rockwell B or higher.

9. According to the relevant EN10346 Specification.
10. Thicknesses larger than 2.00mm are available on enquiry only.
11. Restricted to certain width to thickness ratios.
12. Elongation +8 % for thickness ≥ 1.0 mm to conform to SANS 517 - Light Steel Frames.
13. 1 9x1225mm supplied as untrimmed.
14. AMSA = ArcelorMittal South Africa.

LINE ITEMS WE MANUFACTURE

✓ GROUND MOUNT SOLAR STRUCTURES



✓ CARPORT SOLAR STRUCTURES

✓ A-FRAME SOLAR STRUCTURES

✓ P2000 1mm UNISTRUTS SLOTTED & UN-SLOTTED

GROUND MOUNT
SOLAR STRUCTURES

DESIGN AND ENGINEERING

- All our Ground Mount Solar Structures are Engineer designed and approved.
- The FRAMECAD SOFTWARE will not create a rolling file if all the requirements is not met and passed.
- Various Design Codes used included – SANS 10162-2 and SANS 517
- Design Loads in accordance with SANS 10160
- We cast Plinths to eliminates soil / steel contamination that might occur.

Fast and Precise Manufacturing

SOLAR FARMS

2MW every **10 working days** – Structure Manufacturing Capacity

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SOLAR FARMS

ENGINEER APPROVED GROUND MOUNT SOLAR STRUCTURES

SOLAR FARMS

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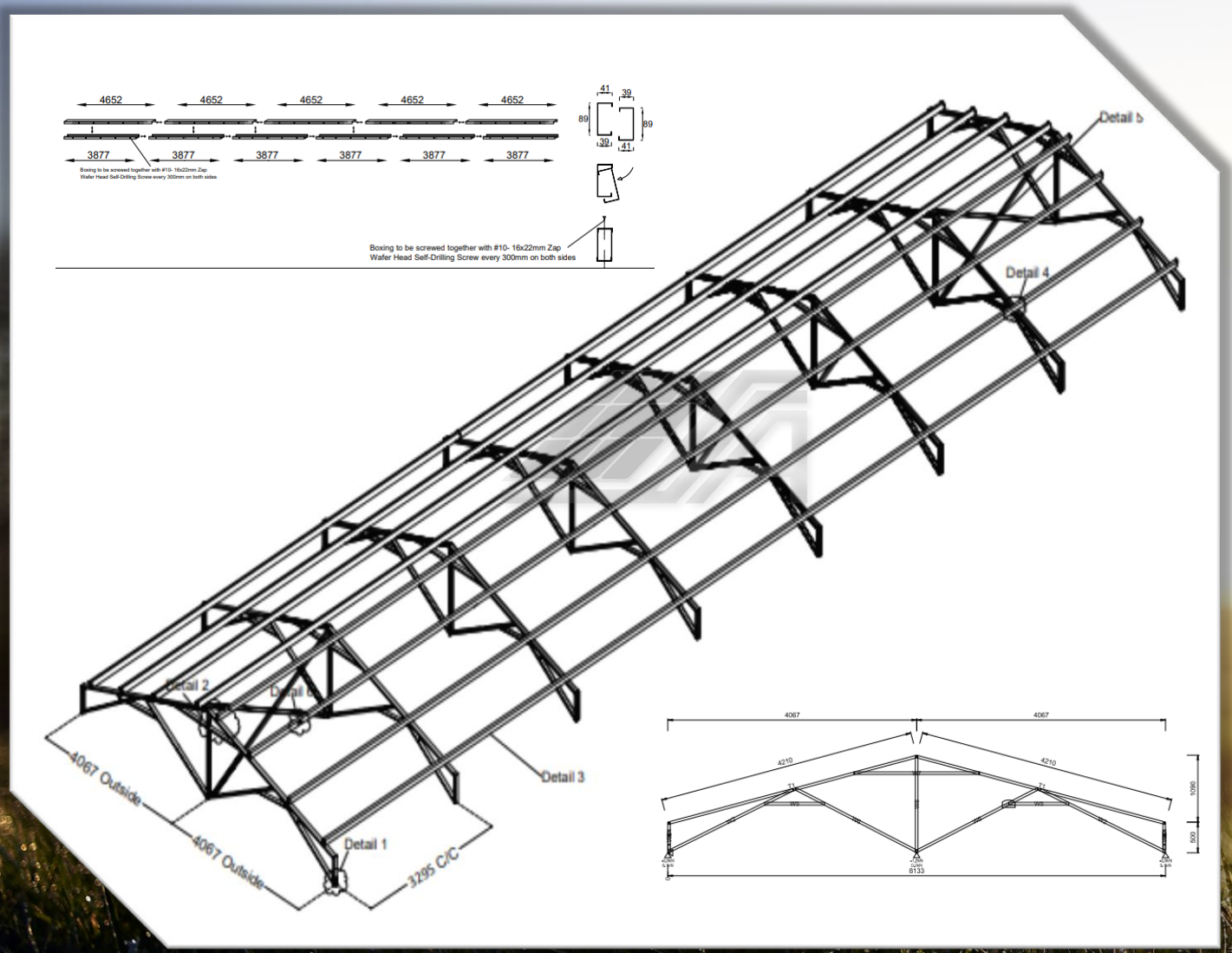
SOLAR FARMS

WE DELIVER ON TIME

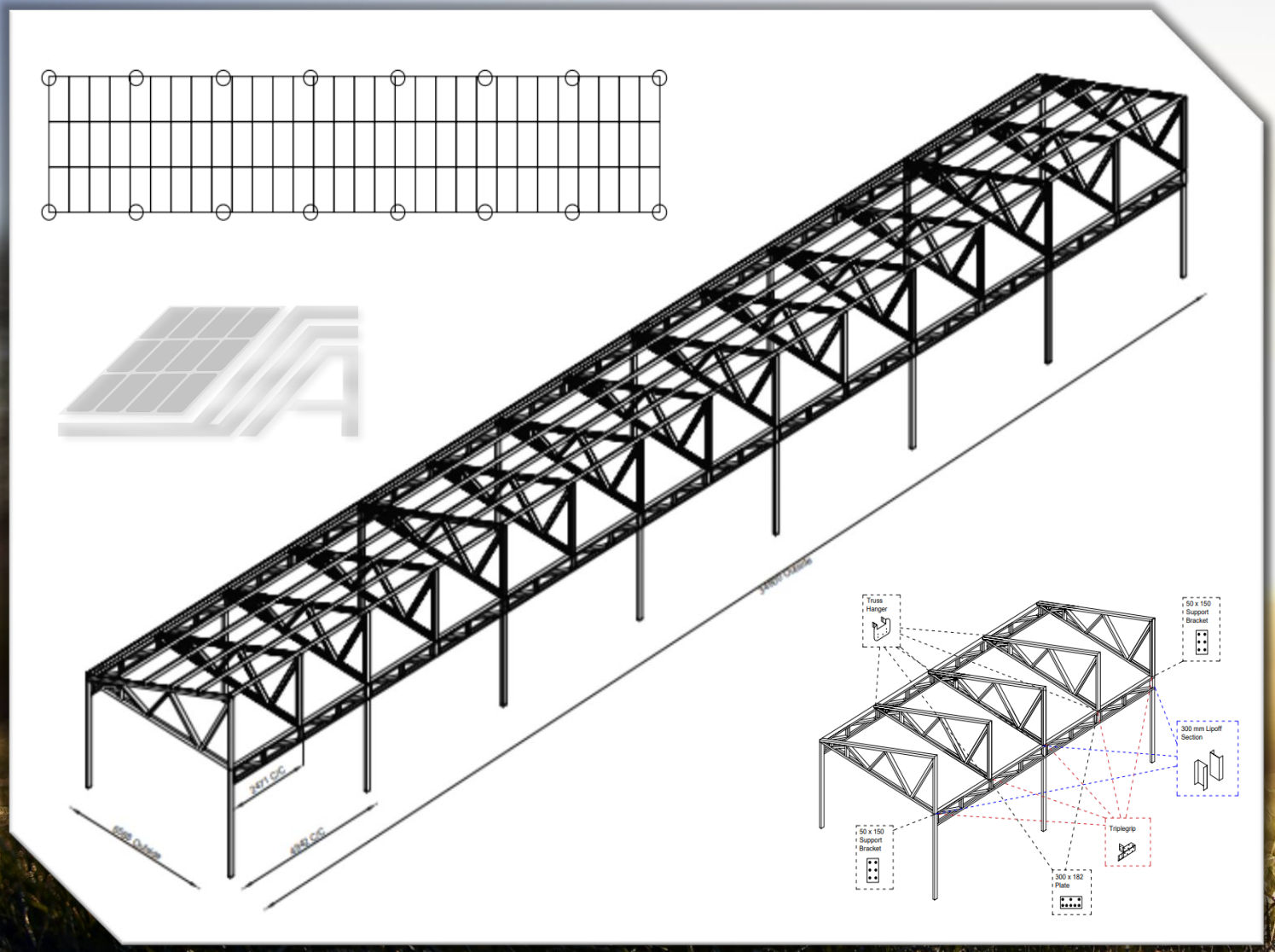
EAST / WEST GROUND MOUNT STRUCTURES



East/West Solar Ground mount structures.

Our East/West structure is designed to carry 4 strings portrait panels at 15 degrees angle.

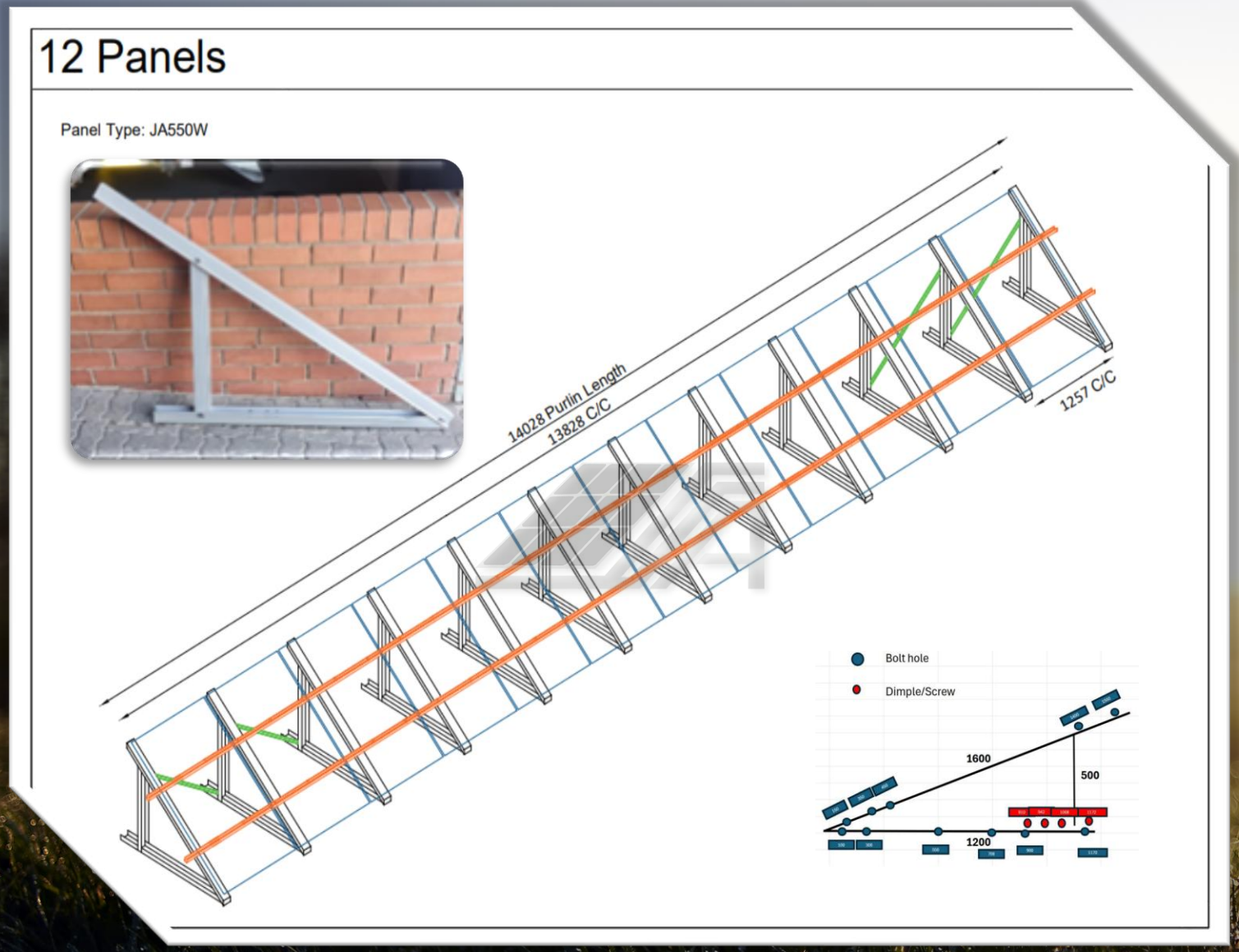
CARPORT STRUCTURES



We offer competitively priced carport structures made from durable ZAM150 G550 material and Mild steel posts.

Installation on carports above 50kwh.

A-FRAMES SLAB AND FLAT ROOFS



We offer competitively priced on the A-Frames [Delta Frames]

These frames are used when you must place your panels on a flat surface.

Light weight and very easy to assemble

CONTAINER ROOF TRUSSES

PROTECT YOUR CONTAINER

Light weight steel – Roof Trusses

LIGHT WEIGHT STEEL BUILDINGS & ROOF TRUSSES - SOME LWS PROJECTS






Light weight steel – Industrial, Commercial, Residential, Agricultural Buildings and Roofs

CONTACT DETAILS

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- Alberton, Gauteng
- South Africa

Call today to get your structure within 10 working days. We deliver and install Solar Ground Mounting
Structures nationwide.

Terms and Conditions apply.