



TIRUPATI FENCE
Strength Beyond Boundaries

MODULAR FENCING & RETAINING SOLUTIONS FOR NATIONAL BORDERS

358 WELDMESH AND GABIONS



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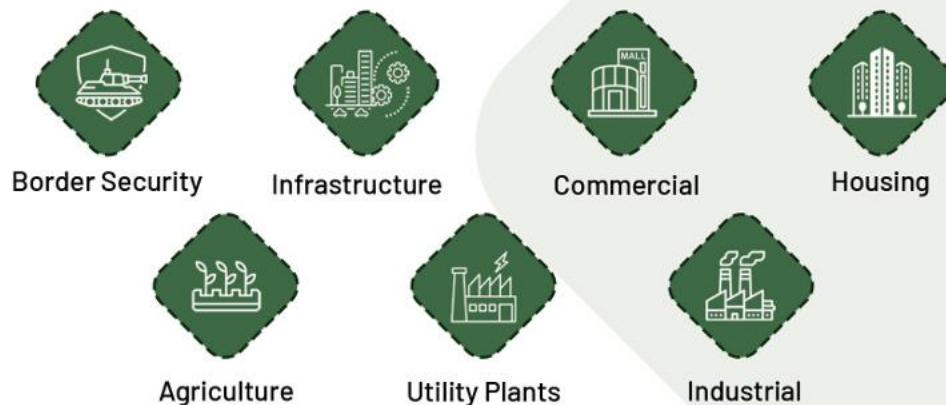
Who We Are

TIRUPATI FENCE : ENGINEERED FOR NATIONAL SECURITY

Tirupati Fence has been safeguarding India since 1987, combining innovation and manufacturing excellence from our Siliguri facility on the banks of the Mahananda River. Strategically positioned at the gateway to India's northeast and international borders, we offer ISO-certified fencing and galvanized/G.I. + PVC-coated products—backed by a commitment to quality, sustainability, and client-focused solutions.

With over three decades of industry presence, Tirupati Fence has established itself as a pioneer in fencing technology by maintaining high manufacturing standards, investing in automation, and developing border-specific solutions tailored to India's dynamic terrain and security demands. Our relentless pursuit of innovation, timely delivery, and client satisfaction positions us as a trusted partner for public infrastructure, paramilitary forces, defence projects, and urban planning initiatives.

Multi-Sector Reliability, One Trusted Partner:



Purpose-Built Solutions



What Sets Us Apart

- **35+ years of industry experience**, trusted by CPWD, BSF, Indian Railways, and private infrastructure giants.
- **Complete in-house manufacturing** with advanced machinery for weldmesh and gabion production, powder coating, and automated quality checks.
- **Government-recognized certifications** (ISO, BIS, QCI) that meet national and international security fencing norms.
- **Product innovation & design flexibility** to meet custom site requirements across topographies.
- **East India advantage** for fast dispatches to borders in West Bengal, Assam, Sikkim, Bhutan, Nepal, and Northeast India.
- **After-sales support & technical consultation** with a dedicated team for government and military

What Drives Us

At Tirupati Fence, we believe every boundary we build is a step toward a stronger, safer, and more resilient India. Our mission is to engineer fencing and retaining solutions that go beyond protection—solutions that uphold national security, support public infrastructure, and adapt to the terrain they serve.

Our vision is to lead with purpose, deliver with integrity, and continuously innovate systems that protect what matters most. But beyond our products, what truly sets us apart is our commitment to those we serve. We take pride in offering responsive customer support, on-ground consultation, and dependable after-sales service—ensuring every project is met with partnership, not just supply.

We are building trust, resilience, and lasting value.



TIRUPATI FENCE
Strength Beyond Boundaries



TIRUPATI RAKSHAQ (358 Modular Weldmesh Fence)

RAKSHAQ is a next-generation perimeter defense system, meticulously designed to meet the uncompromising demands of defense forces, border security, and critical infrastructure protection. Built around tightly spaced **358 weldmesh** panels reinforced with concertina and barbed wire toppings, it creates a seamless, impenetrable security wall. Its anti-climb, anti-cut, and tamper-resistant engineering ensures maximum deterrence against intrusion, making it the ultimate safeguard for sensitive zones in even the most challenging terrains.

What sets **RAKSHAQ** apart is its unmatched durability. Every panel is finished with dual-layer/thermoplastic powder coating, while the supporting posts and accessories are treated with advanced thermoplastic powder coating, providing superior resistance against rust, abrasion, and extreme weather. Combined with heavy-duty, security-grade fixtures, **RAKSHAQ** guarantees long-term performance with minimal maintenance—delivering unwavering reliability where security cannot be compromised.

Beyond strength and resilience, **RAKSHAQ** is engineered with ease of deployment and scalability in mind. Its modular design allows for swift installation across large stretches of terrain, while maintaining structural precision and consistency. Whether safeguarding international borders, defense corridors, industrial complexes, or critical utilities, **RAKSHAQ** adapts effortlessly, offering both high deterrence and seamless integration with surveillance systems, lighting, and other modern security technologies.

Designed for rapid deployment, extended lifecycle value, and precision-engineered strength, **RAKSHAQ** is more than just a fence—it is a comprehensive perimeter solution, reflecting Tirupati Fence's commitment to protecting national borders, strategic assets, and defense corridors with strength, resilience, and purpose.

Key Features



Anti-Cut Protection

Tightly spaced 76.20 mm X 12.70 mm prevents any tool entry.



Anti-Climb Design

No footholds or grip gaps—climbing becomes virtually impossible.



Long-Lasting

Galvanized steel and Powder coated ensures high corrosion resistance.



High Visibility

Designed to secure borders while keeping every angle in clear sight.

Why Modular Matters



The 358 Weldmesh system (**RAKSHAQ**) is designed for easy, on-site assembly—only the fence posts need grouting, with no welding or fabrication required afterward. 358 Weldmesh Panels are securely fixed to posts using fixtures like omega clamps and profile plates with anti-theft nut bolts, ensuring tamper resistance. For added security, Y-arms can be mounted on the posts to support concertina coils, razor wire, barbed wire, or electric fencing.

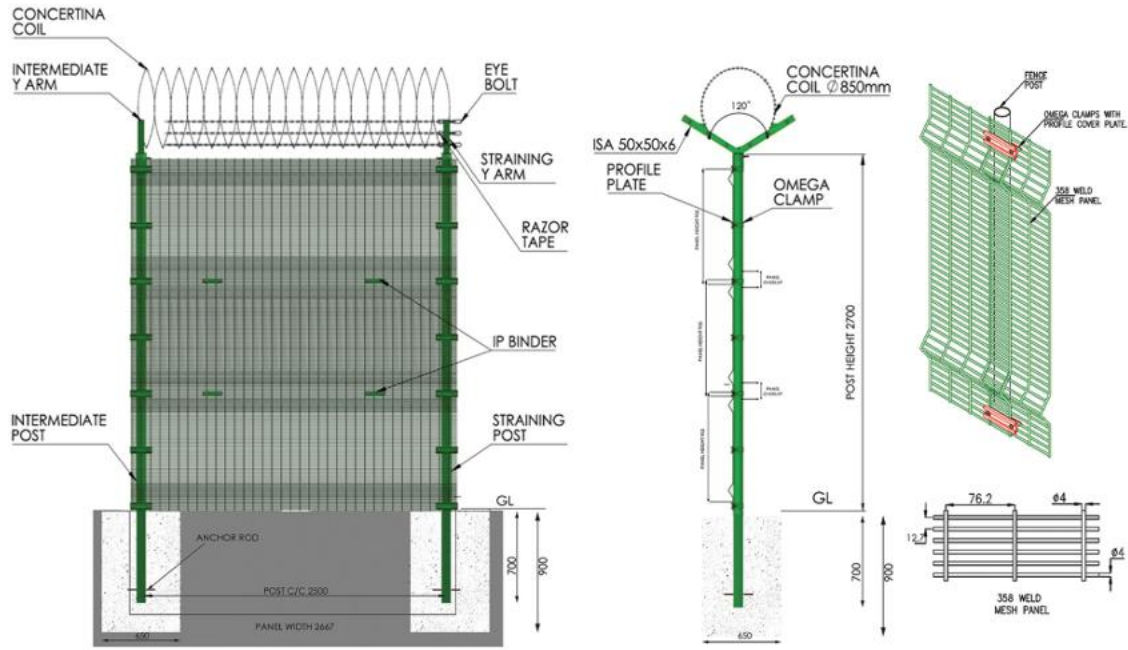
Its fast deployment, modular design, and robust anti-intrusion features make it especially suited for sensitive, high-threat zones like national borders, where reliability and deterrence are critical. This modular approach not only accelerates installation but also simplifies maintenance and scalability. Damaged panels or accessories can be replaced individually without dismantling the entire system, reducing downtime and costs. The result is a future-ready security solution that adapts to evolving perimeter requirements with efficiency and precision.

INTEGRATED DEFENSE CAPABILITY

RAKSHAQ goes beyond being a physical barrier—it is a complete perimeter defense system. The design seamlessly supports advanced integrations such as CCTV cameras, motion sensors, floodlighting, and electric fencing, creating a multi-layered shield against intrusion. By combining mechanical deterrence with smart monitoring technologies, **RAKSHAQ** ensures uncompromising protection for borders, defense zones, and high-value assets where security can never be compromised.

1. Weldmesh Panel
2. Fence Post
3. Omega Clamp (TPC)
4. Anti-theft Nut Bolt
5. Profile Plate
6. IP Binder

Technical Specifications of Tirupati Rakshaq



Crafted with precision and built to last, every element of the **RAKSHAQ** system adheres to the highest industry standards. Each detail reflects our commitment to quality, consistency, and superior performance in critical security environments.

Designed to combine strength with reliability, **RAKSHAQ** brings together advanced coatings, tamper-proof fixtures, and modular construction to ensure long-term resilience. Its adaptable design allows for fast deployment, easy upgrades, and seamless integration with additional security features, making it a trusted solution for borders, defense assets, and high-risk infrastructure.

Corrosion Protection Levels

Fixture	C3 Level – Medium	C4 Level – High	C5 Level – Very High
	Urban & light industrial	Coastal areas with moderate salinity	Offshore & high marine areas
Fence Post, Y-Arms & Accessories	Hot- dipped Galvanized	Galvanized + Thermoplastic Powder Coated (200 microns)	Galvanized + Thermoplastic Powder Coated (400 microns)
Weldmesh Panel	G.I + Single Powder Coated (60-80 microns)	G.I + Dual Powder Coated (140 microns)	G.I + Thermoplastic Coated (300 microns)
Concertina & Razor Wire	Hot- dipped Galvanized	Stainless Steel- 304 Grade	Stainless Steel- 316 Grade
Nut Bolt	Stainless Steel- 304 Grade	Stainless Steel- 304 Grade	Stainless Steel- 316 Grade

1. Weldmesh Panel

Weld Mesh Panel should be produced by electrical resistance welded galvanized wires and subsequently dual polyester powder coated.

It meets the standards of EN 10223-7 with the following key specifications:
(Note: At present, no Indian standards available for weld mesh panels for fencing applications)

Panel size: 2667 mm X 955 mm (WxH)

Tolerance of $\pm 2\%$

Mesh Size: 76.2 mm (± 3.0 mm) X 12.7 mm (± 2.0 mm) (WX H).

V-Shape- 2 nos. per panel of depth 38 ± 5 mm and width 105 ± 5 mm and 100 degree angle.

Overlap: 75 mm overlap in horizontal direction and 167 mm overlap in vertical directions.

Horizontal wire: Dia 4.0 mm (± 0.05 mm)

Vertical wire: Dia 4.0 mm (± 0.05 mm)

Wire grade & make - Grade 1 to 4 as per IS 7887 and BIS Certified

Galvanizing of wire: 60 GSM ± 5 GSM

Tensile Strength of wire: Minimum 550 N/sq.mm

Weight /Panel: 24.3 Kgs $\pm 5\%$

Qty /Km: 1200 Nos.

Weld Shear strength: The average weld shear strength of 4 welds taken at random not be less than 50 % of the breaking strength of the smallest wire (In this case the vertical wire)

Powder Coating: The panels are dual coated with a galvanized base of primer powder (60-80 microns) and polyester powder coated of RAL 6005 Green powder (60-80 microns). Total thickness not less than 120 microns.

Colour: RAL 6005

Other coating requirement: The OEM shall have a facility for Surface Preparation (Blast clean SA 2.5) and Surface treatment for degreasing and Hot Phosphating for better longevity of the coating

Certification: The OEM shall have a valid applicator certificate from M/s Jotun for Polyester Powder coating.

Weldmesh Panel Make: Tirupati Fence or equivalent (As approved)

2. Fence Post

Post for the fence meets the standards of IS 1161:2014 Medium Class for Chemical and Mechanical properties with the following key specifications:

Type: Circular Hollow section (CHS)

Galvanized Coating: Hot dip galvanized with minimum 360 GSM coating on both inside & outside

Outer Diameter: 76.1 mm

Length: 3400 mm (2700 mm above ground level and 700 mm under)

Colour: RAL 6005

Powder Coating: The Galvanized posts subsequently Thermoplastic Powder coated after fabrication with a thickness of minimum 200 Microns.

Other coating requirement: The OEM shall have a facility for Surface Preparation (Blast clean SA 2.5) and Surface treatment for degreasing and

Certification: The OEM shall have a valid applicator certificate from M/s Axalta India for Thermoplastic coating

Weight: 24.515 Kg (+/- 10 kg)

Hot Phosphating for better longevity of the coating.

Powder coating should withstand 1440 Hours of salt spray test.

Qty/Km: 401 Nos (assuming spacing @2.50m C/C)

3.Anchor Rod & Tie Wire

Anchor rods provide stability to the posts. Tie wires are used to fasten the rod securely, made from 2 mm GI wire for flexibility and corrosion resistance.

Anchor Rod:

Material of Construction: Galvanized

Diameter: 10mm

Length: 300mm

Tie Wire:

Material of Construction: Galvanized

Diameter: 1.6mm

Length: 600mm

Qty/Km: 802 Nos.

4.Omega Clamp with Profile Cover Plate

This is used to fix the mesh on the ples by using suitable fasteners. The profile cover plate and omega clamps should be manufactured in uniform manner which provides the necessary holding strength to complete system.

Material of Construction: Galvanised flat (Hot dip galvanized with minimum 350 gsm coating)

Powder Coating: The Galvanized Omega clamp & profile cover plate are subsequently thermoplastic Powder coated with a thickness of minimum 200 Microns.

Powder coating make & grade: Axalta Plascoat PPA 571 ES

Colour: RAL 6005

Omega Clamp:

Length: 180mm

Width: 35mm

Thickness: 3mm

Profile Plate:

Length: 180mm

Width: 50.2mm

Thickness: 2.75mm

Qty/Km: 2807 Nos.

5. Mushroom Head Bolts with Security Nuts and Washers for fixing omega clamp



Each clamp shall be supplied with two sets mushroom headed, square necked bolts with security nuts and washers.

Material: SS 304

Weight of bolt & Nut with washer: 0.6 Kg +/- 8 %

Tensile Strength : Shall be Min 700 N/sq.mm

Qty/ Km: 5614 nos.

Size: M8 X 60 mm as per IS 8535-19 87

Washer specifications: Material: SS 304,
OD-15.89 mm. ID- 8.38, thickness : 2.04 mm

6.IP Binder (Flat Clamps)



A flat clamp is used connect two overlapping panels.

Material: Flat as per IS 277

Colour : RL 6005

Size: 25 x 5, 160mm long, with 2-slots (9 x 20 mm)

Weight/ set: 0.2 Kg +/-10%

Powder Coating: The Galvanized binders are subsequently Thermoplastic Powder coated after fabrication with a thickness of minimum 250 microns thickness

Qty: Each set of IP binder is two plates and for each bay of the fence 4 set of IP binders are required ; 1600 Nos

7. Corner Clamp with Cody Clamp



These Clamps are used to fix the mesh on the poles by using Cody Clamp and suitable fasteners. We are assuming 10 corners each having a 90 degree turn and 10 corners each which are greater than or lesser than 90 degree turn.

Corner Clamp: MS flat 35mm width and 3mm thick

Cody Clamp: MS flat 32.5mm width and 2.8mm thick

Color: RAL 6005

Weight of each Corner Clamp: 0.35 kg +/- 10 %

Weight of each Cody Clamp: 0.05 kg +/- 10 %

8. Mushroom Head Bolts with Security Nuts and Washers for fixing IP binder



Material : SS 304 as per IS 8535-19 87

Weight: 0.025 Kg+/- 10%

Tensile Strength : Shall be Min 700 N/sq.mm

Qty/ Km: 3200 Nos.

Size: M8X35

Washer specifications: Material: SS 304,
OD-15.89 mm. ID- 8.38, thickness : 2.04 mm

9. Straining Y Arm



A Straining Y Arm: Straining Y-Arm for supporting top PTCC:

Type: Angle

Size: 50 x 50 x 6mm , Length of one Arm : 510 mm,

Material: MS angle as per IS 2062 Gr. E250, Welding to fabricate Y arm: 5 mm thick weld

Sleeve cap: Of MS plate, top plate of cap 76 mm dia and 5 mm thick which is welded to 3 mm thick 63 mm OD and 100 long pipe having two sets of 14 mm dia holes to fix the mushroom bolts.

Powder Coating: The Galvanized Y Arms are subsequently Thermoplastic Powder coated after fabrication with a thickness of minimum 200 Microns.

Colour: RAL 6005

One straining Y arm will be installed every 30 meters.

Weight/ Y arm: 5.11Kgs +/- 8%

Qty/ Km: 34 Nos.

10. Fitting accesosory for Straining Y arm



Mushroom Head Bolts with breakable head security nuts: Each Y arm shall be supplied with two sets mushroom headed bolts with security nuts and washers.

Size: M8 X 120 mm

Weight :
bolt, Nut and washer: 0.035 Kg+/- 8%

Material : SS 304

Qty/ KM: 68 Nos.

Tensile Strength: Shall be Min 700 N/sq.mm

11. Eye Bolt for Straining Y arm



Each Y arm shall be supplied with 6 sets of Eye bolts with security nuts & washers.

Material: SS 304

Size: M8 X 100 mm

Weight : Eye bolt, Nut and washer: 0.1 Kg +/- 10%;

Qty/ KM: 204 Nos.

12. Intermediate Y arm



Intermediate Y Arm: Intermediate Y-Arm for supporting top PTCC:

Type: Angle

Size: 50 x 50 x 6mm , Length of 1 Arm: 510 mm

Material: MS, Welding to fabricate Y arm: 5 mm thick weld of size

Sleeve cap : Of 2 mm thick MS plate, 83 mm OD, 79 mm ID and 45 long pipe having two sets of 12 mm dia holes to fix the mushroom bolts.

Powder Coating: The Galvanized Y Arms are subsequently Thermoplastic Powder coated after fabrication with a thickness of minimum 200 Microns.

Colour: RAL 6005

1 intermediate Y arm will be installed at every post except the posts with Straining Y arms.

Weight / Y arm: 5 Kgs +/- 8%

Qty/ KM: 367 Nos.

13. Fitting accessory for Intermediate Y arm



Mushroom Head Bolts with breakable head security nuts: Each Y arm shall be supplied with two sets mushroom headed bolts with security nuts and washers.

Material : SS 304

Size: M8 X 120 mm

Weight :
bolt, Nut and washer: 0.035 Kg +/- 8%

Qty/ KM: 732 Nos.

Tensile Strength: Shall be Min 700 N/sq.mm

14. Concertina Coil

SS 304: 850 mm diameter/56 Loops/3.Smm
Core wire
Coil Diameter: 850mm +/- 50 mm

Steel Tape: Material SS 304 as per IS 6911

Blade Thickness: 0.45 mm +/- 0.02 mm

Tensile Strength of Blade: Min 600 N/sq mm

Core wire: Material SS 304 as per IS 6528

Core Wire Diameter: 3.5 MM +/- 0.05 mm

Tensile Strength of wire: 1400-1500 N/sq.mm

Blade Length: 30 mm

Blade Profile: Tear Blade (TBBT)

Centre to Centre Distance Between blades:
50mm

Type of Clip: SS 304

Number of loops/ coil: 56 Nos.

Weight per coil: 20.01 Kg(+/- 5%).

Qty/KM: 100 coil (Stretchable length of coil:
10mtr)



15. Razor Tape

Steel Tape: Material SS 304 as per IS 6911

Thickness: 0.45 mm +/- 0.02 mm

Tensile strength of Blade: Min 600 N/sq mm

Core wire Material: SS 304 as per IS 6528

Core Wire Diameter: 3.5 MM +/- 0.05 mm

Tensile Strength of wire: 1400-1500 N/sq.mm

Blade Length: 30 mm

Blade Profile: Tear Blade (TBBT)

Centre to Centre Distance Between blades:
50mm

Type of Clip: SS 304

Qty /Km: 60 Coils (Roll length- 100m)



16. Hog Ring

Hog rings are used to secure the concertina coil to the razor wire and also to secure consecutive concertina coils. (The hog ring pilers need to be procured separately and is included in the tools list)

Material: SS 304/ SS 304Cu

Hog Ring wire Dia: 3mm +/- 0.05mm

Weight: 0.005 kg +/-8%

Qty/Km: 8000 Nos.

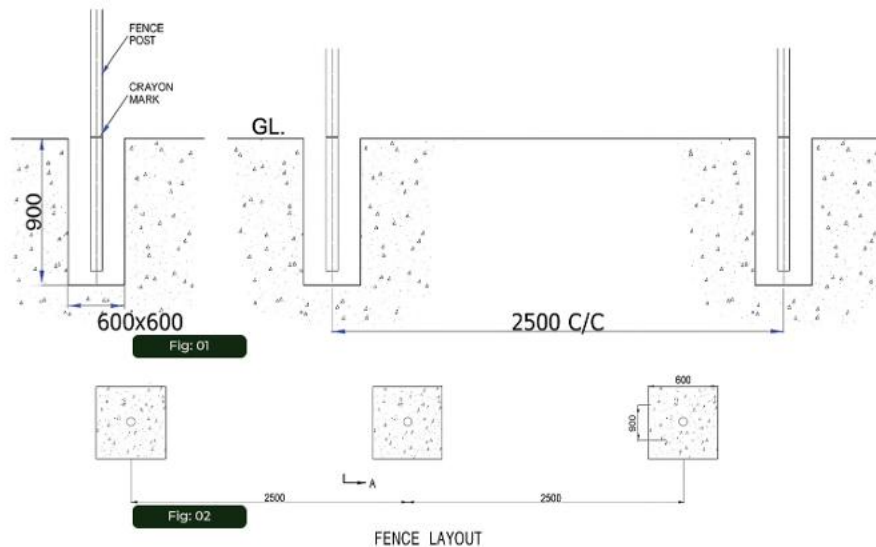


Installation Guide

STEP 1: FORMATION OF PIT

The pit should be formed at every distance of 2500mm with depth of 900mm and width of 600x600 mm (As shown in figure 01 & figure 02).

The construction material required shall be sand, cement and crushed stone filling the said dimension.



STEP 2: FENCE POST ASSEMBLY

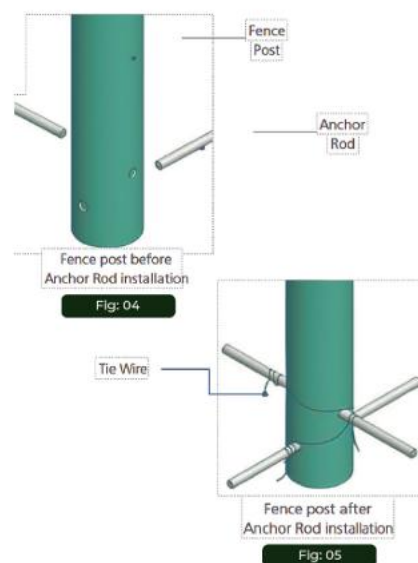
Step 2.1: Fitting anchor rod with fence post:

Before grouting fence post, each fence post to be assembled with anchor rod using tie wire and Y arm on the other end.

The Anchor Rod is fitted with Fence Post along using Tie Wire.

The purpose is to keep the Anchor Rod intact with the Fence Post, it restricts the Fence Post to be pulled back.

Installed as shown in Figure no. 4 & 5.



Step 2.2: Fitting of Straining Y arm on Top of Fence Post

Straining Y arm and Intermediate Y arm is assembled with Fence post using two perpendicular M8x120 Security Nut Bolt (As shown in Fig. 06).

Straining Y arm is of Thick metal plate compared to Intermediate Y arm.

Note:

Straining Y arm is placed at every 30 Meters of distance. Thereby it is been advised to repeat Installation in set of 30 Meters.

Fixing of Straining Y arm:

Straining Y arm have OD of 63mm, it is inserted inside the Fence Post.

Fix the Y arm using M8x120 Security Nut and Bolt as illustrated in Fig 07.

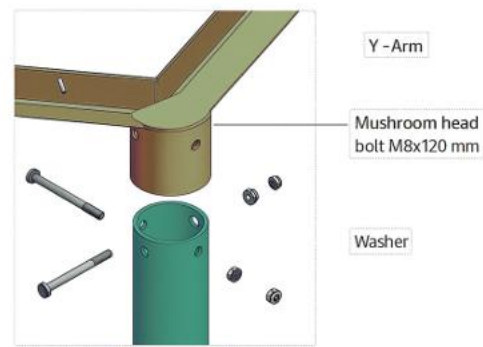
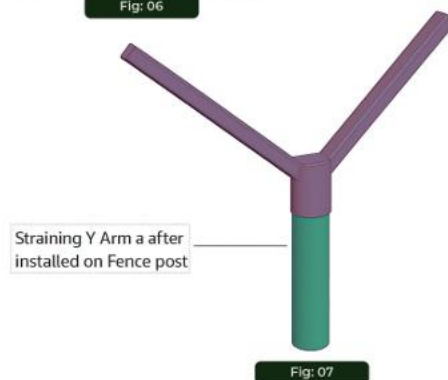


Fig: 06



Step 2.3: Fixing of intermediate arm

Intermediate Y arm has ID of 79mm for it to cover the Fence Post.

Fix the Y arm using M8x120 Security Nut and Bolt as illustrated in Fig 08.

Fixing Flat Bar to Intermediate Y arm:

Flat Bar is to be placed in between two arms. Assemble Flat Bar using M8x25 Security Nut Bolt as shown in Fig. 08.1 and Fig. 08.2

Once the Flat Bar is placed and assembled properly. Break the Security Bolt.



Fig: 08

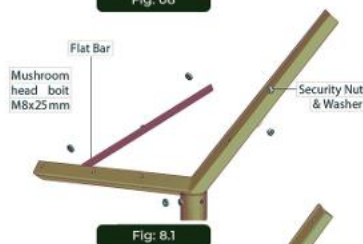


Fig: 8.1



Fig: 8.2

STEP 3: FENCE POST GROUTING

Intermediate & Straining

Insert post inside the pit (0.7 meter of post should remain Inside the ground). Refer Fig 9.
For convenience mark each pole with Ground Level marking either with chalk or crayon. After placing Post inside the pit ensuring the ground level marking start filling the concrete mixture of Grade M20 or M25.

Keep level marker and ensure the erected Post is vertical. Allow the foundation to be dry, it may take more than 24 hours depending on the climatic condition.

While installation the fence post care should be taken of installing fence post with Straining Y arm at every 30 Meters & Intermediate Post will be at every 2.5 meter.

By Fig 10, the Fence post are ready for assembly such as weldmesh panel or concertina coil.

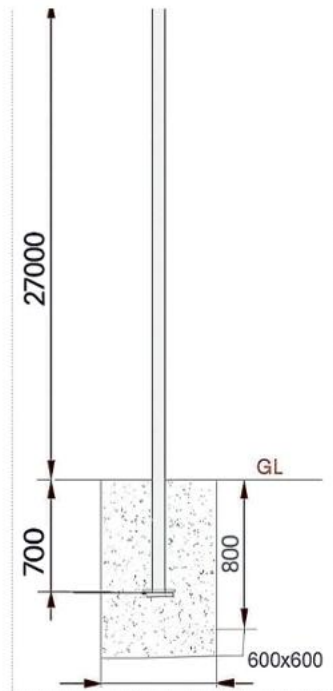


Fig: 09

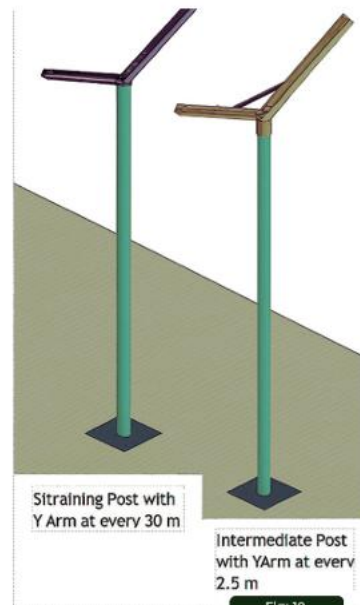
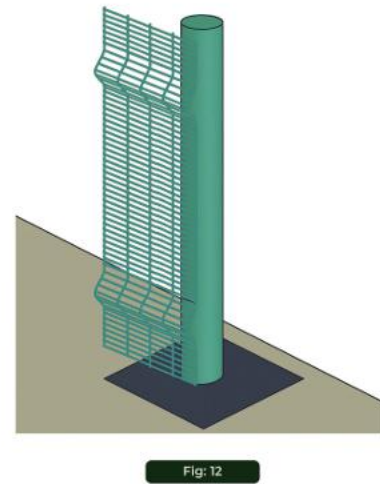
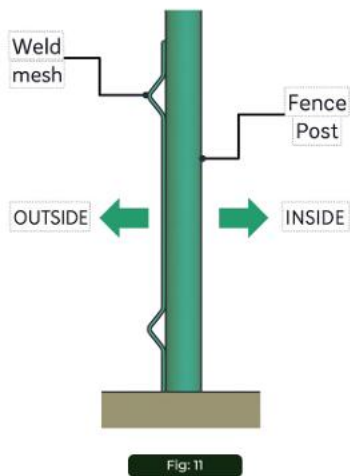


Fig: 10

STEP 4: INSTALLATION OF WELDMESH PANEL

Once the Fence Post is grouted with foundation and well dried, start with Weldmesh installation over the Fence Post.

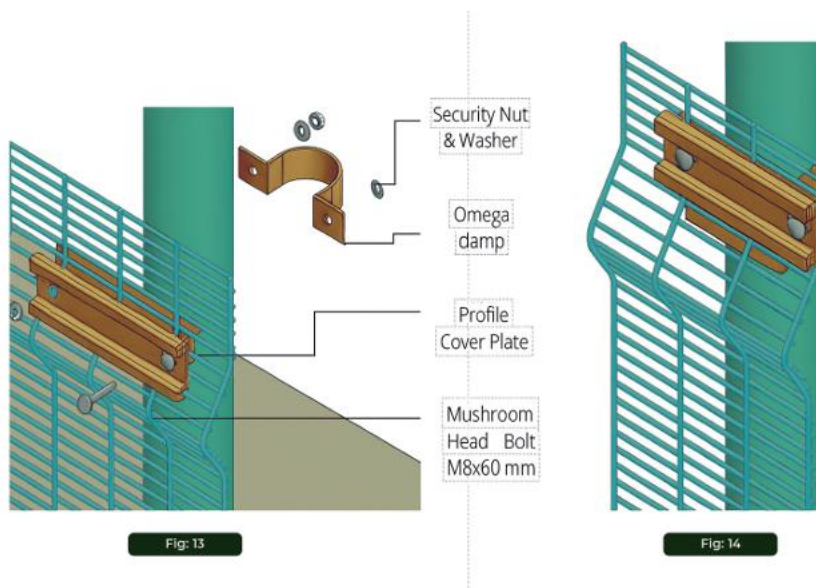
Initiate the installation of Weldmesh Panel by fixing the lowest panel first, keeping the V Bend towards the outer side/ enemy side and the Fence Post should be on the inner side as shown in Figure no. 11 & Figure no. 12.



Fix the Panel using Omega Clamp and Profile Cover Plate using Mushroom Head Nut and Security Bolt M8x50mm as shown in Figure no. 13.

The RIM of Security Bolt to be broken only when appropriate installation process is done.

Note: The Mushroom Head of Nut should be within the Profile Cover plate, as it minimizes risk to remove the Bolt by any means. Refer Fig. 14.



STEP 5: WELDMESH OVERLAP

NOTE: We need to use 4 Omega Clamps for each panel & Corner Clamps at the corner. We need to repeat the weldmesh panel installation procedure for each panel in the system.

Take Weldmesh Panel and start assembling from bottom i.e. ground level.

Initially fix only bottom Omega Clamps on both Post.

Overlap Ground Panel with Mid Panel by 80mm, support the overlap by Placing Omega Clamp with profile cover plate. Similarly Overlap Mid Panel with Top Panel. Refer Figure no. 15

Repeat steps of Installation of above two panels i.e. Centre Panel and Top Panel. In Total 7 Omega Clamps with Profile plate to be fixed per Pole. Refer Figure no. 17 & 18.

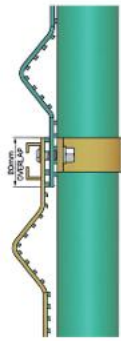


Fig: 15

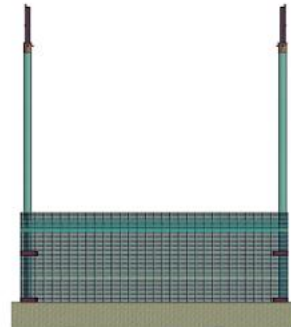
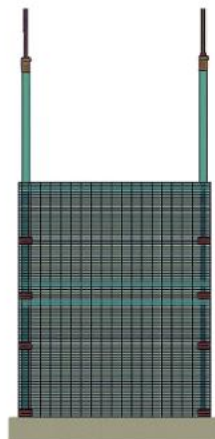


Fig: 16



Weld mesh Panel
(Centre)

Fig: 17



Weld mesh Panel
(top)

Fig: 18

STEP 6: INSTALLATION OF IP BINDER

NOTE: We need to use 2 IP Binders Clamps for each overlaps panel.

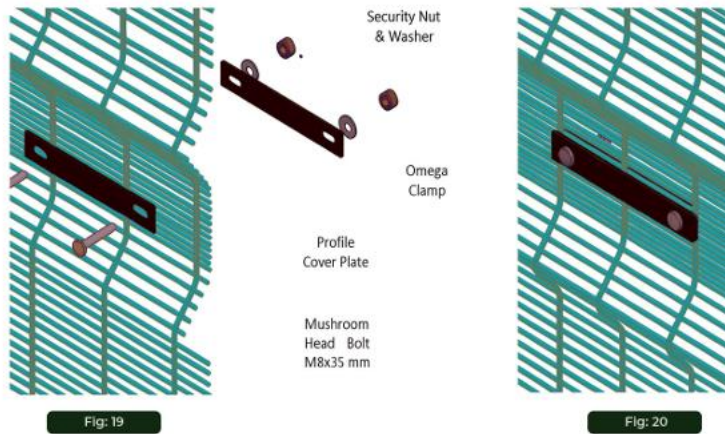
We need to repeat this installation procedure between each panel.

Place the outer edge IP Binder on Panel (Overlap ground panel with centre panel) at 525mm from Left/ Right post centre.

Start assembling from bottom overlap as shown in figure 19 & 20.

Similarly place other IP binder at same level at 525mm from other post center.

Repeat mentioned steps of installation of above two panels i.e. Centre Panel and Top Panel.



STEP 7: INSTALLATION OF R.B.T

Before stretching the R.B.T Wire, make sure Eye bolt is placed across Y arms.

Eye Bolt are only placed across Straining Y arm, as illustrated in Figure no. 22.

Across Straining Y arm:

Initiate the process of Stretching Razor wire across the Y arm.

Across Intermediate Y arm:

Make sure that all intermediate Y arm has R.B.T



wire placed in its respective slots.

Now Stretch the R.B.T Wire and fix it with the hook design of Intermediate Y arm.

Pull the R.B.T Wire with appropriate strain, also fix/ tighten the R.B.T Wire in the Eye Bolt Slot as shown in the Figure no. 23.

Avoid keeping the R.B.T wire line loose, as it may result in improper installation of concertina coil.

You may also use additional / optional tie fix to give additional support between Intermediate Y arm and R.B.T Wire. Refer Fig. 24.

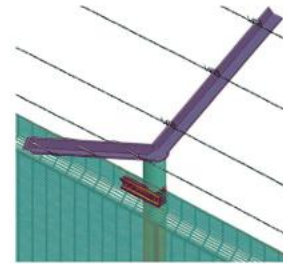


Fig: 23

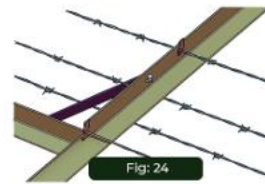


Fig: 24

STEP 7: INSTALLATION OF CONCERTINA COIL

Prior initiating installation of Concertina Coil and R.B.T Wire, appropriate safety tools should be used as the Coil Blades are very lethal.

Once all the six lines of R.B.T Wire are stretched over the Y arms, place the Concertina Coil of Diameter 850 mm and 56 loops per coil over the R.B.T Wire line as shown in the Fig. 25.

Care should be taken while stretching the Concertina Coil over Y arm as uniformity should be maintained. Single Coil could be stretched up to length of 8-10 Meters of Length.

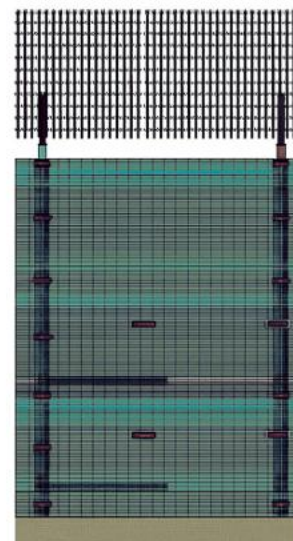
You may use tie wire to keep R.B.T Wire intact with Concertina Coil. Repeat the above-mentioned steps.



Fig: 25



Side View



Front View

Long-Life Protection Through Coating

All **RAKSHAQ** components are protected by industry-grade coatings crafted for exceptional durability and defense-grade resilience:

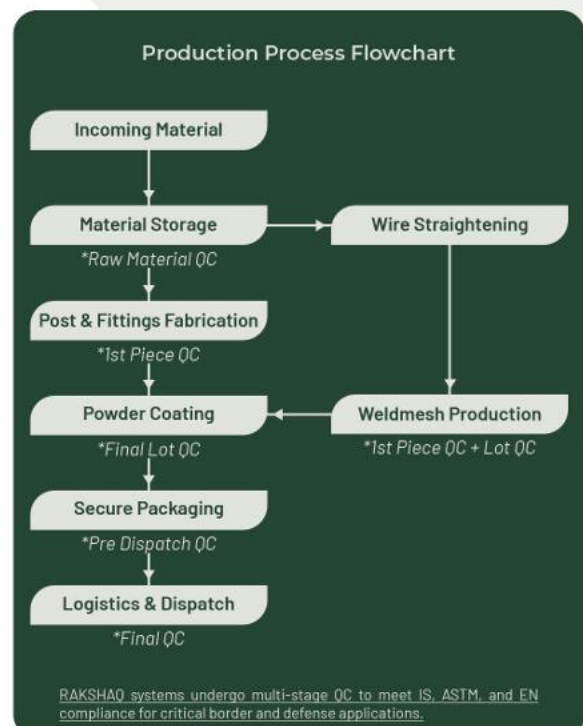
- Welded Mesh Panels are galvanized and then dual polyester powder-coated, totaling 140 µm minimum (average 150 µm)—incorporating a 60–80 µm primer plus 60–80 µm topcoat.
- Posts, Heavy-Duty Accessories, and Gates receive thermoplastic powder coating, at minimum 250 µm (average 300 µm) thickness.
- **Performance Tested:**
 - i. Polyester coating meets 1,000 hours of salt-spray resistance per EN 10245-1, IS 13871, and ASTM B117.
 - ii. Thermoplastic coating endures 1,440+ hours under the same standards.
- Uniformity & Adhesion follows IS 2629, and coating adhesion is tested per IS 6745 / IS 2629.
- For C4 environments, fixtures use dual polyester-coated panels with SS-304 hardware and concertina coils. In C5 environments, the system upgrades to thermoplastic coatings across all components, with SS-316 hardware.
- All coatings are tested and certified by third-party lab/NTH for accelerated salt-spray and QUV-B weathering, meeting C4 and C5 corrosion resistance standards for thermoset and thermoplastic finishes.

RAKSHAQ Production Process

The **RAKSHAQ** system is manufactured through a precision-controlled process, with every stage monitored to defense-grade standards. Production begins with incoming material inspection, followed by storage, wire straightening, and welding into 358 anti-climb panels, while posts, clamps, and Y-arms are fabricated in parallel. Quality checks at each step ensure accuracy and consistency.

All components then undergo advanced coating treatments—dual polyester for panels and thermoplastic for posts and accessories—validated through final lot inspections for thickness, adhesion, and corrosion resistance.

The process concludes with secure packaging protocols and a pre-dispatch inspection, ensuring only fully compliant systems leave the facility. This multi-stage quality assurance guarantees every **RAKSHAQ** installation delivers precision, durability, and long-term reliability in critical border and defense environments.



Quality Assurance Plan (QAP)

S/ No	Item Name	Characteristic (defect code)	Type of Check	Measuring Instrument	Testing Method	Acceptance Norms	Applicable Standard	Records PDI = Pre-dispatch Inspection RMTC = Raw Material MTC SMTc = Supplier MTC On-Site = On Site Inspection TPI = Third Party Inspection
1	2	3	4	5	6	7	8	9
1	Galvanized Wire	Thickness of Wire	Physical	Micrometer	IS-280	Thickness of the wire	IS-280	PDI, RMTC, SMTc, On-Site, TPI
		Mass of Zinc Coating	Chemical	Gravimetric Test Apparatus	IS -6745	As per purchase order /TDS/WO Mass of Zinc coating 40-50 GSM Note-Mass of Zinc coating Test shall be done as per Gravimetric Method only	IS -280	RTMC, SMTc, TPI
		Ultimate Tensile Strength	Physical	Tensile testing Machine	IS1608	As per purchase order / Technical Data Sheet/work Order Min 550 Mpa for Weldmesh panels Gauge length-200mm	IS -1608	RTMC, SMTc, TPI
		Adhesion of Zinc coating on wire	Physical	Mandrel	IS4826	When so wound or bent around the mandrel of same diameter, the zinc coating shall remain adherent to the steel wire and shall be considered as meeting the requirement if owing to such winding or bending it does not flake off, nor crack to such an extent that there is possibility of removing any zinc by rubbing with bare fingers, the use of finger nail being not allowed.	IS -4826	RTMC, TPI
2	Galvanized Circular Hollow Section	Flattening test (Tubes above 50mm NB)	Physical	Tensile testing Machine	IS2328	No cracks shall be occurred after flattening test.	IS 1161:2014	RTMC, TPI
		Mass of Zinc Coating	Physical	DFT Meter/Volumetric test method	ISO2808	As per purchase order /Specification sheet/work Order. The coating thickness as per IS4736 No single DFT test shall be less than 50 microns (for HDG) i.e. 360gsm) For conversion to DFT to GSM, factor of multiplication considered is 1 micron=7.2 GSM	IS4736 IS4711	RTMC, TPI
3	Angles for Y arms	Mechanical Property	Physical	Tensile testing Machine	IS1608	IS2062 Gr. E235	IS 2062 Gr. E235	RTMC, TPI
		Mass of Zinc Coating	Physical	DFT Meter/Volumetric test method	ISO2808	The coating thickness as per IS4736 No single DFT test shall be less than 50 microns (for HDG) i.e. 360gsm) For conversion to DFT to GSM, factor of multiplication considered is 1 micron=7.2 GSM	IS4759	RTMC, TPI
4	Welded Mesh Manufactured and finished panels	General Dimensions	Physical	Measuring Tape, Vernier Calipers	NA	Mesh Size, Panel Size, V-Bend	As per Tech Spec/Drg	PDI, RMTC, SMTc, On-Site, TPI
		Weld Strength in KN	Physical	Tensile testing Machine	EN10223-7	Breaking Load average of 4 tested sample should be greater than 50% of the breaking load of the minimum dia wire Note- the welds should not come off when tested for strength with spanner	As per Tech Spec/Drg	SMTc, TPI



S/ No	Item Name	Characteristic (defect code)	Type of Check	Measuring Instrument	Testing Method	Acceptance Norms	Applicable Standard	Records PDI = Pre-dispatch Inspection RTMC = Raw Material MTC SMTC = Supplier MTC On-Site = On Site Inspection TPI = Third Party Inspection
1	2	3	4	5	6	7	8	9
5	IP Binder	Mechanical Property	Physical	Tensile testing Machine	IS1608	As per IS 277 or IS 513 CRI grade "0" or IS 1079	As per Tech Spec/Drg	RTMC, TPI
		Mass of Zinc Coating(DFT)	Physical	DFT Meter/Volumetric test method	ISO2808	As per purchase order /Specification sheet/work Order	As per Tech Spec/Drg	RTMC, TPI
6	Omega Clamp with profile cover plate and Corner Cody Clamp	Mechanical Property	Physical	Tensile testing Machine	IS1608	As per IS 277 or IS 513 CRI grade "0" or as per IS1079	As per Tech Spec/Drg	RTMC, TPI
		Mass of Zinc Coating(DFT)	Physical	DFT Meter/Volumetric test method	ISO2808	As per purchase order /Specification sheet/work Order The coating thickness as per IS4736 No single DFT test shall be less than 50 microns (for HDG)(i.e. 360gsm) For conversion to DFT to GSM, factor of multiplication considered is 1 micron=7.2 GSM	IS4759	RTMC, TPI
7	GI Anchor Rod	Mechanical Property	Physical	DFT Meter	ISO 2808	As per purchase order /Specification sheet/work Order The coating thickness as per IS4736 No single DFT test shall be less than 50 microns (for HDG)(i.e. 360gsm) For conversion to DFT to GSM, factor of multiplication considered is 1 micron=7.2 GSM	IS 4826/IS 4759	SMTC, TPI
		Mechanical Property	Physical	Tensile testing Machine	IS 1608	IS 5986 Gr.235 or IS 10748 or IS2062 Gr.E250	IS 2062 Gr. E250A or IS 10748 or IS 5986 Gr 235	RTMC, TPI
8	SS Nut & Bolt	Mechanical Property	Physical	Tensile testing Machine	IS 1608 or ISO 3506-1	Tensile strength shall be min 700 Mpa	SS 304	RTMC, TPI
9	SS Core wire for Concertina Coil and Runner Rozor	Mechanical Property	Physical	Tensile testing Machine	IS 6528	Tensile strength shall be 1400-1700 Mpa	IS 6528	RTMC, SMTC, TPI
10	Dual Powder coating	Dry Film Thickness	Physical	DFT Meter	EN ISO 2808	Minimum 60 microns for Primer Minimum 60 microns for Polyester Powder Coating Minimum 120 microns for Dual Coating	Approved Spec	PDI, SMTC, On-Site, TPI
		Salt Spray Test	Physical	SST Apparatus	ISO 9227	With stand 1000 Hours of salt spray test	ISO 9227	TPI
		Resistance to deformation	Physical	Mandrel	EN ISO 1519	No cracking or delamination of the coating	EN10245-4	TPI
10	Thermoplastic powder coating	Dry Film Thickness	Physical	DFT Meter	EN ISO 2808	Minimum 250 microns	Approved Spec	PDI, SMTC, On-Site, TPI
		Salt Spray Test	Physical	SST Apparatus	ISO 9227	With stand 1440 Hours of salt spray test	ISO 9227	TPI

Through this comprehensive QAP, we reaffirm our commitment to delivering fencing solutions that are not only compliant with IS/ISO standards but also tested for long-term performance. Every product is meticulously checked to ensure strength, safety, and consistency—providing our clients with confidence and trust in every installation.



TIRUPATI GABIONS

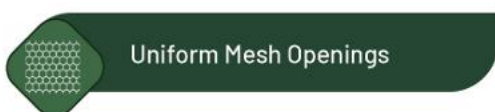
(Retaining Wall Solutions)

Gabions are robust, double-twisted hexagonal wire mesh units filled with stone, forming flexible, permeable, and durable structures. They are widely used in retaining walls, slope stabilization, erosion control, and border protection works, especially in challenging terrains.

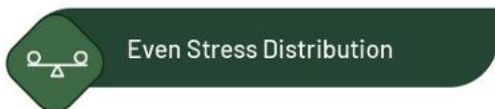
With options in galvanized, PVC, and Zn-Al alloy coated wires, gabions ensure long service life and adaptability even in harsh environments. Easy to assemble, modular in design, and environmentally compatible, they provide reliable reinforcement and protection for national borders, defense corridors, and critical infrastructure projects.

Their strength lies in simplicity—a proven engineering solution that combines natural stone with advanced mesh technology to create barriers that are both cost-effective and dependable across generations

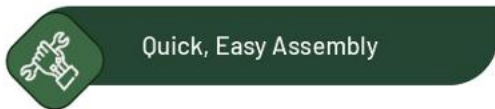
Key Features



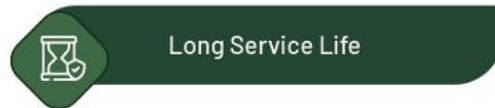
Uniform Mesh Openings



Even Stress Distribution



Quick, Easy Assembly



Long Service Life



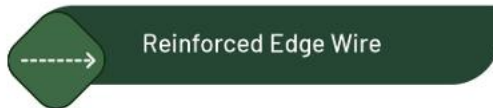
Adapts to Uneven Terrain



Non-Ravel Double Twist



Multiple Coating Options



Reinforced Edge Wire

Core Applications



Retaining Walls



Riverbank Protection



Slope Stabilization



Soil Erosion Control



Road & Rail Safety



Flood Protection



Coastal Defense



Border Works

Why Gabions Secure Borders

Gabions have proven to be a trusted first line of defense in national security projects. Their ability to form robust retaining walls and embankments makes them essential for stabilizing border roads, patrol tracks, and fencing lines in the most difficult terrains.

Engineered for mountain passes, river crossings, and flood-prone zones, gabions provide both structural strength and environmental resilience. They absorb shocks, control erosion, and secure vital access routes, ensuring that border infrastructure remains operational under extreme conditions.

With modular construction, rapid deployment, and minimal maintenance needs, gabions are a strategic choice for defense corridors, protecting not just the land they reinforce, but the security operations that depend on them.



Technical Specifications of Tirupati Gabions

Engineered to IS, ASTM, and EN standards, gabions deliver consistent performance under extreme conditions. Available in multiple mesh apertures and wire diameters, each unit is reinforced with selvedge wires for added rigidity. The result: structures that resist corrosion, absorb stresses, and endure in high-risk border zones.

Hexagonal Gabion unit is factory fabricated from one main panel which forms the front, base, rear and lid of the unit with additional panels connected to the base section of the main panel to form the diaphragm and end panels.

Wire Used for Manufacturing Gabions

The wire used to manufacture the Double Twisted Hexagonal wire mesh is soft annealed, low carbon content mild steel wire provided with heavy coating galvanization as per EN 10244/ASTM A 641 or Zinc Alloy Coated to prevent corrosion. In case of use in aggressive environment, it is further extruded with 0.5 mm thick PVC Coating or PA6 coating. The PVC Coating is UV stabilized as per ASTM A975.

Type of Wire:

- Galvanized Steel (G.I) Wire with heavy Zinc coating
- PVC Coated Wire / PA6 Coated
- ZnAlloy Wire (90%+10%ZnAl or 95%+10%ZnAl)

Properties of Wire:

Tensile Strength of Wire: Regularly the material for Gabion is low-carbon steel wire with tensile strength 350-550 KN/n², in accordance to IS 280.

Galvanization of Wire & Tolerances: The Zinc coating of wire confirms to IS 4826 heavily coated and soft type. The Zinc alloy consists of 90 percent zinc + 10 percent aluminium or 95 percent zinc + 5% aluminium. The wire is tested at the raw material manufacturer's lab, our laboratory and third party lab (NABL or NTH) if required.

The galvanization for each wire type with tolerances in diameter are as below:

Sl No.	Nominal Diameter of Galvanized Wire (mm)	Mass of Zinc/Zinc Alloy Coating (g/m ²)	Permitted Tolerances on Wire Diameters (mm)
i	2.00	240	±0.05
ii	2.20	240	±0.06
iii	2.40	260	±0.06
iv	2.70	260	±0.07
v	3.00	270	±0.08
vi	3.40	270	±0.09
vii	3.90	280	±0.10

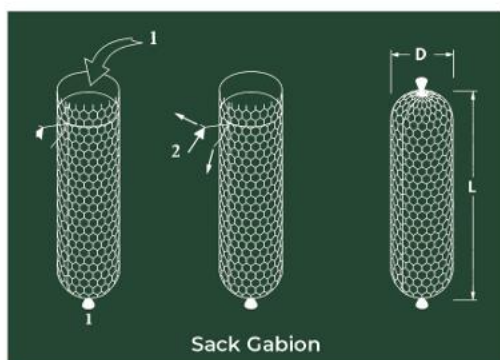
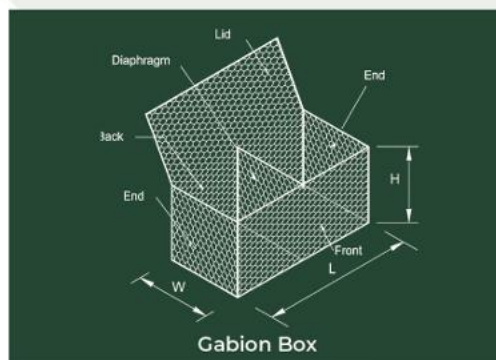
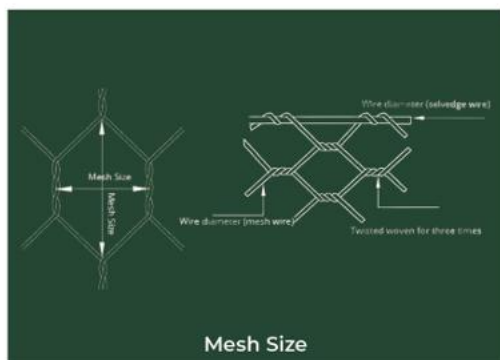


Specification of Gabions/Sack Gabions/ Rockfall Netting: (Mesh Size: 100x120 mm)

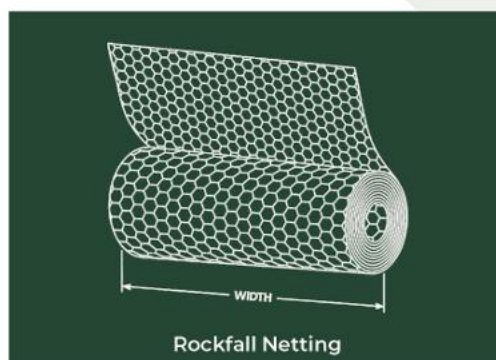
Sl.No	Characteristics	10x12 cm (D=100 MM) +/- 10%		
1	Mesh Type	10x12 cm (D=100 MM) +/- 10%		
		Only Zinc Coated (G.I) / ZnAl 90%+10% / ZnAl 95%+5% (Class 1)		Zn / ZnAl + Polymer Coated (PVC or PA6) (Class 2)
		Type A (Galvanized)	Type B (Galvanized)	Type C (PVC Coated)
2	Mesh Wire Dia (mm)	2.70 mm	3.00 mm	2.7/3.7 mm
3	Edge / Selvedge Wire Dia (mm)	3.40 mm	3.90 mm	3.4/4.4 mm
4	Lacing Wire Dia (mm)	2.20 mm	2.20 mm	2.2/3.2 mm
5	PVC Coated Thickness	N.A	N.A	Nominal - 0.50 mm
6	Minimum Tensile Strength (Parallel to Twist) KN/m	32.00	40.00	32.00
7	Minimum Tensile Strength (Perpendicular to Twist) KN/m	15.50	20.50	15.50
8	Selvedge Strength, Kn/m	10.20	11.22	10.20
9	Punch Strength kN	17.80	19.58	17.8
10	Typical Box Sizes (Length x Width x Height) m (No. of Diaphragms)	4 x 1 x 1 (3 Nos), 3 x 1 x 1 (2 Nos), 2 x 1 x 1 (1 Nos), 1.5 x 1 x 1 (0 Nos) 1 x 1 x 1 (0 Nos), 3 x 1 x 0.5 (2 Nos), 4 x 1 x 0.5 (3 Nos)		
11	Typical Sack Gabion Sizes (m)	1.5 x 0.74m, 2 x 0.96m		
12	Typical Rockfall Netting Sizes (m)	2 x 25m ; 3 x 25m ; 4 x 25m		

*Tolerance in Length and Width +/- 5%

*Tolerance in Height > 0.3 m = +/- 5% & Height < 0.3 m = +/- 10%



(1- Filling ; 2- Lacing wire ; D- Diameter of the sack gabions ; L- Length of the sack gabion)



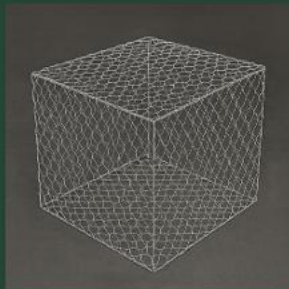


Specification of Gabions/Sack Gabions/ Rockfall Netting: (Mesh Size: 80x100 mm)

S.No	Characteristics	8x10 cm (D=80 MM) +/- 10%		
1	Mesh Type	8x10 cm (D=80 MM) +/- 10%		
		Only Zinc Coated (G.I) / ZnAl 90%+10% / ZnAl 95%+5% (Class 1)		Zn / ZnAl + Polymer Coated (PVC or PA6) (Class 2)
		Type A (Galvanized)	Type B (Galvanized)	Type C (PVC Coated)
2	Mesh Wire Dia (mm)	2.70 mm	3.00 mm	2.7/3.7 mm
3	Edge / Selvedge Wire Dia (mm)	3.40 mm	3.90 mm	3.4/4.4 mm
4	Lacing Wire Dia (mm)	2.20 mm	2.20 mm	2.2/3.2 mm
5	PVC Coated Thickness	N.A	N.A	Nominal - 0.50 mm
6	Minimum Tensile Strength (Parallel to Twist) KN/m	NA	51.00	42.50
7	Minimum Tensile Strength (Perpendicular to Twist) KN/m	NA	26.50	20.50
8	Selvedge Strength, Kn/m	NA	20.40	16.32
9	Punch Strength kN	NA	26.70	21.36
10	Typical Box Sizes (Length x Width x Height) m (No. of Diaphragms)	4 x 1 x 1 (3 Nos), 3 x 1 x 1 (2 Nos), 2 x 1 x 1 (1 Nos), 1.5 x 1 x 1 (0 Nos) 1 x 1 x 1 (0 Nos), 3 x 1 x 0.5 (2 Nos), 4 x 1 x 0.5 (3 Nos)		
11	Typical Sack Gabion Sizes (m)	1.5 x 0.74m, 2 x 0.96m		
12	Typical Rockfall Netting Sizes (m)	2 x 25 m ; 3 x 25 m ; 4 x 25 m		

*Tolerance in Length and Width +/- 5%

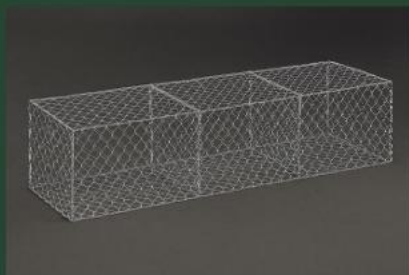
*Tolerance in Height > 0.3 m = +/- 5% & Height < 0.3 m = +/- 10%



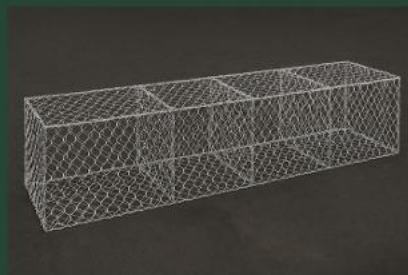
1x1x1 m



2x1x1 m



3x1x1 m



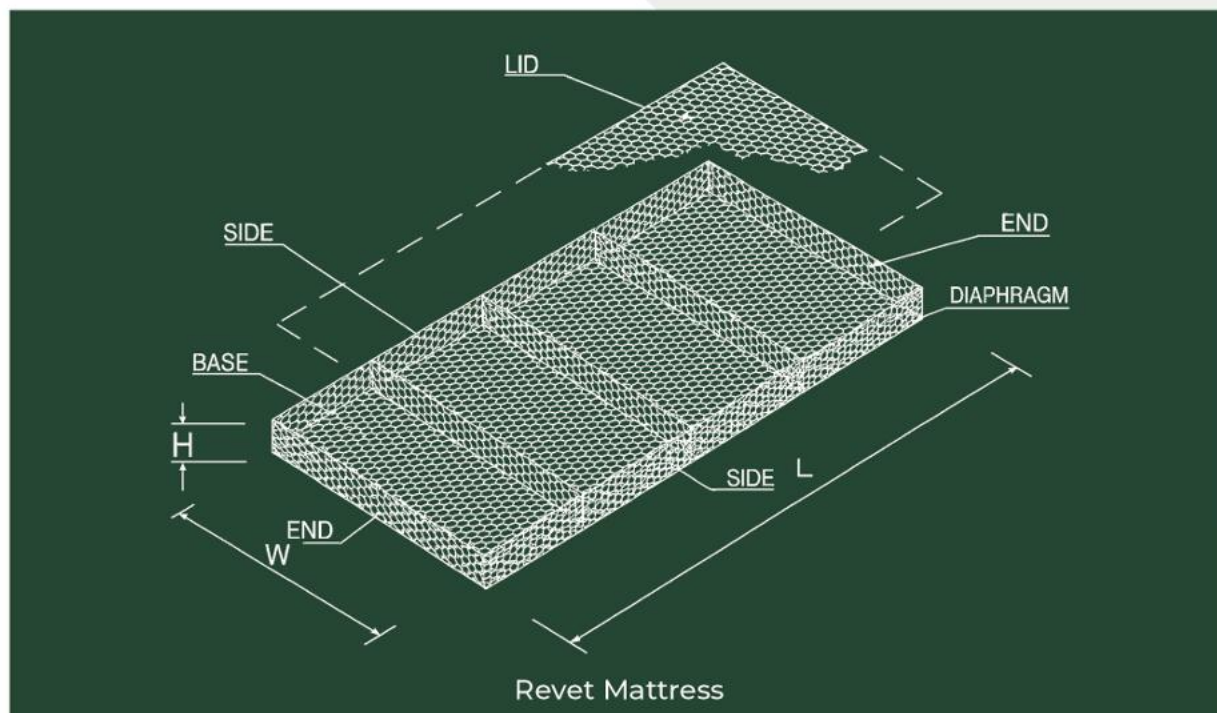
4x1x1 m

Specification of Revet Mattresses: (Mesh Size: 60x80 mm)

S.No	Characteristics		
1	Mesh Type	6x8 cm (D=60 MM) +/- 10%	
		Only Zinc Coated (G.I) / ZnAl 90%+10% / ZnAl 95%+5% (Class 1)	Zn / ZnAl + Polymer Coated (PVC or PA6) (Class 2)
		Type A (Galvanized)	Type B (PVC Coated)
2	Mesh Wire Dia (mm)	2.20 mm	2.7/3.7 mm
3	Edge / Selvedge Wire Dia (mm)	2.70 mm	3.4/4.4 mm
4	Lacing Wire Dia (mm)	2.20 mm	2.2/3.2 mm
5	PVC Coated Thickness	N.A	Nominal - 0.50 mm
6	Minimum Tensile Strength (Parallel to Twist) KN/m	33.50	34.00
7	Minimum Tensile Strength (Perpendicular to Twist) KN/m	13.00	13.00
8	Selvedge Strength, Kn/m	10.20	10.20
9	Punch Strength kN	17.80	17.80
10	Typical Mattresses Sizes (Length x Width x Height) m (No. of Diaphragms)	4x2x0.17 (03 Nos) ; 3x2x0.17 (02 Nos) ; 2x2x0.17 (01 Nos) ; 4x2x0.30 (03 Nos) ; 3x2x0.30 (02 Nos)	
12	Typical Rockfall Netting Sizes (m)	2 x 25 m ; 3 x 25 m ; 4 x 25 m	

*Tolerance in Length and Width +/- 5%

*Tolerance in Height < 0.3 m = +/- 10%



Trusted By DEFENCE



GOVT. & PRIVATE



Flagship Projects



IB & Garrison Fence:
More than 150 kms for
BSF & Indian Army



**Indian Army LOC
Fence (40 kms)**



**Old Type Border
Fence : More than
300 kms**



**Border Outpost &
Camp Fence: More
than 250 kms for BSF
& MES**



A Vision for Security

Over time, **Tirupati Fence** has earned the trust of defense forces, government bodies, and industries by consistently delivering fencing solutions that stand the test of both environment and time. Each project we undertake is a reflection of our belief that security is not just about building barriers, but about creating systems that instill confidence, resilience, and reliability where they are needed most.

Our flagship systems—**RAKSHAQ**, with its next-generation modular fencing, and **Gabions**, with their proven geotechnical strength—demonstrate how innovation and resilience work hand in hand to protect borders and stabilize terrain. RAKSHAQ has been developed to meet the uncompromising demands of **modern border security**, combining advanced coatings, tamper-resistant fixtures, and modular scalability. Gabions, on the other hand, remain one of the most trusted solutions for slope protection, erosion control, and terrain reinforcement in critical zones. Together, they represent our ability to balance cutting-edge engineering with time-tested solutions.

Alongside these, our wider portfolio—**chain link fencing, barbed wire, weldmesh panels, concertina coils, and specialized retaining systems**—has been deployed across diverse and challenging projects. From flood-prone riverbanks to mountainous borders, and from industrial complexes to national defense corridors, our products have reinforced critical infrastructure and safeguarded assets of national importance.

Each solution is manufactured to **international standards**, supported by advanced coating technologies, and validated through **multi-stage quality checks**. This process-driven approach ensures that what we deliver is not only fit for purpose but also built to perform in the most demanding environments. Our guiding principle has always been clear: to provide confidence where failure is not an option.

At Tirupati Fence, **Strength Beyond Boundaries** is more than a tagline—it is a reputation built over decades of performance, partnerships, and trust. It reflects our journey, our values, and our continued commitment to securing borders, protecting infrastructure, and serving the nation with strength and purpose.

Pravin Garodia
Pravin Garodia
Managing Director, Tirupati Fence



Scan to know more about us



TIRUPATI FENCE
Strength Beyond Boundaries



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/Tirupati Fence Products Pvt Ltd

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