HITECH
STEEL INDUSTRIES
FENCE & STEEL

User's Guide For

CHAIN LINK FENCING SYSTEM

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INDEX

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1. Manufacturer's History

HI-TECH FENCE & STEEL INDUSTRIES

HI-TECH Fence & Steel Industry is a subsidiary of NARTEL for telecom, power and construction Company it was established in 2006 by experienced professionals based on the countries construction and security demand. Hi-Tech Fence & Steel, has focused on providing the clients with the best in engineering solutions with the backup of an expertise known –how, creating the global presence with the financial strength of a world class corporation.

Hi-Tech Fence & Steel is by core, customer oriented & distinctly focused on a full service engineering management in the engineering industry. Keeping steel as our forte, all allied sectors are tapped to offer an under- one- roof solution which acts vital in our performance. As a member of Hi-Tech Group of Companies, Hi-Tech Steel has the ability to provide our customers with the global presence, financial strength of a world class corporation, the expertise know- how & market understanding of a local entrepreneurial operating company that can quickly adapt the needs of our client.

With our insight, innovation and technology focused expertise, who include professional engineers, business management graduates, engineering technologists, managers with exceptional field experience & trained technicians, forming a 620 plus strong workforce, we have enlarged our market share and winded our market scope.

We hereby confirm our interest to be listed as your preferred contractor/ subcontractor and would assure you the best of our service anytime. To support our candidature please find herewith our pre-qualification document and hope the same meets your requirement.

Residential & Commercial Buildings, Warehouse & Industrial Buildings, Pre- fabricated houses, Form Storage, Steel Hangers, Chain Link Fencing, Scaffolding, Road- Cash Barriers, and Boundary Wall Railings & Garden Furniture's. Balcony Railings & Lamp Posts, Bridge Parapet Railings & Bollards, Ramp Railings & Duct Makers, Staircase Railing & Road Studs, Decorative Screens & Car Park Barriers, Decorative Gates & GI Railings, GI Cable Gantry & Glass Railings, Wall Mounted Handrails & Stainless Steel Railings, Pergolas & Canopy, Aluminum, GI Cat Ladders & Any Custom make structures.

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Fencing Solutions:

A Chain – Link Fence or Wire netting is a type of woven fence, usually made from galvanized or PVC coated steel wire. The wires run vertically and are bent into Zig – Zag pattern. This forms a characteristic diamond pattern seen in such type of fence. The popularity of chain link fence due to its relatively low cost and ease of installation. A further advantage is that due to the open weave, chain link fence are transparent and do not obscure sunlight / vision from either side of the fence. Few of the applications are as follows:

1. Private Housing
2. Sports Ground
3. Tennis Court
4. Industrial Estates
5. Agricultural Farms
6. Gardens
7. Green Houses
8. Power Stations, Sub Station
9. Wild Life Park / Zoo and many more .....

The standard mesh size is 50 mm x 50 mm which would be manufactured but we have considered and made available to manufacture any other mesh size depending upon the client requirement. The fence fabric either PVC or Galvanized would be manufactured in various diameters as per standard market trends or suit any specific customer requirement. We also cater the manufacture of barbed wire which would be either PVC or Galvanized and it would be manufactured in 2 – strand, 4 – point bards with the barb spacing between 75 mm – 100 mm or suiting any specific client requirement.

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Welded Mesh Fencing System provides a strong but elegant boundary fence without being a visual barrier. Heavy wires are electrically welded at each intersection to provide the security of a traditional welded mesh fence, while several reinforcement ribs fortify the panel rigidity. The welded mesh range would be available in a choice of mesh pattern to select from. It provides many advantages combining aesthetic appeal, long life and is effectively used at high security areas like Defense / Military Installations, prisons, border fencings, power stations and oil terminals.

Concertina Barbed Tape is mesh of metal strips with sharp edges whose purpose is to prevent passage. Although sharper than the barbed wire, it is not actually razor sharp. The sharp edges of the wire can cause serious cuts in a person attempting to pass through quickly. Barbed tape has a central strand of high tensile strength wire and a steel tape punched into a shape with barbs. The steel tape is then cold crimped tightly to the wire everywhere except for the barbs.

This barrier system is more vicious and difficult to tamper along with providing superior perimeter security. The major applications are found in Military sites, Nuclear Energy Sites, Maximum Security Prisons and Petroleum Installations.

Concertina Barbed Wire is a type of barbed wire that is formed in large coils which can be expanded like a concertina instrument. Each coil actually consists of two oppositely

Wound helices which support each other against crushing while allowing easy longitudinal movement. The concertina wire packs flat for ease of transportation, but can very well be deployed as an obstacle much more quickly than the ordinary barbed wire. It is mainly used in very high security are to deter trespassing men and animals.

Gabions originated from an Italian word Gabions meaning “Big Cage” which were round cages with open tops and bottoms which was used to fill earth for the use as military fornications. Modern definitions include any caged arrangement for erosion control. The most common civil engineering use is to stabilize shore against erosion. Other uses include retaining wall, temporary floodwalls, to filter slit from runoff etc. they may be used to direct the force of a flow of flood water around a vulnerable structure. Gabion baskets have advantage due to their modularity and ability to be stacked in various shapes. They also have advantages over more rigid structures because they can conform to ground movement, dissipate energy from flowing water and drain freely. Their strength and effectiveness may increase with time in some cases. They are also used to keep stones which may fall from a cutting or cliff and which can endanger traffic on a through fare.

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2. Installation Process

Fittings

A. **Post caps:** PVC caps, malleable iron, or aluminum alloy weather tight closure cap for tubular posts with the help of hard rubber hammers. Provide one cap for each post. "C" shaped line post without top rail do not require post caps. When top rail is specified provide line post loop tops to secure top rail.

B. **Rail ends:** Mild Steel pressed steel for connection of rails to post using a brace band.

C. **Top rail sleeves:** PVC caps, malleable iron, or aluminum alloy weather tight closure cap for tubular posts with the help of hard rubber hammers. Provide one cap for each post. "C" shaped line post without top rail do not require post caps. When top rail is specified provide line post loop tops to secure top rail.

D. **Tie Wires:** (1.80/2.6 mm) Galvanized and PVC coated steel wire for attachment of fabric to line posts and rails

E. **Brace and tension (stretcher bar) bands:** Mild Steel pressed by 3/4" (19mm) formed to a minimum 300 degree profile curvature for post attachment.

F. **Tension (stretcher) galvanized steel bars:** One piece lengths equal to 2 inches (50 mm) less than full height of fabric with a minimum cross-section of 3/16" x 3/4". Provide tension (stretcher) bars where chain link fabric is secured to the terminal post.

G. **Truss rod assembly:** Mild Steel minimum 10mm diameter truss rod with pressed steel lightener,

H. **Barbed wire supporting arms:** Galvanized pressed steel barb arm Dia 1.80/2.60mm, 2 Ply 4 Points barbs @ 100mm C/C

I. **Bolts and Nuts:** SS-316 grade of commercial quality

LINE WIRE

A. **Line wire:** Poly Vinyl Chloride (PVC) coated metallic coated steel tension wire Dia 3.76/4.88mm color to match chain link fabric.

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BARBED WIRE AND BARBED TAPE

A. **Barbed wire:** Galvanized and PVC Coated barbed wire Dia 2.20/3.20mm, 2 Ply 4 point barbs @ 100mm C/C.

B. **Barbed tape:** Stainless steel barbed tape shall comply with ASTM F1910.

CHAIN LINK SWING GATES

A. **Double Leaf Swing gates:** 7.0Mtr Wide opening by 3.05Mtr high Fabricate chain link swing gates. Gate frame to be of welded construction. Weld areas to be protected with zinc-rich paint per BSEN 1461. The gate frame members are to be spaced no greater than 10mm apart horizontally or vertically. Exterior members to be (60 mm) OD pipe, interior members when required shall be (48 mm) OD pipe. Pipe should be SCH-40 grade Chain link fabric to match specification of fence system. Fabric to be stretched tightly and secured to vertical outer frame members using tension bar and tension bands spaced on center and tied to the horizontal and interior members on center. Hinges, hot dip galvanized pressed steel or malleable iron, structurally capable of supporting gate leaf and allow opening and closing without binding. Non-lift-off type hinge design shall permit gate to swing 180°

B. **Latch:** Galvanized forked type capable of retaining gate in closed position and have provision for padlock. Latch shall permit operation from either side of gate.

C. **Double gates:** Provide galvanized drop rod with center gate stop pipe or receiver to secure inactive leaf in the closed position. Provide galvanized pressed steel locking latch, requiring one padlock for locking both gate leaves, accessible from either side.

D. **Keeper to secure open leafs:** Provide galvanized gate hold back keeper for each gate leaf over 5′ (1524 mm) wide. Gate keeper shall consist of mechanical device for securing free end of gate when in full open position.

E. **Gate posts:** Concrete Gate post (Clients Scope)

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3. EXECUTION

SITE EXAMINATION

A. Ensure property lines and legal boundaries of work are clearly established.

B. Survey of fence location to be provided by Contractor

C. Verify areas to receive fencing are completed to final grade.

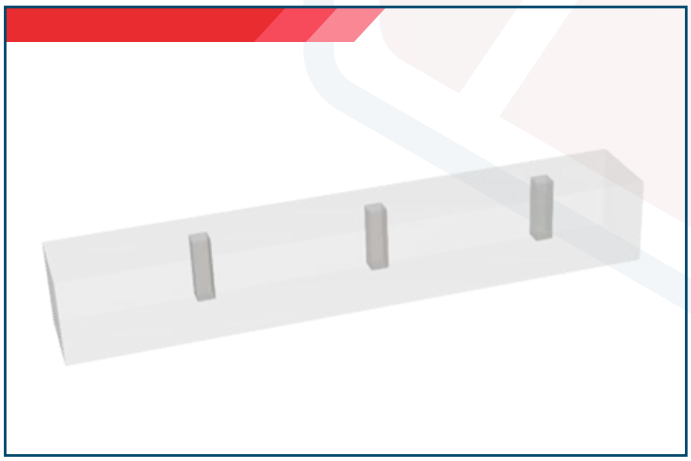
POST INSTALLATION

A. Install chain link fence system in accordance with ASTM F567 and manufacturer's instructions.

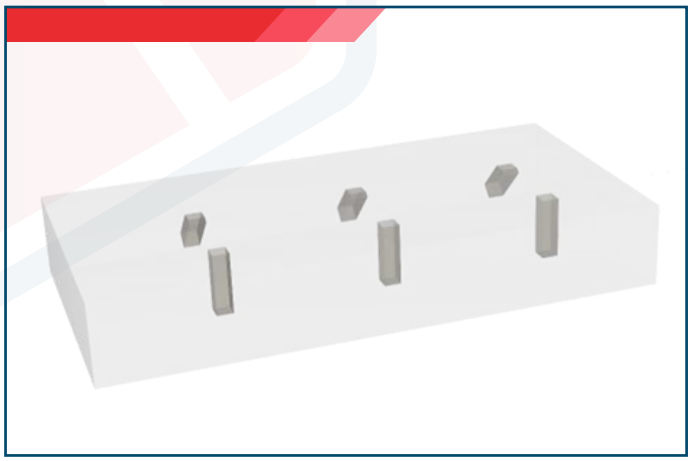
B. Locate terminal post at each fence termination and change in horizontal or vertical direction of 30° or more.

C. Space line posts uniformly at 3.0mtr C/C.

D. Concrete set posts: Clients Scope.



Concrete Footing Placed for post @ Every 3m c/c.



Concrete Footing Placed for post with Back Support @ Every 3m c/c.

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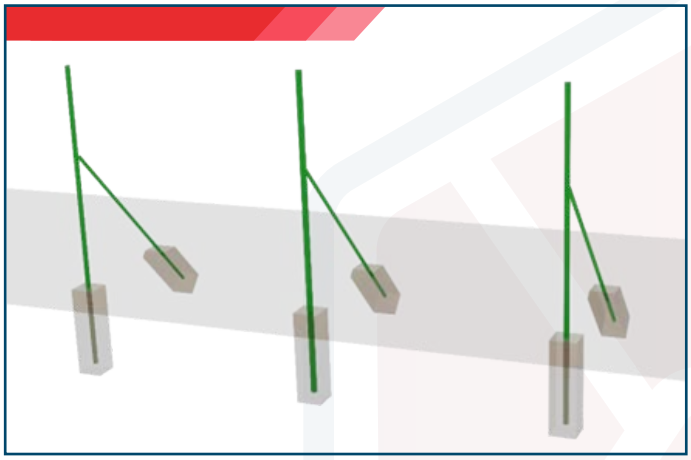
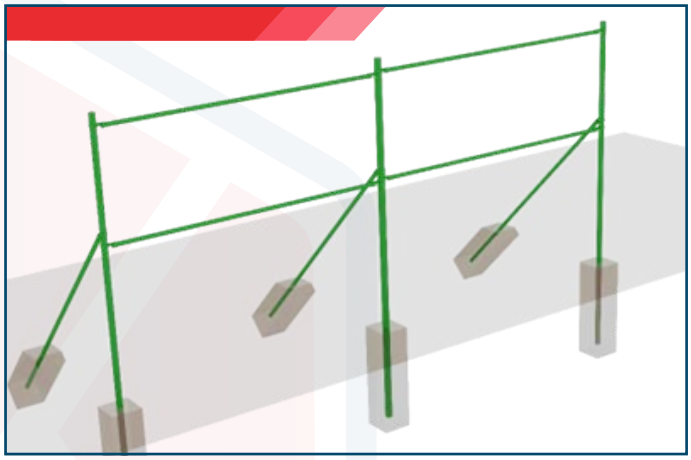
E. Check each post for vertical and top alignment, and maintain in position during placement and finishing operations.

F. racing: Install horizontal brace and truss assembly at mid-height or above for fences at each fabric connection to the terminal post. The diagonal truss rod is installed at the point where the brace rail is attached to the terminal post and diagonally down to the bottom of the adjacent line post. Place the truss rod in tension by adjusting the turnbuckle.

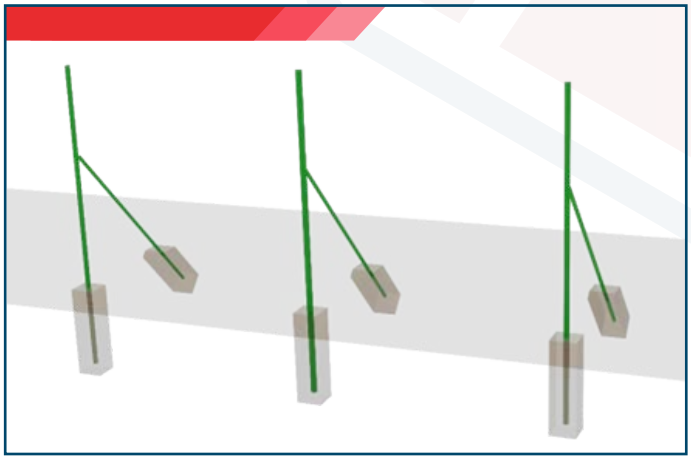


Placing Post on Concrete Post

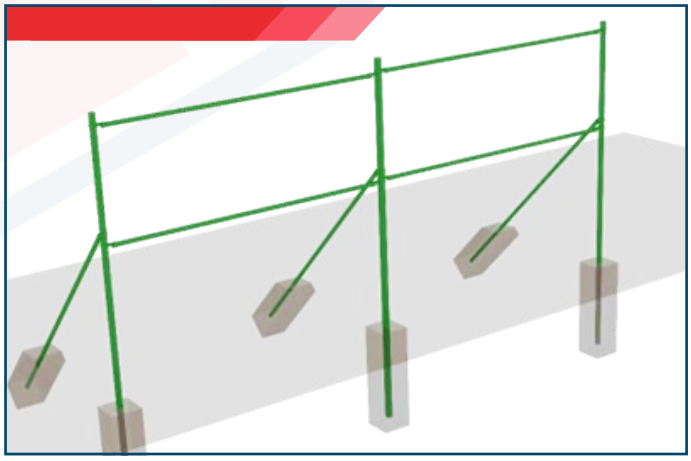


On corner Post Install Horizontal Rail for Stability

G. Top rail: Install in lengths of (3.0 m/6.0m). Connect ends with sleeves forming a rigid connection, allow for expansion and contraction.



Horizontal Rail connected by Sleeves



All accessories to be Connected to Corner Post z

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H. Center Rails: Install mid rails between line posts and attach to post using rail end or line rail clamps.

I. Bottom Rails: Install bottom rails between posts and attach to post using rail end or line rail clamps.

J. Tension wire: Install tension wires so that it will be located (100 m) up from bottom the fabric. If top rail is not specified, install the tension wire so that it will be located (100 mm) down from the top of the fabric. Stretch and Install tension wire before installing the chain link fabric and attach it to each post using wire ties.

All accessories to be Connected to Corner Post with mesh through stretcher bar

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BARBED WIRE AND BARBED TAPE INSTALLATION

Uniformly space and stretch barbed wire between terminal posts. Attach barbed wire to the terminal posts using brace bands and snap and secure barbed wire into each line post barb arm slot.

Barbed Wire install on top of fence

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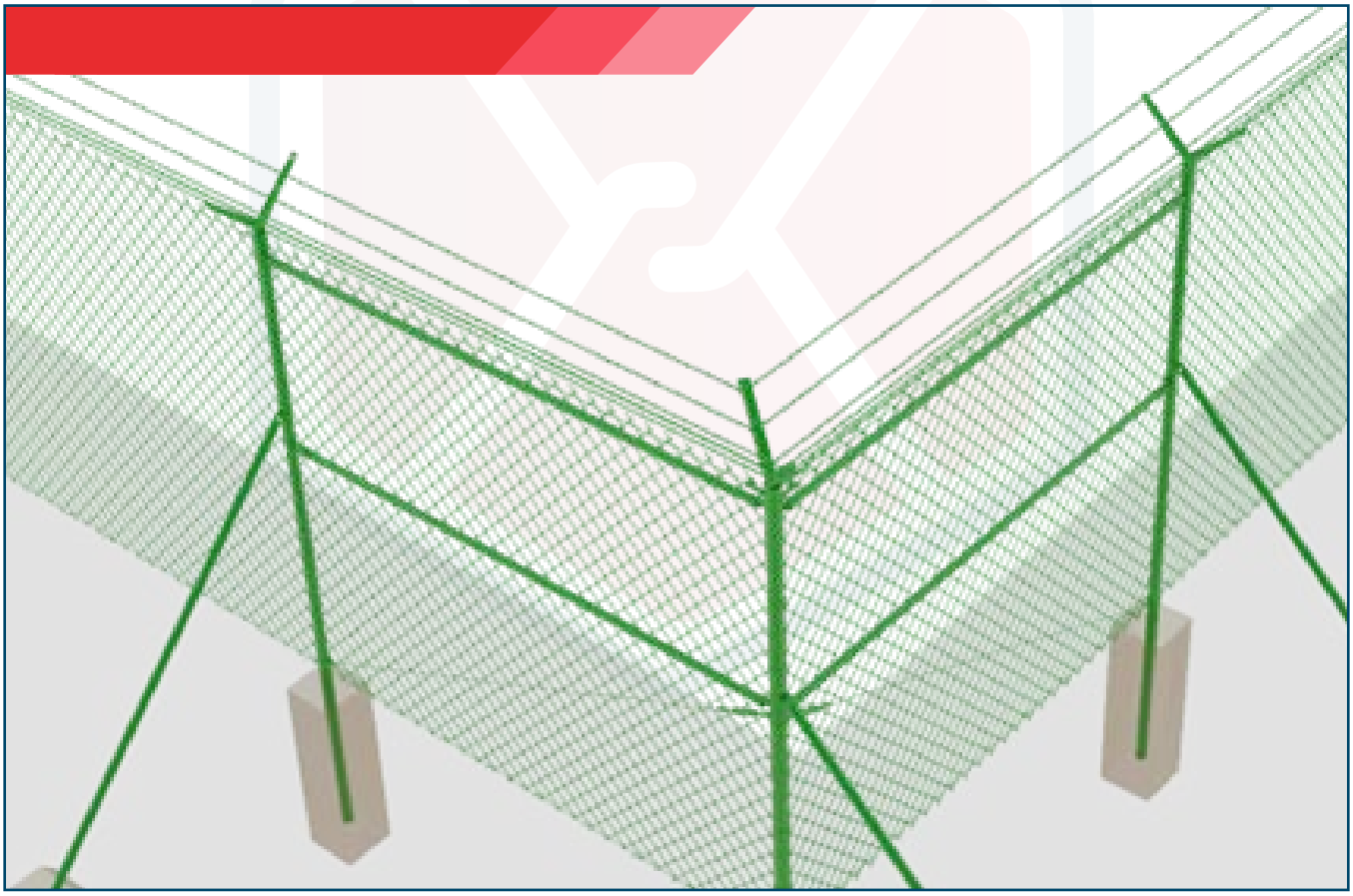
CHAIN LINK FABRIC INSTALLATION

A. Fabric: Install fabric on security side, pull fabric taut; thread the tension bar through fabric and attach to terminal posts with tension bands spaced maximum of (300 mm) on center and attach so that fabric remains in tension after pulling force is released. Install fabric so that it is 2" (50 mm) +/- 1" (25 mm) above finish grade.

B. Secure fabric using wire ties to line posts at (300 mm) on center and to rails and braces 24" (610 mm) on center, and to the tension wire using hog rings 24" (610 mm) on center. Tie wire shall be secured to the fabric by wrapping it two 360 degree turns around the chain link wire pickets. Cut off any excess wire and bend back so as not to protrude so as to avoid injury if a pedestrian may come in contact with the fence.



Corner Post with 90degree bend

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CHAIN LINK GATE INSTALLATION

A. Swing gates: Direction of swing shall be inward or outward [as shown on drawings] Gates shall be hung plumb in the closed position with minimal space from grade to bottom of gate leaf. Gate leaf holdbacks shall be installed on all double gates and all gates leafs greater than 5′ (1524 mm) in width.

B. Horizontal slide gates: Install cantilever and overhead horizontal slide gates and gate posts in accordance with ASTM F567. Horizontal sliding gates shall be plumb in the closed position with minimal ground clearance and slide with an initial force of 40 lbs. (18.14 kg). Double gate drop bar receiver shall be set in a minimum concrete footing (150 mm). Install top and bottom safety roller covers and adjacent safety guide posts on external roller cantilever if needed.

ELECTRICAL GROUNDING

Earthing cleat to be provided if needed and specified in the drawings by the client.

SITE CLEAN UP

Clean up area adjacent to fence line from debris and unused material created by fence installation.

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