BETAFENCE
a PRÆSIDIAD brand

BLOKAD Palifor® Fence Installation Manual

Document 02-V01
Date 09/09/2025

System Overview

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- LPS1175 B3 certified Palisade Fence Integrated with Embedded Crash Rated Fence Posts.

1. 3000mm High 4 Rail System
2. 2400mm High 3 Rail System
3. 3 Types of Pale Toppings Available:
    1. Straight Cut
    2. Straight & Splayed
    3. Splayed and Bent
4. Various splice connections providing different connection options are offered namely:
    1. End & Corner Panel connections
    2. Intermediate Panel connections
    3. Angular Panel Connections
5. Various corner configurations are achievable with corner connections.

In this installation manual we will highlight the suggested steps for the installation of the BLOKAD Palifor System. The installation manual is typical for both heights and applies to all types of Pale Toppings.

The suggested method for the fence installation is **'POST-POST-CABLE POSITIONING-PANEL-PANEL-CABLE TENSIONING'**.

System Overview

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- Tools Required for installation:

1. Spade/shovels
2. Picks
3. Plumbline/Fish Line
4. Dumpy Level (for set-out ground levels)
5. Set Levels
6. Socket Sets (M13 Sockets and Wrenches)
7. Spanner Sets (M13 Spanners)
8. Pegs
9. Tape Measures
10. Chalk Line
11. Wheelbarrows
12. Torque Wrench (M18 Socket)
13. Angle Grinder (Cutting Disc)
14. Tensioning Device MS22-50* **(Provided By Betafence)**

- Materials Required for installation:

1. Clean water
2. Concrete Mix
3. 19mm Stone
4. Dampcourse
5. Wooden or Steel Stay Supports
6. Shuttering (If necessary)

- Equipment Required for installation:

1. Compactor
2. Vibrating Poker
3. Ladder (For 3m System)
4. Generator (If necessary)
5. Blow-Out Pump for drilled holes (for Base plate system)

Installation Guide: Foundations and Post Set-out

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Step 1:

Mark and Excavate the ground for round foundations at **Ø500X1050mm Deep** for **Line Post Foundations** and **Ø600X1300mm Deep** for **Terminal End Post Foundations**, every 2884mm Center to Center. (Fig. 1)

Terminal Post Foundations are to be offset from the Line Post Foundations by 45.30mm, to ensure correct alignment between the panel fixation face of both posts. (Fig. 2)

Second Tip – If Post offset dimension is not achievable, ensure that the faces of the splice fixing points are aligned and set true. This will ensure that the panels will be installed correctly.

*Necessary ground preparation steps such as clearing of debris/vegetation, compaction, base layers, building formwork etc. is to take place according to the site conditions.

Soil conditions may vary. Contact your local Civil Engineer to specify requirements to suit conditions.

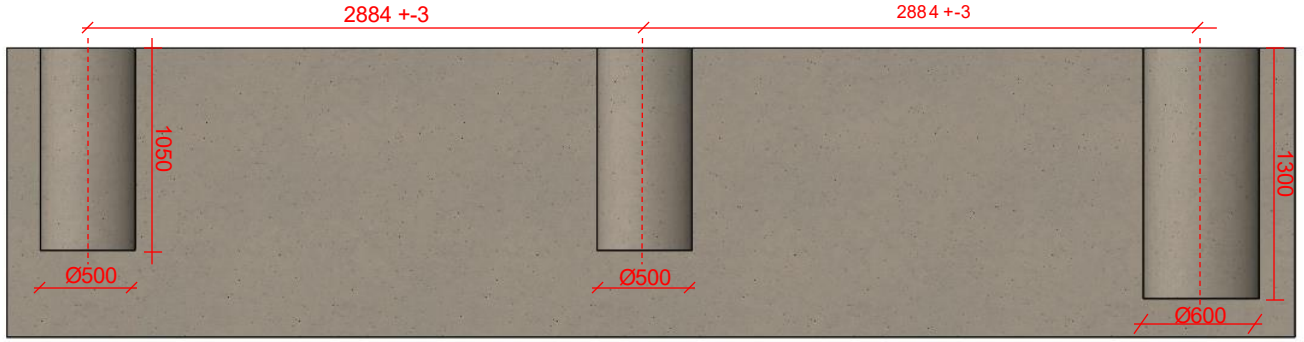

Figure 1

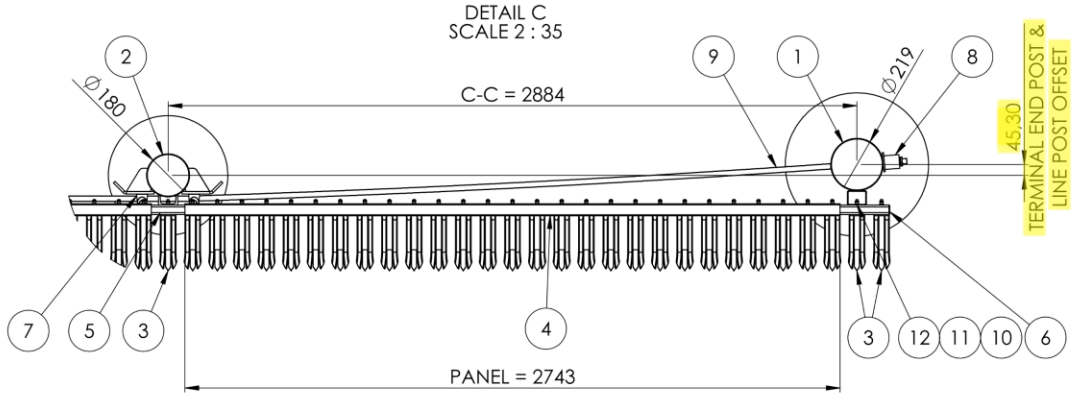

Figure 2

FOUNDATION DRAWING/DETAIL DISCLAIMER:

THE DIMENSIONS OF THE FOUNDATIONS AND THE CONCRETE STRENGTH DEPICTED ARE PURELY INDICITIVE. THE SUPPLY OF SUCH INFORMATION SHOULD IN NO WAY BE CONSTRUED AS A SUBMISSION BY BETAFENCE THAT THE DIMENSIONS OF THE FOUNDATIONS AND CONCRETE STRENGTH WOULD BE FIT FOR PURPOSE OR THAT BETAFENCE HAS ASSUMED ANY DESIGN LIABILITY FOR SUCH INFORMATION.

IT IS THE RESPONSIBILITY OF OTHERS TO CONFIRM THE SOIL/GROUND CONDITIONS.

Installation Guide: Foundations and Post Set-out (Gradients – Max. 10 Degrees)

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Step 1:

The CRF System can be installed on a slope with a maximum gradient of 10 Degrees.

The Following steps & Calculation are to be applied to Calculate the Correct Center – Center Distance on a slope

Mark the calculated C-C positions of the foundation along the slope, by using a plumb-line or Fish Line, from the last "Flat Pitch" foundation.

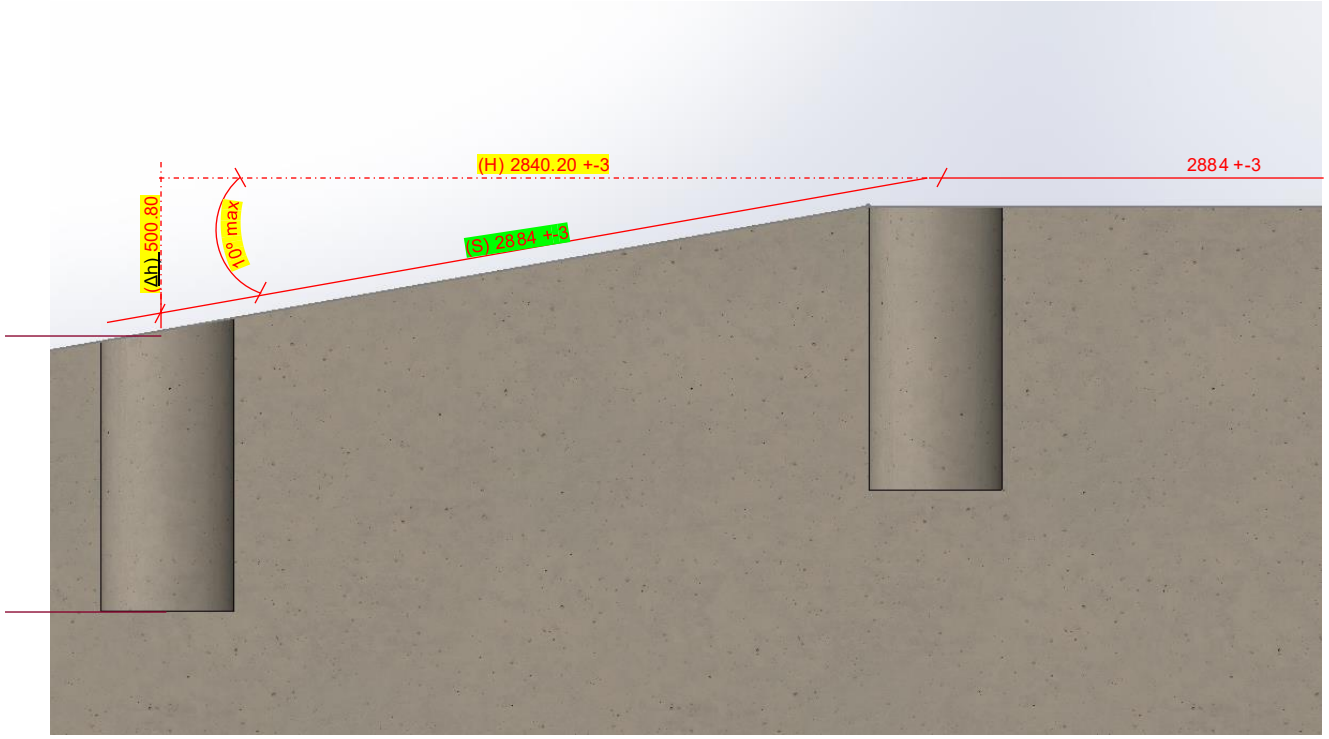
Ensure that the correct calculations are followed to prevent mis-alignment during the installation of the posts and panels.

Repeat Step 1 (Fig. 1), according to the type of foundation needed.

*For ease of installation, we have provided a table with predefined Gradients and their respective center-center dimensions.

*Necessary ground preparation steps such as clearing of debris/vegetation, compaction, base layers, building formwork etc. is to take place according to the site conditions.

Soil conditions may vary. Contact your local Civil Engineer to specify requirements to suit conditions.



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PRE-DEFINED SLOPE & CENTER-CENTER DIMENSIONS	GRADIENT										
	0º	1º	2º	3º	4º	5º	6º	7º	8º	9º	10º
Horizontal C/C (straight) H	2884	2883,56	2882,24	2880,05	2876,97	2873,03	2868,2	2862,5	2855,93	2848,49	2840,19
On-slope C/C (diagonal) S	2884	2884	2884	2884	2884	2884	2884	2884	2884	2884	2884
Height difference per bay Δh	0	50,33	100,65	150,94	201,18	251,36	301,46	351,47	401,38	451,16	500,8

Installation Guide: Foundations and Post Set-out

Step 2:

Insert Reinforcing Cages into the excavated foundation holes. (Fig. 3)

Step 3:

Set Posts, Vertically into the foundations at every 2884mm center to center, with a height of 2150mm above Concrete Level for 2400mm High Systems, and 2750mm above concrete level for 3000mm High Systems.(Fig. 4)

- Temporarily Support posts by use of Stays/braces (Steel RHS Tubes) and support bricks below the post if necessary. (Fig. 5)
- **Level and align posts in the foundation, ensuring they are plumb and set true in the ground.**
- **TIP – Install M18 U-Bolts to all Intermediate Line Post Plates. Keep Loose – DO NOT TIGHTEN**

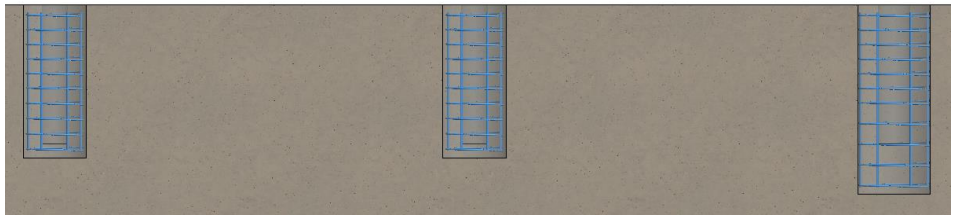


Figure 3

Figure 5

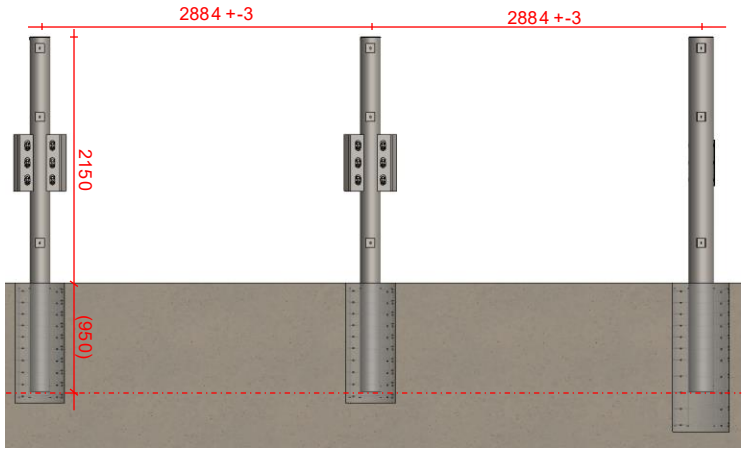
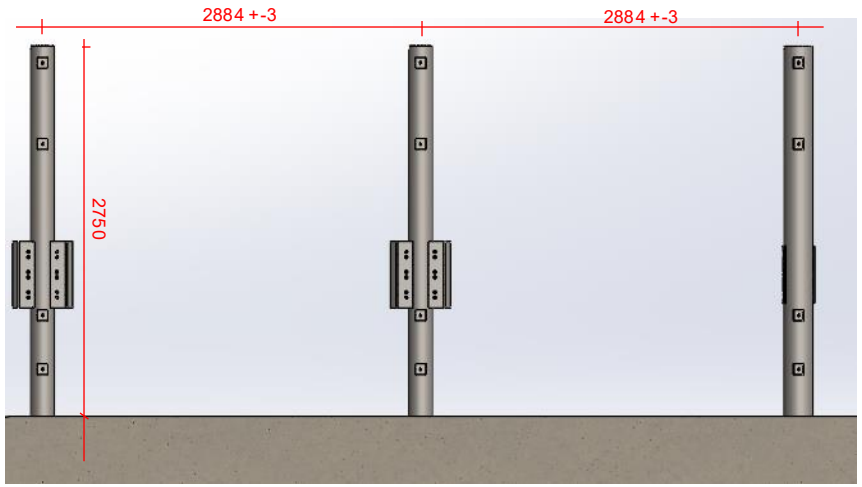


Figure 4



Installation Guide: Foundations and Post Set-out

Although soil conditions may vary from site to site, we have designed standard Reinforcing Cages for the different post foundations which can be used in 'normal' ground conditions.

A project Civil Engineer still needs to be contacted to confirm local soil conditions and confirm that the foundation design specified is adequate for your site.

Reference drawings:

Terminal Post Foundation Reinforcing Cage – PAL09P400002 (Fig 23)

Line Post Foundation Reinforcing Cage – PAL09P400003 (Fig. 24)

Drawings for these cages can be requested from your local Betafence sales division or technical team.

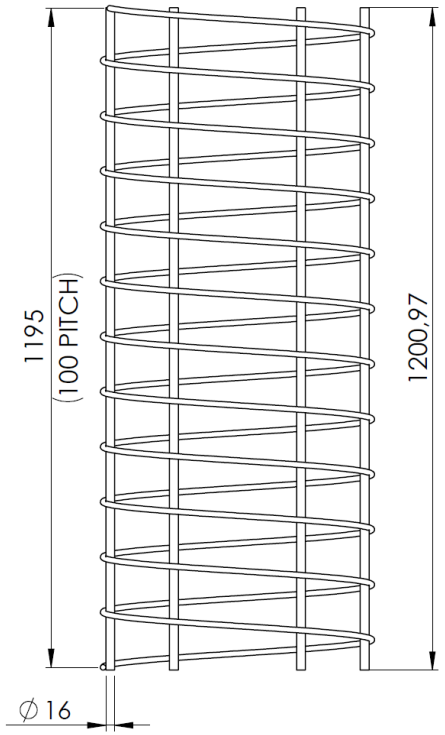


Figure 23

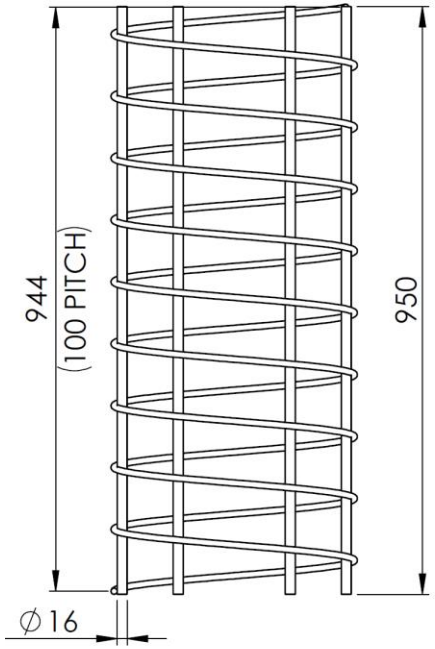


Figure 24

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Installation Guide: Panel Cross Rails, Splices and Post Pales

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Step 4:

Install the Panel Cross Rails to assist in maintaining the center-to-center set-out between each post. (Fig. 6)

Starting from either end of the fence system (Terminal Post side or Line Post Side) start positioning and installing the splice tubes and single pales to each post.

Mount and fixate the uppermost End-Splice Tube Connector and Pale, using a M8x70 Mushroom Head Bolt, Self-Breaking Nut and ISO 7093-1 Washer. (Fig. 7)

Tighten the nut, enough to secure the splice tube and pale but loose enough to allow for the splice tube to rotate about the bolt. Do not shear-off the nut.

Subsequently, proceed to install the lower end-splice tubes, using M8x70 Mushroom Head Bolts, Self-Breaking Nuts and ISO 7093-1 Washers. (Fig. 8)

Tighten the nuts, enough to secure the splice tubes and pale, but loose enough to allow for the splice tubes to rotate about the bolt. Do not Shear-off the nut.

Step 5:

Repeat the above procedure on the following Posts but insert the Panel cross rails between each splice tube. (Fig. 9)

- Slide the Intermediate Splice Connector tube into one end of the cross rail, lift and slide the opposite end of the cross rail to the adjacent 'fixed' splice tube (either on a Terminal End post, as shown, or on an Intermediate Line Post).
- Fixate the uppermost Intermediate Splice Tube Connector and Pale to the Intermediate posts, using a M8X70 Mushroom Head Bolt, Self-Breaking Nut and ISO 7093-1 Washer
- Tighten the nut, enough to secure the splice tube and pale. Do not shear-off the nut.

Subsequently, proceed to install the lower intermediate splice tubes, using a M8X70 Mushroom Head Bolts, Self-Breaking Nuts and ISO 7093-1 Washers.

- Tighten the nuts, enough to secure the splice tubes and pale. Do not shear-off the nut.

Follow the above steps for subsequent Splice Tube Connector and Panel Cross Rail Installation.

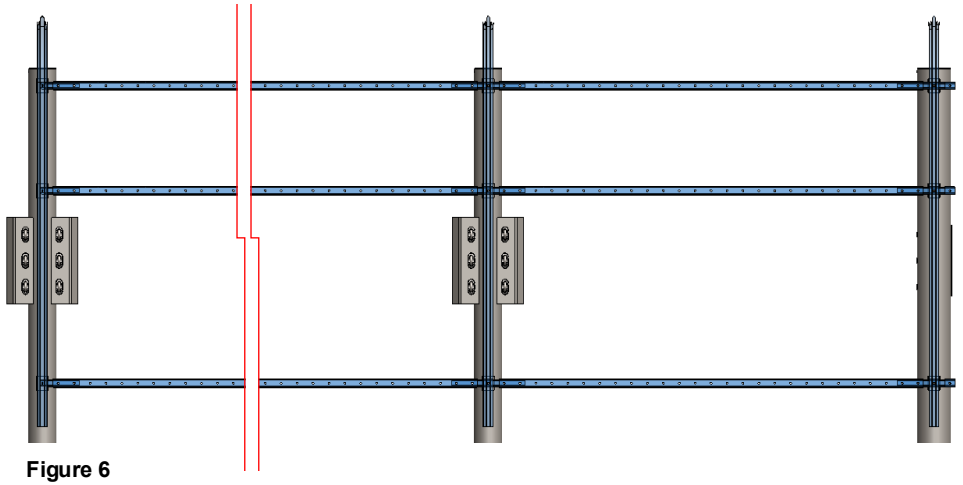

Figure 6

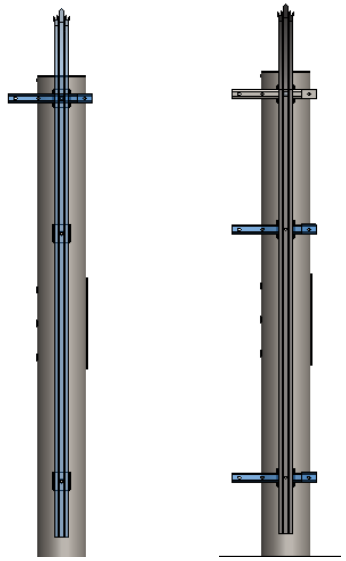

Figure 7

Figure 8

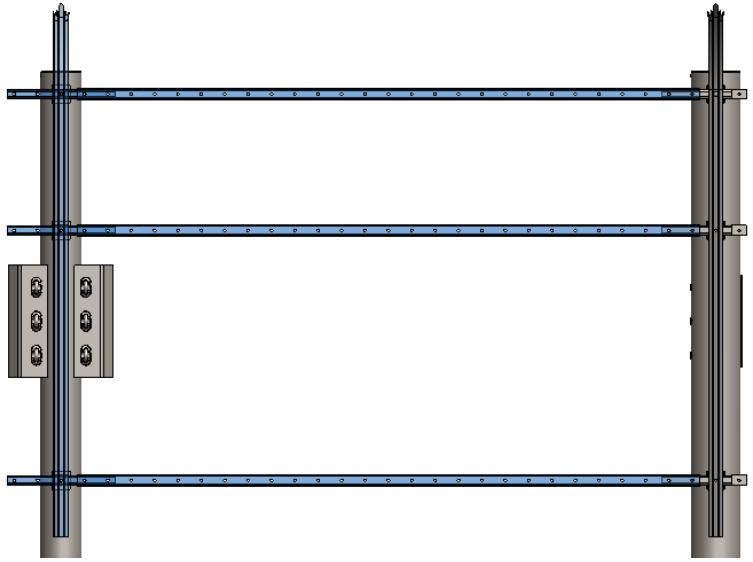

Figure 9

Installation Guide: Panel Cross Rail & Pale Fixation

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Step 6:

Secure each panel cross rail by mounting and fixing the first 2 pales from the right and left of each post.

- Centralize the Panel Cross Rails, by ensuring the 2 holes on the splice tubes are visible on both ends of the cross rail.
- Mount the Pales, in either direction (left to right/or right to left) as shown. (Fig. 10)
- Fix the Pales to the Cross Rails with a M8x70mm Mushroom Head Bolt, through the Cross Rail and splice tube. Secure using a washer and Self-breaking nut.
- Tighten the nuts, enough to secure the pales and rails in place, but loose enough to slide the rails (with pale) on the splice tubes.
- Adjust the Cross Rail and Pale centrally between the Pales fixed on the posts.
- **The distance dimension between the Pales on the Cross Rails and the pales on the posts should be 38mm +-1**.

Continue mounting the pales onto the cross rails on every subsequent post, using M8x70mm Mushroom Head Bolts, Self-Breaking Nuts and Washers. (Fig. 10)

Tighten all nuts, but do not shear-off.

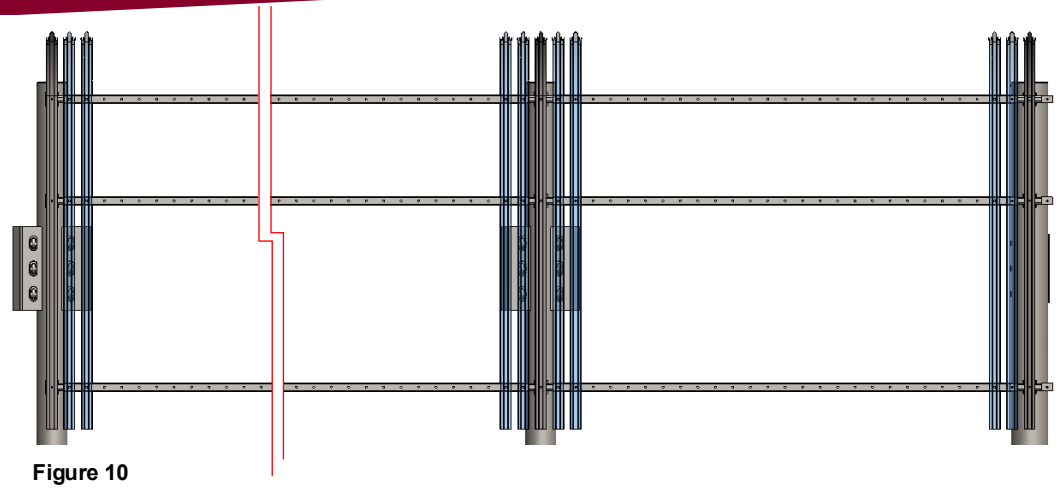

Figure 10

Step 7:

Pour Concrete into the foundation holes. (Fig. 11)

- Ensure the final level and alignment adjustments are made to the posts whilst the concrete is still wet.
- Add additional support stays/braces, as necessary.

Allow a minimum of 3 days for the concrete to set/cure before moving forward with the installation.

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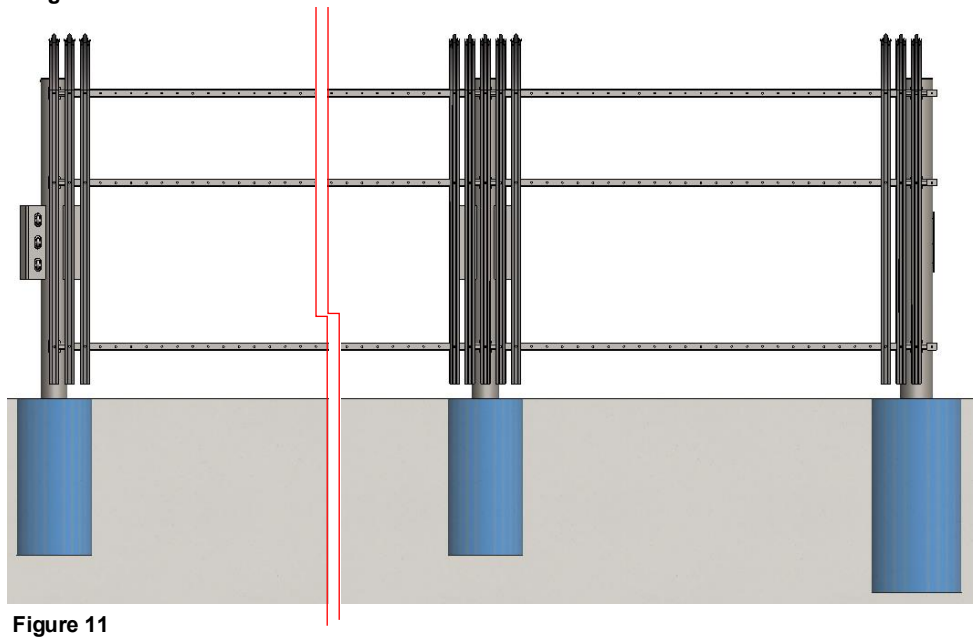

Figure 11

Technical Information:

Concrete Grade: Minimum C35

Important Note*

Concrete Grade is subject to Local Conditions. Consider contacting your local Civil Engineer to clarify/specify the Grade in accordance with the ground conditions.

Installation Guide: Installation Positioning of Cables, Grip Bolts, Anchor Tool & Pales

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Step 8:

Place cables in position on each Intermediate Line Post, Starting for the Last Line Post, and Loosely Clamp with M18 U-Bolts. Do Not Tighten Bolts.

Once all cables are mounted onto each line post, thread the free end (opposite end of the cable closest to the Terminal End Post) into the Terminal End Post and Manually Pre-Stress the cable ends onto the Post using the KM22-1860 Anchorage Tool.

Allow at least 500mm overhang of the cable beyond the Terminal End Post for Cable Tensioning later.

(Fig. 12)

*For M18 U-Bolt - Tighten the nut, enough to secure the cable to the Line Post but loose enough to allow for the cable to be pulled/pushed along the fence line.

***IMPORTANT NOTE: MAXIMUM CABLE LENGTHS PROVIDED ARE EITHER 450M OR 600M (DEPENDING ON ORDER)**

AT EVERY CABLE ROLL TERMINATION POINT, A MID-TERMINAL POST IS TO BE USED TO END AND START A NEW CABLE ROLL.

Step 9:

Install the balance of the Pales onto the Rails. Secure tightly using a M8X70 Mushroom Head Bolts, Self-Breaking Nuts and ISO 7093-1 Washers.

Tighten all nuts, but do not shear-off.

(Fig. 13)

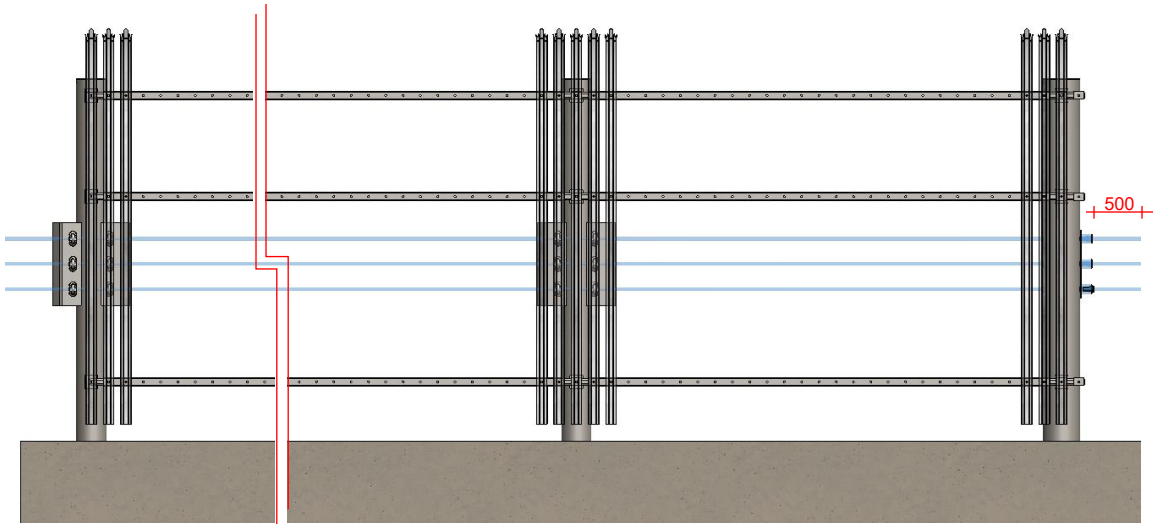

Figure 12

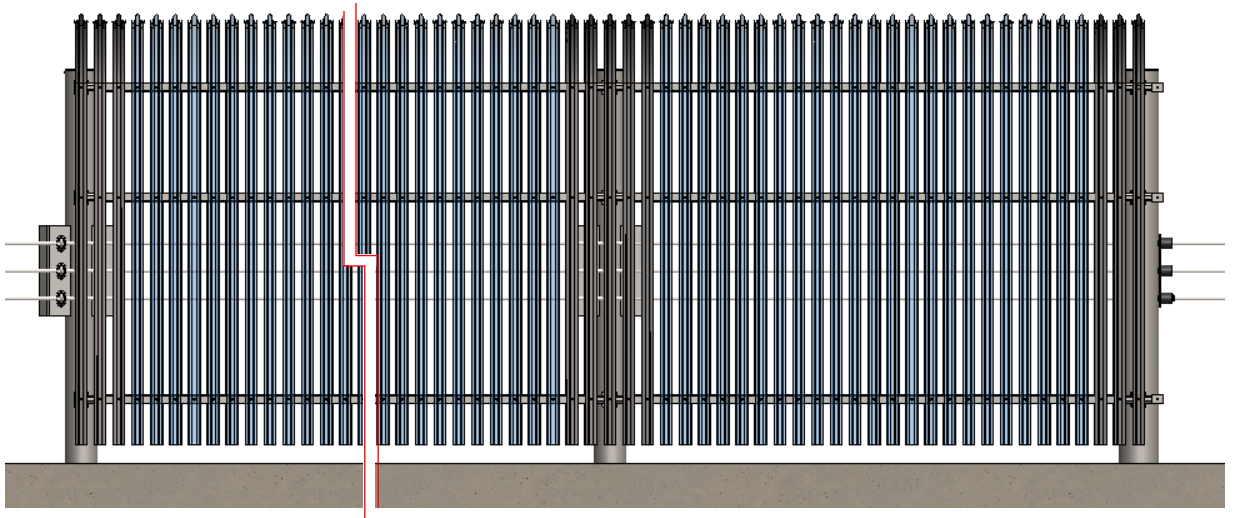

Figure 13

Installation Guide: Mid-Terminal Post, Anchorage Tool Fixation and Mounting

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Mid-Terminal Posts

Mid-Terminal Posts allows the systems Crash Cable to be continued (acting as a splice point for cables) along a fence line that is greater than 450 meters.

Mid-Terminal Posts are required at every Cable Roll 'Ending' which is approximately every 450 meters or 600 meters depending on the selected roll length chosen for your project, or according to your site plan.

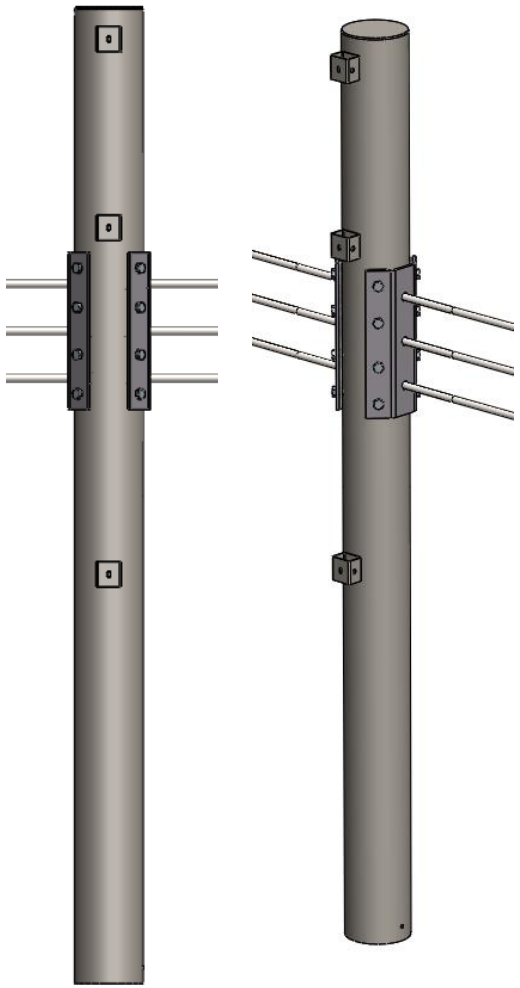
Should your site require a Mid-terminal post, it will be advisable to start your cable anchorage point from the Mid-Terminal Post and Tension from the End Terminal Post.

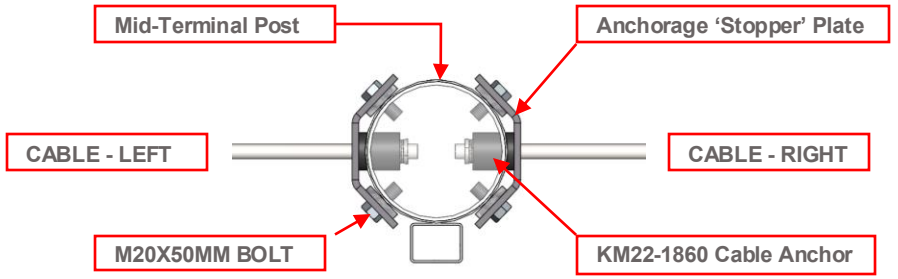
Post Installation steps shall be like the installation steps for the End Terminal posts and Line Posts (Step 2 & 3) with the addition of the following steps:

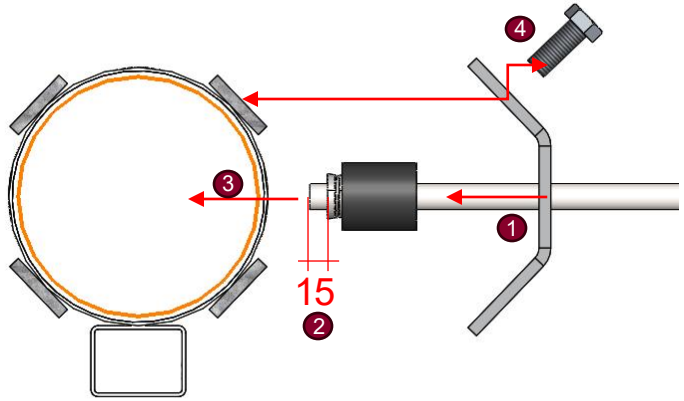
1. Thread the cables through the KM22-1860 Anchorage "stopper" plate.
2. Fix the KM22-1860 Anchor by 'Pre-stressing' to the end of the cable, ensuring that a maximum of 15mm of the Cable is exposed beyond the Anchor tool.
3. Temporarily insert the Anchor and Cable in the foreseen holes on the post, while keeping the anchor and cable hanging loosely against the 'stopper' plate
4. Mount the Anchorage Stopper Plate against the Mid-Terminal Post fixing points, aligning the holes and fix the plate with M20x50mm Bolts.
5. Proceed with the installation steps as per Steps 8 & 9.

TIPS –

1. **Planning and Understanding where the Approximate locations of your Mid-Terminal Posts and End Terminal Post would make it easier to plan your cable installation 'start' and 'end' points.**
2. **Cables can only be tensioned from the Left & Right End Terminal Posts, relative to the Mid-Terminal Posts.**
3. **The holes on the Post and Load Plate (welded on Post) have a M20 internal thread for easy fixation of the M20 Bolts.**







Installation Guide: Cable Tensioning & Panel Completion

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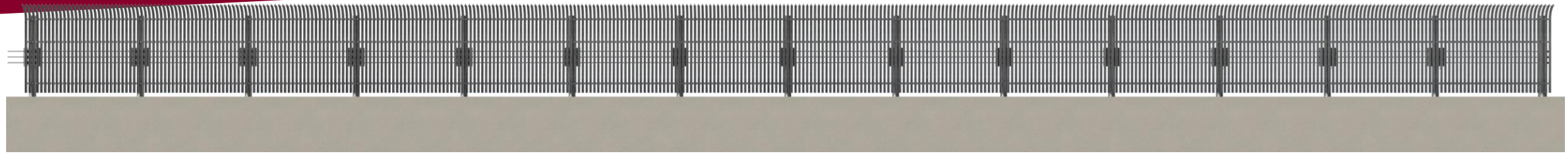

Step 10:

- Ensure all Panel Cross Rails, Pales and Posts are levelled and aligned.
- Ensure all Pales are fixated to the Cross Rails and to Posts
- Ensure all Bolts are secured with Washers and Self-Breaking nuts.
- **Torque and Shear-off all Nuts**.
- **Damage the "thread" of the bolts fixing the pales to the LOWEST horizontal rails. This will make it impossible to remove the break off nut & is mandatory to benefit from the LPCB certification.**

Step 11:

Cable Tensioning –

- **Once all panels have been installed, First Secure the cables on the last Terminal Post (Left or Right side) on the Fence System with KM22-1860 Anchorage Tool.**
- **Proceed to tension the Cables from the opposite Terminal End Post using the KM22-1860 Anchorage Tool and the Tensioning Device MS22-50*.**
  - **Ensure the cable tension force is in accordance with the Tension/Temperature chart (Table 1)**
- **Once the Tension has been achieved, Torque all M18 U-Bolts on each Line Post to hold the Cable in Tension.**
- **The Torque specification for M18 U-Bolts is 240~270 Nm.**
- **Cut Off Cable Ends with Min. 15mm Excess after each anchorage tool on the Terminal End Post. Use an Angle Grinder to Trim Cable Ends**

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Table 1

Tension/ Temperature Chart

Ensure the cable is tensioned at the correct Force according to the Temperature at the time of installation

Degrees Celsius	Tension (N)	Tension (MPa)
-23	22241	3,3
-18	21129	3,2
-12	20017	3,0
-7	18905	2,8
-1	17793	2,7
4	16681	2,5
10	15569	2,3
16	14457	2,2
21	13345	2,0
27	12233	1,8
32	11121	1,7
38	10009	1,5
43	8896	1,3

Ancillary Parts/Fixture Details

An Intermediate splice tube can be used for a continuous gradient slope. (Fig. 14)

For a Slopes that consists of various gradients, the Sloped Splice Tubes can be used. It consists of 2 parts: (Fig. 15)

- Sloped Splice Tube with a spacer plate (Fig. 16)
- Sloped Splice Tube without spacer plate (Fig. 17)

The Sloped Splice Tube (w/out spacer) is suggested to be fixed against the post and the Sloped Splice Tube (with spacer) mounts against the internal face of the 1st Splice Tube with the spacer positioned outward.

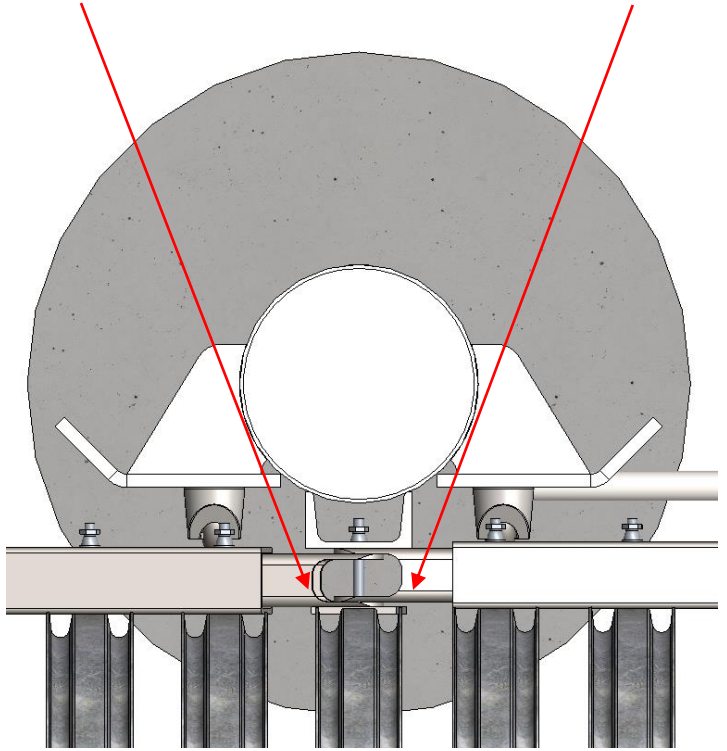
- See Figure 18.
- The maximum Sloped Angle achievable for the Blokad Palifor system is 10°.

Figure 14

Figure 15 – Isometric View

Figure 16

Figure 17



Ancillary Parts/Fixture Details

Line Post Cable Fixation:

Cables are fixated to Line Posts using M18 U-Bolts. (Fig. 20, 21)

Terminal Post Cable Fixation:

Cables are tensioned to Terminal End Posts using a special anchorage tool (KM22-1860) (Fig. 18, 19)

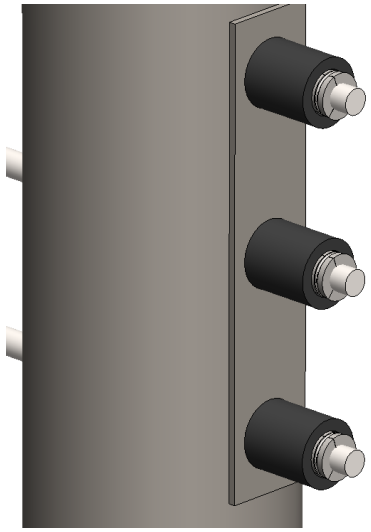


Figure 18

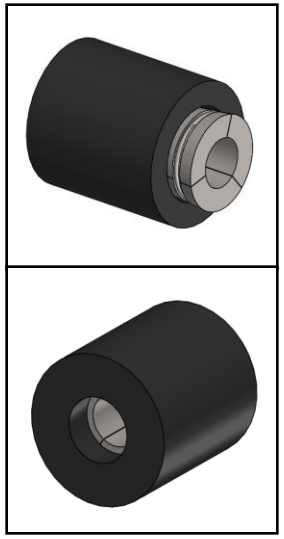


Figure 19

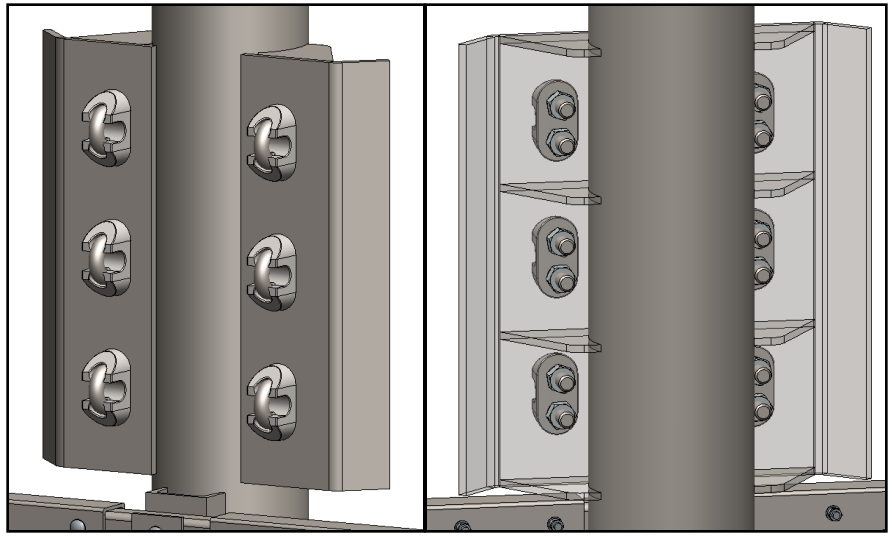


Figure 20

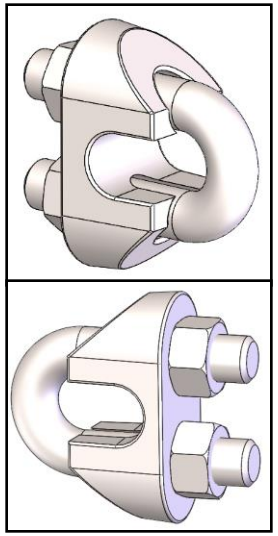


Figure 21

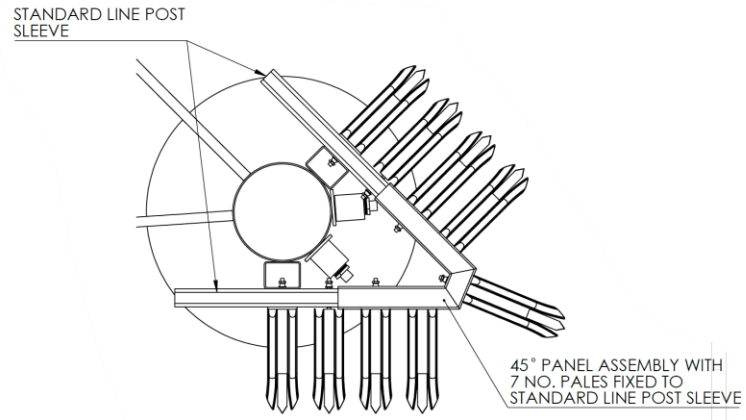
Ancillary Parts/Fixture Details – Corner Details

For corner configurations, a combination of the End Splice Connector and Custom Angled Splice Connectors can be used to achieve Corner Post Installation.

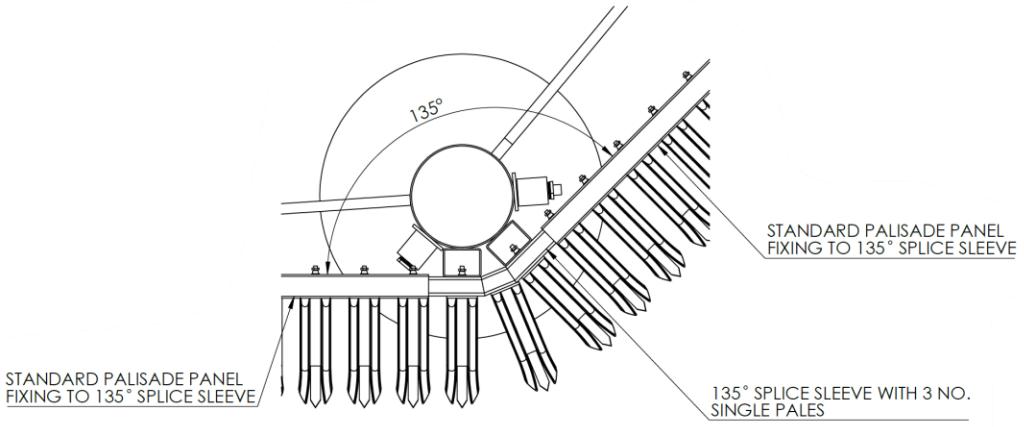
- 90° Inside and Outside Corners
- 135° Inside and Outside Corners

The installation for these Splice Connectors and Posts, along with the Panel Cross Rails and Pales is typical to all Guides provided in this Installation Manual.

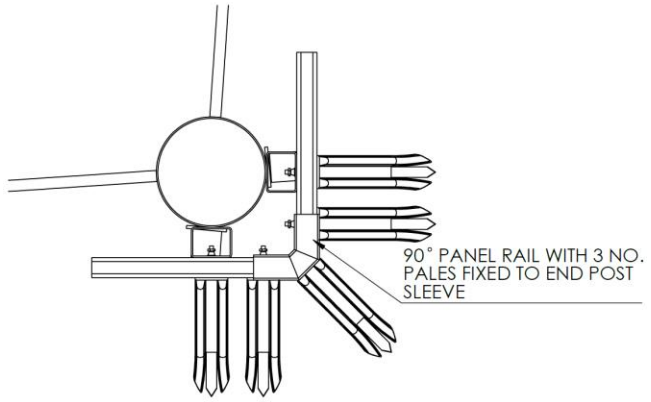
*Custom Angled Corner Splice Connectors can be designed to suit your needs. Please speak to your local salesperson and provide the necessary corner dimensions.



TYPICAL CORNER DETAIL
135° OUTSIDE CORNER CONFIGURATION
(RIGHT AND LEFT)



TYPICAL CORNER DETAIL
135° OUTSIDE CORNER CONFIGURATION
(RIGHT AND LEFT)



TYPICAL CORNER DETAIL
90° OUTSIDE CORNER CONFIGURATION
(RIGHT AND LEFT)

General Notes

Notes:

1. Concrete Cube Test – 7, 14 & 28 day concrete cube test is required. Ensure that all records are kept on file.

2. Cable Tensioning – All cable tensioning are to be recorded and filed. The temperature/pressure values for each cable is to be recorded.

3. M18 U-Bolt Grip Torque records to be filed.

4. FOUNDATION DRAWING/DETAIL DISCLAIMER:

THE DIMENSIONS OF THE FOUNDATIONS AND THE CONCRETE STRENGTH DEPICTED ARE PURELY INDICITIVE. THE SUPPLY OF SUCH INFORMATION SHOULD IN NO WAY BE CONSTRUED AS A SUBMISSION BY BETAFENCE THAT THE DIMENSIONS OF THE FOUNDATIONS AND CONCRETE STRENGTH WOULD BE FIT FOR PURPOSE OR THAT BETAFENCE HAS ASSUMED ANY DESIGN LIABILITY FOR SUCH INFORMATION. IT IS THE RESPONSIBILITY OF OTHERS TO CONFIRM THE SOIL/GROUND CONDITIONS.

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