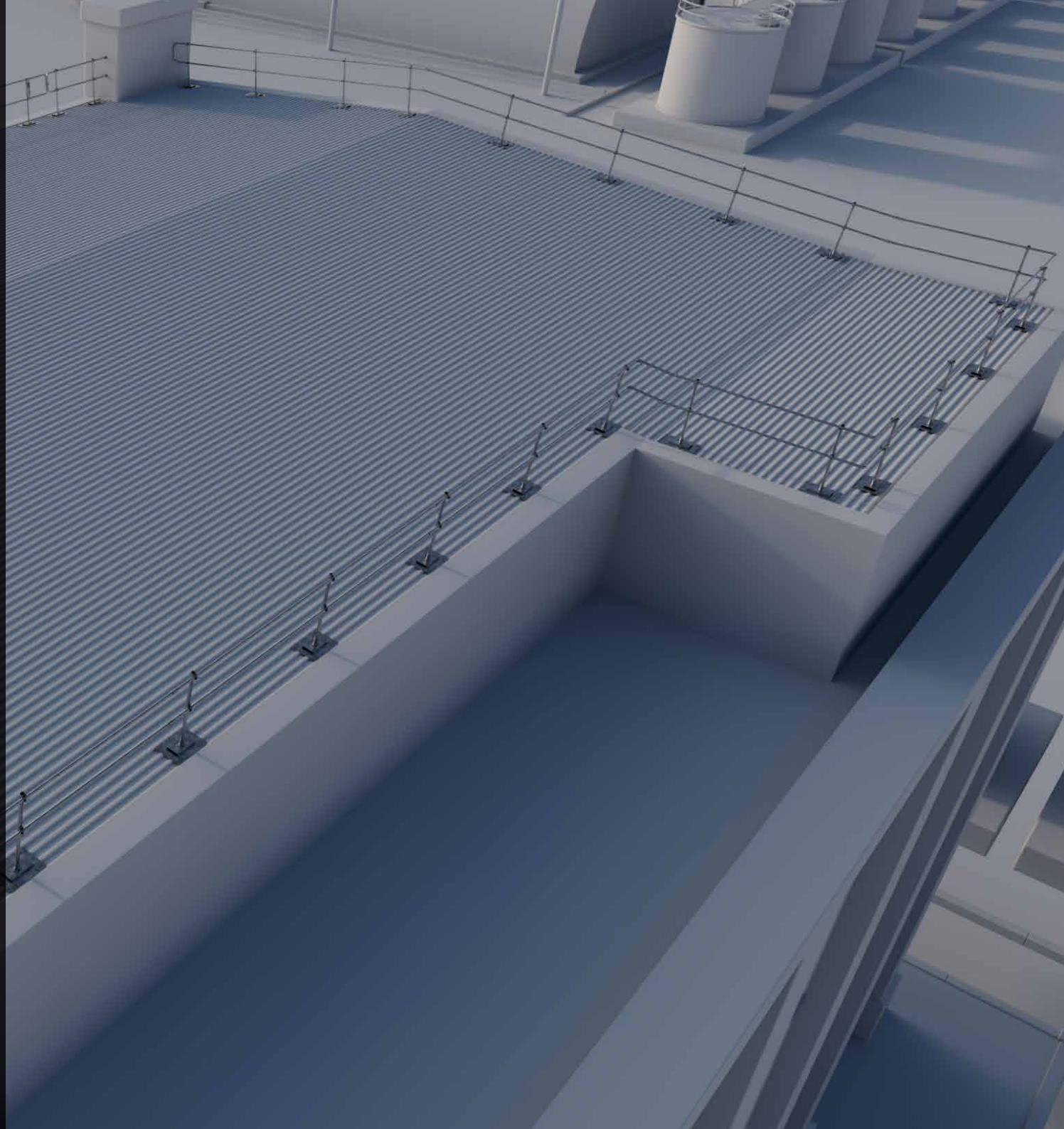




## Operation & Maintenance Manual

# TOPFIX ROOF EDGE PROTECTION SYSTEM



# SYSTEM OVERVIEW

## PERMANENT SOLUTION FOR ENHANCED SAFETY

- The TopFix Roof Protection System serves as a permanent roof guardrail, providing unparalleled protection for staff working in maintenance and inspection zones.
- Its robust design ensures exceptional stability, making it an ideal choice for contemporary commercial and industrial roofing structures.
- Unlike traditional freestanding roof protection guardrails that rely on counterweights (which can be impractical in certain environments), the TopFix system offers a superior alternative.

## ROBUST & RELIABLE

- The roof guardrail system is constructed from galvanised mild steel that meets BS EN ISO 1461 and ASTM A53 standards.
- Grub screws are made of carbon steel with Dacromet protection, ensuring low maintenance and increased reliability.
- The design includes galvanised tubing structure, clamps, and a fortified base plate with rivets and a sealing strip for a secure, weather-resistant fit.



## PRECISION SAFETY FOR EVERY ROOFLINE

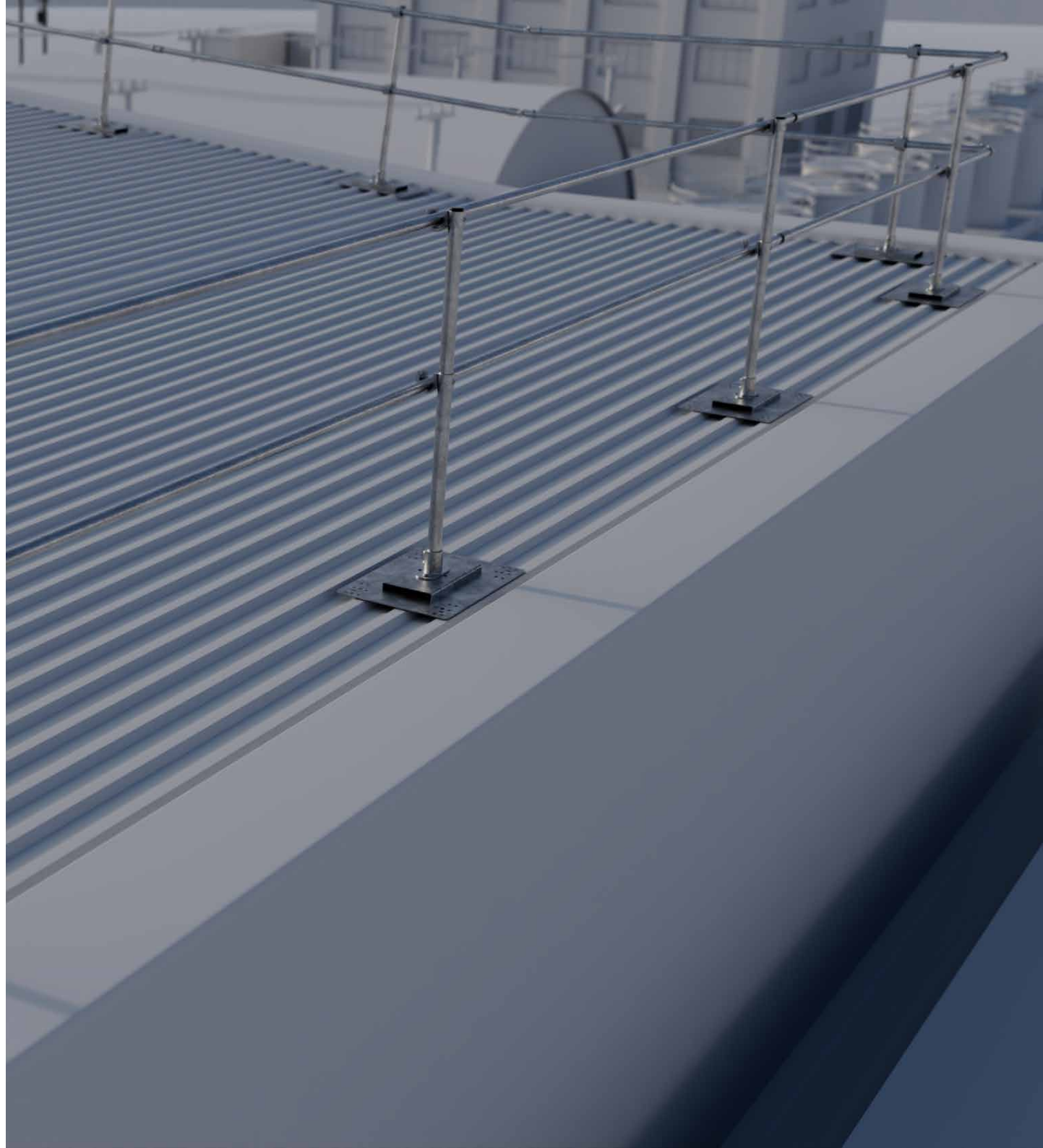
- The TopFix Roof Edge Guardrail System is meticulously engineered to conform seamlessly to any roof configuration – whether flat, pitched, or circular.
- It can navigate varied elevations, roof gradients, and complex architectural elements (such as ductwork and cable trays) at the roof's perimeter.
- The product suite includes classic vertical-legged designs as well as innovative raked models.
- TopFix Roof edge System provides comprehensive protection for industrial cladded pitched roofs, ensuring a safer work environment at heights.

# SYSTEM OVERVIEW

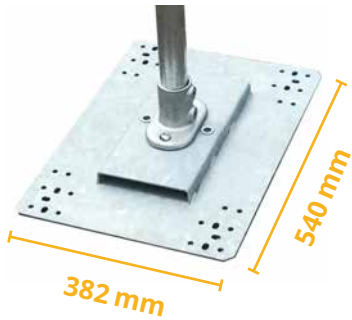
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## TOPFIX ROOF EDGE GUARDRAIL SYSTEM

- Our TopFix Roof Edge Guardrail system is fitted with a sealing strip that needs to be bonded to the metal components' underside. This innovative approach ensures they gently interface with the roof, safeguarding it from potential damage caused by heat transfer or direct component contact.

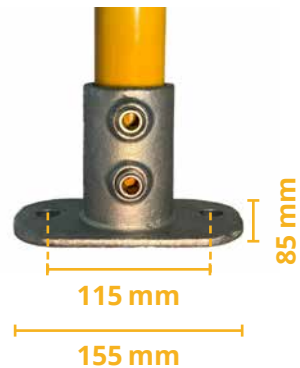


# SYSTEM OVERVIEW Components and their functions



## TOPFIX BASE PLATE

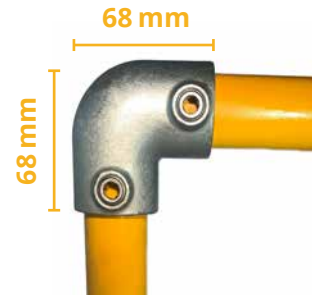
Our TopFix galvanized base plate, also known as roof plate, secures the connection between the base plate and the roof surface. This fortified clamp will ensure the vertical posts will hold the load and resist the wind speed at heights.



## BASE PLATE CLAMP

132-D

The component required to connect the TopFix base plate to the post and improve the robust connection of the system.



## 90-DEGREE ELBOW CLAMP

125-D

Our 90° two-way elbow fitting can be used to create a 90° tube bend. This galvanized 90° angle joint is to suit our 48.3od galvanized tube.



## MULTI SWIVEL ELBOW

166-D

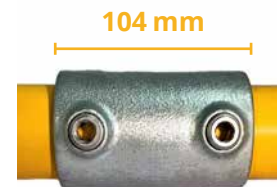
The Multi Swivel Elbow, also called adjustable knuckle is a flexible fitting typically used to create angles other than 90°. Once the preferred angle is acquired, the knuckle is locked with a standard setscrew.



## CRADLE CLAMP

MFRG-JC

Also known as galvanized cup bracket or roof edge saddle fitting. This saddle clamp suits our 48.3od galvanized tube. The open cup fitting supports the connection between posts and tubes to build or extend roof edge protection system. It provides the method of linking the horizontal galvanized tubes to the Support Legs. Grub screws are included.



## EXTERNAL TUBE CONNECTOR

149-D

Inline external tube connector is a straight fitting for connecting tubes of the same size.

# SYSTEM OVERVIEW Components and their functions



## RAIL TUBE

Either 3.2 or 6 metres lengths of rail tubes are supplied to create the top and middle rails and connect horizontally to the posts through the cradle clamps.



## PLASTIC CAP

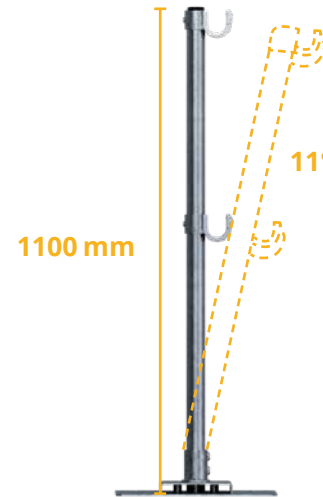
133-D

This round plastic end-cap plug is also called a round tube insert or a plastic stop end. This round end cap is to suit our 48.3od galvanised tube as part of our Freestanding Roof Edge Protection system and TopFix Roof Edge Protection system components.



## SEALING STRIP

This strip is used to form a seal between the underside of TopFix base plate and the metal rooftop. This product comes in 15 metre rolls.



## STANDARD & RAKED POST

The post can be positioned from 0° up to 11° raked angle. This is based on the site requirements.



## RIVETS

Our TopFix rivets are used in conjunction with the Base Plate to connect the base plate to the roof structure. This product comes in 100 pieces per box.

# SYSTEM OVERVIEW Compliance

## NF E85-003

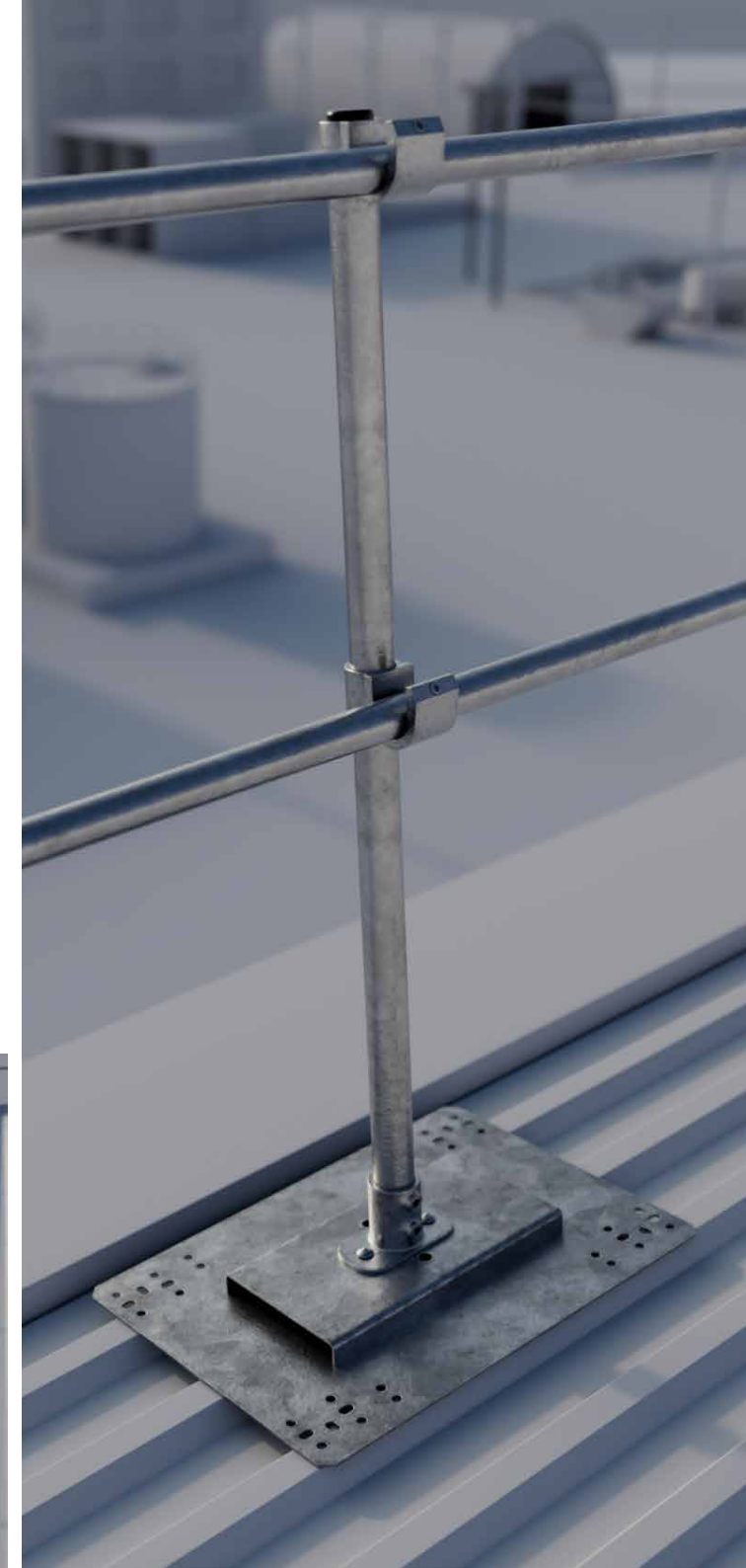
- NF E85-003 is a standard related to wind actions on structures. It provides guidance for calculating natural wind loads on buildings and civil engineering works.
- Wind loading is a critical force that freestanding roof guardrails encounter during their lifetime. This standard helps ensure structural safety in windy conditions.

## BS 6399 Part 2 Code of Practice for Wind Load

- BS 6399 provides guidance on wind loads for the design of structures. Part 2 specifically addresses wind loads on buildings.
- It covers factors such as wind velocity, velocity pressure, and basic values for calculating wind-induced forces on structures.

## EN 1991-1-4

- EN 1991-1-4, part of the Eurocode 1, focuses on wind actions. It describes principles and requirements for calculating design wind loads on structures.
- Designers use this standard to determine wind actions for various types of buildings and civil engineering works<sup>5</sup>.



# SYSTEM OVERVIEW Compliance

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Our TopFix Roof Edge Protection System comprises a fortified base plate securely affixed to the roof using rivets. The base plate connects to a vertical post that supports the horizontal rails of the guardrails via two robust cradle or saddle clamps. This system has undergone rigorous testing to comply with EN 13374 standards, ensuring optimal safety and reliability.

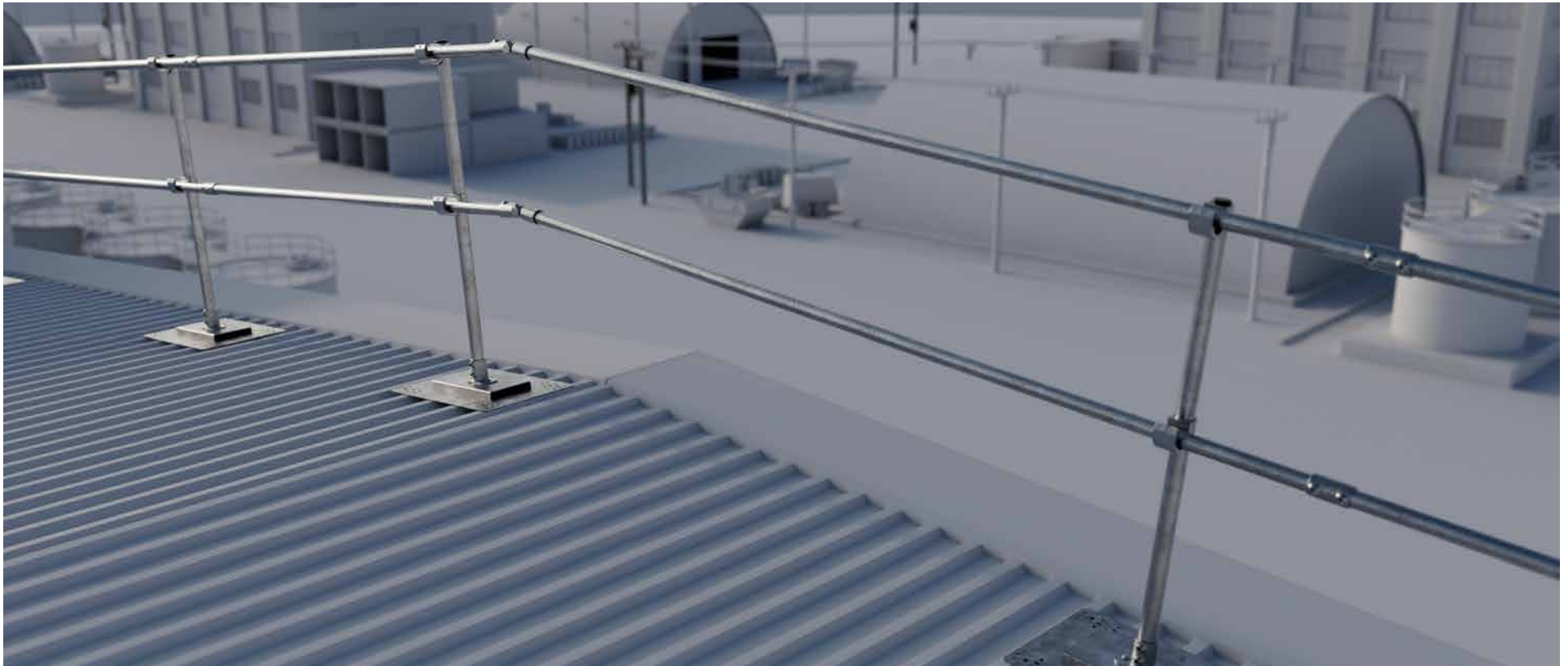
KITE Roof Edge Protection System adheres to building regulations, health and safety regulations, and the requirements of various standards, including:

↪ BS 13700:2021 | ↪ BS EN 13374:2004 | ↪ BS 4592-0:2006+A:2012

↪ BS EN ISO 14122-3:2001+A1:2010 | ↪ UK Health & Safety Executive (HSE) Work at Height (Amendment) Regulations 2007.

It also complies with:

↪ Wind Loadings to BS 6399:Part 2:1995 | ↪ Performs in excess of the HSE Specialist Inspector Report No.15 & HSG33 Health and Safety in Roof Work



# SYSTEM OVERVIEW Compliance

## STEEL TUBING

Conforms to BS EN 10255 with a wall thickness of 3.2mm.

## GALVANISATION

All steel components are galvanised according to BS EN ISO 1461 standards.

## GUARDRAIL RAILS

Both top and intermediate rails are made of steel with an external diameter of 48.3mm and a wall thickness of 3.2mm.

## VERTICAL SUPPORT LEGS

Manufactured in steel with an external diameter of 48.3mm and a wall thickness of 3.2mm.

## CAST CLAMPS

All cast clamps feature Dacromet coating on tapped holes for enhanced durability. Grub screws are made of carbon steel with Dacromet protection to minimise maintenance requirements.

## MALLEABLE CAST IRON

Cast clamps used for guardrail connections are galvanised malleable cast iron, produced in compliance with BS EN 1562.

## ON-SITE TUBING CUTS

When tubing is cut on-site, a zinc-rich paint should be applied to the cut ends to prevent corrosion.

## BASE PLATE FOR METAL ROOFS

Galvanised steel base plates meet BS EN ISO 1461 standards.

## METAL ROOF PANELS

Panels with a minimum steel thickness of 0.7mm require two rivets per corner and include a butyl sealing strip (TA-SEAL 15m roll) for integrity. Fixing centres are set at 400mm, 500mm, 333mm, and 310mm.

## COMPOSITE ROOF PANELS

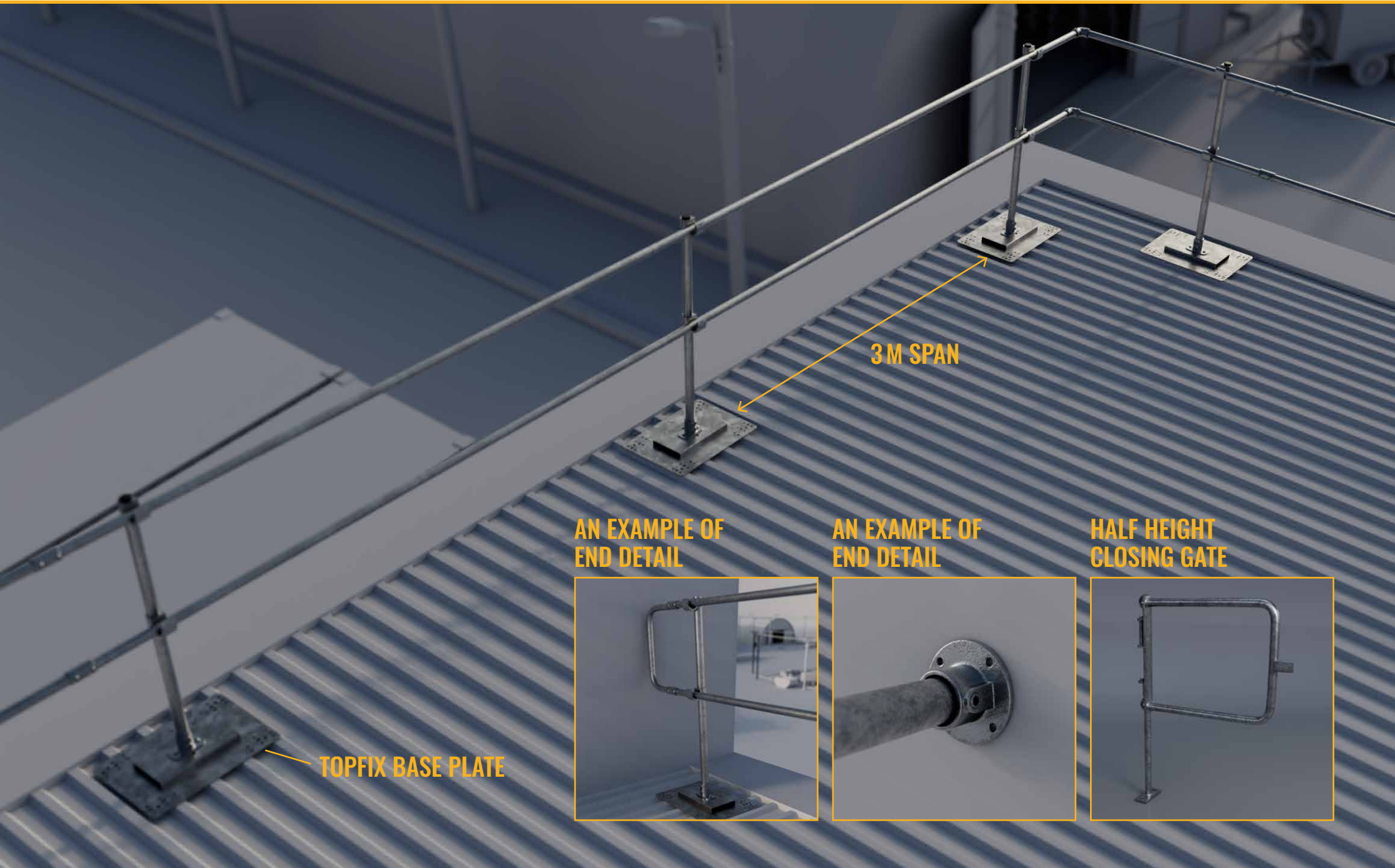
Panels with a minimum steel thickness of 0.5mm require two rivets per corner and also include a butyl sealing strip (TA-SEAL 15m roll) for integrity. Fixing centres are set at 333mm Compliance to BS 13700:2021.

## EN 13374 & BS 13700

ROOF TYPE	TUBE SIZE	TUBE THICKNESS	MAXIMUM BAY CENTRES	
			First/End Bay Length	Subsequent Bay Length
TopFix System				
Restrained	48.3 mm od	3.2 mm	3 m	3 m



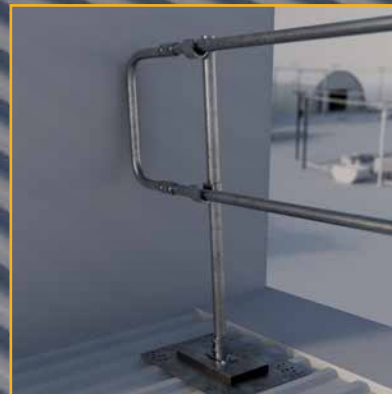
# SYSTEM OVERVIEW System layout and schematics



3M SPAN

TOPFIX BASE PLATE

AN EXAMPLE OF  
END DETAIL



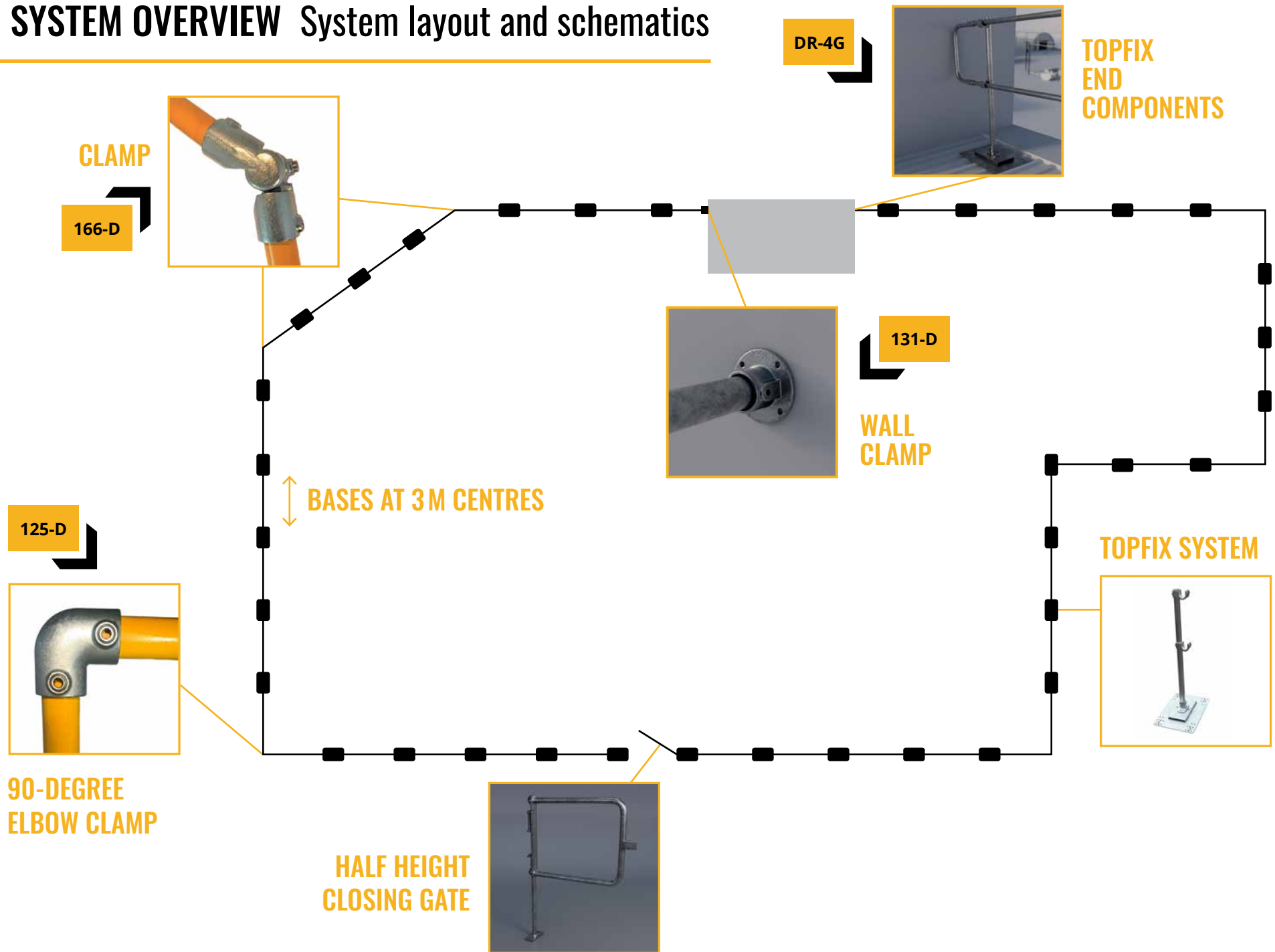
AN EXAMPLE OF  
END DETAIL



HALF HEIGHT  
CLOSING GATE



# SYSTEM OVERVIEW System layout and schematics



# INSTALLATION PROCEDURE Pre-installation checks

1

## SITE SURVEY

Conduct a thorough site survey to assess the roof area where the system will be installed. Identify any potential hazards, obstructions, or irregularities that might affect the installation.

2

## ROOF ASSESSMENT

Check the roof structure for stability and loadbearing capacity.

3

## COMPLIANCE WITH SAFETY REGULATIONS

Verify that the installation complies with local safety regulations and standards. Consider any specific requirements related to the type of building or industry.

4

## CLEARANCE AND ACCESS

Ensure there is sufficient clearance around the installation area. Confirm safe access for workers during installation and maintenance.

5

## SAFETY

Always ensure that you and the equipment are at a safe distance from the roof edge. It is recommended that this distance is no less than 2m.

6

## WEATHER CONDITIONS

Check the weather forecast. Avoid installation during adverse weather conditions (e.g., strong winds, rain, snow). Extreme weather can impact safety and installation quality.

7

## MATERIALS AND TOOLS

Gather all necessary tools and materials required for installation. Verify that the components of the Kite Group Ltd system are complete and in good condition.

8

## ASSEMBLY INSTRUCTIONS

Familiarise yourself with the assembly instructions provided by Kite Group Ltd. Follow the manufacturer's guidelines carefully during installation.

9

## WEIGHT DISTRIBUTION

Understand the weight distribution of the system. Ensure that the base plates or weights are evenly distributed to maintain stability.

10

## ANCHOR POINTS

Identify suitable anchor points for attaching the system. Ensure that the anchor points are secure and compatible with the system.

11

## TESTING AND INSPECTION

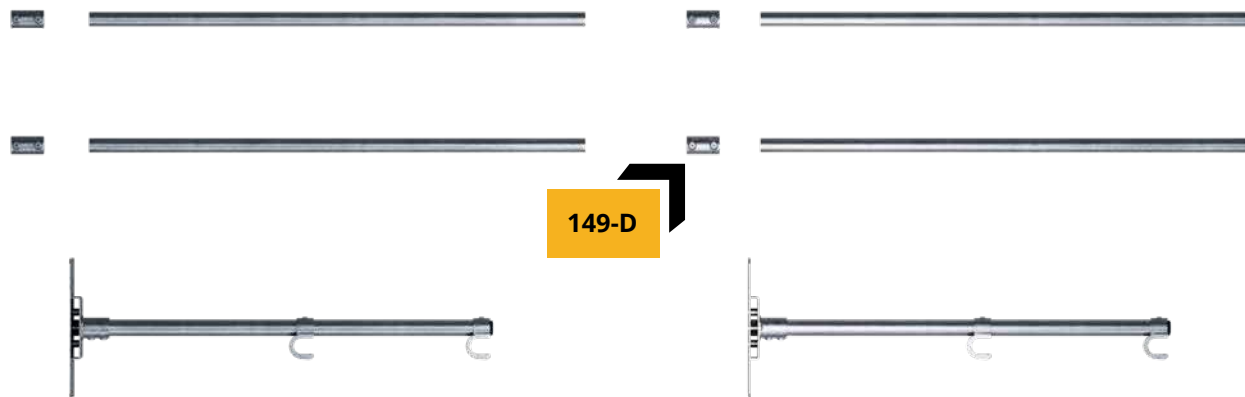
Conduct a test assembly to verify the fit and alignment of components. Inspect all parts for defects or damage before installation.

**REMEMBER** that safety is paramount when working at height. If you have any doubts or need professional assistance, consider consulting a qualified installer for a thorough assessment and guidance.

# INSTALLATION PROCEDURE Step-by-step installation instructions

Safety is paramount when it comes to fall arrest systems. Anchoring a person to the system for fall arrest purposes is strictly prohibited. Additionally, attaching components like timber infill, advertising boards, or polyethylene sheets to the system is not allowed. These guidelines are crucial to prevent accidents and ensure the wellbeing of individuals working at heights.

Lay out the equipment in approximately the positions shown below.



## MAIN RAIL TUBES PLACEMENT

- Lay out two 6.4m Main Rail Tubes (T300-4) or 3.2m (T3.2-4) side by side in a continual line for the entire length of the required guardrail.
- Ensure that these tubes do not roll towards the roof edge.

## SUPPORT LEG UNITS PLACEMENT

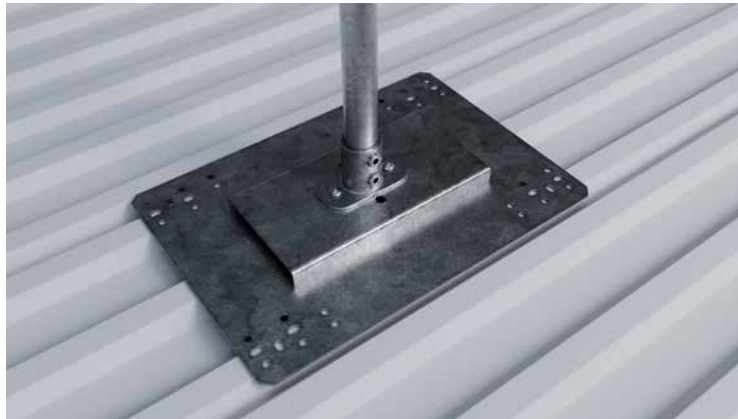
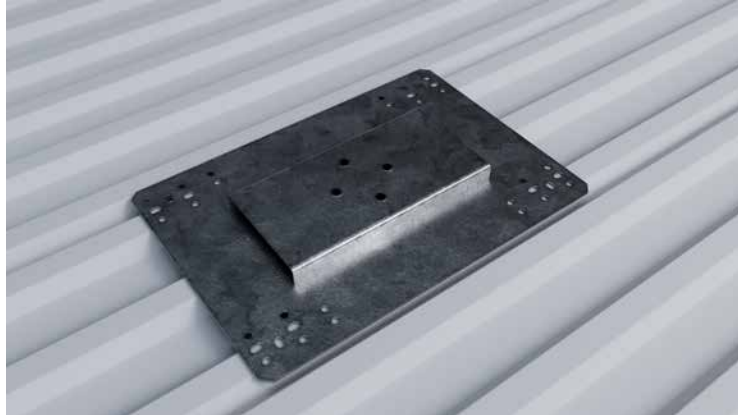
- Start laying out the Support Leg Units.
- If your starting position is from a corner, begin placing the Support Legs at the following maximum centre 3m centres (as per EN 13374 standards).

## CONTINUE SUPPORT LEG PLACEMENT

- Carry on laying out the Support Legs for the entire required length of the guardrail.

# INSTALLATION PROCEDURE Step-by-step installation instructions

# 1



## STAGE 1

- Identify the Starting Point: Begin by determining the precise location where the first Support Post will be installed.
- Base Plate: Decide on the orientation of the Base Plate, particularly which fixing holes will be used.
- Attach the Sealing Strip: On the underside of the Base Plate, adhere the double-sided Sealing Strip along its entire length. Ensure it covers all the holes that will be used for securing the plate to the metal roof.
- Position the Base Plate: Remove the backing from the Sealing Strip with care. Position the Base Plate on the metal roof in the chosen location. Apply firm pressure to the Base Plate, maintaining support to ensure full contact with the roof's crowns.
- Drilling and Fixing: With a 6.7mm (2.64-inch) drill bit, drill through two of the pre-selected holes. Secure the plate using the provided rivets. Check the alignment of the remaining six holes before drilling and riveting them into place. Use all supplied rivets for a secure installation.

# INSTALLATION PROCEDURE Step-by-step installation instructions

# 2



## STAGE 2

- Insert the Support Legs into the open cup Saddle Clamp (MFRG-JC) with the clamp facing inwards. Securely tighten the grub screws on the Standard Railing Flange (132-D).
- Place a Main Rail Tube (T300-4) into the bottom Saddle Clamp (MFRG-JC) of each Standing Leg. Ensure that at least 60mm (2.5 inches) of the tube extends beyond the Saddle Clamp, then tighten the grub screw.
- These grub screws are located on the front of the Saddle Clamp (MFRG-JC).
- Insert the second Main Rail Tube (T300-4) into the top Saddle Clamp (MFRG-JC). Position the tube to leave at least 60mm (2.5 inches) protruding from the Saddle Clamp, and then tighten the grub screw.
- Repeat the process for the subsequent Base Plate Metal Roofs. Follow the technical specification for recommended maximum centres to ensure alignment with the first Base Plate Metal Roofs. Proper alignment is crucial for a straight guardrail installation.

# INSTALLATION PROCEDURE Step-by-step installation instructions

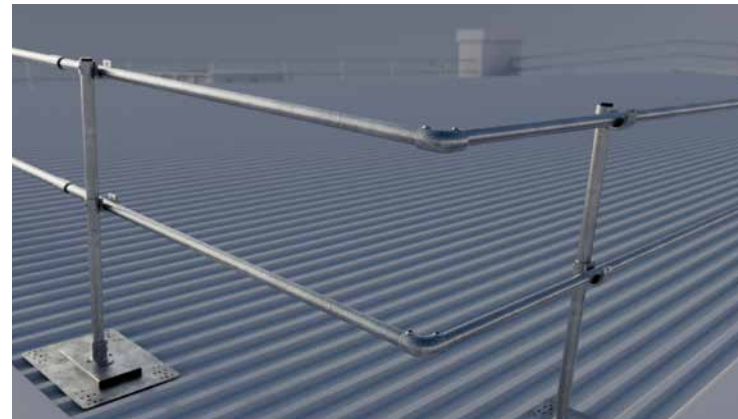
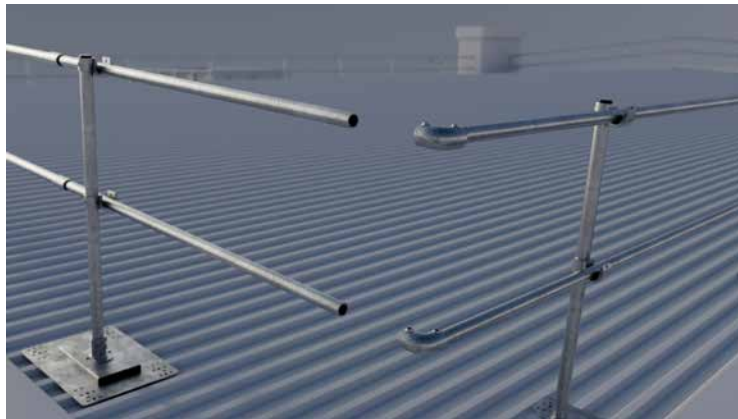
## 3



### STAGE 3

- Position: Begin working away from the corner.
- Slide: Slide a Straight Coupling (149-D) onto the top and intermediate Main Rail Tubes.
- Offset: Ensure that the Straight Couplings (149-D) are offset as shown (presumably not aligned directly on top of each other).
- Usage: Whenever possible, use only one Straight Coupling (149-D) per bay.

## 4



### STAGE 4

- Repeat Stages 2-3: Continue using the same method of fitting the Main Rail Tube (T300-4) and Support Legs for this run of guardrail.
- Alignment: Remember to align the Base Plate Metal Roofs with the first set of Base Plate Metal Roofs. Proper alignment is crucial to maintain a straight guardrail installation.
- Adjustment: After fitting, adjust, line up, and level the guardrail as needed.
- Repeat (STAGE 1-4): Follow the same steps (as described in the initial stages) for the remaining runs of the guardrail.
- Clamp Position: Position the clamp so that the grub screws are facing outwards.
- Tighten: Securely tighten the grub screw at the connected end.

# INSTALLATION PROCEDURE Step-by-step installation instructions

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5



## STAGE 5

Determine the end detail and finish the guardrail accordingly.



# INSTALLATION PROCEDURE

## POST-INSTALLATION CHECKS

Introduction Manufacturers highly recommend periodic inspections by certified professionals to ensure the integrity and safety of installed systems. In the United Kingdom, such inspections are not merely suggestions but are legally required under Regulation 5 of the Workplace (Health, Safety & Welfare) Regulations, the Work at Height Regulations, and the British Standard BS EN 365.

The frequency of these inspections should be tailored to the specific conditions of the environment, location, and intensity of use, with a minimum occurrence of once every 12 months.

## Inspection Protocol

### VISUAL ASSESSMENT

Begin with a thorough walkthrough of the entire system. Pay close attention to the client's unique requirements and evaluate whether any modifications or the addition of new products are warranted, especially in light of any refurbishment or the installation of new equipment necessitating access.

### CONFIGURATION VERIFICATION

Confirm that the current setup of the installation is consistent with the original design drawings or plans. This ensures that the system remains compliant with its intended safety design.



**REMEMBER** that these inspections are vital for upholding safety standards and mitigating potential risks. Consistent and thorough evaluations contribute significantly to maintaining a safe working environment for all personnel involved.

### UNAUTHORISED MODIFICATIONS CHECK

Vigilantly inspect for any changes or tampering with the system by unauthorised personnel. Such alterations could compromise the safety and functionality of the system.

### BASE PLATE METAL ROOFS INSPECTION

Examine all rivets that secure base plate metal roofs, ensuring they are intact and have not been compromised.

### GRUB SCREWS EXAMINATION

Verify that all grub screws are present, adequately lubricated, and tightened to the specified torque settings.

### HEIGHT AND LEVEL ASSESSMENT

Measure the overall height and levelness of the system, including the positioning of its Legs. This is particularly important to check if there's a possibility of tampering between inspections.

### CORROSION INSPECTION

Scrutinise galvanised components for any signs of corrosion. Should significant rust be detected, document the condition with digital photographs and include these images in the inspection report.

### TOE-BOARD BRACKETS CHECK

For systems equipped with toe-boards, ensure that all supporting brackets are securely in place, well lubricated, and tightened to the correct torque.

### WALL/STRUCTURE FIXINGS VERIFICATION

Where the system is affixed to walls or other structures, including cat ladder clamps, confirm that all fixings are secure and torqued as required.

### SYSTEM PLATE POSITIONING

Mark the system plate to record the date of the inspection and to indicate when the next inspection is due. Evaluate if additional plates are necessary due to any refurbishment activities.



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