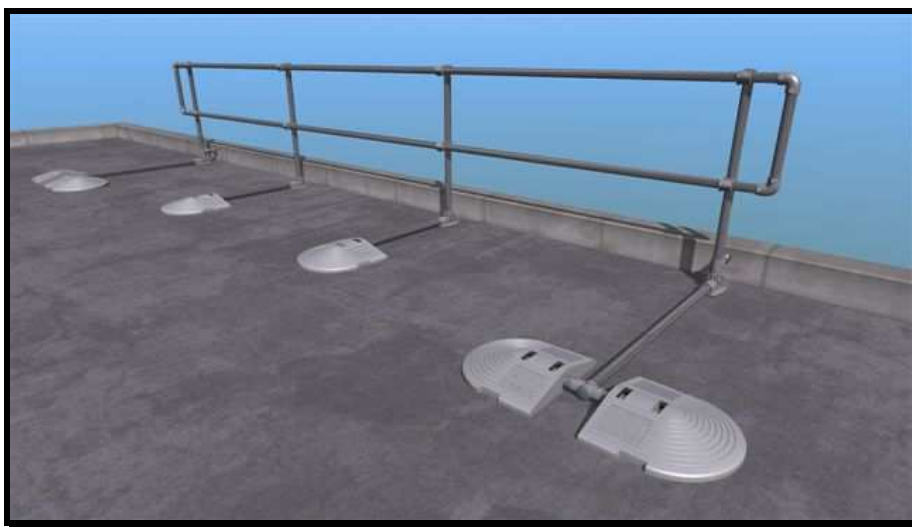




Safety at the highest level



## Temporary Roof Edge Protection System Assembly Instructions

COMPLYING WITH THE REQUIREMENTS OF EN 13374 - 2013 & BS 13700

Kee Safety Ltd  
Unit A2 Cradley Business Park  
Overend Road  
Cradley Heath  
West Midlands B64 7DW

Tel.: +44 (0) 1384 632188

# Contents

Section	Subject	Page
0	Assembling the KeeGuard Fold-shield System	0-1
0.1	Constructing the KeeGuard Fold-shield system	0-1

	Amendments	

# Assembly of KeeGuard Fold-shield

## 0.1 Assembly

### Overview

This section is broken down into the following subjects:

<b>Subject</b>	<b>Page</b>
Copyright & Amendment service	0-2
Owner's duty of care	0-2
Personnel requirements	0-3
Assembling the KeeGuard Fold-shield System	0-4

---



## **Copyright**

This documentation contains information that is protected by copyright. Neither extracts nor the documentation as a whole may be photocopied, reproduced, translated or put onto data carriers without prior approval.

All other rights are reserved.

---

## **Amendment service**

The documentation is not covered by the amendment service of the manufacturer or its branches. Amendments to this documentation can be made without further notification.

---

## **0.2 Owner's duty of care**

### **Contents**

In this section, you will be able to familiarise yourself with the tasks and obligations of the owner or employer with regard to working with the KeeGuard Fold-shield system .

---

### **Definition of "Authorised person"**

A person is regarded as an authorised person if he/she is commissioned to carry out certain types of work on or using the Fold-shield system in accordance with instructions.

---

### **Protection for personnel**

In particular, the owner or employer must ensure that any personal protection equipment required:

- is available for use,
  - is checked regularly.
-

## **Instruction and training**

In particular, the owner or employer must ensure that:

- assembly personnel are instructed in all relevant aspects of health and safety at work and environmental protection before starting work for the first time and also at least once a year after that,
- a full set of legible Assembly instructions are provided to the Installation personnel prior to them commencing work.
- all relevant personnel have familiarised themselves with the contents of these assembly and operating instructions before assembly.

## **0.3 Personnel requirements**

### **Contents**

The manufacturer's requirements regarding assembly, and repair personnel for installing the Fold-shield system are as follows.

---

### **Definition of a “Competent Person”**

Competent people are those who have sufficient knowledge of the system to be able to assemble or check it on account of their specialist training and experience and are familiar with the relevant regulations, guidelines and generally recognised rules of practice – e.g. Health & Safety Guidelines, accident prevention regulations and suchlike – to such an extent that they can carry out assembly and assess whether or not the system under test is safe to be used.

The owner / employer is responsible for selecting a competent person.

---

### **Duties of the assembly personnel**

The assembly personnel must carry out the following duties:

- Assemble the system and check to make sure that it is working safely and has no faults.
- 

### **Requirements relating to assembly personnel**

Assembly personnel must meet the following requirements in order to be able to carry out their duties:

- They must have received instruction from the owner or employer.
  - They must have sufficient knowledge of the English Language in order to be able to understand these Assembly instructions.
  - They must be free from any disability that may effect their ability to assemble this system or understand these instructions.
-

## 0.4 Assembling the KeeGuard Fold-shield System

### 0.41 Checking the KeeGuard Fold-shield system's components

#### Contents

An overview of all the parts which you need in order to assemble the system properly.



#### Danger!

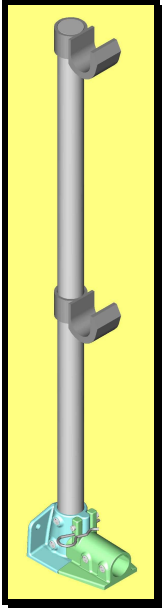
If some of the parts listed in the parts list or on the delivery note are missing or damaged, then you must replace them with original parts. Contact the manufacturer to obtain these.

**Caution**

#### Designation and function of the components for standard systems

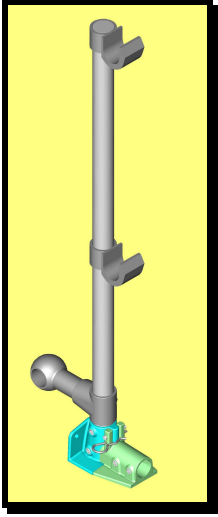


The KeeGuard Fold-shield system consists of the following individual components. The exact number of individual components depends on the length and construction of the KeeGuard Fold-shield system .

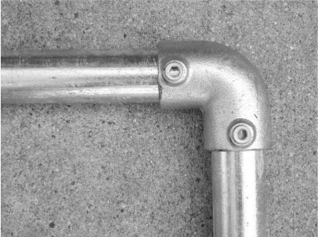

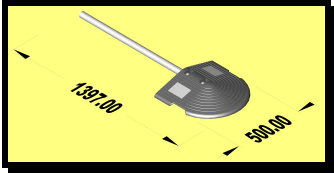
**Note:** A complete list of all parts and details on the total weight of the fall prevention system are provided with the delivery. The load-bearing capacity of the roof must be equal to or exceed the capacity specified.

	Designation	Function	Quantity	For total length
1	"KFU3" vertical post 	Vertical posts for the system Diameter = 48.3 mm Thickness = 2.9mm Matl. = Galv. Iron & Steel Height = 1100 mm Weight = 8.6 kg each Fitted with 2 off 135-8 fittings for the top and mid-rails.	3 off	6 m
			3 off + 1 off for every 3 m of additional length	> 6 m

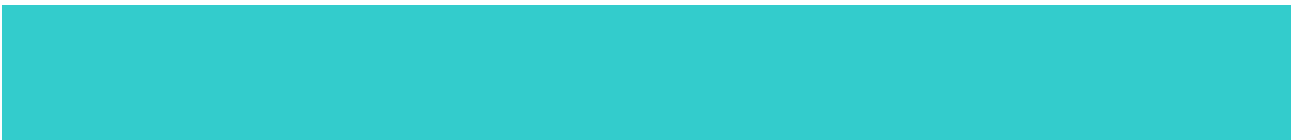
## 0.41 Checking the Fold-shield system's components

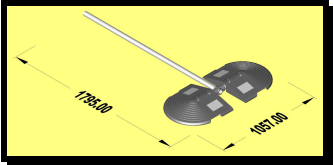
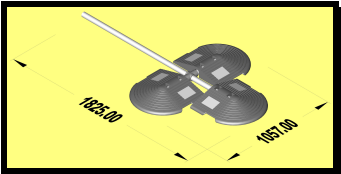
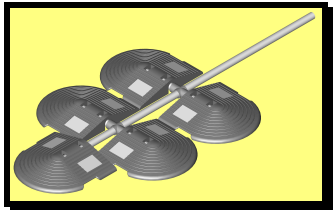
### Designation and function of the components for standard systems

	Designation	Function	Quantity	For total length
2	"KFU4" Braced Vertical post 	Braced Vertical posts for the system  Diameter = 48.3 mm Thickness = 2.9mm Matl. = Galv. Iron & Steel Height = 1100 mm Weight = 10 kg each  <b>Fitted with 2 off 135-8 fittings for the top and mid-rails plus a lower brace to butt up against the parapet wall.</b>	2 off  1 off for every 6 m of additional length	6 m  > 6 m
3	Top and mid-rails 	Top rail and mid rail form the fall guard  Diameter = 48.3 mm Thickness = 2.9mm Matl. = Galvanised Steel Length = variable Weight = 3.26 kg / m	1of each @6m  As stated	6 m  > 6 m
4	77 - 8 plastic stopper 	Seals off the open ends of the tube.	1 off for each tube end	./

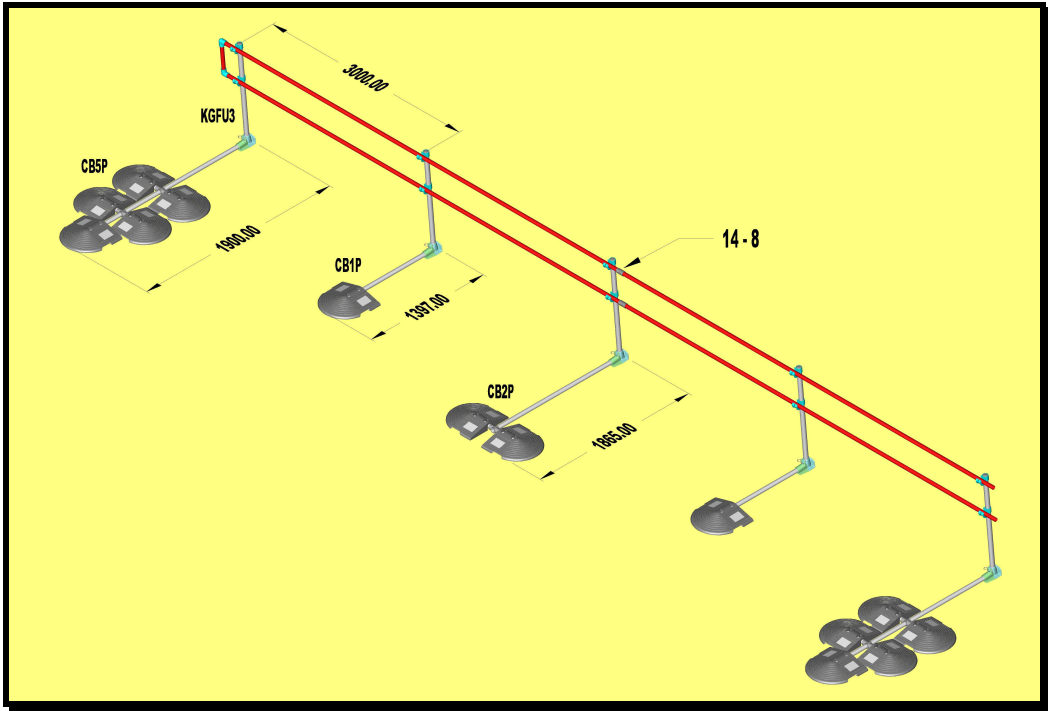
5	<p>15 - 8 90° elbow joint</p> 	<p>Connects the top and mid rails at an angle of 90°</p>	<p>1 off for each 90° angle</p>	<p>./.</p>
6	<p>BC53 - 8 in-line hinge joint</p>	<p>Connects the top and mid rails at variable angles of up to 202°.</p>	<p>1 off for each angle</p>	<p>./.</p>
7	<p>14 - 8 straight tube connector</p> 	<p>Connects the top and mid rails for a straight connection</p> <p>Connection in a top rail should be in the same bay as the connection in the mid rail.</p> <p>Note: assemble with grub screws pointing downwards</p>	<p>1 off for each straight tube connection</p>	<p>./.</p>
8	<p>Counter-weights and Cantilever Tube:</p> <p>CB1P = 1 Weight ( Cantilever 1075mm )</p> <p>SEE IMAGE BELOW</p> 	<p>Produce the Total weight required.</p> <p>Each Counter-weight molding = 13.5 kg to 15.5 kg</p>	<p>2 × CB1P 2 × CB5P</p>	<p>Unrestrained 6 m</p>



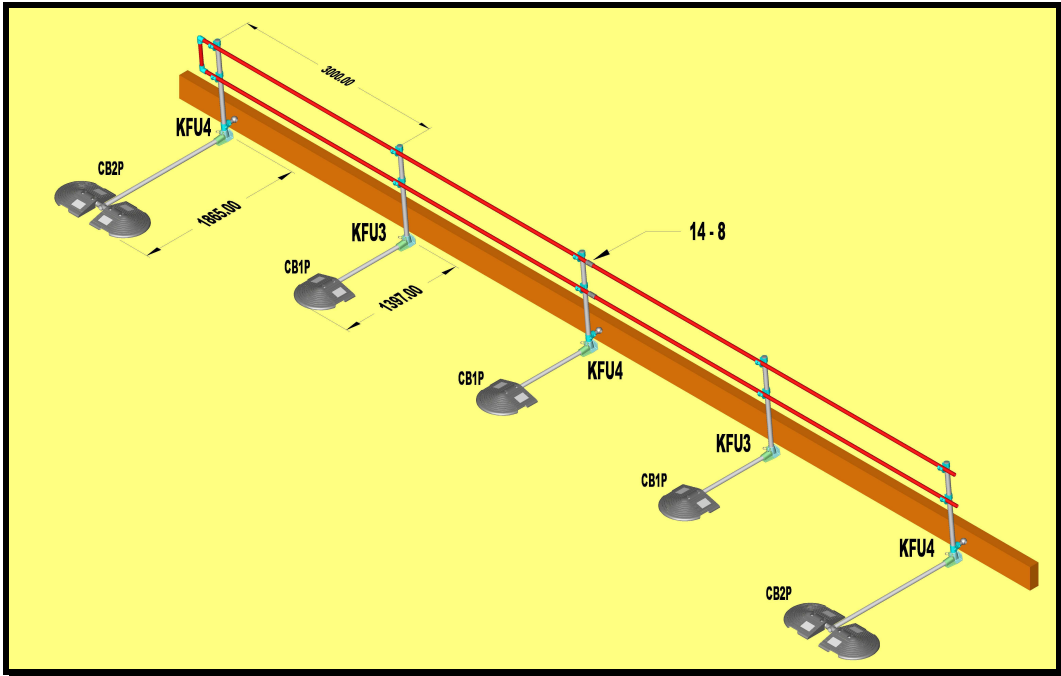


<p>CB2P = 2 Weight ( Cantilever 1575mm )</p> <p>SEE IMAGE BELOW</p>  <p>CB3P = 3 Weight ( Cantilever 1575mm )</p> <p>SEE IMAGE BELOW</p>  <p>CB5P = 5 Weight ( Cantilever 1575mm )</p> <p>SEE IMAGE BELOW</p> 		<p>2 × CB1P 2 × CB5P</p> <p>+ 1 × CB1P for every 3 m of additional length &amp;</p> <p>+ 1 × CB2P for every 6 m of additional length</p>	<p>Unrestrained &gt; 6 m</p>
---	--	--	----------------------------------

**Installation diagram Un-Restrained 6m Plus - Parapet wall within 2 metres**



**Installation diagram Restrained 6m Plus - Parapet wall at least 250mm High**



## 0.42 Selecting a location for installation

### Contents

Necessary requirements for the installation site.

---



#### Danger!

The condition of the installation site has a decisive influence on the safe functioning of the KeeGuard Fold-shield system. If the prerequisites are not met at the site of installation, then do not install the system until you have consulted the manufacturer.

- If you cannot be certain of the load-bearing capacity of the roof, then contact a structural engineer before starting construction.

### Requirements relating to the installation site

The installation site must meet the following requirements:



Criterion	Requirement
Roof construction	Only flat roofs are permissible for this installation.
Permissible roof pitch	Up to 10°
Roof surface	Only, concrete, mineral felt, asphalt (in this case protection may be required to prevent damage to roof surface) or PVC sheeted roofs are permissible for this installation.  The surface of the roof must be free from loose deposits, oil, grease, algae, gravel & accumulated water.
Weather conditions	The roof must be free from snow and ice.  If there is the risk of water freezing over during assembly or it starts to snow, then the system must not be installed.  KeeGuard Fold-shield must not be installed if it is very windy.

## 0.43 Installing the KeeGuard Fold-shield system

### Contents

Description of the standard construction

### Danger!

- If you have been sent a detailed installation diagram with the delivery, you must not deviate from this installation diagram as otherwise the safe functioning of the KeeGuard Fold-shield system cannot be guaranteed.
- The KeeGuard Fold-shield system must not be installed on roofs which are covered with snow or ice. The roof surface must not become covered with snow or ice during assembly.
- Do not use any non approved or damaged parts for assembly.
- Always use all the parts supplied, especially all the weights! If there is insufficient space or there is insufficient load-bearing capacity at the site of installation, then you must not use the KeeGuard Fold-shield system!
- Competent assembly personnel who must use Personal Protection Equipment to prevent them from falling, may only carry out installation.
- KeeGuard Fold-shield is suitable for fitting on Sarnafil PVC membranes without any further requirements. In the case of FPO membranes it will be necessary to incorporate a section of fleece product or Elastomer tiles to act as a barrier between the underside of the KeeGuard Fold-shield and the membrane (for further technical assistance, contact the membrane manufacturer).

---

### Before you start

Before you can start on the installation, you must have carried out the following tasks:

- Check the individual parts are there and not damaged
- Select a suitable location for installation.
- Remove any oil, grease and loose debris from the roof. Standard chipping coverage depth is 15mm. Should the chipping coverage depth exceed this longer upright tubes are required (maximum 1400mm), to maintain the 1100 mm top rail height.
- During installation at least two people should be on the roof at all times. Prior to the KeeGuard Fold-shield Free standing guardrail being erected, all personnel on the roof should ensure they stay at least 2m from the edge of the roof at all times.

Installers should wear a full body safety harness and lanyard, which should be suitably attached to a safe anchor point at all times. The lanyard must be short enough to prevent installers reaching the edge of the roof (so that they are never in a position where they may fall from the roof).

- The above recommendations are made in addition to the following:  
Installers and users must comply with all relevant health and safety regulations. In the U.K., particular attention should be drawn to the following H.S.E. publications: -
  - i) Construction summary sheet – Safety in roofwork.
  - ii) Construction sheet No 21 – Work on flat roofs: - Protection against falls.

U.K. based installers / users may obtain copies of the above publications – free of charge – from their Health and Safety Executive area office.

### **Tools required**

You will need the following in order to install the fall prevention system:

- Hex key socket screw size 5/16" AF
- Torque wrench 10- 60 Nm approx.
- Drill with suitable drill bit (only for wall connection)
- Tape measure
- 50 mm tube cutter
- Soft Mallet

### **Preliminary remarks relating to the installation of the Fold-shield system for runs less than 6 m long**

You must note the following points if you are intending to install a run in the above situation :

- You must contact our technical service department on  
*tel. 0044 118 9311022*

if you intend to install a system with a total length of less than 6 m.

### **Preliminary remarks on the use of tube connectors (Fittings)**

Only use the tube connectors as follows:

- You must use the 14 - 8 straight tube connectors for straight connections.
  - You must use the 15 - 8 90° tube connectors for 90° elbow connections.
  - You must use the BC53 - 88 hinge joint for angle connections adjustable through 202°.
  - Variable angle corner joints of greater than 90° need supporting by either a brace across the angle (using non-swivel type fittings), or by a supporting upright utilising a CB2P counter balance. The brace option is limited to use between the angles of >90° & 120° (based on using a 29 - 8 type fitting).
-

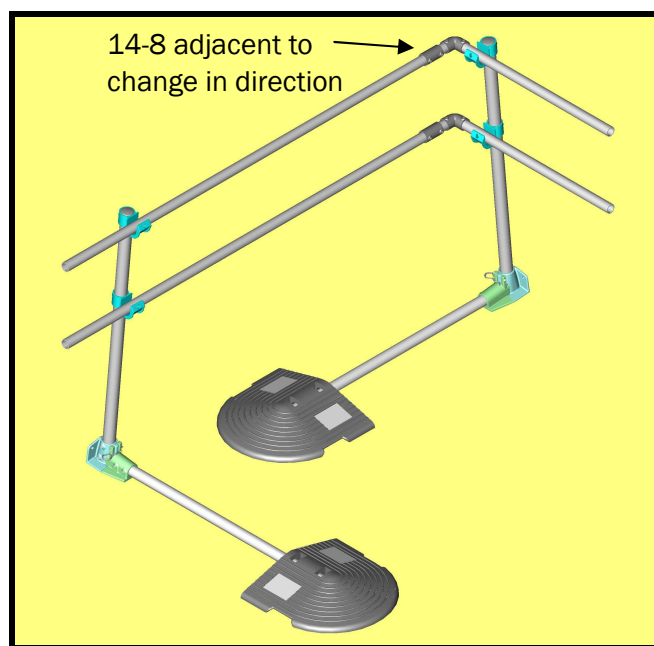
## Installing the 6m PLUS Un-Restrained KeeGuard Fold-shield system – parapet within 2m or edge at least 2m away.

### Step 1: Positioning the Uprights and Counter-Balances

Install the assembled vertical posts. Start with the KFU3 vertical post at the beginning of the section of railing followed by a second KFU3 at no more than 3m from the first KFU3. Subsequently add KFU3 assemblies thereafter.

You must note the following points during assembly:

- The KFU3 Post must first be raised to its upright position and locked in position with the retaining clip if not already done so.
- At the beginning and end of the section of railing, there must always be a KFU3 vertical post connected to a CB5P counterweight if it is not possible to have a wall connection. The arrangement of all the other counterweights is shown in the installation diagrams.
- At the Upright position adjacent to a Rail Joint, 14 - 8, there must always be a CB2P counterweight . The arrangement of all the other counterweights is shown in the installation diagrams.
- The maximum permissible distance between adjacent vertical posts is 3 m (see the installation diagram supplied).
- The maximum permissible distance between a vertical post – before or after angle connections is 500 mm (see installation diagram supplied).
- All the counterweights must be evenly spaced.
- To protect asphalt roofs from damage it is recommended that Spartan OR Elastomer tiles be placed under all uprights and counterbalances.
- At changes in direction a joint in the rail is required just before it, 200mm max, to facilitate ease of use of the system when raising or lowering the sections of Guardrail.



## Step 2: Fitting the top and mid rails

Fit the top and mid rails between the vertical posts as shown in the diagram. To do this, you must drop the rail into the fitting on each vertical post.

You must note the following points during assembly:

- For runs greater than 6 metres each section of the top and mid rails must be at least 6.4 m long (based on maximum 3m bay size). Shorter sections of tube are only permissible for sections less than 6m.
- The top and mid rails may only be connected together using 14 - 8, 15 - 8, 19 - 8, BC53 - 88 and 55 - 8 fittings.
- Ensure the tube connector fittings for the top and mid rail are in line with each other otherwise the system cannot be folded.

## Step 3: Tightening the adjusting screws

Finally, tighten all the adjusting screws by applying a tightening torque of 39 Nm.

## Terminating the run

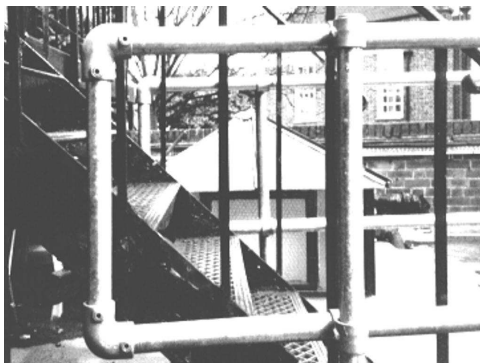
The following terminations can be used at the ends according to the structural conditions in each case:

### Free end with 77 - 8 plastic stopper

Seal off the open ends of the top and mid rails using a 77 - 8 plastic stopper on each end.

### Free end with D-shaped bend

Connect the open ends (max. projection 500 mm) of the top and mid rails using two 15 - 8, 90° fittings and a short vertical tube to form a D-shaped bend. There must be no joint in the rails forming the D.



## Installing the 6m PLUS Restrained KeeGuard Fold-shield system – 250mm High Parapet.

### Step 1: Positioning the Uprights and Counter-Balances

Install the assembled vertical posts. Start with the KFU4 vertical post at the beginning of the section of railing followed by a KFU3 at no more than 3m from the first KFU4. Subsequently add KFU3 assemblies thereafter. At every 6m intervals a KFU4 post is required.

You must note the following points during assembly:

- The KFU3 & KFU4 Posts must first be raised to its upright position and locked in position with the retaining clip if not already done so.
- At the beginning and end of the section of railing, there must always be a KFU4 vertical post connected to a CB2P counterweight if it is not possible to have a wall connection. The arrangement of all the other counterweights is shown in the installation diagrams.
- At the Upright position adjacent to a Rail Joint, 14 - 8, there must always be a KFU4 Post and CB2P counterweight. The arrangement of all the other counterweights is shown in the installation diagrams.
- The maximum permissible distance between adjacent vertical posts is 3 m (see the installation diagram supplied).
- The maximum permissible distance between a vertical post – before or after angle connections is 500 mm (see installation diagram supplied).
- All the counterweights must be evenly spaced.
- To protect asphalt roofs from damage it is recommended that Spartan OR Elastomer tiles be placed under all uprights and counterbalances.
- At changes in direction a joint in the rail is required just before it, 200mm max, to facilitate ease of use of the system when raising or lowering the sections of Guardrail.

### Step 2: Fitting the top and mid rails

Fit the top and mid rails between the vertical posts as shown in the diagram. To do this, you must drop the rail into the fitting on each vertical post.

You must note the following points during assembly:

- For runs greater than 6 metres each section of the top and mid rails must be at least 6.4 m long (based on maximum 3m bay size). Shorter sections of tube are only permissible for sections less than 6m.
- The top and mid rails may only be connected together using 14 - 8, 15 - 8, 19 - 8, BC53 – 88 and 55 – 8 fittings.
- Ensure the tube connector fittings for the top and mid rail are in line with each other otherwise the system cannot be folded.



### **Step 3: Tightening the adjusting screws**

Finally, tighten all the adjusting screws by applying a tightening torque of 39 Nm.

### **Terminating the run**

The following terminations can be used at the ends according to the structural conditions in each case:

#### **Free end with 77 - 8 plastic stopper**

Seal off the open ends of the top and mid rails using a 77 - 8 plastic stopper on each end.

#### **Free end with D-shaped bend**

Connect the open ends (max. projection 500 mm) of the top and mid rails using two 15 - 8, 90° fittings and a short vertical tube to form a D-shaped bend. There must be no joint in the rails forming the D.

The KeeGuard Fold-shield system is also available with Aluminium Horizontal Top and Mid Rails to reduce the amount of weight being lifted when the system is either raised or lowered. The Lite system uses a different configuration to the standard system and is installed as follows.

### **Installing the 6m PLUS Un-Restrained KeeGuard Fold-shield Lite system – parapet within 2m or edge at least 2m away.**

#### **Step 1: Positioning the Uprights and Counter-Balances**

Install the assembled vertical posts. Start with the KFU3 vertical post at the beginning of the section of railing followed by a second KFU3 at no more than 1.2m from the first KFU3. Subsequently add KFU3 assemblies thereafter.

You must note the following points during assembly:

- The KFU3 Post must first be raised to its upright position and locked in position with the retaining clip if not already done so.
- At the beginning and end of the section of railing, there must always be a KFU3 vertical post connected to a CB5P counterweight if it is not possible to have a wall connection. The arrangement of all the other counterweights is shown in the installation diagrams.
- At the Upright position adjacent to a Rail Joint, 14 - 8, there must always be a CB2P counterweight. The arrangement of all the other counterweights is shown in the installation diagrams.
- The maximum permissible distance between adjacent vertical posts is 1.2m (see the installation diagram supplied).
- The maximum permissible distance between a vertical post – before or after angle connections is 500 mm (see installation diagram supplied).
- All the counterweights must be evenly spaced.
- To protect asphalt roofs from damage it is recommended that Spartan OR Elastomer tiles be placed under all uprights and counterbalances.

## Step 2: Fitting the top and mid rails

Fit the Aluminium top and mid rails between the vertical posts. To do this, you must drop the rail into the fitting on each vertical post.

You must note the following points during assembly:

- For runs greater than 6 metres each section of the top and mid rails must be at least 6.0 m long (based on maximum 1.2m bay size). Shorter sections of tube are only permissible for sections less than 6m.
- The top and mid rails may only be connected together using 14 - 8, 15 - 8, 19 - 8, BC53 - 88 and 55 - 8 fittings.
- Ensure the tube connector fittings for the top and mid rail are in line with each other otherwise the system cannot be folded.

## Step 3: Tightening the adjusting screws

Finally, tighten all the adjusting screws by applying a tightening torque of 39 Nm.

## Terminating the run

The terminations advised for the standard system can be used at the ends according to the same structural conditions in each case.

## Installing the 6m PLUS Restrained KeeGuard Lite Fold-shield system – 250mm High Parapet.

### Step 1: Positioning the Uprights and Counter-Balances

Install the assembled vertical posts. Start with the KFU4 vertical post at the beginning of the section of railing followed by a KFU3 at no more than 1.2m from the first KFU4. Subsequently add KFU3 assemblies thereafter. At every 6m intervals a KFU4 post is required.

You must note the following points during assembly:

- The KFU3 & KFU4 Posts must first be raised to its upright position and locked in position with the retaining clip if not already done so.
- At the beginning and end of the section of railing, there must always be a KFU4 vertical post connected to a CB2P counterweight if it is not possible to have a wall connection. The arrangement of all the other counterweights is shown in the installation diagrams.
- At the Upright position adjacent to a Rail Joint, 14 - 8, there must always be a KFU4 Post and CB2P counterweight. The arrangement of all the other counterweights is shown in the installation diagrams.
- The maximum permissible distance between adjacent vertical posts is 1.2 m (see the installation diagram supplied).
- The maximum permissible distance between a vertical post – before or after angle connections is 500 mm (see installation diagram supplied).
- All the counterweights must be evenly spaced.

- To protect asphalt roofs from damage it is recommended that Spartan OR Elastomer tiles be placed under all uprights and counterbalances.
- At changes in direction a joint in the rail is required just before it, 200mm max, to facilitate ease of use of the system when raising or lowering the sections of Guardrail.

### **Step 2: Fitting the top and mid rails**

Fit the top and mid rails between the vertical posts as shown in the diagram. To do this, you must drop the rail into the fitting on each vertical post.

You must note the following points during assembly:

- For runs greater than 6 metres each section of the top and mid rails must be at least 6.4 m long (based on maximum 1.2m bay size). Shorter sections of tube are only permissible for sections less than 6m.
- The top and mid rails may only be connected together using 14 - 8, 15 - 8, 19 - 8, BC53 - 88 and 55 - 8 fittings.
- Ensure the tube connector fittings for the top and mid rail are in line with each other otherwise the system cannot be folded.

### **Step 3: Tightening the adjusting screws**

Finally, tighten all the adjusting screws by applying a tightening torque of 39 Nm.

### **Terminating the run**

The following terminations can be used at the ends according to the structural conditions in each case:

#### **Free end with 77 - 8 plastic stopper**

Seal off the open ends of the top and mid rails using a 77 - 8 plastic stopper on each end.

#### **Free end with D-shaped bend**

Connect the open ends (max. projection 500 mm) of the top and mid rails using two 15 - 8, 90° fittings and a short vertical tube to form a D-shaped bend. There must be no joint in the rails forming the D.

<b>ISSUE No.</b>	<b>AMENDMENTS MADE</b>	<b>DATE MODIFIED</b>
1	First Issue	15 <sup>th</sup> June 2008
2	Page 0 - 11 - Top Bullet point and diagram added.	21 <sup>st</sup> June 2010
3	Page 0 - 9 - Soft Mallet added to tools	6 <sup>th</sup> August 2010
4	Page 0 - 8 - Permissible roof pitch changed	5 <sup>th</sup> October 2010
5	Page 0 - 5 - New Item 2 added. Page 0 - 8 - Restrained system diagram added Page 0 - 14 - Restrained system installation details added	20 <sup>th</sup> December 2010
6	Page 0 - 16 - Restrained KG Lite system installation details added	14 <sup>th</sup> January 2010
7	Cover - Rev No., EN 13374 Year, Address & Copyright year Page 0 - 7 - CB3P added in place of CB7P Page 0 - 8 - New Drawings Page 0 - 12 - Upright Centre Dimensions changed Page 0 - 13 - Upright Centre Dimensions changed Page 0 - 14 - Upright Centre Dimensions changed	28 <sup>th</sup> March 2013
8	Cover - Rev No. & Copyright year Page 0 - 4 - KFU3 Details added Page 0 - 5 - KFU4 Details added & Item 3 Spec changed Page 0 - 6 - Item 8 Changed Page 0 - 7 - CB5P Added Page 0 - 8 - Drawings Changed Page 0 - 12 - Upright references Changed Page 0 - 14 - Upright references Changed Page 0 - 15 - Upright references Changed Page 0 - 16 - Upright references Changed	1 <sup>st</sup> March 2014
9	Cover - BS 13700 added	22 <sup>nd</sup> January 2021