

Alvin Freestand Compact
FREESTANDING
ROOF EDGE PROTECTION
Operation and Maintenance Manual



Issue No. 004. 08-2024

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1.1 System Supplier:

Alvin Key Clamp
(AKC Systems Ltd)
PO Box 478
Sutton
Surrey
SM1 9PG
United Kingdom

Tel: +44 (0) 20 8254 2626
Model year: 2022

1.1.1 System Installed by:

These Operating & Maintenance Instructions are a component part of any Freestanding Roof Edge Protection system and must be used whenever the system is assembled. At no time should any pages from these instructions be removed.

1.2 Intended use.

The Roof Edge Protection system is a collective freestanding guardrail that has been designed to provide an effective barrier for flat or nearly flat roofs with a maximum pitch of 10°.

The Freestanding Roof Edge Protection system is a permanent barrier.

The Alvin Freestanding Roof Edge Protection system is only regarded as being fit for its intended use if the following conditions are complied with:

- Alvin Roof Edge Protection is governed by statutory regulations and guidelines and installation personnel shall be familiar and adhere with the following:
 - EN 13374 Class A (temporary systems).
 - BS 13700, Permanent counterweighted guardrail systems – Specification
 - EN ISO 14122 Part 3.
 - NF E85-003
 - EN 1991-1-4
 - BS 6399 : Part 2 Code of Practice for Wind Load

Alvin Freestanding Roof Edge Protection is designed to withstand a maximum horizontal load applied perpendicular to the top rail of 300N without deflecting more than 55mm. As required by EN 13374 Part A.

The Alvin Roof Edge Protection system is for use on Asphalt using Spartan or Elastomer tiles, Mineral Coated felt roofs or PVC membranes.

1.3 Service life

Metalwork: Will deteriorate with time and atmospheric conditions, but generally indefinite.

PVC Counterweights: 20 years at -10° to + 40°

Rubber pads: 20 years at -10° to + 40°

1.4 Duty of care

The Building Owner and / or Building Manager have a duty of care for the structures they have responsibility for, and in particular they shall ensure:

The Alvin Roof Edge Protection system is/should:

- Be identifiable from other structures by use of a serial number/label.
- Only be used as intended.
- Be Checked regularly.
- Only be used by trained and authorised personnel.
- Be provided in a reliable and fault free condition.
- Where possible be linked into the building's Lightning Protection system.
- Not be used by personnel during windstorms.
- Not be used when sheet ice or heavy snow may affect adhesion.
- Not be used as an anchor point for any fall arrest or other PPE.
- Not be used to support any other structure or be fitted with infills such as banners, visual baffles, or anything else that increases the wind loading factor.

That operatives have:

- Personal Protective Equipment available for use.
- Personal Protective Equipment is checked regularly.
- A current Operation and Maintenance Manual located on site for review as needed.
- All relevant operatives understand the contents of the Manual.
- Installation operatives are duly instructed in all health and safety matters before initial commencement of work, and at least once a year thereafter. In addition to this Installation operatives are to have adequate PPE to prevent falls from height during installation.
- All installation and use should cease when the average wind speed reaches 23 mph (gusting to 35mph or more).

2.1 System Parts list.

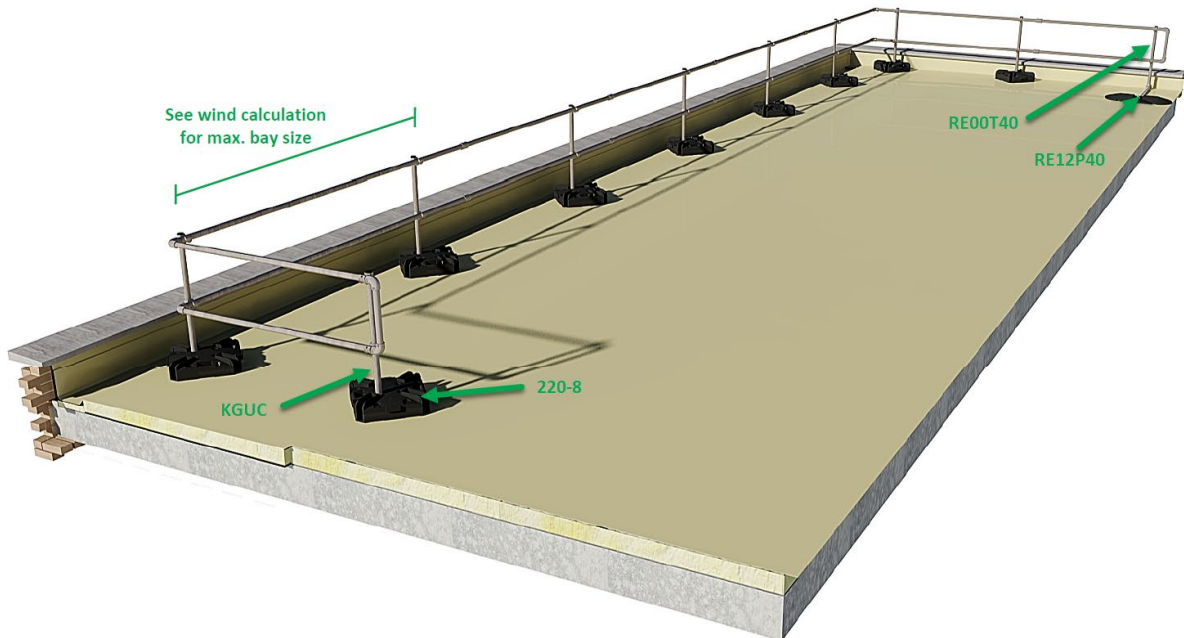
- | | | |
|-----------|------------------------------------|-------------|
| • KGUC | Standard Compact Upright Post | 12 kg each |
| • 220-8 | Compact Recycled PVC Base | 45 kg each |
| • RE00T40 | Standard Counterbalance Post | 12 kg each |
| • RE12P40 | Run End Double Counterweight | 68 kg each |
| • A06-8 | 90° Elbow fitting | 0.99kg each |
| • A08-8 | Straight Joiner | 0.61kg each |
| • T32-8 | 3.2m horizontal tube (3.2mm wall)* | 10.5kg each |

*This is standard 3.2mm wall size 8 tube. Other horizontal tube lengths may be provided for ease of transport or access to the roof.

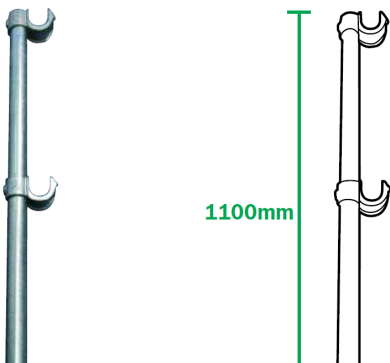
2.2 System parameters – BS13700:2021

- KGUC posts can be spaced up to the MAXIMUM bay size specified on the attached wind calculation (see **5.3**). If no wind calculation document is included with this manual, please seek advice from the site manager or call our office on **0208 254 2626**. Without a site-specific wind calculation, the system may not be BS13700:2021 compliant.
- At free ends on all systems, a 90 degree return of 1.8m terminating with a KGUC upright plus 220-8 base weight and an end loop is required to provide additional support. Alternatively, RE12P40 double counterweights can be fitted to the first and/or last post in a system.
- On closed installations, i.e. installations which have no free ends, there are no requirements to fit returns or RE12P40.
- The cross-rail (horizontal) tube connections should be made using A8 External Connectors. Joins should be staggered so that there is only one join per bay.

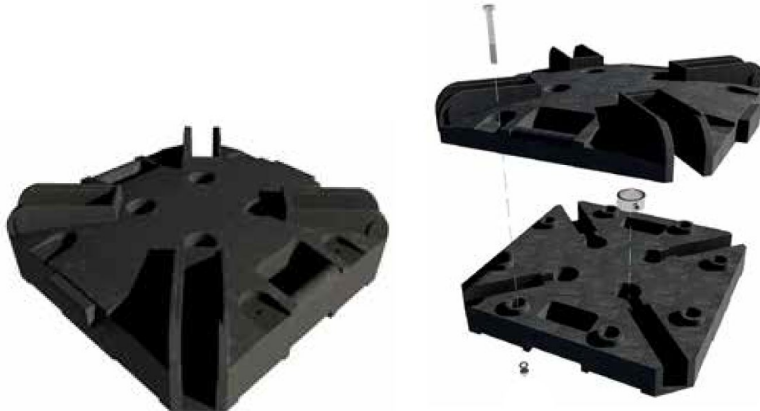
2.3 ASSEMBLY GUIDE



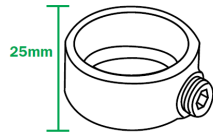
STANDARD COMPACT UPRIGHT (KGUC)



COMPACT RECYCLED PVC BASE (220-8)



COLLAR (A58-8)



(supplied with the compact base above)

STANDARD COUNTERBALANCE UPRIGHT (RE00T40)



Used for alternative to the return end detail. This upright is supplied already assembled at the correct height (1100mm) with the Base Foot & Saddle Clamps set at the correct position.

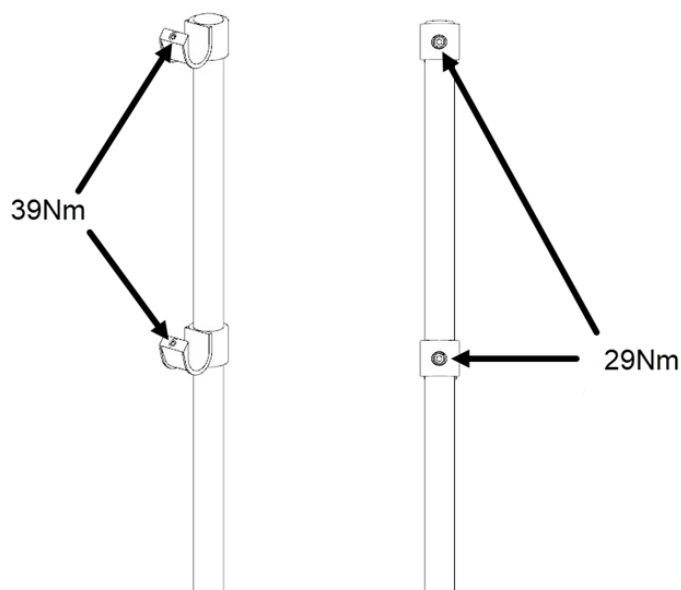
RUN END DOUBLE COUNTERWEIGHT (RE12P40)



Used with the RE00T40 upright for alternative to return end detail.

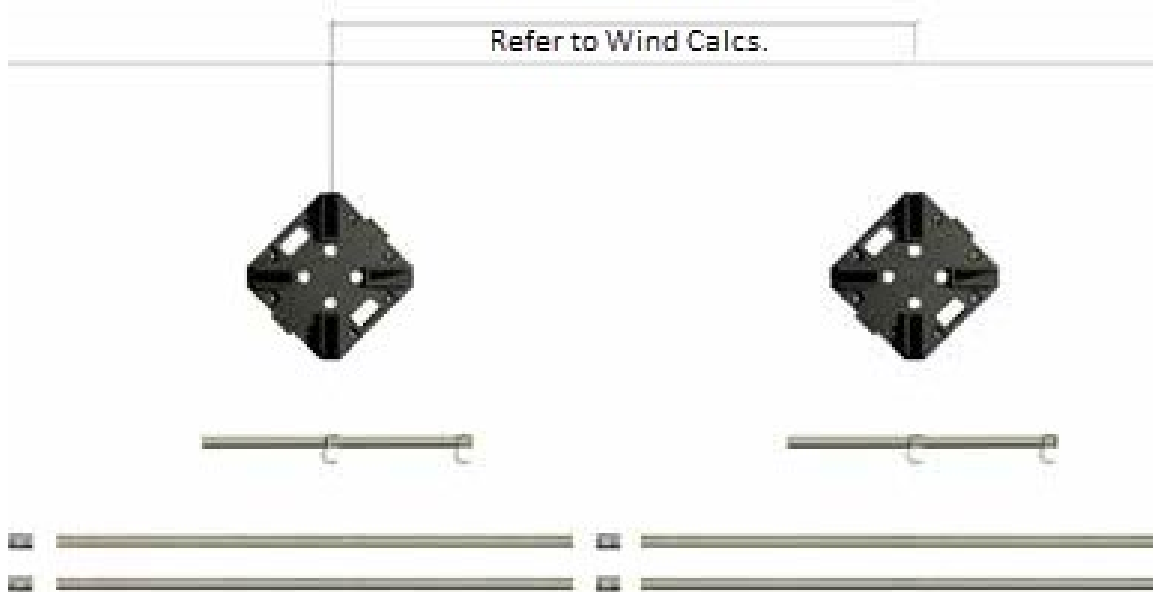
CORRECT TORQUES FOR GRUB SCREWS

The correct torque for the fixing screws is 39Nm for all lateral rail fixing points/joins/corners and 29Nm for the vertical fixing points plus the locking ring in the baseplate.



LAYING OUT SUPPORT LEGS, BASES AND MAIN RAIL TUBES

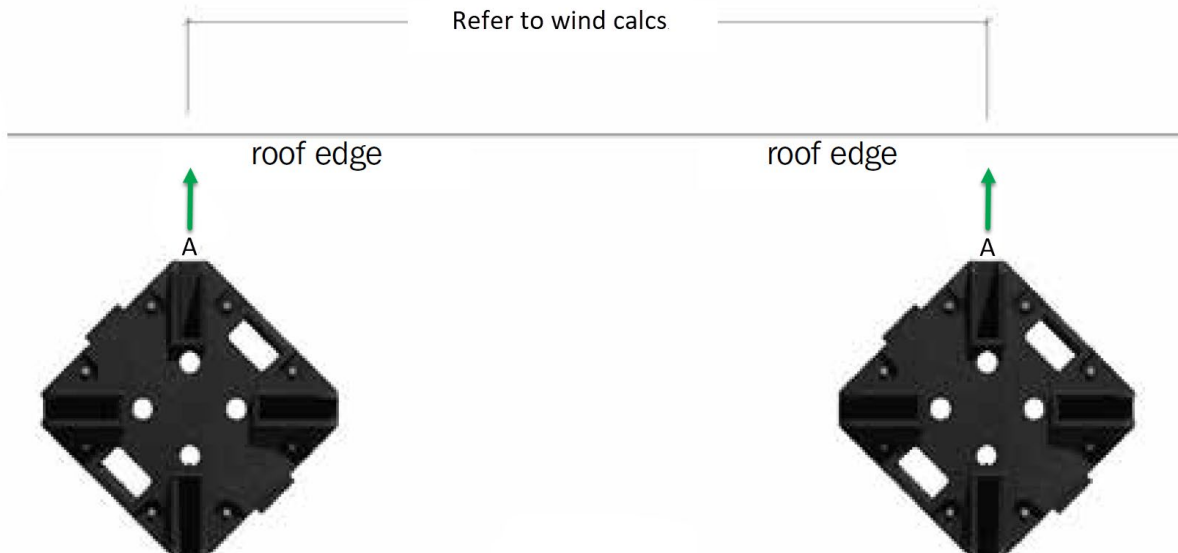
Lay out the equipment in approximately the positions shown below. Always ensure that you and the equipment are at a safe distance from the roof edge. The recommended distance is no less than 2 metres. A risk assessment should be carried out in advance of the works to establish the need for restraint harness or other PPE for the installers, as well as to identify any other risks associated with the works.



Lay out two Main Rail Tubes side by side and in a continual line, for the whole length of the required guardrail (ensure these do not roll towards the roof edge). Then start laying out the upright units

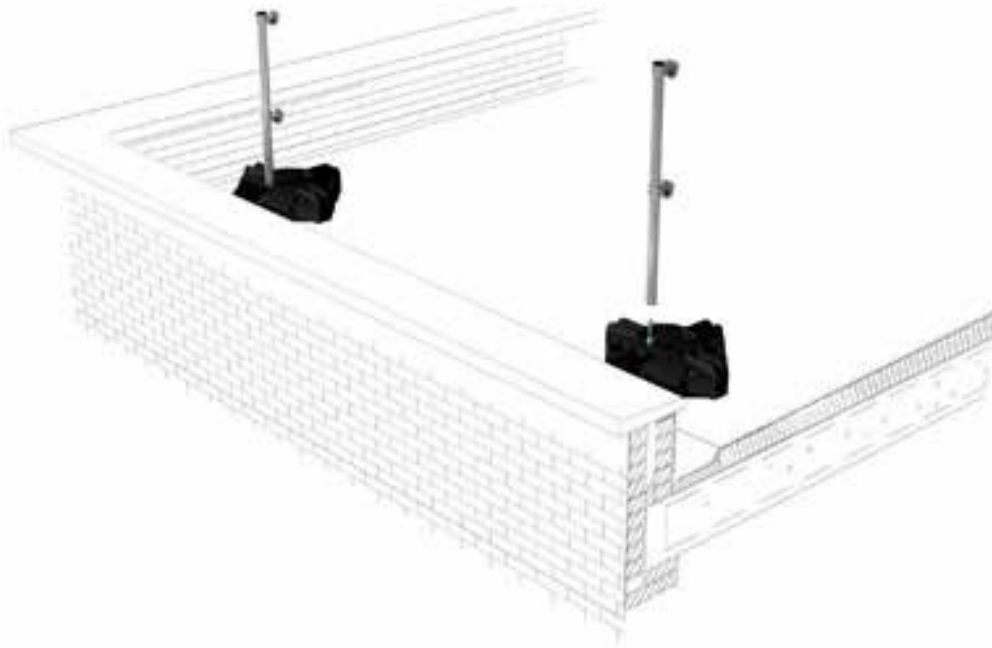
STAGE 1

While tethered to an anchorage device (or otherwise protected from falling), move the PVC Base Feet to the exposed edge working from the centre of the run of guardrail towards the corner or Free Standing End (Refer to wind calculation in 5.3 for the exact recommended centres). Ensure point A faces the roof edge as shown below.



STAGE 2

Fit each support leg (KGUC) into each PVC Base Foot, slotting the leg into the hole closest to the roof edge. Ensure the support legs are in line with each other and are fully located at the bottom of the hole. DO NOT tighten the Locking Collar (A58-8) at this stage.



STAGE 3

Place a horizontal tube into the bottom Saddle Clamp (135-8) of each of the legs. Position the tube so there is at least 60mm protruding from the Saddle Clamp and tighten the grub screw. These are located on the front of the Saddle Clamp. Place the second Main Rail Tube into the top Saddle Clamp, positioning the tube as before, leaving at least 60mm of the tube protruding from the Saddle Clamp and tighten the Grub Screw of the Saddle Clamp to the recommended torque of 39Nm for the lateral tubes and 29Nm for the verticals.



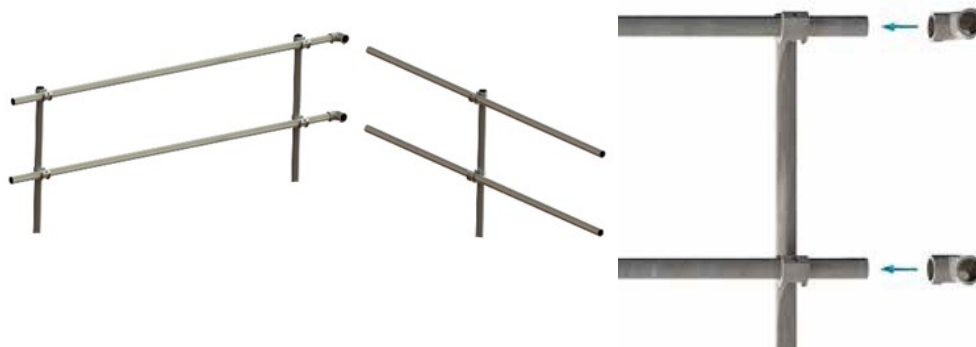
STAGE 4

At each end of the rail loosely fit a straight connector (A08-8). Ensure the Straight Couplings are off set as shown. As far as possible only use one Straight Coupling per bay. Take another 3.2m tube and drop it into the next section of uprights and then slide back against the previously fitted rail with the Straight Coupling attached. Centralise the Straight Coupling over the rail joint and tighten the screws to a torque of 39Nm. Repeat for further sections. For added rigidity, ensure that the Straight Couplings are fitted with the grub screws facing outwards.



STAGE 5

At any corner connect to the next run of guardrail by using 2 No 90° Elbows (A06-8). Connect one of these to the top and one to the bottom of the horizontal rails. There must be a Support Leg within 500mm of the corner. Slide a Main Rail Tube into the bottom Saddle Clamp and 90° Elbow. Slide a Main Rail Tube into the top Saddle Clamp and 90° Elbow. Tighten the grub screws of all lateral clamps to the recommended torque of 39Nm.



WARNING

Under no circumstances should any person be anchored to the system for fall arrest purposes. Further, components such as timber infill, advertising boards, polyethylene sheets must not be fixed to the system because doing so would invalidate the wind loading calculations.

CLOSED INSTALLATION

Stage 5A

Closed installations will either return to themselves forming a complete circuit of the roof, or will be terminated directly into a wall. For wall terminations use a pair of A10-8 wall flanges to connect the horizontals to the wall. The gap between this wall termination and the first upright should be no more than the maximum gap mentioned in the wind calculations document (see 5.3).

It is acceptable to terminate one end in a wall and have one free end as detailed in the section below.

FREE END INSTALLATION

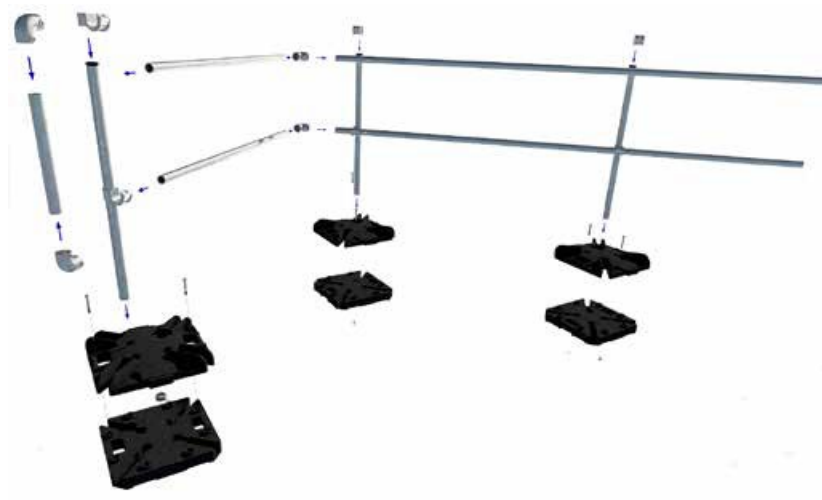
STAGE 5B

Free end termination using a return.

Where possible a 1.8m return can be used to terminate the system, for wall termination see “closed installation” above. This return provides additional counterweight for the free end however it cannot also be used to provide edge protection. If this is required, you should continue the system around the corner and then form the return at a suitable point where there is no edge to protect.

To form a return: At the end of the desired run form a corner connecting a 90° Elbow to each of the top and bottom horizontal tubes.

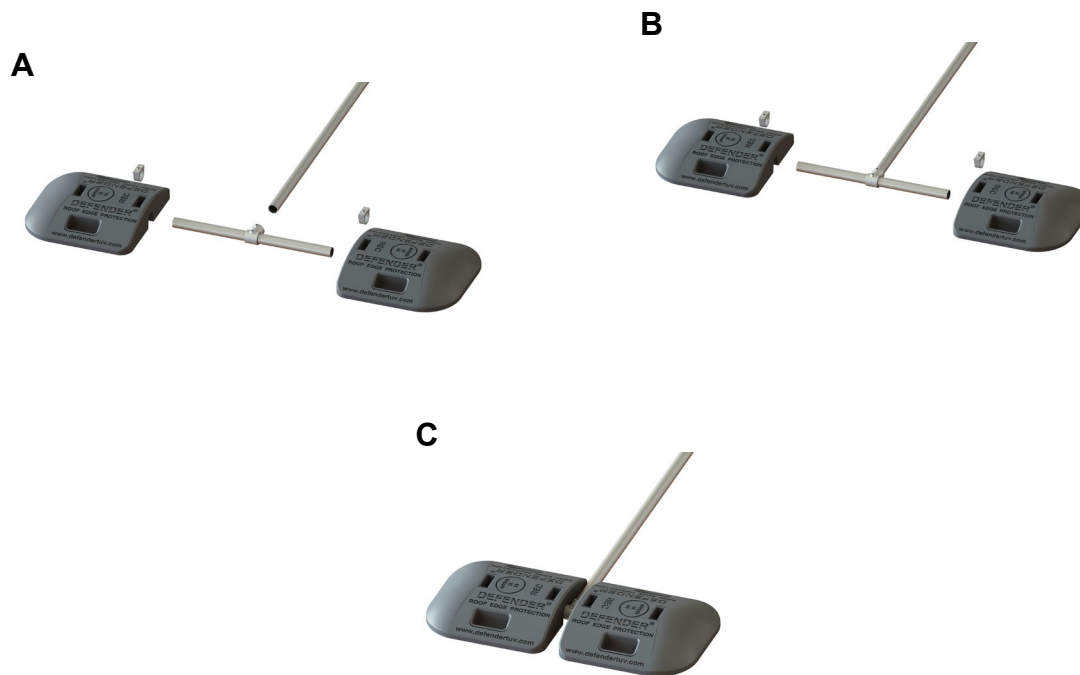
Place a PVC Base Foot (220-8) in the desired position and fit a support leg (KGUC) into the one of the holes. Ensure the support legs are in line with each other and are fully located at the bottom of the hole. DO NOT tighten the Locking Collar at this stage. Slide a Main Rail Tube into the top Saddle Clamp and 90° Elbow. Slide a Main Rail Tube into the bottom Saddle Clamp and 90° Elbow. Form an end loop joining the top to the middle horizontal using two more elbows and a short length of tube. Tighten the grub screws of all clamps to the recommended torque of 39Nm for lateral connections and 29Nm for vertical connections on uprights.



STAGE 5C

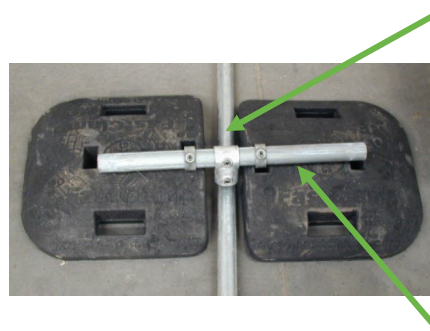
Free end termination using counterbalance weight and arm.

Firstly assemble the Run End Double Counterweight as pictured below. Slide 1No. A2 Short Tee on to the free end of the Cantilever Tube. Do not tighten at this stage. Slide the solid bar through Short Tee and tighten the grub screw holding this tube into position. Place 2No. Collar in the front slot of each PVC Counter Weight. Slide 1No. PVC Counter Weight on to each free end of the solid bar.



The Run End Counterweight comprises 2 counterweights 2 locking collars 1 short tee 1575mm tube and a 900mm solid bar.

Run End Counterweight
RE12P40



Insert the locking collar into the first hole on the PVC weight. The solid bar then passes through the locking collars until it is visible in the second hole. The short tee is positioned on the solid bar between the 2 counterweights. The setscrew on the locking collars is then tightened and the setscrew on the short tee is tightened. The 1575mm tube is then placed into the short tee and the other end into the base of the post and the setscrews tightened.



*illustration shows solid bar as two items however this is now provided as a single 900mm length.

SECTION 5D

Free end cross bars (horizontal) should be terminated by forming a loop using two A06 clamps and a short vertical section of tube. This "D-section" should extend no more than 500mm from the last upright.



NOTES

Make certain that the maximum spacing for posts is no greater than those specified.

Make certain that enough counterweights have been used and spaced correctly.

Apart from at a direction change the joining of the tubes must be in separate bays for the top and middle rail.

SECTION 6

Tighten all the securing screws, including the Locking Collar within compact base, by applying the appropriate tightening torque of 39Nm for lateral connections and 29Nm for vertical connections including the Locking Collar.

SECTION 7

A gap for a gate or ladder is considered the end of one system and the start of another, and both systems should be terminated using returns or counterweights. A gate can be fixed to the vertical member of the end loop.



3.1 Periodic thorough Examination

At least once every 12 months a designated competent person shall check the system against the criteria in the template Report of Thorough Examination (5.2) and record the results in the log table on the following page.

3.2 Cleaning

- System can be cleaned simply by using clean water and a light detergent applied with a hose or by wiping down.

3.3 Maintenance

- The Alvin Freestanding Roof Edge Protection system is constructed from Hot Dip Galvanised iron and steel, and PVC counterweights, this makes the product virtually maintenance free.
- Corrosion may occur with time, particularly in coastal or marine environments and any signs of oxidation should be lightly wire brushed and 2 coats of zinc rich paint should be applied to the affected area.
- Fixings should be immediately replaced on evidence of any deterioration.

4.0 Inspection Records

It is important that a record of regular inspections, comments and remedial action is kept, Each report of thorough examination (template is in attachment 5.2) should be filed with this manual and form 5.1 in the attachment section can additionally be completed to give an overview of the inspection history.

5.2 Template Report of Thorough Examination for Permanent Freestanding Guardrail to BS13700:2021

Guardrail serial number / unique identifier	
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Sold by: AKC Systems Ltd. PO Box 478 Sutton SM1 9PG

Installed by:
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Thorough Examination carried out by:

System install date	Date of last examination	Date of this examination	Next examination due by

The following statements should be marked pass or fail. If an item is not required within the system design, enter n/a. Any defect and corrective action should be recorded in the space provided below. **For advice and spare parts contact sales@alvinkeyclamp.co.uk visit www.alvinkeyclamp.co.uk or call 020 8254 2626**

	Pass/Fail
The system label is present and legible	
System is free of any signs of damage or unauthorised additions to the system (eg. banners, attached plant or netting)	
The height of the guardrail is set correctly at 1100mm	
All Grub Screws are tightened to the required torque (39Nm for horizontals and 29Nm for verticals)	
The system is still in it's original configuration as per O&M manual	
The bay widths are still as per the original design calculations.	
The intermediate cantilever tubes and plates are in the positions and of the size specified in the O&M manual	
Intermediate counterweights are present and in good condition as per the O&M manual	
Any freestanding end cantilever tubes and plates are in the positions and of the size specified in the O&M manual (enter n/a if none required)	
Any freestanding end counterweights present and in good condition as per the O&M manual	
All required friction/protection pads are present and in contact with the roof surface	
Any end terminations fixed to the building are in good condition and the fixings are present and tight.	
Any fixings to gates/ladders are present and tight	
Tubes and clamps are free from damage/cracks/stress fractures	
All components free from signs of corrosion	

Any defects identified must be recorded below along with corrective action required and a deadline for completion. A competent person should sign off each line as it is completed.

Details of defect	Corrective action	Due date	Verified as complete

Attach additional sheet(s) of paper if you need more space and mark here how many you have added:

EXAMINER TO DELETE AS APPROPRIATE:

SIGNED BY EXAMINER

DATE

THE SYSTEM IS FREE OF DEFECTS AND SAFE FOR USE.
 -OR-
THE SYSTEM IS SAFE FOR USE WITH MINOR DEFECTS AS NOTED ABOVE, WHICH MUST BE CORRECTED BY THE DUE DATE.
 -OR-
THE SYSTEM IS NOT SAFE FOR USE. CORRECTIVE ACTION FOR SERIOUS DEFECT(S) MUST BE COMPLETED BEFORE THE SYSTEM IS USED.

Signature of Building Manager.....

Date.....

For the avoidance of doubt, this document template is provided by AKC Systems Ltd for use by its customers or their representatives. AKC Systems Ltd. do not provide a thorough examination service and cannot accept liability for the thorough examination detailed above.

5.3

A BS13700:2021 wind calculation report should be attached to or stored in the same place as this manual. Without this report you will not be able to ascertain the maximum spacing of uprights and counterweights for your system to ensure your it is safe to use.

If you are in any doubt, please contact your installer or if that is not possible our office on 020 8254 2626, we may be able to issue a copy of the report provided we can link your system details to our records.