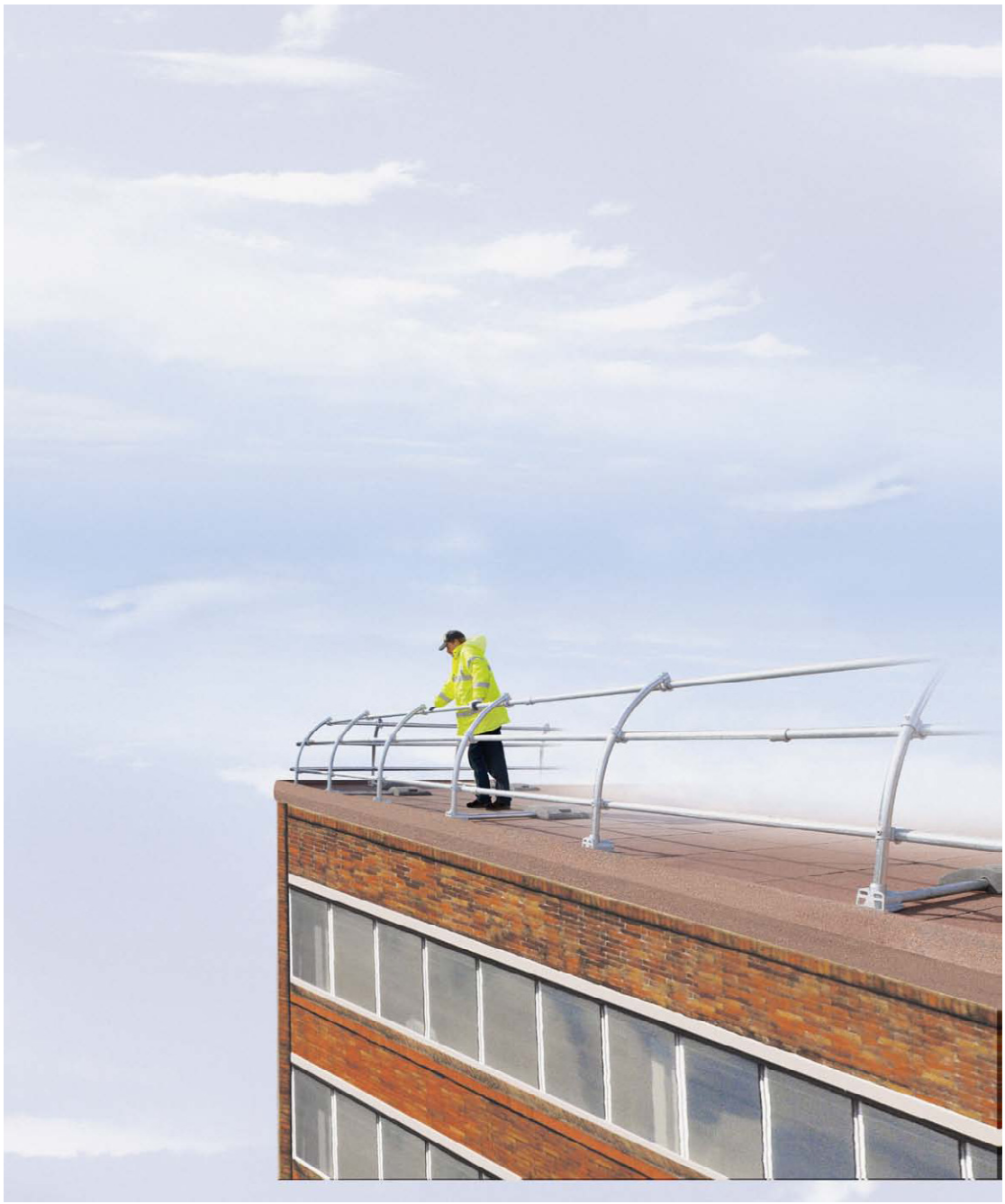
Issue no: 10
Date: March 2012

DEFENDER
ROOF EDGE PROTECTION



Operation and Maintenance Manual

DEFENDER
ROOF EDGE PROTECTION

DEFENDER
ROOF EDGE PROTECTION
ECONOMY SYSTEM

DEFENDER
ROOF EDGE PROTECTION
STANDARD SYSTEM

DEFENDER
ROOF EDGE PROTECTION
PLUS SYSTEM

DEFENDER
ROOF EDGE PROTECTION

Contents

1.1 Manufacturer

Access Technologies Limited
Cradley Business Park
Overend Road
Cradley Heath
B64 7DW
England

Tel: +44 (0) 1384 632387
Fax: +44 (0) 1384 632384
Model year:

These Operating & Maintenance Instructions are a component part of any Defender 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 Defender 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 3°.

The Defender Roof Edge Protection system is a permanent barrier.

The Defender Roof Edge Protection system can be dismantled and relocated in a different area providing the installation is undertaken in accordance with the instructions in section 2.3.

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

- Defender is governed by statutory regulations and guidelines and installation personnel shall be familiar and adhere with the following:

  - EN ISO 14122-part 3
  - EN 13374 – Class A (Part there of) Load & Deflection
  - HSG 33 – Health and Safety in roof work.
  - HSE INDG 284 – Working on Flat Roofs.

Defender is designed to withstand a maximum horizontal load applied perpendicular to the top rail of 300 N / m without deflecting more than 30mm. As required by EN 14122 Part 3.

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

1.3 Misuse

The system will be classed in misuse if any of the following are evident.

- The strength of the roof structure is not capable of withstanding the weight of the system plus operators, if there is any doubt then a suitably qualified Structural Engineer should undertake a detailed inspection.
- The roof surface is not clear of stones, debris, snow, ice, lubricants or anything else that could possibly affect the system performance during installation or relocation.
- Damaged components or incorrect assembly of the system.
- Is being used as an anchor point to lower or secure items from a rope or chain or is being used as an anchor point for PPE.
- Failure to observe the correct assembly configurations.
- Use by personnel without satisfactory instructions.

In the event of misuse the system shall be designated as “out of order” until the necessary remedial actions are taken.

1.4 Service life

Metalwork:	May deteriorate with time and atmospheric conditions, but generally indefinite.
PVC Counterweights:	20 years at -10°C to + 40°C
Rubber pads:	20 years at -10°C to + 40°C

1.5 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:

<u>The Defender Roof Edge Protection system is/should:</u>

- Only be used as intended.
- Checked regularly
- Only used by trained and authorised personnel.
- Provided in a reliable and fault free condition.
- Where possible be linked into the Buildings Lightning Protection system.

<u>That operatives have:</u>

- Personal Protective Equipment available for use.
- Personal Protective Equipment is checked regularly.
- A current Operation and Maintenance Manual located adjacent to the installation.
- 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 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)
- Sufficient knowledge of the English Language in order to understand these instructions.
- Free from any disability which may affect their ability to assemble or repair the Defender system.

2.1 System Parts list.

• RE00G40	Standard Post	8.5 kgs each
• RE00G40SS	Defender Plus Post	12.5 kgs each
• RE11P40	Counterweight	30 kgs each
• RE11P40SS	Defender Plus Counterweight	28 kgs each
• RE12P40	Run End weight	67 kgs each
• C00G40	Sleeve joint	1 kg each
• C02G40	90° Elbow	1 kg each
• C11G40	Wall flange	1 kg each
• C65P40	End cap	10 g each
• T40G3.2	Handrailing	3.6 kgs metre

2.2 System parameters – Un-Restrained – EN 14122 Part 3

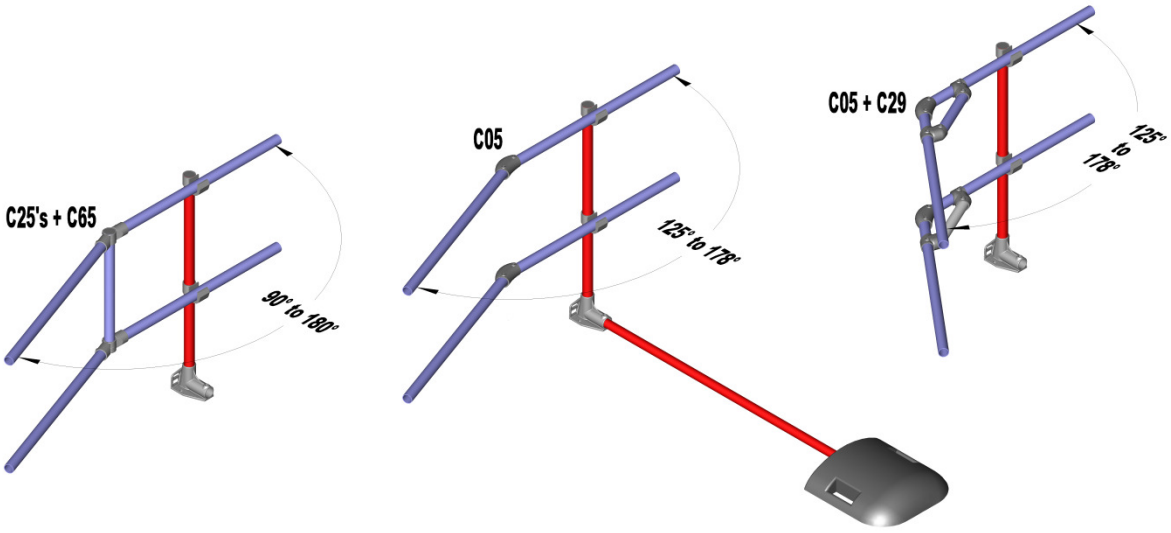
- RE00G40 and RE00G40SS posts can be spaced up to a MAXIMUM of 2000mm centres. In a semi-restrained environment. i.e. A parapet wall of at least 150mm high is within 2m of the system.
- At free ends on all systems, RE12P40 are required to be fitted to the first / last post. On Economy systems an RE11P40 is required to be fitted to the next post after the RE12P40. On Standard and Plus Systems an RE11P40SS is required to be fitted to the next post after the RE12P40.
- On closed installations, i.e. installations which have no free ends, there are no requirements to fit RE12G40
- On Economy systems thereafter an RE11P40 is required at 4000mm maximum centres.
- On Standard systems an RE11P40SS is required at 2000mm maximum centres
- On Plus systems an RE11P40SS is required at 4000mm maximum centres.

- On all systems the cross rail tube connections should be made using C00G40 Sleeve joints. On Economy and Standard Systems the top and mid rail joints must be made in separate bays and be at least 2000mm apart. On Plus systems the Top and Bottom rails can be joined in the same bay but the mid rail must be joined in a separate bay and be at least 2000mm apart from the Top and Bottom joint.

- An upstand or parapet wall at least 150mm high is required within 2000mm of any intended location for a Defender installation.

- All corners need support within 500mm on one side with the cumulative distance between Uprights adjacent to corners not exceeding the maximum bay size of 2000mm. e.g. 0.5 + 1.5 or 0.3 + 1.7 etc.

- Non ninety degree corners will need additional support. The suggested methods are shown in the images below.



2.3 System parameters – Un-Restrained – EN 13374 Class A (Part there of)

- RE00G40 and RE00G40SS posts can be spaced up to a MAXIMUM of 2400mm centres for intermediate bays. End Bays to remain at 2000mm. In a semi-restrained environment. i.e. A parapet wall of at least 150mm high is within 2m of the system.

- At free ends on all systems, RE12P40 are required to be fitted to the first / last post. On Economy systems an RE11P40 is required to be fitted to the next post after the RE12P40. On Standard and Plus Systems an RE11P40SS is required to be fitted to the next post after the RE12P40.
- On closed installations, i.e. installations which have no free ends, there are no requirements to fit RE12G40
- On Economy systems thereafter an RE11P40 is required at 4800mm maximum centres.
- On Standard systems an RE11P40SS is required at 2400mm maximum centres
- On Plus systems an RE11P40SS is required at 4800mm maximum centres.
- On all systems the cross rail tube connections should be made using C00G40 Sleeve joints. On Economy and Standard Systems the top and mid rail joints must be made in separate bays and be at least 2400mm apart. On Plus systems the Top and Bottom rails can be joined in the same bay but the mid rail must be joined in a separate bay and be at least 2400mm apart from the Top and Bottom joint.
- An upstand or parapet wall at least 150mm high is required within 2000mm of any intended location for a Defender installation.
- All corners need support within 500mm on one side with the cumulative distance between Uprights adjacent to corners not exceeding the maximum bay size of 2400mm. e.g. 0.5 + 1.9 or 0.3 + 2.1 etc.
- Non ninety degree corners will need additional support. The suggested methods are shown in the images above.

2.4 **System parameters – Fully Restrained – EN 13374 Class A (Part there of)**

- RE00G40 and RE00G40SS posts can be spaced up to a MAXIMUM of 2800mm centres for intermediate bays. End Bays to remain at 2000mm. In a fully restrained environment. i.e. The base of the upright is placed up against the base of a parapet wall which is at least 150mm high.
- At free ends on all systems, RE11P40 are required to be fitted to the first / last post. On Economy systems an RE11P40 is required to be fitted to the next post after the first & last posts. On Standard and Plus Systems an RE11P40SS is required to be fitted to the next post after the RE11P40.
-

- On Economy systems thereafter an RE11P40 is required at 5600mm maximum centres.

- On Standard systems an RE11P40SS is required at 2800mm maximum centres

- On Plus systems an RE11P40SS is required at 5600mm maximum centres.

- On all systems the cross rail tube connections should be made using C00G40 Sleeve joints. On Economy and Standard Systems the top and mid rail joints must be made in separate bays and be at least 2800mm apart. On Plus systems the Top and Bottom rails can be joined in the same bay but the mid rail must be joined in a separate bay and be at least 2800mm apart from the Top and Bottom joint.

- All corners need support within 500mm on one side with the cumulative distance between Uprights adjacent to corners not exceeding the maximum bay size of 2800mm. e.g. 0.5 + 2.3 or 0.3 + 2.5 etc.

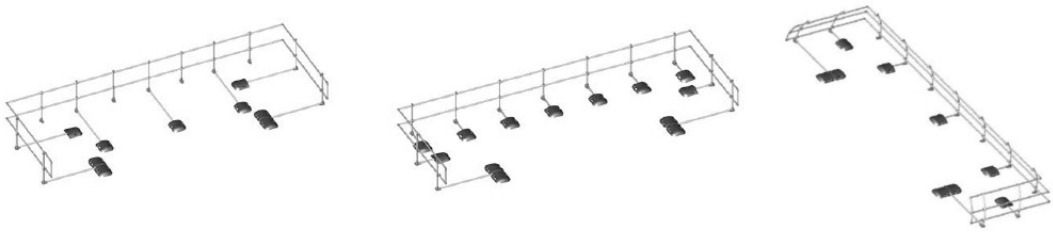
- Non ninety degree corners will need additional support. The suggested methods are shown in the images above.

2.5 Installation – Un-Restrained

Open system

ECONOMY STANDARD PLUS

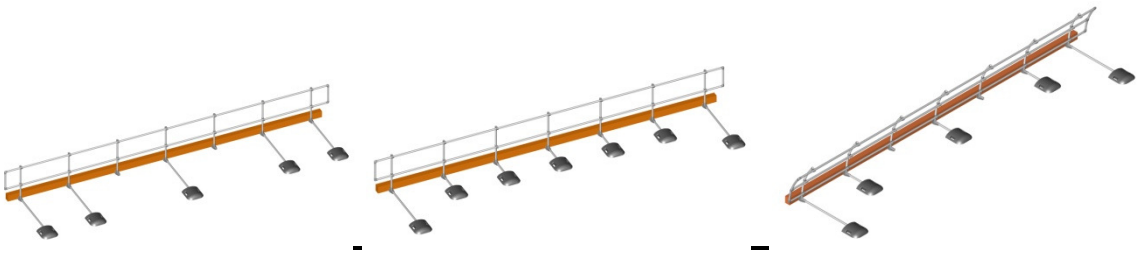
Semi Closed System



ECONOMY STANDARD PLUS

Installation – Restrained

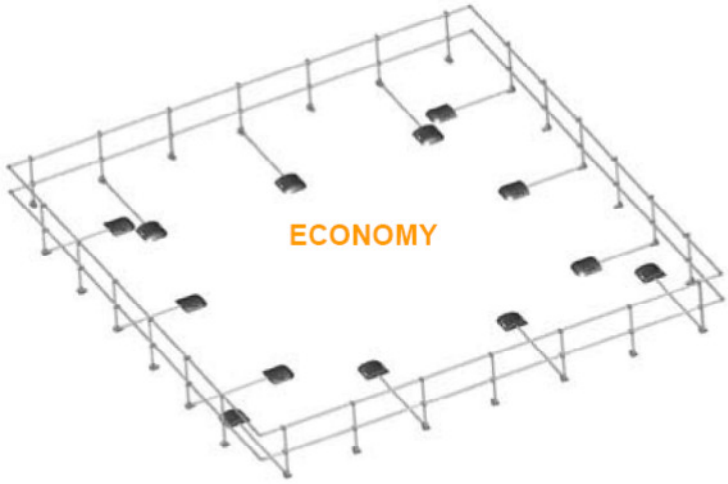
Open system

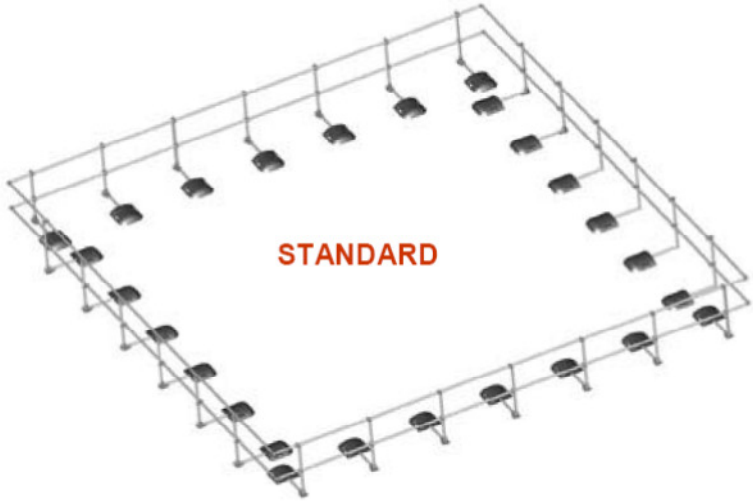


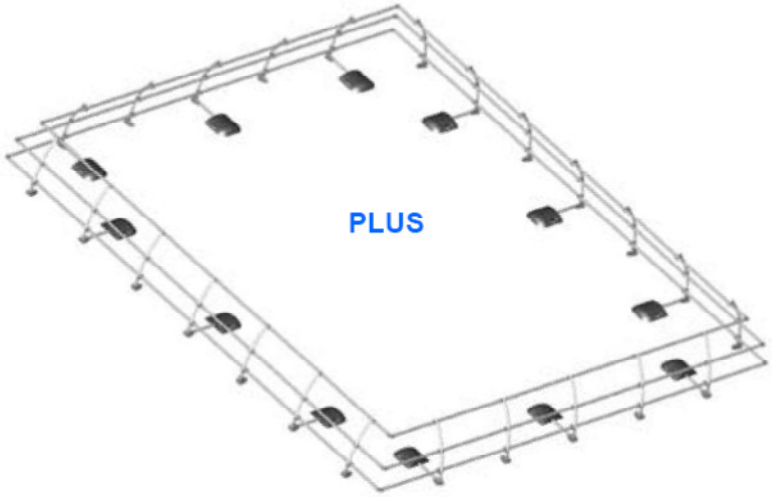
ECONOMY STANDARD PLUS

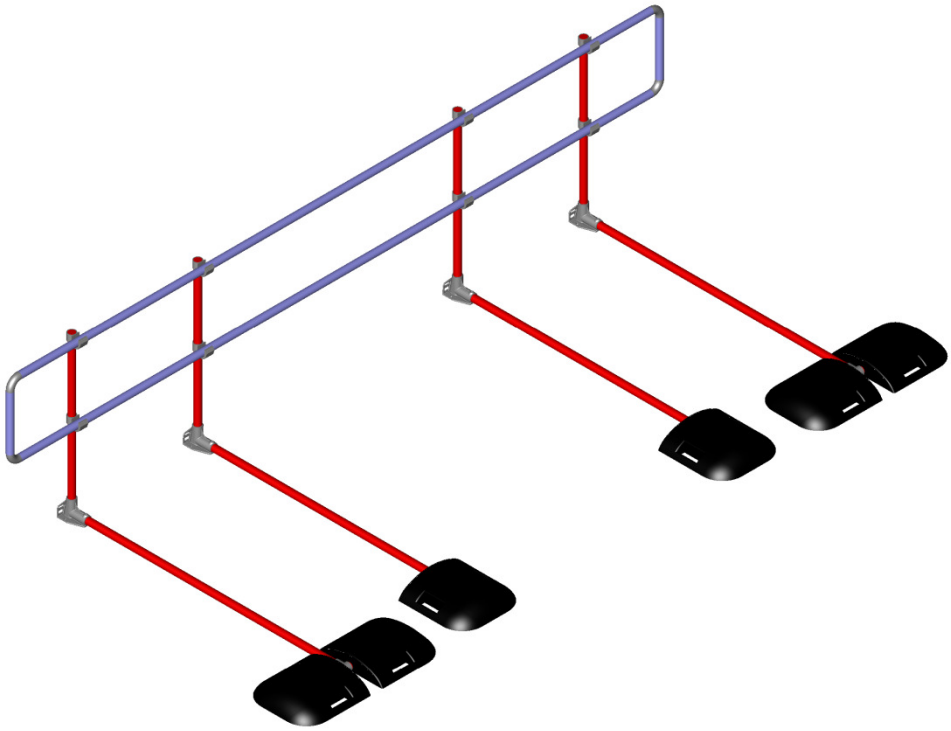
DEFENDER
ROOF EDGE PROTECTION

Fully Closed System

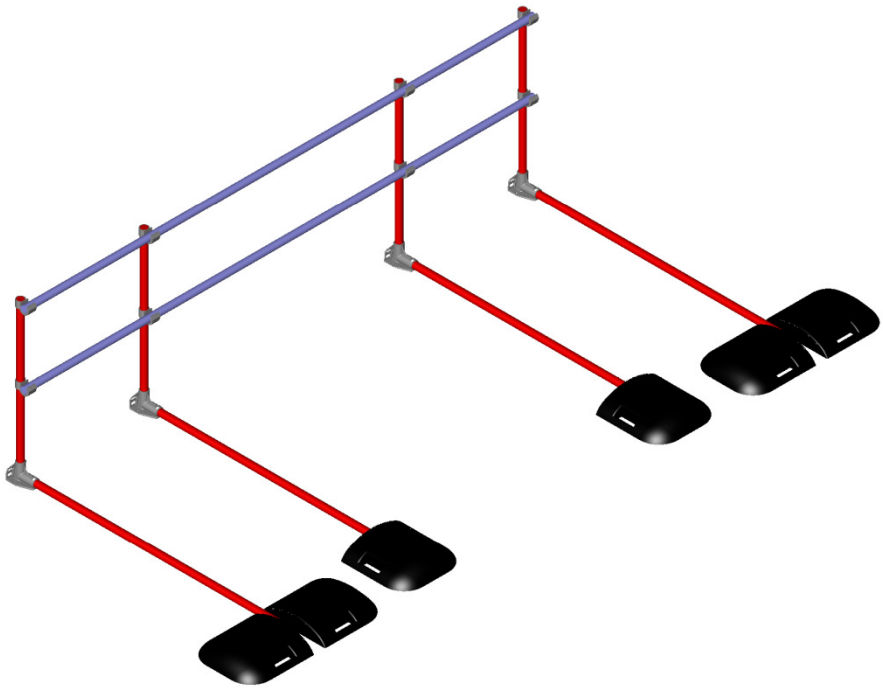




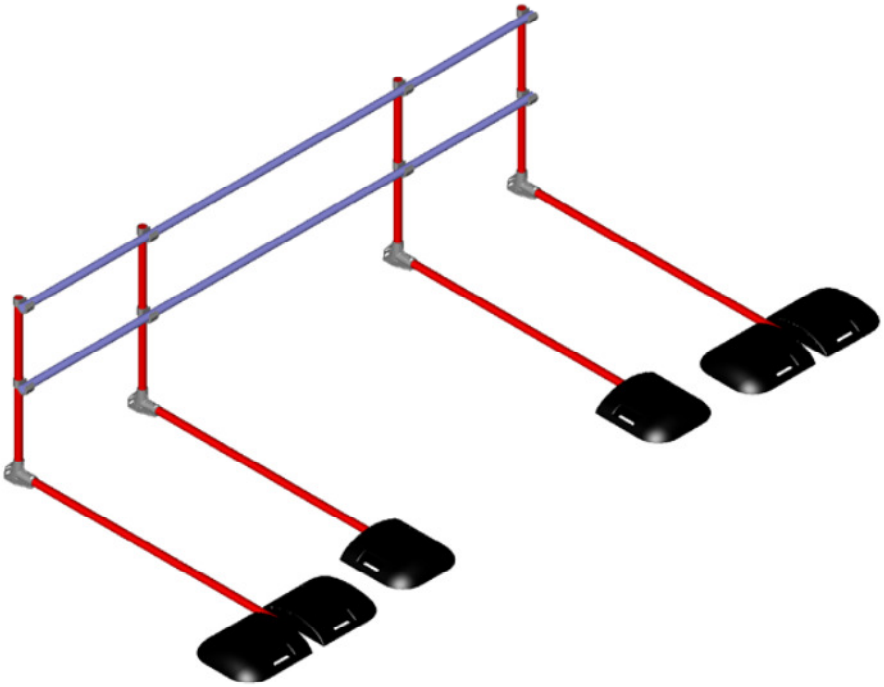




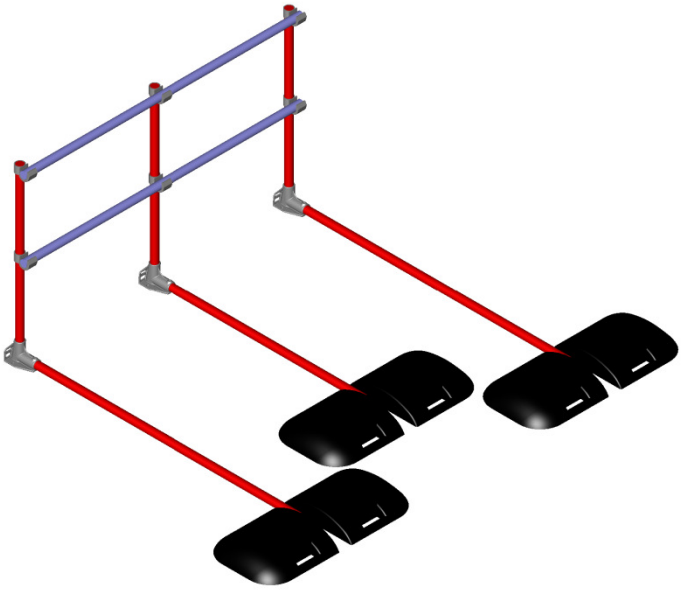
Typical 5000mm Defender Roof Edge Protection system (Economy) construction



Typical 4000mm Defender Roof edge Protection system (Economy) construction

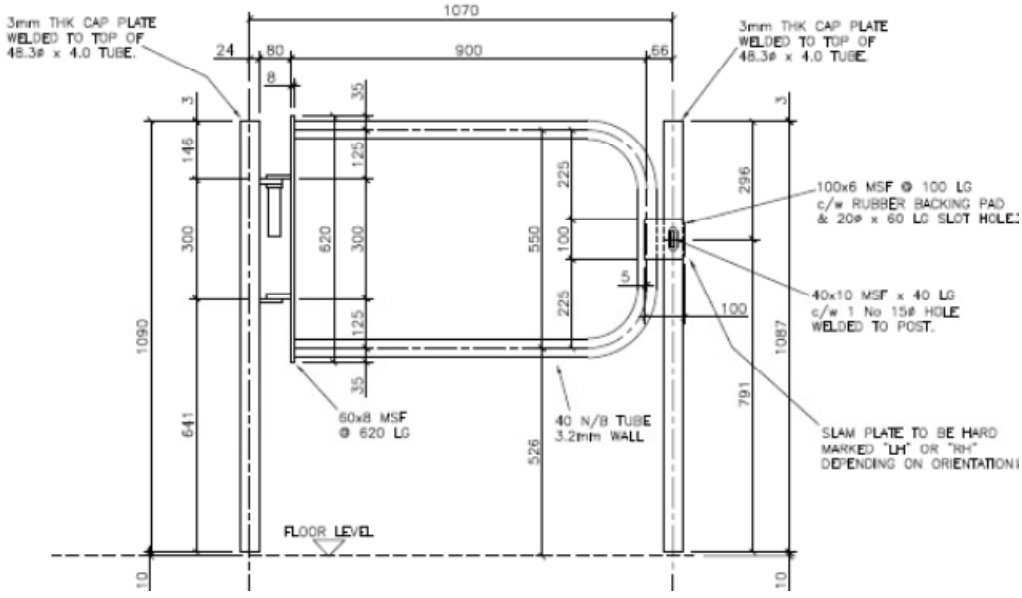


Typical 3000mm Defender Roof Edge Protection system (Economy) construction



Typical 2000mm Defender Roof Edge Protection system (Economy) construction

DEFENDER
ROOF EDGE PROTECTION



Gate Components required:

1 x TCG-1 Gate Left Hand -or- TCG-2 Gate Right hand
4 x C135G40 Defender Cradle fittings
2 x RE50G40 Defender Ski Boot fittings
2 x RE12P40 Run End weight

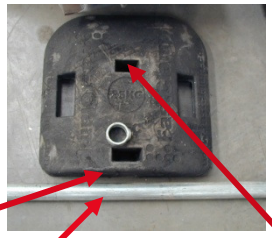
DEFENDER
ROOF EDGE PROTECTION

CLOSED INSTALLATION

SINGLE COUNTERWEIGHT INSTALLATION PROCEDURE

1 Lay the first post (**RE00G40**) at the start position
2 Attach a counterweight with 1575mm long tube to the first post

Single counterweight
RE11P40 or RE11P40SS



The locking collar goes into the first hole in the counterweight. The tube passes through the collar and is in position when the end of the tube is visible in the second hole. The setscrew on the locking collar is then tightened and the setscrews on the post base are tightened.

3 Position the second Post this does not require a counter weight.
4 Position the third post and attach a counterweight.
Continue this procedure with a free post and then a weighted post.

CRADLE AND TUBE INSTALLATION PROCEDURE

5 Lower the tube into position in the cradle tighten the setscrew to a recommended torque of 29 Nm.

NOTES

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

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

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

DEFENDER
ROOF EDGE PROTECTION

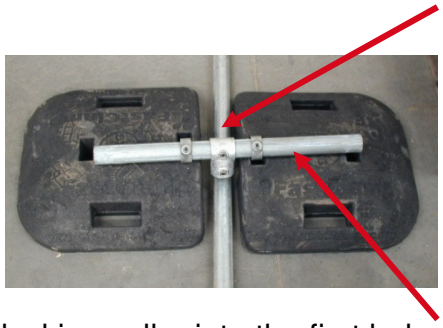
FREE END INSTALLATION

RUN END COUNTERWEIGHT INSTALLATION PROCEDURE

1 Lay the first Post at the start position.
2 Attach a Run End Counterweight assembly with 1575mm long tube to the first Post.

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

Run End Counterweight
RE12P40



As with the single counterweight insert the locking collar into the first hole. 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.

3 Position the second post and attach THE CORRECT counterweight depending on system being used.
4 Position the third Post. This does not require a Counterweight on Economy or Plus systems.
5 Position the fourth Post and attach the correct counterweight.
Continue this procedure according to the system being used with a free post and then a weighted post or a weighted post every time.

Ensure that there is a Run End Counterweight and adjacent Single Counterweight at each free end.

NOTES

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

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

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

3.1 Periodic inspection

At least once every 12 months a designated competent person shall check the system for:

- Any movement of the system.
- Tightness of setscrews.
- Any corrosion of parts.
- Adhesion of rubber pads.
- Damage to component parts.
- Condition of roof areas adjacent to the installation.

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 Maintaining the system.

- The Defender 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 and any signs of oxidisation should be lightly wire brushed and 2 coats of zinc rich paint shall be applied.
- Fixings should be immediately replaced on evidence of any deterioration.

3.4 Disposal

- Except for the PVC weights and Rubber mats the Defender System is predominantly constructed from ferrous metals and can be disposed of in a scrap metal facility.

4.0 Inspection Records

It is important that a record of regular inspections, comments and remedial action is kept, and form 5.1 in the attachment section should be completed and signed after every inspection and action.

5.1 Inspection log

Date	Name of Inspector	Comments	Action	Signature