SAFETY SYSTEMS FOR WORKING AT HEIGHT

Aviator®

A PERMANENT SAFETY LINE FOR WORKING AT HEIGHT

SAYFA SYSTEMS UK
ABOUT US

OUR CREDENTIALS
In construction, refurbishment and maintenance alike, working above ground level spells potential danger to that most important of all commodities – human safety and well-being. It is to protect and safeguard your workforce on site that Sayfa Systems’ expertise and product range is directed.

Recent figures show that 45 people died and nearly four thousand suffered serious injury as the result of a fall from height in the workplace. Such falls remain the most common kind of accident.

Within the regulatory framework is the assertion that the duty holder should, firstly, avoid working at height where they can. Where they cannot, they should use work equipment or other measures to prevent falls. Where the fall risk cannot be eliminated, measures should be taken to reduce the distance and consequence of any fall.

OUR EXPERTISE
It is within this work environment that Sayfa Systems works – exclusively to meet these needs and to provide fitting solutions.

Part of this vital role is the constant innovation and development of new techniques and ideas for safe working at height. Part also is to make sure that we are fully abreast of the regulation hierarchy that governs these industries today and can act authoritatively in the guidance, advice, training and safety certification services that we offer to our customers.

Within this context, too, we are driven to develop safety systems with added value for our customers – putting safety first, yes, but doing so in a way that helps to facilitate other aspects of construction and maintenance.

HISTORY
Sayfa Systems was founded in 2005, meeting a need for workforce fall protection – initially with fall arrest bags and later with Rhino Deck roof systems. Progressive development saw the company add permanent safety systems to its range – notably Aviator static safety lines and Payload roof access systems.

We develop, design and manufacture all Sayfa products, supported by full CAD facilities and large manufacturing and warehouse capacity. The company operates in accordance with all British and European standards. It gained ISO9001, 14001 and 18001 accreditations in 2014 and has CHAS and Safe Contractor approvals.

Current investment sees the development of a new world-class test rig for the line-testing of roof profiles. Throughout, we source responsibly and are environmentally aware.
When selecting equipment for work at height you must:

- use the most suitable equipment
- give collective protection measures (e.g. guard rails) priority over personal protection measures (e.g. safety harnesses);
- take account of:
  - the working conditions; and
  - risks to the safety of all those at the place where the work equipment is to be used.

Disclaimer: The information contained in this brochure has been summarised by Sayfa Systems Ltd from legislation, current at the time of publication. Sayfa Systems Ltd has no responsibility for the accuracy of information contained herein.
PRODUCT DESCRIPTION:

A safety line bracket system for installation on membrane roofs up to a 15 degree pitch. The brackets are installed above the completed roof system with toggle fixings which penetrate the membrane and insulation and the roof substrate which is normally plywood deck or steel deck. The toggles are all fixed from the top of the roof and no access is required underneath. If the roof substrate is concrete we will resin fix directly to this using M12 studs.

Bracket centres ≤10m

For fall arrest 2 users

Bracket centres ≤10m

For fall restraint 2 users

The safety line system is designed to operate as a fall restraint system or a fall arrest system depending on the layout design. All systems have built in shock absorbing units in each bracket and are fitted with an inline shock absorber for added protection. We recommend a limit of 2 users on a fall arrest system.

The shock absorbing capabilities when used together with a shock absorbing lanyard, will ensure that no more than 4kN force is exerted on the users at any point in the system.

The fall restraint systems can be designed for up to 2 users at any one time and provide unrestricted access along the full length of the system. Corners and intermediate brackets allow the line shuttle to move smoothly along the full length of the cable between end brackets.
AVIATOR FLAT ROOF SAFETY LINE SYSTEM

MATERIAL SPECIFICATION:

All brackets and components
Stainless Steel - Grade 304 [UNS S30400]
Fe, <0.08% C, 17.5-20% Cr, 8-11% Ni, <2% Mn,
<1% Si, <0.045% P, <0.03% S

Rain cap
Polyvinyl Chloride-PVC. Tensile Strength
2.60 N/mm², Notched Impact Strength 2.0 -
45 Kj/m², Thermal Coefficient of expansion
80 x 10^-6, Max Cont Use Temp 60 °C,
Density 1.38 g/cm³

Polyvinyl Chloride coating
- PVC PC80GS
Coverage 2.65m²/kg at 300 micron,
tensile strength 13 MPa, Hardness 80 shore
BS 903A26, water absorption (max) 0.5%.
TPO specification on request
AVIATOR FLAT ROOF SAFETY LINE SYSTEM

OPERATING AND DESIGN STANDARDS:
Eurocodes are designated by EN
British standards are designated by BS

- BS EN 795:2012 Class C – flexible safety lines
- BS EN 795:2012 Class A – single anchors, anti-pendulum anchors
- BS 7883: 2005 – Design, selection, installation, use and maintenance for anchors conforming to EN 795
- BSMA 29: 1982 – specification for steel wire rope
- ACR (M) 002:2015 Rev 2
- ACR (CP) 007:2015 Rev 2
- ISO 9001:2008
- ISO 14001:2004
- BS OHSAS 18001:2007
- Work at height regulations 2005 (Ref.7)
- Work at height (amendment) regulations 2007 (Ref.8) WAHR
- Provision and use of work equipment regulations 1998 PUWER 98 (Ref. 5)

Typical connection loads (bracket height up to 150mm)

<table>
<thead>
<tr>
<th>Ultimate factored load on bracket base</th>
<th>Tension</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.0kN</td>
<td>6.15kN</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Bracket moment</th>
<th>Horizontal shear</th>
</tr>
</thead>
<tbody>
<tr>
<td>6.39kN/m</td>
<td>16.95kN</td>
</tr>
</tbody>
</table>

Note: For guidelines only to be checked by Chief Engineer.

The company operates to the following standards:

- ISO 9001:2008
- ISO 14001:2004
- BS OHSAS 18001:2007

- Management of health and safety at work regulations 1999 MHSWR (Ref.2)
- The work at height safety association WAHSA-guidance on inspecting eyebolts used for personal fall protection purposes
- The Building Regulations 2010 part K.
INSPECTION/MAINTENANCE/TRAINING

INSPECTION ROUTINE:
All systems to be inspected at least every 12 months from date of installation.

In harsh environments all systems to be inspected at least every 3 months.

Inspections must be carried out by approved Aviator engineers.

Inspections must be approved to SIMS (Safety Inspection and Maintenance Service) standards.

All inspections to be carried out to EN795:2012 and BS 7883:2005 and WAHSA (inspection of eyebolts) requirements for safety line and anchor points.

All inspections to be carried out to EN364 requirements for personal protective equipment.

Contact Sayfa Systems to arrange inspections.

MAINTENANCE SCHEDULE:
All maintenance to be carried out by approved Aviator engineers.

Maintenance to be in accordance with Sayfa Systems UK (manufacturer) guidelines and recommendations.

In harsh environments all systems to be inspected at least every 3 months.

Maintenance to be in accordance with SIMS standards. (details available on request)

Maintenance to be carried out at time of yearly inspection.

Contact Sayfa Systems to arrange system maintenance.

TRAINING REQUIREMENTS:
All personnel who use the Aviator system should have attended a NASLOT (National Access and Safety Line Operator Training) course. Courses are available from Sayfa Systems UK Ltd.

All inspections to be carried out to EN795:2012 and BS 7883:2005 and WAHSA (inspection of eyebolts) requirements for safety line and anchor points.

All inspections to be carried out to EN364 requirements for personal protective equipment.

Certificate

PASS ✔

12 Months From date of installation

3 Months in harsh environments

12 Months From date of installation

3 Months in harsh environments

Certificate

PASS ✔

For any technical queries please call our advice line on 0845 241 9102
COMPONENT PART DETAILS:

End bracket FRB201
BIM No: SpecEquip_RiSftySymFlatEndBkt_SayfaSystems_FRB201_M3_G2

Intermediate bracket FRB202
BIM No: SpecEquip_RiSftySymFlatIntBkt_SayfaSystems_FRB202_M3_G2

Corner bracket FRB204
BIM No: SpecEquip_RiSftySymFlatCornerBkt_SayfaSystems_FRB204_M3_G2

Line shock absorber SAU260
BIM No: SpecEquip_RiSftySymShkAbs_SayfaSystems_SAU260_M3_G2
AVIATOR FLAT ROOF SAFETY LINE SYSTEM

FIXING DETAILS:
Bracket fixed to timber deck

- Bracket fixed to timber deck
- PVC Rain Cap
- M16 Stainless Steel Eye Bolt
- Stainless Steel Washer
- Neo Prene Washer
- System Label
- Stainless Steel Bracket
- Boot Style Sealing Detail (Recommended) by Roofing Contractor
- Skirt Style Sealing Detail by Roofing Contractor
- Membrane to Client Specification
- Insulation to Client Specification
- 18mm Timber or Greater to Client Specification
- Toggle Fixing with M8 Threaded Bar

For any technical queries please call our advice line on 0845 241 9102
FIXING DETAILS:
Bracket fixed to metal deck

- PVC RAIN CAP
- M16 STAINLESS STEEL EYE BOLT
- STAINLESS STEEL WASHER
- NEO PRENE WASHER
- SYSTEM LABEL
- STAINLESS STEEL BRACKET
- SKIRT STYLE SEALING DETAIL BY ROOFING CONTRACTOR
- MEMBRANE TO CLIENT SPECIFICATION
- BOOT STYLE SEALING DETAIL (RECOMMENDED) BY ROOFING CONTRACTOR
- TOGGLE FIXING WITH M8 THREADED BAR
- METAL DECK TO CLIENT SPECIFICATION
- INSULATION TO CLIENT SPECIFICATION
**FIXING DETAILS:**
Bracket fixed to cast concrete slab

- Bracket fixed to cast concrete slab
- **STAINLESS STEEL BRACKET**
- **PVC RAIN CAP**
- **M16 STAINLESS STEEL EYE BOLT**
- **M12 RESIN SOCKET**
- **SET 100mm IN CONCRETE PRE CAST SLAB.**
- **USE M12 DOME HEAD FIXING SCREW**
- **NEO PRENE WASHER**
- **STAINLESS STEEL WASHER**
- **SYSTEM LABEL**
- **SKIRT STYLE SEALING DETAIL BY ROOFING CONTRACTOR**
- **BOOT STYLE SEALING DETAIL BY ROOFING CONTRACTOR**
- **MINIMUM 150mm THICK CAST CONCRETE SLAB**
- **METAL DECK TO CLIENT SPECIFICATION**
- **PRE CAST CONCRETE SLAB TO CLIENTS SPECIFICATION**
- **150mm**
FIXING DETAILS:
Bracket fixed to hollow core concrete slab

- M16 STAINLESS STEEL EYE BOLT
- PVC RAIN CAP
- STAINLESS STEEL WASHER
- NEO PRENE WASHER
- SYSTEM LABEL
- STAINLESS STEEL BRACKET
- SKIRT STYLE SEALING DETAIL BY ROOFING CONTRACTOR
- 150mm
- TOGGLE FIXING IF FIXING HOLE BREAKS THROUGH HOLLOWCORE
- M12 RESIN SOCKET SET 100mm IN CONCRETE PRE CAST SLAB. USE M12 DOME HEAD FIXING SCREW
- PRE CAST HOLLOWCORE SLAB TO CLIENTS SPECIFICATION

For any technical queries please call our advice line on 0845 241 9102
BUILT UP ROOF SYSTEM - INCORPORATING GREEN ROOF AND BROWN ROOF SYSTEMS

PRODUCT DATA SHEET
REPORT NO: 012
PRODUCT CODE: GRB200

REVISION NO: 001
AVIATOR BUILT UP ROOF SYSTEM

PRODUCT DESCRIPTION:
A safety line bracket system for installation on built up roof systems up to a 15 degree pitch. The brackets are installed onto the roof deck which is usually precast concrete or hollow core concrete slabs using resin fixed anchors or toggle fixings. The system can also be installed on timber or steel deck systems using toggle fixings. The resin anchors and toggles are all fixed from the top of the roof and no access is required underneath.

Brackets are supplied in galvanised steel. Brackets are supplied in various heights from 250mm up to 750mm to accommodate the roof build up. The preferred sealing method is a 25mm pitch pocket around the base. The method of installation requires a first fix to secure the brackets and a return visit to site once the roof has been completed, to fit and commission the cable.

The safety line system is designed to operate as a fall restraint system or a fall arrest system depending on the layout design. All systems have built in shock absorbing units in each bracket and are fitted with an inline shock absorber on the end brackets. The shock absorbers are all fitted above the roof build. The shock absorbing capabilities when used together with a shock absorbing lanyard, will ensure that no more than 4kN force is exerted on the users at any point in the system. We recommend only 1 user on a fall arrest system.

Brackets are supplied in various heights from 250mm up to 750mm to accommodate the roof build up. The preferred sealing method is a 25mm pitch pocket around the base. The method of installation requires a first fix to secure the brackets and a return visit to site once the roof has been completed, to fit and commission the cable.

The fall restraint systems can be designed for up to 3 users at any one time and provide unrestricted access along the full length of the system. Corners and intermediate brackets allow the line shuttle to move smoothly along the full length of the cable between end brackets.

Bracket heights
- 250mm
- 350mm
- 450mm
- 550mm
- 650mm
- 750mm

Bracket centres ≤10m
- For fall arrest 2 users
- For fall restraint 2 users
## MATERIAL SPECIFICATION:

### Brackets - galvanised steel

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yield</td>
<td>275 N/mm² C 0.15 – 0.26; Si ≤ 0.35; Mn ≤ 1.5; P ≤ 0.035; S ≤ 0.040; Mo 0.4 – 0.6.</td>
</tr>
<tr>
<td>Young’s Modulus of Elasticity</td>
<td>200 x 103 MPa at 20 °C</td>
</tr>
<tr>
<td>Density</td>
<td>7.87 g/cm³ at 20 °C</td>
</tr>
<tr>
<td>Coefficient of Thermal Expansion</td>
<td>Low-Carbon/HSLAS: 12.4 µm/m/°C in 20 °C to 100 °C range</td>
</tr>
<tr>
<td></td>
<td>I-F Steel: 12.9 µm/m/°C in 20 °C to 100 °C range</td>
</tr>
<tr>
<td>Thermal Conductivity</td>
<td>Low-Carbon/HSLAS: 89 W/m°C at 20°C I-F Steel: 93 W/m°C at 20°C</td>
</tr>
<tr>
<td>Specific Heat</td>
<td>481 J/kg/°C in 50 °C to 100 °C range</td>
</tr>
<tr>
<td>Electrical Resistivity</td>
<td>0.142 µΩ•m at 20 °C</td>
</tr>
</tbody>
</table>

### Component parts

Stainless Steel - Grade 304 (UNS S30400)
- Fe, ≤0.08% C, 17.5-20% Cr, 8-11% Ni, ≤2%
- Mn, ≤1% Si, ≤0.045% P, ≤0.03%

Stainless Steel

### Rain cap

Polyvinyl Chloride-PVC
- Tensile Strength 2.60 N/mm²
- Notched Impact Strength 2.0 - 45 Kj/m²
- Thermal Coefficient of expansion 80 x 10^-6
- Max Cont Use Temp 60 C
- Density 1.38 g/cm³

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For any technical queries please call our advice line on 0845 241 9102
OPERATING AND DESIGN STANDARDS:

Eurocodes are designated by EN
British standards are designated by BS

- BS EN 795:2012 Class C – flexible safety lines
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- Management of health and safety at work regulations 1999 MHSWR (Ref.2)
- The work at height safety association WAHSA-guidance on inspecting eyebolts used for personal fall protection purposes
- The Building Regulations 2010 part K.

Typical connection loads (bracket height up to 750mm)

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<table>
<thead>
<tr>
<th>Bracket moment</th>
<th>Horizontal shear</th>
</tr>
</thead>
<tbody>
<tr>
<td>9.39kN/m</td>
<td>16.95kN</td>
</tr>
</tbody>
</table>

Note: For guidelines only to be checked by Chief Engineer.
AVIATOR BUILT UP ROOF SYSTEM

INSPECTION/MAINTENANCE/TRAINING

INSPECTION ROUTINE:
All systems to be inspected at least every 12 months from date of installation.

In harsh environments all systems to be inspected at least every 3 months.

Inspections must be carried out by approved Aviator engineers.

Inspections must be approved to SIMS (Safety Inspection and Maintenance Service) standards.

All inspections to be carried out to EN795:2012 and BS 7883:2005 and WAHSA (inspection of eyebolts) requirements for safety line and anchor points.

All inspections to be carried out to EN364 requirements for personal protective equipment.

Contact Sayfa Systems to arrange inspections.

MAINTENANCE SCHEDULE:
All maintenance to be carried out by approved Aviator engineers.

Maintenance to be in accordance with Sayfa Systems UK (manufacturer) guidelines and recommendations.

In harsh environments all systems to be inspected at least every 3 months.

Maintenance to be in accordance with SIMS standards. (details available on request)

Maintenance to be carried out at time of yearly inspection.

Contact Sayfa Systems to arrange system maintenance.

TRAINING REQUIREMENTS:
All personnel who use the Aviator system should have attended a NASLOT (National Access and Safety Line Operator Training) course.

Courses are available from Sayfa Systems UK Ltd.

All inspections to be carried out to EN364 requirements for personal protective equipment.

Certificate

PASS ✔

For any technical queries please call our advice line on 0845 241 9102
COMPONENT PART DETAILS:
End bracket GRB221
BIM No: SpecEquip_RISflySymBuiltUpEndBkt_SayfaSystems_GRB221_M3_G2

Intermediate bracket GRB222
BIM No: SpecEquip_RISflySymBuiltUpIntBkt_SayfaSystems_GRB222_M3_G2

Corner bracket GRB224
BIM No: SpecEquip_RISflySymBuiltUpCornerBkt_SayfaSystems_GRB224_M3_G2

Line shock absorber SAU260
BIM No: SpecEquip_RISflySymShkAbs_SayfaSystems_SAU260_M3_G2
PVC RAINCAP
PRE CAST TO CLIENT'S SPEC
INSULATION TO CLIENT'S SPEC
GROWING MEDIUM & PLANTING
100mm MIN CLEARANCE

SYSTEM LABEL
NEOPRENE WASHER
STAINLESS STEEL WASHER
M16 STAINLESS STEEL EYENUT

GALVANISED STEEL BRACKET

4NR M12 THREADED BARS FIXED THROUGH HOLLOWCORE AND BACKING PLATE, SECURED WITH M12 NYLOCK WASHER & NUT.
**System Details**

- Line to be located as indicated on the roof plan.
- Line primarily used to gain access to exposed roof edges.
- Incorporates Aviator™ units and all Sayfa Systems components required.
- Fixing details for Aviator™ units as indicated within layout.
- System to be used in conjunction with 2m restraining lanyard unless stated otherwise.
- Enables two users simultaneously at any one time.

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**Fixing Details**

<table>
<thead>
<tr>
<th>M16 STAINLESS STEEL EYENUT</th>
</tr>
</thead>
<tbody>
<tr>
<td>STAINLESS STEEL WASHER</td>
</tr>
<tr>
<td>NEOPRENE WASHER</td>
</tr>
<tr>
<td>SYSTEM LABEL</td>
</tr>
<tr>
<td>PVC RAINCAP</td>
</tr>
<tr>
<td>GALVANISED STEEL BRACKET</td>
</tr>
</tbody>
</table>

**Boot Style Sealing Detail by Roofing Contractor**

- 100mm MIN CLEARANCE
- 160mm MINIMUM INSULATION TO CLIENT SPEC

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**Client:**

**Project Title:**

**Job No:**

**DWG No:**

**Status:**

**Under the CDM Regulations 2015, if any alterations are made to this drawing then the person undertaking these changes assume the role of the designer, therefore taking full CDM responsibility.**

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**Drawing Symbols**

**Drawing Revisions**

<table>
<thead>
<tr>
<th>REV</th>
<th>DATE</th>
<th>COMMENT</th>
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<tbody>
<tr>
<td>A</td>
<td>22/12/2014</td>
<td>Issued for information</td>
</tr>
</tbody>
</table>
AVIATOR BUILT UP ROOF SYSTEM

FIXING DETAILS:
Bracket fixed to timber deck

Bracket fixed to timber deck

M16 STAINLESS STEEL EYE BOLT

PVC RAIN CAP

STAINLESS STEEL WASHER

NEO PRENE WASHER

SYSTEM LABEL

GALVANISED STEEL BRACKET

SEDUM LAYER

TO CLIENT SPECIFICATION

GROWING LAYER

TO CLIENT SPECIFICATION

DRAINAGE LAYER

TO CLIENT SPECIFICATION

PITCH POCKET SEALING DETAIL
(RECOMMENDED)

BY ROOFING CONTRACTOR

INSULATION TO CLIENT SPECIFICATION

18MM TIMBER OR GREATER TO
CLIENT SPECIFICATION

TOGGLE FIXING WITH M8 THREADED BAR

POST TO CLEAR SEDUM BY MINIMUM 100mm

250mm-750mm

For any technical queries please call our advice line on 0845 241 9102
AVIATOR BUILT UP ROOF SYSTEM

**FIXING DETAILS:**
Bracket fixed to steel deck

- **Bracket fixed to steel deck**
- **M16 STAINLESS STEEL EYE BOLT**
- **STAINLESS STEEL WASHER**
- **NEO PRENE WASHER**
- **SYSTEM LABEL**
- **GALVANISED STEEL BRACKET**
- **SEDUM LAYER**
- **TO CLIENT SPECIFICATION**
- **250mm-750mm**
- **NEO PRENE WASHER**
- **SYSTEM LABEL**
- **SEALING BASE**
- **TO CLIENT SPECIFICATION**
- **POST TO CLEAR SEDUM BY MINIMUM 100mm**
- **GROWING LAYER**
- **TO CLIENT SPECIFICATION**
- **DRAINAGE LAYER**
- **TO CLIENT SPECIFICATION**
- **PITCH POCKET SEALING DETAIL (RECOMMENDED)**
  - By Roofing Contractor
- **INSULATION TO CLIENT SPECIFICATION**
- **METAL DECK**
  - **TO CLIENT SPECIFICATION**
- **TOGGLE FIXING WITH M8 THREADED BAR**
- **FOR DESIGN N/A**
- **DRAWING NO. 001**
- **DJ**
- **22/12/2014 As Dimensioned**

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**Drawing Symbols**

- **A** = Access point

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**Under the CDM Regulations 200, if any alterations are made to this drawing then the person undertaking these changes assume the role of the designer, therefore taking full CDM responsibility.**

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**Status:**
UNDER THE CDM REGULATIONS 200, IF ANY ALTERATIONS ARE MADE TO THIS DRAWING THEN THE PERSON UNDERTAKING THESE CHANGES ASSUME THE ROLE OF THE DESIGNER, THEREFORE TAKING FULL CDM RESPONSIBILITY.
FIXING DETAILS:
Bracket fixed to hollow core concrete slab with boot seal

- PVC RAIN CAP
- M16 STAINLESS STEEL EYE BOLT
- STAINLESS STEEL WASHER
- NEO PRENE WASHER
- GALVANISED STEEL BRACKET
- SYSTEM LABEL
- POST TO CLEAR
  SEDUM BY MINIMUM 100mm
- SEDUM LAYER
  TO CLIENT SPECIFICATION
- GROWING LAYER
  TO CLIENT SPECIFICATION
- DRAINAGE LAYER
  TO CLIENT SPECIFICATION
- INSULATION TO CLIENT
  SPECIFICATION
- BOOT STYLE SEALING
  DETAIL BY
  ROOFING CONTRACTOR
- PRE CAST HOLLOWCORE
  SLAB TO CLIENTS
  SPECIFICATION
- TOGGLE FIXING
  IF FIXING HOLE
  BREAKS THROUGH
  HOLLOWCORE
- M12 RESIN SOCKET
  SET 100mm IN
  CONCRETE PRE CAST SLAB.
  USE M12 DOME HEAD
  FIXING SCREW
**AVIATOR BUILT UP ROOF SYSTEM**

**FIXING DETAILS:**
Bracket fixed to cast concrete slab with boot seal

- **Bracket** fixed to cast concrete slab with boot seal.
- **PVC RAIN CAP**
- **M16 STAINLESS STEEL EYE BOLT**
- **STAINLESS STEEL WASHER**
- **NEO PRENE WASHER**
- **SYSTEM LABEL**
- **GALVANISED STEEL BRACKET**
- **SEDUM LAYER TO CLIENT SPECIFICATION**
- **POST TO CLEAR SEDUM BY MINIMUM 100mm**
- **INSULATION TO CLIENT SPECIFICATION**
- **DRAINAGE LAYER TO CLIENT SPECIFICATION**
- **BOOT STYLE SEALING DETAIL BY ROOFING CONTRACTOR**
- **M12 RESIN SOCKET SET 100mm IN CONCRETE PRE CAST SLAB. USE M12 DOME HEAD FIXING SCREW**
- **METAL DECK TO CLIENT SPECIFICATION**

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For any technical queries please call our advice line on 0845 241 9102
AVIATOR BUILT UP ROOF SYSTEM

**FIXING DETAILS:**
Bracket fixed to timber deck with boot seal

- **GALVANISED STEEL BRACKET**
- **PVC RAIN CAP**
- **M16 STAINLESS STEEL EYE BOLT**
- **STAINLESS STEEL WASHER**
- **NEO PRENE WASHER**
- **SYSTEM LABEL**
- **SEDUM LAYER TO CLIENT SPECIFICATION**
- **GROWING LAYER TO CLIENT SPECIFICATION**
- **DRAINAGE LAYER TO CLIENT SPECIFICATION**
- **POST TO CLEAR SEDUM BY MINIMUM 100mm**
- **BOOT STYLE SEALING DETAIL BY ROOFING CONTRACTOR**
- **TOGGLE FIXING WITH M8 THREADED BAR**
- **INSULATION TO CLIENT SPECIFICATION**
- **18MM TIMBER OR GREATER TO CLIENT SPECIFICATION**

For any technical queries please call our advice line on 0845 241 9102
FIXING DETAILS:
Bracket fixed to steel deck with boot seal

AVIATOR BUILT UP ROOF SYSTEM

For any technical queries please call our advice line on 0845 241 9102
FIXING DETAILS:
Hotmelt inverted roof fixed to concrete 450 post

For any technical queries please call our advice line on 0845 241 9102
BRACKET SIZE:

GALVANISED TO BS EN ISO 1461
SEALING DETAIL:

- Pitch pocket seal to extend over edge of base.

AVIATOR BUILT UP ROOF SYSTEM

For any technical queries please call our advice line on 0845 241 9102
COMPOSITE METAL PANEL ROOF SYSTEM

PRODUCT DATA SHEET
REPORT NO: 013
PRODUCT CODE: COMP250
PRODUCT DESCRIPTION:
A safety line bracket system for installation on composite metal roof systems up to a 35 degree pitch. The brackets are installed onto the completed roof system with Sayfa bulb type rivets that are designed for fall arrest standards and have an integrated neoprene seal. The brackets are installed with a sealing strip between the bracket and roof deck to ensure a leak proof installation. No additional sealing is required on completion of an installation. Both brackets and cable can be installed in a single visit. Brackets are manufactured in electro polished stainless steel to ensure long service life. Brackets are supplied in a standard length of 426mm with the mounting holes slotted to accommodate most leading makes of metal composite panels. Larger bespoke sizes can be manufactured on request.

The safety line system is designed to operate as a fall restraint system or a fall arrest system depending on the layout design. All systems have built in shock absorbing units in each bracket and are fitted with an inline shock absorber on the end brackets. The shock absorbing capabilities when used together with a shock absorbing lanyard, will ensure that no more than 4kN force is exerted on the users at any point in the system. We recommend only 2 users on a fall arrest system.

The fall restraint systems can be designed for up to 3 users at any one time and provide unrestricted access along the full length of the system. Corners and intermediate brackets allow the line shuttle to move smoothly along the full length of the cable between end brackets.
MATERIAL SPECIFICATION:

Brackets and component parts
Stainless Steel - Grade 304 (UNS S30400)
Fe, ≤0.08% C, 17.5-20% Cr, 8-11% Ni, ≤2% Mn,
≤1% Si, ≤0.045% P, ≤0.03%
Stainless Steel
Surface electropolished typically 20-40 micron case removal of stainless steel.

Rain cap
Polyvinyl Chloride-PVC. Tensile Strength 2.60 N/mm², Notched Impact Strength 2.0 - 45 Kj/m²,
Thermal Coefficient of expansion 80 x 10⁻⁶ , Max
Cont Use Temp 60 C, Density 1.38 g/cm³

Bulb type rivet
Aluminium body 0.50 - 0.75 Si, Max 0.35, Fe 0.40 - 0.70 Mg
Tensile strength 151MPa
Yield strength 89MPa
Neoprene seal Elastomer – Neoprene
Colour - Black
Quality – Commercial Grade - C20 Hardness - 65° Shore A +/-5°
S.G. - 1.4G/Cm³ Tensile Mpa - 5 Min Elongation - 300%
Tear Strength - 20 Kg/Cm  Compression Set - 35%
Operating Temperature -20° / +110° C

For any technical queries please call our advice line on 0845 241 9102
**OPERATING AND DESIGN STANDARDS:**

Eurocodes are designated by EN
British standards are designated by BS

- BS EN 795:2012 Class C – flexible safety lines
- BS EN 795:2012 Class A – single anchors, anti-pendulum anchors
- BS 7883: 2005 – Design, selection, installation, use and maintenance for anchors conforming to EN 795
- BSMA 29: 1982 – specification for steel wire rope
- ACR (M) 002:2015 Rev 2
- ACR (CP) 007:2015 Rev 2
- ISO 9001:2008
- ISO 14001:2004
- BS OHSAS 18001:2007
- Work at height regulations 2005 [Ref.7]
- Work at height (amendment) Regulations 2007 [Ref.8] WAHR
- Provision and use of work equipment regulations 1998 PUWER 98 [Ref. 5]

The company operates to the following standards

- BS EN 795:2012
- ISO 9001:2008
- ISO 14001:2004
- BS OHSAS 18001:2007

**Typical connection loads** (bracket height up to 150mm)

<table>
<thead>
<tr>
<th>Ultimate factored load on bracket base</th>
<th>Tension</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.0 kN</td>
<td>6.15 kN</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Bracket moment</th>
<th>Horizontal shear</th>
</tr>
</thead>
<tbody>
<tr>
<td>6.39 kN/m</td>
<td>16.95 kN</td>
</tr>
</tbody>
</table>

Note: For guidelines only to be checked by Chief Engineer.
INSPECTION/MAINTENANCE/TRAINING

INSPECTION ROUTINE:
All systems to be inspected at least every 12 months from date of installation.

In harsh environments all systems to be inspected at least every 3 months.

Inspections must be carried out by approved Aviator engineers.

Inspections must be approved to SIMS (Safety Inspection and Maintenance Service) standards.

All inspections to be carried out to EN795:2012 and BS 7883:2005 and WAHSA (inspection of eyebolts) requirements for safety line and anchor points.

All inspections to be carried out to EN364 requirements for personal protective equipment.

Contact Sayfa Systems to arrange inspections.

MAINTENANCE SCHEDULE:
All maintenance to be carried out by approved Aviator engineers.

Maintenance to be in accordance with Sayfa Systems UK (manufacturer) guidelines and recommendations.

In harsh environments all systems to be inspected at least every 3 months.

Maintenance to be in accordance with SIMS standards. [details available on request]

Maintenance to be carried out at time of yearly inspection.

Contact Sayfa Systems to arrange system maintenance.

TRAINING REQUIREMENTS:
All personnel who use the Aviator system should have attended a NASLOT (National Access and Safety Line Operator Training) course. Courses are available from Sayfa Systems UK Ltd.
COMPONENT PART DETAILS:
End bracket COMP251
BIM No: SpecEquip_RfSftySymCompEndBkt_SayfaSystems_Comp251_M3_G2

Intermediate bracket COMP252
BIM No: SpecEquip_RfSftySymCompIntBkt_SayfaSystems_Comp252_M3_G2

Corner bracket COMP254
BIM No: SpecEquip_RfSftySymCompCornrBkt_SayfaSystems_Comp254_M3_G2

Bulbtype rivet BTR300
BIM No: SpecEquip_RfSftySymCompRvt_SayfaSystems_Btr300_M3_G2
AVIATOR COMPOSITE METAL PANEL ROOF SYSTEM

FIXING DETAILS:
Fixing to peaks on composite metal panel

THIS FIXING DETAIL IS CORRECT FOR PEAK CENTRES UP TO 400mm
FIXING DETAILS:
Fixing to valley on wide seam composite metal panel

M16 STAINLESS STEEL EYE BOLT
STAINLESS STEEL WASHER
NEOPRENE WASHER
SYSTEM LABEL
ELECTRO POLISHED BRACKET

10nr GESIPA RIVET FIXINGS PER PLATE
BUTILE MASTIC SEALING STRIP

THIS FIXING DETAIL IS CORRECT FOR PEAK CENTRES OVER 400mm
For any technical queries please call our advice line on 0845 241 9102

BRACKET SIZE:

SECTION VIEW

PLAN VIEW
STANDING SEAM ROOF SYSTEM – BULB TYPE

PRODUCT DATA SHEET

REPORT NO: 014

PRODUCT CODE: STSM230
**PRODUCT DESCRIPTION:**
A safety line bracket system for installation on standing seam roof systems up to a 35 degree pitch. The brackets are installed onto the completed roof system with block clamps that are designed to prevent any penetration to the roof sheet. The unique scissor action allows the roof sheets to expand and contract with the atmospheric temperature preventing any pressure points on the roof.

Brackets are supplied in Electro-polished steel. Block clamps are extruded aluminium and separated by washers to prevent galvanic corrosion. Brackets are supplied in a length suitable to accommodate standard roof peak widths of up to 500mm wide. Longer brackets which will accommodate a 1000mm seam are available on request. No additional sealing is required on completion of an installation. Both brackets and cable can be installed in a single visit.

The safety line system is designed to operate as a fall restraint system or a fall arrest system depending on the layout design. All systems have built in shock absorbing units in each bracket and are fitted with an inline shock absorber on the end brackets. The shock absorbing capabilities when used together with a shock absorbing lanyard, will ensure that no more than 4kN force is exerted on the users at any point in the system. We recommend only 1 user on a fall arrest system.

The fall restraint systems can be designed for up to 2 users at any one time and provide unrestricted access along the full length of the system. Corners and intermediate brackets allow the line shuttle to move smoothly along the full length of the cable between end brackets.

**Seam widths**
- Up to 500mm
- Up to 1000mm

**Bracket centres**
- ≤10m

**Deployment**
- 4kN

For fall restraint 2 users
For fall arrest 2 users

For any technical queries please call our advice line on 0845 241 9102
**AVIATOR STANDING SEAM ROOF SYSTEM - BULB TYPE**

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**MATERIAL SPECIFICATION:**

**Brackets - galvanised steel**

<table>
<thead>
<tr>
<th>Property</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yield</td>
<td>275 N/mm² C 0.15 – 0.26; Si ≈ 0.35; Mn ≈ 1.5; P ≈ 0.035; S ≈ 0.040; Mo 0.4 – 0.6.</td>
</tr>
<tr>
<td>Young’s Modulus of Elasticity</td>
<td>200 x 103 MPa at 20 °C</td>
</tr>
<tr>
<td>Density</td>
<td>7.87 g/cm³ at 20 °C</td>
</tr>
<tr>
<td>Coefficient of Thermal Expansion</td>
<td>Low-Carbon/HSLAS: 12.4 μm/m/°C in 20 °C to 100 °C range I-F Steel: 12.9 μm/m/°C in 20 °C to 100 °C range</td>
</tr>
<tr>
<td>Thermal Conductivity</td>
<td>Low-Carbon/HSLAS: 89 W/m°C at 20°C I-F Steel: 93 W/m°C at 20°C</td>
</tr>
<tr>
<td>Specific Heat</td>
<td>481 J/kg/°C in 50 °C to 100 °C range</td>
</tr>
<tr>
<td>Electrical Resistivity</td>
<td>0.142 μΩ•m at 20 °C</td>
</tr>
</tbody>
</table>

**Component parts**

Stainless Steel - Grade 304 (UNS S30400)
- Fe, ≤0.08% C, 17.5-20% Cr, 8-11% Ni, ≤2% Mn, ≤1% Si, ≤0.045% P, ≤0.03% Stainless Steel

**Nylon up stand**

- incorporates stainless steel insert
- Maximum Temperature: 210°F 99°C
- Minimum Temperature: -94°F -70°C
- Autoclavable: No
- Melting Point: 420°F 216°C
- Tensile Strength: 40MPa
- Hardness: R92
- UV Resistance: Good
- Colour Dark grey
- Rigid
- Specific Gravity: 1.13

**Block clamp**

- Extruded aluminium 0.50 – 0.75 Si, Max 0.35, Fe 0.40 – 0.70 Mg
- Tensile strength PSI 25,000 Yield strength 103MPa

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For any technical queries please call our advice line on 0845 241 9102
**OPERATING AND DESIGN STANDARDS:**

Eurocodes are designated by EN  
British standards are designated by BS

- BS EN 795:2012 Class C – flexible safety lines  
- BS EN 795:2012 Class A – single anchors, anti-pendulum anchors  
- BS 7883: 2005 – Design, selection, installation, use and maintenance for anchors conforming to EN 795  
- BSMA 29: 1982 – specification for steel wire rope  
- ACR (M) 002:2015 Rev 2  
- ACR (CP) 007:2015 Rev 2  
- ISO 9001:2008  
- ISO 14001:2004  
- BS OHSAS 18001:2007  
- Work at height regulations 2005 [Ref.7]  
- Work at height (amendment) Regulations 2007 [Ref.8] WAHR  
- Provision and use of work equipment regulations 1998 PUWER 98 [Ref. 5]  

Typical connection loads (bracket height up to 150mm)

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Load (kN)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ultimate factored load</td>
<td>12.0</td>
</tr>
<tr>
<td>Tension</td>
<td>6.15</td>
</tr>
<tr>
<td>Bracket moment</td>
<td>9.39</td>
</tr>
<tr>
<td>Horizontal shear</td>
<td>16.95</td>
</tr>
</tbody>
</table>

Note: For guidelines only to be checked by Chief Engineer.

The company operates to the following standards:

- ISO 9001:2008
- ISO 14001:2004
- BS OHSAS 18001:2007
- Management of health and safety at work regulations 1999 MHSWR [Ref.2]  
- The work at height safety association WAHSA-guidance on inspecting eyebolts used for personal fall protection purposes  
- The Building Regulations 2010 part K.
**AVIATOR STANDING SEAM ROOF SYSTEM - BULB TYPE**

**INSPECTION/MAINTENANCE/TRAINING**

**INSPECTION ROUTINE:**
All systems to be inspected at least every 12 months from date of installation.

In harsh environments all systems to be inspected at least every 3 months.

Inspections must be carried out by approved Aviator engineers.

Inspections must be approved to SIMS (Safety Inspection and Maintenance Service) standards.

All inspections to be carried out to EN795:2012 and BS 7883:2005 and WAHSA (inspection of eyebolts) requirements for safety line and anchor points.

All inspections to be carried out to EN364 requirements for personal protective equipment.

Contact Sayfa Systems to arrange inspections.

**MAINTENANCE SCHEDULE:**
All maintenance to be carried out by approved Aviator engineers.

Maintenance to be in accordance with Sayfa Systems UK (manufacturer) guidelines and recommendations.

In harsh environments all systems to be inspected at least every 3 months.

Maintenance to be in accordance with SIMS standards. [details available on request]

Maintenance to be carried out at time of yearly inspection.

Contact Sayfa Systems to arrange system maintenance.

**TRAINING REQUIREMENTS:**
All personnel who use the Aviator system should have attended a NASLOT (National Access and Safety Line Operator Training) course. Courses are available from Sayfa Systems UK Ltd.

**INSPECTION ROUTINE:**
All systems to be inspected at least every 12 months from date of installation.

In harsh environments all systems to be inspected at least every 3 months.

**TRAINING REQUIREMENTS:**
All personnel who use the Aviator system should have attended a NASLOT (National Access and Safety Line Operator Training) course. Courses are available from Sayfa Systems UK Ltd.

**MAINTENANCE SCHEDULE:**
All maintenance to be carried out by approved Aviator engineers.

Maintenance to be in accordance with Sayfa Systems UK (manufacturer) guidelines and recommendations.

In harsh environments all systems to be inspected at least every 3 months.
COMPONENT PART DETAILS:

End bracket STSM231
BIM No: SpecEquip_RISflySymStandSeamEndBkt_SayfaSystems_STSM231_M3_G2

Intermediate bracket STSM232
BIM No: SpecEquip_RISflySymStandSeamInterBkt_SayfaSystems_STSM232_M3_G2

Corner bracket STSM234
BIM No: SpecEquip_RISflySymStandSeamCornrBkt_SayfaSystems_STSM234_M3_G2

Block clamp STSC305
BIM No: SpecEquip_RISflySymStandSeamClmp_SayfaSystems_STSC305_M3_G2
FIXING DETAILS:
Standing seam end bracket

- M16 STAINLESS STEEL EYEBOLT
- NYLON EXTENSION TUBE
- SYSTEM LABEL
- GALVANISED UNIVERSAL CROSS BRACKETS
- STAINLESS STEEL WASHER
- NEO PRENE WASHER
- ALUMINUM NON-PENETRATING STANDING SEAM CLAMPS
AVIATOR STANDING SEAM ROOF SYSTEM - BULB TYPE

FIXING DETAILS:
Standing seam end bracket

- M16 STAINLESS STEEL EYEBOLT
- NYLON EXTENSION TUBE
- GALVANISED UNIVERSAL CROSS BRACKETS
- STAINLESS STEEL WASHER
- NEO PRENE WASHER
- ALUMINUM NON-PENETRATING STANDING SEAM CLAMPS

For any technical queries please call our advice line on 0845 241 9102
BRACKET SIZE:
Clamp size

STAINLESS STEEL BOLT
STAINLESS STEEL WASHER
GALVANISED STEEL UNIVERSAL CROSS BRACKET
RUBBER WASHERS
STAINLESS STEEL BOLT
STAINLESS STEEL
GRUB SCREWS OPTIONAL ONLY FITTED ON VM ZINC ROOFS

For any technical queries please call our advice line on 0845 241 9102
BRACKET SIZE:
Crossbar size

750mm LONG FOR SEAM CENTRES UP TO 500mm

1270mm LONG FOR SEAM CENTRES UP TO 1000mm

Drawing Symbols

AVIATOR STANDING SEAM ROOF SYSTEM - BULB TYPE
FIXING DETAILS:
Standing seam zinc roof end bracket

- Standing seam zinc roof system
- Pyramid Type

Diagram:
- M16 Stainless Steel Eyebolt
- Nylon Extension Tube
- Galvanised Universal Cross Brackets
- System Label
- Stainless Steel Washer
- Neo Prene Washer
- Roof Deck to Clients Specification
- M16 Stainless Steel Bolt
- Aluminium Non-Penetrating Standing Seam Clamps
BRACKET SIZE:
Clamp size zinc roof

STAINLESS STEEL BOLT
STAINLESS STEEL WASHER
GALVANISED STEEL
UNIVERSAL CROSS BRACKET
RUBBER WASHERS
STAINLESS STEEL BOLT
STAINLESS STEEL GRUB SCREW

ROOF DECK TO CLIENTS SPECIFICATION
SECRET FIX ROOF SYSTEM

PRODUCT DATA SHEET
REPORT NO: 016
PRODUCT CODE: SFB240

REVISION NO: 001
**PRODUCT DESCRIPTION:**
A safety line bracket system for installation on secret fix metal roof systems up to a 35 degree pitch. The brackets are installed onto the completed roof system with Sayfa bulb type rivets that are designed for fall arrest standards and have an integrated neoprene seal. The brackets are installed with a sealing strip between the bracket and roof deck to ensure a leak proof installation. No additional sealing is required on completion of an installation. Both brackets and cable can be installed in a single visit. Brackets are manufactured in electro polished stainless steel to ensure long service life. Brackets are supplied in a standard length of 540mm with the mounting holes slotted to accommodate most leading makes of secret fix panels. Larger bespoke sizes can be manufactured on request.

The safety line system is designed to operate as a fall restraint system or a fall arrest system depending on the layout design. All systems have built in shock absorbing units in each bracket and are fitted with an inline shock absorber on the end brackets. When used together with a shock absorbing lanyard, the shock absorbing capabilities will ensure that no more than 4kN force is exerted on the users at any point in the system. We recommend only 1 user on a fall arrest system.
MATERIAL SPECIFICATION:

Brackets and component parts
Stainless Steel - Grade 304 (UNS S30400)
Fe, ≤0.08% C, 17.5-20% Cr, 8-11% Ni, ≤2% Mn,
≤1% Si, ≤0.045% P, ≤0.03%
Stainless Steel
Surface electropolished typically 20-40 micron case
removal of stainless steel.

Rain cap
Polyvinyl Chloride-PVC. Tensile Strength 2.60 N/
mm², Notched Impact Strength 2.0 - 45 Kj/m²,
Thermal Coefficient of expansion 80 x 10⁻⁶, Max
Cont Use Temp 60 C, Density 1.38 g/cm³

Bulb type rivet
Aluminium body 0.50 - 0.75 Si, Max 0.35, Fe 0.40 - 0.70 Mg
Tensile strength 151MPa
Yield strength 89Mpa
Neoprene seal Elastomer – Neoprene
Colour – Black
Quality – Commercial Grade - C20 Hardness - 65° Shore A +/-5°
S.G. - 1.4G/Cm³ Tensile Mpa - 5 Min Elongation - 300%
Tear Strength - 20 Kg/Cm Compression Set - 35%
Operating Temperature -20° / +110° C
OPERATING AND DESIGN STANDARDS:

- BS EN 795:2012 Class C – flexible safety lines
- BS EN 795:2012 Class A – single anchors, anti-pendulum anchors
- BS 7883: 2005 – Design, selection, installation, use and maintenance for anchors conforming to EN 795
- BSMA 29: 1982 – specification for steel wire rope
- ACR (M) 002:2015 Rev 2
- ACR (CP) 007:2015 Rev 2
- ISO 9001:2008
- ISO 14001:2004
- BS OHSAS 18001:2007
- Work at height regulations 2005 [Ref.7]
- Work at height (amendment) Regulations 2007 [Ref.8] WAHR
- Provision and use of work equipment regulations 1998 PUWER 98 (Ref. 5)

Typical connection loads (bracket height up to 150mm)

- Ultimate factored load on bracket base: 12.0kN
- Tension: 6.15kN
- Bracket moment: 6.39kN/m
- Horizontal shear: 16.95kN

Note: For guidelines only to be checked by Chief Engineer.

The company operates to the following standards:

- ISO 9001:2008
- ISO 14001:2004
- BS OHSAS 18001:2007
- Management of health and safety at work regulations 1999 MHSWR [Ref.2]
- The work at height safety association WAHSA guidance on inspecting eyebolts used for personal fall protection purposes
- The Building Regulations 2010 part K.
AVIATOR SECRET FIX ROOF SYSTEM

INSPECTION/MAINTENANCE/TRAINING

INSPECTION ROUTINE:
All systems to be inspected at least every 12 months from date of installation.

In harsh environments all systems to be inspected at least every 3 months.

Inspections must be carried out by approved Aviator engineers.

Inspections must be approved to SIMS (Safety Inspection and Maintenance Service) standards.

All inspections to be carried out to EN795:2012 and BS 7883:2005 and WAHSA (inspection of eyebolts) requirements for safety line and anchor points.

All inspections to be carried out to EN364 requirements for personal protective equipment.

Contact Sayfa Systems to arrange inspections.

TRAINING REQUIREMENTS:
All personnel who use the Aviator system should have attended a NASLOT (National Access and Safety Line Operator Training) course. Courses are available from Sayfa Systems UK Ltd.

MAINTENANCE SCHEDULE:
All maintenance to be carried out by approved Aviator engineers.

Maintenance to be in accordance with Sayfa Systems UK (manufacturer) guidelines and recommendations.

In harsh environments all systems to be inspected at least every 3 months.

Maintenance to be in accordance with SIMS standards. [details available on request]

Maintenance to be carried out at time of yearly inspection.

Contact Sayfa Systems to arrange system maintenance.

Certificate
COMPONENT PART DETAILS:
End bracket SFB241
BIM No: SpecEquip_RfSftySymSecretFixEndBkt_SayfaSystems_SFB241_M3_G2

Intermediate bracket SFB242
BIM No: SpecEquip_RfSftySymSecretFixIntBkt_SayfaSystems_SFB242_M3_G2

Corner bracket SFB243
BIM No: SpecEquip_RfSftySymSecretFixCornrBkt_SayfaSystems_SFB243_M3_G2

Bulbtype rivet BTR300
BIM No: SpecEquip_RfSftySymCompRvt_SayfaSystems_Btr300_M3_G2
FIXING DETAILS:
Fixing to peaks on secret fix metal panel

AVIATOR™ fall restraint/arrest anchor fix with 10 gesipa rivets with integrated washer and butyl mastic layer between post and roof sheet

THIS FIXING DETAIL IS CORRECT FOR PEAK CENTRES UP TO 440mm
For any technical queries please call our advice line on 0845 241 9102
OVERHEAD AND WALL SYSTEM

PRODUCT DATA SHEET
REPORT NO: 017
PRODUCT CODE: OH200

REVISION NO: 001
AVIATOR OVERHEAD AND WALL SAFETY LINE SYSTEM

PRODUCT DESCRIPTION:
Overhead safety line brackets are designed to be fixed to a structural substrate such as structural steel or concrete to provide suitable connection points for both fall restraint and fall arrest use. The position of the eyebolts in relation to a fall hazard will determine whether the operator is working in fall restraint or fall arrest. Brackets are supplied in stainless steel. They are secured to concrete and brickwork/ blockwork with resin anchors and to steelwork with stainless steel bolts, washers and vibration proof nuts. When fixing to a timber structure it may be necessary to provide a backing plate to ensure compliance. The system comprises of end brackets and intermediate brackets to allow users to have full access along a system without disconnecting. There are no corners on the system and users are provided with a double lanyard to transfer between systems.

The safety line system is designed to operate as a fall restraint system or a fall arrest system depending on the system layout design. The system can be fitted above or to the side of a work area. When designing a system it is good practice to keep the line above the user rather than low down or even at foot level. If the line is kept above the work location it will reduce the fall factor considerably. The use of an overhead system together with a Sayfa self-retracting shock absorbing lanyard, will ensure compliance with all industry regulations. The overhead systems can be designed for up to 2 users at any one time. This will be determined by the distance between the brackets. For fall restraint use, which is highly recommended, the eyebolts need to be positioned at least 2.5m away from any exposed edge. This will allow the operator to access the area using a 2m lanyard connected to a full body harness, safely without risk of falling.
AVIATOR OVERHEAD AND WALL SAFETY LINE SYSTEM

Different lengths of fixed lanyards can be provided to accommodate different eyebolt connection points. If an inertia reel is used or the eyebolts are fixed nearer the end than the length of lanyard the operator will be working in fall arrest. In these situations the operator must ensure they have read and understood the site rescue plan. Involving our specialist design teams as early as possible will ensure the most cost effective system is used without compromising any safety or access requirements. Our designers will consider the welfare and safety of both operatives and non-operative personnel during the construction phase and future use.

Overhead system brackets are supplied in 150mm lengths for concrete and block/brick fixing. Shorter eyebolts of 50mm are used in structural steel. For timber of sufficient strength the 150mm eyebolt can be used with vibration resistant locking nuts and large washers either side. A minimum thickness of 125mm treated timber is required. Brackets can be installed on the horizontal or vertical substrates of a building. Careful consideration must be taken when designing the eyebolt positions to ensure any operator lanyards will not foul with any roof plant or furniture or fixtures. All eyebolts must be secured at least 280mm from any substrate edge. For a stand-off, up to 350mm, fit a bracket support post behind the building’s façade.

All systems are fitted with inline shock absorbers and have built in shock absorbing capabilities in the bracket components. When used together with a shock absorbing lanyard, the system will ensure that no more than 4kN force is exerted on the users at any point in the system. It is important to use the correct PPE which is supplied at time of installation. The use of alternative PPE could result in the system shock absorbers not deploying sufficiently.
OPERATING AND DESIGN STANDARDS:

- BS EN 795:2012 Class C – flexible safety lines
- BS EN 795:2012 Class A – single anchors, anti-pendulum anchors
- BS 7883: 2005 – Design, selection, installation, use and maintenance for anchors conforming to EN 795
- BSMA 29: 1982 – specification for steel wire rope
- ACR (M) 002:2015 Rev 2
- ACR (CP) 007:2015 Rev 2
- ISO 9001:2008
- ISO 14001:2004
- BS OHSAS 18001:2007
- Work at height regulations 2005 [Ref.7]
- Work at height (amendment) Regulations 2007 [Ref.8] WAHR
- Provision and use of work equipment regulations 1998 PUWER 98 (Ref. 5)

Typical connection loads (Maximum cantilever from substrata 75mm. Maximum support spacer 350mm)

**Ultimate factored load on bracket base**

- 12.0 kN

**Bracket moment**

- 9.89 kN/m

**Tension**

- 6.80 kN

**Horizontal shear**

- 16.95 kN

Note: For guidelines only to be checked by Chief Engineer.

The company operates to the following standards

- BS EN ISO 9001:2008
- BS EN ISO 14001:2004
- BS OHSAS 18001:2007
- Management of health and safety at work regulations 1999 MHSWR [Ref.2]
- The work at height safety association WAHSA—guidance on inspecting eyebolts used for personal fall protection purposes
- The Building Regulations 2010 part K.
MATERIAL SPECIFICATION:

**Component parts - Eyebolt**
Stainless Steel - Grade 304 (UNS S30400)
Fe, &lt;0.08% C, 17.5-20% Cr, 8-11% Ni, &lt;2% Mn, &lt;1% Si, &lt;0.045% P, &lt;0.03% Stainless Steel

**Support spacer - Galvanised steel**

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yield</td>
<td>275 N/mm² C 0.15 – 0.26; Si &lt; 0.35; Mn &lt; 1.5; P &lt; 0.035; S &lt; 0.040; Mo 0.4 – 0.6.</td>
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<tr>
<td>Young’s Modulus of Elasticity</td>
<td>200 x 103 MPa at 20 °C</td>
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<td>Coefficient of Thermal Expansion</td>
<td>Low-Carbon/HSLAS: 12.4 μm/m/°C in 20 °C to 100 °C range; I-F Steel: 12.9 μm/m/°C in 20 °C to 100 °C range</td>
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<td>Thermal Conductivity</td>
<td>Low-Carbon/HSLAS: 89 W/m°C at 20°C I-F Steel: 93 W/m°C at 20°C</td>
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<tr>
<td>Specific Heat</td>
<td>481 J/kg/°C in 50 °C to 100 °C range</td>
</tr>
<tr>
<td>Electrical Resistivity</td>
<td>0.142 μΩ•m at 20 °C</td>
</tr>
</tbody>
</table>

**Identity disc**
Polyvinyl Chloride-PVC. Tensile Strength 2.60 N/mm², Notched Impact Strength 2.0 - 45 Kj/m², Thermal Coefficient of expansion 80 x 10⁻⁶, Max Cont Use Temp 60 C, Density 1.38 g/cm³

**Neoprene washer**
Elastomer – Neoprene
Colour – Black
Quality – Commercial Grade - c20
Hardness - 65° shore a +/-5°
S.G. - 1.4G/cm³
Tensile mpa - 5 min
Elongation - 300%
Tear strength - 20 kg/cm
Compression set - 35%
Operating temperature - -20° / +110° c
AVIATOR OVERHEAD AND WALL SAFETY LINE SYSTEM

INSPECTION/MAINTENANCE/ TRAINING

INSPECTION ROUTINE:
All systems to be inspected at least every 12 months from date of installation.

In harsh environments all systems to be inspected at least every 3 months.

Inspections must be carried out by approved Aviator engineers.

Inspections must be approved to SIMS (Safety Inspection and Maintenance Service) standards.

All inspections to be carried out to EN795:2012 and BS 7883:2005 and WAHSA (inspection of eyebolts) requirements for safety line and anchor points.

All inspections to be carried out to EN364 requirements for personal protective equipment.

Contact Sayfa Systems to arrange inspections.

MAINTENANCE SCHEDULE:
All maintenance to be carried out by approved Aviator engineers.

Maintenance to be in accordance with Sayfa Systems UK (manufacturer) guidelines and recommendations.

In harsh environments all systems to be inspected at least every 3 months.

Maintenance to be in accordance with SIMS standards. [details available on request]

Maintenance to be carried out at time of yearly inspection.

Contact Sayfa Systems to arrange system maintenance.

TRAINING REQUIREMENTS:
All personnel who use the Aviator system should have attended a NASLOT (National Access and Safety Line Operator Training) course.

Courses are available from Sayfa Systems UK Ltd.

CONTACT: Sayfa Systems

TRAINING ROUTINE:
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Maintenance to be in accordance with SIMS standards. [details available on request]

Maintenance to be carried out at time of yearly inspection.

Contact Sayfa Systems to arrange system maintenance.

TRAINING REQUIREMENTS:
All personnel who use the Aviator system should have attended a NASLOT (National Access and Safety Line Operator Training) course.

Courses are available from Sayfa Systems UK Ltd.
COMPONENT PART DETAILS:

Overhead end bracket OH265
BIM No: SpecEquip_RfSfySymConcOvrHdEndBkt_SayfaSystems_OH265_M3_G2

Overhead intermediate IPTP325
BIM No: SpecEquip_RfSfySymStlOvrHdIntBkt_SayfaSystems_IPTP325_M3_G2

Support spacer GRB200
BIM No: SpecEquip_RfSfySymBuiltUpEndBkt_SayfaSystems_GRB200_M3_G2

In line shock absorber SAU260
BIM No: SpecEquip_RfSfySymShkAbs_SayfaSystems_SAUN60_M3_G2
FIXING DETAILS:
Eyebolt fixed to concrete slab

- M12 STAINLESS STEEL EYE BOLT
- NEOPRENE WASHER
- CONCRETE TO BE MINIMUM 200mm THICK
- M12 STAINLESS STEEL EYEBOLT SOCKET RESIN ANCHORED TO CONCRETE

SYSTEM LABEL

CONCRETE TO BE MINIMUM 200mm THICK

For any technical queries please call our advice line on 0845 241 9102
FIXING DETAILS:
Eyebolt fixed to blockwork/brickwork

BLOCK WORK TO BE MINIMUM 200mm

SYSTEM LABEL

M12 STAINLESS STEEL EYE BOLT

NEOPRENE WASHER

M12 STAINLESS STEEL EYEBOLT SOCKET RESIN ANCHORED TO BLOCK WORK
FIXING DETAILS:
Eyebolt fixed to timber support

STRUCTURAL TIMBER TO BE MINIMUM 125mm
AVIATOR OVERHEAD AND WALL SAFETY LINE SYSTEM

**FIXING DETAILS:**
Eyebolt fixed steel beam

- **STRUCTURAL STEEL TO BE MINIMUM 5mm**
  - NEOPRENE WASHER
  - M12 STAINLESS STEEL EYEBOLT BOLTED THROUGH STEEL BEAM
  - STAINLESS STEEL WASHER
  - STAINLESS STEEL WASHER
  - NEOPRENE WASHER

- **STRUCTURAL STEEL TO BE MINIMUM 5mm**
  - NEOPRENE WASHER
  - M12 STAINLESS STEEL EXPANDING BOLT
  - STAINLESS STEEL WASHER
  - STAINLESS STEEL WASHER
  - NEOPRENE WASHER

**Fixing Details**
- eyebolt fixed steel beam

**Revision:**
- 22/12/2014
- As Dimensioned
- For Design
- N/A

**Drawing Symbols:**
- A = Access point

**Status:**
- UNDER THE CDM REGULATIONS 200, IF ANY ALTERATIONS ARE MADE TO THIS DRAWING THEN THE PERSON UNDERTAKING THESE CHANGES ASSUME THE ROLE OF THE DESIGNER, THEREFORE TAKING FULL CDM RESPONSIBILITY.

**Copyright and Confidential Information:**
- THIS DRAWING IS PROTECTED BY COPYRIGHT AND THE INFORMATION HEREIN IS CONFIDENTIAL. THE DRAWING MAY NOT BE COPIED AND THE INFORMATION HEREIN MAY NOT BE USED OR DISCLOSED EXCEPT WITH THE WRITTEN PERMISSION OF SAYFA SYSTEMS ©

**DRAWING REVISIONS**
- REV DATE COMMENT
- 001 DJ

**THIS DRAWING WAS CREATED IN CONJUNCTION WITH ____________**
- DRAWING NO. ______________

**TYPICAL FIXING DETAILS**

For any technical queries please call our advice line on 0845 241 9102
AVIATOR OVERHEAD AND WALL SAFETY LINE SYSTEM

FIXING DETAILS:
Support spacer

For any technical queries please call our advice line on 0845 241 9102
AVIATOR ABSEIL ANCHORS

PRODUCT DESCRIPTION:
Abseil anchors are designed to be fixed to a structural substrate such as structural steel or concrete to provide suitable rope access connection points. It is essential when designing rope access to ensure at least 2 different connection points are available to connect to at any one time. There are 2 types of abseil anchors available – abseil brackets and abseil eyebolts. Brackets are supplied in galvanised steel with stainless steel components. Neoprene washers ensure no galvanic reaction can take place. Abseil eyebolts are supplied in stainless steel. Brackets and eyebolts are secured to concrete with resin anchors and to steelwork with stainless steel bolts, washers and vibration proof nuts. When fixing to metal deck or timber deck it may be necessary to provide a backing plate to ensure compliance.

The brackets are designed for 1 user at any one time and 2 users in the event of emergency access requirements. Brackets need to be positioned so any rope connections do not exceed a 120 degree angle when in use – an angle of 90 degrees is recommended. This will be determined by the design layout and position of the anchors. Involving our specialist design teams as early as possible will ensure the most cost effective system is used without compromising any safety or access requirements. Our designers will consider the welfare and safety of both rope access and non-rope access personal during the construction and future use.
Brackets can be supplied in varying heights from 150mm up to 550mm to accommodate different roof constructions. The brackets are manufactured with a strengthening gusset to ensure compliance with 15kN design load requirements. Eyebolts are supplied in 150mm or 100mm lengths for concrete and block/brick fixing. Shorter eyebolts of 50mm are used in structural steel. For timber of sufficient strength the 150mm eyebolt can be used with vibration resistant locking nuts and large washers either side. A minimum thickness of 125 mm treated timber is required.

Both abseil anchors and eyebolts can be installed on the horizontal or vertical substrates of a building. Careful consideration must be taken when designing the abseil positions to ensure abseil ropes will not foul with any roof plant or roof penetrations. If ropes are required to lie over any parapet walls or edge protection such as balustrading it will be necessary to ensure that the parapet has been re-enforced. The use of a abseil rope spreader plate can reduce the point loading considerably.

The main contractor is responsible for calculations regarding building loading capabilities and is responsible for the re-enforcement of the parapet.
### MATERIAL SPECIFICATION:

**Brackets - galvanised steel**

<table>
<thead>
<tr>
<th>Property</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Yield</strong></td>
<td>275 N/mm² C 0.15 – 0.26; Si 0.35; Mn 1.5; P 0.035; S 0.040; Mo 0.4 – 0.6.</td>
</tr>
<tr>
<td><strong>Young’s Modulus of Elasticity</strong></td>
<td>200 x 103 MPa at 20 °C</td>
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<tr>
<td><strong>Density</strong></td>
<td>7.87 g/cm³ at 20 °C</td>
</tr>
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</table>
| **Coefficient of Thermal Expansion** | Low-Carbon/HSLAS: 12.4 μm/m/°C in 20 °C to 100 °C range  
I-F Steel: 12.9 μm/m/°C in 20 °C to 100 °C range |
| **Thermal Conductivity**           | Low-Carbon/HSLAS: 89 W/m°C at 20°C I-F Steel: 93 W/m°C at 20°C |
| **Specific Heat**                  | 481 J/kg/°C in 50 °C to 100 °C range              |
| **Electrical Resistivity**         | 0.142 μΩ•m at 20 °C                               |

**Rain cap**
Polyvinyl Chloride-PVC. Tensile Strength 2.60 N/mm²,  
Notched Impact Strength 2.0 - 45 KJ/m²,  
Thermal Coefficient of expansion 80 x 10⁻⁶,  
Max Cont Use Temp 60 C, Density 1.38 g/cm³

**Component parts**
Stainless Steel - Grade 304 (UNS S30400)  
Fe, ≤0.08% C, 17.5-20% Cr, 8-11% Ni, ≤2% Mn,  
≤1% Si, ≤0.045% P, ≤0.03% Stainless Steel
OPERATING AND DESIGN STANDARDS:

Eurocodes are designated by EN
British standards are designated by BS

- Steel – EN10 113 and EN 10 025
- BS 7985: 2013 Code of Practice for Rope Access Methods
- The lifting operations and lifting equipment regulations 1998
- LOLER REG. 5(1) (a and b) for design
- LOLER REG. 7(a, d and e) for marking
- LOLER REG. 9 (1, 2 , 3 a and b) for examination
- Management of health and safety at work regulations 1999 (MHSWR) ref.2
- Work at height regulations 2005 (Ref 7)
- Work at height (amended) regulations 2007 (Ref. 8) WAHR

The company operates to the following standards

- ISO 9001:2008
- ISO 14001:2004
- BS OHSAS 18001:2007
- Provision and use of work equipment regulations 1999 PUWER 98 (Ref.5)
- The work at height safety association WAHSA- guidance on inspecting eyebolts for personal fall protection purposes

Typical connection loads (550mm maximum height of eyebolt connection from base)

- Ultimate factored load on bracket base: 15.0kN
- Tension: 7.8kN
- Bracket moment: 9.89kN/m
- Horizontal shear: 16.95kN

Note: For guidelines only to be checked by Chief Engineer.
INSPECTION/MAINTENANCE/TRAINING

INSPECTION ROUTINE:
All systems to be inspected at least every 6 months from date of installation.

In harsh environments all systems to be inspected at least every 3 months.

Inspections must be carried out by approved Aviator engineers. All inspections must be carried out in accordance with BS7985:2013, LOLER REG.9 (1, 2, 3 a and b) and IRATA international guidelines.

Inspections must be approved to SIMS (Safety Inspection and Maintenance Service) standards.

Contact Sayfa Systems to arrange inspections.

MAINTENANCE SCHEDULE: MANUFACTURERS REQUIREMENT
All maintenance to be carried out by approved Aviator engineers. Maintenance to be in accordance with Sayfa Systems UK (manufacturer) guidelines and recommendations.

Maintenance to be in accordance with SIMS standards. (details available on request).

Maintenance to be carried out at time of product inspection. In harsh environments all systems to be maintained at least every 3 months together with yearly inspection.

Contact Sayfa Systems to arrange system maintenance.

TRAINING REQUIREMENTS:
All personnel who use the Aviator system must be trained to IRATA level 3 standard or work directly under a supervisor who holds this certificate.

All personnel who use the Aviator system should have attended a NASLOT (National Access and Safety Line Operator Training) course.

Courses are available from Sayfa Systems UK Ltd.
COMPONENT PART DETAILS:

Abseil brackets AB300
BIM No: SpecEquip_RfslySymAbsBlk_SayfaSystems_AB300_M3_G2

Resin fix Abseil eyebolts EBRF370
BIM No: SpecEquip_RfslySymAbsEye BltCon_SayfaSystems_EBRF370_M3_G2

Steelwork abseil eyebolts EBSF365
BIM No: SpecEquip_RfslySymAbsEye BltStl_SayfaSystems_EBRF365_M3_G2

Timber abseil eyebolt EBRF390
BIM No: SpecEquip_RfslySymAbsEye BltTimb_SayfaSystems_EBRF390_M3_G2
M16 STAINLESS STEEL EYENUT
STAINLESS STEEL WASHER
NEOPRENE WASHER
SYSTEM LABEL
PVC RAINCAP
GALVANISED STEEL BRACKET

BOOT STYLE SEALING DETAIL BY ROOFING CONTRACTOR

100mm MIN CLEARANCE

PITCH POCKET SEALING DETAIL (RECOMMENDED) BY ROOFING CONTRACTOR

190mm MINIMUM

INSULATION TO CLIENTS SPEC

GROWING MEDIUM & PLANTING

160mm MINIMUM

4mr M12 (M16 IF POST OVER 250mm) RESIN ANCHOR SET 125mm INTO CONCRETE

METAL DECK TO CLIENT SPECIFICATION
PVC RAINCAP

PRE CAST TO CLIENTS SPEC

INSULATION TO CLIENTS SPEC

GROWING MEDIUM & PLANTING

100mm MIN CLEARANCE

SYSTEM LABEL

NEOPRENE WASHER

STAINLESS STEEL WASHER

STAINLESS STEEL EYENUT

GALVANISED STEEL BRACKET

Pitch Pocket Sealing Detail (Recommended) by Roofing Contractor.

M16 STAINLESS STEEL EYENUT

STAINLESS STEEL WASHER

NEOPRENE WASHER

SYSTEM LABEL

PVC RAINCAP

GALVANISED STEEL BRACKET

4NR M12 THREADED BARS FIXED THROUGH HOLLOWCORE AND BACKING PLATE, SECURED WITH M12 NYLOCK WASHER & NUT.
FIXING DETAILS:
Abseil eyebolt fixed to concrete slab

CONCRETE TO BE MINIMUM 200mm THICK

M12 STAINLESS STEEL EYEBOLT
NEO PRENE WASHER

SYSTEM LABEL

M12 STAINLESS STEEL EYEBOLT SOCKET RESIN ANCHORED TO CONCRETE
FIXING DETAILS:
Abseil eyebolt fixed to timber support

M12 STAINLESS STEEL EYE BOLT

SYSTEM LABEL

STAINLESS STEEL WASHER

NEOPRENE WASHER

M12 STAINLESS STEEL EYEBOLT BOLTED TO TIMBER

STAINLESS STEEL WASHER

NEOPRENE WASHER

STRUCTURAL TIMBER TO BE MINIMUM 125mm

For any technical queries please call our advice line on 0845 241 9102
FIXING DETAILS:
Abseil eyebolt fixed steel beam

- SYSTEM LABEL
- M12 STAINLESS STEEL EYE BOLT
- STAINLESS STEEL WASHER
- NEOPRENE WASHER
- NEOPRENE WASHER
- STRUCTURAL STEEL TO BE MINIMUM 5mm

- SYSTEM LABEL
- M12 STAINLESS STEEL EYE BOLT
- STAINLESS STEEL WASHER
- STAINLESS STEEL WASHER
- NEOPRENE WASHER
- STRUCTURAL STEEL TO BE MINIMUM 5mm

- SYSTEM LABEL
- M12 STAINLESS STEEL EYE BOLT
- STAINLESS STEEL WASHER
- STAINLESS STEEL WASHER
- NEOPRENE WASHER
- M12 STAINLESS STEEL EXPANDING BOLT
- NEOPRENE WASHER
AVIATOR ABSEIL ANCHORS

EYEBOLT SIZE:

- Ø36
- 100
- 150

- Ø36
- 50
- 100

- Ø36
- 40
- M12 STAINLESS STEEL EYEBOLT

- Ø36
- 50
- M12 STAINLESS STEEL EYEBOLT SOCKET

For any technical queries please call our advice line on 0845 241 9102
RAPTOR RAIL
ABSEIL AND RESTRAINT RAIL

PRODUCT DATA SHEET
REPORT NO: 022
PRODUCT CODE: RR255

REVISION NO: 001

Aviator®

SAYFA SYSTEMS UK
AVIATOR RAPTOR RAIL

PRODUCT DESCRIPTION:
Raptor Rail is designed to be fixed to a structural substrate such as structural steel or concrete to provide a continuous rope access connection point. The rail is supplied with a unique wheeled connection point which moves smoothly along the track and around any profiled corners and bends, without the need to disconnect. The robust sealed bearing trolley ensures effortless operator mobility when used as a rope access or fall arrest system. Lateral stabilising bearings allow the trolley to function normally when angled or side loading is required providing unlimited flexibility for positioning the rail to best suit the application and safety of the operator. The Raptor Rail provides the highest level of safety for all abseil, fall arrest and fall restraint use. Both the track and the connection point are certified for 33kN loads.

The Raptor Rail is extruded in aluminium and every batch is load tested to ensure material compliance. The aluminium has a unique material specification which enables the product to maintain a lightweight structure with increased load bearing capacity. Provided the rail is fitted in accordance with the fitting instructions, the Raptor Rail can span up to 6m between brackets. The Raptor Rail can be designed for use by up to 4 users at any 1 time. In order to accommodate these requirements a longspan section may be required to be fitted together with the rail. The wheeled connection points are cast in stainless steel for durability and strength.

Aluminium Rail OH255 33kN
BIM No: SpecEquip_RISHySymAbsRopRai_SayfaSystems_RR255_M3_G2

Fall Arrest Trolley RR260 15kN
BIM No: SpecEquip_RISHySymAbsRopRaiTrllyl_SayfaSystems_RR260_M3_G2

The Raptor Rail is designed for use for Abseil, fall arrest and fall restraint use. The position of the rail in relation to a fall hazard will determine whether a system is fall arrest or fall restraint. It is our recommendation to always design a system to be fall restraint. For abseil use care must be taken to ensure a suitable hook on anchor to enable safe attachment to the rail for abseil use. Involving our specialist design teams as early as possible will ensure the most cost effective system is used without compromising any safety or access requirements. Our designers will consider the welfare and safety of both rope access and non-rose access personal during the construction and future use. When the Raptor rail is set up to be used as a fall arrest system, the retractable lanyard needs to be positioned at least 600mm above the operators head to ensure correct fall arrest action of the system.
When using the system for abseil use it may be necessary to fit support steels and brackets over a parapet wall or obstruction if the abseil ropes cannot press down on the building edge. This is normally required when there is a light duty edge capping or parapet wall or balustrade that has not been designed for abseil use. All support steel and the connection to the building construction must be designed to an ultimate force of 33kN. It is recommended that any support brackets are designed prior to the building construction to avoid any unnecessary or additional rework.

A number of different fixing options are available for the Raptor rail. Due to the construction of the extrusion it is very easy to attach the rail to both top or side fixings. The extrusion has a fixing slot which can accommodate Sayfa T-bolts along the complete section of the track. This flexibility ensures reduced installation time on site.
AVIATOR RAPTOR RAIL

The aluminium Raptor Rail extrusion is profiled to bend around an angle of 45 and 90 degrees. The rail can be colour coded to match a building façade to ensure very low visual impact. End stops are easily fitted on each system. Wheeled connection points are always supplied in pairs to ensure a double connection point is available. No specialist PPE is supplied with the installation and this is brought to site by the system users when required.

Raptor Rail can be installed on a horizontal or vertical substrates of a building. Careful consideration must be taken when designing the rail positions to ensure abseil ropes and lanyards will not foul with any roof plant or roof penetrations. If ropes are required to lie over any parapet walls or edge protection such as balustrading it will be necessary to ensure that the parapet has been re-enforced at the point of contact. The use of an abseil rope spreader plate can reduce the point loading considerably.
**MATERIAL SPECIFICATION:**

### Brackets - galvanised steel

<table>
<thead>
<tr>
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<td>Young’s Modulus of Elasticity</td>
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<td>Density</td>
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<tr>
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</tr>
<tr>
<td>Electrical Resistivity</td>
<td>0.142 μΩ•m at 20 °C</td>
</tr>
</tbody>
</table>

### Wheeled connection point and runners

- **Cast Stainless Steel - Grade 304 (UNS S30400)**
  - Fe, ≤0.08% C, 17.5-20% Cr, 8-11% Ni, ≤2% Mn, ≤1% Si, ≤0.045% P, ≤0.03% Stainless Steel

### Profiled extrusion

- **Aluminium extrusion** 0.56 - 0.72 Si
  - Max 0.45, Fe 0.40 - 0.70 Mg
  - Tensile strength 186MPa
  - Yield strength 131MPa
OPERATING AND DESIGN STANDARDS:
Eurocodes are designated by EN
British standards are designated by BS

- Steel – EN10 113 and EN 10 025
- BS 7985: 2013 Code of Practice for Rope Access Methods
- The lifting operations and lifting equipment regulations 1998
- LOLER REG. 5(1) (a and b) for design
- LOLER REG. 7(a, d and e) for marking
- LOLER REG. 9 (1, 2 , 3 a and b) for examination
- Management of health and safety at work regulations 1999 (MHSWR) ref.2
- Work at height regulations 2005 (Ref 7)
- Work at height [amended] regulations 2007 (Ref. 8) WAHR

The company operates to the following standards

- ISO 9001:2008
- ISO 14001:2004
- BS OHSAS 18001:2007

RAPTOR RAIL SPAN TABLE (FOR FALL ARREST USE)

<table>
<thead>
<tr>
<th>RAPTOR RAIL ONLY</th>
<th>RAPTOR RAIL WITH LONGSPAN SUPPORT</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>No of Users Per Span</strong></td>
<td><strong>Max Span Length</strong></td>
</tr>
<tr>
<td>1</td>
<td>4000mm</td>
</tr>
<tr>
<td>2</td>
<td>3200mm</td>
</tr>
<tr>
<td>3</td>
<td>2500mm</td>
</tr>
<tr>
<td>4</td>
<td>2000mm</td>
</tr>
</tbody>
</table>
AVIATOR RAPTOR RAIL

INSPECTION/MAINTENANCE/TRAINING

INSPECTION ROUTINE:
All systems to be inspected at least every 6 months from date of installation.

In harsh environments all systems to be inspected at least every 3 months.

Inspections must be carried out by approved Aviator engineers. All inspections must be carried out in accordance with BS7985:2013, LOLER REG.9 (1,2,3 a and b) and IRATA international guidelines.

Inspections must be approved to SIMS (Safety Inspection and Maintenance Service) standards.

Contact Sayfa Systems to arrange inspections.

MAINTENANCE SCHEDULE:
MANUFACTURERS REQUIREMENT
All maintenance to be carried out by approved Aviator engineers. Maintenance to be in accordance with Sayfa Systems UK (manufacturer) guidelines and recommendations.

Maintenance to be in accordance with SIMS standards. (details available on request).

Maintenance to be carried out at time of product inspection. In harsh environments all systems to be maintained at least every 3 months together with yearly inspection.

Contact Sayfa Systems to arrange system maintenance.

TRAINING REQUIREMENTS:
All personnel who use the Aviator system must be trained to IRATA level 3 standard or work directly under a supervisor who holds this certificate.

All personnel who use the Aviator system should have attended a NASLOT (National Access and Safety Line Operator Training) course.

Courses are available from Sayfa Systems UK Ltd.
COMPONENT PART DETAILS:

**Raptor rail RR255**
BIM No: SpecEquip_RfSftySymAbsRptRail_SayfaSystems_RR255_M3_G2

![Raptor rail RR255](image1)

**Raptor end stop RR265**
BIM No: SpecEquip_RfSftySymAbsRptRailEndStp_SayfaSystems_RR265_M3_G2

![Raptor end stop RR265](image2)

**Raptor wheeled connector RR260**
BIM No: SpecEquip_RfSftySymAbsRptRaiTrlyl_SayfaSystems_RR260_M3_G2

![Raptor wheeled connector RR260](image3)

**Raptor bracket RR276**
BIM No: SpecEquip_RfSftySymAbsRptRailWM_SayfaSystems_RR276_M3_G2

![Raptor bracket RR276](image4)
FIXING DETAILS:
Raptor Rail fixed to concrete

CAST CONCRETE SLAB

ALUMINUM MOUNTING BRACKET
5mm THICK

EXTRUDED ALUMINUM RAIL

STAINLESS STEEL BOLT WITH T-NUT TO SUIT MOUNTING CHANNEL

To Engineers specification

For any technical queries please call our advice line on 0845 241 9102
FIXING DETAILS:
Raptor Rail fixed to steel

- Structural Steel to be confirmed by Engineer
- Extruded Aluminum Rail
- Stainless Steel Bolt with T-nut to suit Mounting Channel
- Stainless Steel Bolt EXPANDING BOLT
- M12 Stainless Steel Expanding Bolt
- Mounting Bracket 5mm thick
- MOUNTING BRACKET
- 8/12 Stainless Steel
- For Design N/A
- As Dimensioned
- THIS DRAWING WAS CREATED IN CONJUNCTION WITH ____________
- DRAWING NO. ______________
- TYPICAL FIXING DETAILS
- 22/12/2014
- As Dimensioned

For any technical queries please call our advice line on 0845 241 9102
FIXING DETAILS:
Raptor Rail fixed to cantilever arm

- Bespoke Design For Intended Application
- TBC
- EXTRUDED ALUMINUM RAIL
- 50
- 50

Diagram:

- TBC
- EXTRUDED ALUMINUM RAIL
- 50
- 50

For any technical queries please call our advice line on 0845 241 9102
DAVIT BASE PLATES

PRODUCT DATA SHEET
REPORT NO: 023
PRODUCT CODE: DB400

REVISION NO: 001
AVIATOR DAVIT BASE PLATES

PRODUCT DESCRIPTION:
Davit base plates are designed to be permanently fixed to a structural substrate such as structural steel or concrete to provide a suitable connection point for a removable Davit arm. Davit base plates can be supplied to be used in conjunction with separate abseil rope connection points or can be supplied with suitable abseil eyebolt connections already attached to the base such as a removable davit arm. It is essential when designing rope access to ensure at least 2 abseil rope connection points are available to connect to at any one time. Brackets are supplied in galvanised steel with stainless steel components. Neoprene washers ensure no galvanic reaction can take place.

The main contractor is responsible for calculations regarding building loading capabilities and is responsible for the re-enforcement of the parapet.

The brackets are designed for 1 user at any one time and 2 users in the event of emergency access requirements. Brackets need to be positioned so any rope connections do not exceed 120 degree angle when in use. This will be determined by the design layout and position of the anchors. Involving our specialist design teams as early as possible will ensure the most cost effective system is used without compromising any safety or access requirements. Our designers will consider the welfare and safety of both rope access and non-rope access personnel during the construction and future use.
AVIATOR DAVIT BASE PLATES

Davit base plates are manufactured with a minimum location tube of 150mm. A removable davit arm is designed to fit inside the tube locator allowing the arm to pivot 360 degrees before bolting down. Mounting holes on the top plate should be used to lock davit arms in position when required. The length of the location tube ensures that the arm can be fitted by a single operative. The davit base plates are supplied in 3 types which allows for resin fixing to concrete floor slabs, cast in situ during concrete floor slab pouring or fixed to a concrete or steel parapet wall with resin anchors or suitable bolts.

Floor mounted davit base plates can be supplied with a cover plate which is designed to fit over the top of the tube locator and extend flush with finished floor level. The cover plate is designed to be load bearing and manufactured in aluminium pressed plate to be both stylish and hard wearing. Cover plates can be powder coated to most RAL colour codes to match the site roof finishes. They will help prevent moisture and dirt penetrating the tube locator and also provide an indication for any persons using the system as to the location of the davit base plates.
MATERIAL SPECIFICATION:

Brackets - galvanised steel

<table>
<thead>
<tr>
<th>Property</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yield</td>
<td>$275,\text{N/mm}^2$, C 0.15 – 0.26; Si $\leq 0.35$; Mn $\leq 1.5$; P $\leq 0.035$; S $\leq 0.040$; Mo 0.4 – 0.6.</td>
</tr>
<tr>
<td>Young's Modulus of Elasticity</td>
<td>$200 \times 103,\text{MPa at 20 °C}$</td>
</tr>
<tr>
<td>Density</td>
<td>$7.87,\text{g/cm}^3$ at 20 °C</td>
</tr>
</tbody>
</table>
| Coefficient of Thermal Expansion | Low-Carbon/HSLAS: $12.4\,\mu\text{m/m/°C}$ in 20 °C to 100 °C range  
                                  | I-F Steel: $12.9\,\mu\text{m/m/°C}$ in 20 °C to 100 °C range |
| Thermal Conductivity          | Low-Carbon/HSLAS: $89\,\text{W/m°C}$ at 20°C  
                                  | I-F Steel: $93\,\text{W/m°C}$ at 20°C |
| Specific Heat                 | $481\,\text{J/kg/°C}$ in 50 °C to 100 °C range |
| Electrical Resistivity        | $0.142\,\mu\Omega\cdot\text{m at 20 °C}$   |

Cover plate

Aluminium 0.50 - 0.75 Si,  
Max 0.35, Fe 0.40 - 0.70 Mg  
Tensile strength 186MPa  
Yield strength 110MPa

Component parts

Stainless Steel - Grade 304 (UNS S30400)  
Fe, $\leq 0.08\%$ C, 17.5-20% Cr, 8-11% Ni, $\leq 2\%$ Mn,  
$\leq 1\%$ Si, $\leq 0.045\%$ P, $\leq 0.03\%$ Stainless Steel  

For any technical queries please call our advice line on 0845 241 9102
OPERATING AND DESIGN STANDARDS:

Eurocodes are designated by EN
British standards are designated by BS

- Steel – EN10 113 and EN 10 025
- BS 7985: 2013 Code of Practice for Rope Access Methods
- The lifting operations and lifting equipment regulations 1998
- LOLER REG. 5(1) (a and b) for design
- LOLER REG. 7(a, d and e) for marking
- LOLER REG. 9 (1, 2 , 3 a and b) for examination
- Management of health and safety at work regulations 1999 (MHSWR) ref.2
- Work at height regulations 2005 (Ref 7)
- Work at height (amended) regulations 2007 (Ref. 8) WAHR

Typical connection loads (Maximum SWL 136kg for single user with a factor of safety greater than 10:1 with maximum davit arm cantilever of 0.8m)

- Ultimate factored load on bracket base: 6.28kN/m
- Tension: 21.3kN
- Bracket moment: 5.02kN

Note: For guidelines only to be checked by Chief Engineer.
INSPECTION/MAINTENANCE/TRAINING

INSPECTION ROUTINE:
All systems to be inspected at least every 6 months from date of installation.

In harsh environments all systems to be inspected at least every 3 months.

Inspections must be carried out by approved Aviator engineers. All inspections must be carried out in accordance with BS7985:2013, LOLER REG.9 (1,2,3 a and b) and IRATA international guidelines.

Inspections must be approved to SIMS (Safety Inspection and Maintenance Service) standards.

Contact Sayfa Systems to arrange inspections.

MAINTENANCE SCHEDULE:
MANUFACTURERS REQUIREMENT
All maintenance to be carried out by approved Aviator engineers. Maintenance to be in accordance with Sayfa Systems UK (manufacturer) guidelines and recommendations.

Maintenance to be in accordance with SIMS standards. (details available on request).

Maintenance to be carried out at time of product inspection. In harsh environments all systems to be maintained at least every 3 months together with yearly inspection.

Contact Sayfa Systems to arrange system maintenance.

TRAINING REQUIREMENTS:
All personnel who use the Aviator system must be trained to IRATA Level 3 standard or work directly under a supervisor who holds this certificate.

All personnel who use the Aviator system should have attended a NASLOT (National Access and Safety Line Operator Training) course.

Courses are available from Sayfa Systems UK Ltd.
COMPONENT PART DETAILS:
Davit base floor mount DB400-350
BIM No: SpecEquip_RfSftySymDvtBse_SayfaSystems_DB400350_M3_G2

Davit base wall mount DB500
BIM No: SpecEquip_RfSftySymDvtBseWM_SayfaSystems_DB500_M3_G2

Floor cover DBCAP01
BIM No: SpecEquip_RfSftySymDvtBseCap_SayfaSystems_DBCAP01_M3_G2
8NR MOUNTING HOLES FOR DAVIT ARM CONNECTION

GALVANISED STEEL DAVIT BASE

PITCH POCKET SEALING DETAIL (RECOMMENDED) BY ROOFING CONTRACTOR

8NR M16 BOLTS RESIN FIXED INTO CONCRETE SLAB

160mm MIN

150-350mm

UNDER THE CDM REGULATIONS 2015, IF ANY ALTERATIONS ARE MADE TO THIS DRAWING THEN THE PERSON UNDERTAKING THESE CHANGES ASSUME THE ROLE OF THE DESIGNER, THEREFORE TAKING FULL CDM RESPONSIBILITY.
AVIATOR DAVIT BASE PLATES

BRACKET DIMENSIONS

For any technical queries please call our advice line on 0845 241 9102
88.9x5 S335 CHS

Grade E35

All Steel Plates S275

M16 Spig Epcon 8 - Tightening
Torque 60Nm Hole Depth
125mm-Minimum Slab Depth 160mm

10mm High Strength Grout

Minimum Slab Thickness 160mm
PRODUCT DESCRIPTION:
The Aviator Davit Arm is designed to be removable and to be used together with the permanent Davit base plates. They are designed for lifting and lowering personnel and materials. The hook on the end of the arm allows abseil and lifting ropes to extend over the roof edge or balustrading. The Davit base can also be used to anchor a personal fall arrest system when the user is being lifted and lowered. It is essential when designing rope access to ensure at least 2 abseil rope connection points (one for working line and the other for safety line) are available to connect to at any one time. Davit arms are manufactured in aluminium section to ensure they are light weight and easily transportable. The davit arm is designed to fold to facilitate storage and transport.

The Standard DA300 davit arm can be manufactured up to a height of 1500mm with a maximum reach of 850mm. It weighs approximately 15Kg. The arm can be locked into 2 positions – 135 degrees and 90 degrees off the vertical arm. The locking pin and clip are permanently fixed to the Davit arm to prevent them being mislaid.
The DA300 davit arm has a maximum safe working load of 136 kg. This is a greater than 10:1 safety factor for personnel use and a greater than 5:1 safety factor for materials (272 kg). In the event of an emergency or for rescue situations, 2 persons can use the davit arm. The davit arm can be supplied with a hand winch and pulley for material lifting. The Aviator davit arms are designed and manufactured to fit into the Aviator davit base plates. Never use the Aviator arm on any other make or model of davit base or the system warranty will be invalidated.
**Material Specification:**

**Davit Arm**
Aluminium 0.50 - 0.75 Si, Max 0.35, Fe 0.40 - 0.70 Mg
Tensile strength 186 MPa  Yield strength 110 MPa

**Component parts and fixings**
Stainless Steel - Grade 304 (UNS S30400)
Fe, ≤0.08% C, 17.5-20% Cr, 8-11% Ni, ≤2% Mn, ≤1% Si, ≤0.045% P, ≤0.03% Stainless Steel

**Brackets - galvanised steel**

<table>
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<tr>
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</thead>
<tbody>
<tr>
<td>Yield</td>
<td>275 N/mm² C 0.15 – 0.26; Si ≤ 0.35; Mn ≤ 1.5; P ≤ 0.035; S ≤ 0.040; Mo 0.4 – 0.6.</td>
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<td>Density</td>
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<tr>
<td></td>
<td>I-F Steel: 12.9 μm/m/°C in 20 °C to 100 °C range</td>
</tr>
<tr>
<td>Thermal Conductivity</td>
<td>Low-Carbon/HSLAS: 89 W/m°C at 20°C I-F Steel: 93 W/m°C at 20°C</td>
</tr>
<tr>
<td>Specific Heat</td>
<td>481 J/kg/°C in 50 °C to 100 °C range</td>
</tr>
<tr>
<td>Electrical Resistivity</td>
<td>0.142 μΩ•m at 20 °C</td>
</tr>
</tbody>
</table>
OPERATING AND DESIGN STANDARDS:

Eurocodes are designated by EN
British standards are designated by BS

• Steel – EN10 113 and EN 10 025
• BS 7985: 2013 Code of Practice for Rope Access Methods
• The lifting operations and lifting equipment regulations 1998
• LOLER REG. 5(1) (a and b) for design
• LOLER REG. 7(a, d and e) for marking
• LOLER REG. 9 (1, 2, 3 a and b) for examination
• Management of health and safety at work regulations 1999 (MHSWR) ref.2
• Work at height regulations 2005 (Ref 7)
• Work at height (amended) regulations 2007 (Ref. 8) WAHR

Typical connection loads (Maximum SWL 136kg for single user with a factor of safety greater than 10:1 with maximum davit arm cantilever of 0.8m)

<table>
<thead>
<tr>
<th>Ultimate factored load on bracket base</th>
<th>Tension</th>
</tr>
</thead>
<tbody>
<tr>
<td>6.28kN/m</td>
<td>21.3kN</td>
</tr>
</tbody>
</table>

Bracket moment

5.02kN

Note: For guidelines only to be checked by Chief Engineer.
AVIATOR DAVIT ARM

INSPECTION/MAINTENANCE/ TRAINING

INSPECTION ROUTINE:
All systems to be inspected at least every 6 months from date of installation.

In harsh environments all systems to be inspected at least every 3 months.

Inspections must be carried out by approved Aviator engineers. All inspections must be carried out in accordance with BS7985:2013 , LOLER REG.9 (1,2,3 a and b) and IRATA international guidelines.

Inspections must be approved to SIMS [Safety Inspection and Maintenance Service] standards.

Contact Sayfa Systems to arrange inspections.

MAINTENANCE SCHEDULE:
MANUFACTURERS REQUIREMENT
All maintenance to be carried out by approved Aviator engineers. Maintenance to be in accordance with Sayfa Systems Uk [manufacturer] guidelines and recommendations.

Maintenance to be in accordance with SIMS standards. [details available on request].

Maintenance to be carried out at time of product inspection. In harsh environments all systems to be maintained at least every 3 months together with yearly inspection.

Contact Sayfa Systems to arrange system maintenance.

TRAINING REQUIREMENTS:
All personnel who use the Aviator system must be trained to IRATA level 3 standard or work directly under a supervisor who holds this certificate.

All personnel who use the Aviator system should have attended a NASLOT [National Access and Safety Line Operator Training] course.

Courses are available from Sayfa Systems UK Ltd.
AVIATOR DAVIT ARM

COMPONENT PART DETAILS:

Davit arm personnel use DA300
BIM No: SpecEquip_RfSfySymDvtArm_SayfaSystems_DA300_M3_G2

Davit arm materials lifting DA400
BIM No: SpecEquip_RfSfySymDvtArm_SayfaSystems_DA400_M3_G2

Winch Bracket DAWB01
BIM No: SpecEquip_RfSfySymDvtArmWnchBkt_SayfaSystems_DAWB01_M3_G2

For any technical queries please call our advice line on 0845 241 9102
FIXING DETAILS:
Davit arm for personnel use
BIM No: SpecEquip_R5itySymDvtArm_SayfaSystems_DA300_M3_G2

AVIATOR DAVIT ARM

ARM HINGE
TO HOLD ARM AT 90°
AND 135° ONLY

ALUMINUM FOLDING ARM
WEIGHT 15kg Approx

MOUNTING HOLES
TO SECURE DAVIT ARM
TO DAVIT BASE WITH 4 M16 BOLTS

800-1500
650-850
150-350
955

AVIATOR DAVIT ARM

FIXING DETAILS:
Davit arm for materials lifting
BIM No: SpecEquip_RSftySymDvtArm_SayfaSystems_DA400_M3_G2

AVIATOR DAVIT ARM

MOUNTING HOLES
TO SECURE DAVIT ARM
TO DAVIT BASE WITH 4 M16 BOLTS

ALUMINUM FOLDING ARM
WEIGHT 35kg Approximately

650-850
150-350
800-1500

For any technical queries please call our advice line on 0845 241 9102
AVIATOR PERMANENT EYEBOLTS

PRODUCT DESCRIPTION:
Permanent eyebolts are designed to be fixed to a structural substrate such as structural steel or concrete to provide suitable connection points for both fall restraint and fall arrest use. The position of the eyebolts in relation to a fall hazard will determine whether the operator is working in fall restraint or fall arrest. Eyebolts are supplied in stainless steel. They are secured to concrete and brickwork/blockwork with resin anchors and to steelwork with stainless steel bolts, washers and vibration-proof nuts. When fixing to metal deck or timber deck it may be necessary to provide a backing plate to ensure compliance.

The eyebolts are designed for 1 user at any one time and 2 users in the event of any emergency evacuation requirements. For fall restraint use, which is highly recommended, the eyebolts need to be positioned at least 2.0m away from any exposed edge. This will allow the operator to safely access the area using a 2.m lanyard connected to a full body harness without risk of falling. Different lengths of fixed lanyards can be provided to accommodate different eyebolt connection points. If an inertia reel is used or the eyebolts are fixed closer to the edge of the window than the length of lanyard, the operator will be working in fall arrest. In these situations the operator must ensure they have read and understood the site rescue plan.

Involving our specialist design teams as early as possible will ensure the most cost-effective system is used without compromising any safety or access requirements. Our designers will consider the welfare and safety of both operatives and non-operative personal during the construction phase and future use.

Concrete Block / Brickwork eyebolts

| 150 mm | 100 mm | 100 mm |

Steel fix

| 50 mm |

Timber fix

| 150 mm |

Restraint

2m

2m

Arrest
Permanent Eyebolts are supplied in 150mm or 100mm lengths for concrete and block/brick fixing. Shorter eyebolts of 50mm are used in structural steel. For timber of sufficient strength the 150mm eyebolt can be used with vibration resistant locking nuts and large washers either side. A minimum thickness of 125mm C16 or stronger is required. Eyebolts can be installed on the horizontal or vertical substrates of a building. Careful consideration must be taken when designing the eyebolt positions to ensure any operator lanyards will not foul with any roof plant or furniture or fixtures. All eyebolts must be secured at least 280mm from any substrate edge.

Permanent eyebolts are designed to be left permanently in position. This must be considered when fitting them inside buildings open to the general public such as office blocks and hotels. Do not position the eyebolts in an area that may cause bodily damage to persons. Entrance halls and corridors should be avoided. The use of removable eyebolts should be considered during design for these areas. Although the eyebolt is fixed permanently in place it must be able to be removed during routine servicing. Sockets must be used for resin fixed eyebolts and access to any locking nuts must be available for timber or steel fixed eyebolts. In the event any eyebolts cannot be removed for service these must be treated as an eyebolt in harsh conditions and Inspection routine must be changed accordingly –refer to Inspection/Maintenance/Training section page.
AVIATOR PERMANENT EYEBOLTS

OPERATING AND DESIGN STANDARDS:

Eurocodes are designated by EN
British standards are designated by BS

• BS EN 795:2012 Class C – flexible safety lines
• BS EN 795:2012 Class A – single anchors, anti-pendulum anchors
• BS 7883: 2005 – Design, selection, installation, use and maintenance for anchors conforming to EN 795
• BSMA 29: 1982 – specification for steel wire rope
• ACR (M) 002:2015 Rev 2
• ACR (CP) 007:2015 Rev 2
• ISO 9001:2008
• ISO 14001:2004
• BS OHSAS 18001:2007
• Work at height regulations 2005 (Ref. 7)
• Work at height (amendment) Regulations 2007 (Ref. 8) WAHR
• Provision and use of work equipment

The company operates to the following standards

9948 ISO 9001:2008
9948 ISO 14001:2004
9948 BS OHSAS 18001:2007

Typical connection loads (Maximum cantilever from substrate 75mm)

Ultimate factored load on bracket base

Tension

Bracket moment

Horizontal shear

12.0kN
6.80kN
7.89kN/m
16.95kN

Note: For guidelines only to be checked by Chief Engineer.
MATERIAL SPECIFICATION:

Component parts - Eyebolt
Stainless Steel - Grade 304 (UNS S30400)
Fe, ≤0.08% C, 17.5-20% Cr, 8-11% Ni, ≤2% Mn, ≤1% Si,
≤0.045% P, ≤0.03% Stainless Steel

Socket
Stainless Steel - Grade 304 (UNS S30400)
Fe, ≤0.08% C, 17.5-20% Cr, 8-11% Ni, ≤2% Mn, ≤1% Si,
≤0.045% P, ≤0.03% Stainless Steel

Identity disc
Polyvinyl Chloride-PVC. Tensile Strength 2.60 N/mm², Notched
Impact Strength 2.0 - 45 Kj/m², Thermal Coefficient of expansion
80 x 10⁻⁶, Max Cont Use Temp 60 C, Density 1.38 g/cm

Neoprene washer
Elastomer - neoprene Colour - Black
Quality – Commercial Grade - c20 Hardness - 65° shore a +/-5°
S.G. - 1.4G/cm³ Tensile mpa - 5 min Elongation - 300%
Tear strength - 20 kg/cm Compression set - 35%
Operating temperature - -20° / +110° c
AVIATOR PERMANENT EYEBOLTS

INSPECTION/MAINTENANCE/TRAINING

INSPECTION ROUTINE:
All systems to be inspected at least every 12 months from date of installation.

In harsh environments all systems to be inspected at least every 3 months.

Inspections must be carried out by approved Aviator engineers.

Inspections must be approved to SIMS (Safety Inspection and Maintenance Service) standards.

All inspections to be carried out to EN795:2012 and BS 7883:2005 and WAHSA (inspection of eyebolts) requirements for safety line and anchor points.

All inspections to be carried out to EN364 requirements for personal protective equipment.

Contact Sayfa Systems to arrange inspections.

MAINTENANCE SCHEDULE:
All maintenance to be carried out by approved Aviator engineers.

Maintenance to be in accordance with Sayfa Systems UK (manufacturer) guidelines and recommendations.

In harsh environments all systems to be inspected at least every 3 months.

Maintenance to be in accordance with SIMS standards. (details available on request)

Maintenance to be carried out at time of yearly inspection.

Contact Sayfa Systems to arrange system maintenance.

TRAINING REQUIREMENTS:
All personnel who use the Aviator system should have attended a NASLOT (National Access and Safety Line Operator Training) course. Courses are available from Sayfa Systems UK Ltd.

TRAINING REQUIREMENTS:
All personnel who use the Aviator system should have attended a NASLOT (National Access and Safety Line Operator Training) course. Courses are available from Sayfa Systems UK Ltd.
COMPONENT PART DETAILS:

**Resin fix permanent eyebolts EBRF370**
BIM No: SpecEquip_RfSfySymPermEyeBltCon_SayfaSystems_EBRF370_M3_G2

**Steelwork permanent eyebolts EBSF365**
BIM No: SpecEquip_RfSfySymPermEyeBltStl_SayfaSystems_EBRF365_M3_G2

**Timber permanent eyebolt EBRF390**
BIM No: SpecEquip_RfSfySymPermEyeBltTimb_SayfaSystems_EBRF390_M3_G2

**Resin anchor socket RAS100**
BIM No: SpecEquip_RfSfySymPermEyeBltCon_SayfaSystems_RAS100_M3_G2
FIXING DETAILS:
Eyebolt fixed to concrete slab

SYSTEM LABEL
M12 STAINLESS STEEL EYE BOLT
NEOPRENE WASHER

CONCRETE TO BE MINIMUM 200mm THICK
M12 STAINLESS STEEL EYEBOLT SOCKET RESIN ANCHORED TO CONCRETE
AVIATOR PERMANENT EYEBOLTS

FIXING DETAILS:
Eyebolt fixed to blockwork/brickwork

BLOCK WORK TO BE MINIMUM 200mm

SYSTEM LABEL

M12 STAINLESS STEEL EYE BOLT

NEOPRENE WASHER

M12 STAINLESS STEEL EYEBOLT SOCKET RESIN ANCHORED TO BLOCK WORK
AVIATOR PERMANENT EYEBOLTS

FIXING DETAILS:
Eyebolt fixed to timber support

Structural timber to be minimum 125mm

SYSTEM LABEL
M12 STAINLESS STEEL EYE BOLT
STAINLESS STEEL WASHER
NEOPRENE WASHER
M12 STAINLESS STEEL EYEBOLT BOLTED THROUGH TIMBER

NEOPRENE WASHER
STAINLESS STEEL WASHER

For any technical queries please call our advice line on 0845 241 9102
AVIATOR PERMANENT EYEBOLTS

FIXING DETAILS:
Eyebolt fixed steel beam

- **STRUCTURAL STEEL TO BE MINIMUM 5mm**
- **NEOPRENE WASHER**
- **M12 STAINLESS STEEL EYEBOLT BOLTED THROUGH STEEL BEAM**
- **STAINLESS STEEL WASHER**
- **STAINLESS STEEL WASHER**
- **NEOPRENE WASHER**

- **STRUCTURAL STEEL TO BE MINIMUM 5mm**
- **NEOPRENE WASHER**
- **M12 STAINLESS STEEL EXPANDING BOLT**
- **STAINLESS STEEL WASHER**
- **STAINLESS STEEL WASHER**
- **NEOPRENE WASHER**

For any technical queries please call our advice line on 0845 241 9102
DIMENSIONS:
Size of eyebolts

AVIATOR PERMANENT EYEBOLTS

For any technical queries please call our advice line on 0845 241 9102
REMOVABLE EYEBOLTS

PRODUCT DATA SHEET
REPORT NO: 032
PRODUCT CODE: RE380

REVISION NO: 001
PRODUCT DESCRIPTION:
Removable eyebolts are designed to be fixed to a structural substrate such as structural steel or concrete to provide suitable connection points for both fall restraint and fall arrest use. The position of the eyebolts in relation to a fall hazard will determine whether the operator is working in fall restraint or fall arrest. Eyebolts are supplied in stainless steel. They are secured to concrete and brickwork/blockwork with resin anchors and to steelwork with stainless steel bolts, washers and locking nuts. When fixing to metal deck or timber deck it may be necessary to provide a backing plate to ensure compliance. A socket extender must be used when fitting to timber and hollow core concrete floors.

The eyebolts are designed for 1 user at any one time and 2 users in the event of any emergency evacuation requirements. For fall restraint use, which is highly recommended, the eyebolts need to be positioned at least 2.0m away from any exposed edge. This will allow the operator to access the area using a 2.m lanyard connected to a full body harness, safely without risk of falling. Different lengths of fixed lanyards can be provided to accommodate different eyebolt connection points. If an inertia reel is used or the eyebolts are fixed nearer the end than the length of lanyard the operator will be working in fall arrest. In these situations the operator must ensure they have read and understood the site rescue plan.

Involving our specialist design teams as early as possible will ensure the most cost effective system is used without compromising any safety or access requirements. Our designers will consider the welfare and safety of both operatives and non-operative personal during the construction phase and future use.

For any technical queries please call our advice line on 0845 241 9102
AVIATOR REMOVABLE EYEBOLTS

Removable eyebolt sockets are supplied in a length of 100mm. This socket is for use on concrete and block/brickwork thicker than 100mm. These eyebolt sockets are also used when fixing to structural steel and are secured with stainless steel locking nuts. For any concrete substrates less than 100mm deep such as hollow core concrete or cavity walls the socket extension must be used. For timber of sufficient strength the 100mm eyebolt socket with extension must be used can be used. A minimum thickness of 125 mm C16 or stronger timber is required. Eyebolts can be installed on the horizontal or vertical substrates of a building. Careful consideration must be taken when designing the eyebolt positions to ensure any operator lanyards will not foul with any roof plant or furniture or fixtures. All eyebolts must be secured at least 280mm from any substrate edge.

Removable eyebolts are designed so the eyebolt key can be inserted in the socket when required and removed when the work is completed. They are ideally suited for fitting inside buildings open to the general public such as office blocks and hotels. They can be positioned in pedestrian areas such as entrance halls and corridors, because when the key is removed a socket cap is fitted, which is virtually flush with the wall finish. The use of removable eyebolts should always be considered during design for these areas. Unlike permanent eyebolts the socket does not require removal for inspections and the wide throat of the socket can be inspected for wear and rust using the correct equipment. This feature is essential when it would not be possible to access the complete socket in timber and steel fixed eyebolts.

For any technical queries please call our advice line on 0845 241 9102
AVIATOR REMOVABLE EYEBOLTS

OPERATING AND DESIGN STANDARDS:
Eurocodes are designated by EN
British standards are designated by BS
- BS EN 795:2012 Class C – flexible safety lines
- BS EN 795:2012 Class A – single anchors, anti-pendulum anchors
- BS 7883: 2005 – Design, selection, installation, use and maintenance for anchors conforming to EN 795
- BSMA 29: 1982 – specification for steel wire rope
- ACR (M) 002:2015 Rev 2
- ACR (CP) 007:2015 Rev 2
- ISO 9001:2008
- ISO 14001:2004
- BS OHSAS 18001:2007
- Work at height regulations 2005 (Ref.7)
- Work at height (amendment) Regulations 2007 (Ref.8) WAHR
- Provision and use of work equipment

Typical connection loads (Maximum cantilever from substrate 75mm)

- **Ultimate factored load on bracket base**: 12.0kN
- **Tension**: 6.80kN
- **Bracket moment**: 7.89kN/m
- **Horizontal shear**: 16.95kN

Note: For guidelines only to be checked by Chief Engineer.

The company operates to the following standards

- ISO 9001:2008
- ISO 14001:2004
- BS OHSAS 18001:2007

- Management of health and safety at work regulations 1999 MHSWR (Ref.2)
- The work at height safety association WAHSA-guidance on inspecting eyebolts used for personal fall protection purposes
- The Building Regulations 2010 part K.
AVIATOR REMOVABLE EYEBOLTS

MATERIAL SPECIFICATION:

Component parts - Eyebolt
Stainless Steel - Grade 304 (UNS S30400)
Fe, ≤0.08% C, 17.5-20% Cr, 8-11% Ni, ≤2% Mn, ≤1% Si,
≤0.045% P, ≤0.03% Stainless Steel

Socket and locking nuts
Stainless Steel - Grade 304 (UNS S30400)
Fe, ≤0.08% C, 17.5-20% Cr, 8-11% Ni, ≤2% Mn, ≤1% Si,
≤0.045% P, ≤0.03% Stainless Steel

Identity disc
Polyvinyl Chloride-PVC. Tensile Strength 2.60 N/mm², Notched
Impact Strength 2.0 - 45 KJ/m², Thermal Coefficient of expansion
80 x 10^-6 , Max Cont Use Temp 60 C, Density 1.38 g/cm³

Nylon cap

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Specific gravity</td>
<td>1.14</td>
</tr>
<tr>
<td>Tensile strength P.S.I.</td>
<td>8,700-13,000</td>
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<tr>
<td>Elongation %</td>
<td>50 - 200</td>
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<tr>
<td>Melting Point °C</td>
<td>265</td>
</tr>
<tr>
<td>Minimum °C</td>
<td>-40</td>
</tr>
<tr>
<td>Max. - Continuous °C</td>
<td>80</td>
</tr>
<tr>
<td>Max. - intermittent °C</td>
<td>170</td>
</tr>
<tr>
<td>Effect of weak acids</td>
<td>resistant</td>
</tr>
<tr>
<td>Effect of weak Alkalis</td>
<td>resistant</td>
</tr>
<tr>
<td>Effect of Organic solvents</td>
<td>resistant</td>
</tr>
<tr>
<td>Effect of Oils &amp; greases</td>
<td>resistant</td>
</tr>
<tr>
<td>Effect of Sunlight</td>
<td>discolours slightly</td>
</tr>
</tbody>
</table>
AVIATOR REMOVABLE EYEBOLTS

INSPECTION/MAINTENANCE/ TRAINING

INSPECTION ROUTINE:
All systems to be inspected at least every 12 months from date of installation.

In harsh environments all systems to be inspected at least every 3 months.

Inspections must be carried out by approved Aviator engineers.

Inspections must be approved to SIMS (Safety Inspection and Maintenance Service) standards.

All inspections to be carried out to EN795:2012 and BS 7883:2005 and WAHSA (inspection of eyebolts) requirements for safety line and anchor points.

All inspections to be carried out to EN364 requirements for personal protective equipment.

Contact Sayfa Systems to arrange inspections.

MAINTENANCE SCHEDULE:
All maintenance to be carried out by approved Aviator engineers.

Maintenance to be in accordance with Sayfa Systems UK (manufacturer) guidelines and recommendations.

In harsh environments all systems to be inspected at least every 3 months.

Maintenance to be in accordance with SIMS standards. (details available on request)

Maintenance to be carried out at time of yearly inspection.

Contact Sayfa Systems to arrange system maintenance.

TRAINING REQUIREMENTS:
All personnel who use the Aviator system should have attended a NASLOT (National Access and Safety Line Operator Training) course. Courses are available from Sayfa Systems UK Ltd.

Contact Sayfa Systems to arrange inspections.

MAINTENANCE SCHEDULE:
All maintenance to be carried out by approved Aviator engineers.

Maintenance to be in accordance with Sayfa Systems UK (manufacturer) guidelines and recommendations.

In harsh environments all systems to be inspected at least every 3 months.
COMPONENT PART DETAILS:

Eyebolt socket resin fix REK380  
BIM No: SpecEquip_RfsftySymRemEyeBltCon_SayfaSystems_REK380_M3_G2

Removable eyebolt key REK385  
BIM No: SpecEquip_RfsftySymRemEyeBltCon_SayfaSystems_REK385_M3_G2

Removeable Eyebolt REK390  
For concrete:  
BIM No: SpecEquip_RfsftySymRemEyeBltCon_SayfaSystems_REK370_M3_G2  
For steel:  
BIM No: SpecEquip_RfsftySymRemEyeBltStl_SayfaSystems_REK390_M3_G2

Socket extension RESE400  
BIM No: SpecEquip_RfsftySymRemEyeBltCon_SayfaSystems_RESE400_M3_G2

For any technical queries please call our advice line on 0845 241 9102
AVIATOR removable eyebolts

FIXING DETAILS:
Eyebolt fixed to concrete slab

PVC CAP TO BE INSERTED ONCE KEY IS REMOVED

STAINLESS STEEL REMOVABLE EYEBOLT KEY

SYSTEM LABEL

M20 STAINLESS STEEL EYEBOLT SOCKET RESIN ANCHORED TO CONCRETE

CONCRETE TO BE MINIMUM 200mm THICK

Client: Jubilee House
Location: Shepshed, Leicestershire
LE12 9NH
T: 0845 241 9102
F: 0845 130 4520
www.sayfasystems.com

For any technical queries please call our advice line on 0845 241 9102
AVIATOR REMOVABLE EYEBOLTS

FIXING DETAILS:
Eyebolt fixed to blockwork/brickwork

SYSTEM LABEL

PVC CAP TO BE INSERTED ONCE KEY IS REMOVED

100mm CAVITY INSULATION

STAINLESS STEEL REMOVABLE EYEBOLT KEY

SYSTEM LABEL

M20 STAINLESS STEEL EYEBOLT SOCKET RESIN ANCHORED IN BLOCK WORK

M20 STAINLESS STEEL EYEBOLT SOCKET EXTENSION RESIN ANCHORED IN BLOCK WORK

For any technical queries please call our advice line on 0845 241 9102
AVIATOR REMOVABLE EYEBOLTS

FIXING DETAILS:
Eyebolt fixed to timber support

Structural timber to be minimum 125mm

PVC Cap to be inserted once key is removed

M20 stainless steel eyebolt socket

System label

Stainless steel removable eyebolt key

M20 stainless steel locking nut

M20 stainless steel eyebolt socket extension

For any technical queries please call our advice line on 0845 241 9102
AVIATOR REMOVABLE EYEBOLTS

FIXING DETAILS:
Eyebolt fixed steel beam

- PVC CAP TO BE INSERTED ONCE KEY IS REMOVED
- SYSTEM LABEL
- STRUCTURAL STEEL TO BE MINIMUM 5mm
- M20 STAINLESS STEEL LOCKING NUT
- M20 STAINLESS STEEL EYEBOLT SOCKET
- STAINLESS STEEL REMOVABLE EYEBOLT KEY
Sayfa Systems UK Ltd ("SSUK") warrants to the original purchaser (the "Customer") that, subject to these provisions, its ManAnchor Safety Systems (the "Product") will be free of material defects in workmanship and materials under normal use, for a period of up to twelve months from the date of delivery (the "Warranty Period"). Warranties can be extended up to 25 years at the discretion of Sayfa Systems UK Ltd and will be renewed each year following the completion of the legal recertification by an authorised installer.

This Warranty shall only become valid and effective once registered with SSUK using the attached form. The warranty number provided upon registration must be produced when any claim is made under the Warranty. When this Warranty is registered by the Customer, it shall supersede and replace any warranties given by SSUK in its standard terms of sale.

Before returning the Product believed to be defective SSUK must be supplied with details of the warranty number provided upon registration and a description of the defect which has arisen.

To report a defective Product covered by this Warranty please contact Sayfa Systems UK on 0845 2419102.

During the Warranty Period, if any part of the Product is found in the reasonable judgement of SSUK to contain material defects in materials or workmanship, SSUK will, at its option:

1 provide replacement parts necessary to repair the Product;
2 replace the Product with a comparable product; or
3 re-fund the amount paid for the Product, less depreciation, upon its return.

Replacement parts or products will be new or serviceably used, comparable in function and performance to the original part or Product and warranted for the unexpired part of the Warranty Period. Any additional purchases or upgrades will not extend this Warranty. Sayfa Systems will not be liable for any on costs, remedial work charges or supply of temporary access and handrail, when supplying replacement parts.

This Warranty covers normal use only. SSUK shall not be liable for a breach of this Warranty:

1 if the Customer makes any further use of the Product after notifying SSUK of a defect;
2 to the extent that any defect arises out of normal wear and tear;
3 to the extent that any defect arises out of actions or event beyond the control of SSUK, including without limitation, impacts, fire, flood, wind, earthquake, lightning or similar disaster, war, lockout, epidemic, destruction of production facilities, riot, insurrection, or material unavailability; unauthorised modifications, attachments or peripherals;
4 to the extent that any defect arises as a result of the Customer’s failure to follow SSUK’s written or oral instructions as to the storage, installation, commissioning, use and yearly maintenance checks of the Goods or (if there are none) good trade practice.
5 To the extent that the Customer has engaged the services of any unauthorised company to install, maintain, retest or do any works on the SSUK systems without written authorisation from SSUK.
This Warranty shall be governed by and construed in accordance with the laws of England and Wales and SSUK and the Customer each agree that any disputes relating to this Warranty shall be subject to the exclusive jurisdiction of the courts of England and Wales.

Neither SSUK nor the Customer intend that any term of this Warranty shall be enforceable by virtue of the Contracts [Rights of third Parties] Act by any person who is not a party to it.

This Warranty is personal to the Customer and may not be assigned or otherwise transferred to any other person.

Except for the warranties expressed in this agreement, ssuk disclaims all other warranties, either express or implied, including implied warranties of merchantability or fitness for a particular purpose, other than those warranties implied by and incapable of exclusion, restriction or modification by law. The maximum liability of ssuk to you is limited to the purchase price paid for the product. Ssuk will not be liable under this warranty for property damage, death or personal injury (except where caused as a result of the negligence of ssuk), loss of use, interruption of business, "down time", loss of use of related equipment, lost profits, lost data or other consequential, incidental, punitive or special damages, however caused, whether for breach of warranty, contract, tort (including negligence), absolute or strict liability or otherwise. Nothing in this warranty shall have the effect of excluding or limiting any liability of ssuk which cannot be excluded or limited by law.

To register your product Warranty under the terms of Sayfa Systems UK Ltd Product Warranty please complete the form below and send to:

SAYFA SYSTEMS UK LTD
Jubilee House, Unit 3, Gelders Hall Road, Loughborough, Leicestershire LE12 9NH

Section 1 – to be completed by customer.
Failure to supply this information will invalidate the warranty.

Company Name
Contact Name
Property Address

Type of product installed:
- Safety Line Systems
- Handrail Systems
- Access Ladders
- Balustrade Systems
- Walkway Systems

Delivery/ Installation Date
Correspondence Address

Tel    Email address

Signature

Section 2 – to be completed by Sayfa Systems UK Ltd before warranty can be effective.

Warranty No*
Date*
Signature*

* To be completed by Sayfa Systems UK Ltd