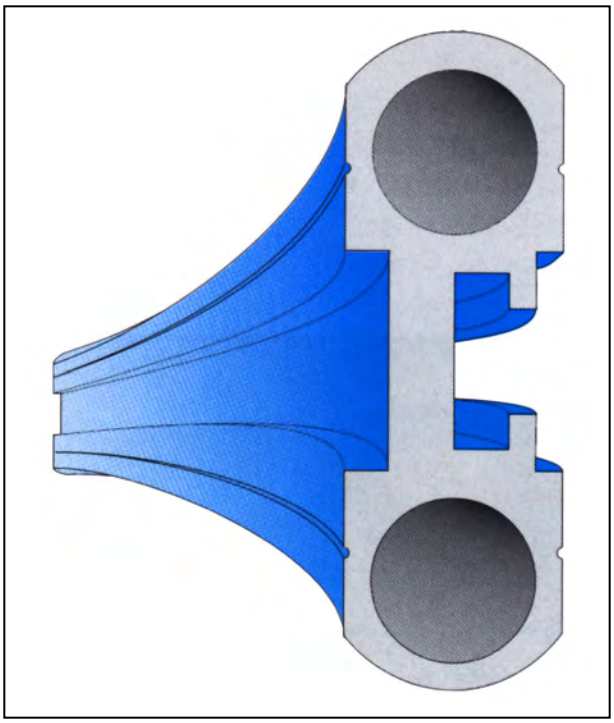
Railscaf



Tractel® Ltd.
Swingstage® Division

1. GENERAL

The RAILSCAF is a building maintenance system comprising a monorail fixed around the perimeter of a building or structure. A traversing trolley, from which may be suspended a SOLO cradle or a SOLSIT powered seat, travels along the monorail to reach the various parts of the building.*

The height of lift is limited to 40 m.

The maximum suspended load on each lifting point is 350 kg.

The trolley travels horizontally and is manually or power traversed.

**This system may also be used to suspend a 2 m or 3 m platform from 2 traversing trolleys. However, for such an application great care should be exercised and it is strongly recommended to consult us with particular regard to the maximum allowable distances between support brackets. It is also essential to ensure that the traversing around the bends can be done with the platform on the ground.*

2. MECHANICAL SPECIFICATION OF THE RAIL

Aluminium profile:		120x40 mm
Standard length:		5800 mm
Weight kg/m:		6.05
Aluminium material:		serie 606035 F18-20
Limit of elasticity:		Re ≥ 160 MPa
Breaking strain:		Rm ≥ 190 MPa
Standard elasticity:		E = 69 500 MPa
Linear expansion coefficient:		23 10E-06/°C
Section:		S = 22.4 cm2
Inertia:	Ixx = 276 cm4	Iyy = 34.3 cm4
	Wxx = 46 cm3	Wyy = 16.5 cm3
Minimum bending radius (outer/inner)		R = 500 mm

The maximum distance between brackets is limited to 3 m with a suspended load of 350 kg.

In these conditions, the safety coefficient compared to the breaking strain of the rail, as well as the various connecting sections, is greater than 4.

The distorsion of the rail under a load of 350 kg is less than 1/250th of the span, i.e. less than 12 mm.

3. PROTECTION

3.1. Anodisation gives protection against corrosion by depositing a layer of aluminium oxide.

We recommend 2 thicknesses of protection:

– Class 20, 20 µ m. thickness

– Class 25, 25 µ m. thickness

The colours available are:

– Natural aluminium	– Light beige	Eurocolor 2005
– Gold	– Dark beige	Eurocolor 2006
	– Chestnut	Eurocolor 2007
	– Black	Eurocolor 2008

3.2. Electro-static painting

The paint adhers well to the aluminium rail.

The colours available are in the RAL range, mat or gloss (sample on request).

4. SITE INSTALLATION

The rails are delivered to site in lengths of 5.8 m. Each rail weighs ±35 kg.

The minimum radius of the curves is 500 mm, and is made in the factory before despatch.

The rails are fixed to the brackets with hammerhead M12 hot galvanised 8.8 steel bolts.

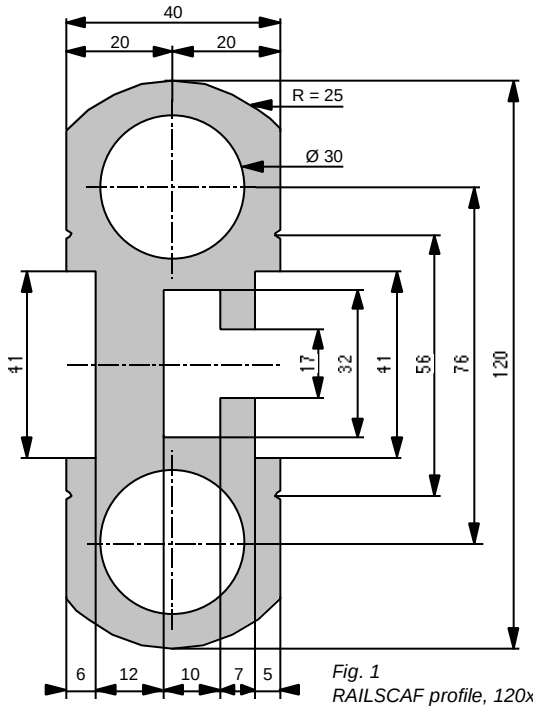


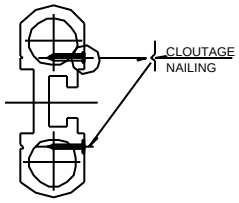
Fig. 1
RAILSCAF profile, 120x40

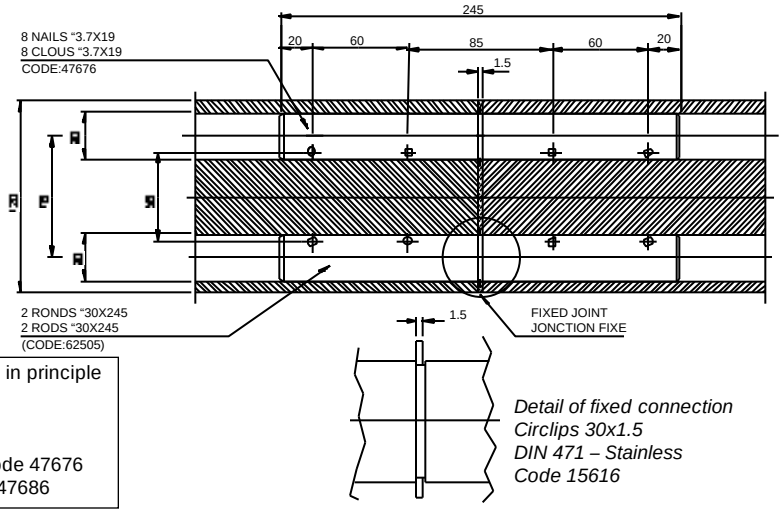
5. RAIL CONNECTIONS

5.1. Fixed connection

The connection between two rails is by 2 aluminium rods, dia. 30x245 mm, fixed by 8 pins, dia. 3.7x19 mm.
This type of connection should be done with a maximum distance of 500 mm from the bracket.

Fig. 2
Fixed connecting two rails



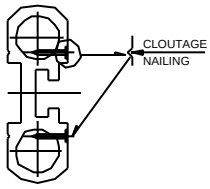


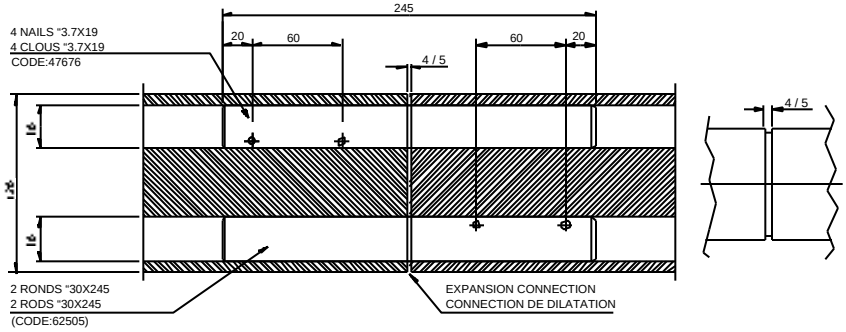
Detail of fixed connection
Circlips 30x1.5
DIN 471 – Stainless
Code 15616

Pinning is only done on one side, and in principle on the side facing the facade (i.e. on the bracket side).
Pinning machine: DX 36M-HILTI
Pin: EDN-19-P8-HILTI, dia. 3.7x19, code 47676
Cartridge: 6.8/11M-RED-HILTI, code 47686

5.2. Expansion connections

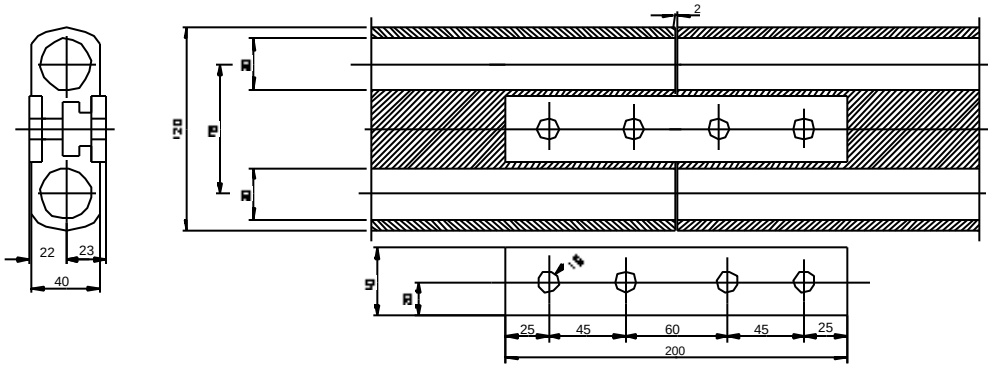
An expansion connection is fitted after two fix connections (= every 17.40 m). The connection between two rails is by 2 aluminium rods.
This type of connection should be done with a maximum distance of 500 mm from the bracket.





5.3. Connection with 2 fish plates

Only used at the end of a closed travelling track. The connection between two rails is by 2 fish plates 40x8x200.
This type of connection should be done with a maximum distance of 500 mm from the bracket.



6. RAIL END STOP

On "open" trackways an end stop (11) must be fitted at the end of the rails. It is fixed by screws.

End limit sensors (12) fitted on the motorised trolley stop the trolley at the end of the trackway, approaching the end stop.

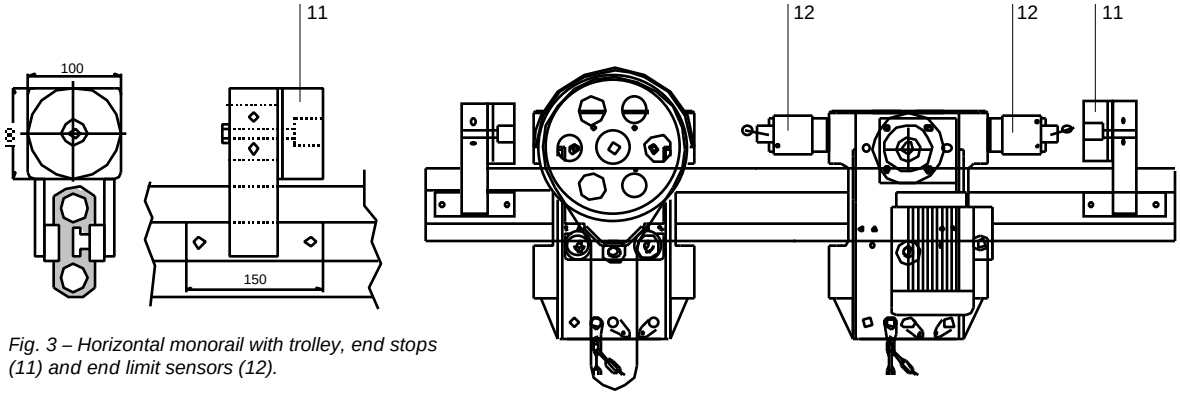
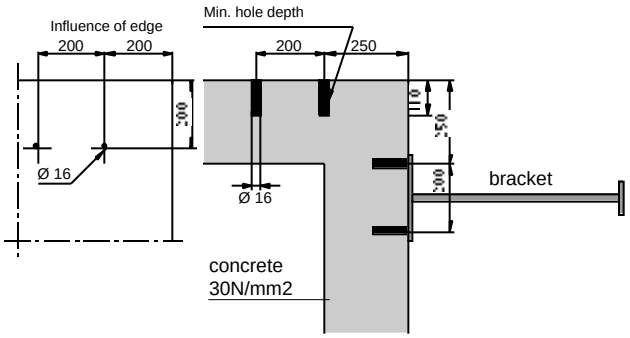


Fig. 3 – Horizontal monorail with trolley, end stops (11) and end limit sensors (12).

7. BRACKETS

The brackets (Fig. 4) which support the rail, are positioned every 3 m on the straight sections and as set out in figures 7 to 12 for the curved sections. The brackets are galvanised or stainless steel.

The fixing plate of the bracket itself has a ± 10 mm vertical adjustment.



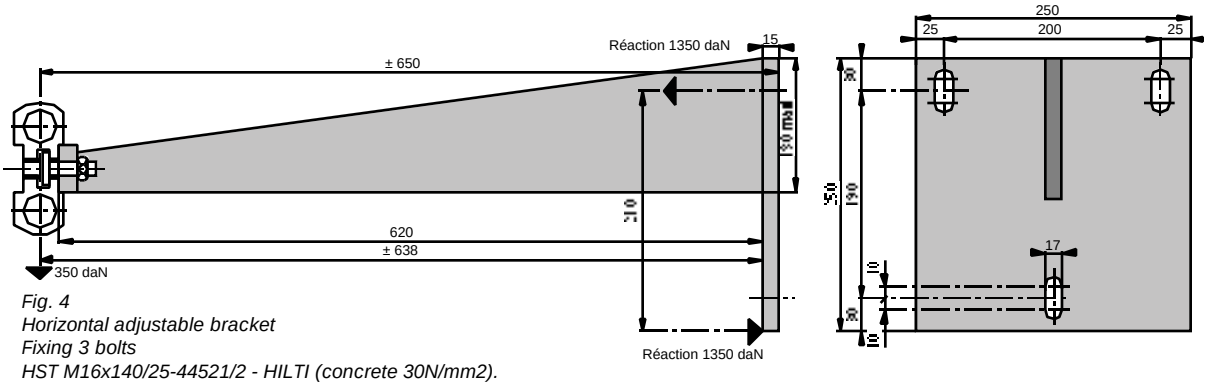


Fig. 4
Horizontal adjustable bracket
Fixing 3 bolts
HST M16x140/25-44521/2 - HILTI (concrete 30N/mm2).
Max. tightness 125 Nm.
Loading bolt 675 daN.

8. TRAVERSING TROLLEY

The traversing trolley is designed for a solo cradle or SOLSIT powered seat, **on a single suspension system,** to pass around the corners of buildings. On straight parts 2 m or 3 m platforms may be used on two suspension points. The trolley comprises 2 travelling rollers and 1 guide roller, fitting around the rail. The rollers have a polyurethane tread to prevent wear to the rail.
The casing of the trolley is in stainless steel.
The trolley is either manually or power traversed.

8.1. Manual traversing trolley by endless rope (Fig. 5)

Generally, a manual traversing trolley is sufficient, since the effort required to traverse the trolley is low.
Weight: 18 kg. Code for complete manual trolley: 21438.

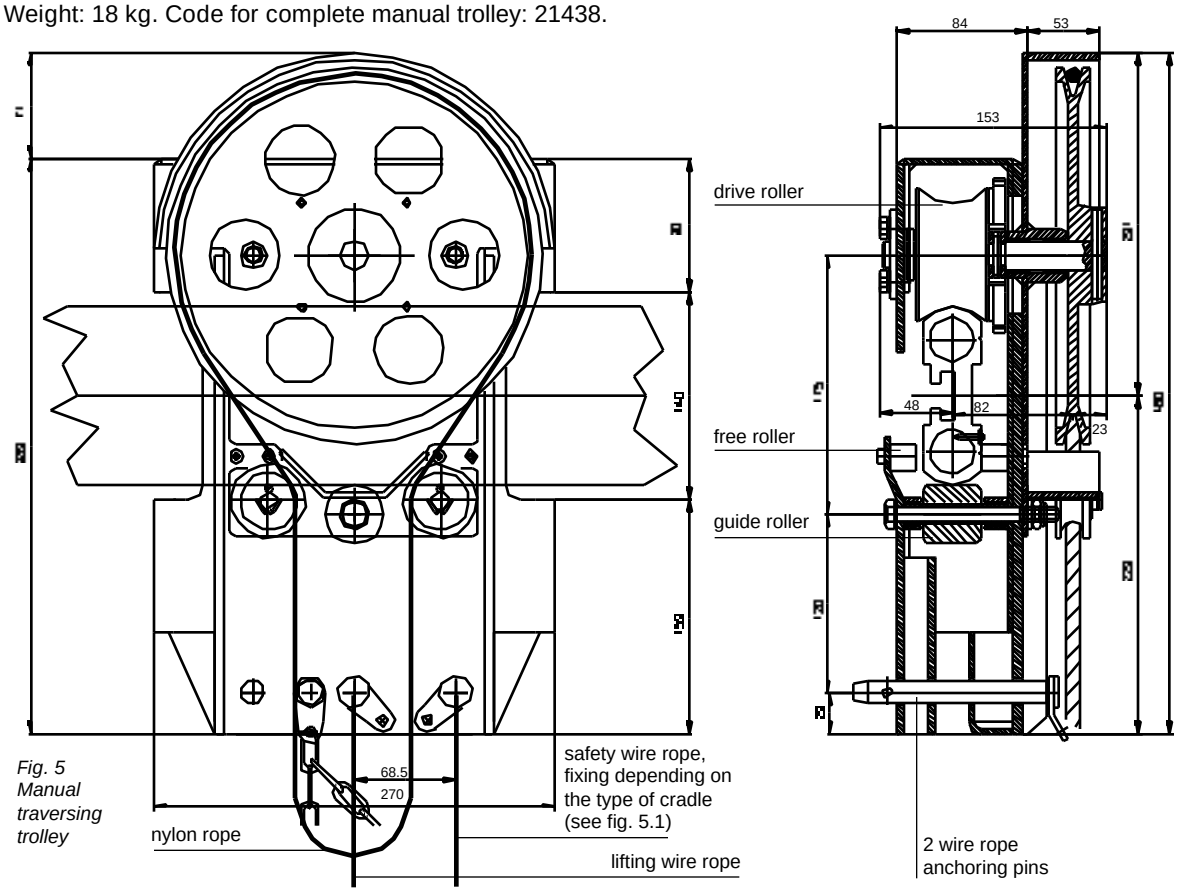


Fig. 5 Manual traversing trolley

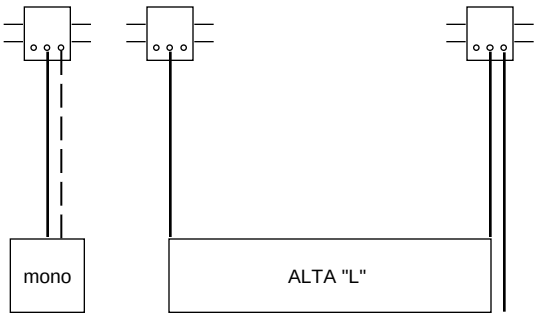


Fig. 5.1 - Arrangement of the lifting and safety wire ropes on the mono cradle or with two suspension points.

8.2. Powered trolley (Fig. 6)
The trolley is powered using a completely enclosed geared motor with brake; level of protection IP 54, Class F insulation, suitable for use in tropical conditions. 3 phase 220/380 V or 240/415 V, 50 Hz.
Controls by push-button pendant including UP/DOWN and Emergency Stop.
Weight: 24 kg. Code for complete powered trolley: 21448.

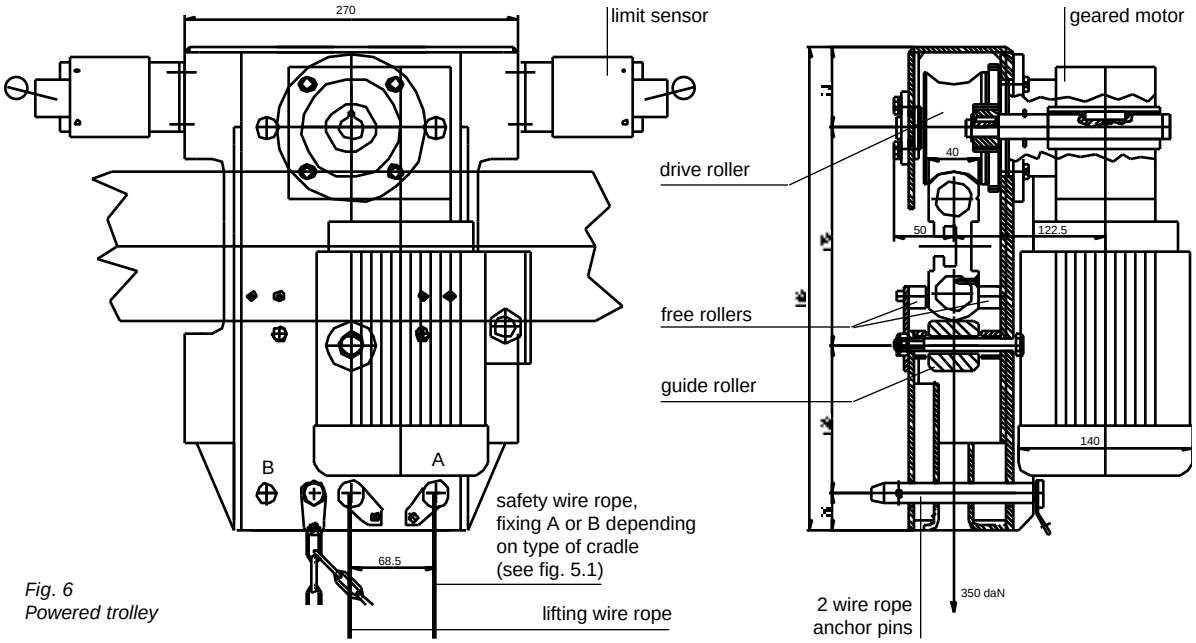


Fig. 6
Powered trolley

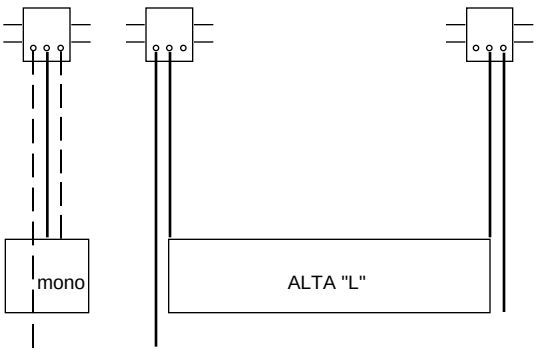
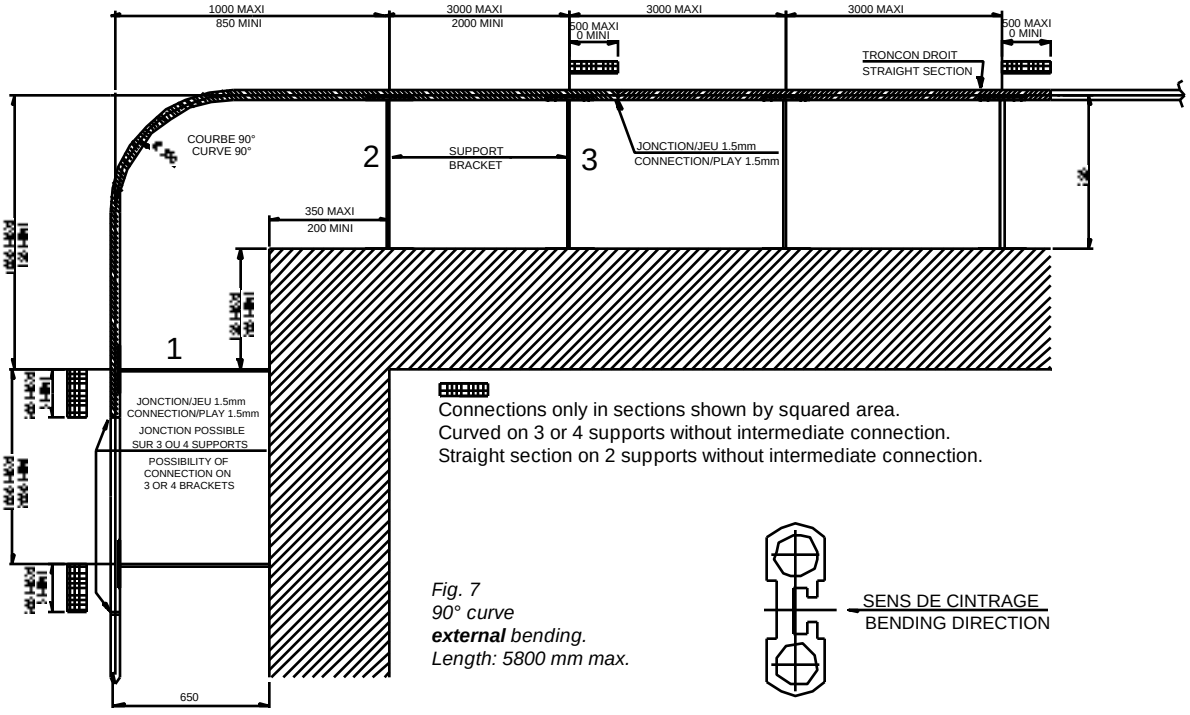


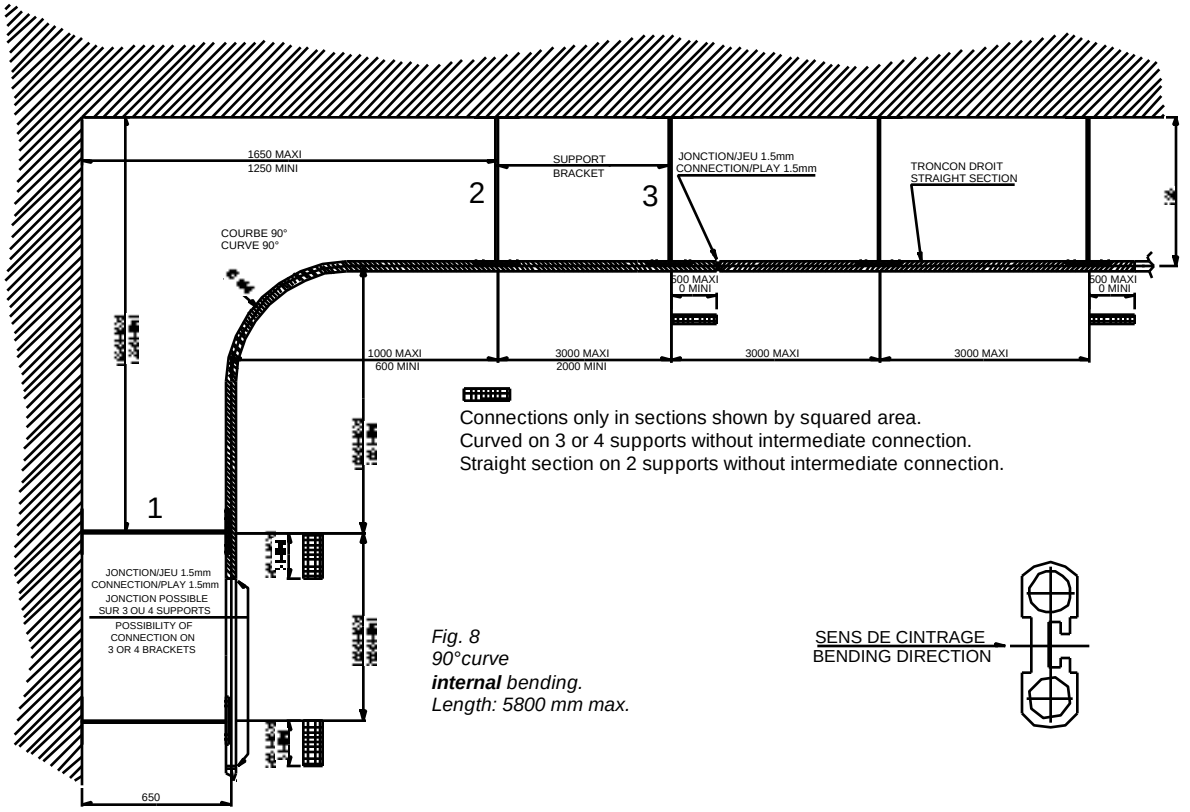
Fig. 6.1 - Arrangement of the lifting and safety wire ropes on the mono cradle or with two suspension points.

9. SEVERAL EXAMPLES OF APPLICATIONS



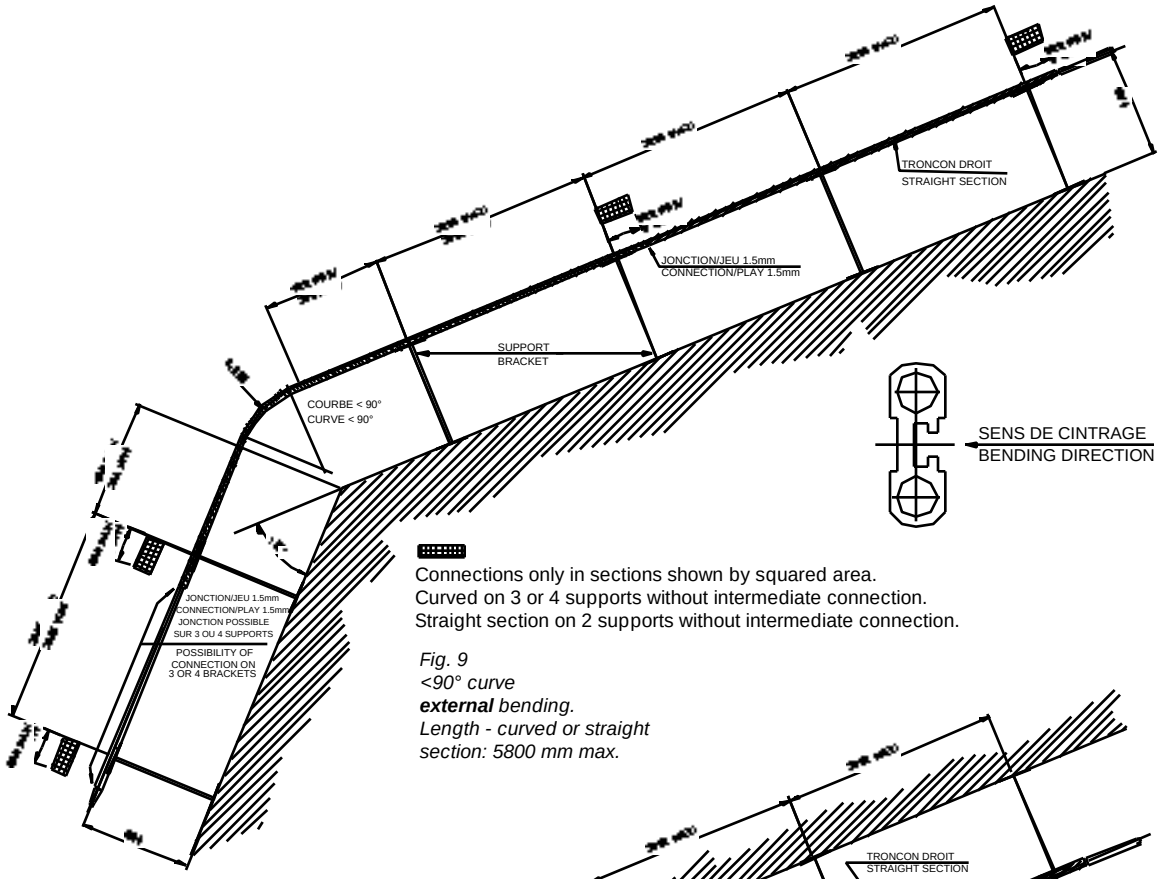
Connections only in sections shown by squared area.
Curved on 3 or 4 supports without intermediate connection.
Straight section on 2 supports without intermediate connection.

Fig. 7
90° curve
***external** bending.*
Length: 5800 mm max.



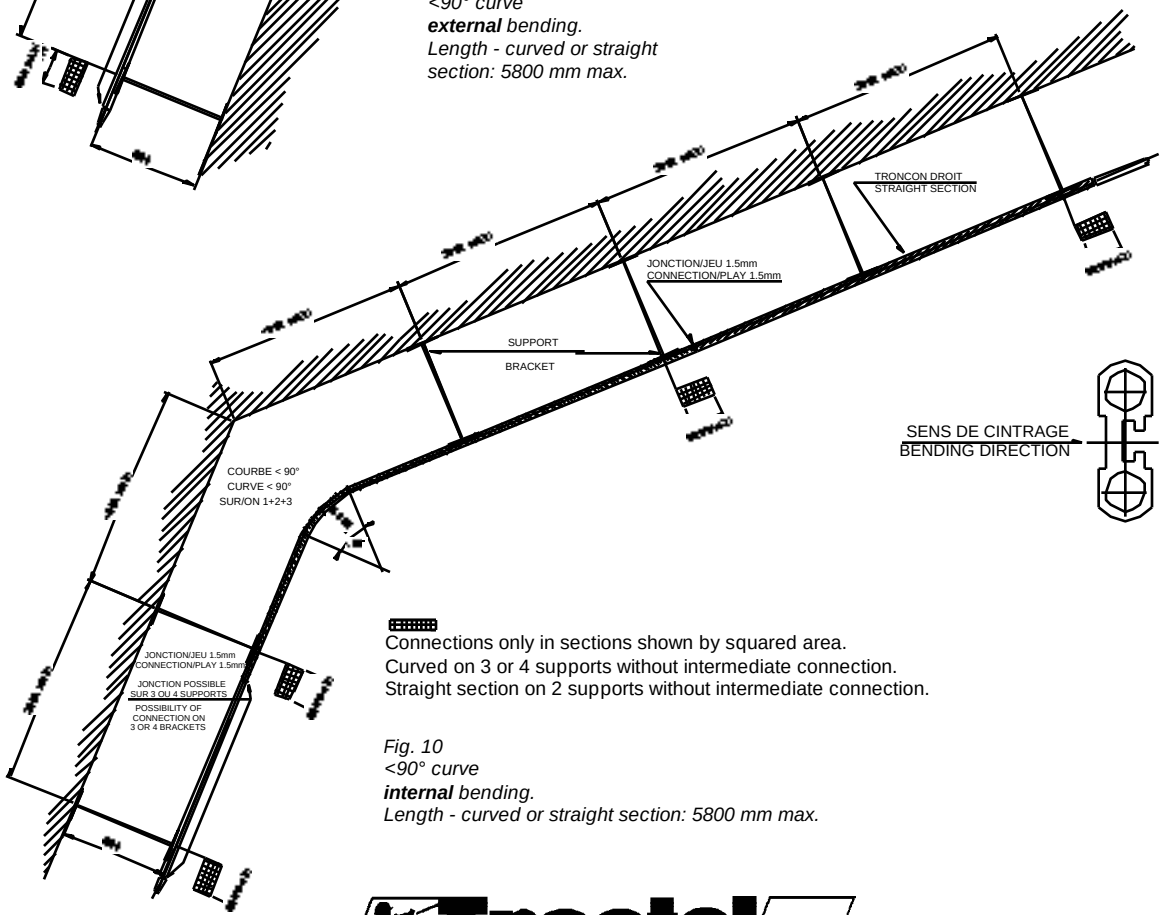
Connections only in sections shown by squared area.
Curved on 3 or 4 supports without intermediate connection.
Straight section on 2 supports without intermediate connection.

Fig. 8
90°curve
***internal** bending.*
Length: 5800 mm max.



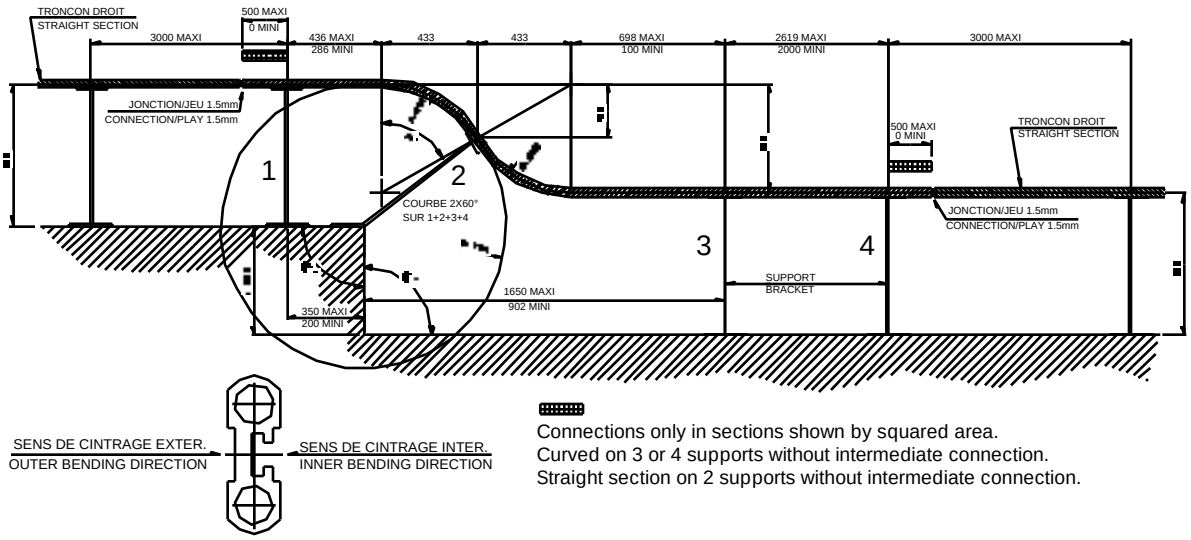
Connections only in sections shown by squared area.
Curved on 3 or 4 supports without intermediate connection.
Straight section on 2 supports without intermediate connection.

Fig. 9
<90° curve
***external** bending.*
Length - curved or straight section: 5800 mm max.



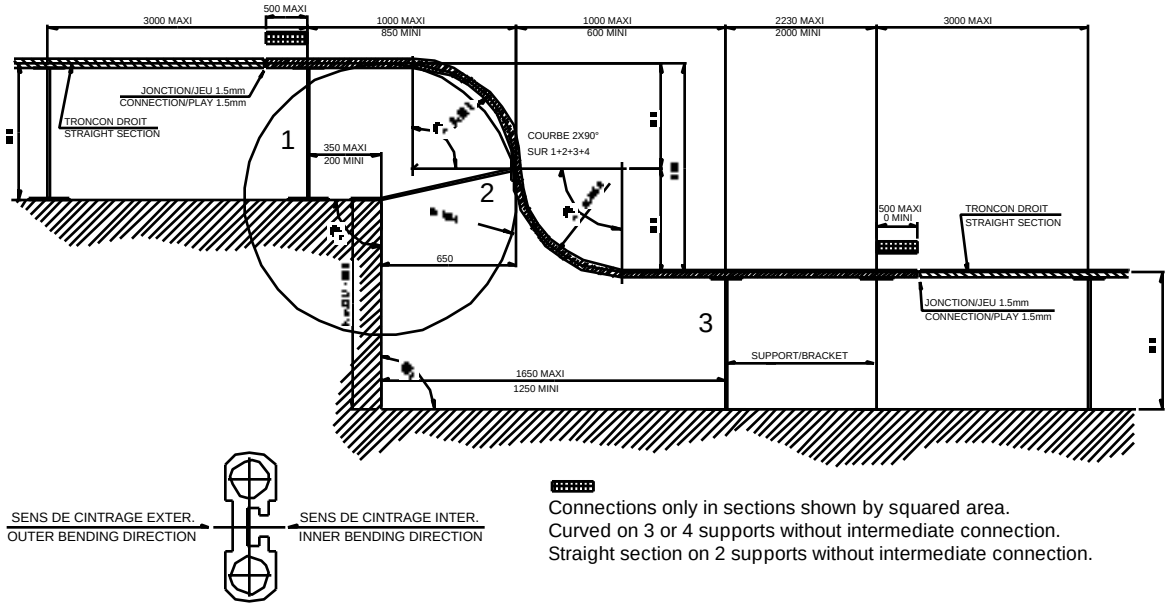
Connections only in sections shown by squared area.
Curved on 3 or 4 supports without intermediate connection.
Straight section on 2 supports without intermediate connection.

Fig. 10
<90° curve
***internal** bending.*
Length - curved or straight section: 5800 mm max.



Connections only in sections shown by squared area.
Curved on 3 or 4 supports without intermediate connection.
Straight section on 2 supports without intermediate connection.

Fig. 11 - 2 x 60° for horizontal profile.
***external** and **internal** bending.*
Length - curved or straight section: 5800 mm max.



Connections only in sections shown by squared area.
Curved on 3 or 4 supports without intermediate connection.
Straight section on 2 supports without intermediate connection.

Fig. 12 - 2 x 90° for horizontal profile.
***external** and **internal** bending.*
Length - curved or straight section: 5800 mm max.

1. GENERAL

The RAILSCAF is a building maintenance system comprising a monorail fixed around the perimeter of a building structure. A traversing trolley, from which may be suspended a SOLO cradle, travels along the monorail to reach the various parts of the building.
The height of lift is limited to 40 m.
The maximum suspended load on each lifting point is 350 kg.
The powered trolley travels **horizontally** or on an **inclined** track.
For operating on an **inclined section** (up to 60°), the RAILSCAF rail has an integrated chain whereas the trolley is fitted with a pinion which engages automatically in the chain, giving safe and reliable traversing.

2. MONORAIL

2.1. Mechanical specifications

Aluminium profile:	120x45 mm
Standard length:	5800 mm
Weight kg/m:	7.6
Aluminium material:	serie 6060 F18-20
Limit of elasticity:	Re ≥ 160 MPa
Breaking strain:	Rm ≥ 190 MPa
Standard elasticity:	E = 69 500 MPa
A %:	10
Linear expansion coefficient:	$23x10^{-6}$ °C
Section:	S = 28 cm^2
Inertia: Ixx = 311,5 cm4	Iyy = 53,6 cm^4
Wxx = 52,4 cm3	Wyy = 23 cm^3
Minimum bending radius (outer/inner)	R = 700 mm

Chain (only in inclined segments) ASA 3/4"x1/2"

The maximum distance between brackets is limited to 3 m with a suspended load of 350 kg.
The distorsion of the rail under a load of 350 kg is less than 1/250th of the span, i.e. less than 12 mm.

The RAILSCAF machine conforms to EU Directives and is manufactured in accordance with ISO 9001

TÜV CERT DIN EN ISO 9001:2000 Certificat : 01 100 6535

2.2. Protection

2.2.1. Anodisation gives protection against corrosion by depositing a layer of aluminium oxide.
We recommend 1 thicknesses of protection:
– Class 20, 20 µ m. thickness
The colours available are:

– Natural aluminium	– Light beige	Eurocolor 2005
– Gold	– Dark beige	Eurocolor 2006
	– Chestnut	Eurocolor 2007
	– Black	Eurocolor 2008

2.2.2. Electro-static painting
The paint adhers well to the aluminium rail.
The colours available are in the RAL range, mat or gloss (sample on request).

2.3. Site installation

The rails are delivered to site in lengths of 5.8 m. Each rail weights ±44 kg.
The minimum radius of the curves is 700 mm, and is made in the factory before despatch.
The rails are fixed to the brackets with hammerhead M12 hot galvanised 8.8 steel bolts.

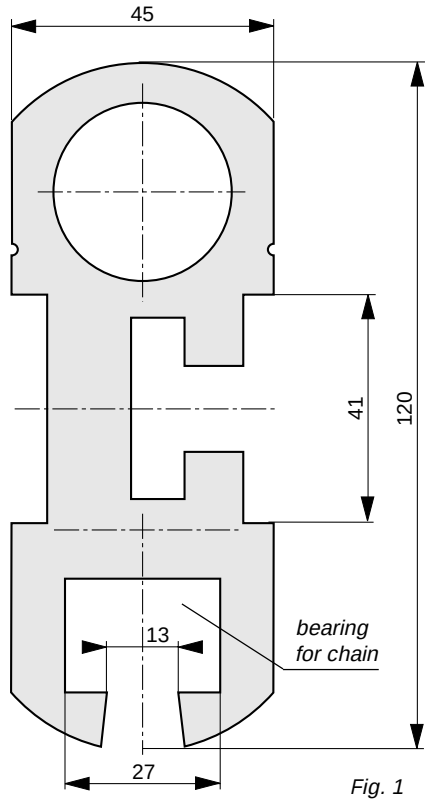


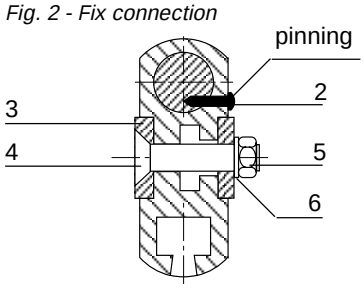
Fig. 1
RAILSCAF profile, 120x45

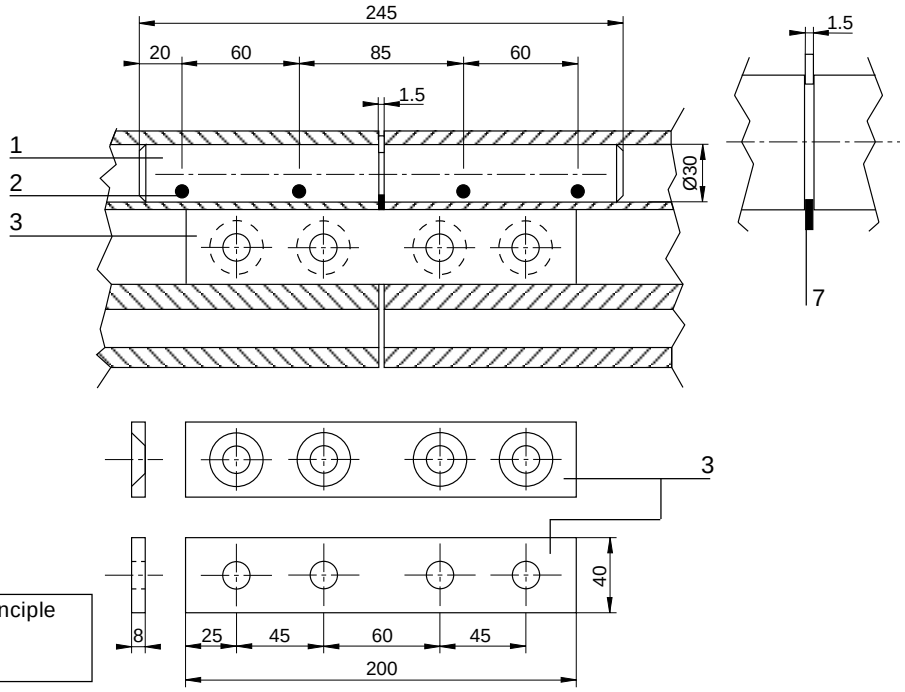
2.4. Rail connections

2.4.1. Fix connections

The connection between two rails is by 2 splice bars (3) and 1 aluminium rod (1), fixed by 4 pins (2).
This type of connection should be done with a maximum distance of 500 mm from the bracket.

Fig. 2 - Fix connection





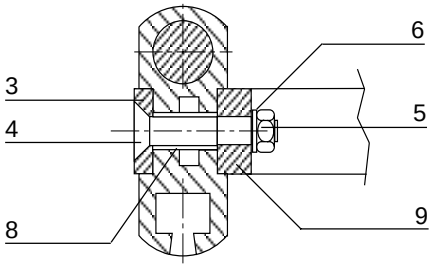
1. *Aluminium rod Ø 30 (1),*
2. *Pin Ø 3.7 (4),*
3. *Splice bar 200x40x8 (1) + (1),*
4. *Screw (4),*
5. *Nut (4),*
6. *Washer (4),*
7. *Snap ring 30x1.5 INOX (1),*

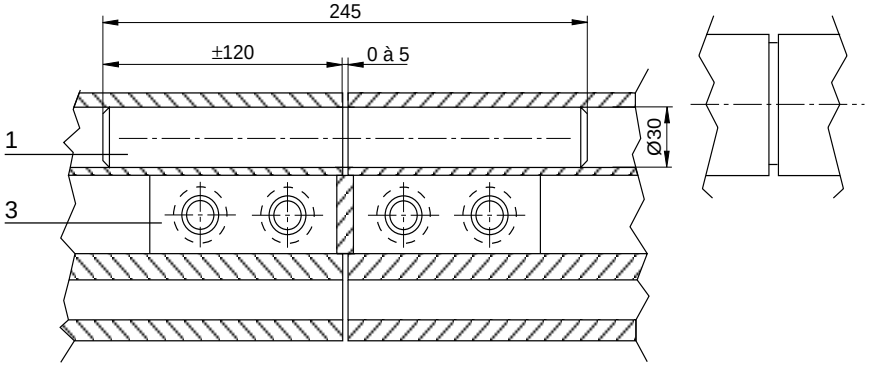
Pinning is only done on one side, and in principle on the side facing the facade, (i.e. on the bracket side).

2.4.2. Expansion connections

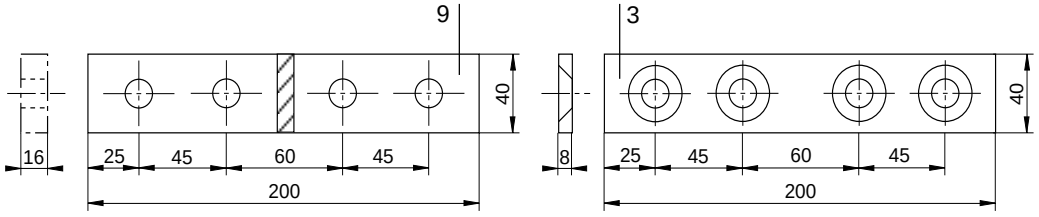
An expansion connection is fitted after two fix connections. The connection between two rails is by 1 aluminium rod (1) and 1 splice bar (3), fixed to the bracket. This type of connection must always be done on a bracket.

Fig. 2.1 - Expansion connection





8. Spacer Ø 16x1,5x35 (4)
9. Bracket



2.5. Rail end stop

On "open" trackways an end stop (11) must be fitted at the end of the rails. It is fixed by screws.

End limit sensors (12) fitted on the trolley stop the trolley at the end of the trackway, approaching the end stop.

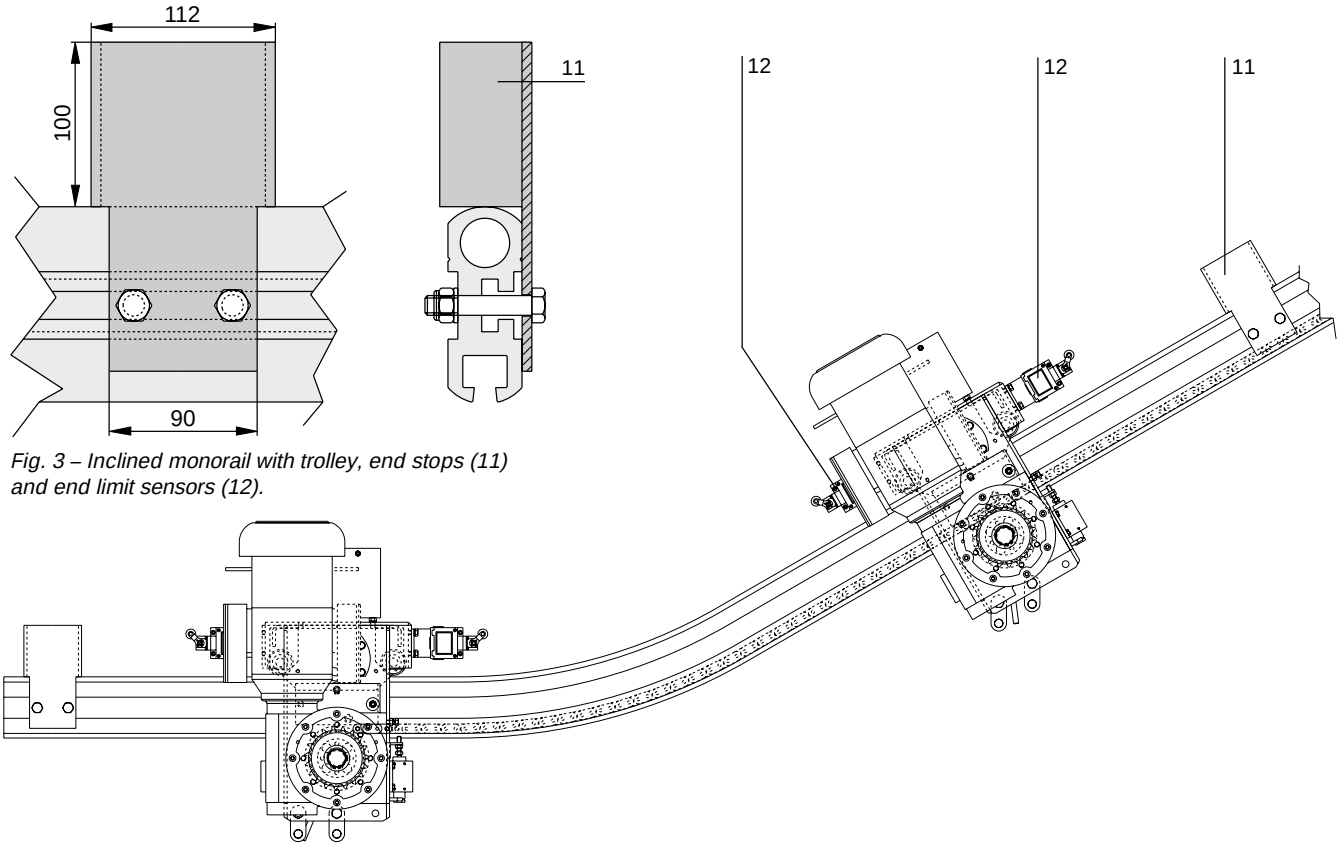


Fig. 3 – Inclined monorail with trolley, end stops (11) and end limit sensors (12).

3. BRACKETS

The brackets (Fig. 4) which support the rail, are positioned every 3 m on the straight sections and as set out in figures 6 to 9.1. for the curved sections. The brackets are galvanised or stainless steel.

The fixing plate of the bracket itself has a ±10 mm vertical adjustment.

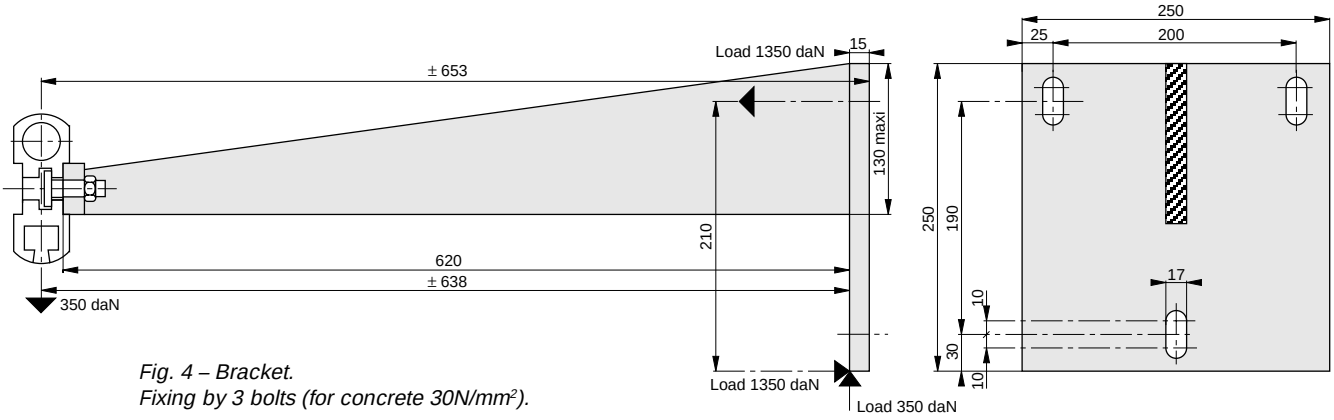


Fig. 4 – Bracket.
Fixing by 3 bolts (for concrete 30N/mm²).

4. TRAVERSING TROLLEY

The traversing trolley comprises 1 geared motors the main brake doubled by a fallstop device (secondary overspeed brake) and 1 set of guide rollers and sliding contacts fitted on the rail and giving a safe and reliable traversing around the corners and on inclined sections.
The casing of the trolley is in stainless steel.
On inclined sections the motor pinion engages automatically in the integrated chain of the rail.
Traversing speed: ±6.5 m/mn.

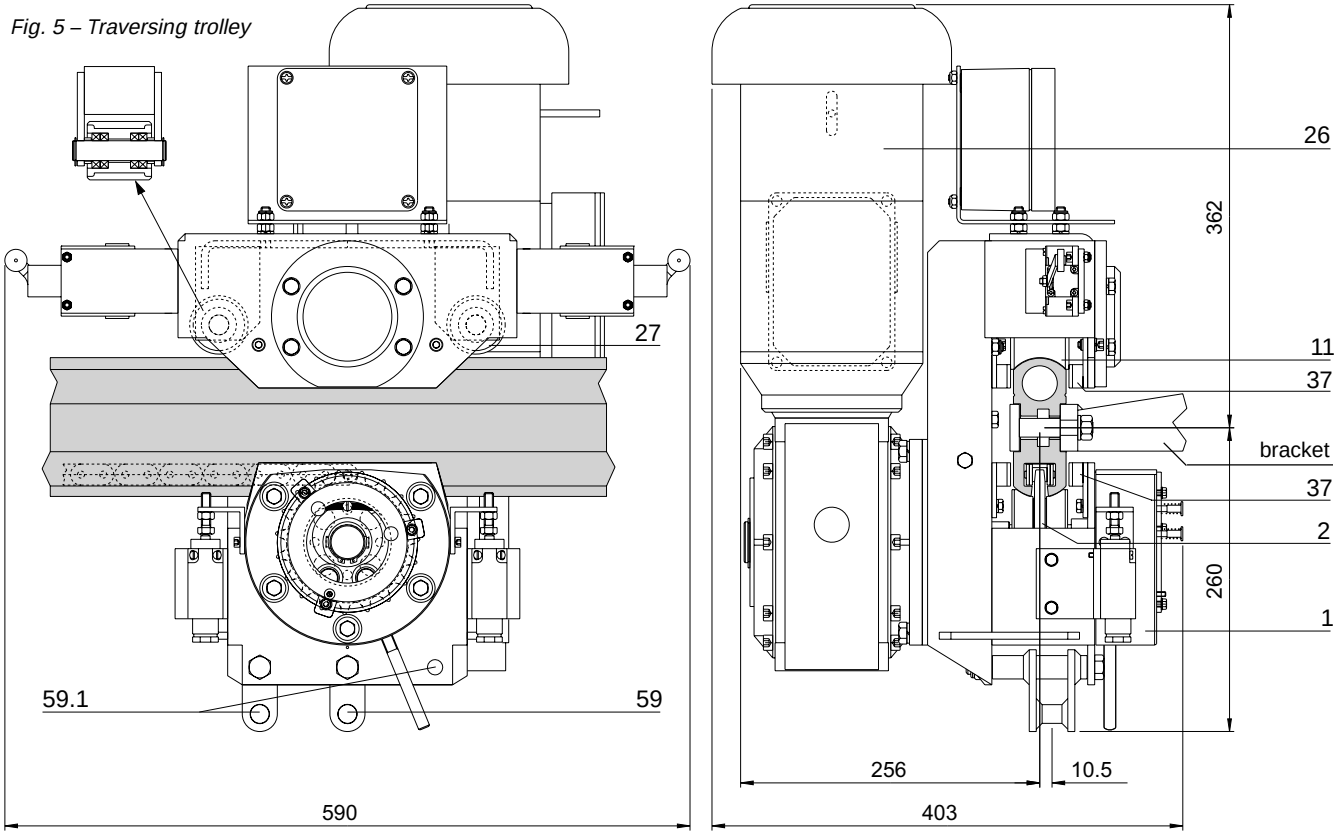
4.1. Motor technical data

Type:	geared motor with brake
Level of protection:	IP 55
Insulation class:	F
Voltage:	3-phase 220/380 V 50 Hz or 240/415 V 50 Hz
Controls:	by push-button pendant control box or by the cradle control box.

4.2. Main caracteristics of the fallstop curce

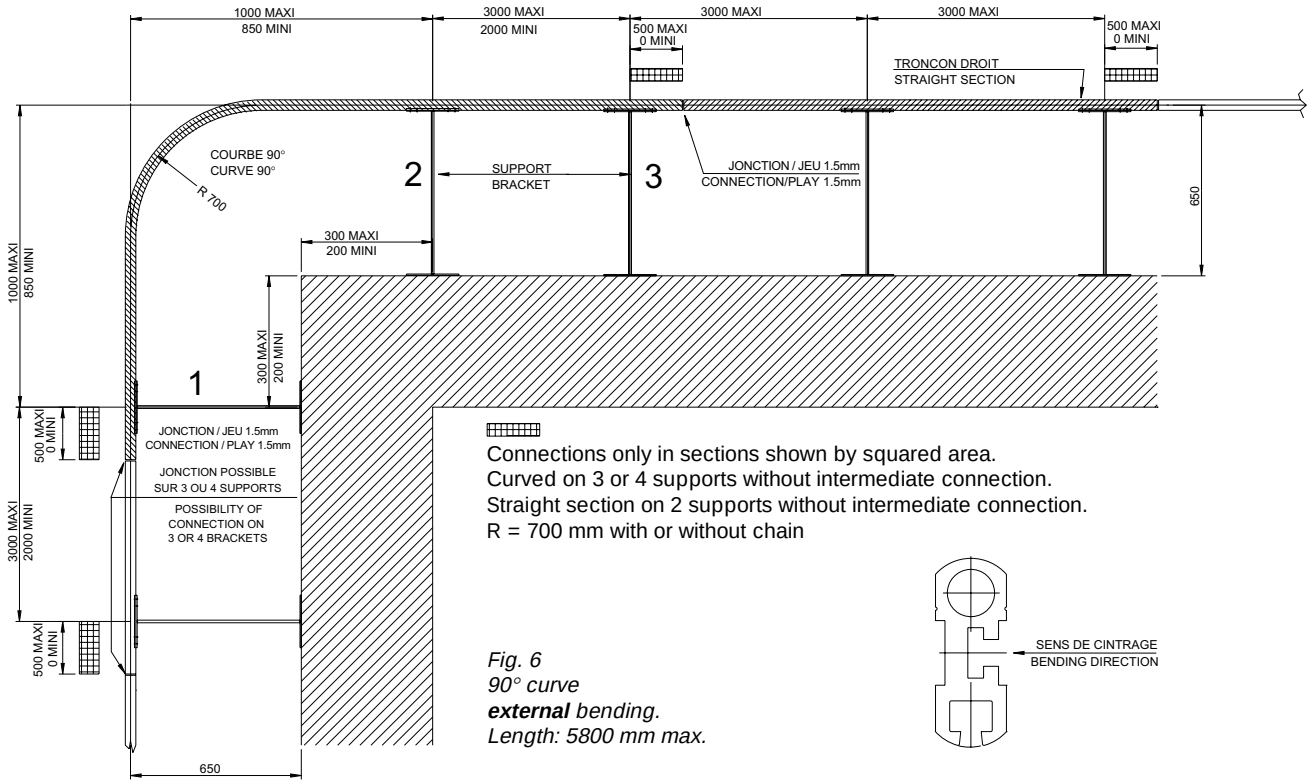
– action by overspeed
– stainless steel + INOX
– window to check the correct movement of the weights.

Fig. 5 – Traversing trolley



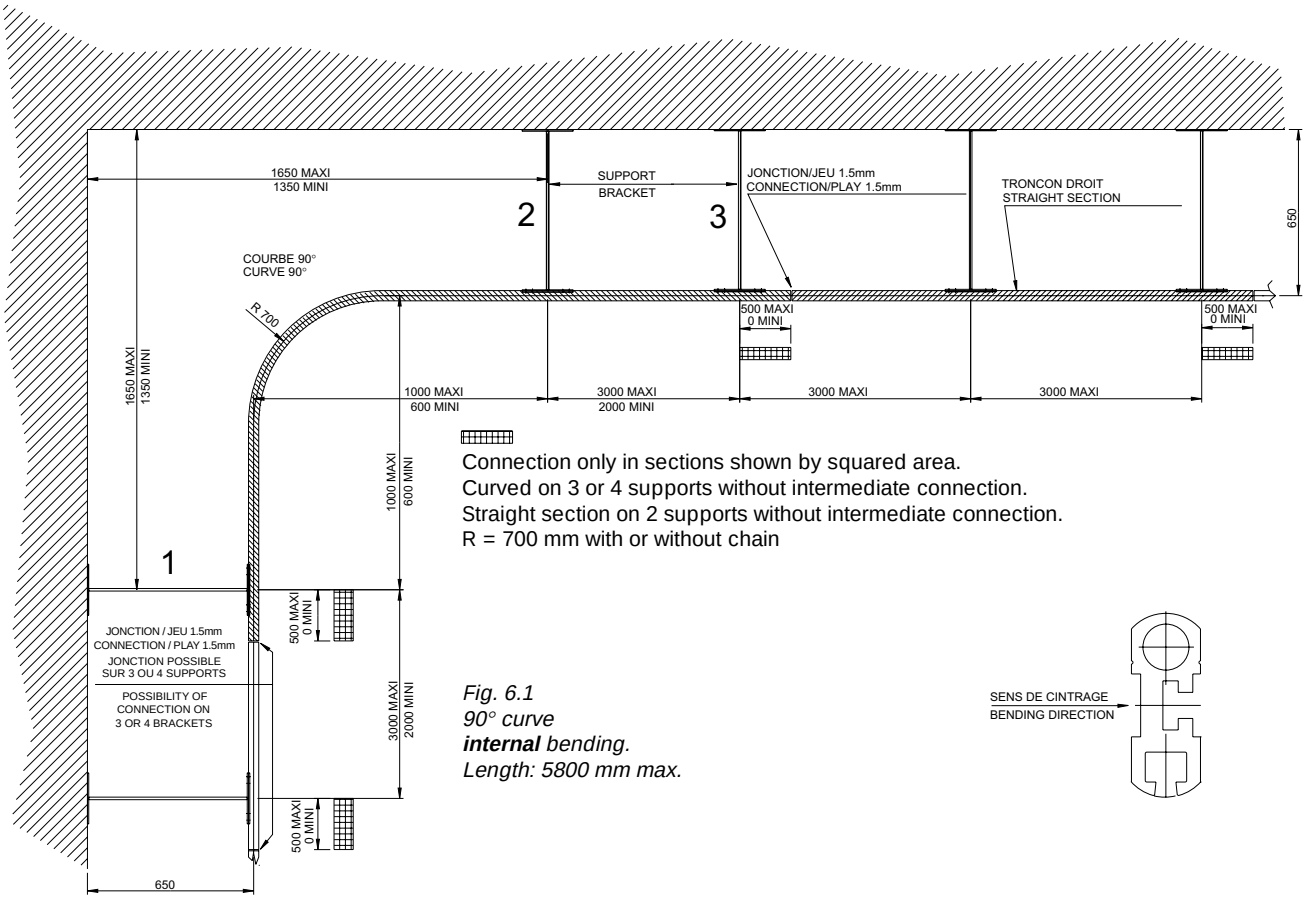
1. Fallstop device (1)
2. Set of chain pinion with guide roller (1)
11. Roller (1)
26. Gear motor (1)
27. Counter roller (2)
37. Lower (2) and upper (4) sliding contact
59. Lifting wire rope anchoring (1)
59.1. Safety wire rope anchoring (1)

5. SEVERAL EXAMPLES OF APPLICATIONS



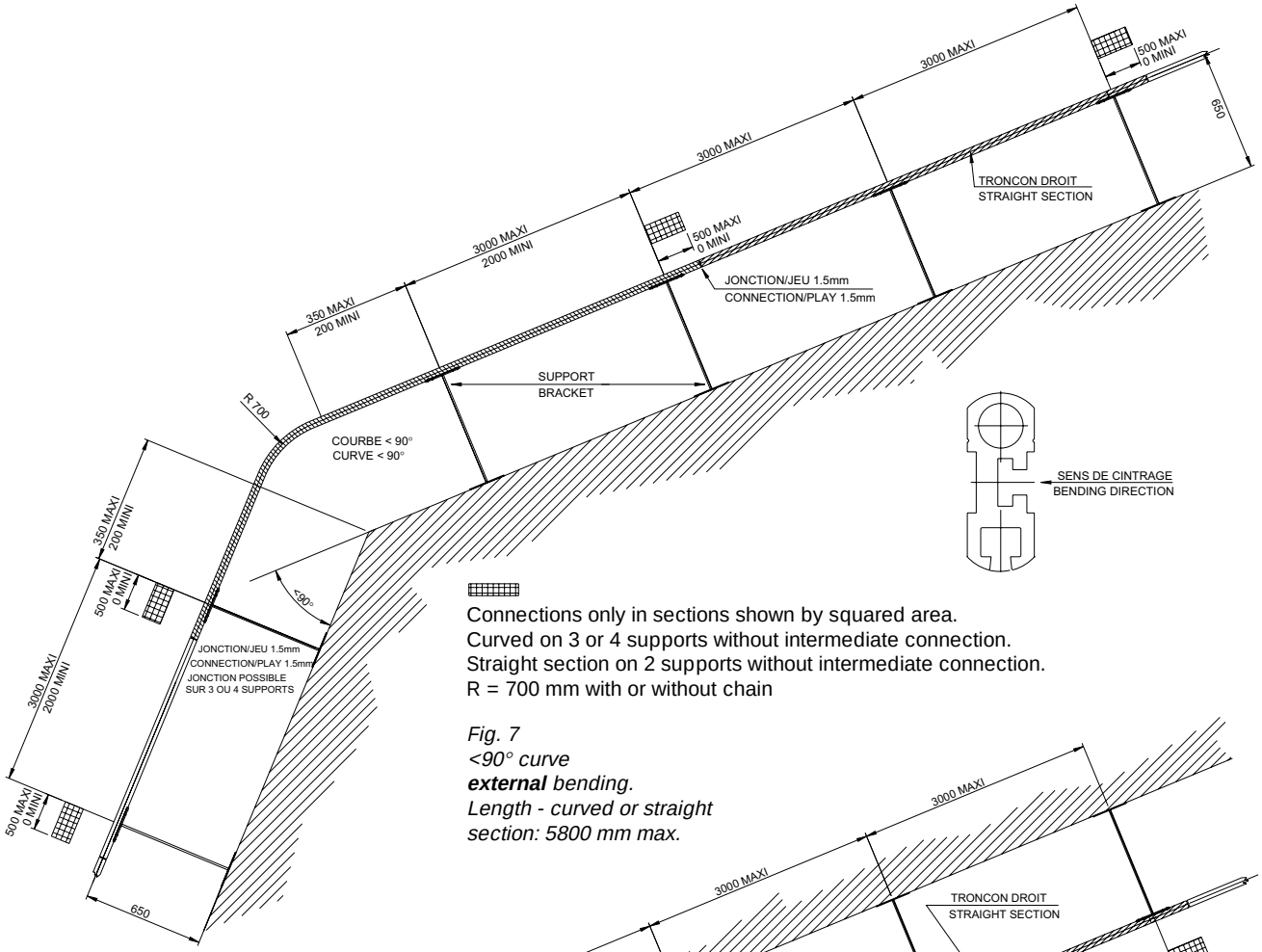
Connections only in sections shown by squared area.
Curved on 3 or 4 supports without intermediate connection.
Straight section on 2 supports without intermediate connection.
R = 700 mm with or without chain

Fig. 6
90° curve
***external** bending.*
Length: 5800 mm max.



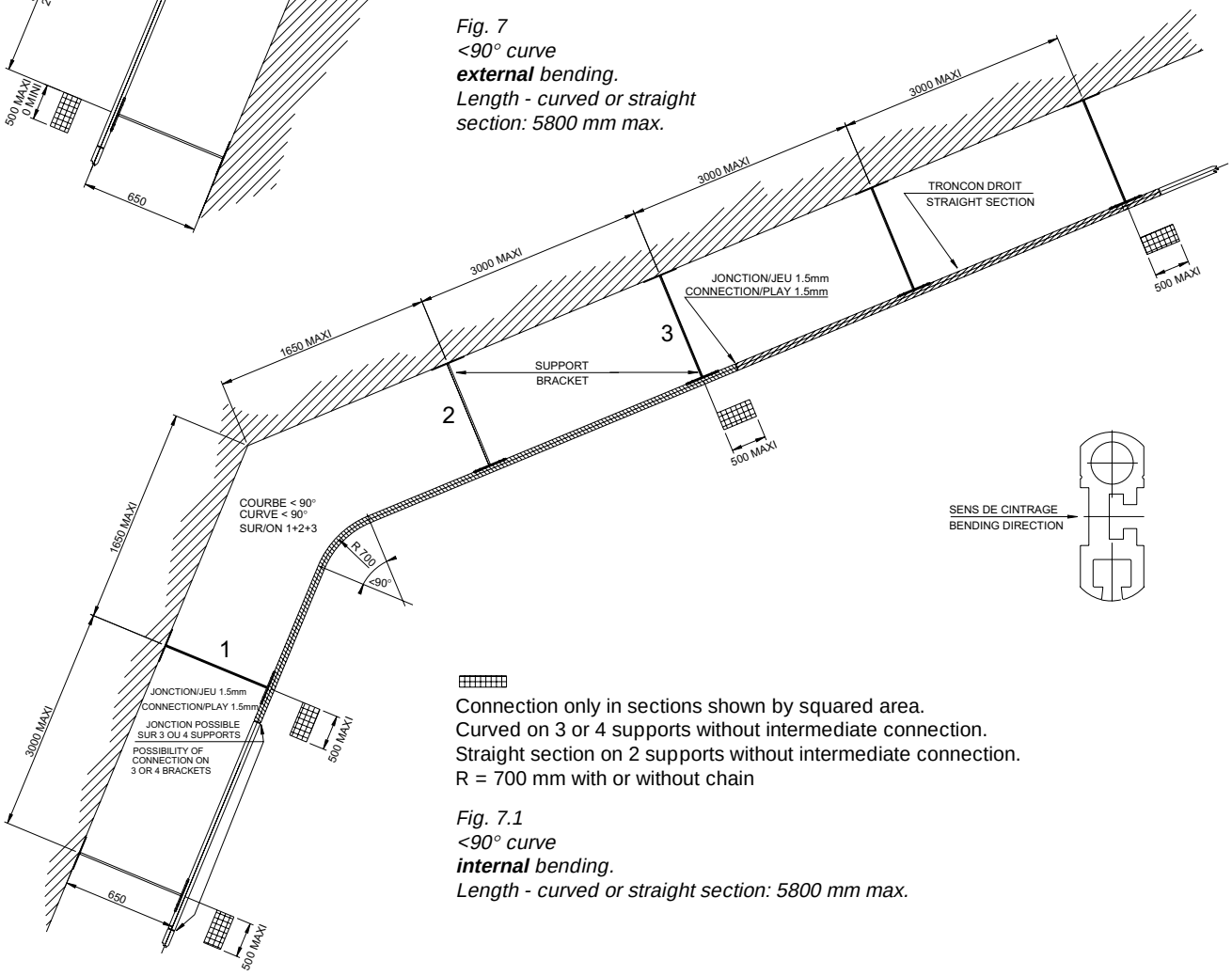
Connection only in sections shown by squared area.
Curved on 3 or 4 supports without intermediate connection.
Straight section on 2 supports without intermediate connection.
R = 700 mm with or without chain

Fig. 6.1
90° curve
***internal** bending.*
Length: 5800 mm max.



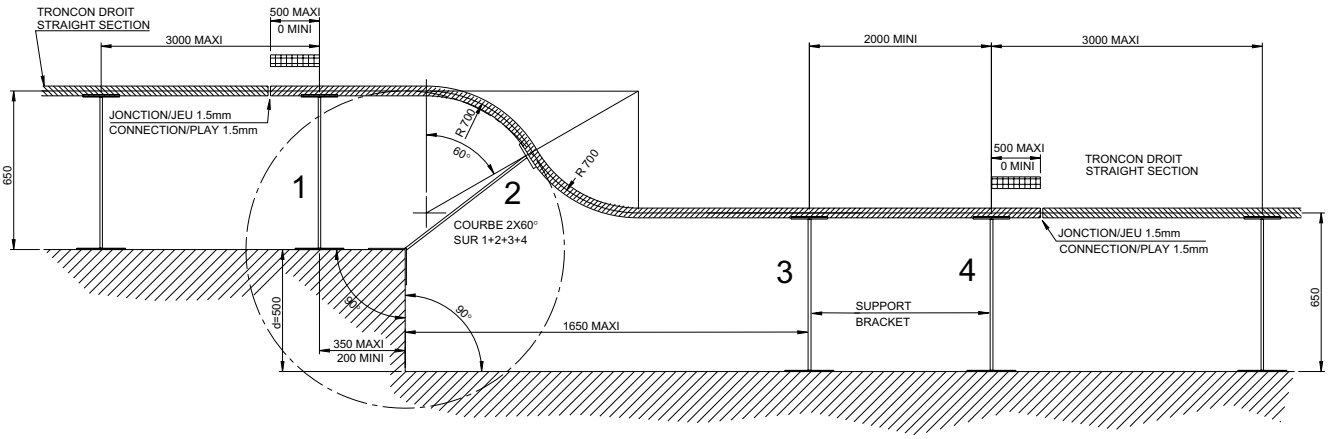
Connections only in sections shown by squared area.
Curved on 3 or 4 supports without intermediate connection.
Straight section on 2 supports without intermediate connection.
R = 700 mm with or without chain

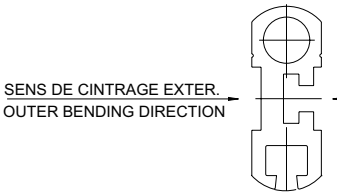
Fig. 7
<90° curve
***external** bending.*
Length - curved or straight section: 5800 mm max.



Connection only in sections shown by squared area.
Curved on 3 or 4 supports without intermediate connection.
Straight section on 2 supports without intermediate connection.
R = 700 mm with or without chain

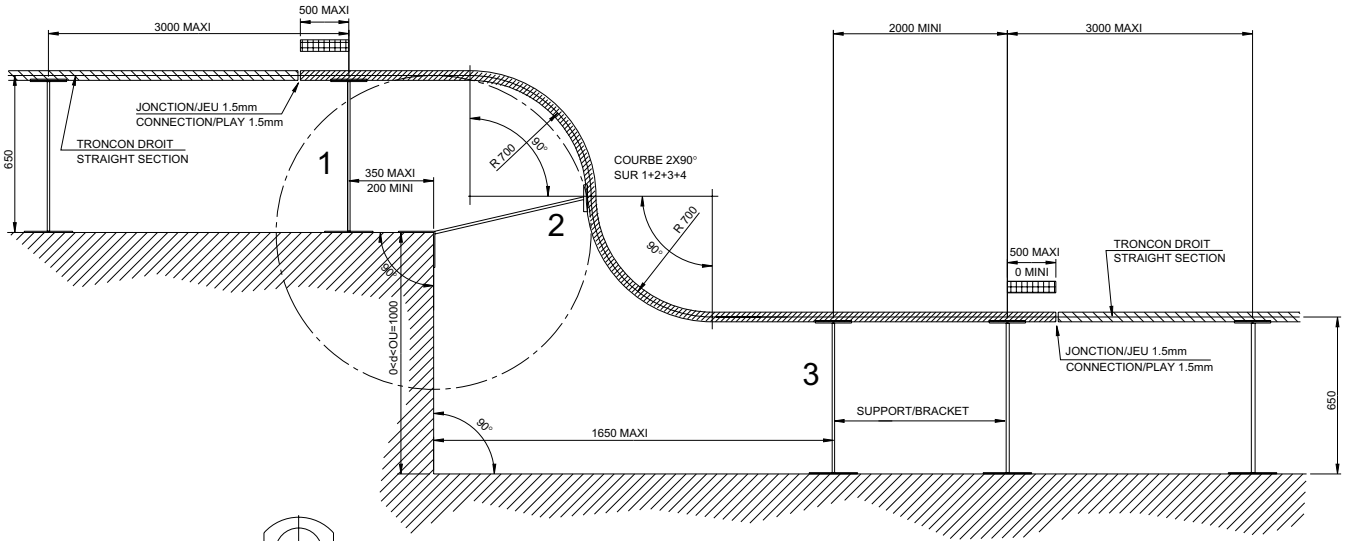
Fig. 7.1
<90° curve
***internal** bending.*
Length - curved or straight section: 5800 mm max.

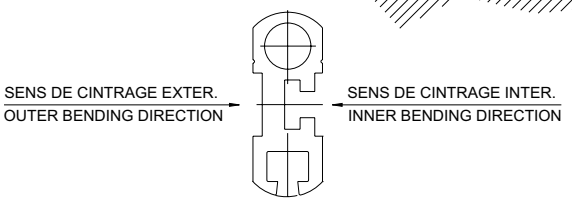




Connections only in sections shown by squared area.
Curved on 3 or 4 supports without intermediate connection.
Straight section on 2 supports without intermediate connection.
No chain in the curves.

Fig. 8 - 2 x 60° for horizontal profile.
***External** and **internal** bending.*
Length - curved or straight section: 5800 mm max.





Connections only in sections shown by squared area.
Curved on 3 or 4 supports without intermediate connection.
Straight section on 2 supports without intermediate connection.
No chain in the curves.

Fig. 8.1 - 2 x 90° for horizontal profile.
***External** and **internal** bending.*
Length - curved or straight section: 5800 mm max.

Fig. 9 - 45° slope.
Length: mini 3050 mm
maxi 5800 mm
Minimum bending radius:
R = 1500 mm

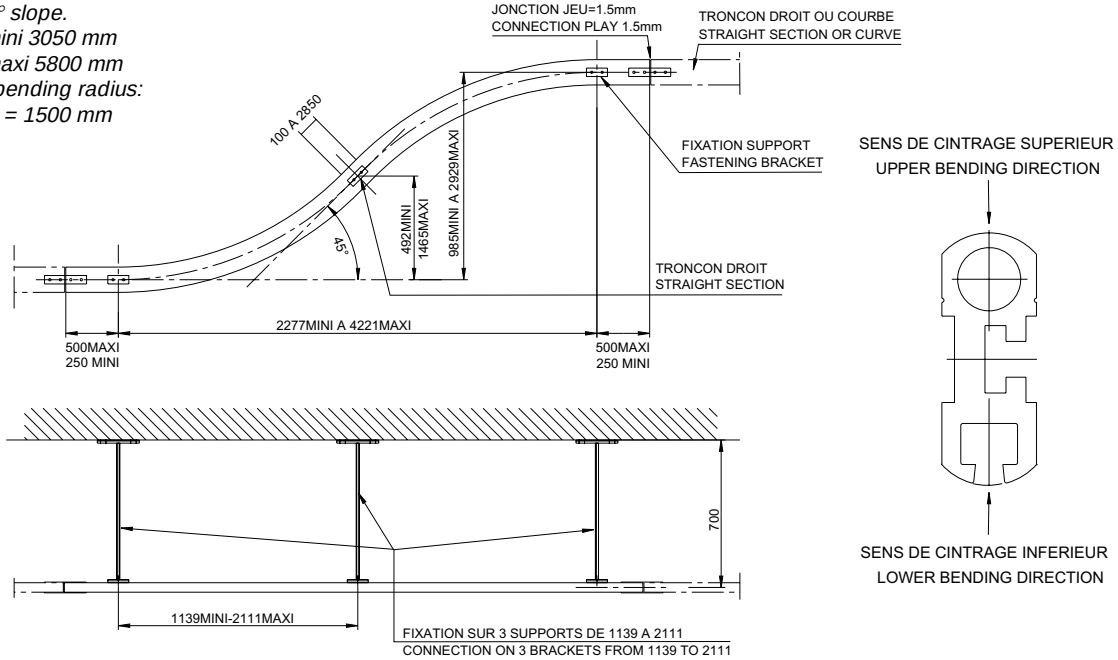
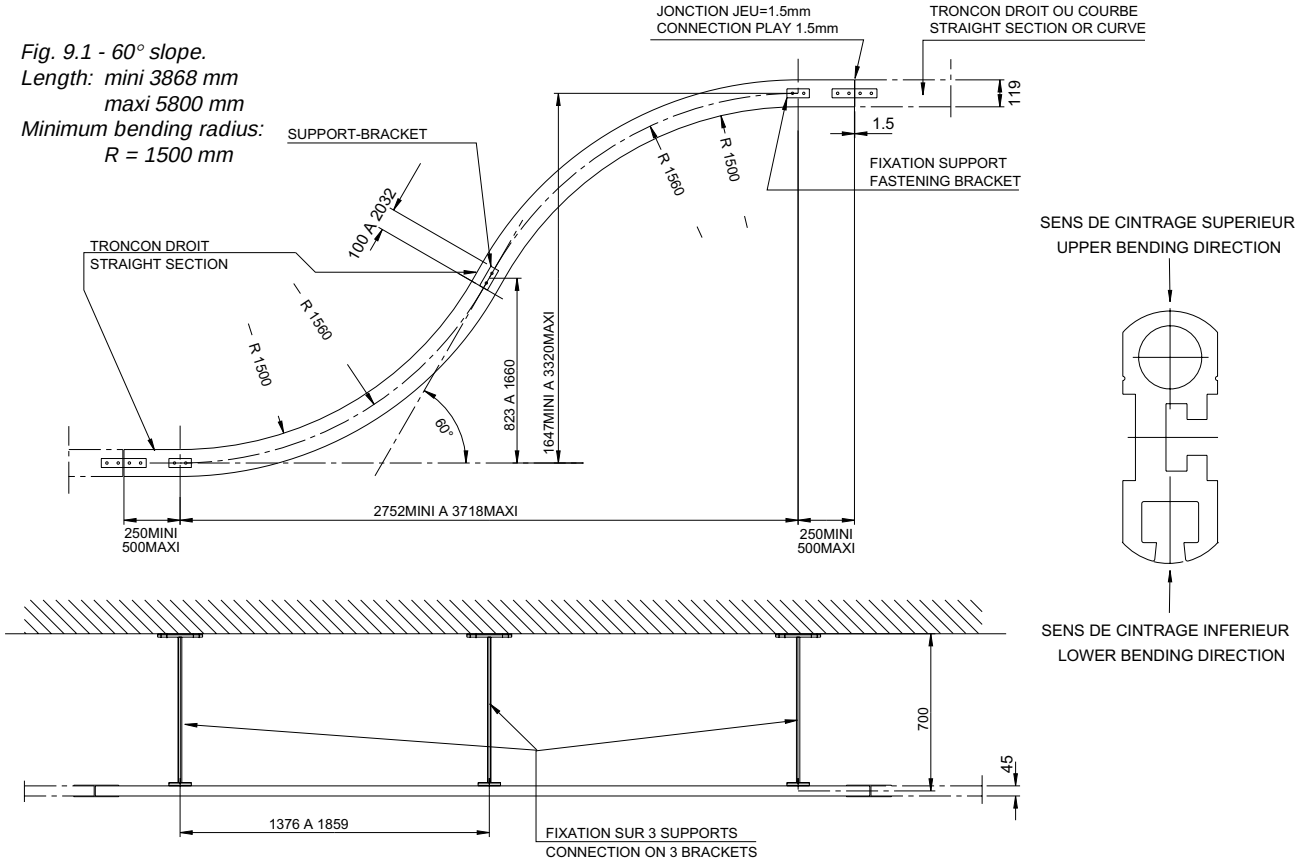
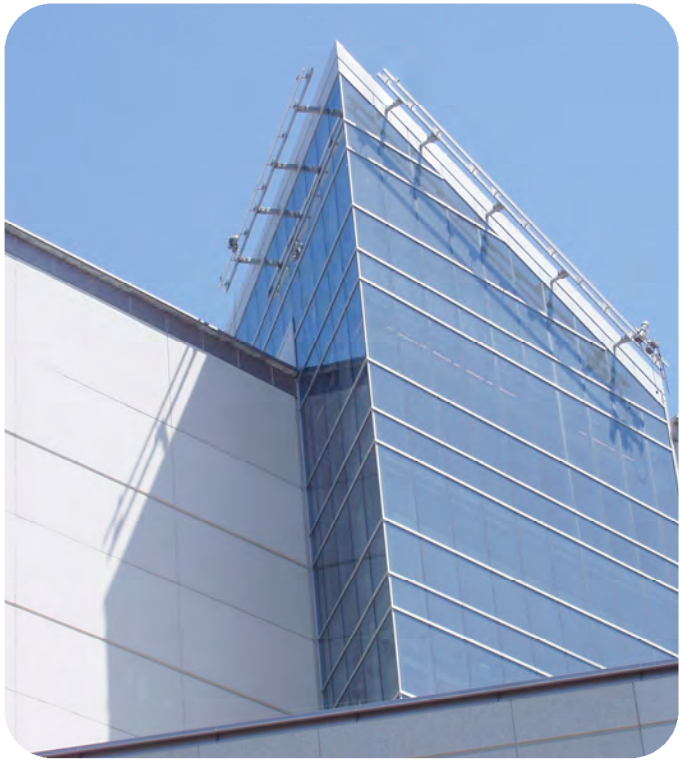


Fig. 9.1 - 60° slope.
Length: mini 3868 mm
maxi 5800 mm
Minimum bending radius:
R = 1500 mm



product information	access reference Railscaf®	ref.: M4828 rev. no.: 0 date: 06/07 page: 1/1



Application: Railscaf®

Site: Dr. Martin Luther King, Jr. Library
San Jose, CA - ref 8154

Customer: Hensel Philps Construction Company

Architect: Carrier Johnson Architects

Equipment: 80 ft. Railscaf® Track, Interior Monorail and Davit system.

Description of the application:
Railscaf® was chosen for building facade maintenance on selected sections of the library where the Davit System could not access the exterior of the building. Since Railscaf® closely follows the line of the façade the aesthetic appeal of the building could be maintained. The Railscaf® profile features concealed joints for a clean appearance and rear mounting to the support brackets to ensure that no exposed fixings are on view.

Tractel Ltd.
Swingstage Division