Freyssinet Expansion Joints

DESIGN, BUILD, MAINTAIN

FREYSSINET
SUSTAINABLE TECHNOLOGY

The Freyssinet Group

Freyssinet brings together **an unrivalled set of skills in the specialist civil engineering sector**. The company implements solutions with high added value in two major fields: construction and repairs.

Freyssinet is involved in numerous projects across five continents, making it the world leader in the specialist areas of:

- Prestressing
- Construction methods
- Cable-stayed structures
- Structural accessories
- Repairs
- Structural reinforcement and maintenance

Freyssinet is highly involved in sustainable development issues and has set up a number of initiatives to reduce the environmental impact of its projects and enhance its social responsibility policy.

Freyssinet is a subsidiary of the Soletanche Freyssinet Group, a world leader in the soils, structures and nuclear sectors.

Cover photo:
Reconstruction of the bridge over the river Crni Timok - Gamzigrad, Serbia

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Freyssinet integrated offer

Freyssinet has been involved in developments in bridge fittings and their installation and maintenance for several decades, developing expert techniques and drawing on its innovation driven culture. Freyssinet now offers a range second to none, for high reliability and sheer diversity along with exclusive associated services.

Freyssinet provides end-to-end support for the:

- Design of expansion joints
- Assistance for design offices
- Manufacture of expansion joints
- Installation by our specialist teams

Tens of thousands of metres of Freyssinet joints are installed every year in over 80 countries, offering guaranteed durability and features appropriate to any traffic and climate conditions.

Freyssinet joints have been subject to successful approval procedures in numerous countries.

WP 700 and WP 960 joints Lourés bridge - Portugal

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Features of Freyssinet joints

The expansion joint is without doubt the element under most strain in an engineering structure. Expert in managing the functionalities and stresses to which expansion joints are subjected, Freyssinet develops products designed to meet specific site and climate conditions and specific operational conditions.

Our solutions integrate the following criteria:

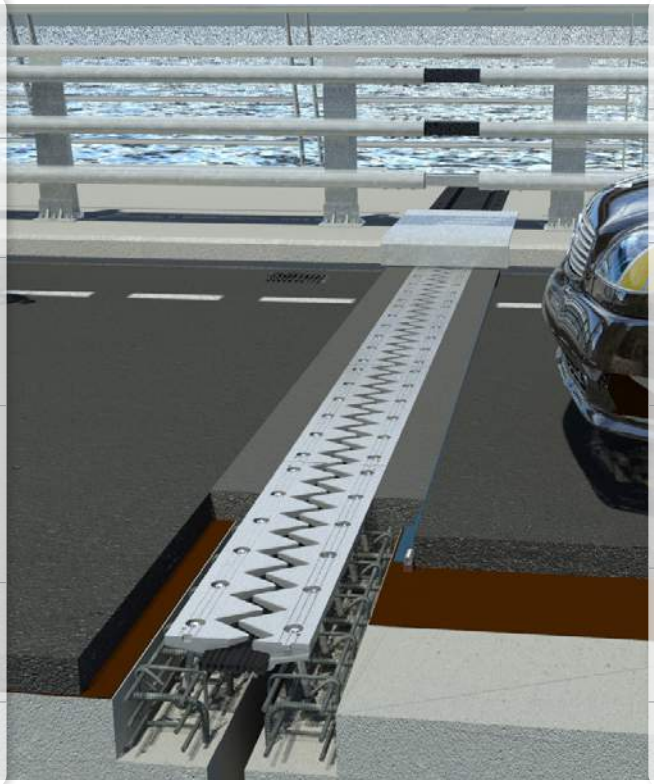
Runoff water collection: a determining factor in design

Appropriate for all users: cyclists, pedestrians, etc.

Permanent wheel contact with joint for excellent riding comfort and low noise nuisance

Account taken of structural movements due to surface shrinkage, creep, temperature variations, deformation under load, effects of wind, earth movements, etc.

Adaptability to all types of structure (concrete, steel, mixed)



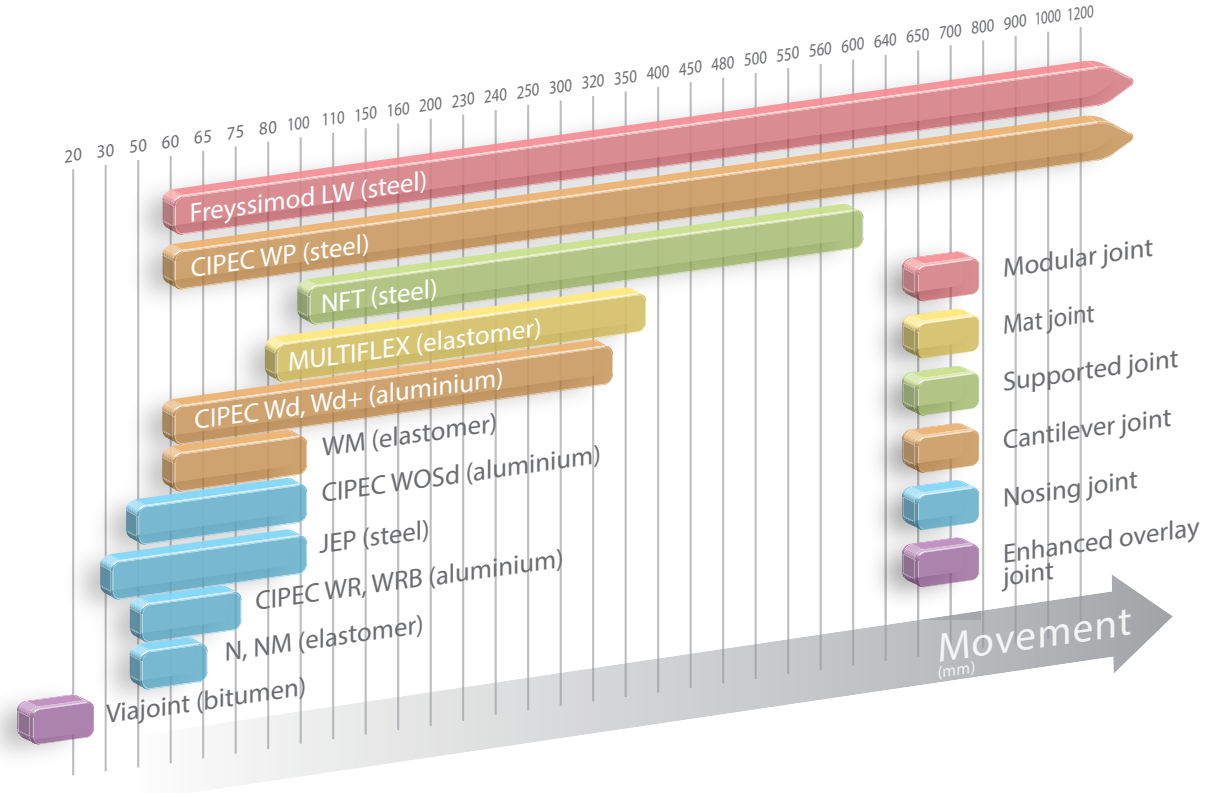
Barrier connection with Transpec 4-18

Footpath joints providing joint continuity to non-traffic areas

Assurance of **running surface continuity** under different traffic loads (impacts, fatigue, etc.)

Selected materials offering **exceptional resistance to aggressive elements** (oil, gravel, salt, sand, etc.)

Easy replacement in traffic flow conditions thanks to short length modules



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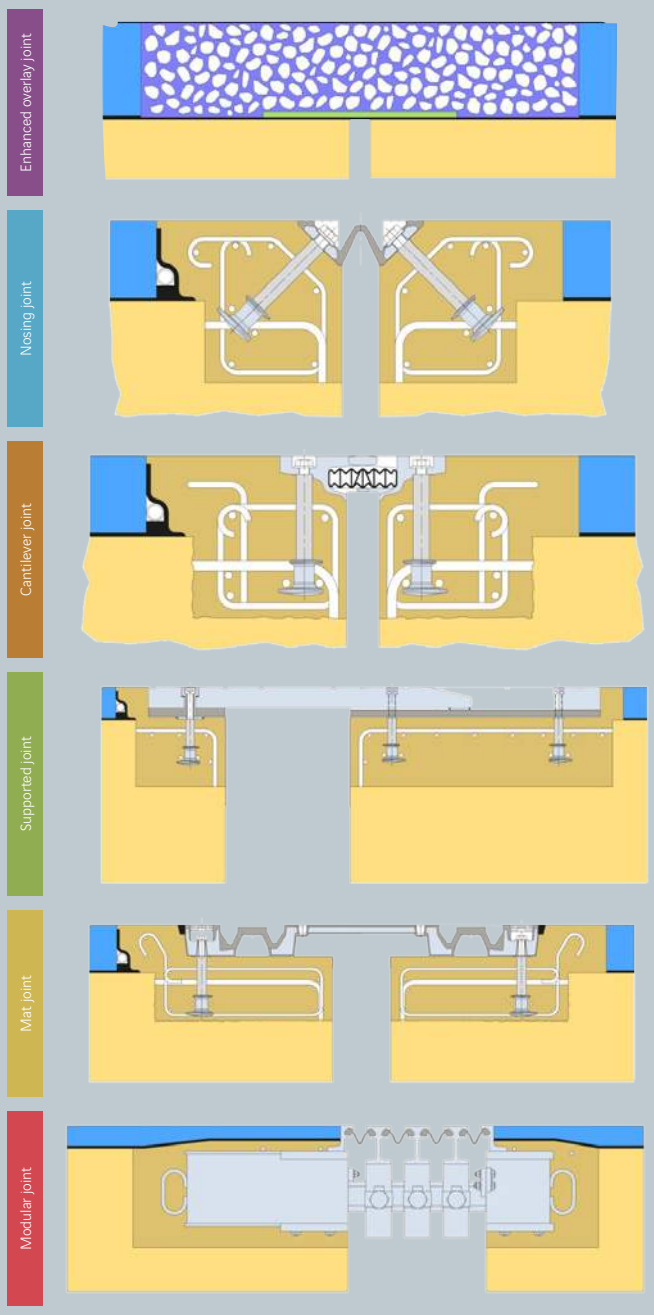
Design of joints

Compliant with ETAG 32 recommendations, our expansion joints comprise three main elements:

- Aluminium alloy or drawn steel elements that ensure joint strength. Short length modules make for easy maintenance and upkeep as well as installation in traffic conditions
- Anchoring systems that connect the joint to the main structure
- Elastomeric elements for watertightness. A continuous elastomeric section is inserted along the entire length of the expansion joint between the metal elements. It prevents entry of foreign bodies and collects surface runoff water

Expansion joint families to which Freyssinet joints belong include:

• Enhanced overlay joint	**Viajoint**
• Nosing joints	**N**
	NM
	CIPEC WR
	CIPEC WRB
	CIPEC JEP
	CIPEC WOSd
• Cantilever joints	**WM**
	Cipec WD
	Cipec WD+
	WP
• Supported joint	**NFT**
• Mat joint	**Multiflex SX**
• Modular joint	**Freyssimod LW**



SELECTION CRITERIA

Joint type	Model	Heavy traffic	Traffic frequency	User comfort	Noise level	Watertightness	Transversal movement	Ease of upkeep	Durability
Enhanced overlay	Viajoint	★★★	★★★	★★★★★	★★★★★	★★★★★	★★	★★★★★	★★★
Nosing joint	N, NM	★★★	★★★	★★★	★★★	★★★★	★★★	★★★★	★★★
	WR, WRB	★★★★	★★★★	★★★	★★★	★★★	★★★★	★★★★	★★★★
	JEP	★★★★★	★★★★★	★★★	★★★	★★★★	★★★★	★★★	★★★★
	WOSd	★★★★	★★★★	★★★★	★★★	★★★★	★★★★	★★★★	★★★★
Cantilever	WM	★★★★★	★★★★★	★★★★★	★★★★	★★★	★★★	★★★★	★★★★
	Wd	★★★★★	★★★★★	★★★★★	★★★★★	★★★★	★★	★★★★	★★★★★
	WP	★★★★★	★★★★★	★★★★★	★★★★★	★★★★	★	★★★★★	★★★★★
Supported	NFT	★★★★★	★★★★★	★★★★★	★★★★★	★★★★	★	★★★	★★★★
Mat joint	Multiflex SX	★★★★	★★★	★★★★	★★★★	★★★	★★★	★★★★	★★★
Modular	Freyssimod LW	★★★★★	★★★★★	★★★	★★	★★★★★	★	★★★	★★★★★

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Installation of Freyssinet joints

Our experienced experts regularly review all aspects of joint installation, an essential operation for guaranteed performance and durability:

- **Pre-adjustment of joints**

A joint's movement capacity can be pre-adjusted at installation to suit climatic or operational conditions.

- **Installation principle**

Various solutions for connection of the joint to the main structure: with rabbet or within the thickness of the surface layers.

- **Connection quality**

Tightening of the anchors for fixing the joint is carefully controlled.

- **Drains and connection**

Installing drains increases joint durability by preventing seepage under the joint itself through its connection to the main structure's waterproofing system.

- **Module assembly**

Assembly using appropriate tools to ensure optimal running surface continuity, user comfort and minimal noise nuisance.

- **Quality control**

Performed at each installation stage.

Durability

World-renowned for their durability and simple, robust design, Freyssinet expansion joints are perfectly suited to different conditions. The materials selected are designed to withstand continued traffic growth and standard road maintenance techniques. Our installation teams have the necessary expertise, qualifications and training for optimal joint installation. This unique experience allows us to provide the very best advice for our customers.

1. WD joint installation tool
2. Detail of anchoring
3. Installing a WP joint

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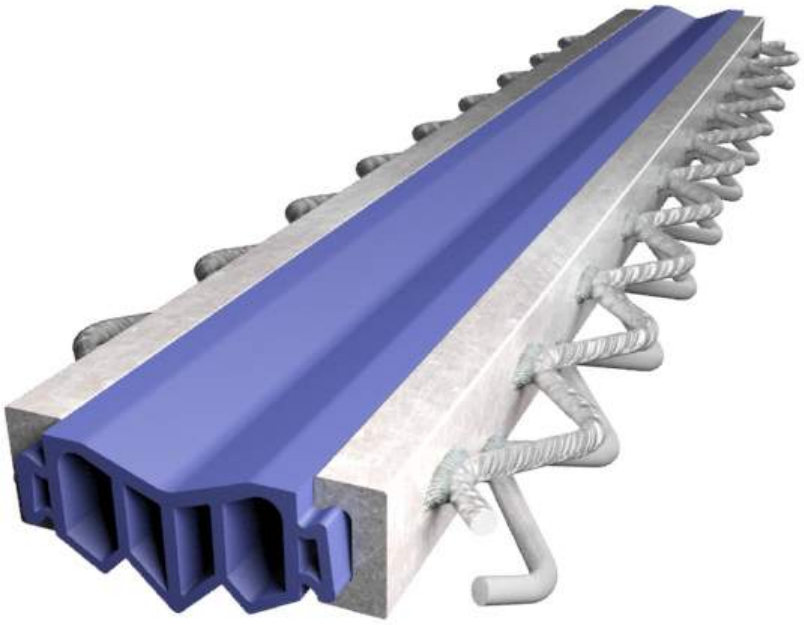
CIPEC JEP JOINT



Design

Belonging to the nosing family, these joints comprise two extruded steel sections supplied in 3.50 metre lengths and placed facing each other.

These are fitted with two wavy steel anchoring sections embedded in a resin mortar beam bonding to the main structure.

A series of pairs of sections installed and welded end-to-end form the joint line.

Specific features:

- Installed within the thickness of the surface layers;
- Quick to install and no recesses or drillings in the main structure;
- Especially well suited for solving specific problems such as the replacement of existing joints, work done lane by lane, renovation work necessitating only very short traffic interruptions and when speed of execution is all important;
- Absence of saw-teeth means that JEP joints can accept large skew angles without any change to their intrinsic qualities.

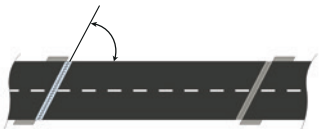
CIPEC JEP joint seam - Nice Airport - France

Movement range

The table opposite shows the capacity of JEP joints to accept movement depending on skew angle (α) of the main structure.

Type	Straight (100 gr)	80 gr	60 gr	40 gr
JEP3	30	32	37	51
JEP5	50	53	62	85
JEP8	80	84	99	136

Dimensions in mm



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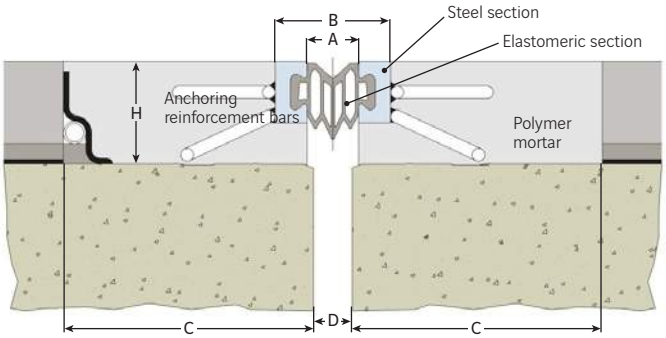
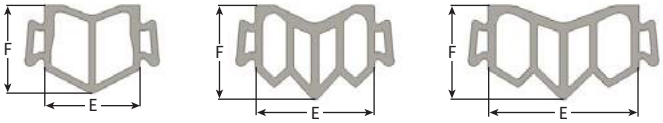
Technical data sheet

Type	A		B		D		H	C	E	F
	min.	max.	min.	max.	min.	max.				
JEP3	30	60	80	110	10	40	80	140	60	55
JEP5	25	75	75	125	10	60	80	140	75	59
JEP8	25	105	75	155	10	90	80	140	95	59

Dimensions in mm



Elastomeric section models



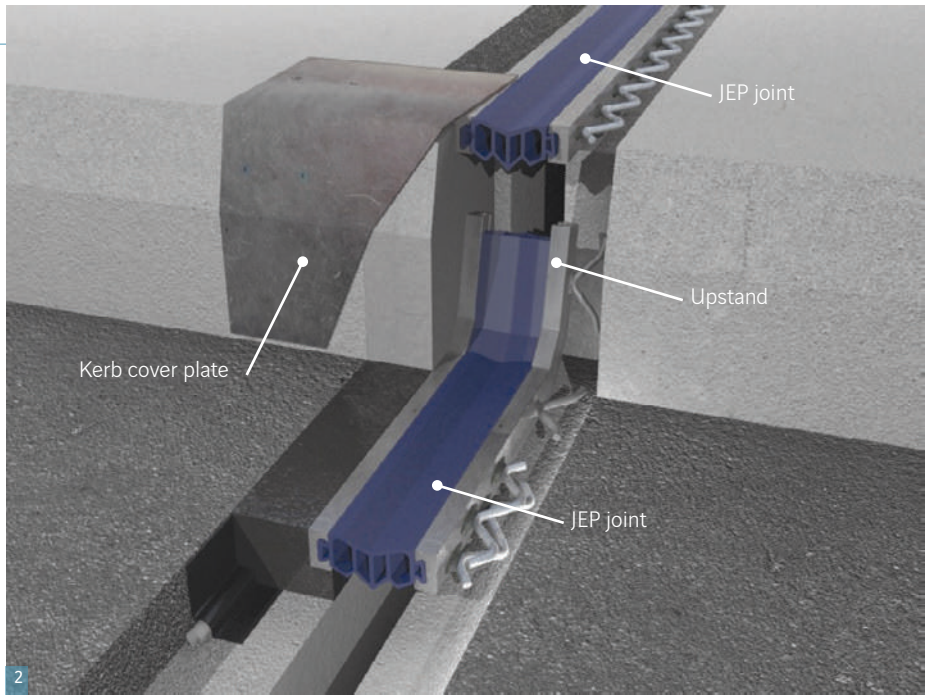
JEP 3 JEP 5 JEP 8

1

Accessories

To ensure watertightness at expansion joint level and joint continuity to pavements (or non-traffic areas), the following accessories are available:

- Footpath joints;
- End section upstands;
- Drain (see page 33).



2

3

1. Anchoring a joint line
2. 3D view of upstand
3. JEP joint line

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CIPEC WR & WRB Joints

▲ WR with sleeves

WRB with anchor bars ►

Design

Belonging to the nosing family, these joints comprise two extruded aluminium alloy sections supplied in three metre lengths and laid opposite each other.
The elements are anchored by means of a series of slightly inclined fasteners in reinforced microconcrete beams bonded to the main structure by link reinforcement bars. These fasteners may comprise anchor rods with sleeves (WR model) or anchor bars with a load transfer plate (WRB model). A series of pairs of sections installed end-to-end form the joint seam.

1

2

Specific features:

- Installed within the thickness of surface layers;
- Quick to install and no recesses in the main structure;
- Particularly economical;
- Suitable for new and replacement works.

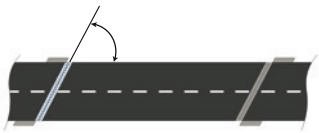
1. Adjusting a WR joint
2. Concreting the flashing

Movement range

The table opposite shows the capacity of WR and WRB joints to accept movement depending on skew angle (α) of the main structure.

Type	Straight (100 gr)	80 gr	60 gr	40 gr
WR/WRB 50	50	52.5	62	85
WR/WRB 65	65	68	80	110
WR/WRB 75	75	79	92	127

Dimensions in mm



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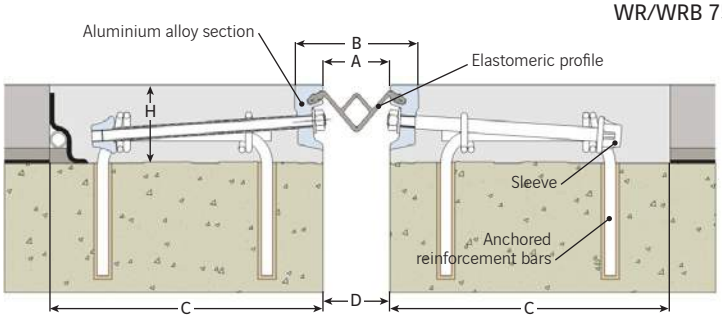
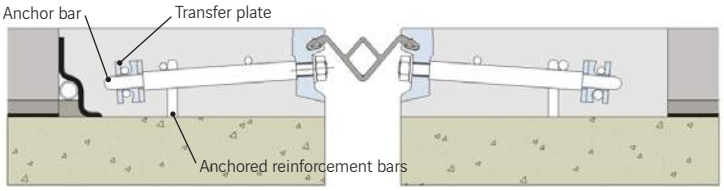
Technical data sheet

Type	A		B		H	D		C
	min.	max.	min.	max.		min.	max.	
WR/WRB 50	15	65	65	115	70 or 80	15	65	250/200
WR/WRB 65	15	80	65	130	70 or 80	15	80	250/200
WR/WRB 75	15	90	65	140	70 or 80	15	90	250/200

Dimensions in mm



WR with sleeves

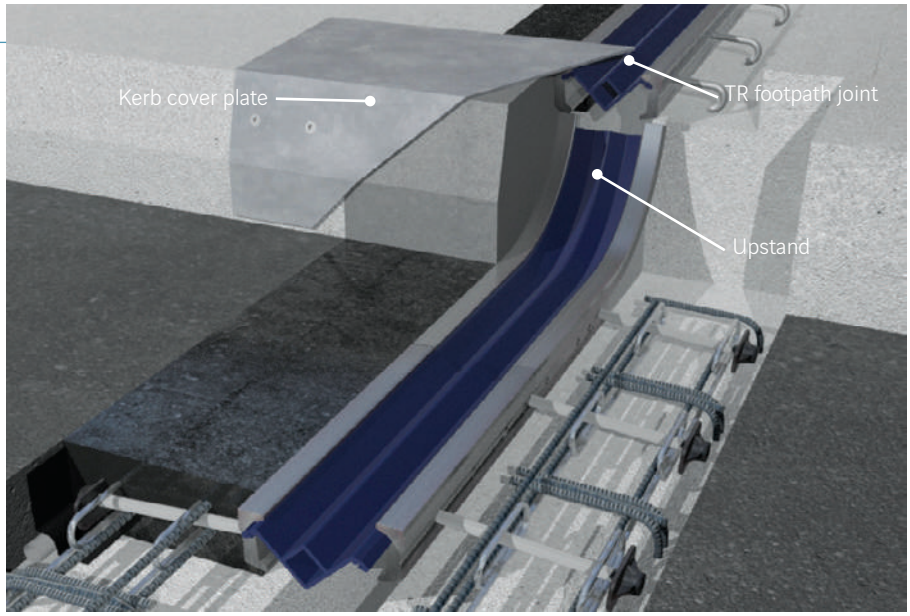


WRB with anchor bars

Accessories

To ensure general watertightness at expansion joint level and joint continuity to pavements (or non-traffic areas), the following accessories are available:

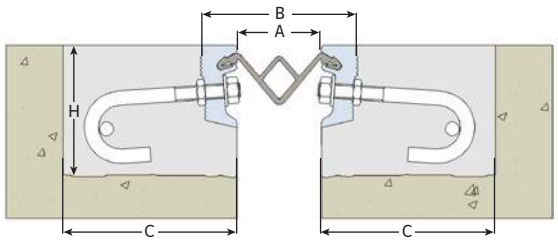
- Footpath joints;
- End section upstands + kerb cover plate;
- Drain (see page 33).



WR 50 joint Île Saint Louis bridge - Paris

Type	Pavement joint model	A		B		C	H
		min.	max.	min.	max.		
WR/WRB 50	TR 50	15	65	65	115	150	100
WR/WRB 65	TR 65	15	80	65	130	150	100
WR/WRB 75	TR 75	15	90	65	140	150	100

Dimensions in mm



TR footpath joint

CIPEC WOSd Joint

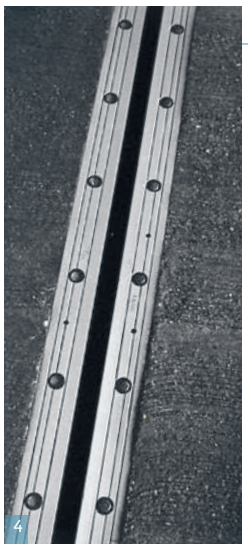
Design

Belonging to the nosing family, these joints comprise two extruded aluminium alloy sections supplied in three or six metre lengths and laid opposite each other.
A series of pairs of sections installed end-to-end form the joint seam. The metal elements are anchored to the main structure by fasteners.


1


2


3


4

Specific features:

- Easily accessible anchor bolts and method of fastening the elastomeric section make for easy removal of the WOSd joints if necessary (for example, during resurfacing works);
- The shape of the elastomeric profile and its position slightly below the running surface enables elimination of debris simply by suction caused by passing vehicles;
- Absence of saw-teeth means that WOSd joints can accept large skew angles without any change to their intrinsic qualities.

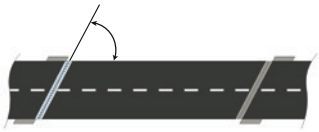
1. Installing a WOSd joint
2. Adjusting a WOSd at upstand
3. Tightening the anchors
4. Finished WOSd Joint

Movement range

The table opposite shows the capacity of WOSd joints to accept movement depending on skew angle (α) of the main structure.

Type	Straight (100 gr)	80 gr	60 gr	40 gr
WOSd50	50	52.5	62	85
WOSd75	75	79	92	127
WOSd100	100	105	123	170

Dimensions in mm



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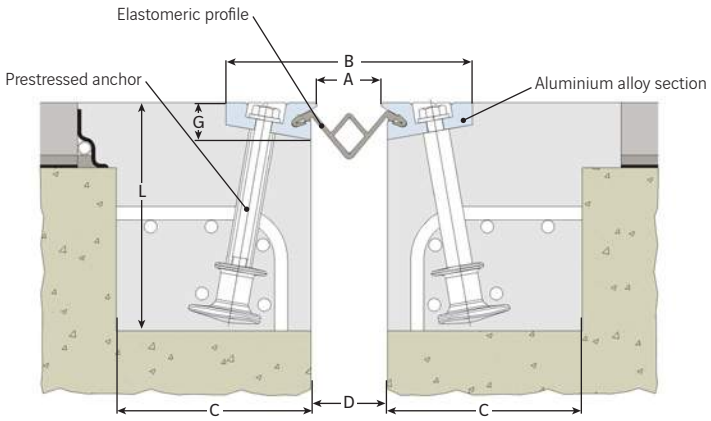
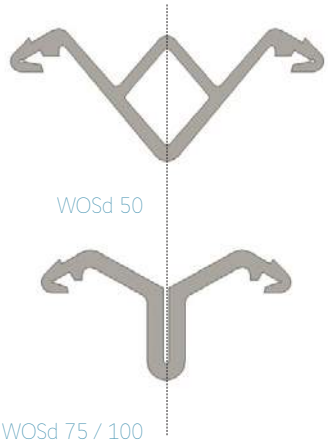
Technical data sheet

Type	A		B		D		G	Recesses	
	min.	max.	min.	max.	min.	max.		C	L
WOSd50	15	65	146	196	15	65	28.5	150	200
WOSd75	0	75	150	225	12	87	30	150	200
WOSd100	0	100	150	250	12	112	30	150	200

Dimensions in mm



Elastomeric section models



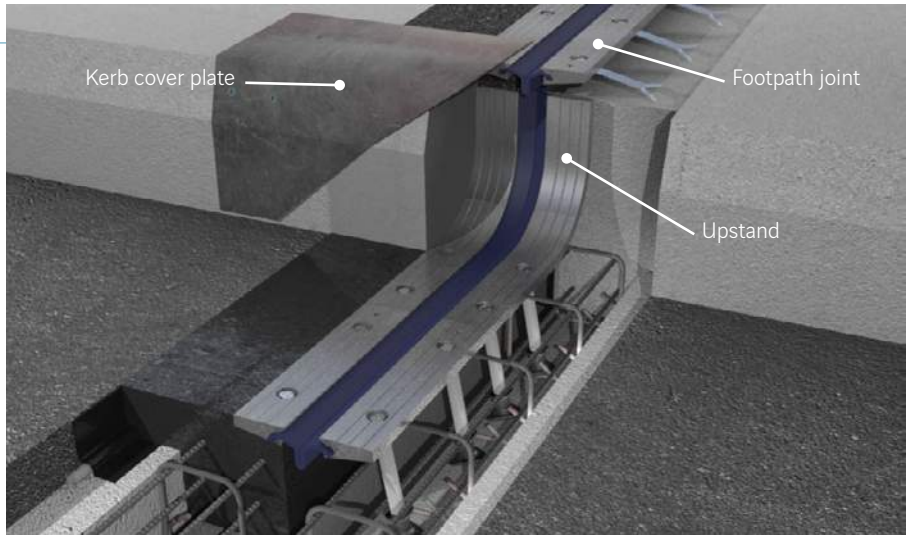
WOSd 50

WOSd 75 / 100

Accessories

To ensure general watertightness at expansion joint level and joint continuity to pavements (or non-traffic areas), the following accessories are available:

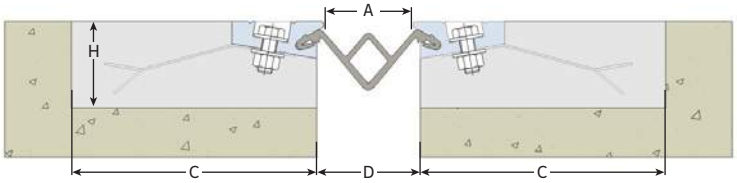
- Footpath joints;
- End section upstands + kerb cover plate;
- Drain (see page 33).



Footpath upstand (3D)

Type	Model	A		C	D		H
		min.	max.		min.	max.	
WOSd50	TO 50	15	65	200	15	65	70
WOSd75	TO 80	0	80	200	12	92	70
WOSd100	TO 100	0	100	200	12	112	70

Dimensions in mm



TO joint

N Joint

Design

The N joint is a one-piece nosing joint comprising a 1 or 2 metre long moulded vulcanized elastomer section containing metal inserts shaped to ensure optimal load transmission.

N joint seam

Specific features:

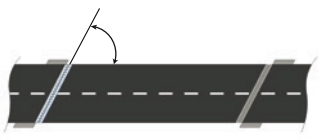
- Watertightness ensured by total elastomer continuity and an overlap area where the elements meet;
- The special shape of the N joint and contact by the elastomer enable absorption of wheel impact and running surface irregularities thereby providing an excellent level of user comfort;
- Steel inserts entirely elastomer coated, fully protected against corrosion and chemical attack (oil, grease, hydrocarbons and de-icing salts);
- Especially simple to install.

Movement range

The N joint is designed to accommodate 65 mm movement capacity only. For skew angles under 70 gr, the movement capacity is reduced.
The table opposite shows the capacity of N joints to accept movement depending on skew angle (α) of the main structure.

Type	Straight (100 gr)	90 gr	80 gr	70 gr	60 gr	50 gr	40 gr
N65	65	65	65	65	50	41	36

Dimensions in mm



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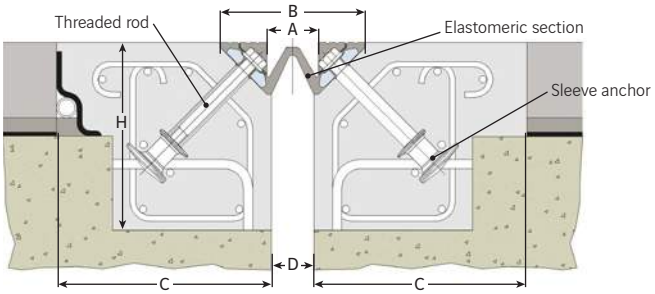
Technical data sheet

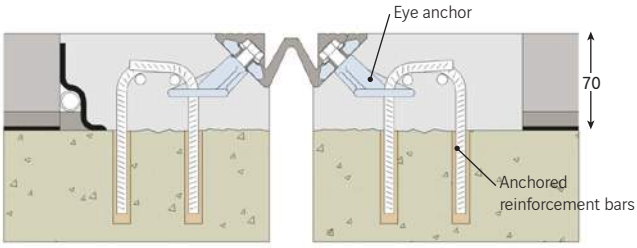
The N joint can be fastened with 2 types of anchoring for installation either with rabbet or directly within the thickness of the surface material.

Type	A		B		C	D		H
	min.	max.	min.	max.		min.	max.	
N65	20	85	120	185	230	20	85	200

Dimensions in mm



Assembly with rabbet



Assembly without rabbet

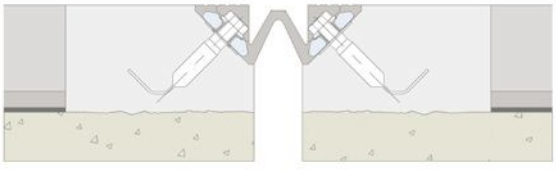
N joint with anchor parts

N joint with eye anchor

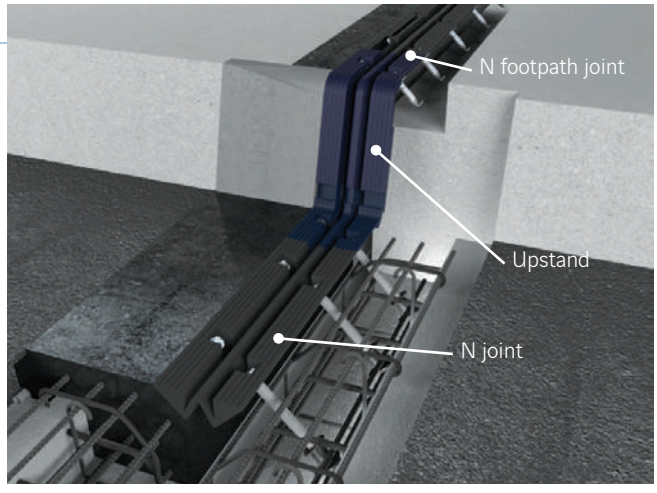
Accessories

To ensure general watertightness at expansion joint level and joint continuity to pavements (or non-traffic areas), the following accessories are available:

- Footpath joints;
- End section upstands;
- Drain (see page 33).



N footpath joint



Footpath upstand (3D)

NM Joint

Design

The NM joint is a one-piece nosing joint. It comprises 2-metre moulded elastomeric elements containing steel bands.
It is fastened to the main structure by means of M12 bolts sealed with resin or anchored by means of sleeves. They are available in galvanized or stainless steel.

NM joint seam

Specific features:

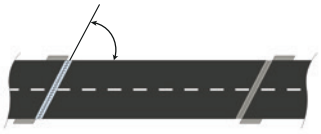
- Excellent watertightness due to one-piece design and male/female interlocking system at joins between elements;
- Entirely covered steel elements and a galvanized or stainless steel fastening system providing excellent corrosion resistance;
- Very simple to install or replace on both new and existing main structures.

Movement range

The NM joint is designed to accommodate 50 mm movement capacity only.
The table opposite shows the capacity of NM joints to accept movement depending on skew angle (α) of the main structure.

Type	Straight (100 gr)	90 gr	80 gr	70 gr	60 gr	50 gr	40 gr
NM50	50	50	50	46	36	30	26

Dimensions in mm



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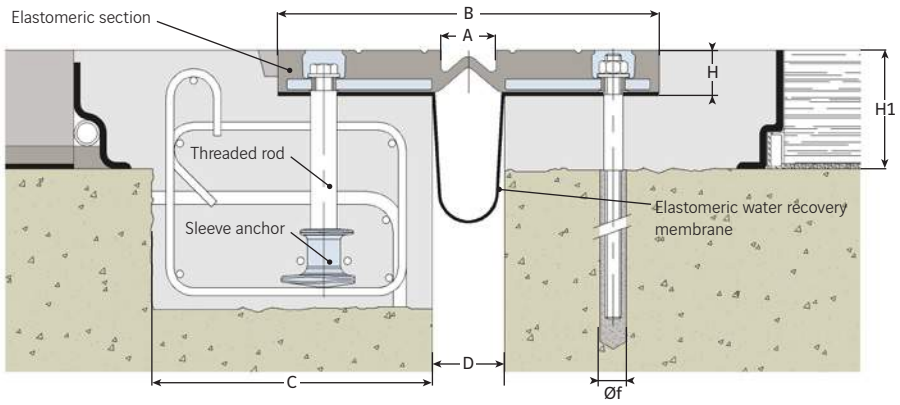
Technical data sheet

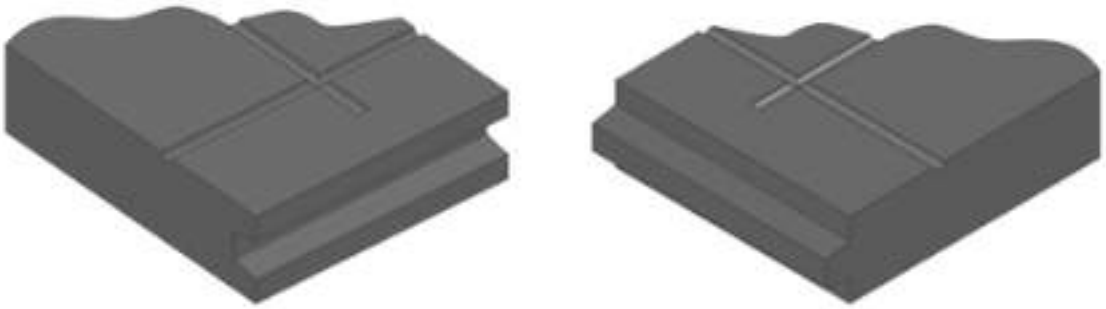
Type	Longitudinal movement	A	B	C	D	H	H1	Øf	Weight (kg/m)
NM50	± 25	45 ± 25	290 ± 25	200	45 ± 25	32	60	14	22

Dimensions in mm



Anchoring using sleeves

Anchoring using sealed bolts

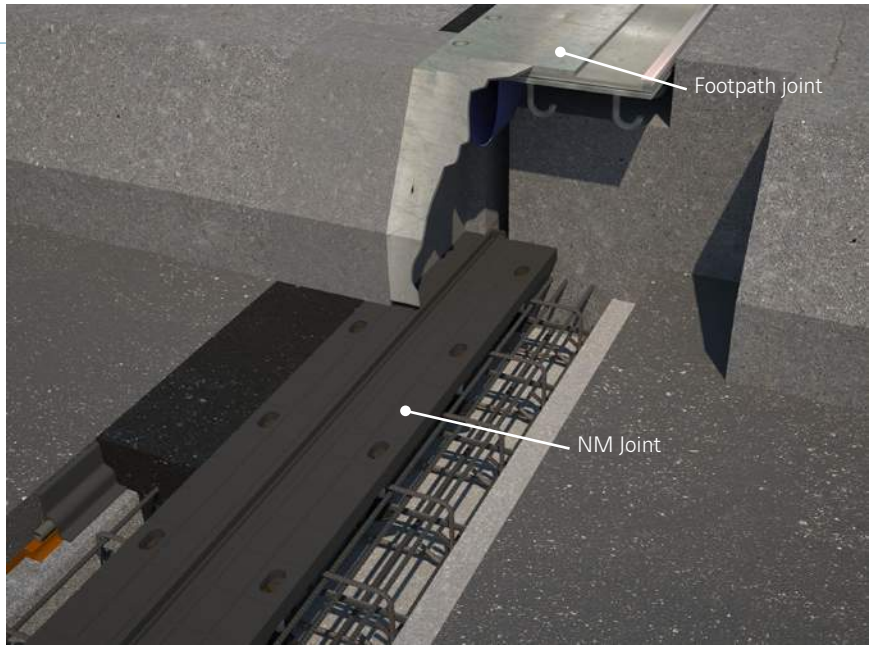


Join between two elements

Accessories

To ensure general watertightness at expansion joint level and joint continuity to pavements (or non-traffic areas), the following accessories are available:

- Footpath joints (all types used for other expansion joint types are suitable for this system);
- Drain (see page 33).



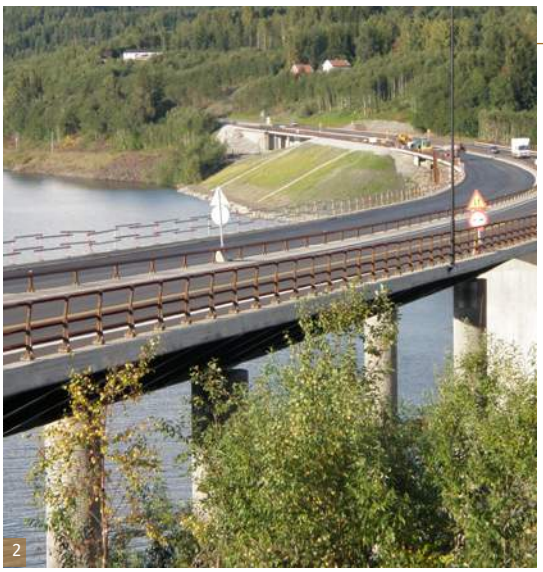
CIPEC Wd & Wd+ joints

Design

Belonging to the cantilever saw-tooth family, this joint comprises a pair of individual cast aluminium alloy sections with triangular saw-teeth supplied in one metre lengths and laid opposite each other. A series of pairs of elements installed end-to-end forms the joint line.

The metal elements are anchored to the main structure by fasteners.
The bottom surface of the joint in contact with the concrete may be coated with epoxy paint (model Wd+) for main structures subject to high humidity and de-icing salts.

1



2

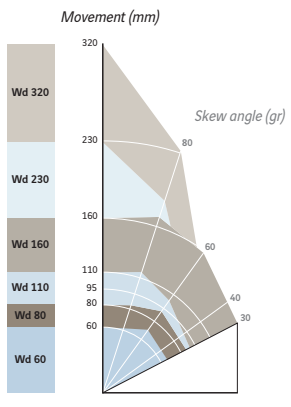
Specific features:

- Wd joints are exceptionally robust thanks to the use of tension control bolts to connect the metal elements to the main structure and also the choice of materials. They are designed for frequent heavy traffic;
- The triangular saw-teeth of the metal elements enable operation with no gap and so ensure perfect running surface continuity and significantly reduced noise over the joint;
- Easily accessible anchor bolts and the short length of the elements make it easy to maintain and remove the joint with traffic interruption only necessary on the lane in question;
- Wd and Wd+ joints accept skew angles up to 30 gr without any change to their intrinsic qualities.

1. Installed Wd joint
2. Minnesund bridge E10 - Norway

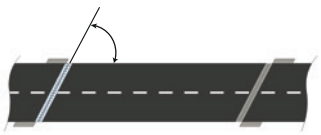
Movement range

The table opposite shows the capacity of Wd and Wd+ joints to accept movement depending on skew angle (α) of the main structure.



Type	Straight (100 gr)	80 gr	60 gr	40 gr	30 gr
Wd/Wd+ 60	60	61	71	66	67
Wd/Wd+ 80	80	84	92	85	86
Wd/Wd+ 110	110	116	104	92	90
Wd/Wd+ 160	160	169	158	141	139
Wd/Wd+ 230	230	185	127	102	97
Wd/Wd+ 320	320	231	150	120	112

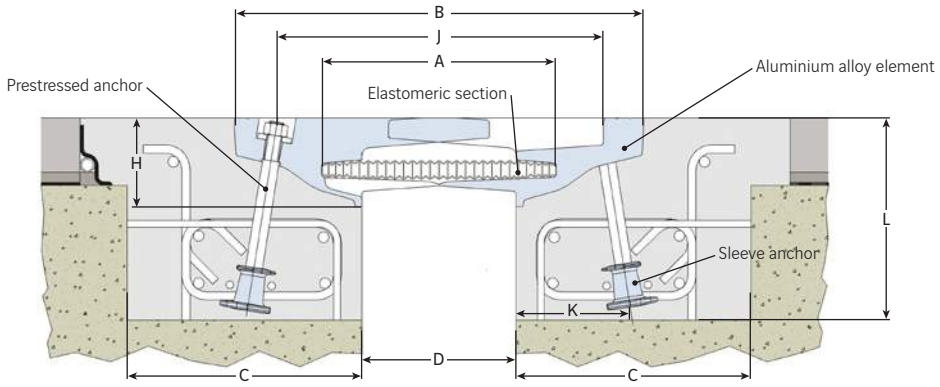
Dimensions in mm



Technical data sheet

Type	A		B		J		D		H	Recesses		Fasteners		
	min.	max.	min.	max.	min.	max.	min.	max.		C	L	K	Force	Nb.
Wd/Wd+ 60	65	125	185	245	125	185	20	80	55	200	200	52.5	6.5	5
Wd/Wd+ 80	90	170	220	300	155	235	30	110	57	200	200	62.5	6.5	6
Wd/Wd+ 110	120	230	300	410	210	320	40	150	82	250	250	85	10	5
Wd/Wd+ 160	170	330	400	560	290	450	50	210	98	300	280	120	19	4
Wd/Wd+ 230	240	470	440	670	320	550	70	300	123	350	280	175	19	5
Wd/Wd+ 320	190	510	450	770	320	640	70	390	115	350	280	175	19	4

Dimensions in mm



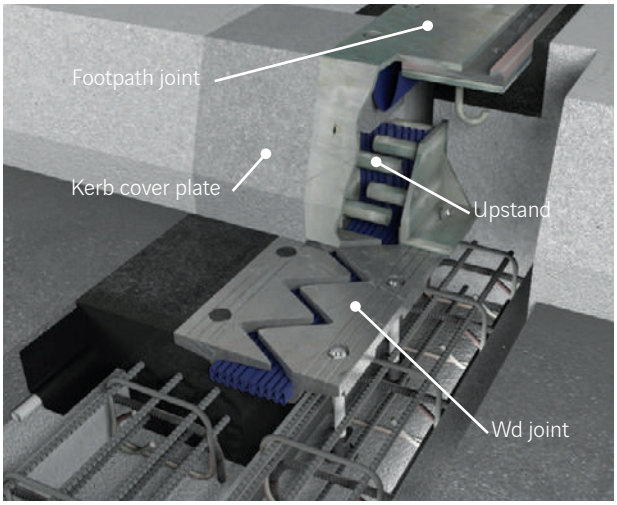
Accessories

To ensure general watertightness at expansion joint level and joint continuity to pavements (or non-traffic areas), the following accessories are available:

- Footpath joints;
- End section upstands + kerb cover plate;
- Drain (see page 33).

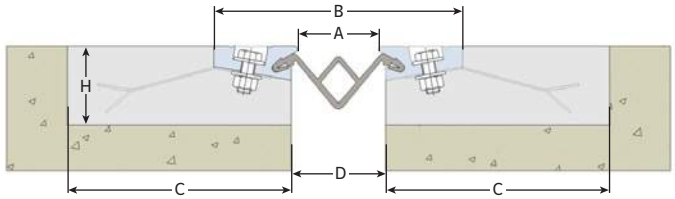
Type	Pavement joint model	A		B		C	D		E	H
		min.	max.	min.	max.		min.	max.		
Wd/Wd+ 60	TO 80	0	80	150	230	200	12	92	-	70
Wd/Wd+ 80	TO 80	0	80	150	230	200	12	92	-	70
Wd/Wd+ 110	PL 110	20	130	220	330	300	20	130	150	150
Wd/Wd+ 160	PL 160	25	185	275	435	350	25	185	150	150
Wd/Wd+ 230	PL 230	70	300	390	620	420	70	300	150	150
Wd/Wd+ 320	PL 350	50	400	490	840	540	50	400	150	150

Dimensions in mm

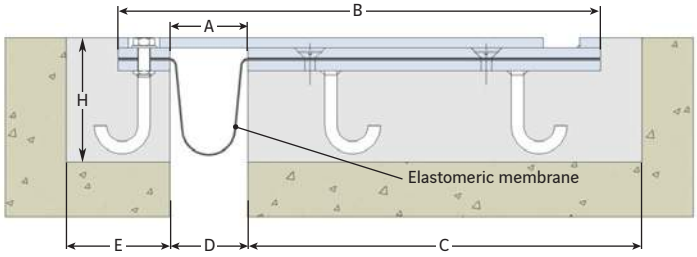


Footpath upstand (3D)

"TO" model footpath joint



"PL" model footpath joint



WM Joint

Design

The WM joint is a one-piece cantilever saw-tooth joint comprising metal elements designed to accommodate rolling loads at necessary gaps. The inserts are elastomer coated on surfaces not subject to abrasion to protect against corrosion. The traffic surface is corrosion-resistant metal. The waterproof membrane, although very close to the running surface to enable removal of debris, dœs not enter into direct contact with vehicle tyres.

Partial replacement of an M joint by a WM joint

Specific features:

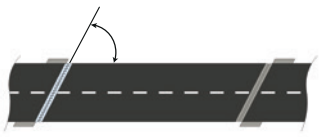
- Greatly improved durability thanks to use of low corrosion materials (cast iron) protected by an elastomeric coating;
- The bellows are bonded for watertightness on the metal elements, enabling runoff water to be channelled directly to the drainage system of the main structure;
- Vertical fasteners comprising a sleeve embedded in concrete and a prestressed bolt allow for easy replacement of elements if necessary;
- This is a new generation joint ideal as a replacement for the former M joint.

Movement range

Movement capacity depending on skew angle (α) of the main structure.

Type	Straight (100 gr)	90 gr	80 gr	70 gr	60 gr	50 gr	40 gr
WM80	40	41	43	45	35	29	25
WM100	50	51	53	45	35	29	25

Dimensions in mm



The transversal movement of joints WM80 and WM100 is +/-20 mm.

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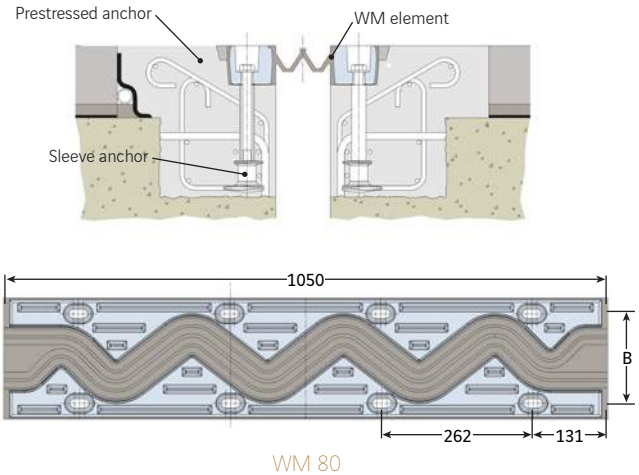
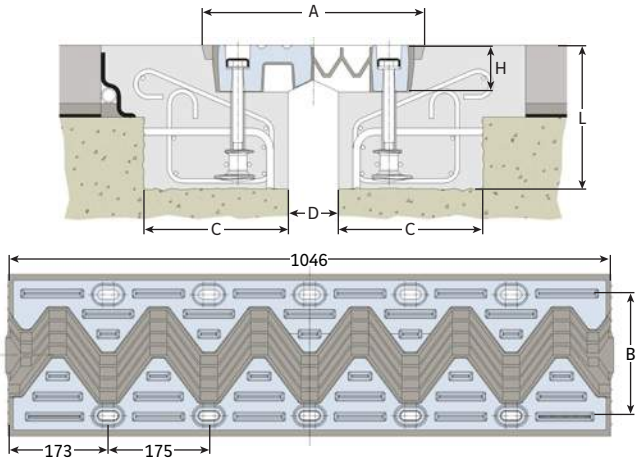
Technical data sheet

Type	A		B		C	D		L	H
	min.	max.	min.	max.		min.	max.		
WM80	165	245	115	195	170	10	90	210	55
WM100	225	325	175	275	200	15	115	210	65

Dimensions in mm



WM 80



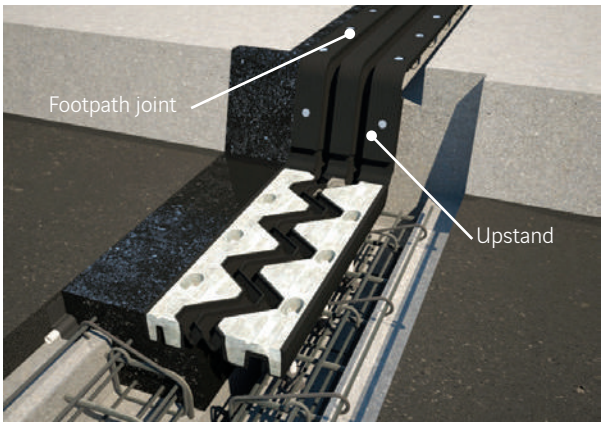
WM 100

Accessories

To ensure general watertightness at expansion joint level and joint continuity to pavements (or non-traffic areas), the following accessories are available:

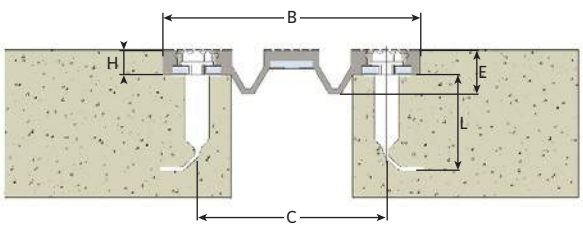
- Footpath joints;
- End section upstands;
- Drain (see page 33).

TM footpath

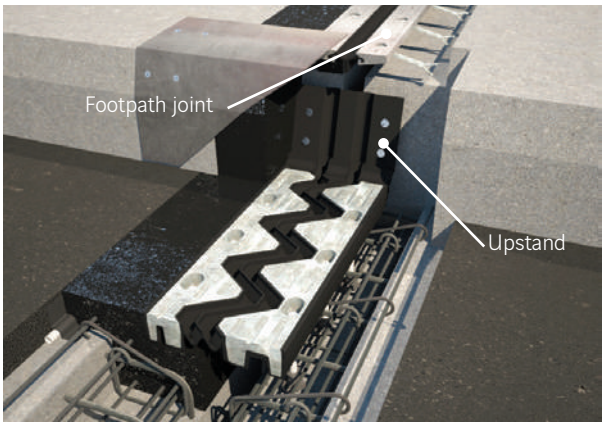


Type	Model	B	C	E	H	L
WM80	M80	210	155	41.5	20	70
WM100	M100	280	210	49.5	20	70

Dimensions in mm

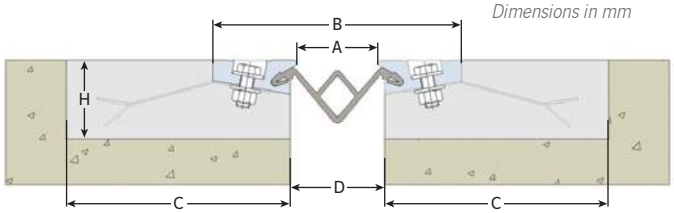


TO footpath



Type	Model	A		C	D		H
		min.	max.		min.	max.	
WM80	TO 80	0	80	200	12	92	70
WM100	TO 100	0	100	200	12	112	70

Dimensions in mm



CIPEC WP Joint

Design

Belonging to the cantilever comb family, this joint comprises a pair of individual elements (combs) with parallel saw-teeth supplied in one metre lengths and laid opposite each other.

The combs are either flame cut from a rolled steel plate or cast in aluminium alloy.

A series of pairs of elements installed end-to-end forms the joint seam. The metal elements are anchored to the main structure by tension control fasteners.

Specific features:

- WP joints are manufactured on request and may be adapted to the directional movement of the main structure, straight (fig.1) or skew (fig.2);
- WP joints are exceptionally robust due to the simple design;
- The comb joint principle provides user comfort and noise free ride.

Vienne viaduct (France)

Movement range

The capacity varies from 60 to 1200 mm depending on the model.

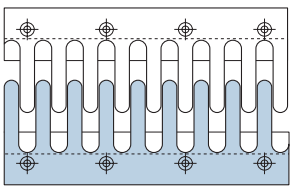


Fig.1

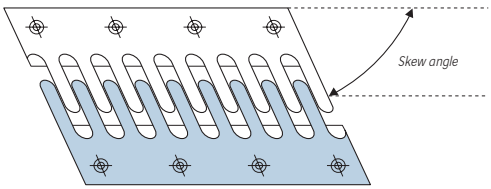


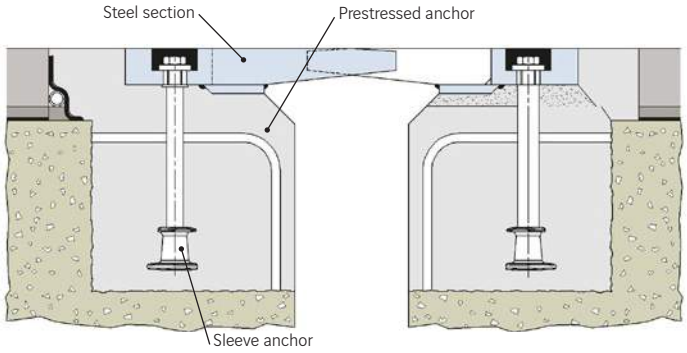
Fig.2

Water collection

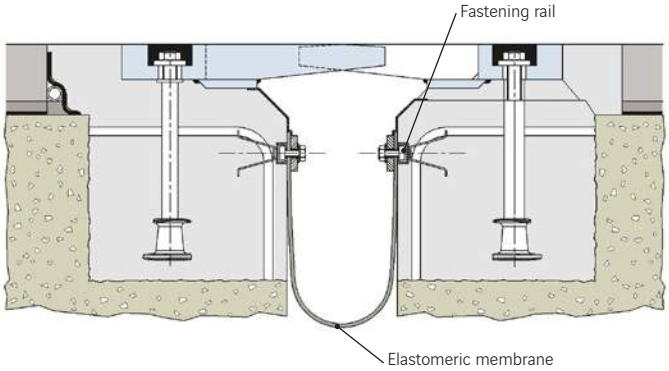
A system for recovering runoff water may be combined with basic WP joints (type 1).

The system comprises either:

- A continuous elastomeric looped membrane over the entire length of the joint (type 2)
- An elastomeric section inserted between the metal elements (type 3)
- Two elastomeric or stainless steel sheet water recovery membranes with a gutter located under the joint (type 4)

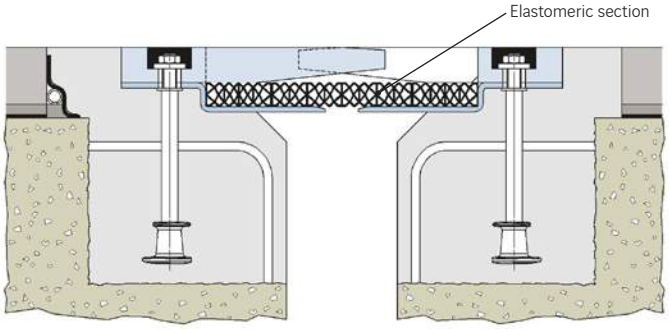


Type 1



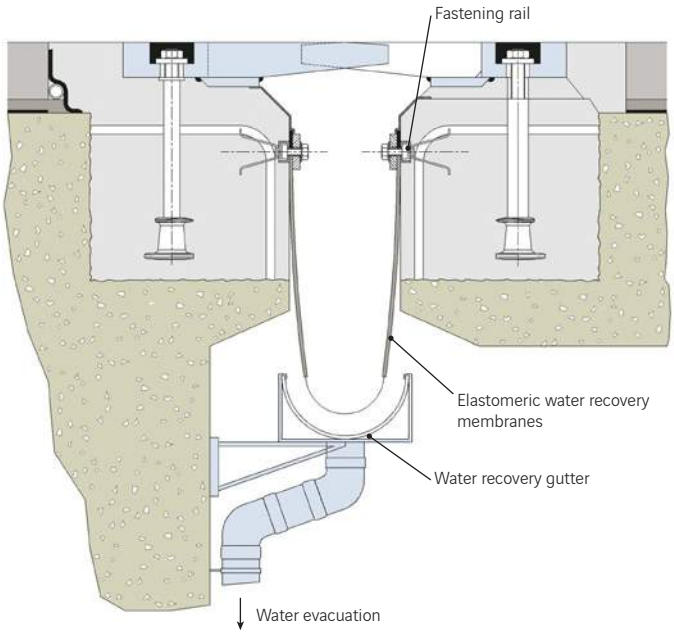
Type 2

Type 3



Up to WP600

Type 4



CIPEC WP Joint

Types 1, 2 and 4

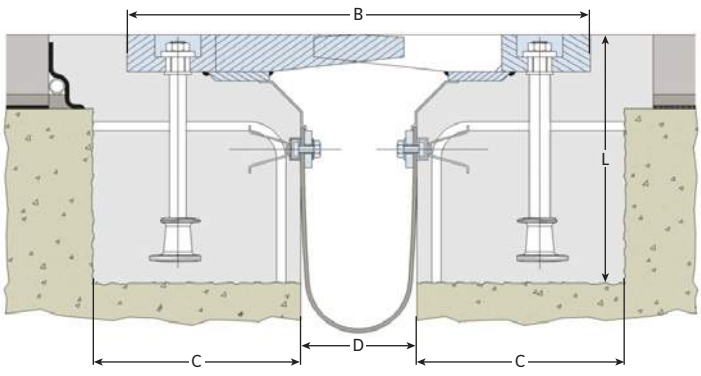
Type	B		D		Recesses	
	min.	max.	min.	max.	C	L
WP60	240	300	50	110	70	300
WP80	355	435	50	130	110	300
WP100	375	475	50	150	120	300
WP120	395	515	50	170	130	300
WP160	540	700	50	210	185	300
WP180	520	700	50	230	180	350
WP200	580	780	50	250	202.5	350
WP250	510	760	50	300	160	350
WP300	590	890	50	350	180	350
WP350	650	1000	50	400	210	350
WP400	740	1140	50	450	245	350
WP450	810	1260	50	500	250	350
WP500	890	1390	50	550	280	350
WP550	960	1510	50	600	310	350
WP600	1020	1620	50	650	335	350
WP700	1160	1860	50	750	385	350
WP800	1440	2240	50	850	455/575	350
WP900	1610	2510	50	950	485/605	350
WP1000	1810	2810	50	1050	585/705	350
WP1100	1910	3010	50	1150	625/745	350
WP1200	2090	3290	50	1250	635/755	350

Not applicable to WP Type3 (see opposite)

Dimensions in mm

Type Alu	B		D		Recesses	
	min.	max.	min.	max.	C	L
WP200	430	630	50	250	300	350
WP250	570	820	50	300	350	350
WP300	620	920	50	350	350	350

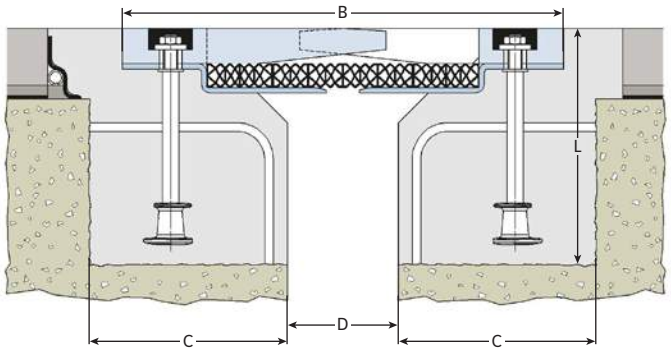
Dimensions in mm



Type 3

Type	B	D	C	L
WP3 200	820-1020	120-320	500	350
WP3 250	900-1150	170-420	515	350
WP3 300	965-1265	220-520	525	350
WP3 350	1045-1395	270-620	535	350
WP3 400	1200-1600	320-720	590	300
WP3 450	1265-1715	370-820	600	350
WP3 500	1450-1950	420-920	665	350
WP3 550	1560-2110	470-1020	695	350
WP3 600	1685-2285	520-1120	730	350

Dimensions in mm



WP joint seen from below

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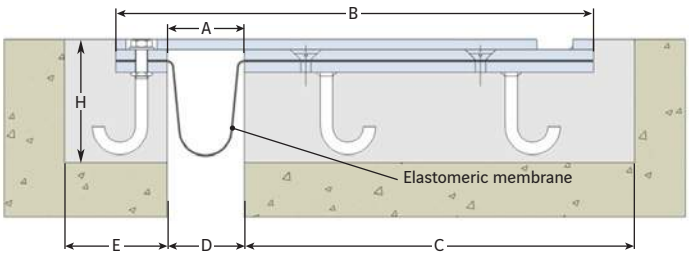
Accessories

To ensure general watertightness at expansion joint level and joint continuity to pavements (or non-traffic areas), the following accessories are available:

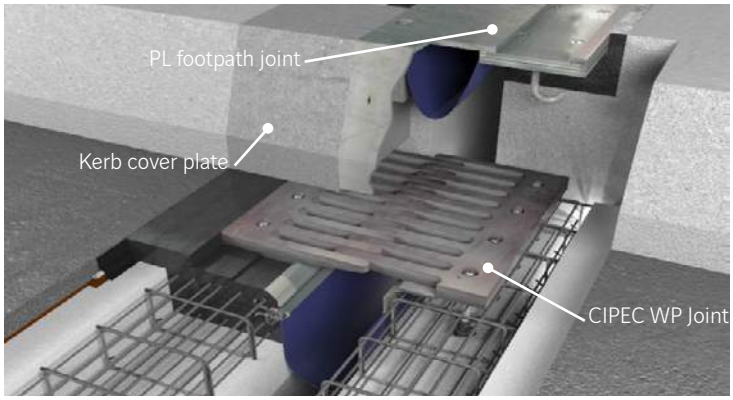
- Pavement joints (with our without water recovery membrane)
- End section upstands + kerb cover plate
- Drain (see page 33)



"PL" model footpath joint

Type	Pavement joint model	A		B		C	D		E	H
		min.	max.	min.	max.		min.	max.		
WP60	PL 60	10	70	160	220	250	10	70	150	150
WP80	PL 80	10	90	180	260	270	10	90	150	150
WP100	PL 100	20	120	210	310	290	20	120	150	150
WP120	PL 120	20	140	230	350	310	20	140	150	150
WP160	PL 160	25	185	275	435	350	25	185	150	150
WP180	PL 180	50	230	320	500	370	50	230	150	150
WP200	PL 200	30	230	320	520	390	30	230	150	150
WP250	PL 250	40	290	380	630	440	40	290	150	150
WP300	PL 300	50	350	440	740	490	50	350	150	150
WP350	PL 350	50	400	490	840	540	50	400	150	150
WP400	PL 400	50	450	540	940	590	50	450	150	150
WP500	PL 500	50	550	640	1140	690	50	550	150	150
WP600	PL 600	50	650	740	1340	790	50	650	150	150
WP700	PL 700	50	750	840	1540	890	50	750	150	150
WP800	PL 800	50	850	940	1740	990	50	850	150	150
WP900	PL 900	50	950	1040	1940	1090	50	950	150	150
WP1000	PL 1000	50	1050	1140	2140	1190	50	1050	150	150
WP1100	PL 1100	50	1150	1240	2340	1290	50	1150	150	150
WP1200	PL 1200	50	1250	1340	2540	1390	50	1250	150	150

Dimensions in mm



Arrangement at upstand

Adaptation for cycle lanes

To provide optimal safety and comfort for cyclists, a specially designed metal sheet is added to joints on cycle lanes.

Adaptation for cycle lanes

NFT Joint

Design

Belonging to the supported joints family, this joint comprises a robust metal plate securely anchored to the main structure and equipped with saw-teeth that bridge the gap and rest on a sliding surface. A rubber interface allows for rotation of the metal plate and absorbs shocks due to traffic. An innovative device prohibits any lifting of the metal components.

Specific features:

- The exceptionally robust design gives the NFT joint very high resistance including under high dynamic stress;
- Excellent user comfort and the presence of saw-teeth makes it virtually noise free;
- Upper surface has anti-skid grooves for optimal user safety;
- Designed specifically for extreme exposure conditions and in particular to withstand snow clearing equipment;
- NFT joints are manufactured on request and may be adapted to the directional movement of the main structure, straight (fig.1) or skew (fig.2).

Bridge over the Tecino river - Switzerland

Movement range

The capacity varies from 100 to 600 mm depending on the model.

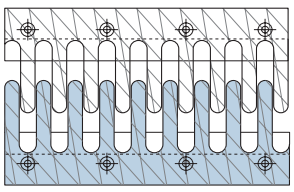


Fig.1

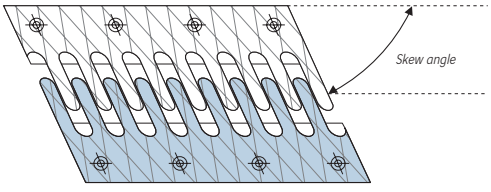
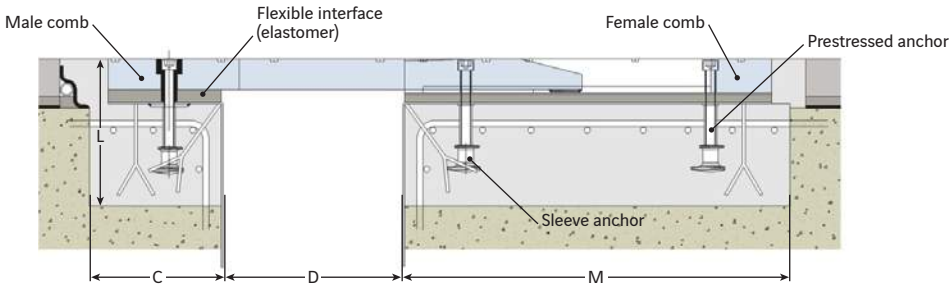


Fig.2

Technical data sheet



Type	L	C	M	D	
				min.	max.
100	35	58	350	100	200
200	40	63	450	100	300
300	45	68	550	100	400
400	50	73	650	100	500
500	55	78	750	100	600
600	60	83	850	100	700

Dimensions in mm


1

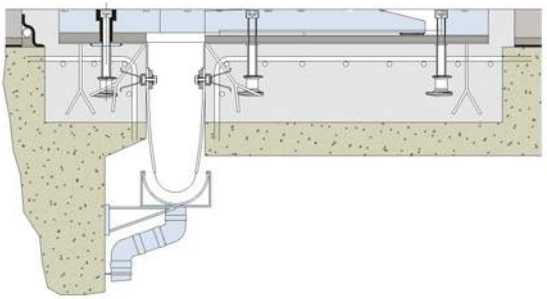

2

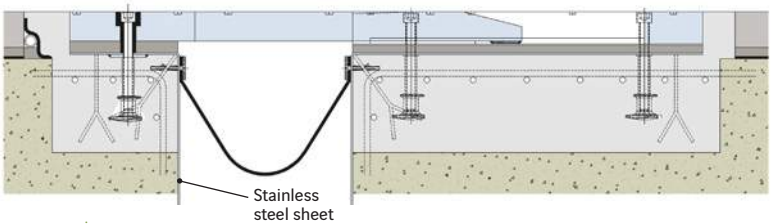
1. Installation of an NFT joint
2. NFT joint seam and footpath adaptation

Water collection

A system for recovering runoff water may be combined with NFT joints.
The system comprises either:

- Two elastomeric or stainless steel sheet water recovery membranes with a gutter located under the joint ▸
- A continuous elastomeric looped membrane over the entire length of the joint ▾

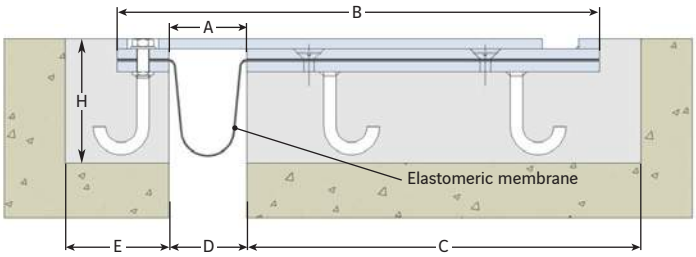




Accessories

To ensure general watertightness at expansion joint level and joint continuity to pavements (or non-traffic areas), the following accessories are available:

- Pavement joints (with our without water recovery membrane);
- End section upstands + kerb cover plate;
- Drain (see page 33).



"PL" model footpath joint

Type	Pavement joint model	A		B		C	D		E	H
		min.	max.	min.	max.		min.	max.		
NFT 100	PL 100	20	120	210	310	290	20	120	150	150
NFT 200	PL 200	30	230	320	520	390	30	230	150	150
NFT 300	PL 300	50	350	440	740	490	50	350	150	150
NFT 400	PL 400	50	450	540	940	590	50	450	150	150
NFT 500	PL 500	50	550	640	1140	690	50	550	150	150
NFT 600	PL 600	50	650	740	1340	790	50	650	150	150

Dimensions in mm

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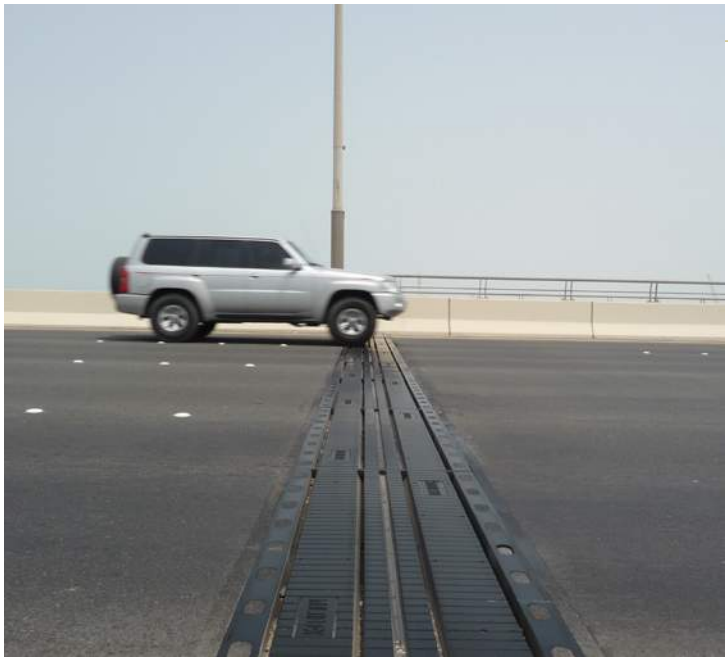
Multiflex SX Joint

Design

The Multiflex SX joint is a Mat joint where movement imposed by the main structure is absorbed by deformation of the elastomeric sections. It comprises moulded elastomeric elements of 1 or 2 metres in length (depending on the model) vulcanized and bonded to metal inserts designed to accommodate rolling loads and distribute loads in the fasteners.



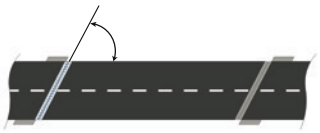
Specific features:

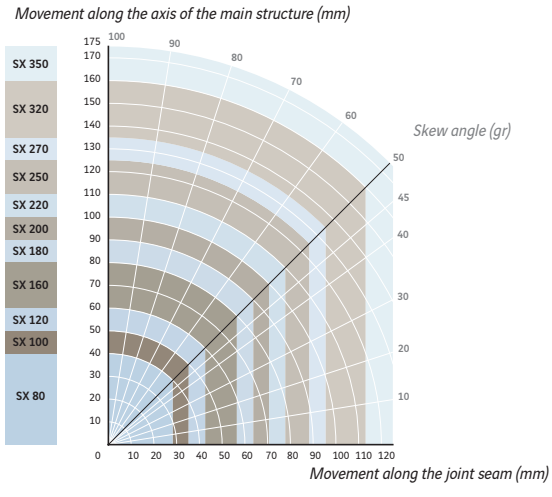
- Perfect watertightness ensured by total elastomer continuity and by positioning a high quality adhesive seal where the elements meet;
- The elastomer contact enables absorption of wheel impact and running surface irregularities thereby providing an excellent level of user comfort;
- Upper surface has anti-skid grooves for optimal user safety;
- Very effectively accommodates transversal, vertical and rotational movements of the main structure;
- Steel inserts entirely elastomer coated, fully protected against corrosion and chemical attack (oil, grease, hydrocarbons and de-icing salts);
- Exceptionally simple installation and can be installed directly without recesses in the main structure.

Saadiyat Bridge - United Arab Emirates

Movement range

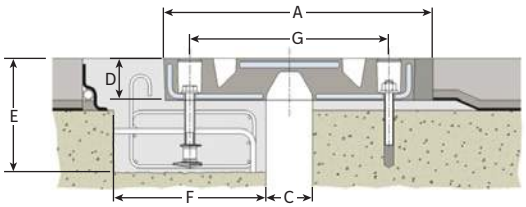
Movement capacity by model depending on skew angle (α) of the main structure.



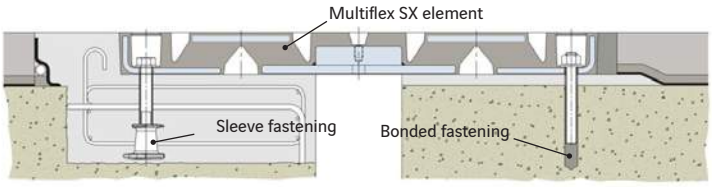


Technical data sheet

There are two different designs, the single module joint and the bridged joint. They have different movement capacities.



Single element module



Double element module

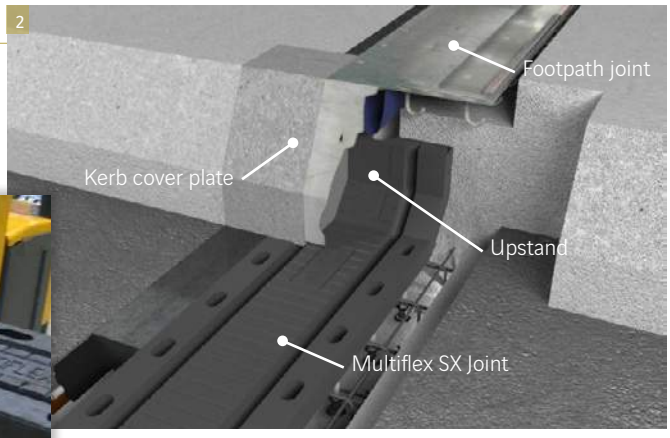
Type	Design	Movement	Dimensions			G	C	E	F	Weight of one element (kg/m)
			Length	A	D					
SX 80	single	±40	2000	275	42	220	50	195	213	27
SX 100	single	±50	2000	355	46	280	60	200	238	35
SX 120	single	±60	2000	390	53	300	70	190	257	29
SX 160	single	±80	2000	470	78	370	90	200	288	87
SX180	single	±90	2000	500	82	400	100	210	298	96
SX 200	double	±100	2000	895	60	795	110	220	452	128
SX 220	double	±110	2000	800	69	700	120	230	400	152
SX 250	double	±125	2000	1040	69	940	135	230	512	244
SX 270	double	±135	2000	890	78	790	150	245	431	179
SX 320	double	±160	1250	1275	82	1165	220	320	588	244
SX 350	double	±175	1000	1105	100	980	220	335	502	318

Dimensions in mm

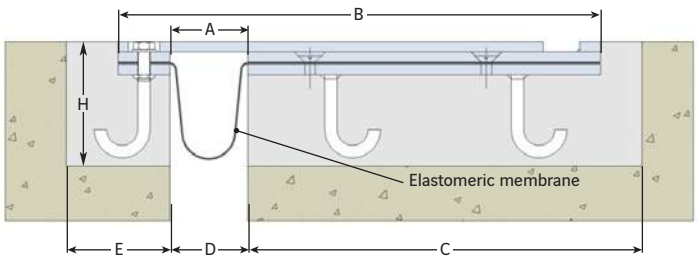
Accessories

To ensure general watertightness at expansion joint level and joint continuity to pavements (or non-traffic areas), the following accessories are available:

- Footpath joints;
- End section upstands + kerb cover plate;
- Drain (see page 33).



1. Tailor made footpath upstand
2. PL footpath joint adaptation



"PL" model footpath joint

Type	Pavement joint model	A		B		C	D		E	H
		min.	max.	min.	max.		min.	max.		
SX 80	PL 80	10	90	180	260	270	10	90	150	150
SX 100	PL 100	20	120	210	310	290	20	120	150	150
SX 120	PL 120	20	140	230	350	310	20	140	150	150
SX 160	PL 160	25	185	275	435	350	25	185	150	150
SX180	PL 180	50	230	320	500	370	50	230	150	150
SX 200	PL 200	30	230	320	520	390	30	230	150	150
SX 220	PL 230	70	300	390	620	420	70	300	150	150
SX 250	PL 250	40	290	380	630	440	40	290	150	150
SX 270	PL 300	50	350	440	740	490	50	350	150	150
SX 320	PL 350	50	400	490	840	540	50	400	150	150
SX 350	PL 350	50	400	490	840	540	50	400	150	150

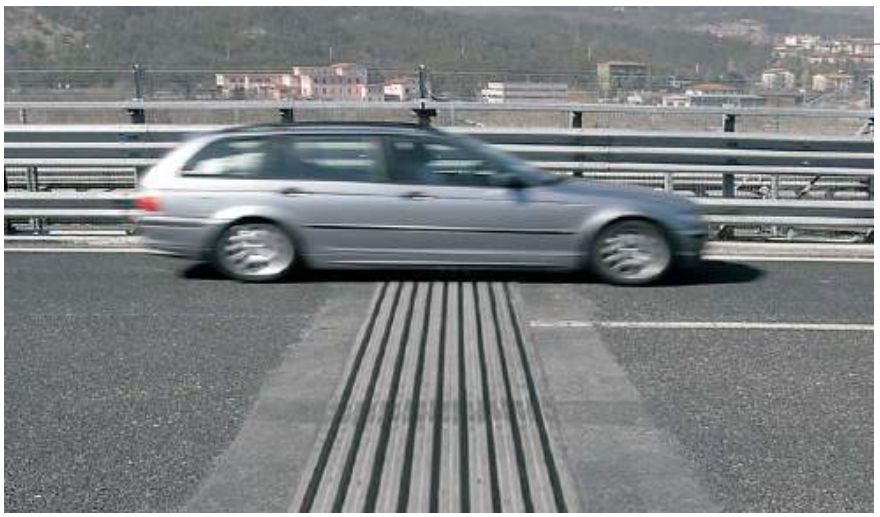
Dimensions in mm

Freyssimod LW Joint

Design

Belonging to the modular joint family, this joint comprises special steel sections with elastomer sections installed between them. The movement capacity is determined by the number of sections chosen. There are 3 models:

- LW 80: no intermediate sections therefore no support bar (small movements)
- LW model T: with multiple support bars (medium movements)
- LW model L: with monolithic support bars (large movements)



Freyssimod LW joint seam

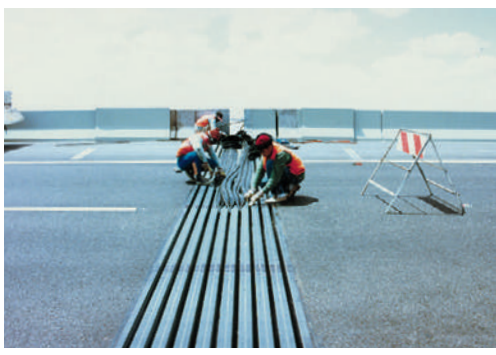
Specific features:

- Totally watertight, requires no water collection system;
- Installation in a single piece;
- Suitable for curved bridges or movements not parallel to the roadway;
- Accepts vertical movements, rotational movements and deformations of the main structure;
- Durable and requires minimal upkeep.

Movement range

Freyssimod joints are manufactured on request and may be adapted to the directional movement of the main structure, straight or skew. The capacity varies from 80 to 960 mm depending on the model, but larger movement capacities can be proposed on request.

Installation

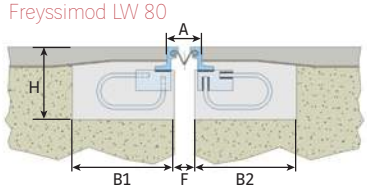


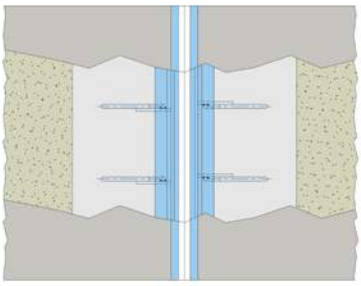
Technical data sheet

Dimensions in mm

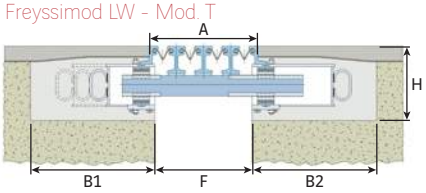
Type	Number of elastomeric profiles	Mouvement	A		Weight	H	B1	B2	B3	F	
			min.	max.	(kg/m)					min.	max.
LW80	1	± 40	80	160	50	280	300	300	-	0	80
LW160T	2	± 80	160	320	180	290	300	300	210	90	250
LW240T	3	± 120	240	480	280	290	400	400	350	170	410
LW320T	4	± 160	320	640	390	320	450	450	480	250	570
LW400L	5	± 200	400	800	400	350	710	350	340	330	730
LW480L	6	± 240	480	960	500	350	790	350	340	410	890
LW560L	7	± 280	560	1 120	610	370	870	350	340	490	1 050
LW640L	8	± 320	640	1 280	730	370	950	350	370	570	1 210
LW720L	9	± 360	720	1 440	860	390	1 030	350	370	650	1 370
LW800L	10	± 400	800	1 600	980	390	1 110	350	370	730	1 530
LW880L	11	± 440	880	1 760	1 120	420	1 190	350	390	810	1 690
LW960L	12	± 480	960	1 920	1 280	420	1 270	350	390	890	1 850

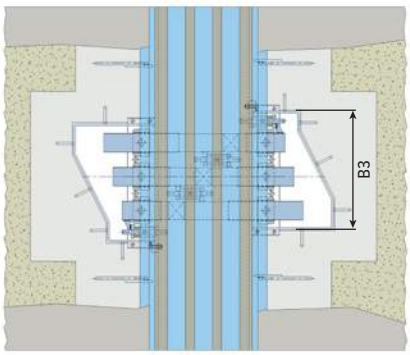
Freyssimod LW 80



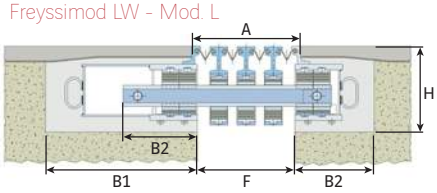


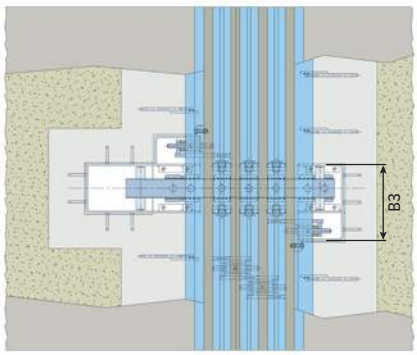
Freyssimod LW - Mod. T





Freyssimod LW - Mod. L

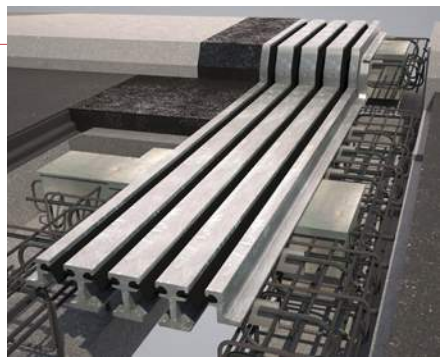


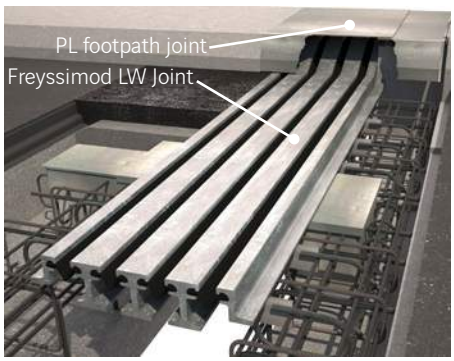


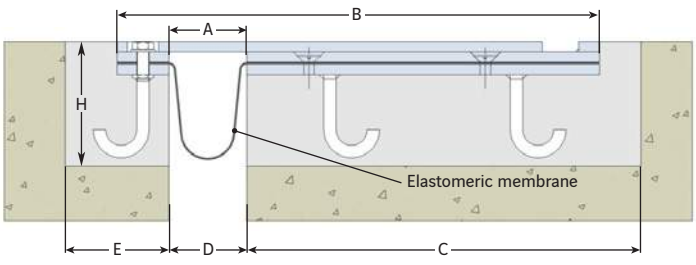
Footpath joint

There are two options for creating the joint at footpath level:

- The joint sections exactly match the pavement geometry;
- A simple slanted upstand combined with a PL joint, covered with steel sheet.





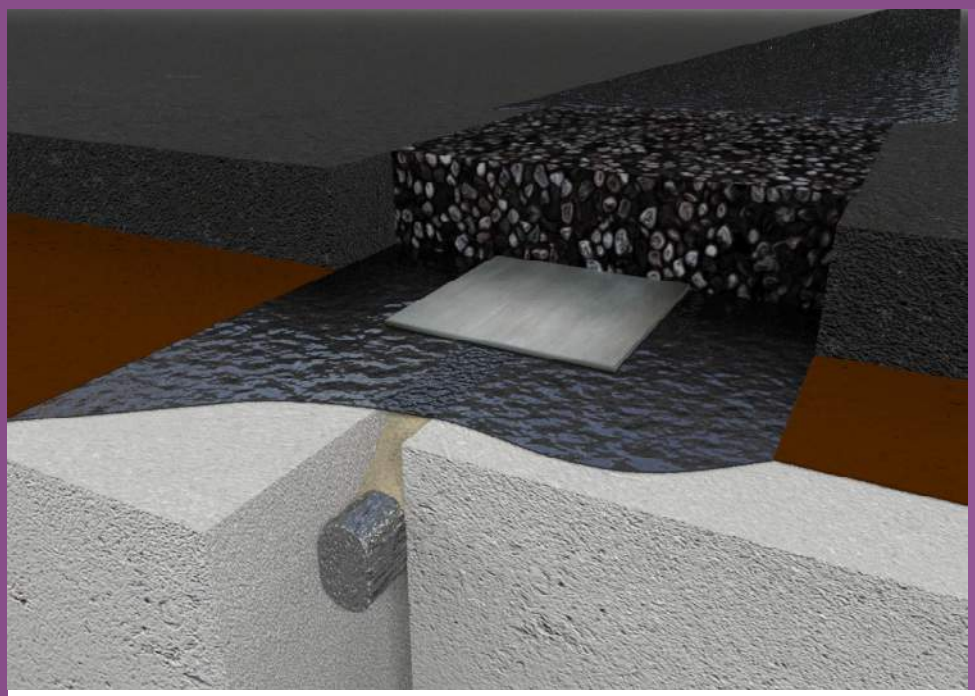


"PL" model footpath joint

Type	Pavement joint model	A		B		C	D		E	H
		min.	max.	min.	max.		min.	max.		
LW80	PL 80	10	90	180	260	270	10	90	150	150
LW160T	PL 160	25	185	275	435	350	25	185	150	150
LW240T	PL 250	40	290	380	630	440	40	290	150	150
LW320T	PL 350	50	400	490	840	540	50	400	150	150
LW400L	PL 400	50	450	540	940	590	50	450	150	150
LW480L	PL 500	50	550	640	1140	690	50	550	150	150
LW560L	PL 600	50	650	740	1340	790	50	650	150	150
LW640L	PL 700	50	750	840	1540	890	50	750	150	150
LW720L	PL 800	50	850	940	1740	990	50	850	150	150
LW800L	PL 800	50	850	940	1740	990	50	850	150	150
LW880L	PL 900	50	950	1040	1940	1090	50	950	150	150
LW960L	PL 1000	50	1050	1140	2140	1190	50	1050	150	150

Dimensions in mm

VIAJOINT



Design

Viajoint is the product of highly sophisticated design processes: the choice of constituent materials and ultra-precise quantity proportioning ensure optimal quality.

It consists of a bitumen-elastomer binder ensuring absolute adhesion to the support, watertightness and bridging elasticity. Addition of rigorously selected granular aggregate provides excellent mechanical resistance. An aluminium section provides mechanical bridging.

Specific features:

- Suitable for any type of surfacing and requires no maintenance irrespective of traffic conditions;
- Provides excellent user comfort and noise control;
- Economic solution;
- Traffic flow can be resumed very quickly.

Viajoint seam

Movement capacity

The maximum movement capacity of this joint is 20 mm. This type of joint accepts skew angles up to 50 gr.

Slanted Viajoint seam

Installation

Viajoint installation is performed after cutting and stripping the existing road surface material. Once the joint base is installed the recess is filled with the preheated aggregate and the bitumen-elastomer binder in 40 to 60 mm layers. Each step requires expertise and special precautions and calls for qualified and experienced personnel.

1. Pouring the first layer of binder
2. Introducing the aggregate
3. Installation equipment


1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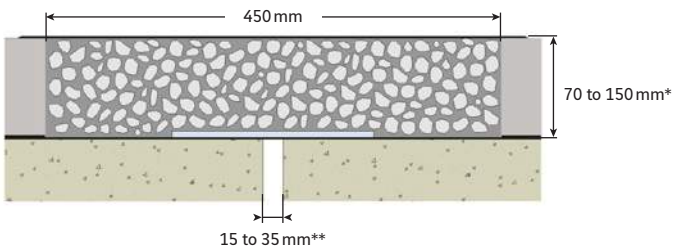
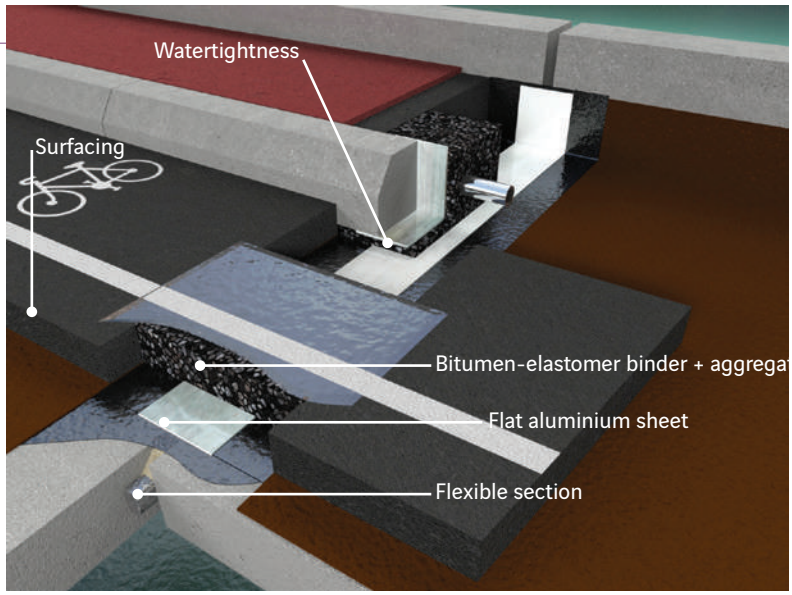
3

Technical data sheet

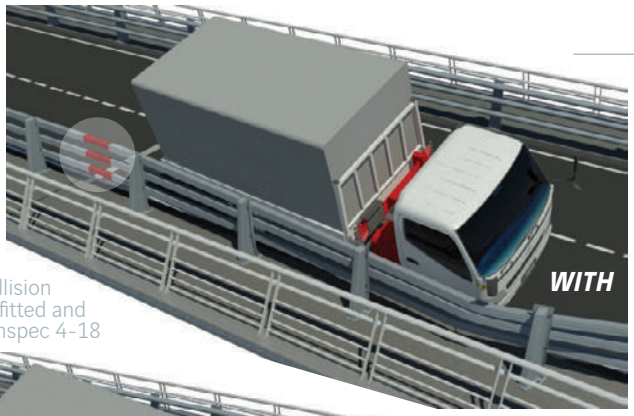
As the joint is not adjustable, the movement value (20 mm) can only be attained if installation is carried out at a temperature corresponding to the average of extreme temperatures for the region.

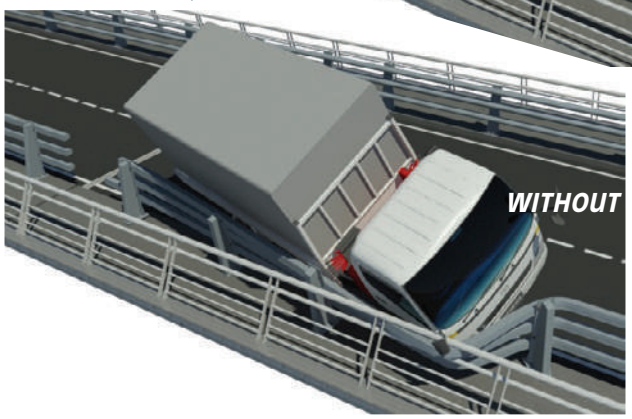




** For values under 70 mm, please contact us*
*** For other values, please contact us*

TRANSPEC 4-18





Simulation of a collision on a crash barrier fitted and not fitted with Transpec 4-18

Principle

Designed by Freyssinet and completely unique, the Transpec 4-18 ensures mechanical continuity of safety barriers at roadway expansion joints, while also accommodating longitudinal deck movements. In normal operation the Transpec 4-18 slides freely. In the case of a vehicle collision in the vicinity of an expansion joint the Transpec 4-18 takes up the load and inhibits deformation while locking the previously separated barrier elements together. The vehicle is therefore prevented from going through the barrier.

Specific features:

- Process tested and proven fully effective under actual conditions. The Transpec 4-18 is positioned inside BN4 barrier rails and requires no specific or special arrangement.
- It is also possible to fit other models of protection barrier subject to a special design study.
- Installation of Transpec 4-18 is strongly recommended for movements from 150 mm.

Detail of connection to barrier

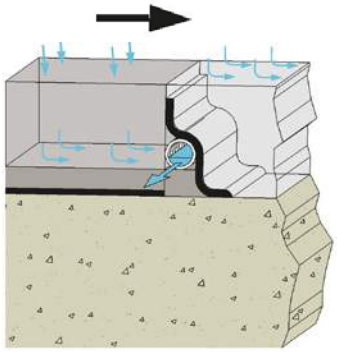
Barrier fitted with two Transpec 4-18s

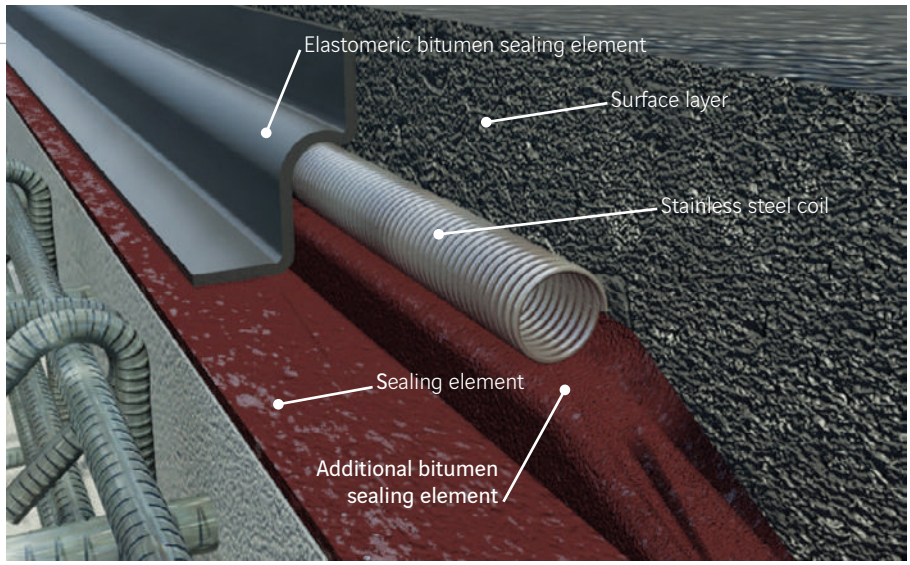
Application on a guardrail

Complementary devices

Drain

A drain should be installed before the joint to collect and evacuate any runoff water that may infiltrate into the deck surface layers. This prevents build up of water in this area that could damage the flashing. The drain is comprised of a continuous stainless steel coil along the length of the joint protected by a bituminous strip.





Detail of drain assembly

Gully

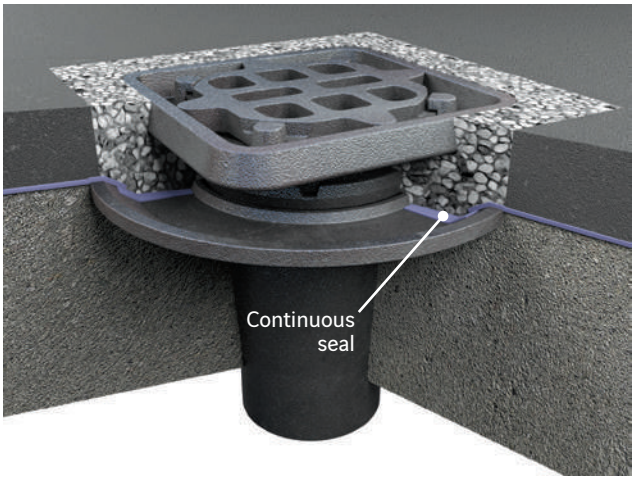
Principle

Device intended to evacuate water from a bridge deck with effective connection to the general waterproofing and evacuation system.
Assembly is compliant with French ST.E.R 81 requirements sub-dossier E Section II, published by SETRA.

Description

The all cast steel components of this CIPEC gully are as follows:

- Base tube with flange (1 unit);
- Riser (number depending on height of surface layer);
- Inlet - grating support (1 unit);
- Grating (1 unit);
- Grating bolts (1 pair).

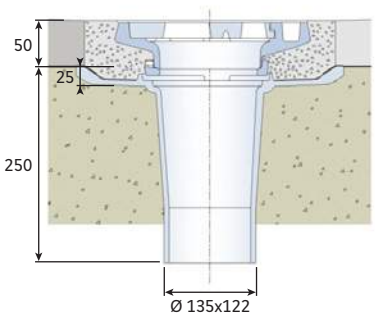


Grating

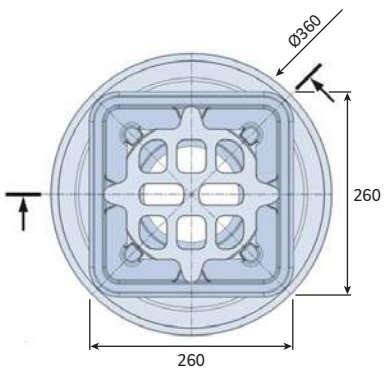
Inlet - grating support with two bolts

20 mm risers (number to be specified depending on desired height)

Riser tube with flange

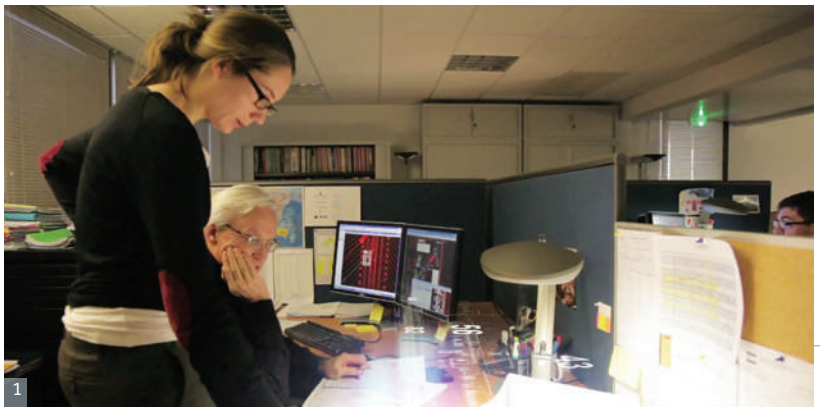


Base assembly with one riser



Dimensions in mm

Manufacturing of joints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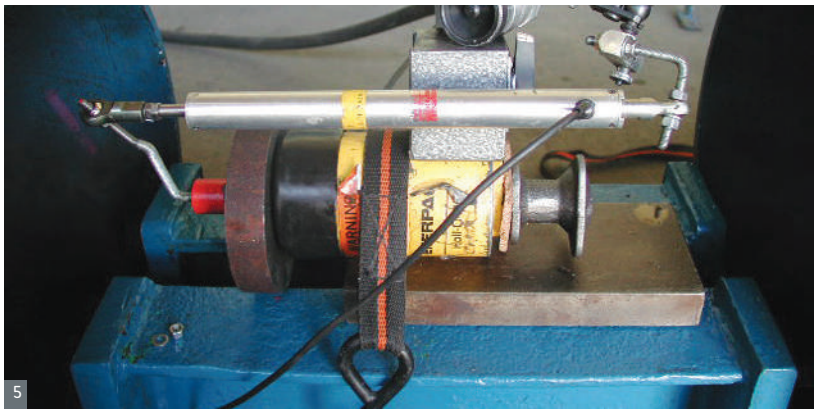
5

We guarantee all our customers around the world the same level of excellence and quality in our products and services by designing and manufacturing our own expansion joints. We can draw on our expertise across the product and system lifecycle to gear our solutions towards a broad array of applications and extreme operating conditions.

Products designed and manufactured by Freyssinet

All Freyssinet expansion joints are conceived and designed by an in-house technical department that fine-tunes the products in conformity with current standards and project specifications. Coordination between design, manufacturing solutions and choice of materials is critical for optimizing our solutions and providing reliable and durable products.

Our in-house mechanical testing centre with its broad range of specific materials carries out full-scale testing on most of our products during both the product development and approval phase.

Certified products

Recognition of Freyssinet's expertise and high-quality processes is reflected in a number of certifications in very diverse fields. Our expansion joints have gained recognition around the world by such organizations as: SETRA (France) • TZUS (Czech Republic) • AREVA (Nuclear) • TNSISS (Russia) • ASME (Nuclear) • EDF (Nuclear, Hydraulics) • SNCF (France) • DNV SUBSEA 7 (Off Shore) • INTRATEC (Nuclear, China) • IBDIM (Poland) • Politechnico Di Milano (CE Marking) • AFAQ-AFNOR (ISO Certification), and many others.

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Expertise and industrial know-how

Based in France, our FPC Industrial Division (Freyssinet Products Company) acts as a focal point for all of Freyssinet's expertise in materials, manufacturing, production engineering, control and logistics. It coordinates all our production activities on a global scale. Numerous experts in foundry work, elastomers, mechanical engineering and quality travel the five continents to develop and control the manufacturing processes and guarantee the same level of product quality irrespective of the production site's location.

Guaranteed quality

The sprawling network of FPC-managed production sites requires daily involvement by the quality control department. This guarantees the quality and conformity of the products supplied. All products are quality controlled by FPC at a given moment in time using cutting-edge measuring instruments.

All checkpoints are defined internally and FPC issues a certificate of conformity for each product supplied.


6


7


8


9

10

1. Design office
2. Assembly of a WR joint
3. Fatigue testing a WP joint
4. Watertightness testing on Wd joint
5. Testing a sleeve anchor
6. The FPC building (external view)
7. The FPC building (internal view)
8. Capacity testing on WM joint
9. Dimensional check on WP expansion joint.
10. Dimensional check on WM joint

CV1 - 09/14

Over 60 locations worldwide

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