BAS®
BUILDING AND SPAN
EXPANSION JOINTS (NZ)

"Your Local Joint Dealer!"

BAS® Long-Run Expansion Joint System

Manufactured to AS5100.4 and the NZ Transport Bridge Manual Edition 3

PO Box 84-177 | Westgate | Auckland | New Zealand | 0800 SPAN-IT | www.expansion-joint.co.nz

Innovation in joints for durability

Traditional Expansion Joint Systems are installed into a bridge structure to simultaneously provide smooth vehicle movement (across the joint area), while ensuring the deck structure can move freely under temperature changes, drying concrete shrinkage, and ive loads, etc. Joints are frequently damaged from increased traffic volumes, poor installation accuracy, and lack of maintenance. Damaged bridge joints often cause secondary damage and the durability of the bridge structure is subsequently reduced.

The BAS®Long-Run Expansion Joint System has been developed as an innovative way to combat durability issues. They are designed to solve the inefficiency of the existing expansion joint technology, specifically surrounding the finger joint type systems. As it stands now, the expansion joint is often considered as a consumable item. The BAS®Long-Run Expansion Joint system challenges this perception and has changed the bridge expansion joint into being considered a permanent component of any bridge structure.

Furthermore, we have developed a BAS®Earthquake-Resistant expansion joint system (ERJ) that is movable on three axes (X, Y, Z) during seismic events, thus minimizing damage to the bridge. The BAS®ERJ is reusable after the seismic event stops (when used with a damper and bearing). By specifying the correct BAS®ERJ system, you can eliminate secondary destructive back-up designs (such as knock-off blocks etc.). Giving confidence that the structure will be usable immediately following a disaster, so emergency vehicles, evacuation traffic etc. can continue to use the bridge.

Our Catalogue

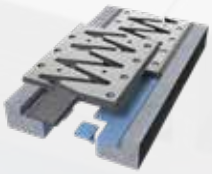
More information can be provided on any of these products on request, or call our Marcus, Managing Director for an obligation free discussion on how our products can meet your specific project requirements

Finger Type

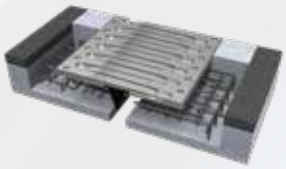
LFJ Long-Run Finger Expansion Joint

LFJ-E Long-Run Finger Expansion Joint Type E

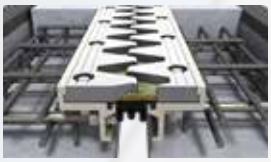
LCFJ Long-Run Change Finger Joint



BFJ Big Finger Expansion Joint



LE-DPS Long-Run Expansion Joint Debris Prevention System



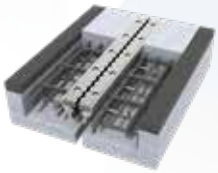
Earthquake Resistant application (All Direction Movement)

ERJ Earthquake-resistant Expansion Joint

Rail Type (StripSeal Alternative)

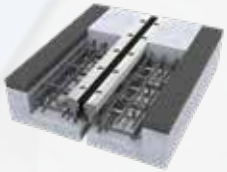
LRJ Long-Run Rail Expansion Joint

LMJ Long-Run Monocell Expansion Joint



LCRJ Long-Run Compacted Rail Expansion Joint

LHAJ Long-Run Height Adjustment Joint



LCJ Long-Run Culvert Expansion Joint

Special application

RWJ Railway Expansion Joint

RWJ 1 (Type 1)

RWJ 2 (Type 2)

RWL 3 (Type 3)

RWJ 4 (Type 4)

About us

BAS Expansion Joints (NZ)® is a 100% privately owned and operated New Zealand company that specialises in expansion joints and seismic related products.

Our local NZ representatives have a combined experience of over 25 years in this specialisation. We have manufacturing partners worldwide. This ensures we have the capability to supply top quality products, at competitive rates, for any size project.

Formed in 2014, BAS Expansion Joints Limited is focused on assisting construction companies to select and install quality branded systems that we exclusively distribute into the New Zealand market. Across a range of industries including Architectural, Civil and Commercial. In 2017 Biggles Industries Ltd purchased the company and started trading as BAS Expansion Joints (NZ)® (BASNZ).

Today, BASNZ has increasied our capacity for product supply in Roading and Bridge construction. Along with brands such as WABO®, BASF® and TechStar™ Pacific , we are manufacturing our own range of bridge accessories such as expansion joints, seismic devices, bridge bearings (elastomeric and mechanical) and base isolation products.

We are constantly involved in projects of national significance, and have established an outstanding reputation. Engineers and contracting companies have come to trust and rely on our expertise and prompt, concise flow of information. From the tip of the North Island of New Zealand, to the far reaches of western Australia, let us partner with you for your next project!

"Your Local Joint Dealer!"

"Let BAS Expansion Joints (NZ) assist you in sourcing top quality products, designed for New Zealand and Australian conditions and standards/specifications at great rates. We are here to support you throughout your project, from design to installation!"

- Marcus Beagley (Managing Director)

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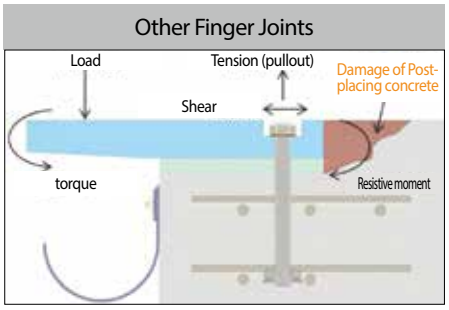
Full System

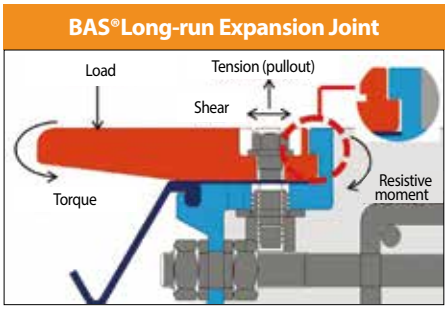
BAS®Long-Run Bridge Expansion Joint System

Benefits of BAS®Long-Run Expansion Joint

Structural stability



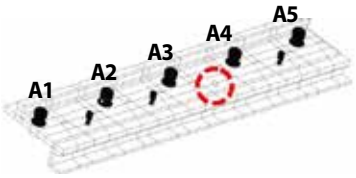
1. Hold down bolts directly receive dynamic loads (bolt damage)
2. Concrete damage is normal as finger plates are in direct contact with the concrete



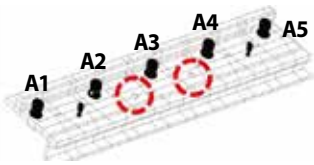
1. Cogged joint design disperses pullout and shear forces and protects hold down bolts from damage.
2. There is no adjacent concrete damage, as the top plate doesn't contact with the concrete.

Structural stability when a bolt is released

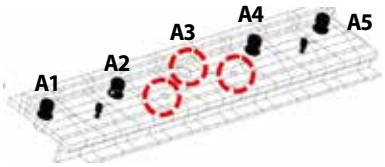
There is no increased stress of neighboring bolts with BAS®Long-Run EJ system - Structurally safe



Condition1 : 1 wrench bolt released

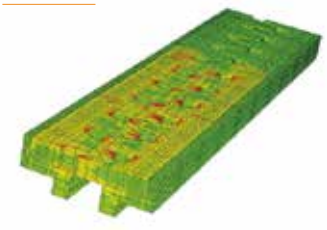


Condition2 : 2 wrench bolts released

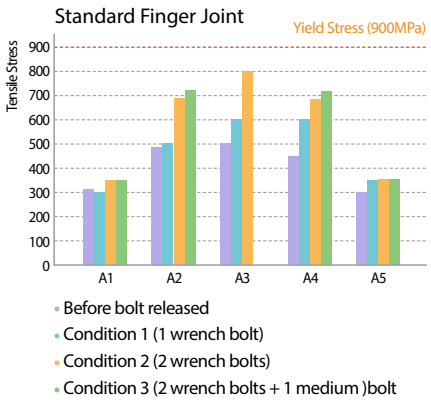


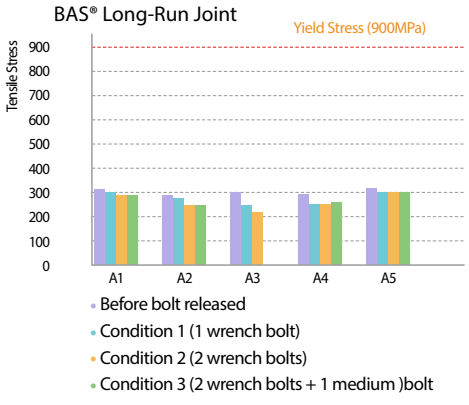
Condition3 : 1 medium bolt and 2 wrench bolts released

Analysis



BAS®Long-Run system distributes loads on bolts equally to prevent stress concentration





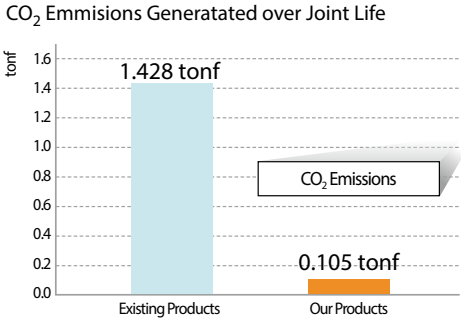
Eco-friendly

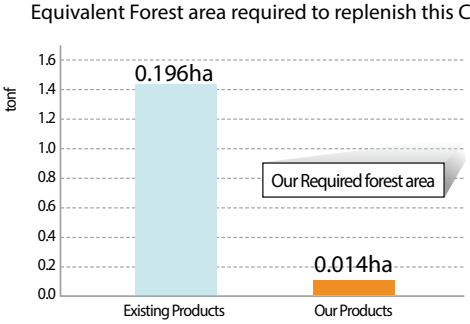
Standard Finger Joints

Generates CO2 and construction waste from removing concrete to repair/ replace

BAS®Long-Run System with Cogged Joint

CO2 emissions and construction waste is reduced by 13.6 times when you only replace rubber or top plates

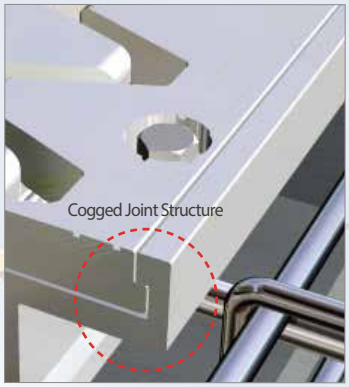




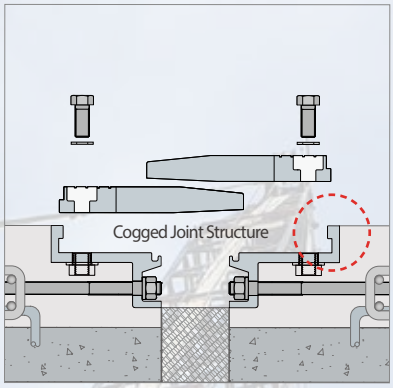
Technology of the BAS®Long-Run Expansion Joint System

The unique construction method of the BAS®Long-Run system is designed to reduce bolts releasing and bolts failing. It is achieved by distributing the stress of the bolt into the cogged joint, engaging the separate top and bottom plates of the system with a cogged joint structure on the edge of the product.

It is also an economical design that reduces the time required for seal repairs to approx 10 min/M from 60min/M . This is due to the rubber seal and top plate being replaceable, without damaging the post-placing concrete with a separable structure



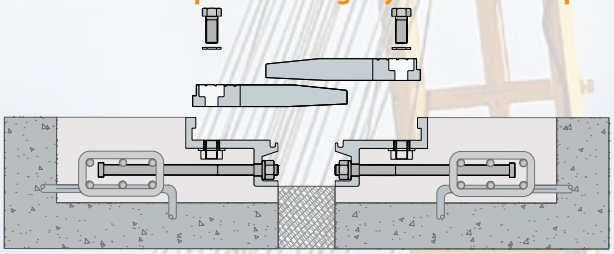
Conceptual Diagram



Expanded Detail

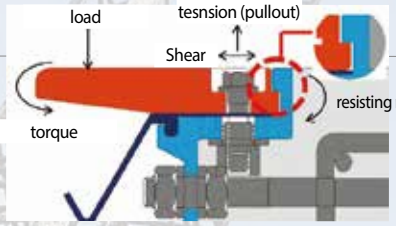
Advantages of BAS®Long-run Expansion Joint System

01. Does not require breaking any concrete for repairs



- Reduces maintenance costs by allowing the most readily damaged component , the rubber seal, to easily and quickly be replaced.
- Prevents damage of post-placing concrete due to the bottom plate isolating the area when removing the top plate for maintenance.
- Reduces road user complaints by reducing repair time.
- More eco-friendly due to less required repairs, therefore full life-cycle demands less construction waste and less CO2 from equipment.

02. The bolts will not loosen from dynamic traffic loads

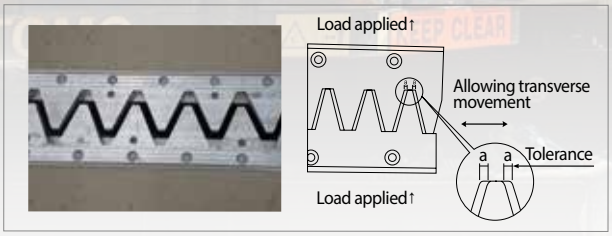


- The concentrated load on the bolt is distributed to the cogged joint with cantilever structure.
- The system reduces bolt releasing and failure.
- BAS® also uses a specially designed washer to prevent bolt releasing.
- The unique system has redundancies built in to reduce the chance of the top plate releasing, even if some bolts are compromised.

03. Rubber seal is 'full width' and protected from the traffic

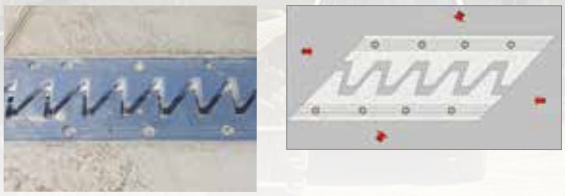
- The rubber moisture seal is held in place, under the top plates, protecting it from the traversing traffic.
- The seal can be installed full bridge width (Max 100m) eliminating the requirements for any splice joins.
- Stop bridge joints leaking, and therefore protect the substructure of the bridge from water damage.
- Save on maintenance costs by reducing secondary damage to the structure from leaks.

04. Finger Plate design allows for transverse movement



- Our design accepts transverse movement of bridge bearing.
- Prevents damages to concrete and hold-down bolts due to finger interference.
- It is suitable for skewed or curved bridges.

05. Allows movement in skewed angles



- Customisation is available for varying skew angles.

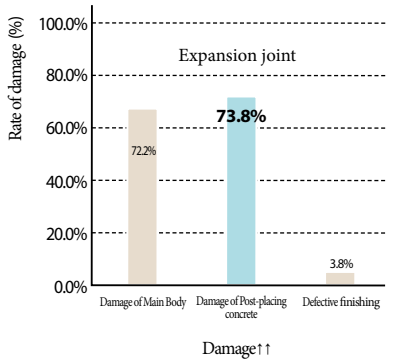
Addressing known issues in current Bridge Expansion Joints

The BAS®Long-Run Expansion Joint addresses some of the most common and costly issues that infrastructure asset owners face. Analysis of the rate of damage and pictures of common damage are included below. You can choose a customised BAS system to address any or all of these issues.

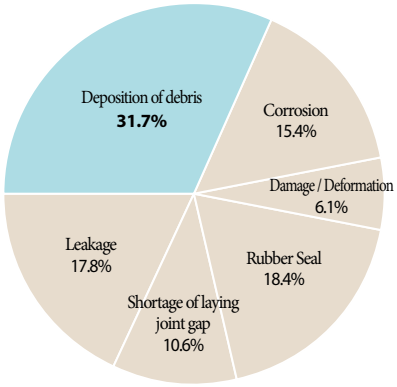
Distribution Rate of Damage to Bridge Expansion Joints

A Study on the Improvement of Inspection Efficiency through Bridge Survey Analysis

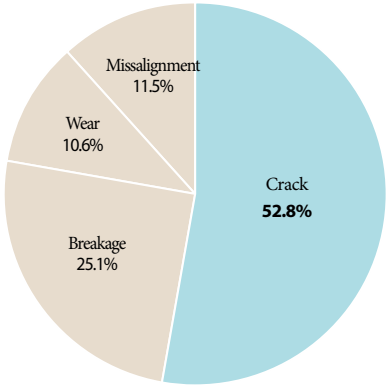
Result of Analysis: The results show most of the damage to expansion joints occurs in post-placing concrete damage (73.8%), the main body damage (72.2%), and defective finishing (3.8%).



<Rate of damage based on the type of damages of expansion joint>



<Main causes of damage of main body>



<Main causes of damage of post-placing concrete>

Major Damage of the Expansion Joint

Rubber seal breaking

Damage of the main body

Secondary Damage from Leakage

Concrete Deterioration

Secondary Damage due to Expansion Joints' Leakage

Concrete Deterioration

Steel Girder Corrosion

Bridge Bearing Corrosion

Concrete Spalling

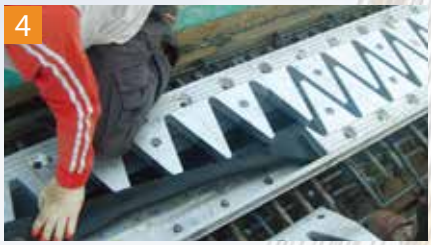
Deposition of Debris

BAS® Long-Run Construction Procedures

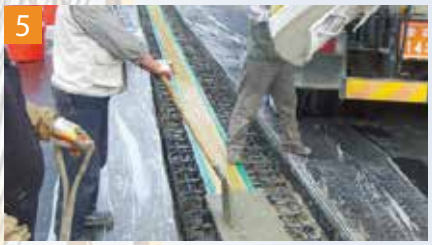
Block-out

Positioning

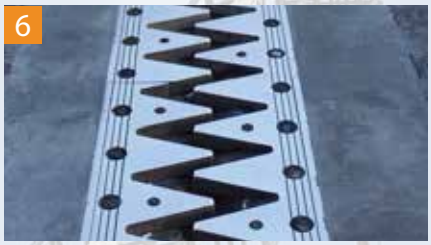
Welding



Installing rubber seal & placing top plate



Concrete Pour



Finished Product

BAS®Long-Run LRJ condition check after installation (4 yrs later)

As installed

Releasing top plate

After release

Bottom of top plate after dismantlement = Good

Thread of a bolt = Good

Condition of the side = Good

Custom design conditions are possible

Using BAS®Long-Run Expansion joints you are able to fabricate details to cater for transistions, footpath covers, and change of directions. We ae able to assist you with design that will make specifying our products a breeze. Often the system can come pre-fabricated, ready to install, making installation contractors methodology that much easier.

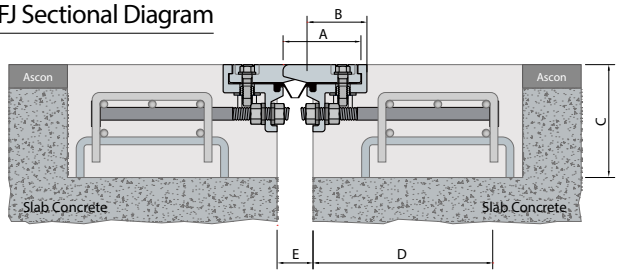
LFJ BAS®Long-Run Finger Expansion Joint

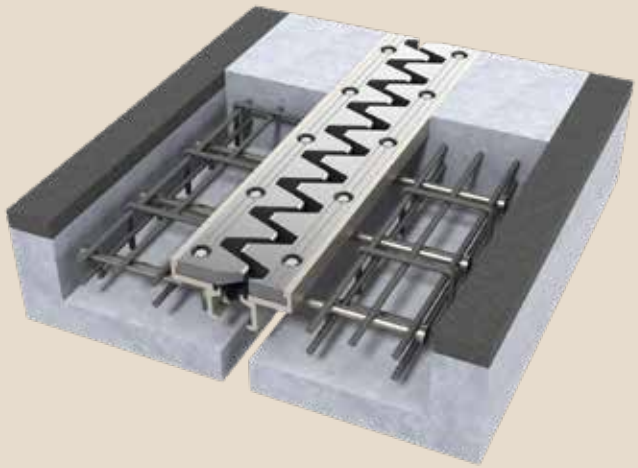
Use : Longitudinal Movement Bridge Joint

Movement range : 50mm to ~ 500mm

Applicability : Suitable for large movement
Low noise EJ

LFJ Sectional Diagram





LFJ Specification

Model	Max.Allowable Movement range	Product Data A	Product Data B	Block-out C	Block-out D	Laying gap(E) Min	Laying gap(E) Avg	Laying gap(E) Max	BOLT(per M)		Amount of Reinforcement (Kg)	Concrete (Per M) M^3
BASLFJ-50	50	124	99	200	300	20	45	70	M16*45,10EA		19.60	0.12
BASLFJ-60	60	129	99	200	300	20	50	80	M16*45,10EA		19.60	0.12
BASLFJ-80	80	139	99	200	300	20	60	100	M16*45,10EA		19.60	0.12
BASLFJ-100	100	175	125	200	300	20	70	120	M16*45,10EA		19.60	0.12
BASLFJ-130	130	190	125	200	300	20	85	150	M16*45,10EA		19.60	0.12
BASLFJ-150	150	232	134	200	350	20	95	170	M18*45,10EA	M14*40,6EA	20.50	0.17
BASLFJ-160	160	232	134	250	350	20	100	180	M18*45,10EA	M14*40,6EA	20.50	0.17
BASLFJ-200	200	282	186	250	400	20	120	220	M22*50,10EA	M18*45,6EA	20.90	0.20
BASLFJ-230	230	307	186	250	450	20	135	250	M22*50,10EA	M18*45,6EA	20.90	0.20
BASLFJ-250	250	346	226	250	450	20	145	270	M22*50,10EA	M18*45,6EA	20.90	0.20
BASLFJ-300	300	371	226	250	500	20	170	320	M22*50,10EA	M18*45,6EA	21.00	0.25
BASLFJ-350	350	430	250	250	550	40	215	390	M24*60,10EA	M20*50,6EA	21.00	0.27
BASLFJ-400	400	500	299	250	600	40	240	440	M24*60,10EA	M20*50,6EA	21.20	0.30
BASLFJ-450	450	550	330	300	600	40	265	490	M24*60,10EA	M20*50,6EA	21.80	0.36
BASLFJ-500	500	615	364	300	600	40	290	540	M24*60,10EA	M20*50,6EA	21.80	0.36

- This product specification has an error range of ± 5 ~ 10mm and a movement range from 400 to 500mm is produced with steel
- The product specifications shown are standard and can be customised to suit the specifications and characteristics of a bridge.

Foothpath Finishing

Treatment of longitudinal and transverse EJ

LFJ-E

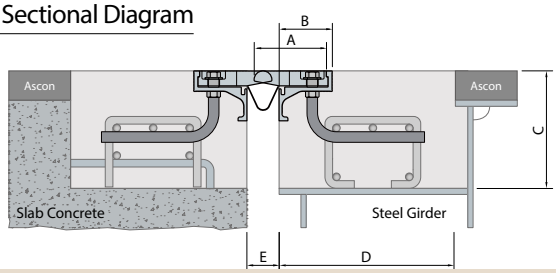
BAS®Long-Run Finger Expansion Joint - Type E

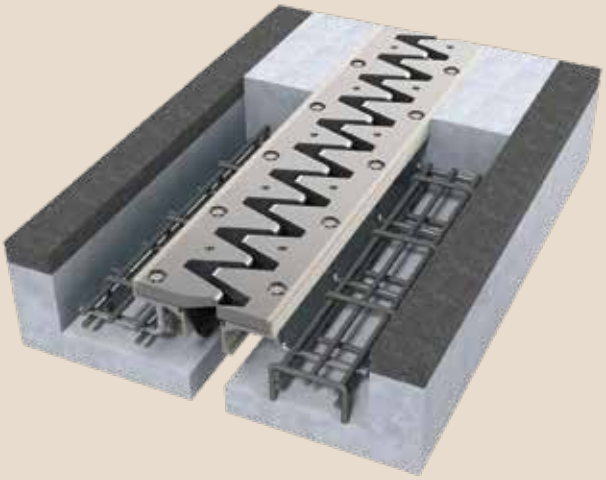
Use : Longitudinal Movement Bridge Joint

Movement range : 60mm to ~ 500mm

Applicability : Deep block-out or steel girder.
Bridges with large movement
Low noise EJ

LFJ-E Sectional Diagram





LFJ-E Specification

(Unit: mm)

Model	Max.Allowable Movement range	Product Data A	Product Data B	Block-out C	Block-out D	Laying gap(E) Min	Laying gap(E) Avg	Laying gap(E) Max	BOLT(per M)	Amount of Reinforcement (Kg)	Concrete (Per M) M^3
BASLFJ-E60	60	126	90	200	300	20	50	80	M18*120H*200L, 10EA	18.70	0.12
BASLFJ-E80	80	136	90	200	300	20	60	100	M18*120H*200L, 10EA	18.70	0.12
BASLFJ-E100	100	164	109	200	300	20	70	120	M18*150H*200L, 10EA	18.70	0.12
BASLFJ-E110	110	164	109	200	300	20	75	130	M18*150H*200L, 10EA	18.70	0.12
BASLFJ-E130	130	169	109	200	300	20	85	150	M18*150H*200L, 10EA	18.70	0.12
BASLFJ-E160	160	210	132	250	400	20	100	180	M22*150H*250L, 10EA	19.98	0.20
BASLFJ-E200	200	248	150	250	400	20	120	220	M22*150H*250L, 10EA	19.98	0.20
BASLFJ-E230	230	292	183	250	400	20	135	250	M22*150H*250L, 10EA	19.98	0.20
BASLFJ-E250	250	312	183	250	400	20	145	270	M24*150H*250L, 10EA	19.98	0.20
BASLFJ-E300	300	389	255	250	500	20	170	320	M24*150H*250L, 10EA	20.08	0.25
BASLFJ-E350	350	454	297	250	500	20	185	370	M24*150H*250L, 10EA	20.08	0.25
BASLFJ-E400	400	490	345	250	600	40	240	440	M24*150H*250L, 10EA	21.20	0.30
BASLFJ-E500	500	590	365	300	600	40	290	540	M24*150H*250L, 10EA	21.80	0.36

- The product specifications are standard and subject to change with the specifications and characteristics of a bridge
- The above product specification has an error range of ± 5 ~ 10mm depending on the specifications and characteristics

Foothpath Finishing

Finished Installation

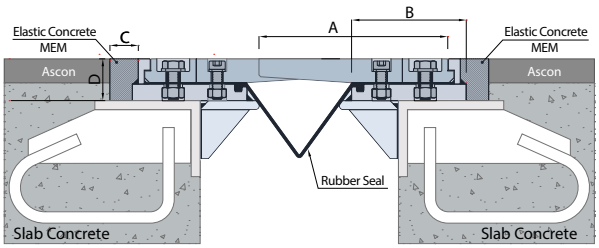
LCFJ BAS®Long-Run Change Finger Joint

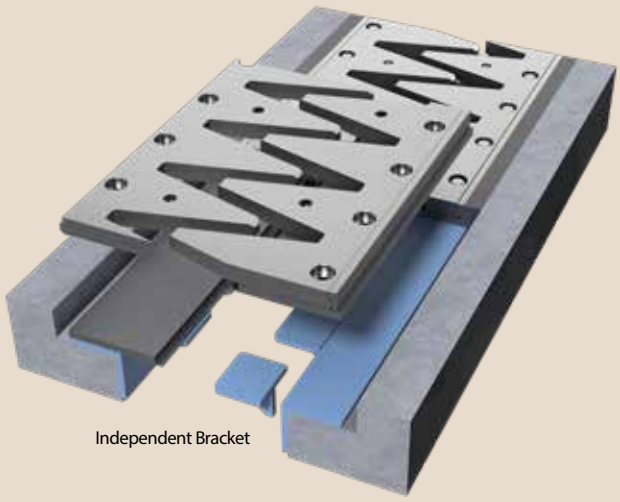
Use : Replaces damaged, existing Modular Expansion Joint System (MEJS)

Movement range : 160mm to ~ 480mm

Applicability : A system / construction method that is used to replace MEJS with LCFJ by installing an independent bracket on the existing anchor rail.

LCFJ Sectional Diagram





Independent Bracket

LCFJ Specification

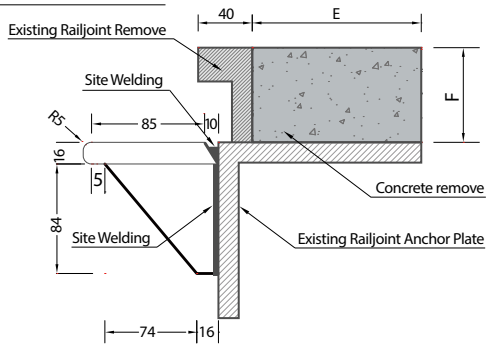
(Unit : mm)

Model	Max Allowable Movement range	Product Data A	Product Data B	Post-placing concrete filling C	Post-placing concrete filling D	Post-placing concrete removal E	Post-placing concrete removal F
BASLCFJ-160	160	246	152	100	80	150	80
BASLCFJ-240	240	307	192	100	80	200	80
BASLCFJ-320	406	406	232	100	80	200	80
BASLCFJ-400	486	486	272	100	80	200	80
BASLCFJ-480	570	570	500	100	80	200	80

- Error range of ± 5 ~ 10mm
- The product specifications shown are standard and can be customised to suit the specifications and characteristics of a bridge.

MEJS (before replacement)

Sectional Diagram of Bracket

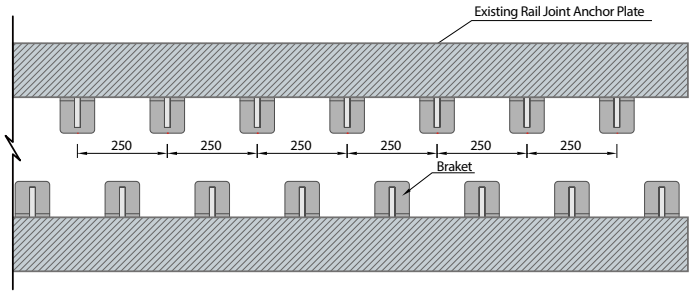


LCFJ (after replacement)

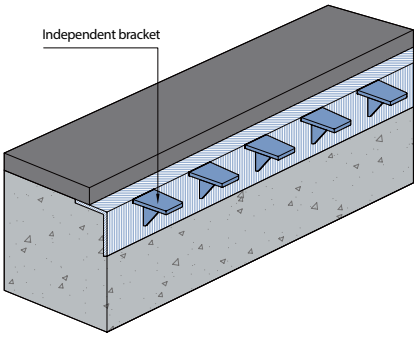
Benefits

1. Minimises disturbance to public and traffic that is needed to replace a failed joint
2. Will not damage the structure because no concrete removal needed
3. Provides a continuous surface for smooth, quiet driving
4. Structurely safe - as dual structure of base plate and finger plate
5. Easy ongoing maintenance

Plan of Independent Bracket



3D view of Independent Bracket



• Dimension and space of bracket specification can be changed as required

Installation Procedure

Existing Site

Removing the existing MEJS

Tack welding independent brackets using a jig

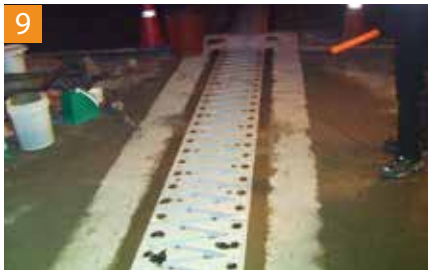
Welding EJ bracket

Installing BAS®LCFJ (adjusting laying gap)

Rear welding of LCFJ

Installing of rubber seal

Placing top plate of BAS®LCFJ and locking bolts



Placing BAS®Crete EC Elastomeric Concrete

Completion of BAS®LCFJ installation

BFJ

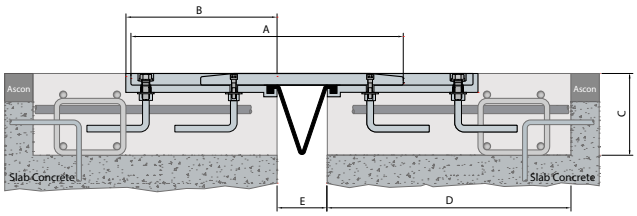
BAS®Big Finger Expansion Joint

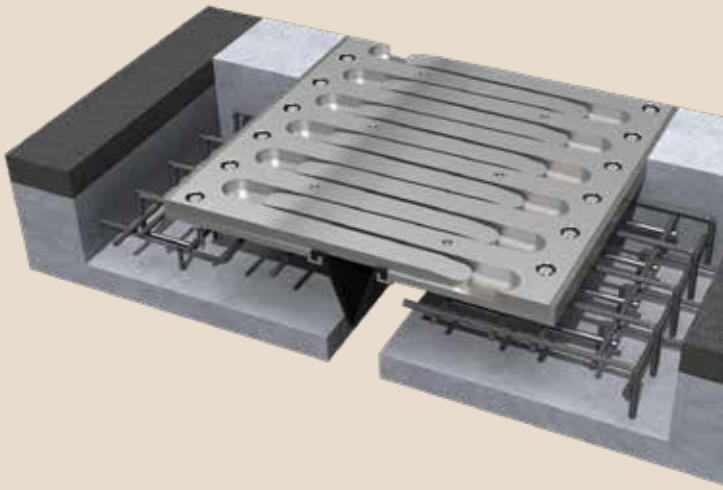
Use : Longitudinal Movement Bridge Joint

Movement range : 300mm to ~ 1500mm
transverse movement also available

Applicability : Suitable for long span bridges with large movement

BFJ Sectional Diagram





STEEL TYPE (product colours may differ from those pictured)

BFJ Specification

(Unit : mm)

Model		Max.Allowable Movement range	Product Data A	Product Data B	Block-out C	Block-out D	Laying gap(E) Min	Laying gap(E) Avg	Laying gap(E) Max	BOLT(per M)		Amount of Reinforcement (Kg)	Concrete (Per M) M^3
STEEL	BASBFJ-300	300	820	455	250	655	30	180	330	M22*60,12EA	M14*45,6EA	74.63	0.33
	BASBFJ-350	350	870	505	250	705	30	205	380	M22*60,12EA	M14*45,6EA	75.53	0.35
	BASBFJ-400	400	920	555	250	755	30	230	430	M22*60,12EA	M14*45,6EA	92.23	0.38
	BASBFJ-450	450	970	605	250	805	30	255	480	M22*60,12EA	M14*45,6EA	105.91	0.40
	BASBFJ-500	500	1020	655	250	905	30	280	530	M22*60,12EA	M14*45,6EA	107.48	0.45
	BASBFJ-600	600	1120	755	250	1005	30	330	630	M22*60,12EA	M14*45,6EA	114.70	0.50
	BASBFJ-700	700	1220	855	250	1105	30	380	730	M22*60,12EA	M14*45,6EA	125.72	0.55
	BASBFJ-800	800	1320	955	250	1205	30	430	830	M22*60,12EA	M14*45,6EA	130.49	0.60

• The product specifications shown are standard and can be customised to suit the specifications and characteristics of a bridge including the amount of steel reinforcement and stadards of the anchor.

LE-DPS

BAS®Long-Run Expansion Joint Debris Prevention System

Use : Prevention of Debris buildup in EJ

Debris buildup on exisiting EJ

Application of LE-DPS on EJ

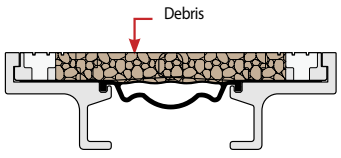
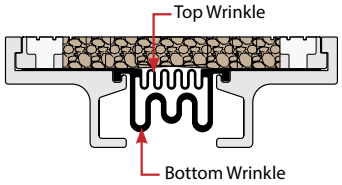
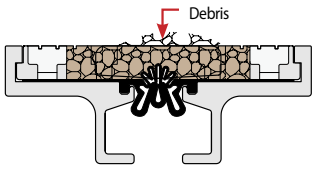
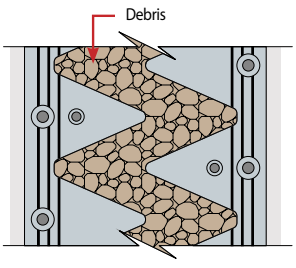
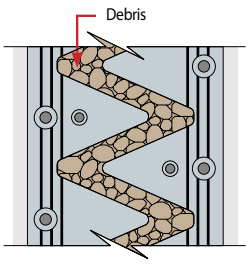
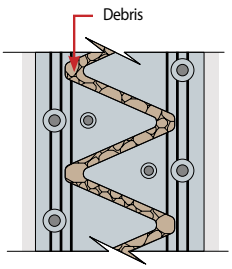
Issues of debris in a standard EJ

Regular cleaning is required for smooth expansion movement. It is very difficult to clean large amounts of debris deposited on the rubber seal. The debris can become hardened if left unchecked for too long. A common method of cleaning is to use a steel bar to remove it from the joint area. This can easily damage the rubber seal and lead to secondary structural damage to the bridge from leaks.

Strengths of Debris Prevention System

Instead of using a standard "V" seal (refer BFJ Sectional diagram on previous page), we can use the LE-DPS (as shown in installation diagram below). The LE-DPS (wrinkle seal) is easier to clean debris from, minimises expansion joint leaks with the dual structure and increases the service life of the rubber seal.

Installation Diagram

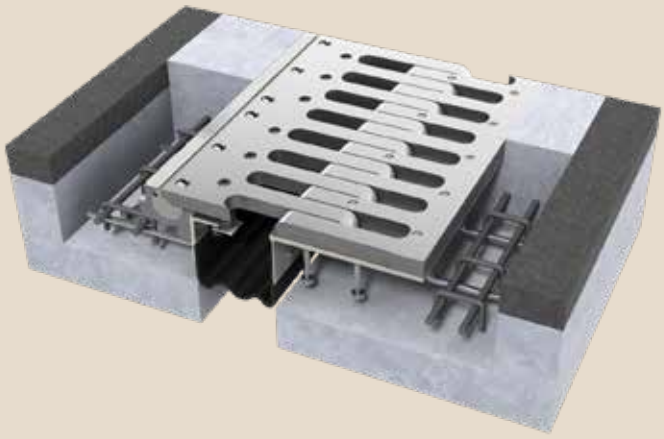
Section	Expansion	Ordinary	Shrinkage
	 Preventing sag due to debris when top wrinkle rubber expands		 During closing, the bottom wrinkle rubber pushes the top wrinkle rubber which pushes the debris upward
Plan Diagram			

ERJ BAS®Earthquake-resistant Expansion Joint

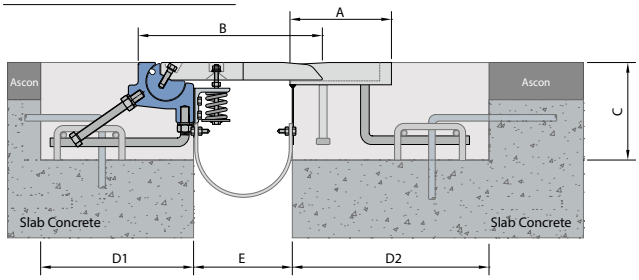
Use : Longitudinal Movement Bridge Joint

Movement range : 160 mm to ~ 1000mm

Applicability : Suitable for a bridge requiring earthquake-resistance or tri-axial (all direction) movement.
Long span and/or curved bridges



ERJ Sectional Diagram



ERJ Specification

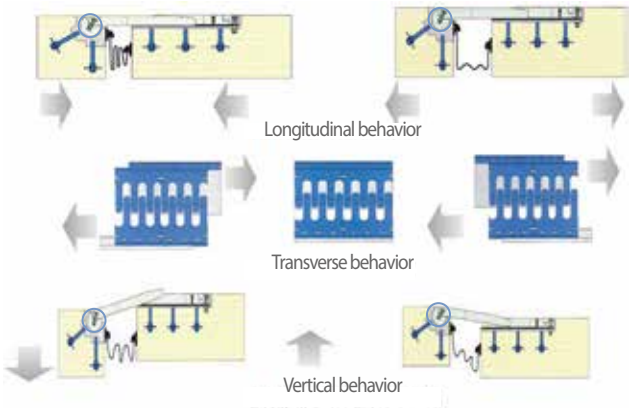
(Unit : mm)

Model	Max.Allowable Movement range	Product Data A	Product Data B	Block-out C	Block-out D2	Block-out D1	Laying gap(E) Min	Laying gap(E) Avg	Laying gap(E) Max	BOLT(per M)	Amount of Reinforcement (Kg)	Concrete (Per M) M^3
BASERJ-160	160	260	472	300	650	500	90	170	250	M16*55, 6EA	17.90	0
BASERJ-250	250	310	522	300	700	500	90	215	340	M16*55, 6EA	17.90	0
BASERJ-300	300	360	572	300	750	500	90	240	390	M18*55, 6EA	17.90	0
BASERJ-400	400	460	672	300	850	500	90	290	490	M20*55, 6EA	17.90	0
BASERJ-500	500	560	772	300	950	500	90	340	590	M20*55, 6EA	17.90	0
BASERJ-600	600	660	872	300	1050	500	90	390	690	M24*55, 6EA	17.90	0
BASERJ-700	700	760	972	300	1150	500	90	440	790	M24*55, 6EA	17.90	0
BASERJ-800	800	860	1072	300	1250	500	90	490	890	M24*55, 6EA	17.90	0

- The product specifications shown are standard and can be customised to suit the specifications and characteristics of a bridge.
- Skew angles and various transistions can be catered for during design.

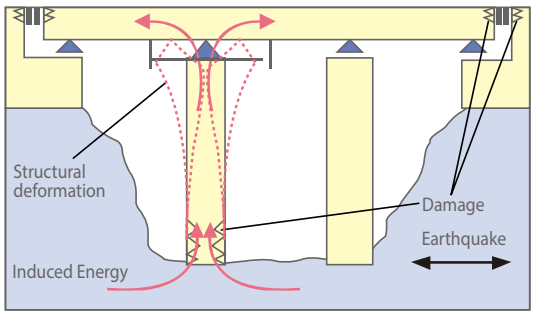
Skew angle example

ERJ Behavior



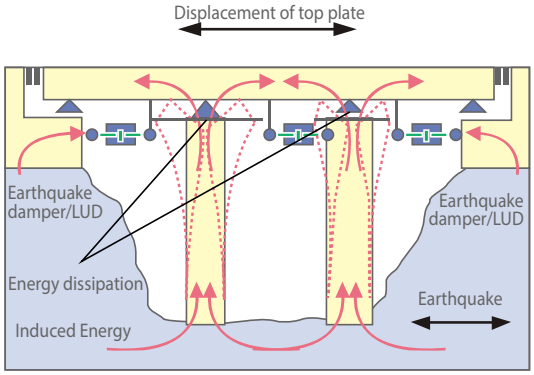
3-axes movement test rig

Earthquake-Resistant System on Bridge



1. No application of Earthquake Resistant System

Earthquake energy flows intensively into the structure and can damage the rigid axle structure.



2. Application of Earthquake Resistant System

Exhausts energy and blocks earthquake. Small energy inflows to structure and minimises/mitigates the remaining energy effectively.

ERJ systems can be used for:

1) New bridge designs 2) Reinforced ER design of existing bridge 3) Skew conditions
4) Long-span bridges 5) Curved bridges (if internal and external movement requirements are different)

Comparison to Others

	BAS®ERJ	Other earthquake-resistant EJ (MEJS)	Other earthquake-resistant EJ (Biaxial behavior finger type)
Structure	• Simple	• Complicated	• Complicated
Summary	• Movement range: 160mm to ~1000mm • Material : Aluminum Alloy + Steel • Structure : Separable steel and rubber seal, hinge type finger plate format	• Movement range : 80 to ~1,000mm • Material : Steel • Structure : Support beam format	• Movement range : 80 to ~1,000mm • Material : Steel • Structure : Rotary type finger format
Movement Characteristics	• Sufficient movement in X, Y and Z axes	• Limited movement allowance for X, Y and Z	• Acceptable X and Y axes behavior but uncertain of acceptable displacement for vertical behavior. Individual finger rotates and partial damage may occur.
Reparability	• Easy, partial-repair of unit structure. • No damages to ERJ structurural members during earthquake • Allows traffic immediately after the seismic force is extinguished • Recovers to original state without repair after earthquake • No traffic control nor public distrubtion for rubber seal replacement	• Partial repairs are hard due to integrated design to the width of a bridge. • EJ damage occurs at the limit of Z axis during earthquake • Only damaged rubber seals can be replaced after earthquake • Generates public complaints due to traffic control needed to replace the rubber seal • Difficult to do partial replace any steel that is damaged	• Repairs possible with individual finger layout, but non- shrink material may be damaged • Finger damage may occur due to vertical movement during an earthquake • Fingers breaking due to bolt release with finger of cantilever structure • Reinstallation is required when fingers are damaged after an earthquake • Generates public disturbance due to traffic control for rubber seal replacement (overall traffic control)
Construction	• Simple construction with simple structure	• Requires heavy equipment for installation due to integrated structure. • Precise construction is required	• Simple construction with simple structure
Driving Comfort	• Comfortable driving with finger type structure	• Noisy and less comfortable driving is possible, due to non-continuious road surface	• Comfortable driving with finger type structure
Economic	• Good	• Average	• Average

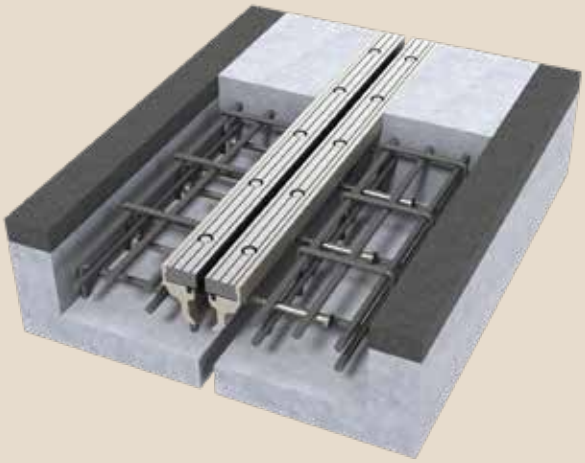
Rail Type

LRJ BAS®Long-Run Rail Expansion Joint

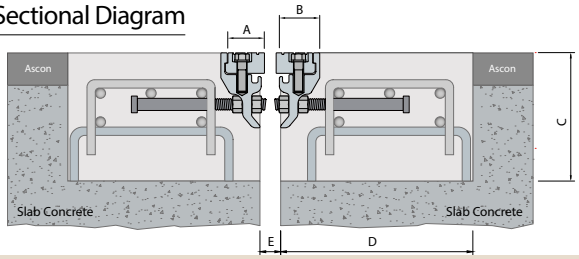
Use : Longitudinal Movement Bridge Joint

Movement range : 20mm ~ 100mm

Applicability : For small longitudinal movements.
Also suitable for orientation along the bridge deck length, due to no practical longitudinal movement limitations.



LRJ Sectional Diagram



LRJ Specification

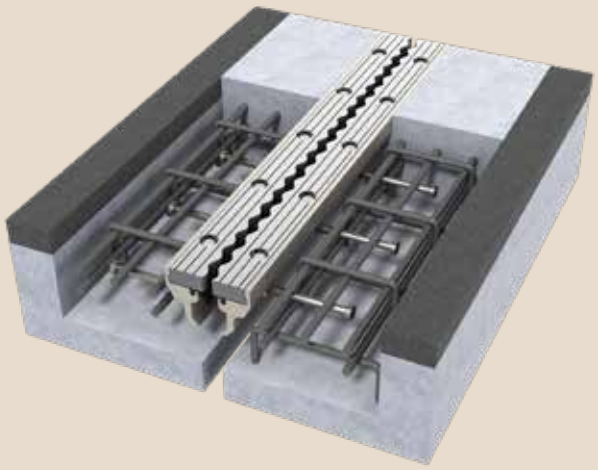
(Unit : mm)

Model	Max.Allowable Movement range	Product Data		Block-out		Laying gap(E)			BOLT(per M)	Amt. of Reinforcement (Kg)	Concrete (Per M) M^3
		A	B	C	D	Min	Avg	Max			
BASLRJ-20	20	57	63	200	300	10	20	30	M14*45,10EA	19.60	0.12
BASLRJ-40	40	57	63	200	300	10	30	50	M14*45,10EA		0.12
BASLRJ-60	60	57	63	200	300	10	40	70	M14*45,10EA		0.12
BASLRJ-80	80	57	63	200	300	10	50	90	M14*45,10EA		0.12
BASLRJ-100	100	57	63	200	300	10	60	110	M14*45,10EA		0.12

• The product specifications shown are standard and can be customised to suit the specifications and characteristics of a bridge.

Rail Type

LMJ BAS®Long-Run Monocell Expansion Joint

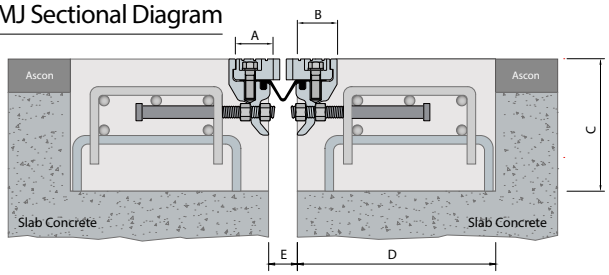


Use : Longitudinal Movement Bridge Joint

Movement range : 20mm ~ 100mm

Applicability : Suitable for small movement, less noise, improved durability.

LMJ Sectional Diagram



LMJ Specification

(Unit : mm)

Model	Max.Allowable Movement range	Product Data		Block-out		Laying gap(E)			BOLT(per M)	Amount of Reinforcement (Kg)	Concrete (Per M) M^3
		A	B	C	D	Min	Avg	Max			
BASLMJ-20	20	67	63	200	300	20	30	40	M14*45,10EA	19.60	0.12
BASLMJ-40	40	67	63	200	300	20	40	60	M14*45,10EA		0.12
BASLMJ-50	50	67	63	200	300	20	45	70	M14*45,10EA		0.12
BASLMJ-60	60	67	63	200	300	20	50	80	M14*45,10EA		0.12
BASLMJ-80	80	67	63	200	300	20	60	100	M14*45,10EA		0.12
BASLMJ-100	100	82	73	200	300	20	70	120	M14*45,10EA		0.12

• The product specifications shown are standard and can be customised to suit the specifications and characteristics of a bridge.

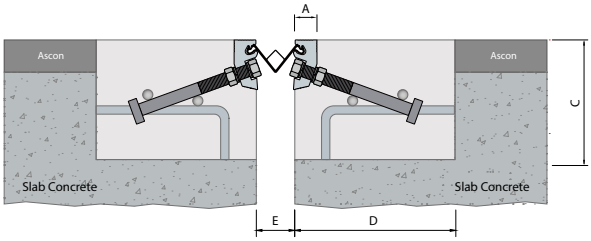
LCRJ BAS®Long-Run Compact Rail Expansion Joint

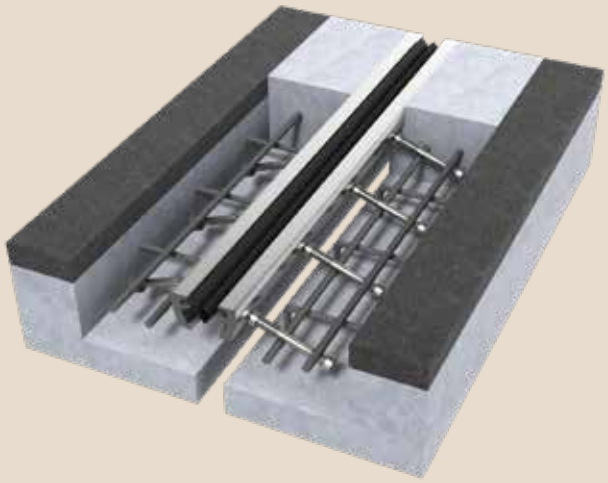
Use : Longitudinal, Transvers EJ

Movement range : 20mm ~ 100mm

Applicability : For small longitudinal movements.
Also suitable for orientation along the bridge deck length, due to no practical longitudinal movement limitations.

LCRJ Sectional Diagram





LCRJ Specification

(Unit : mm)

Model	Max.Allowable	Product Data	Block-out		Laying gap(E)			Concrete (Per M) M^3
	Movement range	A	C	D	Min	Avg	Max	
BASLCRJ-20	20	34	200	250	10	20	30	0.10
BASLCRJ-30	30	34	200	250	10	25	40	0.10
BASLCRJ-40	40	34	200	250	10	30	50	0.10
BASLCRJ-50	50	34	200	250	10	35	60	0.10
BASLCRJ-60	60	34	200	250	10	40	70	0.10
BASLCRJ-80	80	34	200	250	10	50	90	0.10
BASLCRJ-100	100	34	200	250	10	60	110	0.10

• The product specifications shown are standard and can be customised to suit the specifications and characteristics of a bridge.

Foothpath Finishing

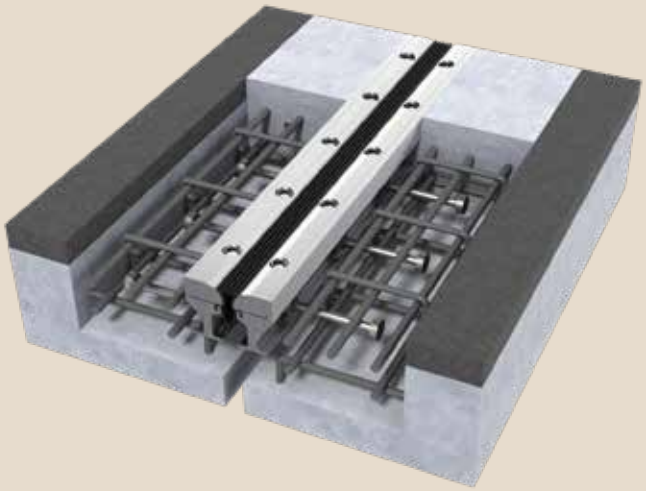
Installation Example

LHAJ BAS®Long-Run Height Adjustment Joint

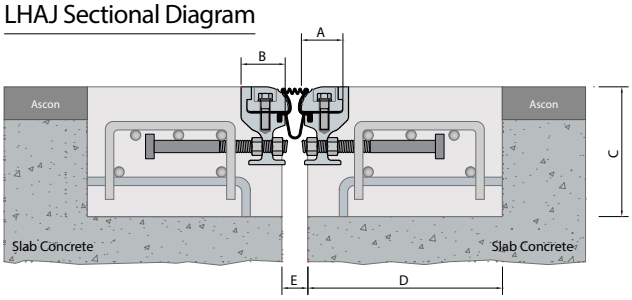
Use : For vertical adjustments along the length of a bridge

Movement range : 20 to ~80mm

Applicability : Suitable for extended lane bridges or bridges that are expected to experience height differences between decks while in service.



LHAJ Sectional Diagram



LHAJ Specification

(Unit : mm)

Model	Max Allowable Movement range		Product Data		Block-out		Laying gap(E)			BOLT(per M)	Amount of Reinforcement (Kg)	Concrete (Per M) M^3
	Horizontal	Vertical	A	B	C	D	Min	Avg	Max			
BASLHAJ-20	20	20	64	68	200	300	40	50	60	M14*45,10EA	19.10	0.12
BASLHAJ-40	20	40	64	68	200	300	40	50	60	M14*45,10EA	19.10	0.12
BASLHAJ-60	20	60	64	68	200	300	40	50	60	M14*45,10EA	19.10	0.12
BASLHAJ-80	20	80	64	68	200	300	40	50	60	M14*45,10EA	19.10	0.12

• The product specifications shown are standard and can be customised to suit the specifications and characteristics of a bridge, including amount of steel reinforcement and type /number of anchors, different heights and changes of A and B values.

• To determine the required movement, the transverse , longitudinal, and vertical behaviour needs to be considered (with a margin of 10mm)

To determine the required movement, the transverse , longitudinal , and vertical behaviour needs to be considered (with a margin of 10mm)

LHAJ Plan

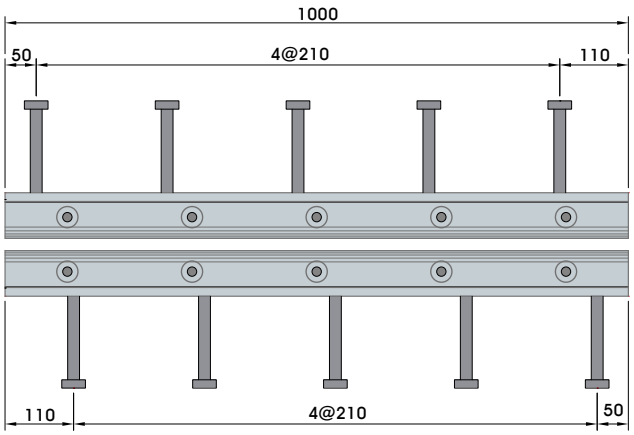
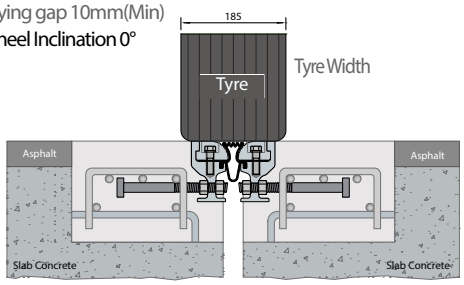
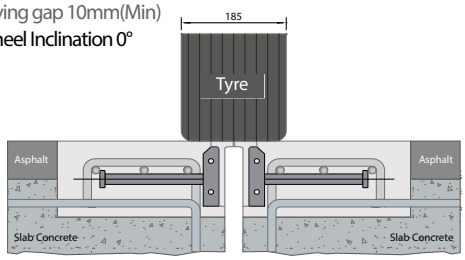
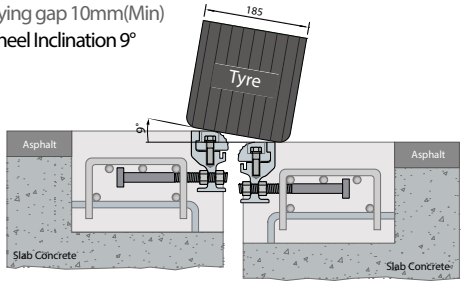
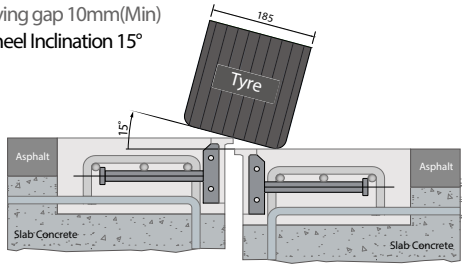
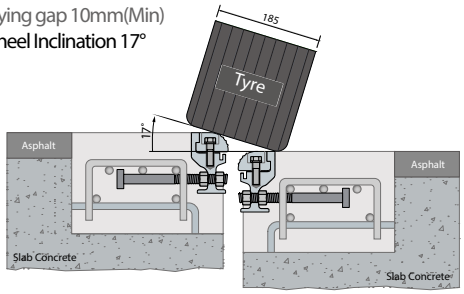
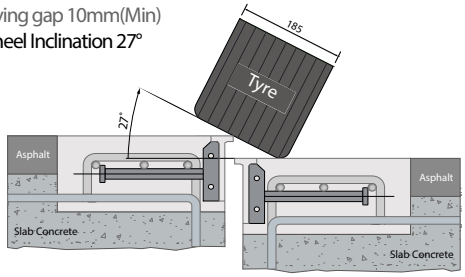
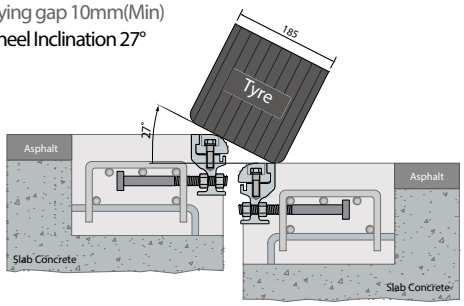
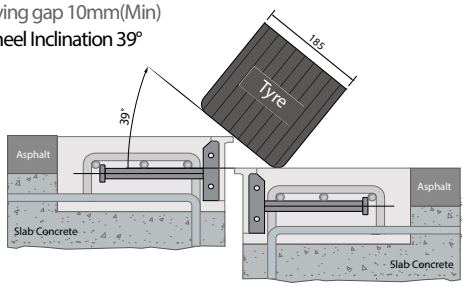


Diagram of Wheel Condition

	BAS®LHAJ	Other EJ
CASE-1	Height Difference 0mm Laying gap 10mm(Min) Wheel Inclination 0° 	Height Difference 0mm Laying gap 10mm(Min) Wheel Inclination 0° 
CASE-2	Height Difference 20mm Laying gap 10mm(Min) Wheel Inclination 9° 	Height Difference 20mm Laying gap 10mm(Min) Wheel Inclination 15° 
CASE-3	Height Difference 40mm Laying gap 10mm(Min) Wheel Inclination 17° 	Height Difference 40mm Laying gap 10mm(Min) Wheel Inclination 27° 
CASE-4	Height Difference 60mm Laying gap 10mm(Min) Wheel Inclination 27° 	Height Difference 60mm Laying gap 10mm(Min) Wheel Inclination 39° 

Benefits

The BAS®LHAJ system over comes some of the issues encountered when using a standard EJ for varying height difference:

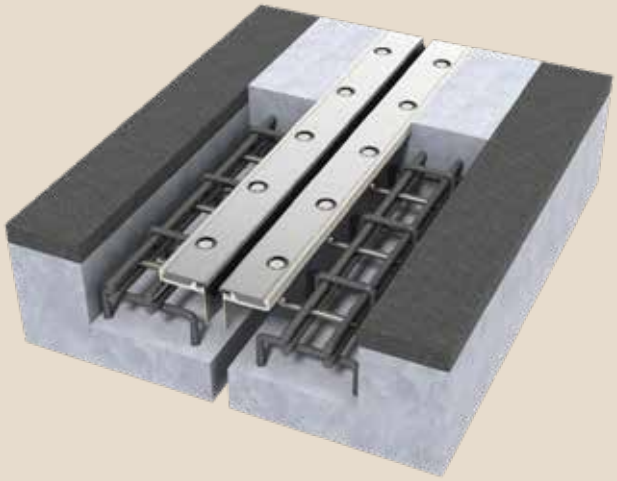
1. CASE-2, 3 and 4, show about 2 times the incline occuring when a normal EJ is used over the BAS®LHAJ system
2. When using a normal EJ in poor (wet) conditions, the safety will be compromised by the lack of tyre footprint (traction) on the road surface.
3. Tyres are more likely to experience damage if a expansion joint designed for varying heights is not used.

LCJ BAS®Long-Run Culvert Expansion Joint

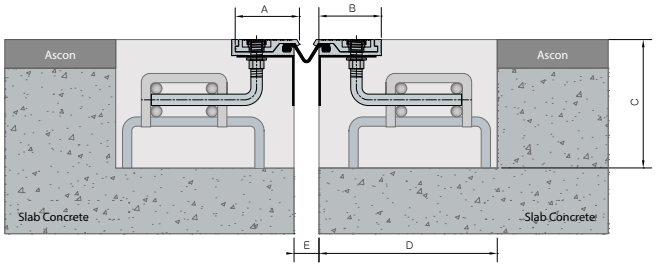
Use : Longitudinal & Transverse Movement
Bridges
Expansion Joint for Culverts

Movement range : 20 mm to ~ 100mm

Applicability : Suitable for small longitudinal movements For EJ along the deck length
Bridges / culverts that require waterproofness



LCJ Sectional Diagram



LCJ Specification

(Unit : mm)

Model	Max.Allowable Movement range	Product Data A	Product Data B	Block-out C	Block-out D	Laying gap(E) Min	Laying gap(E) Avg	Laying gap(E) Max	Amount of Reinforcement (Kg)	Concrete (Per M) M^3
BASLCJ-20	20	90	87.5	180	250	20	30	40	14.80	0.09
BASLCJ-40	40	90	87.5	180	250	20	40	60	14.80	0.09
BASLCJ-60	60	90	87.5	180	250	20	50	80	14.80	0.09
BASLCJ-80	80	90	87.5	180	250	20	60	100	14.80	0.09
BASLCJ-100	100	90	87.5	180	250	20	70	120	14.80	0.09

- The above table shows our standard models and all aspects can be modified as required for your project.

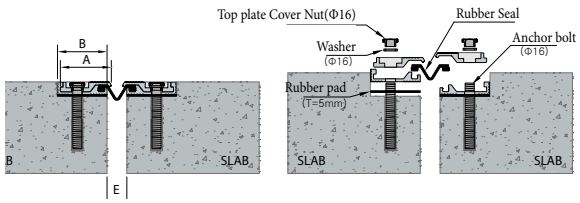
RWJ BAS®Railway Expansion Joint

Use : Railway Bridges

Movement range : 20 mm to ~ 100mm

Applicability : For railway bridges that require waterproof joints.
Where, fast, easy replacment of seals is desired to reduce maintenance costs.
Stainless Steel is also an option for this system.

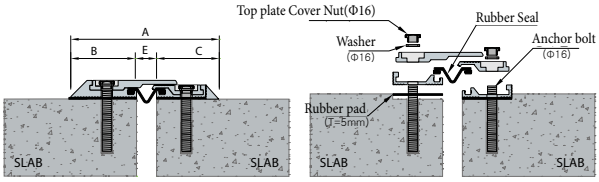
RWJ 1 (TYPE-1)



RWJ1 Specification (Unit : mm)

Model	Max.Allowable Movement range	Product Data A	Product Data B	Laying gap (E) Min	Laying gap (E) Avg	Laying gap (E) Max
BASRWJ1-20	20	90	87.5	20	30	40
BASRWJ1-40	40	90	87.5	20	40	60
BASRWJ1-60	60	90	87.5	20	50	80
BASRWJ1-80	80	90	87.5	20	60	100
BASRWJ1-100	100	90	87.5	20	70	120

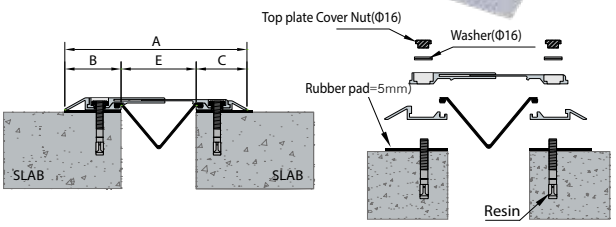
RWJ 2 (TYPE-2)



RWJ2 Specification (Unit : mm)

Model	Max.Allowable Movement range	Product Data A	Product Data B	Product Data C	Laying gap(E) Min	Laying gap(E) Avg	Laying gap(E) Max
BASRWJ2-20	30	286	135	121	20	30	40
BASRWJ2-40	50	306	135	121	20	40	60
BASRWJ2-50	60	316	135	121	20	50	80
BASRWJ2-60	70	326	135	121	20	50	80
BASRWJ2-80	90	346	135	121	20	60	100
BASRWJ2-100	110	395	135	150	20	70	120
BASRWJ2-120	130	415	135	150	20	80	140
BASRWJ2-135	145	430	135	150	20	87.5	155
BASRWJ2-150	160	475	135	180	20	95	170

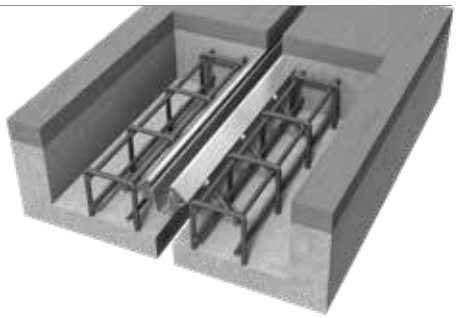
RWJ 3 (TYPE-3)

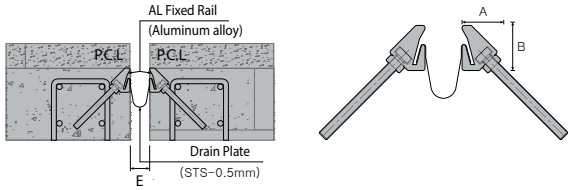


RWJ3 Specification (Unit : mm)

Model	Max.Allowable Movement range	Product Data B	Product Data C	Product Data A	Laying gap(E) Min	Laying gap(E) Avg	Laying gap(E) Max
BASRWJ3-20	30	135	121	286	20	30	40
BASRWJ3-40	50	135	121	306	20	40	60
BASRWJ3-50	60	135	121	316	20	50	80
BASRWJ3-60	70	135	121	326	20	50	80
BASRWJ3-80	90	135	121	346	20	60	100
BASRWJ3-100	110	135	121	366	20	70	120
BASRWJ3-120	130	135	121	386	20	80	140
BASRWJ3-135	145	135	121	401	20	87.5	155
BASRWJ3-150	160	135	121	416	20	95	170

RWJ 4 (TYPE-4)





RWJ4 Specification (Unit : mm)

Model	Max.Allowable Movement range	Product Data A	Product Data B	Laying gap(E) Min	Laying gap(E) Avg	Laying gap(E) Max
BASRWJ4-20	20	47	60	20	30	40
BASRWJ4-40	40	47	60	20	40	60
BASRWJ4-60	60	47	60	20	50	80
BASRWJ4-80	80	47	60	20	60	100
BASRWJ4-100	100	47	60	20	70	120

- The width of EJ can be changed to accomodate additional movements if required.

BUILDING AND SPAN
EXPANSION JOINTS (NZ)

BAS EXPANSION JOINTS (NZ)
PO BOX 84-177, Westgate 0652
Auckland,
NEW ZEALAND

Phone: 0800SPAN-IT
Email: admin@expansion-joint.co.nz
Web: www.expansion-joint.co.nz