

EXPANSION JOINT FOR BRIDGES



Interbuna S.L. Spain

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San Sebastian Moraleja De Enmedio
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CERTIFICATE



Management system as per
EN ISO 9001 : 2008

In accordance with TÜV NORD CERT procedures, it is hereby certified that

Interbuna S.L.
C/ Orense, 68-3° A
28020 Madrid
Spain

applies a management system in line with the above standard for the following scope

Sales of rubber parts

Certificate Registration No. 44 100 130835-002
Audit Report No. 3512 0124

Valid until 2019-07-24

G. Bräutigam
Certification Body
at TÜV NORD CERT GmbH

Essen, 2013-07-25

This certification was conducted in accordance with the TÜV NORD CERT auditing and certification procedures and is subject to regular surveillance audits. This certificate is valid in conjunction with the main certificate.

TÜV NORD CERT GmbH

Langemarckstrasse 20

45141 Essen

www.tuev-nord-cert.com



TGA-ZM-07-06-00

ASQPE**CERTIFICAT DE
CONFORMITÉ****CE****N° 1683 - CPD - 0012****APPAREILS D'APPUI STRUCTURAUX EN ELASTOMERE****Certificat de conformité délivré par l'organisme certificateur : ASQPE**

Numéro d'identification : 1683

Adresse : ASQPE 58 boulevard Lefebvre 75732 Paris Cedex 15

Fabricant : CACESAAdresse : Carretera de Humanes, km 0,800
E-28944 Fuenlabrada - Madrid (Espagne)**Site de production : CACESA**Adresse : Polígono industrial San Sebastián C/Lomo, 2
E-28950 Moraleja de Enmedio - Madrid (Espagne)**Produits certifiés : Appareils d'appui en élastomère**

Dans le cadre de la mise en application de la Directive 89/106/CEE du Conseil des Communautés Européennes du 21 décembre 1988, relative au rapprochement des dispositions législatives, réglementaires et administratives des Etats Membres, concernant les produits de construction (Directive Produits de Construction – DPC), modifiée par la Directive 93/68/CEE du Conseil des Communautés Européennes du 22 juillet 1993, il a été établi que :

les appareils d'appui en élastomère « type A » et « type » B, composés soit de caoutchouc naturel de module G égal à 0.9 MPa, soit de caoutchouc naturel de module G égal à 0.9 MPa avec un enrobage de polychloroprène, avec des frettes d'acier nuance S235JRG2 (EN 10025), pour une température de service minimale de -25° C et une capacité de rotation statique déterminée sur la base de l'essai sous charge excentrée, produits par :

la Société « Caucho Celular del Centro, S.A. » (CACESA)

ont été soumis aux essais de type initiaux et que le fabricant assure un contrôle de la production en usine conforme aux exigences de l'annexe ZA de la norme EN 1337-3 pour des appareils d'appui selon le système 1 « utilisation critique ».

L'organisme notifié ASQPE a réalisé l'inspection initiale de l'usine et a vérifié la mise en place du contrôle de la production. Ce certificat atteste que les essais de type initiaux réalisés sur des appareils d'appui issus de la production de l'usine de Moraleja de Enmedio ont satisfait les exigences prescrites dans la partie harmonisée de la norme EN 1337-3.

Ce certificat est délivré pour la première fois le 20 août 2010 et, sauf retrait ou suspension, demeure valide tant que les conditions précisées dans la spécification technique de référence, les conditions de fabrication en usine ou le contrôle de la production en usine lui-même ne sont pas modifiés de manière significative.

Délivré à Paris, le 20/08/2010

le Président de l'ASQPE

ASQPE

Jacky SEANTIER

ASQPE (Association Pour la Qualification de la Précontrainte et des Equipements des Ouvrages et de Génie Civil)
58, Boulevard Lefebvre - 75732 Paris cedex 15 - Tél: 33 (0)1 40 43 53 04 - Fax: 33 (0)1 40 43 65 22 - www.asqpe.fr



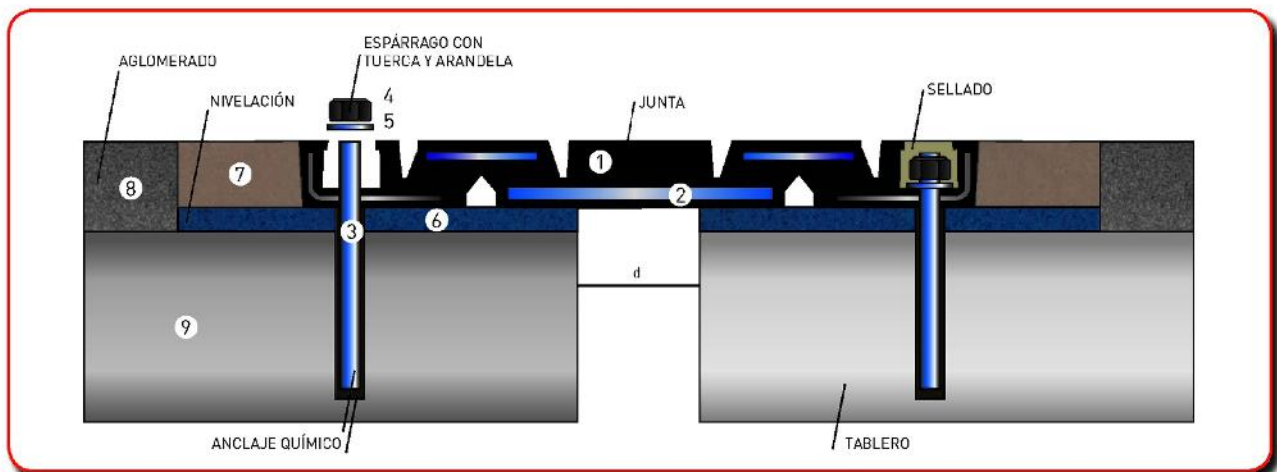
RUBBER ELASTOMERIC JOINTS

Description

The reinforced elastomeric joint is a device which allows relative movements between two parts of a structure. To succeed, a joint must accomplish the following functions:

- Assure freedom of deck's movements.
- Provide continuity to the wearing course and be capable to support the traffic loads.
- Be able to avoid noise, impacts and vibrations.
- Have good sealing properties and allow surface water evacuation.

The basic construction of these Reinforced Elastomeric Joints is molded rubber reinforced with steel. This elastomeric material is formulated to provide elasticity, strength required to transfer traffic loads and avoid its bending when absorbing movements. The set is anchored to the structure by bolts. The steel anchoring bolts are fastened to the structure with epoxy resins and tightened by zinc washers and self-locking nuts. Once the mechanical fixing is placed, they are sealed in order to provide continuity to the wearing course.



Main features

Each model has been carefully designed to bear extreme conditions of work.

Every joint module has been put under long compression and expansion cycles, measuring the stress required to compress or expand the values for which each joint has been designed.

Movements slightly higher than the theoretical values of the design have not affected the joint work after the test performance. Cracks, breaks or metal rubber detachments have not been observed.

The rubber trapezium, placed between the metal profiles of each module, absorbs the stress in compression and expansion process, transmitting less stress to anchoring than other joint models.

Furthermore, the rubber-metal adhesion is guaranteed to be higher than 30 kg/inch, often reaching values of 40-60 kg/inch, allowing these joints to absorb higher stress than normal.

Joints manufacturing is performed under the Certified System according to ISO 9001-2008.

Manufacturing process starts by mixing the different materials, comprising the elastic element. This takes place in a mixer with automatic dosage, to avoid human mistakes occasionally made when weighting the different components.

Every resultant mixture is analyzed by the laboratory, to assure that its reometric bends match the original ones, and the mixtures are maintained within tolerances.

Following ISO 9001-2000 different controls are periodically performed to obtain ripens values, break load results, etc.

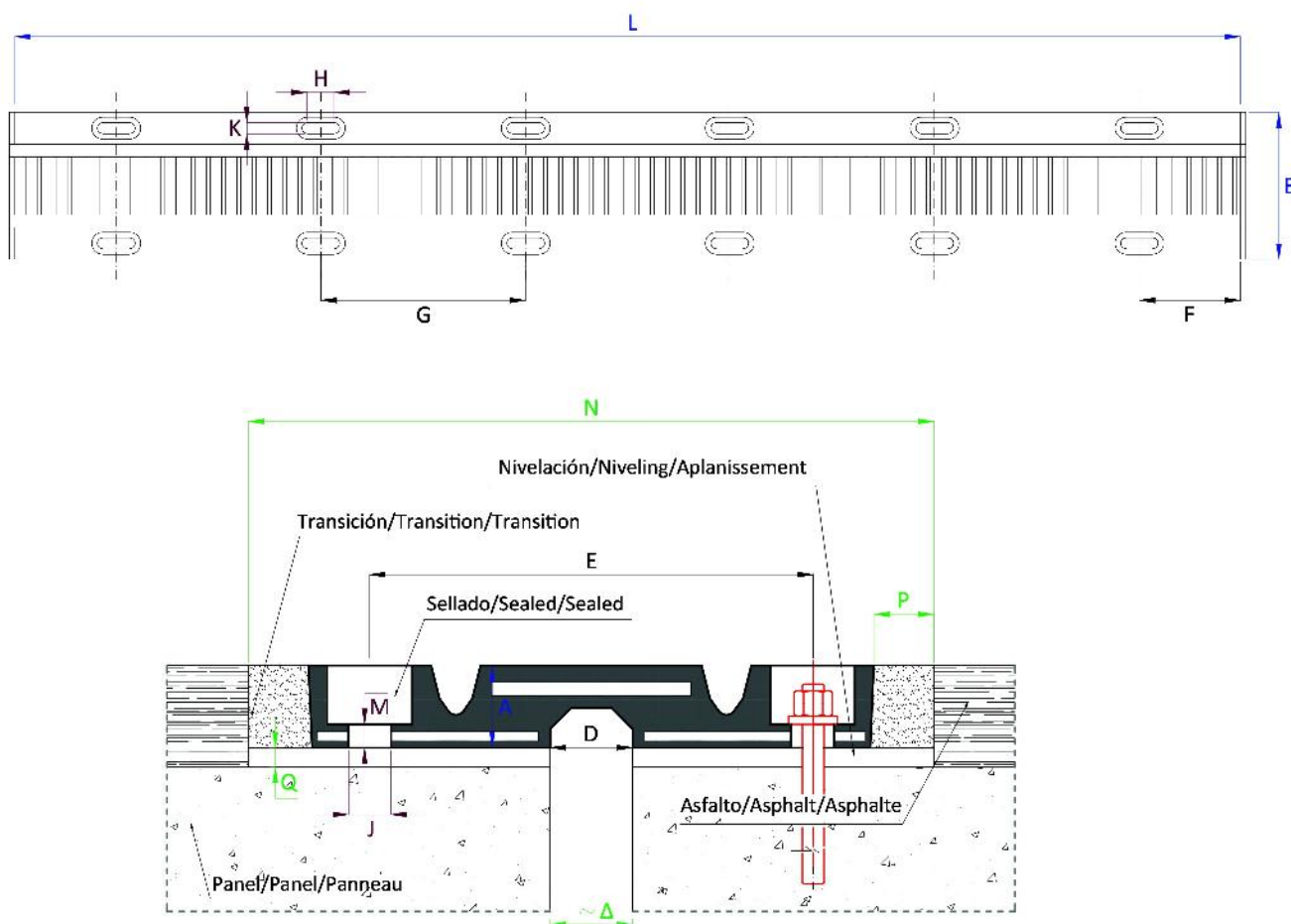
By sandblasting the metal parts are cleaned of any grease or corrosion up to a degree SA 2,5. The moulding process starts by checking the mould condition. When it is correct, the metal parts and rubber performs are loaded and the pressing operation takes place.

Finally, and when the vulcanization process is completed, the pieces are extracted, flogged and checked as for their hardness, dimensional measures and condition of metal parts, specially as for their parallelism or distance to the external side of pieces.

JUNTAS DE DILATACIÓN / EXPANSION JOINTS / JOINT DE CHAUSSE

tipo / type / type : **REJ**

Movimiento medio / Medium movement / Moyen Mouvement



Referencia	Movimiento Movement Mouvement (mm)	Peso Weight Poids (kg)	Dimensiones / Dimensions / Dimensions (mm)										
			*A	B	L	D	E	F	G	H	J	K	M
42	±22	33	35	240	2000	35	188	165	334	36	15	36	6
52	±26	37	40	270	1829	50	220	152	305	40	18	40	8
70	±35	62	45	356	1829	70	280	152	305	40	15	40	10
80	±40	85	54	432	1829	86	342	152	305	57	22	57	8

Referencia	Instalación / Installations / Installation				Anclajes / Anchors / Ancre		
	Ancho corte Cutting width Largeur coupe (N)	*Ancho transición Transition width Largeur Transition (P)	Alta nivelación Levelling height Epaisseur de nivelation (Q)	GAP (Δ)	Cantidad Quantity Montant	Metrica x long. Metric x long. Métrique x long. (mm)	Par apriete Tightening torque Torque (Nm)
42	380	50	50	35	12	M-14 x 200	70
52	420	50	50	50	12	M-14 X 200	70
70	500	70	70	70	12	M-16 X 200	90
80	580	80	80	86	12	M-18 x 200	120

*Nota: El espesor de la transición coincide con la altura "A" / the thickness of the transition coincides with the height A / L'épaisseur de la transition coïncide avec la hauteur A.



link shahpur kanjran to Raiwind Road



Bridge Over New Railway Crossing at Kahna Kacha



Khushal Garh Bridge Project



New Khanki Barrage Project



REJ - 42



REJ - 50



REJ - 52



REJ - 80



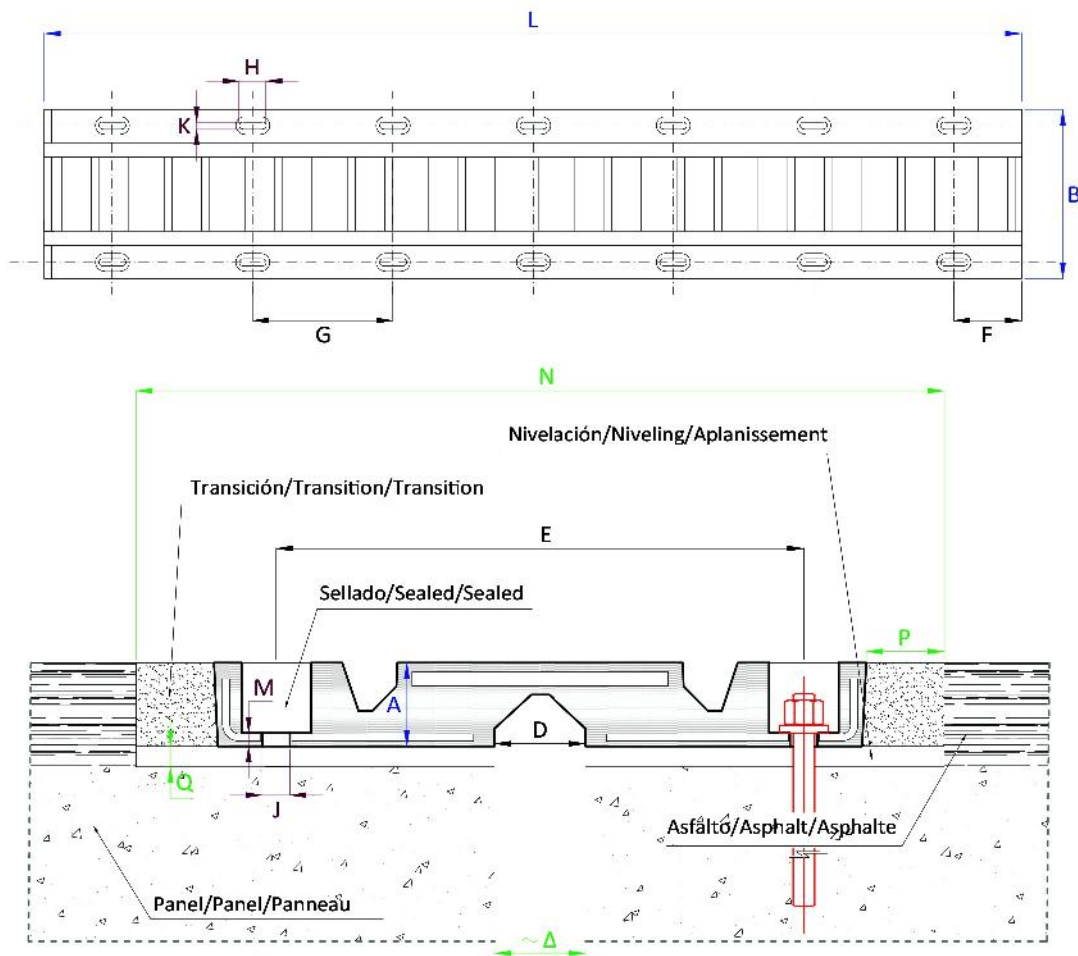
REJ - 230



REJ - 330

JUNTAS DE DILATACIÓN / EXPANSION JOINTS / JOINT DE CHAUSSE

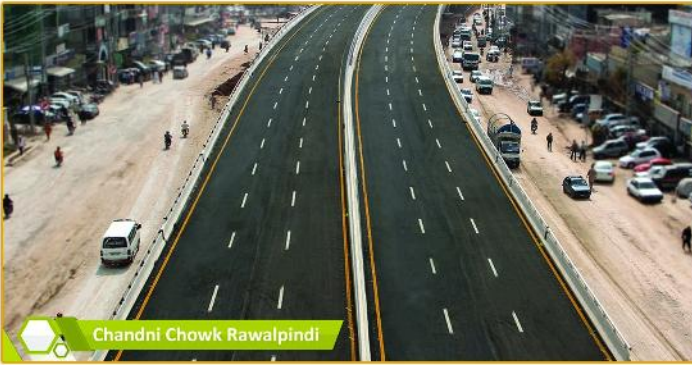
tipo / type / type : **EJN**
Movimiento medio / Medium movement / Moyen Mouvement



Referencia	Movimiento Movement Mouvement (mm)	Peso Weight Poids (kg)	Dimensiones / Dimensions / Dimensions (mm)										
			*A	B	L	D	E	F	G	H	J	K	M
80	±40	61,5	47	356	2000	50	288	288	287	55	17	37	7,5
100	±50	76,5	54	405	2000	70	318	318	287	55	19	47	8,5
140	±70	121,0	71	490	2000	90	402	402	287	55	19	47	8,5
160	±80	151,5	82	520	2000	100	432	432	287	55	19	47	8,5

Referencia	Instalación / Installations / Installation				Anclajes / Anchors / Ancre			
	Ancho corte Cutting width Largeur coupe (N)	*Ancho transición Transition width Largeur Transition (P)	Alta nivelación Levelling height Epaisseur de nivelation (Q)	GAP (Δ)	Cantidad Quantity Montant	Metrica x long. Metric x leng. Métrique x long. (mm)	Par apriete Tightening torque Torque (Nm)	
80	500	70	70	42	14	M-16 x 200	90	
100	560	80	80	50	14	M-18 X 200	120	
140	640	80	90	70	14	M-18 X 200	120	
160	670	80	100	80	14	M-18 x 200	120	

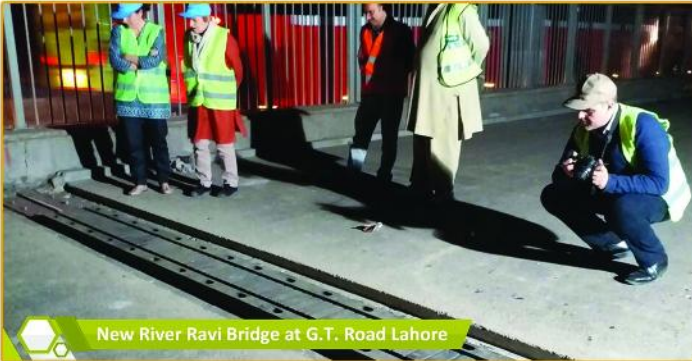
*Nota: El espesor de la transición coincide con la altura "A" / the thickness of the transition coincides with the height A / L'épaisseur de la transition coïncide avec la hauteur A.



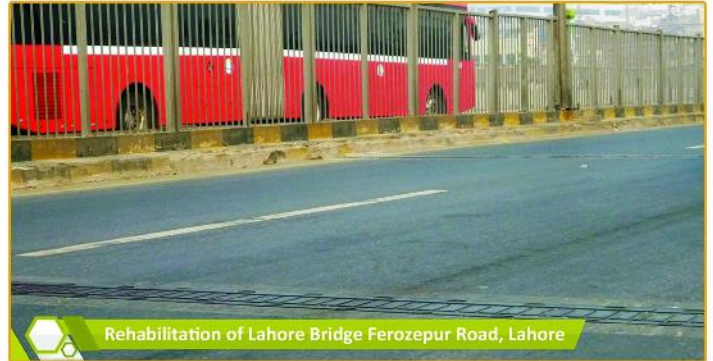
Chandni Chowk Rawalpindi



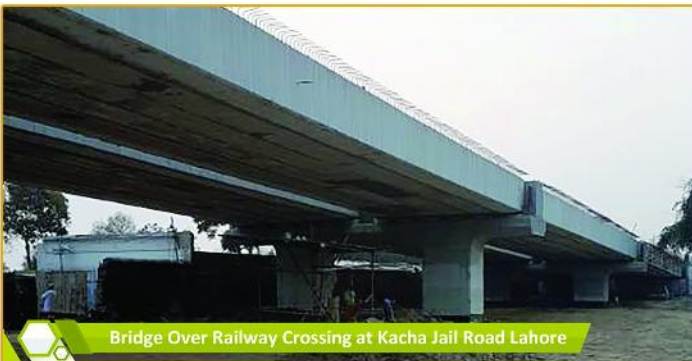
Canal Expressway, Faisalabad



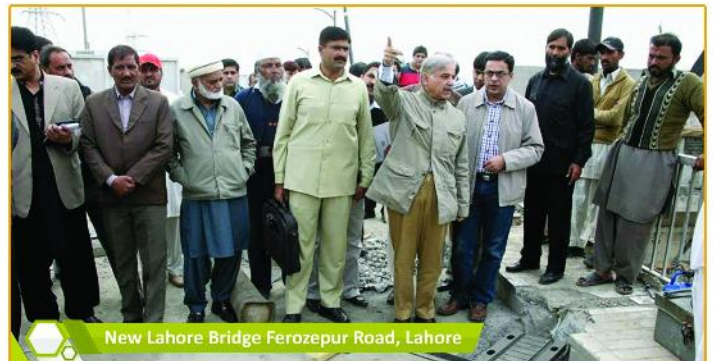
New River Ravi Bridge at G.T. Road Lahore



Rehabilitation of Lahore Bridge Ferozpur Road, Lahore



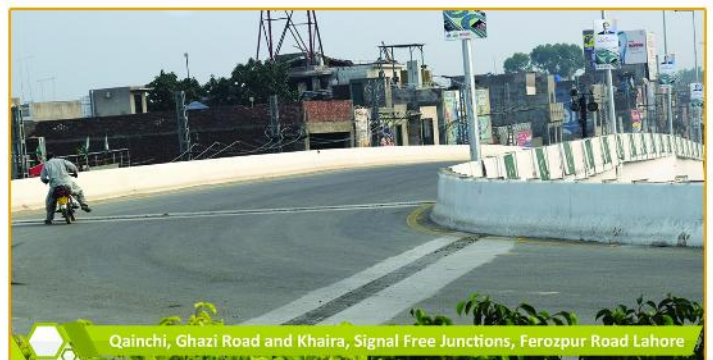
Bridge Over Railway Crossing at Kacha Jail Road Lahore



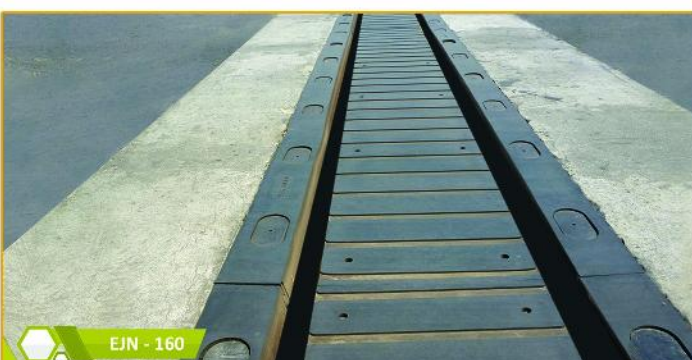
New Lahore Bridge Ferozpur Road, Lahore



EJM - 80



Qainchi, Ghazi Road and Khaira, Signal Free Junctions, Ferozpur Road Lahore



EJM - 160

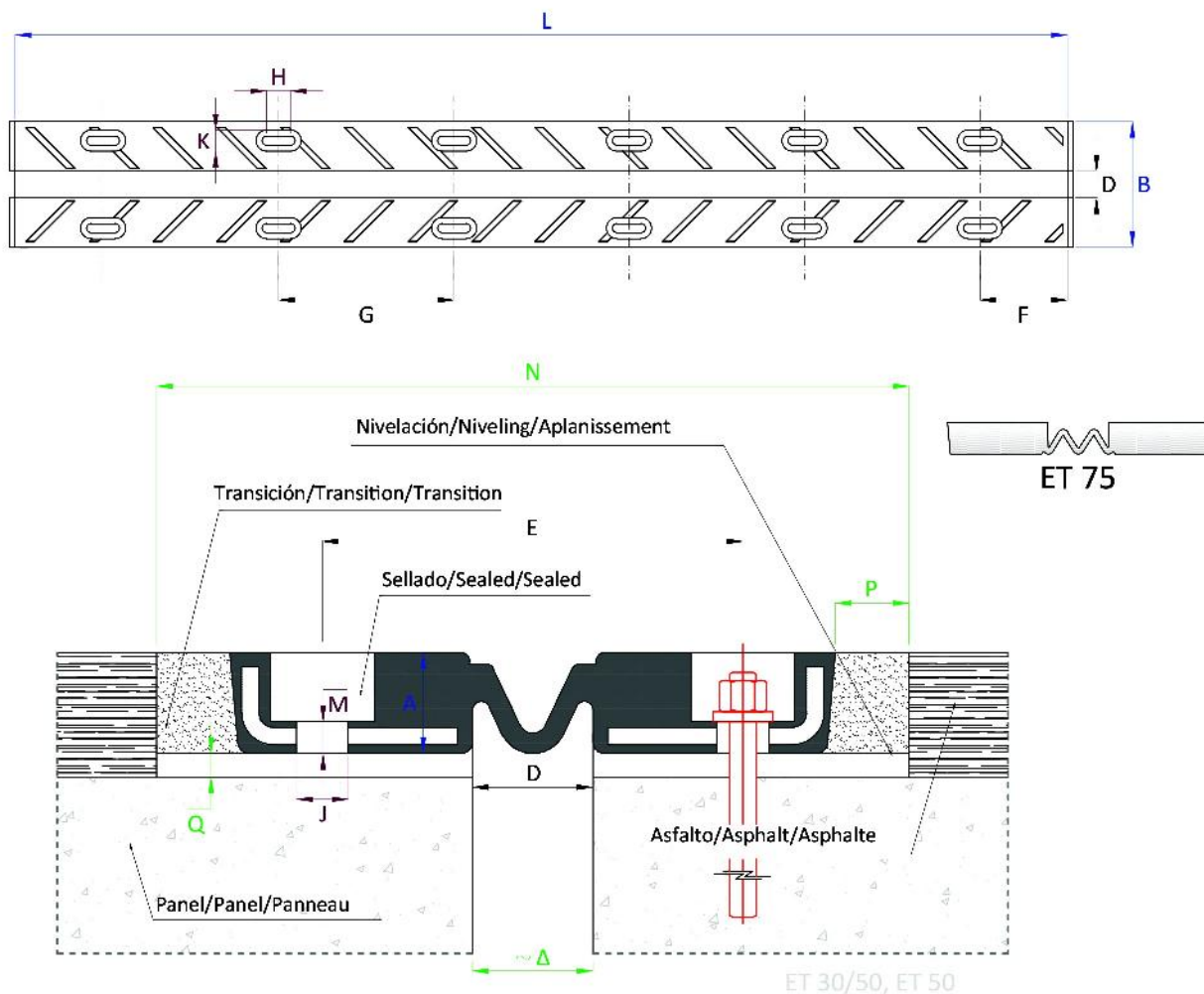


EJM - 330

JUNTAS DE DILATACIÓN / EXPANSION JOINTS / JOINT DE CHAUSSE

tipo / type / type : ET

Movimiento pequeño / Little movement / Petit Mouvement



Referencia	Movimiento Movement Mouvement (mm)	Peso Weight Poids (kg)	Dimensiones / Dimensions / Dimensions (mm)										
			*A	B	L	D	E	F	G	H	J	K	M
30/50	±20	16.5	30	205	2010	50	140	165	334	36	20	40	7
50	±20	21.5	35	210	1752	42	146	146	292	44	18	55	11
75	±37	28	35	290	2000	77	200	280	288	38	15	55	6,5

Referencia	Instalación / Installations / Installation				Anclajes / Anchors / Ancre			
	Ancho corte Cutting width Largeur coupe (N)	*Ancho transición Transition width Largeur Transition (P)	Altura nivelación Levelling height Épaisseur de nivelation (Q)	GAP (Δ)	Cantidad Quantity Montant	Métrica x long. Metric x leng. Métrique x long. (mm)	Par apriete Tightening torque Torque (Nm)	
30/50	355	70	50	40	12	M-14 x 200	70	
50	340	70	50	42	12	M-14 X 200	70	
75	420	70	50	55	12	M-14 X 200	70	

*Nota: El espesor de la transición coincide con la altura "A" / the thickness of the transition coincides with the height A / L'épaisseur de la transition coincide avec la hauteur A.



New Islamabad International Airport NIIA



Sadhoki-Gujranwala GT Road C-08 Project



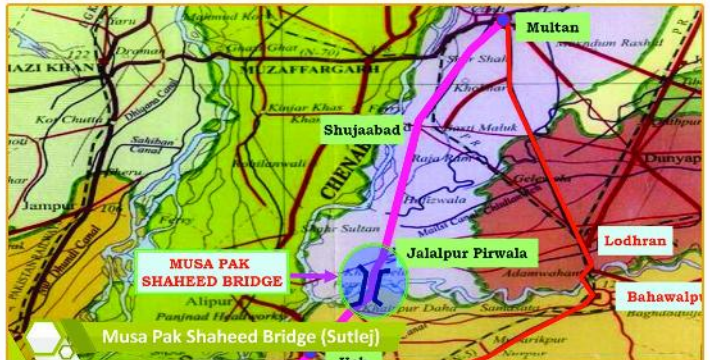
Hassan Abdal to Havelian Section of E-35 ICB P II (GRC)



Hassan Abdal to Havelian Section of E-35 ICB P I (A.M.ASSOCIATES)



Shaheen Chowk Flyover, Gujrat



Musa Pak Shaheed Bridge (Sutlej)



Karachi-Thatta Dual Carriageway (FWO)



Karachi-Thatta Dual Carriageway (ZK ASSOCIATES)



ET - 50



ET - 75

NHA Standards for Expansion Joint

ASTM Code	Test Discription	Methodology / Testing Method	Units	Satndard Values / Units
D-412	Tensile Strength	Standard	Kgs/cm2	127 (min)
	Elongation at break	Standard	Percent	400 (min)
D-2240	Hardness(Durometer-A)	Standard	Points	45 ± 5
D-395 METHOD-B	Compression Set	22Hrs at 70°C	Percent	20 (max)
D-746	Low temperature	At 40°C	Observation	Not Brittle
D-1149	Ozone resistance test	Exposure to 100 PPHM Ozone for 70 Hrs at 38°C. Sample under 20%	Observation	No cracks
D-470	Oil Deterioration	Volume increase after soaking in ASTM oil No. 3 for 70 Hrs at 100°C	Percent	120 (max)

INSTALLATION METHODOLOGY (A)

1. Construction and Function of the Expansion Joint

This expansion joint is a simplified version of modular Transflex Multiflex expansion joints for small movement capacities. The structure of the joint is a single gap joint type and consists of two edge profiles which are fastened above the reinforcement frame to the concrete structure. The horizontal and vertical forces are carried transmitted through edge structures and their anchoring into the adjacent concrete structures.

2. Movement Capacity of the Expansion Joint

The elastic sealing profile of the joint allows movements of the expansion joint in all 3 directions (e_x , e_y , and e_z) and rotations over all axes (x , y , and z).

3. Preparation of the Joint Gap (Recess)

The recess must be adjusted to the size and shape of the expansion Joint Check the existing reinforcement according to drawings. Missing reinforcement is to be replaced by steel rods (Rebar), which are placed at relevant depths. The recess shall be thoroughly cleaned. If required, the surface is to be roughened by picking. All loose material has to be removed with air pressure prior to concreting.

4. Shuttering Plates

The shuttering plates have to be installed in such a manner that they are close to the recess after lowering the expansion joint. If required, the plates should be attached to the reinforcement by using a fastening wire.

5. Filling of Gap

Fill the gap between deck slabs with Thermo pore sheets covered with ply from both sides. Thermo pore sheet thickness should be as per gap.

6. Preparation of Expansion joint (Assembling)

Prepare Expansion joint modules by assembling and installing the Anchoring system provided by the manufacturer accordingly. Expansion joints anchoring system may be available in shape of welded anchor bars or in shape of Nut+Bolts as in picture.

7. Placement of Expansion joint and Leveling

Place expansion joint on the block out and level using leveling bars as in pictures.

8. Concreting

Before applying the concrete, the position of the expansion joint has to be recorded. Only after proper installation the Engineer shall give permission to fill in the concrete.

INSTALLATION METHODOLOGY (B)

1. Asphalt Cut

Cut vertically the bituminous layer following the marked lines using a saw for concrete. The objective, is to create a recess deep.

The objective, is to create a recess deep and wide enough to accommodate the joint unit plus its level regulating screed and transition strips.

In any case the recess must reach the concrete deck but without cutting it.

2. Mortar Filling

Mix the material until it is well mixed. Remove the mix for the cement mixer and place it in the wheelbarrow. Pour it from the wheelbarrow into the joint very carefully level the bed properly placed before. Compact the mix with the help of a shovel and pass the appropriate pattern.

3. Laying of the Expansion Joints

Once the mortar has cured, modules will be placed centre in the structural opening, trying to fit all the modules thanks to the groove end of the pieces.

With the help of the drill, mark the points where the holes will be done later. Once the holes have been marked, put the modules aside and complete drilling, once the holes are drilled, they will be blow very well to eliminate the dust.

4. Transitions

Once the joints in anchored, the transitions will be filled with a special mortar (rigid or elastic), depending on the chosen type.

Transitions made with elastic mortar should not be very wide, due to the possible deformations. This feature is not very important, but the wider the transition is, the longer the joint will last.

Projects Completed By INTERBUNA S.L. Spain

1	Expansion joints at Lahore Gujranwala project (C08)
2	Expansion joints at Musa Pak Shaheed Bridge Multan.
3	Bearing pads, Expansion joints at Kabul-Kandahar Highway Bridge #45 Repair Wks.
4	Bearing Pads and Expansion joints for Chandni Chowk Fly Over Rawalpindi.
5	Bearing pads for Muslim Town Fly over Lahore.
6	Bearing Pads at Lahore Rapid Transport Service Package II and Package 2-B (MetroBus Service Lahore).
7	Expansion joints at Lahore Bridge Ferozepur Road Lahore.
8	Expansion joints at 2-LaneBridge over River Indus at Khushal Garh, District Kohat and Its approach Roads. Package-III.
9	Expansion joints at 2-LaneBridge over River Indus at Khushal Garh, District Kohat and Its approach Roads. Package-II.
10	Bearing Pads at High Level Bridge L 900 Rft. On River Soan Between District Mianwali & Attock.
11	Expansion joints and Bearing pads on construction of signal free junction at Qainchi, Ghazi road and Khaira .
12	Bearing pads at Rawalpindi-Islamabad Metro Bus Project Package III Rawalpindi.
13	Expansion joints at LOS (Drain) Naula connecting Multan road with Ferozepur road , Lahore.
14	Bearing Pads and Expansion joints at Link Road Motorway at Shahpu Kanjran to Raiwind Road and Khayaban-e-Jinnah.
15	Bearing pads and Expansion joints at Sahianwala Flyover, Canal Expressway Gutwalla Bridge to (M-3) Interchange Faisalabad.
16	Expansion joints at Jhumra Flyover, Canal Expressway GATT walla Bridge to Sahianwalla (M-3) Interchange, Faisalabad
17	Bearing pads at Bridge over River Jehlum at Langarwala Pattan in District Sargodha/Khoshab.
18	Bearing Pads at Metro Bus Service Multan. Package I and Package IV.
19	Bearing pads at Hasan Abdal Havelian Section of E-35-ICB-I Burhan to Jarikas.
20	Bearing pads at Hasan Abdal Havelian Section of E-35-ICB-II Jarikas to Sarai Saleh.
21	Bearing pads at Hasan Abdal Havelian Section of E-35-ICB-III Sarai Saleh to Havelian.
22	Expansion joints at New Khanki Barrage and Auxiliary Works.
23	Bearing pads at Rehabilitation Of Road Portion Of Riawind Road From Thokar Nia/Baig to Bhohtian Chowk at Sattu Katla.
24	Expansion Joints at Bridge over Railway Crossing at Kahna Kacha.
25	Expansion joints at construction of Bridge over River Ravi for Metro Bus Service Lahore.
26	Rehabilitation of Lahore-Islamabad Motorway M-2 Replacement of Bearing pads.
27	Bearing pads at Construction of Flyover at Shaheen Chowk on Gujrat ByPass (N-5) in District Gujrat.
28	Bearing pads at Green Line Metro Bus Service Project Karachi.
29	Bearing pads at Construction of Flyover on G.T Road at Aziz Crossing Gujranwala.
30	Bearing pads at Bridge of Railway Crossing Kacha Jail Road Lahore
31	Bearing pads at Karal chowk Islamabad Express way, Islamabad
32	Expansion joints at Flyover at Shaheen Chowk on Gujrat ByPass (N-5) in District Gujrat.
33	Bearing pads at Lahore Ring Road Southern loop.
34	Expansion joints at Rehabilitation of Existing Bridge over River Ravi Lahore.
35	Expansion joints at Hasan Abdal Havelian Section of E-35-ICB-I , II and III.
36	Expansion joints at Construction of Section from M-1/M-2 to New Islamabad International Airport Main Link.
37	Supply of Rubber Seal for LRTS rehabilitation WD-80.
38	Bearing pads at Karachi-Thatta Dual Carriageway at Package-1 and II FWO
39	Expansion joints at Karachi-Thatta Dual Carriageway at Package-1 and II ZKA



25-B, XX, Khayaban-e-Iqbal Phase III, D.H.A Lahore



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