Introduction

Market leaders in Expansion Joint Technology.

We are a world class, multi-disciplined engineering solution provider, with core competencies in structural protection and movement control.

We offer an unrivalled range of specialist services including spray applied bridge deck membranes, bridge deck expansion joints, structural bearings, bridge deck drainage as well as bespoke structural fabrications.

Through early project engagement with stakeholders, we are able to provide high quality engineering solutions by way of consultancy support or the delivery of a complete project management service.

From design, manufacture and installation, to inspection, site maintenance and replacement work, our single point of responsibility offering, leaves USL Ekspan uniquely placed to solve complex challenges on a truly global scale.

PRODUCT IN BRIEF

The NJ expansion joint is a surface mounted nosing joint with an elastomeric compound known as Britdex Resin Mortar.

The NJ system is approved in accordance with CD357 standard.

Unlike the BEJ system, the NJ system can only be used in the situation where the open gap at carriageway level does not exceed 65mm (N.B. for U.K. only).

SYSTEMS BENEFITS

• Rapid installation
• Minimised installation periods and future maintenance costs
• No mechanical fixings
• Resists deformation from traffic load
• Installed to the ‘as built’ geometry of the structure
• Accepts horizontal and vertical movement
• Excellent track record
For refurbishment contracts, nosing width and depth can be varied, however the 'W' and 'D' dimensions are the minimum for new works contracts. The ratio of 1.25:1, width to depth, should always be based upon a minimum aspect ratio of 1:2.5:1, width to depth.

**APPLICATIONS**

- Highway bridges
- Footbridges

The NJ joint is ideally suited for maintenance schemes and has been developed to provide a whole life economic solution for applications where previously asphaltic plug joints have always been considered and can be installed to the full depth of the surfacing. See Figure 2.

**SPECIFICATIONS**

(i) Polyureide Resin – The patented Britflex Polyureide Resin is a two part liquid system comprising one clear component (base) and one black (hardener), packed in colour coded drums.

(ii) Elastomeric Insert – The extruded EPDM insert is capable of accommodating a range of movement. The insert is supplied in 30-60 metre lengths.

(iii) NJ Adhesive – A solvent free fast setting epoxy gap filling adhesive with excellent bond strength and non-slump characteristics making it ideally suited for application in vertical situations. The material has been specifically developed to bond the elastomeric insert to the Britflex resin mortar.

(iv) Aggregate – The aggregate is a graded mix supplied in 20kg sealed plastic bags.

**TYPICAL DESIGNS**

- Figure 2
- Figure 3
- Figure 4
- Figure 5

**INSTALLATION**

(a) General steps in the installation of the "NJ" Expansion Joint.

(i) The two resin components are warmed in oil jacketed gas fired heaters and maintained at 65º-85ºC.

(ii) The joint width is marked out on the concrete deck and any previously failed joint will depend on the selected nosing width.

(iii) The surfacing or the existing failed joint is broken out.

(iv) The concrete deck and any previously formed recess in the verge/central reserve is lightly gritblasted or other suitable means just prior to priming. The "NJ" insert should be protected from white-lining materials e.g. sand.

(v) The surfacing or the existing failed joint is broken out. The concrete deck and any previously formed recess in the verge/central reserve is lightly gritblasted or other suitable means just prior to priming. Britflex Polyureide Resin does not emulsify in water and is also more dense than water. Consequently the resin mortar may be placed with care in periods of light rain, provided the resin is placed in such a way as to prevent water from being trapped in the trench. The preliminary operations of sawcutting and breaking out can be undertaken during inclement weather.

(vi) The resin mortar will cure after two to three hours at approximately 70°C. It is then allowed to cool before the spacer plates and nosing formers are removed.

(vii) The resin mortar will cure after two to three hours at approximately 70°C. It is then allowed to cool before the spacer plates and nosing formers are removed.

(viii) The nosing formers are suspended on the spacer plates of the selected size movement gap and set for line and level.

(ix) The resin mortar is mixed in 30-60 metre lengths.

(x) The resin mortar will cure after two to three hours at approximately 70°C. It is then allowed to cool before the spacer plates and nosing formers are removed.

(xi) Bonding adhesive is applied to the nosing either side of the expansion gap.

(xii) The elastomeric insert is installed using compression longes and can now accept traffic.

(c) Time lag after completion and before opening to traffic

Shortly after the resin mortar has cured the elastomeric element can be inserted and the joint opened to traffic. During phased working the joint can be opened to traffic shortly after the cure with or without the elastomeric element in place to suit the sequence of installation and minimise traffic disruption.

(d) Other Notes

(i) The NCU system is bonded to steel, this should be prepared by grit blasting or other suitable means just prior to priming. The "NJ" insert should be protected from white-lining materials e.g. sand.

<table>
<thead>
<tr>
<th>Total Movement Capacity</th>
<th>Minimum Nosing Size</th>
<th>Optimum Nosing Gap 'B'</th>
<th>Nosing Gap 'B'</th>
</tr>
</thead>
<tbody>
<tr>
<td>Horizontal W D</td>
<td>W D</td>
<td>Min Max</td>
<td></td>
</tr>
<tr>
<td>NJ 1 40 ±3 100 60 50</td>
<td>30 20 40</td>
<td></td>
<td></td>
</tr>
<tr>
<td>NJ 2 20 ±5 100 60 30</td>
<td>20 40</td>
<td></td>
<td></td>
</tr>
<tr>
<td>NJ 4 15 ±3 100 60 30</td>
<td>35 40</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Notes

The 'W' and 'D' dimensions are the minimum for new works contracts. For refurbishment contracts, nosing width and depth can be varied, however the 'W' and 'D' dimensions should always be based upon a minimum aspect ratio of 1:2.5:1, width to depth.
With a comprehensive portfolio of products and a highly developed global network, USL EKSPAN is focussed on providing specialist construction solutions on a truly global basis.

USL EKSPAN
PRODUCT RANGE

EXPANSION JOINTS - CD 357
Uniflex - Buried
BP1 - Buried
FEBA - Flexible Plug
Britflex NJ - Raising
ES & EW - Joint Seal
Transflex & Transflex HM - Mat
T-MAT - Mat
Britflex BJE - Modular
Britflex MEJS - Modular
LJ - Longitudinal Joint
ES - Joint Seal
Aqueduct/Immersed Joint
Open Type Joint - Rail Joint
Britflex UCP - Footbridge Joint
Finger Joint
Roller Shutter Joint

STRUCTURAL BEARINGS
EKE - Elastomeric (EN1337-3)
KE - Pot (EN1337-5)
DE - Line Rocker (EN1337-6)
GE - Spherical (EN1337-7)
FE - Restraint & Guide (EN1337-8)
D - Line Rocker (BS5400-9)
F - Restraint & Guide (BS5400-9)
G - Spherical (BS5400-9)
J - Roller (BS5400-9)
K - Pot (BS5400-9)
Link Bearing (BS5400-9)
EA - Sliding Bearing
EKR - Rubber Pad & Strip
EQF - Sliding Bearing
Bespoke Bearings

STRUCTURAL WATERPROOFING - CD 358
Pitchmastic PmB
Polyurethane (Pu) Waterproofing System
Britdex MDP
Methyl Methacrylate (MMA) Waterproofing System
Britdex CPM Tredseal
Combined Waterproofing and Anti-Skid Surfacing (MMA)
Uradeck BC
Combined Waterproofing and Anti-Skid Surfacing (Pu)

SUB-SURFACE BRIDGE DRAINAGE
Ekspan 325 Channel
Ekspan 302 System
ES Seal System
DriDeck

SURFACE BRIDGE DRAINAGE
Envirodeck

Technical & Advisory Service
Further technical information may be obtained on request and consultation is encouraged to ensure choice of materials selected and detailing are optimised to suit in-service performance requirements and economic solutions. A recommended inspection and maintenance statement is available and will also be issued at the time of installation.

Health & Safety
USL Ekspan operate a strict policy on health and safety and details are available on request.

Note:
The colours used in the illustrations may not be indicative of the finished product. USL Ekspan reserve the right to update and improve the ‘NJ’ Expansion Joint and its specification without notice and Engineers and Contractors should satisfy themselves that they have full and up to date information.

USL Ekspan operate a strict policy on health and safety and details are available on request.
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