Transflex Bridge Joints

Reinforced Elastomeric Joint System
Market Leaders in Expansion Joint Technology

USL BridgeCare provides a complete service to the civil engineering industry for bridge deck protection which includes the supply and installation of expansion joints and spray applied bridge deck waterproofing membranes.

The bridge expansion joint range of products caters for movements from 20mm through to 330mm.

The division also manufactures and applies their Britdex MDP waterproofing system which is a rapid curing, spray applied methyl methacrylate membrane. All of USL's products have a proven track record and comply with the latest Highways Agency requirements.

Through their technical department USL BridgeCare are able to offer a complete package of services to clients and will review a particular application from initial design to final installation to ensure the selection of the most appropriate and cost effective solution.

The product in brief

The Transflex system is registered with the UK Highways Agency, the Scottish Executive and the Welsh Assembly for use on highway bridge decks on all classes of roads and motorways. (BD 33/94: Joint Type S refers). The Transflex system is included in the UK Highways Agency list of approved products SA1. Britflex Resin Mortar is also included in SA1 as an approved material for transition strips to all types of expansion joint.

USL Transflex bridge joints comprise of steel angles and a steel bridging plate system encased in a flexible elastomer. They are supplied in module lengths designed to be bolted to the structural concrete on either side of the expansion gap. A range of models are available to accommodate movement up to 330mm, providing a substantially waterproof joint and a smooth running surface.

- Movement accommodation up to 330mm
- Corrosive resistant elastomer casing
- Accommodates skew movement
- Factory vulcanised kerb and skew kerb units to special order
- Membrane system included for maximum waterproofing

Principal applications

- Highway bridge decks
- Service Ramps
- Multi-storey car parks
**USL Transflex bridge joint models**

<table>
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<tr>
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<th>Models</th>
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Note: Add 3mm to the recess depth ‘R’ when using the Uniflex secondary membrane.
The USL Transflex bridge joint system comprises of 8 No. standard models designed to accommodate movement up to 350mm by shear deformation of the elastomer between the steel components. Each model incorporates steel angles designed to be butted to the structural deck and a steel bridging plate system which spans the open joint gap. The elastomer core is highly resistant to oils, solvent spillage and the trafficked surface includes an anti-skid pattern for safety having a rubber to rubber coefficient of static friction of 0.69. Each model is specifically designed to accommodate horizontal and shear movement and will also accommodate vertical movement due to rotation of up to 0.1 mm.

Special steel clipped washers are provided with each unit designed specifically for the Transflex joint. Stainless steel washers to the same high specification can be supplied to special order. It is important that the correct washer is used in each case. When additional waterproofing is specified a continuous length of Uniflex membrane should be bonded to the levelling bed with adhesive over the full width of the Transflex joint unit. Drain outlets will be incorporated.

Rebond profiles
During installation it is sometimes necessary, for practical reasons, to cut a Transflex unit on-site. In order to maintain the integrity of the joint between each module, male and female rebound profiles are available for each unit to reinstate the end configuration as required.

Performance
Transflex bridge joints are designed to accept both horizontal and vertical loads due to traffic in accordance with the UK Highways Agency Technical Memorandum BD 33/94.

The graphs illustrated opposite are an indication of the horizontal load required to deflect each Transflex joint.

Graph of maximum movements absorbed by the different modules according to the angle formed by the joint with the longitudinal axis of the floor.
Kerb upstand units

Examples of a factory vulcanised kerb unit for models 130, 200, 250 & 300

Examples of a factory vulcanised skew kerb upstand

Examples of a factory vulcanised kerb unit for models 400, 650, 900 & 1300

Factory Vulcanised junctions

Kerb Units

On-site modification

As part of a bridge joint installation scheme factory vulcanised junctions are available to accommodate the change in level at kerbs, footways and at the central reservation subject to special order and design detail.

The junctions available include kerb units, skew kerb units and change of level units, each factory vulcanised to maintain high quality standards and integrity of the seal.

Change of level junctions are available factory Vulcanised to meet the requirements for changing level from road deck to footway.

The junctions are fabricated such that the change in level from road to footway takes place behind the kerb line. Leg lengths, the included angles and the male or female configurations should be specified at the time of order.

Whilst factory vulcanised change of level junctions should be used as far as possible it may be necessary to modify standard units on-site to accommodate changes of level from road to footway.

This is achieved by cutting and notching the steel bridging system and steel angles and bending the units through 30°. The point of change of level from road to footway taking place behind the kerb line. The void in the kerb line being protected with galvanised steel cover plate.

Details on change of level modifications available from Universal Sealants (UK) Ltd.

Transflex temperature adjustment guide

It will often be necessary to pre-compress or pre-extend the Transflex joint to pre-set the joint unit to suit the relative position of the structural expansion joint in the bridge deck.

At the time of installation therefore knowing the mean deck temperature range and the movement to be accommodated, the amount of pre-compression or pre-extension can be taken off a graph prepared in the manner of the example illustrated.

Key:

1. Example based on model 200 (274mm wide)
2. The example assumes a total design movement accommodation requirement of + and – 25mm from the mid point position.
3. The installation temperature requires that the joint be compressed to 254mm overall width – prior to installation.
4. Hence the new bolt hole centres “C” to be drilled in the structural concrete will be 199mm instead of 219mm.
5. Maximum movement of joint + and – 25mm.
6. Actual movement required + and – 25mm.

Site installation – for concrete decks

A flat and level monolithic haunch breaker of a width just under the combined width of the joint and the transition strips prior to the surfacing being laid. At the time of installation dependent upon mean deck temperature it may be necessary to pre-compress or pre-extend the Transflex joint unit to suit the relative position of the structural expansion joint in the bridge deck.

The removal of the surfacing over the joint in the deck is facilitated by the location of the plywood bond breaker of a width just under the combined width of the joint and the transition strips prior to the surfacing being laid. At the time of installation dependent upon mean deck temperature it may be necessary to pre-compress or pre-extend the Transflex joint unit to suit the relative position of the structural expansion joint in the bridge deck.

The installation width of the joint may be determined using graphical means illustrated in the example under the heading “Temperature Adjustment Guide”.

Once the Transflex module installation width and the new bolt hole centres have been determined the joint module can be adjusted in width accordingly.
Installation (continued)

The surfacing may then be sawn and removed to the dimension equivalent to the installation width of the joint plus the two transition strips. The exposed concrete should be scarified and the final level of the bed adjusted using a polymer modified screed approximately 20mm thick maintaining the recess depth “R” ie -6mm in the case of model 200.

The bridge joint modules centred over the expansion joint in the deck may then be used as templates for the pilot holes thus determining the final position of the bolt holes or by use of a prepared template.

The final bolt holes should be drilled and studs installed using chemical fixing anchors. Each bridge joint unit may then be laid into position over the studs on the bridge joint module.

Subsequent modules should then be located and fixed in the same way, the sealant first being applied to the tongue and groove edges of each unit prior to jacking into position to ensure a substantially waterproof junction.

The fixing nuts should be tightened to the rate indicated for each model and the polyureide resin transition strips laid level with the wearing surface but finished slightly higher (3mm) than that of the top of the bridge joint module.

Further Information

1. USL Transflex Installation Manual
   The detailed Installation Guide sets out the recommended installation procedure for Transflex bridge joints.

2. USL Transflex Product Schedules
   Detailed product schedules for each joint module set out the components available against each Transflex model type.

Waterproof Installations

For improved waterproofing it is necessary to incorporate Uniflex Secondary Membrane which should be fixed with epoxy adhesive to the top surface of the levelling screed or bed. The recess depth “R” should be adjusted by ±3mm.

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Ancillary materials and equipment

Materials:

- Studs and Chemical fixing anchors – See chart under heading “Description for recommended diameter and type”
- Uniflex membrane for waterproofing applications.
- Unicem 120, one part polysulphide for bedding and sealing each module.
- Transflex Bolt/Hole Sealant for filling bolt holes.
- Transflex Levelling Screed polymer modified mortar for use as a levelling screed or bed.
- Britflex polyureide resin for forming transition strips between road wearing surfaces and the module joint.

Equipment:

- Extension/compression tool for adjusting and pre-setting the module joint to suit temperature/ joint gap at time of installation.
- Rotary percussion drill; Forced action mixer; ‘G’ Gun; Torque spanner; Jacking equipment.

There are no health hazards associated with USL Transflex in normal use.

Ancillary materials

- Health and safety data sheets for Uniseal 120, Transflex Bolt/Hole Sealant, Transflex Levelling Screed are available separately from USL’s Technical Service Department.

Important Note

Whilst all reasonable care is taken in compiling technical data on the company’s products all recommendations or suggestions regarding the use of such products are made without guarantee since the conditions of use are beyond the control of the company. It is the customer’s responsibility to satisfy himself that each product is fit for the purpose for which he intends to use it and that the actual conditions of use are suitable.