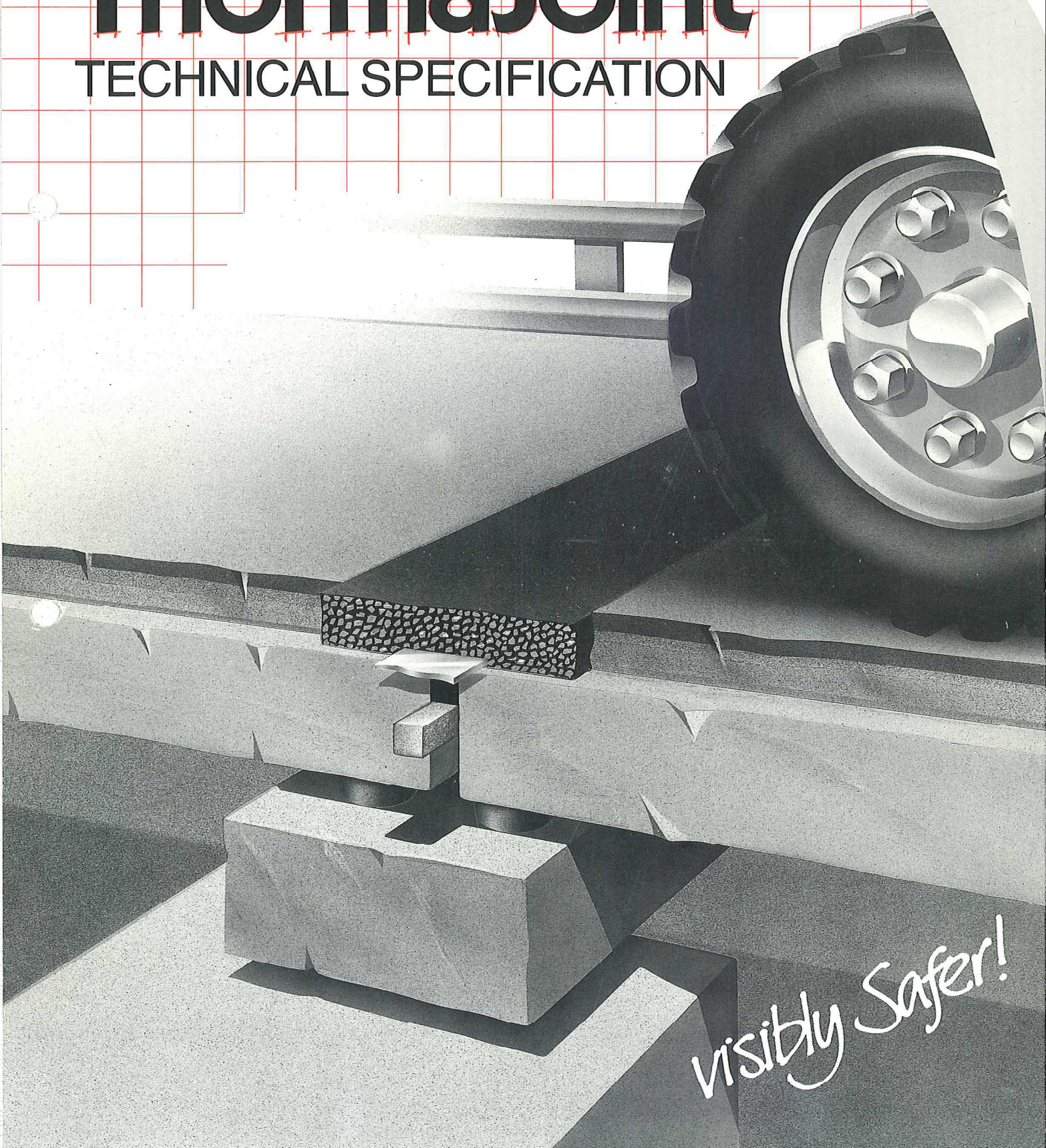


**Prismo**

# ThormaJoint

TECHNICAL SPECIFICATION



*visibly Safer!*

# ThormaJoint

## Introduction

Bridge expansion joints subject to water, salt, acid or alkali penetration or mechanical failure, if left untreated can seriously damage the structure and bearings of the bridge.

Over the years other jointing systems have been proposed with some proving prohibitively expensive or ineffective.

Prismo is an acknowledged expert in bridge jointing having developed and patented the **ThormaJoint** system which is completely waterproof, flexible in all directions and has high load bearing capability. (UK Patent No. 2001379B and European Patent No. 0000642).

## The Product Range

**ThormaJoint** – should be the first choice for bridge engineers when selecting a system to accommodate up to 50mm movement. It incorporates **Thormafoam** caulking plug, a locating pin, and an aluminium or steel plate. For larger gaps the traditional **ThormaJoint** is modified with a locating peg and a steel plate. Both products use a modified bitumen binder **BJ200** and single size **BJ Stone**.

**ThormaJoint 90** – a high performance version of the standard **ThormaJoint** using **BJ Super** binder, is normally installed where the depth of asphalt is 100mm or more. Its key features are increased movement capability and greater tolerance to extremes of ambient temperature.

## FEATURES AND BENEFITS

- The joint can accommodate longitudinal, rotational and transverse movements.
- It can be installed on new works or for maintenance.
- It is flexible and completely watertight.
- It presents a good riding surface without further treatment.
- In case of accidental damage it is easy to repair economically and can be replaced without damage to the adjacent road surfacing.
- Sub-surface water drainage can be provided within the joint by building in transverse and/or longitudinal drainage tubes during joint construction minimising the possibility of damage by freeze/thaw action.
- **ThormaJoint** products are designed to accommodate extremes of air temperature from  $-30^{\circ}\text{C}$  to  $+45^{\circ}\text{C}$ .
- It can be surface dressed with the remainder of the road surfacing.
- It can be planed off to an intermediate or full depth during re-surfacing operations, unlike elastomeric joints which must be removed then reset.
- Fast installation minimises disruption to traffic.
- **ThormaJoint** is a cost effective answer to the problem of leaking joints.

## ThormaJoint

**ThormaJoint** is a combination of an elastomer modified bitumen binder, **BJ200**, and a carefully selected aggregate, **BJ Stone**. The joint is constructed in-situ and is a hot process.

**BJ200** is a special blend of bitumen, polymers, fillers and a surface active agent, formulated to combine good fluidity at process temperatures with low temperature flexibility and ambient temperature slump control. It is delivered to site in bags in its solid state, where it is heated in special boilers to its normal application temperature in accordance with the manufacturers recommendations.

The formulation of **BJ200** is varied according to the climate of the country or region in which the joint is to be installed, varying from the cold of Northern Europe to the warmth of tropical climates. This ensures that the joint remains flexible, even in very cold conditions, but does not become too soft in very warm conditions.

**BJ Stone** is a single-size aggregate normally chosen from the Basalt, Gritstone, Gabbro or Granite groups listed in BS812. For the standard joint the aggregate size is 20mm to BS63. In special cases, other sizes may be specified, e.g. a 14mm size in shallow joints. The use of a single-size aggregate enables a high binder content to be reached and ensures a constant ratio of stone to **BJ200**, important to give the optimum combination of flexibility and load bearing capacity.

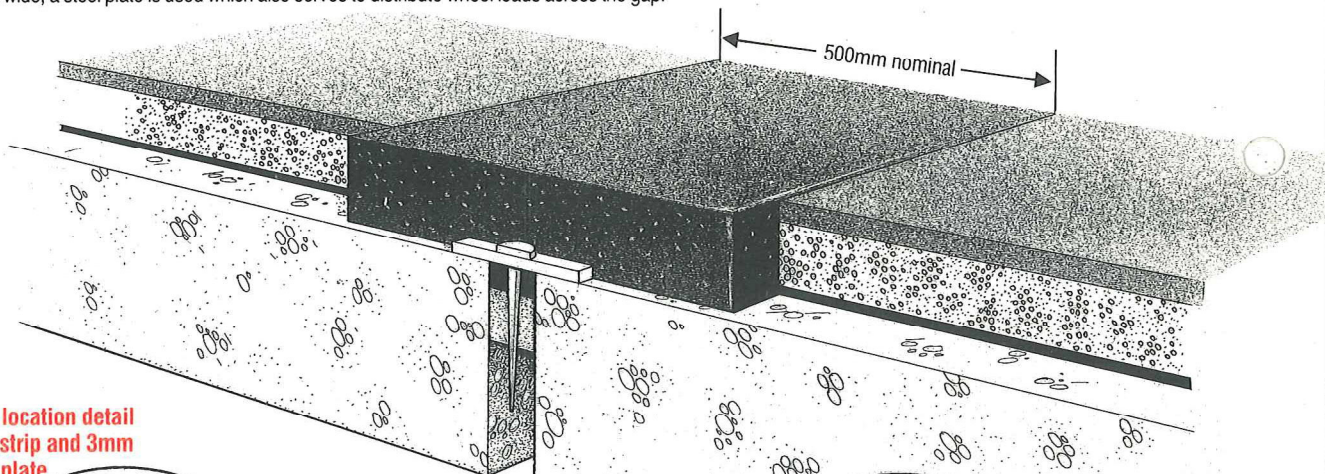
The stone is cleaned, sized and bagged under factory conditions for despatch to site. Immediately prior to its use on site, it is further cleaned by being rotated in a perforated drum mixer whilst being heated by hot compressed air to a working temperature range of  $150^{\circ}\text{C}$ – $190^{\circ}\text{C}$ .

All joints extend the full depth of the asphalt road surfacing and waterproof membrane down to the structural deck concrete. In certain instances, a rebate may be cut in the concrete, with the approval of the engineer, to increase the depth of the joint.

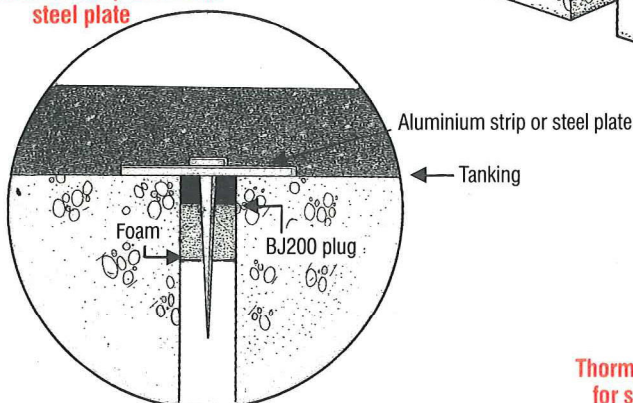
The joint develops a very strong bond to the concrete and to the vertical faces of the adjacent asphalt.

In gaps up to 30mm wide, an aluminium flashing strip spans the gap to prevent stone entering the gap during joint construction or under the punching action of subsequent traffic. For gaps over 30mm wide, a steel plate is used which also serves to distribute wheel loads across the gap.

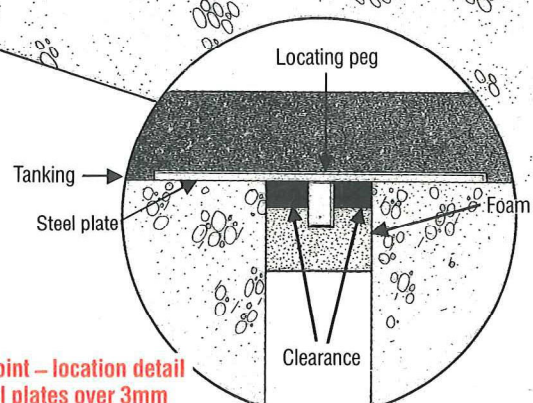
## ThormaJoint



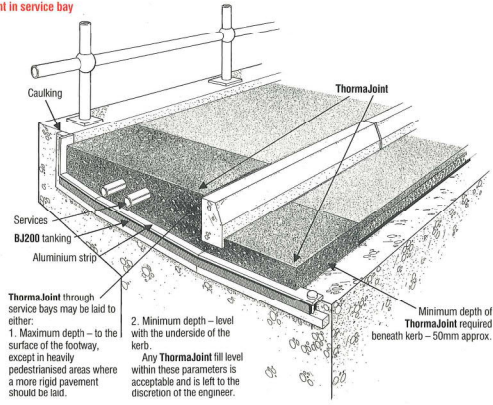
## ThormaJoint – location detail for aluminium strip and 3mm steel plate



## ThormaJoint – location detail for steel plates over 3mm

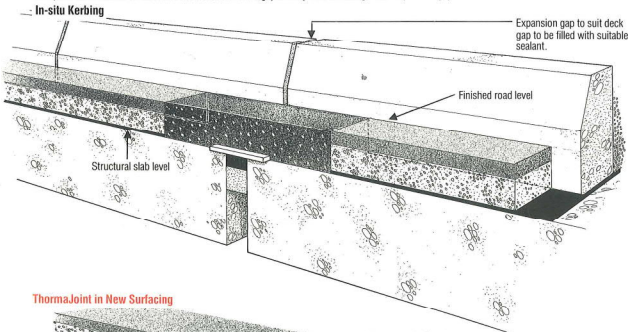


**ThormaJoint in service bay**

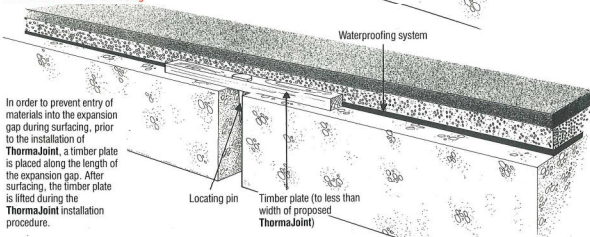


**Kerb Detailing**

Complete kerbs should be used and these should form a gap directly over the bridge deck expansion gap.



**ThormaJoint in New Surfacing**



In order to prevent entry of materials into the expansion gap during surfacing, prior to the installation of ThormaJoint, a timber plate is placed along the length of the expansion gap. After surfacing, the timber plate is lifted during the ThormaJoint installation procedure.

Information given in this leaflet is based on general principles and accumulated experience in practice. ThormaJoint is installed only by Prismo Limited or its licensees and the company reserves the right to vary installation procedures in accordance with individual site conditions and product development.

# ThormaJoint

Also from Prismo:

- Thormaflex\*
- Thormagrip\*
- ThormaJoint 90\*
- Thormadeck 2000\*

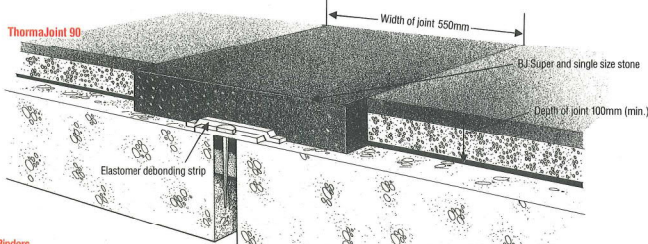
\*Registered Trade Marks

**Prismo**  
**KLAROW**  
 POSTBUS 2085  
 8001 CB TILBURG HOI L A ND

**ThormaJoint 90**

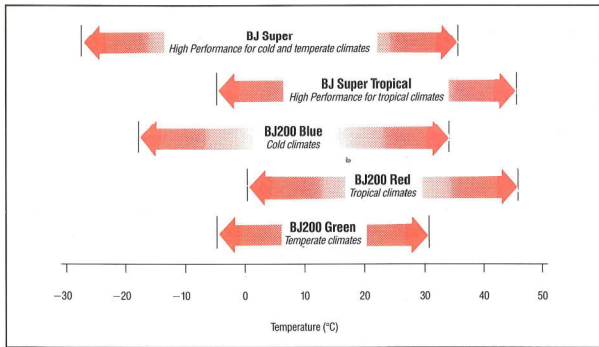
Where a total movement capability of more than 50mm and up to 70mm is required then **ThormaJoint 90** is recommended. This incorporates a steel plate with elastomer debonding strip which enables the **ThormaJoint** to move over the bridging plate thereby relieving some of the stresses built up as a result of the expansion and contraction processes.

**ThormaJoint 90** can accommodate thermal movements of 70mm (±35mm) under the specified depth, width and installation conditions. This is achieved using **BJ Super** binder which is specially formulated to give high performance. It remains flexible down to very low temperatures whilst being stable at very high temperatures.



**ThormaJoint Binders**

The binder known as **BJ200** is available in five grades, each formulated to meet certain requirements of climate, movement range and traffic conditions. The following grades are available:



**INSTALLATION GUIDELINES**

After locating the expansion gap, remove the asphalt surfacing to the desired width by saw cutting and jack hammering the asphalt. The asphalt should be completely removed to expose the deck. A clean joint to the asphalt is essential. The recess should be cleaned out, and then prepared with a Prismo hot compressed air lance, as this warms the surrounding surfaces.

The expansion gap should be caulked, using **Thormafoam** to seal the gap. The recess should then be tanked with hot **BJ** binder to seal the joint and improve adhesion of the joint to the asphalt. The metal plate should then be installed over the gap.

Stone heated to 150°C-190°C should then be poured into the joint to a maximum depth of 40mm, but not less than 20mm. This layer should then be flooded with binder heated to the correct temperature. This process should be repeated until the joint is within 25mm ± 5mm of the surface. The **ThormaJoint** pre-mix layer should then be applied.

**ThormaJoint** will perform well under most conditions of temperature and traffic flow. However, certain site conditions may detract from its performance and the following guidelines are intended to assist the engineer when **ThormaJoint** is being considered for a particular site:

- For tropical climates, the maximum gradient for standard width **ThormaJoint** is 2%. In temperate locations the maximum gradient is 4%. This is particularly important where there are roads which are subject to large numbers of heavy, slow moving vehicles.
- Locations where the joint is in close proximity to junctions and traffic lights, and hence where there is likely to be a build up of stationary traffic, are not suitable for **ThormaJoint**.
- The standard **ThormaJoint** width is 500mm. This dimension may be increased under favourable conditions to an absolute maximum of 750mm. The other limiting factors listed must always be considered when deciding whether to move up the range from 500mm width to 750mm.
- Skew is a limiting factor since it increases the effective width or running length of a joint. (A 30° skew produces an effective 15% increase of width, while a 45° skew produces a 41% increase.) Skew should not exceed 45° and in this case maximum joint widths must be limited to 500mm. Longitudinal joints may only be considered when they are not in the main wheel track line.
- The minimum depth is 50mm. Movement capability for standard width joints installed at mean gap is a total of ±25mm (50mm) at a preferred joint depth of 100mm or more. As depth decreases so movement capability is reduced.
- Traffic loading will often lead to rapid vertical movement at joints. The normal maximum vertical movement capability for **ThormaJoint** is ±1mm.
- Where the movement is over ±15mm care should be taken not to install **ThormaJoint** at unduly hot or cold temperatures.

The various limiting factors are additive and care must be taken to avoid situations which lead to an accumulative increase of stress.

**Movement**

In standard configurations, **ThormaJoint** can be installed where expansion and contraction movements do not exceed 50mm (±25mm) installed at mean gap position. It is not always necessary to install the joint at mean temperature (mean gap). The joint can accommodate normal rotational and transverse movements anticipated for typical bridge construction.

When considering **ThormaJoint** for a particular bridge site, the movement capability must take into account the climate, bridge design and all movements occurring at the bridge joint. In new works additional allowance for calculating bridge movements must take into account factors such as creep and shrinkage of concrete used in their construction.

**Width of Joint**

300mm to 400mm: Suitable for articulation and small movement (±5mm) joints; 500mm: Optimum width; 400mm to 750mm: Satisfactory and can be adopted for special reasons; Over 750mm: Not normally recommended.

**Depth of Joint\***

50mm to 75mm: Only used when special circumstances preclude the use of a deeper joint (50mm is the absolute minimum depth); Optimum depth: 75mm to 175mm; Over 175mm: Special care needed. Please consult Technical Department, but can be used in footways and verges.

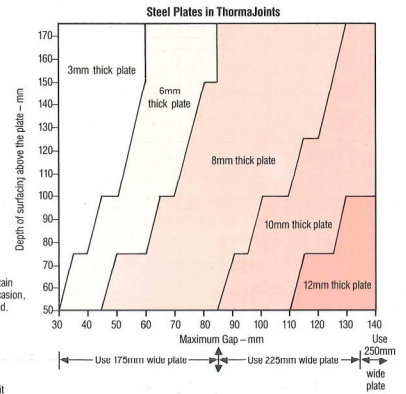
\*Depth above plate.

**NOTE:** Further guidance on the movement capability of **ThormaJoint** is available. For this or any other information, please contact the Technical Department.

**Details of Plates**

- For gaps of maximum 30mm, caulk with **Thormafoam** and plug with **BJ200**, protected by aluminium flashing strip.
- For gaps over 30mm, caulking and plugging details as above. For plate size refer to table opposite.
- Steel plates should be 1 metre in length to aid bedding onto the base of the excavation. In some circumstances it may be necessary to cut the aluminium strip into lengths to reduce the effects of expansion due to heating during installation.

**NOTE:** The chart is intended for guidance only, as certain constructional details on site may require that, on occasion, plate sizes differing from those given above are needed.

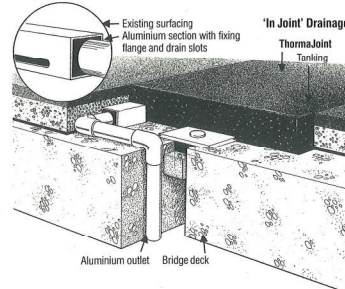


**Detailing for kerb footway services and surfacing**

**ThormaJoint** can be specified for areas of awkward detailing often when it is difficult to maintain a watertight joint using other systems.

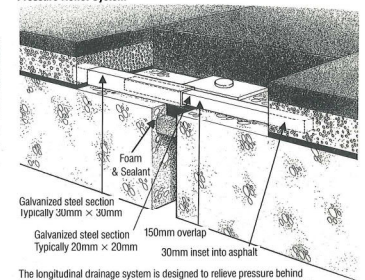
**Drainage**

Because **ThormaJoint** is completely water-tight, in some circumstances it may be desirable to install drainage channels in order to prevent build-up of water in the adjacent asphalt.



This transverse drainage system is installed during the **ThormaJoint** process, and requires an outlet through parapet or bridge deck. Not recommended for **ThormaJoint** less than 100mm in depth.

**Pressure Relief System**



The longitudinal drainage system is designed to relieve pressure behind **ThormaJoint**, and does not require a drainage outlet. Not recommended for **ThormaJoint** less than 100mm in depth.