

Copyright © Agrément South Africa, September 2004

The master copy of this document appears on the website:

<http://www.agrement.co.za>

Validity

Users of any Agrément certificate should check its status: all currently valid certificates are listed on the website. In addition, check whether the certificate is [Active](#) or [Inactive](#).

The certificate holder is in possession of a confirmation certificate attesting to his status.

Quick guide

Contents	page 3
Preamble	page 4
Conditions of certification	page 5
Assessment	page 7
Technical description	page 11

P O Box 395 Pretoria 0001
Telephone 012 841 3708
Fax 012 841 2539
e-mail agrement@csir.co.za
<http://www.agrement.co.za/>

Subject:
HONEL GAM 80 – 480 Series Bridge Deck Expansion Joints

Certificate holder:
HONEL Structural Products (Pty) Ltd

18 Padfield Road, Padfield Park,
PINETOWN 3610

Telephone: 031 701 1355 Fax: 031 701 1356

e-mail: jdavey@honel.co.za

web site: www.honel.co.za



Description and use

HONEL GAM Series 80 – 480 are a series of multi-element gland-and-claw bridge-deck expansion joints. Joints consist of between two and six glands to accommodate movements up to 480 mm in units of 80 mm per installed gland. The joint is manufactured in South Africa in accordance with the original designs by Glacier Bearings (Pty) Ltd. As far as possible, all materials are sourced locally.

The joint is assessed as being suitable for use in concrete bridge structures in all climatic regions of South Africa and in all types of corrosive environment.

This certificate and Agrément South Africa's assessment set out in detail in Part 2 Table 1 apply only to the HONEL GAM Series 80 – 480 bridge deck expansion joints manufactured by HONEL Structural Products (Pty) Ltd and installed as described and illustrated in this certificate, and where the terms and conditions of certification are adhered to.

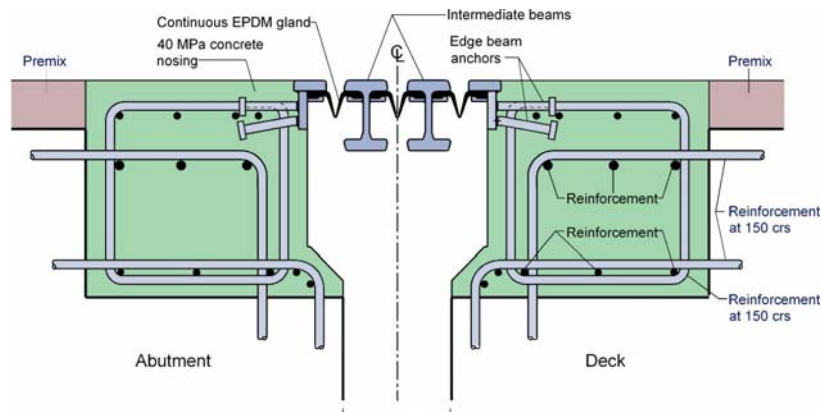


Figure 1: Typical section through a HONEL GAM 240 Series Multi-Element bridge deck expansion joint between joist box and control spring (new installation)

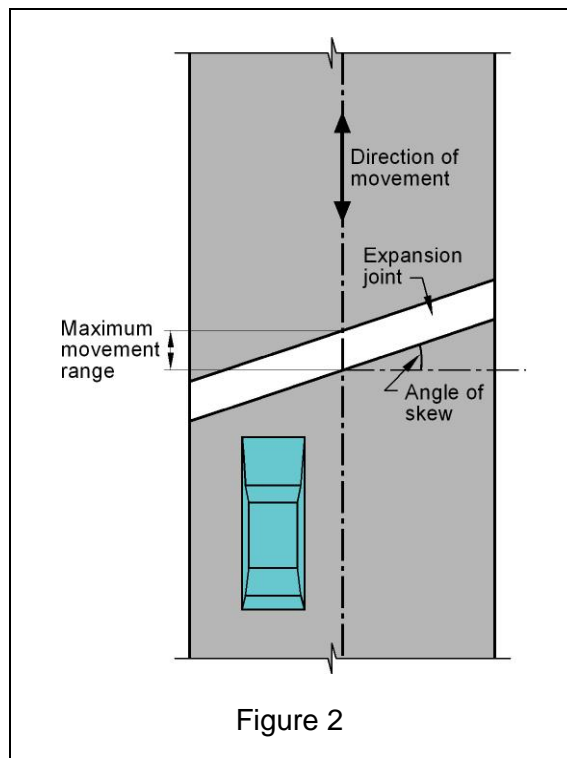


Figure 2

Criteria for application of the HONEL GAM Series 80 – 480 bridge deck expansion joint

The HONEL GAM Series 80 – 480 bridge deck expansion joint is suitable for use where:

- the movement range is up to a maximum of 480 mm (up to five intermediate beams and six glands would be required to accommodate movements of 480 mm, that is 80 mm per gland), and
- the skew angle of the joint is not greater than 45 degrees.

Movement range - combination of contraction and expansion in the direction of movement.

CONTENTS

PREAMBLE

PART 1: CONDITIONS OF CERTIFICATION

General conditions

Reappraisal

PART 2: ASSESSMENT

Scope of assessment

Assessment

Table 1

PART 3: TECHNICAL DESCRIPTION

General description

Manufacture

Materials

Joint installation (new installations)

Joint installation (existing joint replacements)

PREAMBLE

This certificate is issued by Agrément South Africa in terms of the powers granted to it by the Minister of Public Works. This certificate:

- has been granted after a technical appraisal of the performance of HONEL GAM 80 – 480 Series bridge deck expansion joints for the [uses](#) covered by the certificate
- is independent of any patent rights that may or may not subsist in the subject of the certificate
- does not relieve the certificate holder of the obligation to obtain the prior approval of the appropriate roads authority for the use of the subject.

Agrément South Africa considers that the quality and performance of HONEL GAM 80 – 480 Series bridge deck expansion joints will be satisfactory provided that the requirements stipulated in this certificate are adhered to. However, Agrément South Africa does not on behalf of itself, or the State, or any of its employees or agents, guarantee such quality or performance.

Where required, guarantees for the product must be agreed between the client and the certificate holder.

Responsibility for the proper exercise of the quality system and compliance with the requirements of this certificate resides with the certificate holder.

No action for damages, or any other claim whatsoever, lies against Agrément South Africa, its members, the State or any of its employees should the said components and materials fail to comply with the standard set out in the certificate issued by Agrément South Africa.

Interested parties who are in any doubt about any detail or variation should contact Agrément South Africa.

The validity of this certificate is reviewed every three years. The certificate shall remain valid for so long as Agrément South Africa is satisfied that:

- the certificate holder complies with the general and specific conditions of certification as stipulated in the certificate
- the performance-in-use of the subject is acceptable, and
- any changes in relevant standards or Agrément criteria have not invalidated the technical assessment which formed the basis of certification.

Agrément South Africa reserves the right to withdraw the certificate at any time, should reasonable cause exist.

Notices affecting the validity of this certificate will be published on Agrément South Africa's web site and in the *Government Gazette*.

PART 1: CONDITIONS OF CERTIFICATION

This certificate covers only HONEL GAM 80 – 480 Series bridge deck expansion joints that comply strictly with:

- one of the following drawings:
 - Concrete Nosing Multi-Element Expansion Joint Type GAM 480 (Series 2): GBM 375, Rev 1, dated 30/01/02
 - Concrete Nosing Multi-Element Expansion Joint Type GAM 160 (Series 2): GBM 375, Rev 4, dated 09/03/04
 - Concrete Nosing Multi-Element Expansion Joint Type GAM 240 (Series 2): GBM 377, Rev 4, dated 09/03/04
 - Concrete Nosing Multi-Element Expansion Joint Type GAM 320 (Series 2): GBM 511, Rev 2, dated 09/03/04
 - Concrete Nosing Multi-Element Expansion Joint Type GAM 400 (Series 2): GBM 512, Rev 3, dated 09/03/04

and

- Seal for Fabricated Expansion Joints Critical Inspection Dimensions – Rubbertek: GRS 121, Rev 0, dated 25/03/91
- Bolted Connection Multi- Element GAM (II) Expansion Joint: GBM 504/2, Rev 0, dated 23/3/00
- HONEL Structural Products (Pty) Ltd's specifications, technical manuals and quality management system
- the requirements of this certificate,

and which are installed by

- the certificate holder, or
- a licensee appointed and trained by the certificate holder and registered as such with Agrément South Africa.

Licensee – any person or company appointed and trained by the certificate holder and registered with Agrément South Africa to manufacture and/or install HONEL GAM 80 – 480 Series bridge deck expansion joints in accordance with the certificate and authorised by him to claim compliance with the certificate. It is the certificate holder's responsibility to ensure that a licensee carries out the work in compliance with this certificate and in accordance with the approved quality system.

This certificate does not apply to any other product marketed, manufactured or installed by HONEL Structural Products (Pty) Ltd or by any other entity.

Any person needing to check on details of construction must refer to the documentation listed above, which is available from the certificate holder.

A change to any one aspect of the HONEL GAM 80 – 480 Series bridge deck expansion joints could result in changes in the performance of installed joints. For this reason, no change may be made to HONEL GAM 80 - 480 Series expansion joints unless any such change is approved in writing by Agrément South Africa before it is implemented.

General conditions


The validity of this certificate is subject to the continued participation of the certificate holder in Agrément South Africa's post-certification quality-assurance scheme.

An identification plate having a minimum size of 65 mm by 100 mm, as illustrated below, must be attached to the bridge balustrade.

Agrément South Africa's logo, as shown in the lower part of the plate, is to be printed on all HONEL GAM 80 – 480 Series bridge deck expansion joint promotional material.

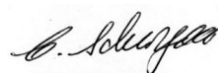
Reappraisal

- must be requested by the certificate holder prior to implementing changes to materials or the method of installation, and
- will be required by Agrément South Africa if there are changes to Agrément criteria or if deemed necessary for any other reason.

BRIDGE EXPANSION JOINT	
DATE	Nov. 2004
TYPE	GAM Series
REF.No
TEL.No	031 7011355
Honel Structural Products	
Certificate 2004/312	
 innovative construction product assessments	

This certificate may be withdrawn if the certificate holder or a registered licensee fails to comply with these requirements.

On behalf of the Board of Agrément South Africa



Chairman

29 September 2004

PART 2: ASSESSMENT

Scope of assessment

Guidelines - Steyn, Silbernagl and Nordengen. Guideline document for evaluation of bridge deck joints. CSIR Transportek, May 2001

The assessment is based on guidelines for the evaluation of bridge-deck joints adopted by Agrément South Africa, as applicable to modular bridge-deck expansion joints with manufactured metal claws and multiple glands. The joint has been assessed as an integral part of a concrete bridge-deck structure and road surface, as described and illustrated in this certificate. Aspects of the bridge-deck or road surface affected by the installation or performance of this joint, where applicable, have also been assessed.

Assessment

In the opinion of Agrément South Africa, when the HONEL GAM 80 – 480 Series bridge deck expansion joints are manufactured and installed by HONEL Structural Products (Pty) Ltd or one of their licensees in accordance with:

- one of the following drawings:
 - Concrete Nosing Multi-Element Expansion Joint Type GAM 480 (Series 2): GBM 375, Rev 1, dated 30/01/02
 - Concrete Nosing Multi-Element Expansion Joint Type GAM 160 (Series 2): GBM 375, Rev 4, dated 09/03/04
 - Concrete Nosing Multi-Element Expansion Joint Type GAM 240 (Series 2): GBM 377, Rev 4, dated 09/03/04
 - Concrete Nosing Multi-Element Expansion Joint Type GAM 320 (Series 2): GBM 511, Rev 2, dated 09/03/04
 - Concrete Nosing Multi-Element Expansion Joint Type GAM 400 (Series 2): GBM 512, Rev 3, dated 09/03/04

and

- Seal for Fabricated Expansion Joints Critical Inspection Dimensions – Rubbertek: GRS 121, Rev 0, dated 25/03/91
- Bolted Connection Multi- Element GAM (II) Expansion Joint: GBM 504/2, Rev 0, dated 23/3/00
- HONEL Structural Products (Pty) Ltd's specifications, technical manuals and quality management system, and
- the requirements of this certificate,

they are suitable for the uses specified.

Agrément South Africa's comments on the properties of materials used and the various aspects of performance of the HONEL GAM 80 – 480 Series bridge deck expansion joints are set out in Table 1 below. Each aspect of performance was assessed by experts in that field.

Table 1: Assessment

Aspect of assessment	Opinion of Agrément South Africa	Explanatory notes
Maintenance plan	Satisfactory	HONEL's maintenance plan for HONEL GAM Series bridge deck expansion joints is satisfactory. The specified inspection/maintenance interval of five years is considered adequate.
Movement range	Satisfactory	<p>HONEL GAM Series bridge deck expansion joints have been assessed as fit-for-purpose for applications where:</p> <ul style="list-style-type: none"> • the movement range in the direction of movement of the bridge structure of up to 480 mm must be accommodated • the skew angle of the joint is not greater than 45 degrees <p>It is recommended that vertical movements, measured at midpoint of the joint, do not exceed 6 mm for a two-gland joint and 22 mm for a six-gland joint.</p>
Strength	Satisfactory	<p>HONEL GAM Series bridge deck expansion joints have been designed to meet the loading requirements of the Austrian RVS guidelines adopted by Agrément South Africa, together with AASHTO and BS5400 loadings for highway bridges. These requirements are as follows:</p> <ul style="list-style-type: none"> • Vertical: 140 kN • Horizontal: 42 kN <p>acting over a width of 500 mm. Loads are inclusive of a dynamic factor. Calculations show that the joints meet the required standard.</p>
Fatigue	Satisfactory	Calculations and in-service performance indicate that the fatigue resistance of all components of the joint is acceptable.

Table 1: Assessment (continued)

Aspect of assessment	Opinion of Agrément South Africa	Explanatory notes
<i>Durability and environmental resistance</i>	Satisfactory	Based on knowledge of the materials used in the manufacture of the joints, the in-service performance of the joints, and the durability and the environmental resistance of elements of the HONEL GAM Series bridge deck expansion joints, the useful service life is assessed as being not less than 15 years.
<i>Watertightness</i>	Satisfactory	<p>When manufactured and installed as specified, and when tested as required below, joints will be within acceptable limits of permeability.</p> <p>In the workshop, a 10 % NaCl solution having a 30 mm head must be applied over a selected portion of joint for a period of eight hours. Vulcanised sections of the seal must be included in the section of seal being tested. The seal is to be deformed, both along and across the joint, to 20 % more than the design deformation.</p> <p>On site, the complete installation must be flushed for half an hour, and each end of the joint ponded for a length of 1 m, with a head of 150 mm for two hours.</p> <p>In both tests no moisture may appear on the underside of the seal. In the case of an unsuccessful test result, appropriate remedial action must be taken in accordance with the quality management system.</p>
<i>Quality management</i>	Satisfactory	<p>HONEL Structural Products (Pty) Ltd's factory in Pinetown, where joint components are manufactured, is certified to SANS 9001:2000.</p> <p>Installation is controlled by a quality system that complies with the requirements of Agrément South Africa. This system is based on the requirements of SANS 9001:2000</p> <p>If these systems are properly followed quality will be consistently satisfactory.</p>

SANS 9001:2000 *Quality management systems – Requirements*

Table 1: Assessment (continued)

Aspect of assessment	Opinion of Agrément South Africa	Explanatory notes
<i>Skid resistance</i>	Skid resistance can be unsatisfactory if installed in areas where this is required. This also depends on the width of the joint ie, the number of intermediate beams.	In special cases, such as where traffic passes the joint at a sharp angle, eg when turning at an intersection, there could be a skid hazard on multi-element joints, due to the surface area of metal exposed to vehicle tyres. Hence it is recommended that the bridge engineer situate the joint in areas where skid resistance requirements are low.
<i>Practicality of installation</i>	Satisfactory	Observations of installations in progress indicate that, given adequate training of staff, the presence of suitable supervisory staff and suitable equipment, as well as adherence to established quality procedures, joints can be readily and successfully installed.

PART 3: TECHNICAL DESCRIPTION



General description

Movement range - combination of contraction and expansion in the direction of movement.

HONEL GAM Series 80 – 480 bridge deck expansion joints are a series of multi-element gland and claw joints suitable for use in all climatic regions of South Africa and in all types of corrosive environment where:

- a movement range of up to a maximum of 480 mm must be accommodated (up to five intermediate beams and six glands would be required to accommodate movements of 480 mm - ie, 80 mm per gland), and
- the skew angle of the joint is not greater than 45 degrees.

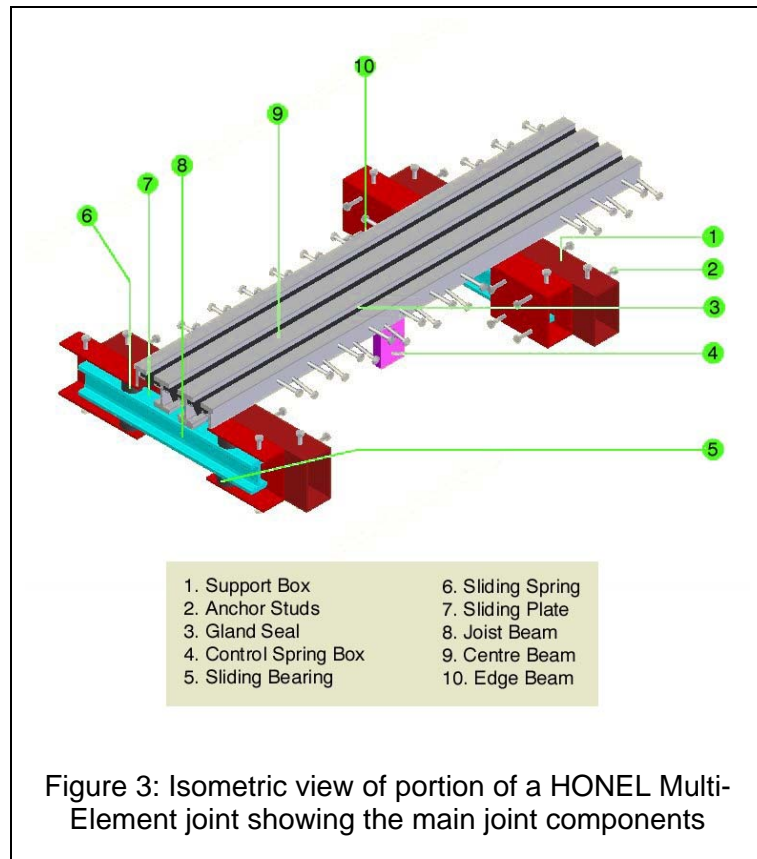
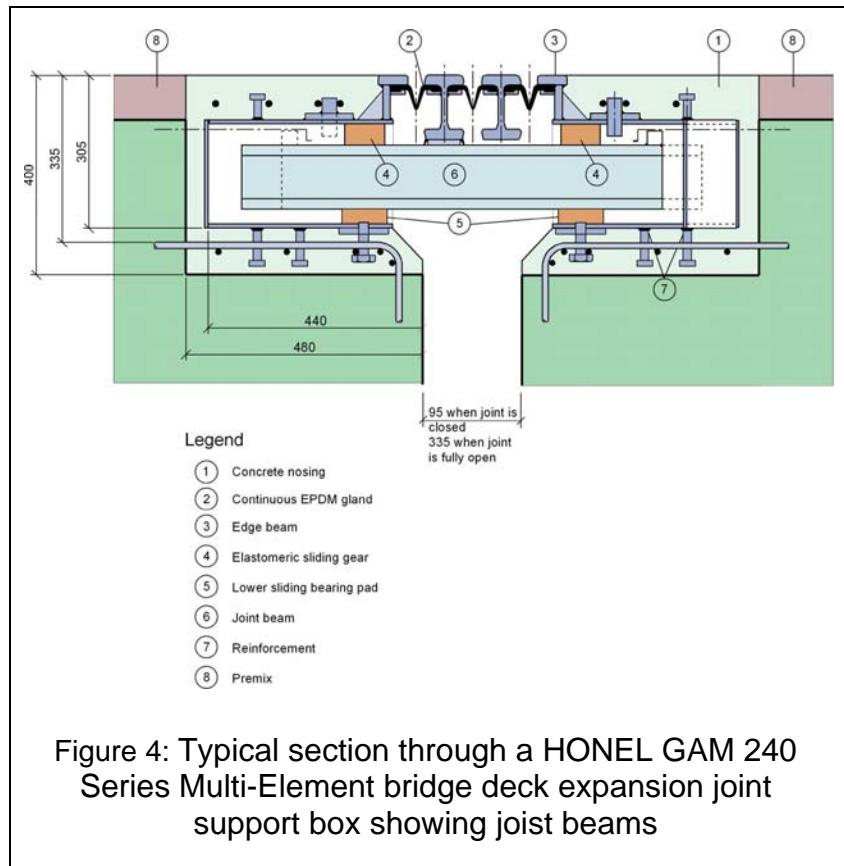


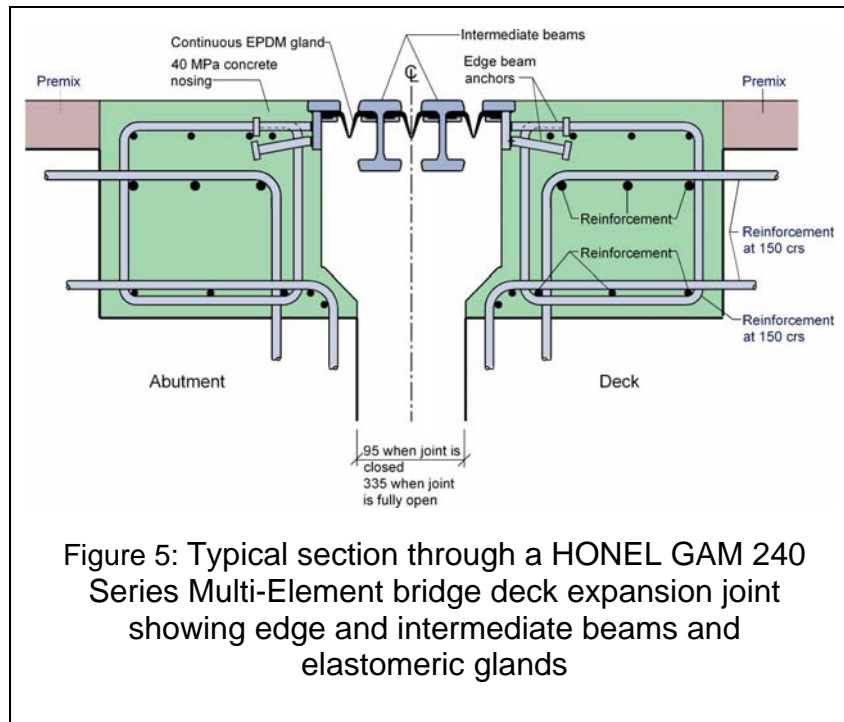
Figure 3: Isometric view of portion of a HONEL Multi-Element joint showing the main joint components

The Honel GAM Series of expansion joints consists of edge beams and an intermediate beam or beams, depending on the type of joint. The intermediate beam(s) are supported on joist beams, which in turn are supported on bearings in support boxes on each side of the joint. Above each joist beam at a bearing position is an elastomeric sliding pad installed under precompression. This precompression prevents the beams from lifting off the bearings under traffic conditions.



Edge beams and support boxes are rigidly anchored into the adjacent reinforced concrete by means of plate or shear-connector anchors.

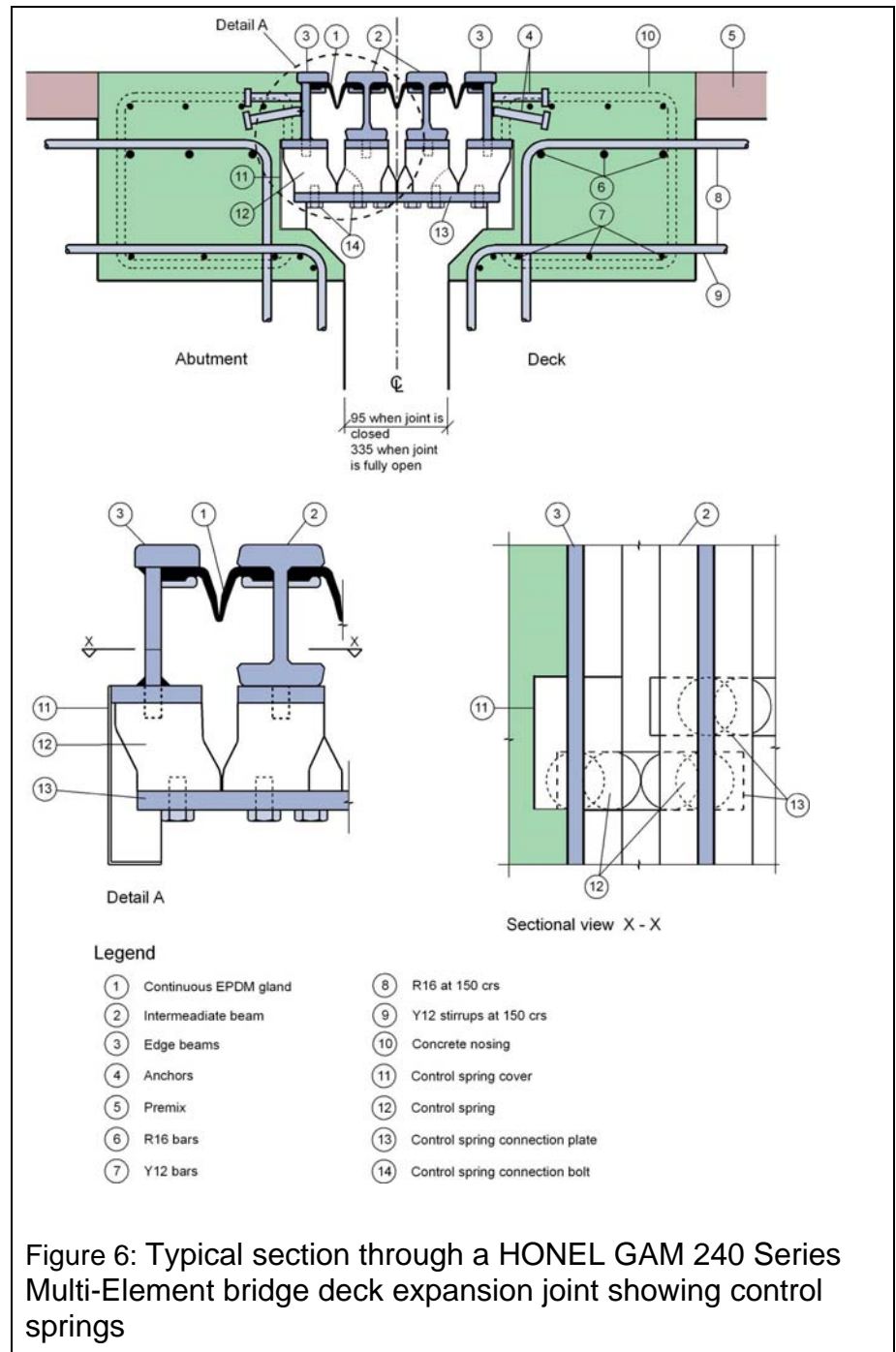
The intermediate beam(s) divide the joint into transverse individual gaps, which are sealed with elastomeric glands.



These glands span between the beams and prevent debris and water from entering the joint.

Without adequate restraint, the intermediate beam(s) can be pushed out of position by traffic forces, which also attempt to tilt the beam(s). Internal friction forces may also hinder the movement of the beams. The elastomeric glands are not able to ensure an equal spacing between the beams alone, so control springs are necessary. The springs work in shear to open as well as close the gaps, and work in compression and tension to resist the tendency of the beams to tilt.

The control springs occur at approximately 1,6 m centres and are positioned between support boxes. Control springs are bolted to the underside of intermediate beams, which in turn are bolted to control-spring connection plates.



SANS 1431 Weldable structural steels

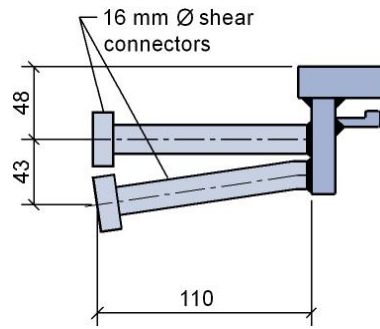
ASTM A108-03 Standard Specification for Steel Bar, Carbon and Alloy, Cold-Finished

Manufacture

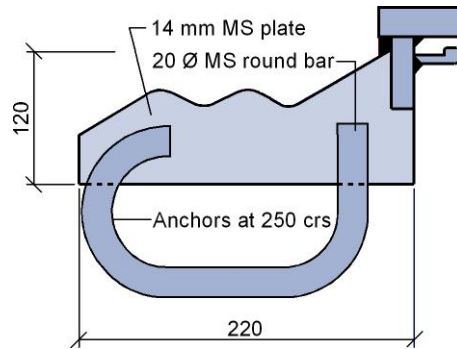
The joint is manufactured by HONEL Structural Products (Pty) Ltd in South Africa in accordance with the original designs by Glacier Bearings (Pty) Ltd. As far as possible, all materials are sourced locally.

Edge beams including claws are manufactured from plates meeting the requirements of BS4360 GR43A/SANS 1431 GD 300 WA, and shear connectors are manufactured from steel meeting the requirements of ASTM A108 GD 1020. The joint anchorage can be one of three options, as shown in Figure 6 as follows: pre-cut 14 mm thick steel fish-plates (SP anchors),

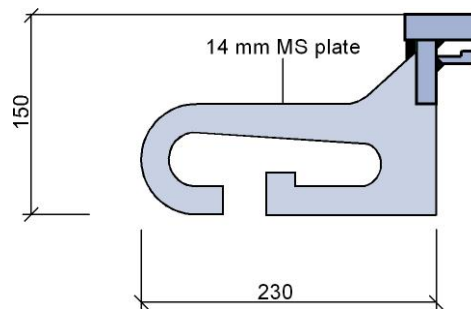
or cut plate anchors (G anchors) welded at 250 mm centres to the edge beam with continuous fillet welds, or 16 mm diameter shear connectors (C anchors) welded to the edge beam in two staggered rows at 150 mm centres.



'C' edge beam anchors



'SP' edge beam anchors

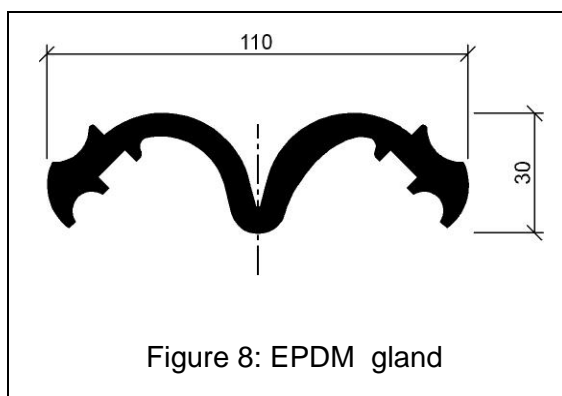


'G' edge beam anchors

Figure 7: 'C', 'SP', and 'G' edge beam anchors

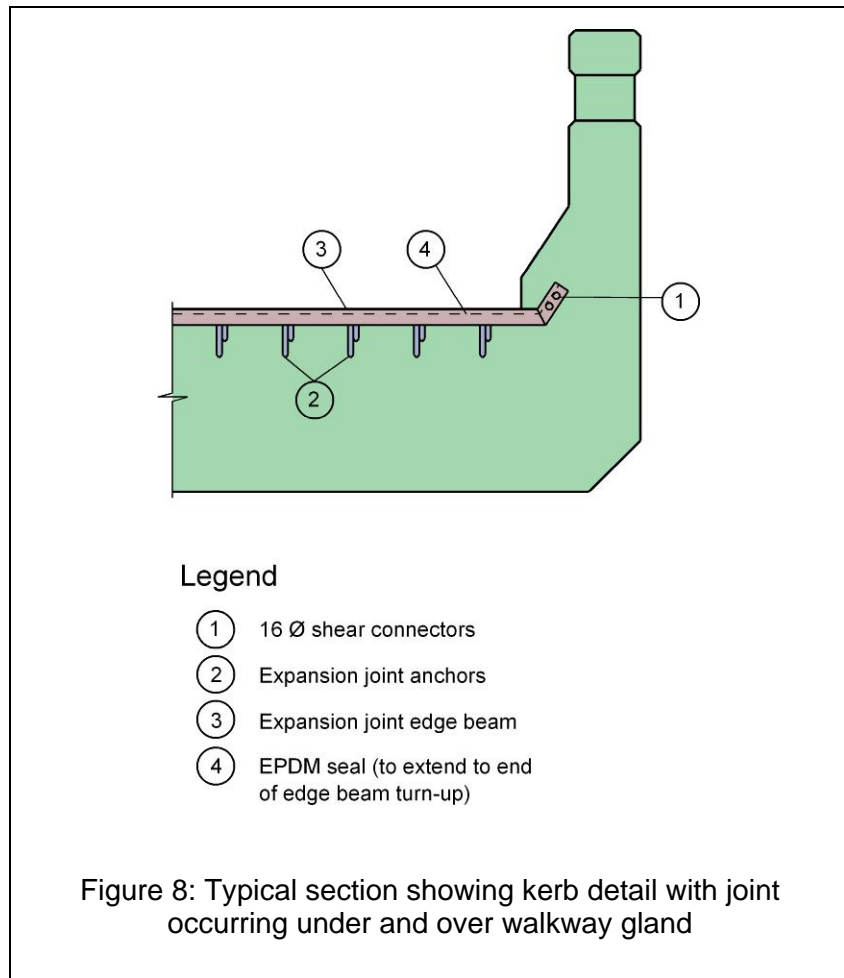
The joints are manufactured in lengths to suit available transportation and handling requirements. Where lengths of the joint are to be joined on site, provision is made for connecting plates which are welded to the ends of edge and intermediate beams. These connecting plates are bolted together on site to create continuous joints. Where necessary, edge and intermediate beams may be trimmed in length to suit the as-built dimensions of bridge-decks and abutments. However, care must be taken to ensure that damaged protective coatings are repaired, as specified.

Where possible, the gland, as shown below, is installed during joint manufacture in the factory. The gland is manufactured from extruded vulcanised rubber with a base polymer consisting of 100 % EPDM rubber. The EPDM, with one exception, meets the requirements of ASTM D5973. The exception is the oil-swell requirement, which may be 100 %.



Where specified, joints may extend into balustrades below or over walkways, as shown below.

I



SANS 1431 *Weldable structural steels*

Steel cover plates for covering the expansion joint gap at bridge parapets are manufactured from Grade 300W steel to SANS 1431.

ISO 1461:1999 *Hot dip galvanized coatings on fabricated iron and steel articles -- Specifications and test methods*

Cover plates and all exposed areas of the joint are hot-dip galvanized after the completion of welding, slotting and drilling, where appropriate. Galvanising is carried out in accordance with ISO 1461: 1999 to a 140 microns nominal thickness.

Joint dispatch from the factory and storage on site

The joint leaves the factory in a fully assembled condition, including the gland, where possible, with expansion gaps preset. Transport brackets are attached to the joint by means of bolts or welds. The joint preset allows for the opening and closing capacity specified by the engineer. This preset may need to be adjusted prior to installation, depending on irreversible movements which may have occurred in the structure and as a result of the temperature at the time of installation. Should the gland or a portion of the gland need to be installed on site, a minimum gap of 35 mm is required in order to allow installation.

Upon arrival on site, the joint must be lifted carefully, by means of the transport brackets provided at approximately quarter points along the joint. The joint must be checked for any damage which may have occurred in transport and any remedial action taken, if necessary.

Where the protective coating is damaged for any reason during offloading or subsequently during installation, and the affected area will not have at least 40 mm of concrete cover once the nosings have been cast, it must be repaired. Repairs are carried out by abrasive cleaning of the area and applying two coats of a proprietary brand zinc-rich galvanising repair coating (Galvaroid, Spanjaard Cold Zinc spray, or similar) in accordance with the manufacturer's specifications.

Where it is necessary for the joint to be stored on site for a period before installation takes place, it is important that cleanliness of the joint be maintained, particularly around the lower bearing pads, control system and gland-claw area. Storage by placing directly onto soil is not acceptable. Where the joints are stored outside they must be kept off the ground by means of timber or similar packing and must be covered. Joints must not be unduly stressed; cambers which may be built into the joint must be maintained.

Joint installation procedure (new installations)

Joint recesses for the concrete nosings must be accurately cast into the bridge-decks and abutments to the dimensions specified. Provision must be made for the main reinforcement to protrude into the recess at approximately 250 mm centres or a spacing as directed by the engineer. Protruding bars must be bent below the level of the underside of the premix to give acceptable concrete cover.

Temporary joint-filling material must be inserted into the expansion gap between the deck or abutment below the joint recess, over the full depth and width of the deck slab. The joint recess must be filled to the underside of the premix with a well-compacted crusher run, sand or weak concrete. Care must be taken to ensure that reinforcement will not be contaminated with bituminous agents.

Asphalt surfacing must be laid continuously over the filled joint recess. The asphalt must then be saw-cut and a strip of asphalt surfacing, centred over the joint, removed. Saw cuts must be straight and parallel, and extend into the parapet end-block faces to form recesses to accommodate the joint turn-ups. Care must be taken not to damage, or break into, the service ducts where provided.

The temporary recess filler material must then be removed, using light pneumatic or electric chipping equipment, to the full depth of the recess. At the faces of the recess aggregate must be exposed to leave a sound, irregular laitance-free surface. Exposed reinforcement must be cleaned of mud, oil, grease, bituminous agents, paint, loose rust, mill scale, concrete slurry or any other substance which could impair the bond or have an adverse chemical effect on the steel or concrete. Bars projecting into the recess must then be straightened. Additional bars, in the form of 25 mm or 32 mm

dowels which will later be used to support the joint must be installed along the length and on each side of the joint. and positioned so as not to coincide with support beam boxes.

Prior to lowering the joint into the recess, the expansion joint gap width must be adjusted, if necessary, in accordance with the written instructions of the engineer. The minimum allowable gap width at the time of installation is 35 mm.

Where joints are made up in short lengths they must be bolted together by means of the factory-fitted connecting plates. A gasket must be inserted between the connecting plates at the time of bolting to ensure watertightness of the connection. The joint must then be lowered into position by crane, using the lifting points. Anchors must not be cut off where these are found to clash with the deck reinforcement without written instructions from the engineer.

Care must be taken to ensure that the joint does not rest directly on any steel deck or abutment reinforcement. The joint must be positioned both laterally and longitudinally. Where necessary, levelling jacks or wedges must be positioned at quarter points to support the joint during the positioning process. Once the joint has been levelled it must be fixed in position by spot welding it to the additional 25 mm or 32 mm dowels referred to above. Welding must not be carried out on the joint profile since this has a detrimental effect on corrosion protection. Welding must be completed along one side of the joint before any welding can take place on the opposite side. As soon as the welds are completed on both sides of the joint, the transport brackets must be released and removed in order to allow the joint to begin functioning.

Additional longitudinal reinforcement must be placed and tied in position in accordance with the approved drawings. The straightened R12 bars projecting vertically from the recess must be bent down to form stirrups. Care must be taken to ensure that 40 mm of concrete cover to the reinforcement will be achieved once concrete is cast. Pre-heating of reinforcing bars by means of a cutting torch or similar equipment to facilitate must be not carried out.

Prior to the casting of the concrete nosings, joint levels and shutter plates at the back of boxes must be checked to ensure a proper fit, and additional tape applied where necessary. To prevent concrete from getting into gland claw-recesses or from soiling the glands, a strip of plastic must be taped over the edge and intermediate beams. The recess must be thoroughly washed to remove dust and deleterious material. All traces of surface water must be removed and a wet-to-dry epoxy-resin concrete-bonding agent must be applied to the existing concrete, strictly in accordance with the manufacturer's instructions.



The proposed concrete mix intended for use in the nosings must be approved by the engineer prior to casting. The mix must have a characteristic compressive strength of 40 MPa at 28 days.



Concreting may be carried out on one side of the joint at a time, or may be carried out on both sides simultaneously. Concrete must be compacted by internal vibrator (poker diameter not greater than 30 mm) ensuring that the concrete is well compacted around and under the expansion joint. Concrete work must be carried out in accordance with a relevant, nationally recognised specification. The surface of the nosing must be screeded flush with the asphalt surfacing to a class U2 wood-float surface finish. At least three test cubes must be made from the concrete used in each individual joint to establish the characteristic 28-day cube-crushing strength.





Immediately after the concreting operation has been completed all concrete spillage on the exposed surface areas of the joint must be removed, as well as the plastic strip protecting the gland claw-recess from the ingress of concrete. Concrete curing must be achieved by laying water-saturated underfelt over the concrete and then covering this with plastic sheeting.

After the concrete has attained a characteristic cube-crushing strength of not less than 15 MPa, all the temporary joint-filling material and/or foreign material must be removed from the expansion gap for the full width and depth of the bridge deck and parapets. Care must be taken to ensure that the claw in the edge beam is kept clean.

Where glands have not been factory-fitted, as is the case where joints are delivered to site in halves and with bolted connections, they must be installed on site. A thin film of water-soluble soap must be applied to the gland seal-recess to facilitate installation. The gland must be installed in one continuous length, ensuring that the joint is watertight over the full length of the joint (only factory-bonded or fused glands are utilised). Silicone sealant must be applied in the gland claw-recess at bolted connection points to ensure watertightness of the joint. To facilitate easy fitment of the gland into the turn-up sections, the gland must be fitted prior to the finishing of the balustrade concrete recesses.

All bolts securing the transport brackets to the expansion joint are removed and, where necessary, cut back to give 40 mm concrete cover. The corrosion protection must be repaired as described above.

Traffic must not be permitted to travel over the joint, without the written authorisation of the engineer. Concrete must usually have attained a characteristic strength of 30 MPa, but in some cases higher strengths may be specified.

Joint installation procedure (existing joint replacement)

Existing expansion-joint cover-plates, where provided, must be removed and the presence and depth of existing reinforcement within the confines of the proposed new concrete nosings must be established.

A strip of asphalt surfacing and/or concrete centred over the joint and corresponding to the widths and depths of the proposed new concrete nosings must be removed following saw-cutting. Precautions must be taken to ensure that no damage occurs to existing reinforcement, structural members, service ducts, etc, during the saw-cutting and concrete-breaking process.

“Weak” concrete exposed in the joint recess must be removed and/or repaired as described in the project specifications, or as instructed by the engineer.

The expansion gap must be cleared of all jointing and/or foreign material over the full width and depth of the deck slab.

Where the existing reinforcement exposed in the nosing recesses does not comply with the details of the joint drawings, extra reinforcing bars must be installed so as to comply with the joint drawings. This procedure is as follows:

- 16 – 22 mm diameter holes, 200 mm deep must be drilled for Y12 anchor bars. Y12 bars must meet the requirements of SANS 920 for high-yield deformed steel bars.
- Holes must be cleared of drill spoil to ensure that they are free of any foreign material.
- Y12 pre-bent anchor bars must be test-fitted in the pre-drilled holes and adjusted in length and/or shape where necessary.
- Holes must be primed and sufficient epoxy grouting-compound must be placed in each hole to ensure that the holes are filled to their full depths on installation of the Y12 anchor bars without subsequent topping-up. For bars not pre-bent, the grout must be allowed to cure before bending to form stirrups.

SANS 920 *Steel bars for concrete reinforcement*

The preparation of the recesses, installation of the expansion joints, concreting and curing of the concrete nosings and installation of the steel cover-plates must be proceeded with as described above for new installations.

In cases where open service ducts are present at sidewalks and the paving slabs extend over the expansion joint without edge beams, concrete nosings must be provided, as specified, to accommodate edge beams.

Where specified in the project specification, the concrete nosings must be protected with 25 mm thick bridging plates, temporarily bolted to the bridge deck, in order to accommodate traffic over the expansion joint. The cover plates must not be removed on standard installations until the concrete in the nosings has attained a characteristic cube-crushing strength of 30 MPa. In special cases, the engineer may specify higher concrete strengths.