

Expansion Joints

2600

Expansion Joints

2601. DESCRIPTION

This work shall consist of fabrication and placing of expansion joints as indicated on the drawing and conforming to these specifications or as directed by the Engineer.

2602. GENERAL

- a) The expansion joints shall be designed and duly got approved by the Engineer. It shall cater for expected movement and rotation of the structure at the joints and provide smooth riding surface. It shall also be easy for inspection, maintenance and replacement.
- b) Expansion joints shall be robust, durable, water-tight and replaceable. Site fabricated expansion joints shall be prohibited. Expansion joints shall be obtained by the Engineer either directly or through the Contractor from approved manufacturers and be of proven type.
- c) For bridges with prestressed concrete superstructure, with individual span length more than 20 m or built with innovative design/construction elastomeric expansion joints of slab seal or strip seal type shall be provided.
- d) For slab type of bridges of spans less than 10 metres continuous surfacing may be provided across the expansion gaps, supported on a 20 mm thick plate placed and fixed at the level of the deck slab.
- e) For bridges other than those mentioned in (c) above with spans above 10 metres, an alternative specification of sliding steel plate joint or filled joints with copper plates may also be adopted if approved by the Engineer, apart from elastomeric expansion joint of slab seal or strip seal type.
- f) Vehicular traffic shall not be allowed over expansion joints after its construction for such period as may be determined by the Engineer.
- g) Proprietary type deck joints offered by the Contractor in lieu of the type specified shall comply in all respects with the manufacturer's specifications and meet the required range of movements and rotations and be fit for the purpose of ensuring satisfactory long term performance in the bridge.

Where alternative type proprietary deck joints are proposed by the Contractor, the following information shall be provided.

- i) Name and location of the proposed manufacturer.
- ii) Dimensions and general details of the joint including material specifications, holding down bolt or anchorage details and installation procedures.
- iii) Evidence of satisfactory performance under similar environmental conditions of similar joints being produced by the manufacturer.

Any acceptance of alternative types will be at the sole discretion of the Engineer.

Such deck joints shall be installed in accordance with the manu-

factorer's recommendations and to the general requirements of this Specification.

No expansion joint shall be provided only for the width of the carriageway. It shall follow the profile including the kerb and the footway and fascia, if provided. The type of expansion joint for the latter may be made different from that used for the carriageway expansion joint.

2603. REQUIREMENTS

2603.1. The requirement criterion will be separately applicable for the expansion joint proper and the transition zone of attachment to the deck.

2603.2. There are two types of performance requirements for the expansion joint proper viz. from the necessity of the bridge and from the road users e.g. man, animal and vehicle.

2603.3. Performance Requirement with Respect to Bridges

The expansion joint shall :

- a) Withstand the imposed load including the impact load from live load and other sources.
- b) Allow expansion and contraction movement due to temperature, creep, shrinkage, prestressing and structural deformations.
- c) Permit relative rotation in elevation and plan due to the causes as noted above,
- d) Be waterproof. Bridge deck expansion joint seals play a critical role in preventing the degradation of the structural components of the bridge system. Without effective joint seals, water passes through the bridge deck and works harmfully to corrode steel components and cause deterioration of the concrete. Rain water gathers various corroding additives from the atmosphere and also from the carriageway.
- e) Ensure sealing. In case bridge deck joints are not sealed, apart from loss of waterproofing, grit and other forms of road debris may enter the joint. Debris, when impacted with the joint can seriously restrict the movement instead of facilitating the same. In the case of proprietary joints being accepted for adoption, the sealing shall be as specified by them,
- f) Ensure long life by being resistant to corrosion,
- g) Be easy to install,
- h) Be easy to maintain. Replaceability of expansion joint shall be one of the basic criteria for selection of type of expansion joint,
- i) Be resistant to the materials likely to collect/spill over the deck in its normal service.

2603.4. Performance Requirement with Respect to User

The expansion joint shall :

- a) Provide smooth continuity at the top of the deck for riding comfort,
- b) Be of skid resistant surface,
- c) Be non-damaging to the rubber tyre,
- d) Make minimum noise during vehicular crossing,
- e) Ensure that animal paws and hooves should not get entangled where bridges are used by animal drawn traffic,
- f) Permit passing of bullock cart steel tyre for bridges where bullock carts ply,
- g) Look good aesthetically.

2603.5. Performance Requirement for Transition Zone

It is the zone of connection of joint assembly and the adjoining deck.

The expansion joint shall :

- a) Permit transfer of generated forces without distress, i.e., without getting uprooted. The purpose will not be served if the bonding is with the wearing coat only. Anchorage must be provided with the deck structural element,
- b) Ensure that surface in the transition zone stays undisturbed during long term service.

2604. STEEL PLATE SLIDING EXPANSION JOINTS

- a) In this type of buried joint, the wearing coat shall be made continuous over the joint. The other alternative shall be to keep a gap in the wearing coat which is filled up with a seal and filler, to be provided in extremely hot areas.
- b) Materials for steel plates shall conform to Section 1900. The exposed metallic components shall be galvanised or coated with approved anti-corrosive paint. The thickness shall be 20 mm or so for obtaining satisfactory performance.
- c) Plates shall be placed to the line, grade and expansion gap shown on the drawings with any adjustment required for temperature, particular care being taken with the top of the plates.
- d) Plates shall be firmly held in place during concreting by methods approved by the Engineer.
- e) Any temporary bolts or other fixings which prevent relative movement of the adjacent parts of the joint shall be removed as soon as the concrete has set sufficiently to hold the expansion plates in their correct positions. In any case, temporary bolts or other fittings shall be removed within 6 hours of placing concrete unless otherwise directed by the Engineer.
- f) Care shall be taken to prevent damage to expansion joint plates or its coating.
- g) If any damage occurs, the plates and coatings shall be restored by the Contractor to the satisfaction of the Engineer.
- h) Plates shall be free of oil, rust, loose paint or other similar material before coating.

2605. FILLER JOINTS

- a) The components of this type of joint shall be at least 2 mm thick corrugated copper plate placed slightly below the wearing coat, 20 mm thick compressible fibre board to protect the edges, 20 mm thick pre-moulded joint filler filling the gap upto the top level of the wearing coat, sealed with a joint sealing compound.
- b) The material used for filling expansion joint shall be bitumen impregnated felt, elastomer or any other suitable material, as specified on the drawings. Impregnated felt shall conform to the requirements of IS:1838, and shall be got approved from the Engineer. The joint filler shall consist of large pieces and assembly of small pieces to make up the required size shall be avoided.
- c) Expansion joint materials shall be handled with care and stored under cover by the Contractor to prevent damage.
- d) Any damage occurring after delivery shall be made good to the satisfaction of the Engineer and at the expense of the Contractor.
- e) Joint gaps shall be constructed as shown on the drawings. Surfaces of joint grooves shall be thoroughly cleaned with a wire brush to remove all loose materials and dirt and debris, then washed or jetted out.
- f) Pre-moulded expansion joint filler shall not be placed in position until immediately prior to the placing of the abutting material. If the two adjacent surfaces of the joint are to be placed at different times, this type of joint filler shall not be placed until the second face is about to be placed.
- g) Sealants shall be installed in accordance with the manufacturer's recommendations and all appropriate requirements for joint face priming.
- h) Sealants shall be finished approximately 3 mm below the upper surfaces of the joint.
- i) Joint materials spilt or splashed onto finished surfaces of the bridge during joint filling operations shall be removed and the surfaces made good to the Engineer's approval.
- j) No joint shall be sealed until inspected by the Engineer and approval is given to proceed with the work.

2606. ELASTOMERIC SLAB SEAL EXPANSION JOINT

2606.1. Materials

- a) Steel inserts shall conform to IS:226. Use of any other materials like fibre-glass or similar material shall not be permitted.
- b) Elastomer for elastomeric slab unit (ESU) shall conform to clause 915.1 of IRC:83 (Part II), compounded to give hardness IRHD 60 \pm 5, subject to the following additional stipulations :
 - i) Chloroprene (CR) only shall be used in the manufacture of elastomeric expansion joints. No reclaimed/natural rubber or vulcanised wastes shall be used.
 - ii) The chloroprene material used in the manufacture of elastomeric (expansion joints) shall be Neoprene WRT, Bayprene 110, Skyprene B5 or Denka S-40V.

- iii) Chloroprene content of the compound shall not be lower than 60 per cent by weight. The ash content shall not exceed 5 per cent (as per tests conducted in accordance with ASTM D-297 for (i) and (ii) above.
- iv) EPDM and other similar candidate elastomers for expansion joints shall not be permitted.
- c) Elastomeric plugs.
- d) Spacer bars, marked with centre to centre distance of fixing holes.
- e) Fixing bolts and nuts made of stainless steel.
- f) Anchor bars comprising hooked anchor stiffeners welded with lower steel inserts and sinusoidal anchor bars welded with horizontal leg of the edge steel inserts. The elaborate anchoring arrangements of steel inserts shall be permanently welded/tied with the steel reinforcement.

2606.2. Fabrication

- a) Steel inserts shall be grit blasted and provided with epoxy paint.
- b) Edges of reinforcing steel sections shall be rounded.
- c) Expansion joints shall be fully moulded to the required size in one single vulcanising operation including the encasing layers as integral and homogeneous part.
- d) Tolerances of fabrication shall be as follows :
 - i) Plan dimension $\rightarrow \pm 5$ mm
 - ii) Total height $\rightarrow \pm 3$ mm

2606.3. Supply and Handling

- i) The Contractor shall supply all steel-reinforced elastomeric expansion joints including bolts, nuts, sealant, plugs and all other accessories for the effective installation of the joints including angled jointing sections for kerbs.
- ii) Expansion joint material shall be handled with care and stored under cover by the Contractor to prevent damage. Any damage occurring after delivery shall be made good at the expense of the Contractor to the satisfaction of the Engineer.

2606.4. Installation

2606.4.1. Expansion joints shall be installed as per approved drawing. Steel inserts, spacer bars, concreting of pockets, fixing of elastomer slab unit and presetting, etc., shall be done as per the following:

- a) Steel Inserts
 - i) Deck casting shall be done leaving pockets or recess for steel inserts and anchors of the expansion joint as per drawing.
 - ii) Steel inserts shall be lowered at the appropriate location inside the pocket.
 - iii) The top of the insert shall be flush with the finished level of wearing course maintaining the camber.
 - iv) Spacer bars, duly set appropriately to the month of installation, shall be fitted under proper supervision.

- v) Anchor rods shall be tied/welded with the existing deck main reinforcement, maintaining level and alignment.
 - vi) Welding between anchor rods and deck reinforcement is preferable. If welding is not possible, strong steel tie wires shall be used for fastening, under proper supervision.
- b) Spacer Bar
- i) Spacer bars shall be used to ensure proper positioning of bolts and also levelling of the steel inserts during fixing of the same with the deck reinforcement and casting second stage concreting in the pocket thereafter.
 - ii) The 2nd stage concreting operation shall preferably be started within 24 hours of fixing the steel inserts. In such cases, spacer bars should be removed just after concreting is finished. If there is a substantial time lag between fixing of inserts and concreting, then any one of the following methods shall be adopted, depending on the support condition :
 - a) For simply supported bridge resting on simple elastomeric bearings, (with no dowel pins), insert shall be placed in position with spacer bars at every alternate joints. Such joints shall be called restrained joints hereafter. In other words, inserts shall not be fixed simultaneously at two ends of one span. If the above condition is satisfied, inserts with spacer bars shall be kept in position for a substantially longer period at such restrained joints. Spacer bars shall be removed after concreting of such restrained joints and inserts placed in position with spacer bars at the other unrestrained joints thereafter.
 - b) For bridges resting on other than elastomeric bearings (including bearings with dowel pins at one end), after placing and aligning the inserts and securing the same, the spacer bars shall be removed. Concreting shall be done with great care so that inserts are not dislocated or distorted.
 - iii) While removing the spacer bar after concreting, one must take care to see that the concrete is not damaged during withdrawal of spacer bar. If the spacer bar happens to be snugly fitted, it shall not be pulled by any means; it shall be gas cut in two pieces and then removed.
- c) Concreting of Pocket
- i) Concreting of pocket shall be done with great care using proper mix conforming to grade similar to that of the deck casting besides ensuring efficient bonding between deck and steel insert. Also proper care shall be given for ensuring efficient bonding with the already cast concrete.
 - ii) Needle vibrators shall be used. Care shall be taken so that the position of steel insert is not disturbed during vibration.
 - iii) Spacer bar shall be removed within an appropriate time before the joint is required to permit movement.
- d) Fixing of Elastomeric Slab Unit (ESU)
- i) Special jig shall be used to preset the ESU during installation.
 - ii) ESU (mounted on the jig, if preset) shall be lowered to position.

- iii) The line and level on the ESU should be adjusted.
 - iv) ESU shall be removed and coated with special adhesive
 - v) ESU shall be placed in position again, ensuring waterproof joining at required faces.
 - vi) ESU shall be tightened with stainless steel nuts and lock washers in position. Tightened nuts shall be locked with lock washers.
 - vi) Special sealant shall be poured inside the plug holes.
 - vii) The elastomeric plugs shall be pressed in position after applying adhesive on the appropriate surface.
 - viii) ESU shall be fitted in position after completion of wearing course. While completing this part of the wearing course, adequate care shall be taken to ensure a waterproof joining with the already existing wearing course.
- e) Pre-Setting
- i) The main purpose of presetting of the steel inserts at the time of its installation is to ensure as closely as possible the condition that in the long run at the mean average annual temperature, the ESU remains at its nominal state.
 - ii) Major factors responsible for changing the longitudinal length of the bridge superstructure are indicated below :
 - a) Temperature variation from annual mean.
 - b) Changes due to shrinkage of concrete.
 - c) Changes due to elastic shortening and creep of the prestressed bridge superstructure.
 - d) Deformation of superstructure and substructure, if any.

Resultant changes in expansion gap due to first factor can occur in both directions from any pre-selected mean position whereas changes due to creep and shrinkage are unidirectional such that the expansion gap continuously increases with passage of time.

The steel insert unit of expansion joint can be fixed in any month of the year. As stated earlier, the expansion gap between bridge superstructure may vary from time to time; hence the initial fixing distance between fixing points will obviously depend on the month of installation of steel insert. The c/c distance between stainless steel fixing of bolts as indicated in the drawing can be taken as only nominal. The same shall be modified by presetting depending on :

- i) The difference between the mean temperature of the month of fixing of steel insert and the annual average temperature.
- ii) The elapsed period between the casting and/or prestressing and fixing of steel insert for calculating the remnant creep and shrinkage.

2606.4.2. Special requirements for installation

- i) Prior to construction of bridge deck area adjacent to the joint, the supplier shall provide detailed working drawings showing the location of all bolts, recesses and holes necessary for the installation of the joint. Reinforcing bars in superstructure shall be amended as required to ensure that there will be no interference in the installation of the joint.
- ii) All bearing surfaces and recesses which are in contact with the joint assembly shall be checked with a straight edge to ensure flatness of profile.
- iii) No holes shall be drilled for fixing bolts within 7 days of concreting. Holes for the bolts shall be drilled to the size and depth shown on the drawings.
- iv) Sections of the jointing making the completed joint shall follow a straight line.
- v) The fixing bolts shall not be placed in a position until at least 4 weeks after stressing is completed in post-tensioned box or beam and slab structures. Prior to placing sections of jointing, contact surfaces shall be cleaned to remove all grease, tar, paint, oil, mud or any other foreign material that may affect adhesion of the sealant.
- vi) Sealant shall only be applied to dry contact surfaces. Sufficient sealant shall be applied to the contact surfaces to cause extrusion of sealant when the jointing is fixed in position.
- vii) Final sealing of the finished expansion joint shall be completed immediately after completion of installation. All exposed ends, joints between units and other areas of possible leakage shall be filled with sealant. A sealant between the sides of the jointing and concrete or plates shall be applied.
- viii) Bolt cavities shall be cleaned and plugged with neoprene cavity plugs. Prior to placing the plugs sufficient sealant shall be placed in the cavity to cause extrusion of the sealant by the plugs.
- ix) All excess sealant shall be removed from the jointing and adjacent areas.

2606.5. Acceptance Test

2606.5.1. As per clause 918.7 of IRC-83 (Part II), necessary quality control certification by the manufacturer in regard to properties of Elastomer and steel will be furnished.

For severe environment, ozone resistance test as per clause 915.2.3 of IRC:83 (Part II), shall be carried out for elastomer.

The properties of the elastomer shall conform to Table I of clause 915.2 of IRC:83 (Part II). The acceptance testing for elastomer material shall conform to clause 918.4.1.2 of IRC:83 (Part II) with additional criteria as stated in Clause 2005.

2606.5.2. The fabricated expansion joint shall be subjected to the following acceptance tests :

- i) Routine test. Each expansion joint shall be tested for at least 100 cycles for a test movement which shall be 10 per cent more than the design expansion/contraction movement.
- ii) In addition to routine test, one out of every 20 expansion joints shall be subjected to the test movement for 4000 cycles.
The lot shall be rejected if the elastomer material shows signs of fatigue or permanent set or distress in the test. The test piece shall not be used in the bridge.
- iii) The type test for abrasion resistance shall be carried out for one joint out of every 20 nos. as per IS:3400 (Part 3) and the standard deviation shall be within ± 20 per cent

The manufacturer shall preferably have in-house testing facility. Otherwise, the testing shall be got done by him at his expense at any testing establishment selected by the Engineer. A manufacturer who cannot carry out the acceptance test shall not be entitled to supply elastomeric slab seal joint.

2607. STRIP SEAL EXPANSION JOINT

2607.1. Components

Strip seal expansion joint shall comprise the following items :

- a) Edge beams - This special claw leg profiled member shall be of extruded rolled steel section combining good weldability with notch toughness.
- b) Strip seal - This shall be of chloroprene with high tear strength, insensitive to oil, gasoline, and ozone. It shall have high resistance to aging. This component, provided to ensure water tightness, shall have bulbous shape of the part of the seal which is inserted into the groove, provided in the edge beam. The seal should be vulcanised in single operation for minimum full length of joint.
- c) Rigid Anchorage - This shall be welded to the edge beam at staggered distance.
- d) Anchor loops - This shall be made of weldable steel connecting the rigid anchorage with deck reinforcement.

2607.2. Material

- a) Edge beams of this special section are at present being directly imported in India. The steel shall conform to steel grade Rst 37-2 of German Standard or equivalent.
- b) Chloroprene of strip seal shall conform to clause 915.1 of IRC:83 (Part II). The properties of chloroprene shall conform to Table 2600-1.
- c) Anchorage steel shall conform to IS:2062.
- d) Anchor loop shall conform to IS:2062.

TABLE 2600-1. STRIP SEAL ELEMENT SPECIFICATION

Sealing element is made of chloroprene and must be a extruded section. The working movement range of the sealing element shall be at least 80 mm with a maximum of 100 mm at right angles to the joint and ± 40 mm parallel to the joint.

PROPERTY	SPECIFIED VALUE
Hardness	63 \pm 5 Shore A
Tensile Strength	Min 11 MPa
Elongation at fracture	Min 350 per cent
Tear Propagation Strength	
Longitudinal	Min 10 N/mm
Transverse	Min 10 N/mm
Shock Elasticity	Min 25 per cent
Abrasion	Min 220 mm ³
Residual Compressive Strain (22 h/70 deg C /30 per cent strain)	Max 28 per cent
Ageing in hot air (14 days/70 deg C)	
Change in hardness	Max +5 Shore A
Change in tensile strength	Max -20 per cent
Change in elongation at fracture	Max -20 per cent
Ageing in ozone (24 h/50pphm/25 deg C/20 per cent strain)	No cracks
Swelling behaviour in Oil (116 h/25 per cent C) ASTM Oil no.	
Volume Change	Max 5 per cent
Change in hardness ASTM Oil no.3	Max 10 Shore A
Volume Change	Max 25 per cent
Change in hardness	Max 20 Shore A
Cold Hardening Point	Min -35 deg C

2607.3. Fabrication (Pre-installation)

- a) Rolled steel profiles for edge beams shall be long enough to cater for a 2-lane carriageway. These shall be cut to size of actual requirements by means of a mitre box saw. Alignment of the cut-to-size steel profiles shall then be made in accordance with the actual bridge cross-section on work tables. For this purpose, the contour of bridge cross-section shall be sketched onto these tables. After the steel profiles are aligned, they will be chucked to the tables by means of screw clamps and tacked by arc welding.
- b) Anchor plates shall be cut to the required size by gas cutting. These shall be welded to the edge beams.
- c) Anchor loops shall be bent to the required shape and welded to anchor plate.
- d) The finally assembled joints shall then be clamped and transported to the work site.

2607.4. Handling and Storage

- a) For transportation and storage, auxiliary brackets shall be provided to hold the joint assembly together.
- b) The manufacturer shall supply either directly to the Engineer or to the Bridge Contractor all the materials of strip seal joints including sealants and all other accessories for the effective installation of the jointing.
- c) Expansion joint material shall be handled with care. It shall be stored under cover on suitable lumber padding by the Contractor to prevent damage. Any damage occurring after delivery shall be made good at the Bridge Contractor's expense to the satisfaction of the Engineer.

2607.5. Installation

2607.5.1. The width of the gap to cater for movement due to thermal effect, prestress, shrinkage and creep, superstructure deformations (if any) and sub-structure deformations (if any) shall be determined and intimated to the manufacturer. Depending upon the temperature at which the joint is likely to be installed, the gap dimension shall be preset.

2607.5.2. Taking the width of gap for movement of the joint into account, the dimensions of the recess in the decking shall be established in accordance with the drawings or design data of the manufacturer. The surfaces of the recess shall be thoroughly cleaned and all dirt and debris removed. The exposed reinforcement shall be suitably adjusted to permit unobstructed lowering of the joint into the recess.

2607.5.3. The recess shall be shuttered in such a way that dimensions in the joint drawing are maintained. The formwork shall be tight.

2607.5.4. Immediately prior to placing the joint, the presetting shall be inspected. Should the actual temperature of the structure be different from the temperature provided for presetting, correction of the presetting shall be done. After adjustment, the brackets shall be tightened again.

2607.5.5. The joint shall be lowered in a pre-determined position. Following placement of the joint in the prepared recess, the joint shall be levelled and finally aligned and the anchor loops on one side of the joint welded to the exposed reinforcement bars of the structure. Upon completion, the same procedure shall be followed for the other side of the joint. With the expansion joint finally held at both sides, the auxiliary brackets shall be released, allowing the joint to take up the movement of the structure.

2607.5.6. High quality concrete shall then be filled into the recess. The packing concrete must feature low shrinkage and have the same

strength as that of the superstructure, but in any case not less than M 35 grade. Good compaction and careful curing of concrete is particularly important. After the concrete has cured, the movable installation brackets still in place shall be removed.

2607.5.7. Rolled up neoprene strip seal shall be cut into the required length and inserted between the edge beams by using a crow bar pushing the bulb of the seal into the steel grooves of the edge beams. A landing to a bead shall be formed in the thickened end of the edges of the seal which would force the thickened end against the steel beam due to wedge effect when the strip seal is buttoned in place.

2607.5.8. As soon as the concrete in the recess has become initially set, a sturdy ramp shall be placed over the joint to protect the exposed steel beams and neoprene seals from site traffic. Expansion joint shall not be exposed to traffic loading before the carriageway surfacing is placed.

2607.5.9. The carriageway surfacing shall be finished flush with the top of the steel sections. The actual junction of the surfacing/wearing coat with the steel edge section shall be formed by a wedge shaped joint with a sealing compound. The horizontal leg of the edge beam shall be cleaned beforehand. It is particularly important to ensure thorough and careful compaction of the surfacing in order to prevent any premature depression forming in it.

Acceptance Test

- i) All steel elements shall be finished with corrosion protection system.
- ii) For neoprene seal, the acceptance test shall conform to the requirements stipulated in Table 2600-I. It shall also be stretch tested. If a manufacturer is to supply this type of joint, they will have to produce a test certificate accordingly conducted in a recognised laboratory, in India or abroad.
- iii) In view of the importance of the built up edge beams, special investigation of fatigue strength of this section with anchorages to withstand 2×10^6 load change cycles without showing signs of damage, will be required. The supplier shall have to produce a test certificate in this regard, conducted in a recognised laboratory, in India or abroad.
- iv) The manufacturer shall produce test certificates indicating that anchorage system had been tested in a recognised laboratory to determine optimum configuration of anchorage assembly under dynamic loading.
- v) The manufacturer shall satisfy the Engineer that water tightness test for the type of joint has been carried out in a recognised laboratory to check the water tightness under a water pressure of 4 bars.
- vi) As strip seal type of joint is specialised in nature, generally of the proprietary

type, the manufacturer shall be required to produce evidence of satisfactory performance of this type of joint.

2608. TESTS AND STANDARDS OF ACCEPTANCE

The materials shall be tested in accordance with these specifications and shall meet the prescribed criteria.

The work shall conform to these specifications and shall meet the prescribed standards of acceptance.

2609. MEASUREMENTS FOR PAYMENT

The expansion joint shall be measured in running metres. For filled joints, the rate per running metre shall include the cost of sealant for the depth provided in this drawing.

2610. RATE

The contract unit rate shall include the cost of all material, labour, equipment and other incidental charges for fixing the joints complete in all respects as per these specifications in the case of Bridge Contractor supplying the expansion joint. If the manufacturer supplies the expansion joint directly to the Engineer, the cost of installation, handling and fixing shall be borne by the Bridge Contractor.
