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## Special bearings and expansion joints from METCOgroup

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The METCOgroup of Engineers Pvt Ltd, Kolkata, has provided specially-designed appurtenances like bearings, expansion joints, etc, for major bridges over Sardan, Dudhar Khad, etc.

Both Sardan and Dudhar Khad bridges have been constructed over very deep gorges with maximum pier height of 80 m. The vertical load on the bearings has been quite high. Further, horizontal loads due to tractive and braking forces of high speed locomotive, wind, seismic forces, etc, were enormous. The horizontal movements have also been quite large due to temperature variation, creep, shrinkage and other factors. That is why the bearing system envisaged segregation of the vertical loads and the horizontal loads to be independently carried and shared by different types of bearings more efficiently. This was possible by providing high capacity POT/PTFE bearings, namely, *Steflomet* brand verso bi-axial bearings for supporting the vertical loads and *Seslomet* brand elastomeric stopper bearings of special design to resist the horizontal forces. One end of the bearings was locked from all sides and the other end locked from lateral sides, but allowing longitudinal movement only. The POT/PTFE bearings also catered for rotational movements. The design of the bearings has been done by the manufacturers as per relevant BS/IS/IRC codes, accepted good

engineering practice and approved by Northern Railway. All the bearings have been tested at their works by RDSO and certified as per approved QAP and drawings. The inspection procedure included testing of all types of raw materials as well as finished bearings including load testing at the specially-designed testing rig at the manufacturers workshop.

### Expansion joint

The Metcogroup also designed very special type of expansion joints for these railway bridges, which consisted of *Mageba-India* brand single module strip seal joint of 200 mm movement capacity with stainless steel sliding top plate arrangement for protection against track ballast. This expansion joint is manufactured by Metcogroup of Companies in India in technical collaboration and under licence from the world renowned "Mageba Sa" of Switzerland. This type of expansion joint is being used in a railway bridge, for the first time in India.

The following are the details of bearings provided for the two bridges:

### Sardan bridge

- (i) For the viaduct span, 36 *Steflomet* POT/PTFE bearings and 72

*Seslomet* elastomeric stopper bearings were used.

- (ii) For the continuous main span (river portion), 8 *Steflomet* POT/PTFE bearings of 2500-t capacity and 12 *Seslomet* elastomeric bearings of 375-t capacity was used.

### Dudhar bridge

- (i) 4 *Steflomet* POT/PTFE bearings of 3850-t capacity for Central Piers.
- (ii) 4 *Steflomet* POT/PTFE bearings of 1600-t capacity for Abutments.
- (iii) 12 *Steflomet* elastomeric stopper bearings of 350-t capacity.
- (iv) 4 *Seslomet* elastomeric uplift restraining bearings of 550-t capacity.

For more details, please contact

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