

## M8 FERMOY BYPASS BRIDGE, IRELAND - TF EXPANSION JOINT REPLACEMENT



### Project Brief

Replacement of expansion joint - supply and installation of 1 no. 23m Ekspan TF 1300 expansion joint.

### Project Team

**Client:** Direct Route (Fermoy) Ltd.  
**Main Contractor:** USL Ekspan

### Background Information

The Fermoy Bypass (circa 450m long) located on the M8 motorway approximately 20km north of Cork, is a multiple span concrete post-tensioned bridge carrying the M8 motorway over the River Blackwater. The M8 forms part of the main link for traffic commuting from Dublin to Cork city. This structure was built and is maintained by Direct Route (contractors for the PPP Project M8 Fermoy/Rathcormac Bypass).

Following an in-depth independent investigation, requested by Direct Route, findings revealed the existing joints on the southern abutment in both directions had failed. Measurements and readings taken exposed considerable abnormal shrinkage and creep on the joints, and prestress had caused elastic shortening of the deck. The temperature differences and movement ranges had exceeded the capacity of the movement joint for this bridge, making the existing joints non-functional and proving these, through collated data, to be either an incorrect joint type or incorrectly installed. Direct Route required these joints renewing with a suitable joint system to accommodate the more than originally anticipated movement range for the M8 Fermoy Bypass.

### USL Ekspan's Workscope

USL Ekspan were approached by Direct Route to undertake a full inspection of the current expansion joints on both north and south abutments to establish current conditions and advise remedial works required. On submission of their report, Ekspan were contracted to remove and replace the failed joints on the south abutment.

USL Ekspan's inspection had also verified the failing of the south abutment expansion joints and their incapability to achieve the designed bridge movements or accommodate the bridge expansion gap between the deck and abutment ballast wall. This inadequacy had forced the joint fixings to rotate and shear due to the bridge's large thermal movements and the loads/speeds of vehicles travelling across. The joint was audible and sporadic bouncing was visible during transit. Eventually this would result in the joint lifting out of the road, creating a catastrophic hazard to motorists, especially motorbikes. The north abutment joints had deteriorated, not to the same extent, but also required maintenance as these too were likely to fail in the same way.

USL Ekspan's programme of works was undertaken in three phases. These included removal of the south abutment joints; installation of the secondary seal and downpipes to suit the existing drainage arrangement and installation of one 23 m TF 1300 over both carriageways. Remedial works were carried out on the north abutment joints.

This project was successfully co-ordinated and completed in line with lane closures, on time and to budget.



*Failed expansion joint - showing detachment from surface, delamination and joint exposure.*



*New installed TF1300 expansion joint*



*Completion of replaced expansion joint*

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