



Kanta Rubber Pvt Ltd

INSTALLATION METHODOLOGY OF MODULAR EXPANSION JOINT

(Ref. STD. IRC: SP 69 - 2011)

Doc. No: MEJ - IM

Rev. No:01

Eff. Date:01-07-2023

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1. PURPOSE

This installation methodology describes the general procedure for installation of a Modular Expansion Joint, including blockout preparation, joint placement, alignment, anchoring, concreting, curing, and installation of the neoprene seals.

The installation shall be carried out in accordance with the approved installation drawing, project specifications, and applicable provisions of **IRC:SP:69-2011, Chapter 9**, wherever applicable.

2. REQUIRED EQUIPMENT & TOOLS

The following equipment/tools may be required for installation:

- Welding machine and welding accessories
- Cutting/grinding machine
- Measuring tape and steel scale
- Spirit level / precision level
- Total station or suitable surveying equipment, wherever required
- Plumb line and alignment tools
- Adjustable supports / temporary supports
- Shuttering/formwork materials
- Concrete placing and compaction equipment
- Vibrator suitable for the concrete placement
- Seal installation tools
- Hand tools and other necessary accessories

All equipment shall be in suitable working condition and appropriate for the site installation activity.



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3. INSTALLATION PROCEDURE

STEP 1 — Blockout / Recess and Shuttering

1. The blockout/recess of the required dimensions, as indicated in the approved drawing, shall be provided in the deck slab at the Modular Expansion Joint location.
2. The blockout shall be cleaned and made free from loose concrete, debris, laitance, oil, and other contaminants before installation.
3. Suitable shuttering/formwork shall be provided at the underside and sides of the blockout, as required, to prevent leakage of concrete during concreting.
4. The blockout dimensions and available reinforcement shall be checked against the approved drawing before proceeding with installation.

STEP 2 — Joint Fabrication and Continuity

1. The Modular Expansion Joint shall be supplied in suitable prefabricated segments, as required for transportation and site handling.
2. Where site welding is required, the individual segments shall be positioned and welded in accordance with the approved drawing and manufacturer's recommended procedure.
3. All splice locations shall be properly aligned and welded to achieve the required continuity of the joint.
4. The welded portions shall be visually inspected for proper alignment, weld continuity, and workmanship before proceeding with installation.
5. Any site welding shall be carried out by suitably qualified personnel using appropriate welding equipment and procedures.

STEP 3 — Placement, Alignment and Level Checking

1. The fabricated Modular Expansion Joint shall be carefully placed in the prepared blockout using suitable lifting/handling arrangements.
2. The joint shall be positioned with respect to the bridge centreline and expansion gap centreline as indicated in the approved drawing.
3. The following shall be checked before anchoring:
 - Joint centreline and bridge centreline
 - Longitudinal and transverse alignment



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- Finished level/elevation
 - Required expansion gap
 - Straightness and orientation of the joint
 - Position of anchor bars
4. Suitable temporary supports, clamps, or fixtures shall be provided to maintain the joint in the correct position during reinforcement fixing and concreting.
 5. The alignment and level shall be rechecked after securing the joint and before concreting.

STEP 4 — Anchoring and Reinforcement Connection

1. The anchor bars of the Modular Expansion Joint shall be properly connected with the main deck reinforcement as shown in the approved drawing.
2. Where welding is specified, the anchor bars shall be secured to the deck reinforcement by welding to provide adequate stability and integrity during concreting.
3. Additional/secondary MS reinforcement in the form of **C, Z, L-bars or stirrups**, as required by the approved drawing/site arrangement, may be provided to facilitate proper connection between the anchor bars and deck reinforcement.
4. Care shall be taken to ensure that the welding/anchoring arrangement does not disturb the specified position, level, or alignment of the Modular Expansion Joint.
5. The complete anchoring arrangement shall be inspected and verified before closing the formwork and commencing concreting.

STEP 5 — Filler and Preparation for Concreting

1. Thermocol or other approved compressible filler of suitable thickness shall be provided at the expansion gap, as indicated in the approved drawing.
2. The filler shall be properly secured to prevent displacement during concreting.
3. The internal areas of the blockout shall be cleaned before concrete placement.
4. Formwork shall be checked for proper fixing, rigidity, dimensions, and prevention of concrete leakage.
5. The Modular Expansion Joint shall be checked once again for alignment, level, expansion gap, and anchorage before the concrete pour.
6. After satisfactory completion of the above checks, the installation shall be considered ready for concreting.

STEP 6 — Concreting

1. Concrete of suitable quality and strength, as specified in the project requirements/approved drawing, shall be used for filling the blockout. Unless otherwise specified, the concrete strength shall not be less than that of the superstructure and shall be **minimum M35**.



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2. Concrete shall be placed carefully around the joint and reinforcement to ensure complete filling of the blockout.
3. Proper compaction shall be carried out using a suitable vibrator, taking care not to disturb the alignment, level, or position of the Modular Expansion Joint.
4. Particular attention shall be given to the area beneath and around the joint to avoid honeycombing, voids, or inadequate compaction.
5. The top surface of the concrete shall be finished to the required level and profile in accordance with the approved drawing.
6. Any temporary rod/fixture provided for maintaining the joint position shall be removed after the concrete has attained adequate strength and, where specified, after approximately **48 hours** of concreting.

STEP 7 — Curing and Removal of Formwork

1. The newly placed concrete shall be adequately cured in accordance with the applicable project specification and concrete requirements.
2. Formwork shall be removed only after the concrete has attained sufficient strength and the removal is considered safe.
3. After removal of the formwork, the blockout shall be inspected for proper filling, surface condition, honeycombing, cracks, or other visible defects.
4. Any repair, if required, shall be carried out using an approved repair procedure/material.

STEP 8 — Neoprene Seal Installation

1. After adequate curing of the blockout and completion of necessary finishing works, the neoprene seals shall be installed.
2. The seal shall be cleaned and inspected before installation to ensure that it is free from damage, cuts, or other defects.
3. The neoprene seal shall be installed carefully in the designated position of the Modular Expansion Joint.
4. The seal shall preferably be installed in **one continuous length**, avoiding unnecessary splicing or joints.
5. The seal shall be properly engaged/seated in the seal grooves/profiles throughout the complete length of the joint.
6. After installation, the seal shall be checked for proper seating, continuity, and freedom from twisting or displacement.



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4. KEY INSTALLATION PRECAUTIONS

1. Installation shall be carried out only with reference to the latest approved drawing and applicable project requirements.
2. The Modular Expansion Joint shall be handled carefully to avoid damage, distortion, or deformation during transportation, lifting, and installation.
3. The joint shall be adequately supported and secured before and during concreting.
4. The required alignment, level, centreline, and expansion gap shall be verified before concrete placement.
5. Welding shall be carried out carefully so that excessive heat or welding operations do not adversely affect the joint components.
6. Concrete placement and vibration shall be carried out without disturbing the position or alignment of the joint.
7. Adequate compaction shall be ensured around the anchorage and beneath the joint to avoid voids and honeycombing.
8. Concrete, mortar, debris, or other foreign material shall not be allowed to enter the seal grooves or moving parts of the Modular Expansion Joint.
9. The expansion gap and movement mechanism shall remain free from obstruction throughout the installation process.
10. Neoprene seals shall be protected from cuts, excessive stretching, twisting, and mechanical damage during installation.

5. QUALITY CONTROL & INSPECTION

The following checks shall be carried out and recorded as applicable:

Before Installation

- Verification of approved/latest installation drawing
- Blockout dimensions
- Reinforcement availability and condition
- Joint components and segment identification
- Visual inspection for transportation/handling damage

During Installation

- Segment welding and splice continuity
- Joint alignment and centreline
- Joint level/elevation
- Expansion gap
- Anchorage and reinforcement connection
- Temporary supports/fixtures
- Shuttering and filler arrangement



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During Concreting

- Concrete grade and approved mix
- Concrete placement and compaction
- Stability of the joint during concreting
- Blockout filling and surface finish

After Concreting

- Curing
- Formwork removal
- Visual inspection of concrete
- Proper seating and installation of neoprene seals
- Final inspection of alignment, seal continuity, and joint condition

All inspections and tests shall be carried out in accordance with the approved project Quality Assurance/Quality Control requirements.
