

Installation procedure

MODULAR JOINTS (TYPE LG)

1. Expansion joint assemblies are supplied preassembled with a “K” gap width, as shown on the shop drawings, which corresponds to a temperature of 15 °C (unless indicated otherwise). In cases where joint assemblies will be installed at a temperature that is significantly different than that indicated in the contract documents, it is possible to deliver the joint assemblies with the corresponding gap width provided that the request is made when the shop drawings are approved.
2. Clean the area where the joint assembly will be installed using compressed air to remove any accumulated debris. If the joint assembly will be placed on formwork or shoring, ensure that the structure can support the weight of the joint assembly.
3. Descend the joint assembly into position and bend back any rebars that may be in the way. In the case of a new bridge, we recommend that rebars be positioned in order to avoid any obstructions. In addition, we recommend that the concrete pour of the deck should be performed prior to the joint installation, and that the slab ends as close as possible to the joint assembly in order to limit the unsupported length of rebars that protrude from the deck.
4. Position the joint assembly according to its axis, and the profile and slope of the roadway surface, while also ensuring that the vertical portion of the sidewalk or parapet is recessed by the specified value. Pay attention to formwork, shoring and other bridge construction-related structures or elements that could impede the installation or adjustment of the joint assembly, or that may not be stable enough to support the weight of the joint assembly.
5. When the joint assembly is supplied in several sections, make sure that the edge beams and central beams are well aligned, both vertically and horizontally. Install the splice plates between the main beams using the A325 bolts that were supplied with the joint assembly. Tighten bolts adequately. A seal weld must then be performed on the top chord of the main beams on the bolted connection, as shown on the connection detail in the shop drawings. The weld must overlap into the interior of the edge and central beams, and the surface on which the strip seal will rest must be grounded smooth to assure water tightness.
6. Adjust the joint assembly. Adjustment of the modular joint assembly shall begin at the connection between two sections, or, if this is not the case, at one of the extremity of the joint assembly. We recommend that a surveyor be on site when these adjustments are made.
 - 6.1 The gap width is adjusted at the first support bar box, in accordance with the “K” gap widths table, after slightly loosening the bolts of the temporary assembly devices (angle or HSS) on top of the support boxes and on adjacent boxes as needed. It is important that the joint assembly’s “K” gap width be adjusted on site in accordance with the ambient temperature, which is measured under the bridge structure. In the case of a concrete bridge structure, ambient temperature is determined based on the mean shade air temperature over the previous 48 hours, while for steel bridges, ambient temperature is based on the mean shade air temperature over the previous 24-hour period. Temperature measurements must be coordinated with the resident engineer and/or the supervisor. If the joint assembly is being attached to a joint section cast in a previous phase, the gap width of the previously installed joint section will guide the adjustment of the current section (unless indicated otherwise).
 - 6.2 Once the gap width has been adjusted at the first support bar box, the upper angle (or HSS) bolts must be re-tightened.
 - 6.3 The gap, elevation, transversal slope, longitudinal slope and alignment of the joint assembly must be verified at this first box. The joint assembly must be installed flush with the top of the wearing surface unless indicated otherwise.

- 6.4 Both sides of the joint assembly are welded to the slab or abutment deck rebar, on or close to the support bar box and to the anchor plates at a maximum distance of 600 mm centre-to-centre (c/c). The horizontal, longitudinal and vertical rebar framework of both the structure and the slab must be used so that the joint assembly is secured in each direction. Do not weld onto support bar boxes less than 100 mm from the joint assembly's vertical bulkhead plate. The horizontal rebar can be placed alternately near the top and near the bottom of the joint assembly for increased resistance against rotation. In the case of a bridge rehabilitation project, if existing rebars are not in good condition, holes with a minimum depth of 150 mm must be drilled in the existing concrete at a maximum distance of every 600 mm centre-to-centre (c/c), in order to insert 20M dowels. The dowels must be secured in place using high strength grout or an injectable chemical anchor product such as Hilti HIT-HY 200 or equivalent. It is also possible to begin by securing one side of the assembly to the rebar framework along its entire length before proceeding with the adjustment of the other side, box by box. However, the first side must be correctly adjusted in accordance with deck elevations and slopes as well as properly aligned.
- 6.5 Remove the temporary assembly device and verify if the joint assembly is properly secured by measuring the opening and placing a straight edge on top of the anchor plates of the adjusted box. If any movements and/or rotations occurred, replace the temporary assembly device, tighten the bolts to ensure full contact with the top of the anchor plates (100%), adjust the gap width and make the necessary adjustments to the structural framework attachments.
- 6.6 Touch up the damaged galvanized surfaces with two coats of zinc-rich paint as per the project specifications.
- 6.7 Perform adjustments on the second support bar box, the third, and so on, in order to adjust the assembly along its entire length, one box at a time. If the adjustment of a single assembly takes several hours to complete, it is possible that the bridge structure will contract or expand with changing temperatures, which will impact the joint assembly's gap width at the time of installation. Regularly review the installation gap width by referring to the gap width at support bar boxes that have already been adjusted. Be careful to ensure that the joint assembly can move freely in the already adjusted support boxes as the structure expands and contracts. To do so, it is recommended to slightly loosen the bolts of the temporary assembly devices in order to allow movements to take place.
7. As specified in Ministère des Transports du Québec (MTQ) specifications, the contractor must obtain written authorization from the expansion joint fabricator concerning the installation procedure before casting joint assemblies or joint sections, in cases where the work is performed in several phases.
8. Install, when required, the additional rebars needed to complete the concrete work on the structure, as shown on the contract drawings, and complete the formwork.
9. Cover the top of the joint assembly using plywood panels with a minimum thickness of 6 mm to prevent concrete and other debris from filling the joint assembly gap.
10. The temporary assembly devices (angles or HSS) must be removed before the joint assembly is cast in concrete.
11. Fill the blockout around the joint assembly with the specified concrete. The concrete vibration must be performed carefully to eliminate all voids at the numerous steel/concrete interfaces and particularly in the spaces under the support bar boxes and around anchors. Screed the concrete with a rough finish that is flush with the top of the snowplow blade protection plates.
12. Before the initial set of the concrete, nothing must impede the free movement of the joint assembly as the structure expands and contracts, and no loads should be placed on the joint assembly or the adjacent rebar framework as this could affect the adjustment of the joint assembly.