EXPANSION JOINTS – LARGE MOVEMENTS

GRANOR ETIC®
SFEJ SERIES
STEEL FINGER JOINTS
These joints should be adopted where the structure gap will open beyond 85mm ULS, in which case the use of a "stripseal" type single seal element joint will transgress the maximum 85mm open gap criterion nominated in AS5100.4. The SFEJ series joints are designed to AS5100.4 with RMS Position Paper Rev 4 modifications. Alternate designs can be generated for other design criterion such as AS5100.4 unmodified and NZTA. Joints with custom skew orientations are also available.

The SFEJ joints utilise as a standard detail an underside draped flexible 'trough' gland that locates into separate extruded aluminium retainers that are cast into the blockout during the joint systems installation process. This gland drains to a suitable underside of structure collection point at the low side of the joint.

ROBUST BRIDGE DECK EXPANSION JOINTS WHICH ACCOMMODATE LARGE MOVEMENTS RANGING FROM 150MM UP TO 600MM TOTAL CAPACITY.
All the models in the SFEJ series utilise as standard a continuous central flexible ‘trough’ membrane, which locates into extruded aluminum retainer profiles. These elements are independent of the Finger plate joint elements and are located underside of the main joint system. The trough gland will need to drain to a suitable collection point at the low side of the joint.

As the aluminum retainers and trough are independent from the finger joint plates installed above, they can be cast into the blockout at a steeper slope than the joint above in order to enhance self-drainage.

Alternatively for special projects the trough membrane can be produced in our workshop such that its invert is on a steeper incline than the joint to achieve an enhanced drainage outcome.

When possible it is best to completely separate cyclist and vehicular traffic through use of separate bridge structures or with suitable demarcation barriers. In this scenario steel finger joints can be used for the vehicular traffic and cyclist friendly expansion joints with appropriate movement range used for cyclist traffic. For recommendations regarding cyclist friendly expansion joints to suit particular projects and movement ranges please contact Granor.

Where it is not possible to separate cyclist and vehicular traffic, it is possible to provide cover plates in the emergency lane / verge areas only. These are typically bolted directly to the steel finger joints and can be designed by Granor. The recommended design uses two separate cover plates bolted on each side of the joint and extended part way up the length of the fingers.

Note: cover plates should only be permitted in emergency lanes with low traffic count and should never be used in the main running lanes.
**SPECIFICATIONS**

<table>
<thead>
<tr>
<th>TYPE</th>
<th>A* (min.)</th>
<th>A* (max.)</th>
<th>B</th>
<th>J*</th>
<th>S* (min.)</th>
<th>S* (max.)</th>
<th>C*</th>
<th>L</th>
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**A* (min.)**
Is when the fingers are fully closed up.

**A* (max.)**
Is when the fingers are fully open.

**J**
Is the critical metal to metal gap between the ends of respective assembled joint components, at the time of installation, as determined by the engineer after consideration of future opening and closing of the fingers.

**S* (min.)**
Is the minimum acceptable gap when fingers are fully closed up.

**S* (max.)**
Is the minimum acceptable gap when fingers are fully open.

**C**
Is the minimum clearance to the uppermost deck reinforcement beneath the joint (subject to AS5100.5 clause 4.10). Reinforcement that is required adjacent to joint such as to reinforce the concrete transition strip is unaffected.

\[ W = (2L + S*) \]
INSTALLATION PROCESS

A DETAILED INSTALLATION GUIDE IS SUPPLIED WITH EACH ORDER HOWEVER THE FOLLOWING PROVIDES A BRIEF SUMMARY OF THE OVERALL INSTALLATION PROCESS.

01. The SFEJ series expansion joints are cast into appropriately formed block-outs with minimum dimensions as per the performance table.

02. Removable formwork is placed underside in the expansion joint gap to the appropriate gap set “S” at the time of installation. To this formwork is connected the continuous aluminium extrusion profiles that eventually accommodate the draped flexible “trough” membrane. It should be noted that the important dimension set at time of installation is the gap “J” at the top of the joint system between the end of the finger and the invert of the opposing plate’s finger slot. The underside gap set “S” is set to the as found structure gap.

03. Form release is applied to the underside of the galvanised steel plates. The total system is preassembled above the blockout and suspended with purpose steel suspension arms and brackets (Granor Installation Kit) to the correct level and “J” gap set width.

04. The system’s fixings are placed such that they locate perfectly normal to underside plane of the joint system and the required reinforcement is placed and tied.

05. The gaps between the fingers and counterbored bolt recesses are protected from concrete slurry ingress and the blockout infill concrete is placed with thorough vibration practices. The suspension brackets are loosened once the concrete has solidified in order to allow structure movement to occur without pulling and shifting the joint system prior to full concrete cure.

06. Upon achievement of minimum concrete strength the SFEJ steel plates are lifted and the formwork is removed exposing the cast-in aluminium retainers.

07. The trough seal membrane is installed.

08. The exposed concrete surface is cleaned and a suitable epoxy bedding paste is applied to the surface to fill any air voids and imperfections. This epoxy paste is applied just prior to the steel finger plates being reattached. The epoxy paste ensures full surface contact of the reinstated finger plates.

09. The joint fixings are then tensioned to the advised torque setting and re-torqued 24 hours later, after which an infill compound is installed into the bolt well recesses.

10. The joint is now ready for full trafficking.
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FINGER JOINTS
ARE A ROBUST
LARGE MOVEMENT
SOLUTION

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