Design for Movements in Bridges

Contents
- Design philosophy
- Examples of movement structures
  - Faroe Bridges
  - Great Belt East Bridge
  - New Little Belt Bridge
- Challenges in the future

Design Philosophy
- As few as possible movements structures
- Long durability
- Easy to maintain and replace

Example of long durability
Examples of Movement Structures
The Faroe Bridges

Examples of Movement Structures
The Great Belt East Bridge
Examples of Movement Structures
The Great Belt East Bridge

Support arrangement on the anchor block

Examples of Movement Structures
The Great Belt East Bridge

Bearing and anti lift device

Examples of Movement Structures
The Great Belt East Bridge

Breaking test without control springs
Examples of Movement Structures
The Great Belt East Bridge

Hydraulic buffers reduce wear

<table>
<thead>
<tr>
<th>Bridge type</th>
<th>Continuous length</th>
<th>Maximum movement at joint</th>
<th>Yearly accumulated movement at joint</th>
<th>Relative comparison</th>
</tr>
</thead>
<tbody>
<tr>
<td>Great Belt East Bridge</td>
<td>2494 m</td>
<td>± 1.0 m</td>
<td>~ 100–200 m</td>
<td>1-2</td>
</tr>
<tr>
<td>Suspension Bridge</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>without hydraulic system</td>
<td>2494 m</td>
<td>± 1.0 m</td>
<td>~ 75–150 m</td>
<td>~0.5</td>
</tr>
<tr>
<td>Great Belt West Suspension</td>
<td>2510 m</td>
<td>± 0.7 m</td>
<td>~ 100 m</td>
<td>1</td>
</tr>
<tr>
<td>Approach spans Halsskov</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Great Belt West Gate</td>
<td>50 m</td>
<td>0 m</td>
<td>~ 5 m</td>
<td>0.05</td>
</tr>
</tbody>
</table>

Examples of Movement Structures
The New Little Belt Bridge

Examples of Movement Structures
The New Little Belt Bridge
Examples of Movement Structures
The New Little Belt Bridge

Challenges in the Future
The Stonecutters Bridge

Detailed design by Ove Arup with COWI as sub consultant
Challenges in the Future
The Stonecutters Bridge
Design for movements in bridges

Challenges in the Future
The Fehmarn Belt Bridge
Design for movements in bridges

Challenges in the Future
The Messina Bridge
Design for movements in bridges