

**“Incorrect fixing selection was identified as the top cause of ceiling collapse.”**

FIS member survey

<b>Identify the application parameters</b>	
<p>These include the applied load, the base material and any environmental factors. Fluctuations in air pressure caused by wind or large opening doors may increase the load on the fixing. Not all fixings are suitable for all base materials. Environmental considerations which may influence fixing choice include conditions which may cause corrosion, elevated temperatures, fluctuations in pressure and the need for a fire rating.</p>	
<b>Check the load bearing structure will support the applied load</b>	
<p>The guidance given here is based on the assumption that all fixings will be fixed into, and the loads involved supported by, a load bearing structure capable of sustaining the required loads. If there is any doubt then the advice of a qualified structural engineer should be obtained before proceeding.</p>	
<b>Check the need for redundancy in the ceiling grid</b>	
<p>Robustness means having sufficient redundancy in the system such that one isolated failure does not result in the excessive overloading of other fixings leading to a progressive collapse. Selecting an anchor with an ETA will simplify substantially considerations of redundancy.</p>	
<b>Select the fixing type</b>	
<p>Not all fixings are suitable for all the base materials. The manufacturer should state clearly which base materials the fixing is suitable for. The manufacturer’s guidance should be checked and takes precedence over any guidance contained within this document.</p>	
<b>Check the fixing load capacity</b>	
<b>Recommended load of the fixing known for the specific base material</b>	<b>Recommended load of the fixing unknown for the specific base material</b>
<p>For anchors, the approach set out in BS 8539 for determining the anchor size once the anchor type has been selected should be used. For anchors with an ETA the design method applicable to the ETA should be followed. The safe working load is usually referred to by the fixing manufacturer as the recommended load.</p>	<p>If there is no recommended load data quoted by the manufacturer then the allowable load may be determined from preliminary tests.</p>
<b>Check the applied load is lower than the recommended load</b>	<b>Find the recommended load from preliminary tests on site, check the applied load is lower than the recommended load</b>
<p>For fixings without an ETA, the key design criterion can be stated as: <b>APPLIED LOAD ≤ SAFE WORKING LOAD</b></p>	
<b>Specify the selected fixing in the project documentation NBS K10/40</b>	
<p>Once the top fixing is chosen its specification should be detailed in the project documentation. More guidance on the selection and specification of anchors can be found in BS 8539.</p>	