TECHNICAL UPDATE

THERMAL BRIDGING: WHAT IT IS AND HOW TO PREVENT IT

This technical document provides additional guidance relating to what thermal bridging (often referred to as cold bridging) is and how to prevent it in your construction project.

Executive summary

Construction projects incorporate the use of a variety of materials in differing situations, locations and build-ups. This can often lead to thermal bridging and can result in heat loss through the building fabric and mould growth where warm internal air comes into contact with a cold surface and condensates. This technical document aims to provide additional guidance around what thermal bridging is and how it can be prevented.

What is thermal bridging?

Thermal bridging is where there is a direct link between the inside and outside is formed through building elements that are more thermally conductive than the rest of the building fabric.

Common examples of where thermal bridging is required or to be prevented

Thermal bridging is commonly formed (but not limited to) in the following scenarios:

- Where masonry is used to close cavities at window and door reveals (or other openings). Ideally, a cavity closer should be used (which has a layer of insulation between) to thermally break the opening.
- Similarly, for refurbishments with solid walls, thermal bridging around window and door reveals can be a huge issue as the solid wall will potentially be warm and cold and this can lead to a build-up of condensation and eventually mould around the reveals. To overcome this, the independent lining system should be carried around the reveals and insulated plasterboard should be used at the reveals.
- Metal window / door frames to the wall construction: If a thermal break is not included in the assembly, there is a risk that the mechanical fixings securing the frame to the external leaf of the wall can result in the frame being thermally deficient.
- Cantilevered steel beams to support a steel framed balcony. The steel beams have a higher thermal conductivity than the surrounding building envelope and as a result can form interstitial condensation where the steel passes through the insulation layer in the external wall makeup. To prevent this, a proprietary thermal break should be used and this should be specified by the project structural engineer.
- With a greater emphasis on building energy efficient homes, we are seeing more developments with wider width cavities. These in turn require more substantial wall ties which can lead to thermal bridging issues. To prevent this, low thermal conductivity wall ties should be used and they should be specified by your project structural engineer and included in the SAP calculations.
- With masonry cavity wall construction we often see a variety of materials and objects that are inadvertently dropped down the cavities, from bricks and excessive mortar droppings to scaffolding clamps and water bottles. A lot of these objects can result in thermal bridging and can be prevented by regular inspections by the site manager and bricklayers at each lift.

How to prevent thermal bridging?

The above provides some examples of how to prevent thermal bridging. Your project structural engineer and designer will be able to prevent thermal bridging by designing it out, however the most effective

and efficient way of dealing with thermal bridging is understanding how it works and analysing a building design prior to works commencing on site.

At the start of the project, we carry out a Site Risk Assessment which is a meeting on site, between the site manager and the warranty surveyor (and other stakeholders if needed) to go through the main risks for our insurer and outlining how they will be managed; thermal bridging should be discussed at this stage.

If, for example, balconies are proposed, the following should be ascertained

- Are they steel framed balconies?
- Are they cantilevered or bolt on?
- If they are cantilevered steel framed, we would require details of the thermal breaks (location, type, size etc.).

If the wider cavity wall widths are adopted for example, it should be established if the designer has specified low thermal conductivity wall ties. If they haven't or the site manager and warranty surveyor are unsure, this should be set as a condition on the Site Risk Assessment Report.

Warranty position

This article has provided some background information with what thermal bridging is, common situations where you may find thermal bridging in your construction project and how to prevent it. Thermal bridging should be considered before works commence on site by your design team and should be discussed during the Site Risk Assessment with the site manager and the warranty surveyor.

Every care was taken to ensure information in this article was correct at the time of writing (September 2021). Guidance provided does not replace the reader's professional judgement and any construction project should comply with the relevant building regulations or applicable technical standards. For the most up to date LABC Warranty technical guidance please refer to your risk management surveyor and the latest version of the LABC Warranty Technical Manual.