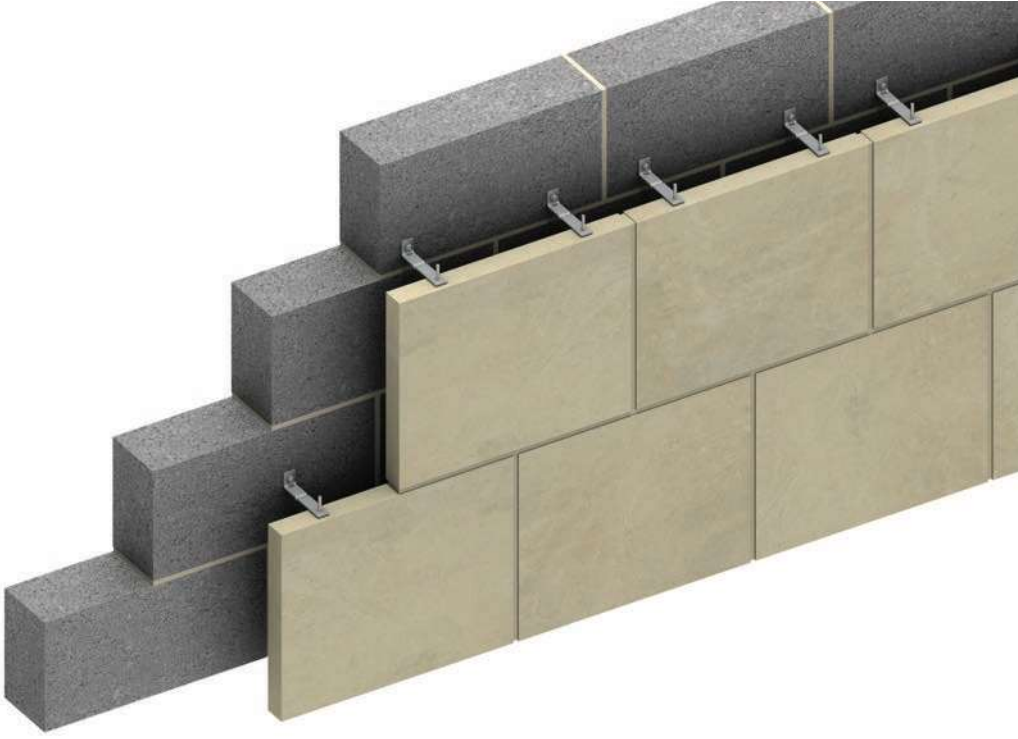


Restraints for Stone Cladding

Reference should be made to BS 8298-2: 2020 "Design and installation of natural stone cladding and lining", when selecting ties for restraining stone cladding. Restraints should be designed to resist wind loads and any imposed loads from, for example, window cleaning equipment.

Each stone will normally be restrained in four places, two at the top and two at the bottom. These are usually situated in the horizontal joints. The restraints should be located in pre-formed mortises or holes positioned in the centre of the thickness of the stone panel, and located at 1/4 points for half bonded stones and 1/5 points for stack bonded stones. Restraints should be kept at least 75mm from any corner with the peripheral distances between any two restraints not exceeding 1200mm.

The embedment of restraint dowels and lips into the stone should be at least 20mm. To achieve this, lipped ties (LPBs) have a 25mm downstand and dowelled ties (DPBs and YPBs) have 60mm long dowels.

The actual capacity of the restraints will normally be restricted by the breaking load of the stone and/or the restraint fixing bolt. Breaking loads at the fixing should be determined in accordance with BS EN 13364.

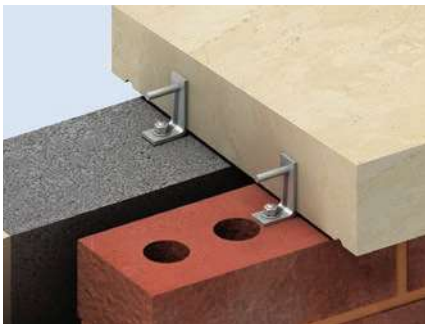
Frame cramps with a B end have a 7mm diameter hole to suit a range of fixings. Ancon M6 Expansion Bolts are recommended for fixing to concrete and M6 set screws or SDTSS-38-5PT self-drilling screws for fixing to steelwork. Frame cramps can be fixed to masonry with suitable plugs and screws or resin anchors. Poor substrates will limit the capacity of fixings and site testing is advisable in such applications. All fixings should be used in conjunction with a DIN washer.



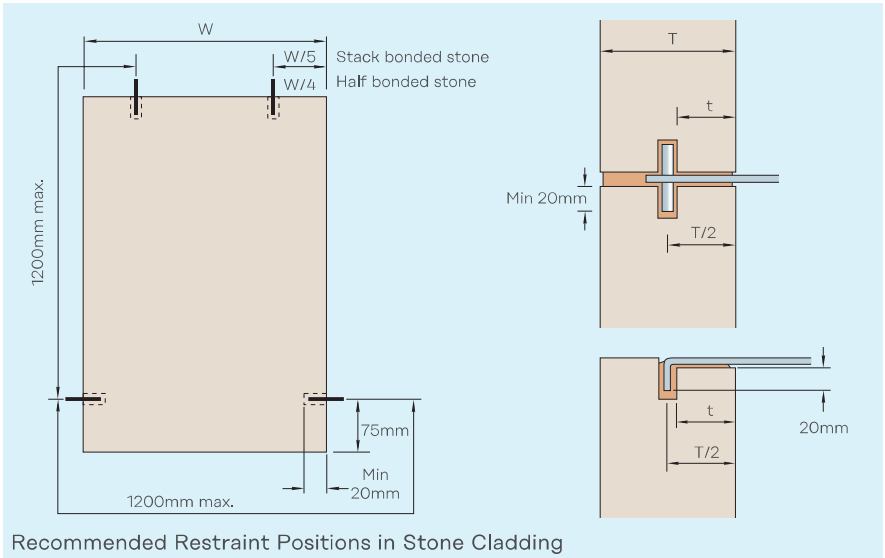
Buchanan Galleries, Glasgow

Coping Stones

For restraining horizontal coping stones, YPB ties may be used as pictured to provide nominal restraint. For copings on a slope e.g. gable ends, restraint fixings are designed to suit the requirements of the application, including the slope and size of stone. For applications involving abseiling loads or other loading arrangements, please contact our Technical Services team with details of your project for help with product selection.



Two Ancon YPB Ties Restraining Coping Stone



Recommended Restraint Positions in Stone Cladding

Minimum Stone Thickness 'T' and Minimum Dimension Behind Restraint 't'

	More than 3.7m above ground - including facias		Soffits - including inlined soffits		Sills, copings and supported reveals	
Type of Stone	**T (mm)**	**t (mm)**	**T (mm)**	**t (mm)**	**T (mm)**	**t (mm)**
Granite, slate, white marble, quartzites	40	15	40	15	30	12
Hard limestone, travertines	40	15	40	15	30	12
Limestone, sandstone	75	30*	75	30*	50	20

* t = T/2 if stone thickness (T) is greater than 75mm