



How to Test Replacement Cavity Wall Ties

Why are Pull-out Tests Necessary when Installing Remedial Brick Ties?

A crucial part of any wall tie replacement scheme is to check the ties' anchorage strength. BRE Digest 401 suggests tension-testing in the outer and inner walls at random positions. The pull-out trials ensure the tying system is suitable for the material of the building. It also urges in-process tests during the work for quality control needs.

What is a Pull-out Test?

Pull-out testing involves fixing a *tension test meter* to a wall tie. The testing rig exerts a tensile stress force on the anchorage to show whether it can withstand the necessary service loads.

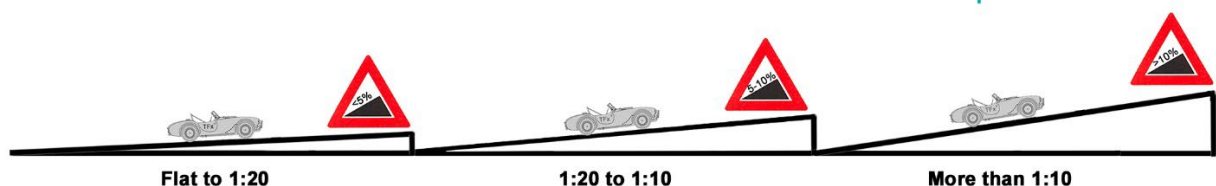
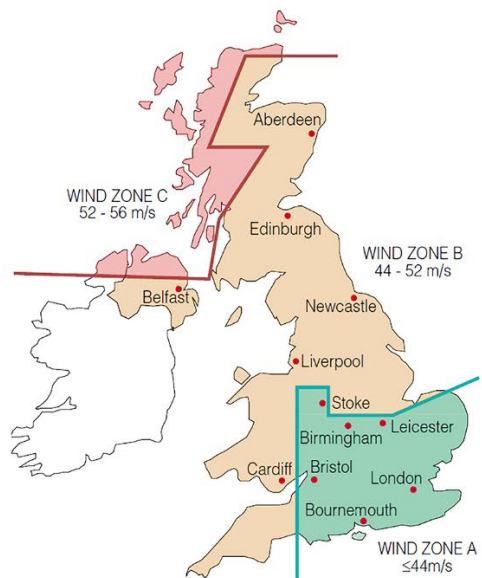
Test the ties' pull-out strength in both the inner and outer walls. The connection in one wall may resist less load than in the other. If that is the case, it is best to concentrate the in-process testing on the wall with the weakest anchorage.

What Tensile Load Value is necessary for Testing Wall Ties?

To find the necessary tension load, you must classify the following four details about the building and its exposure.

1. What is the height of the building?
2. Is the structure in an urban or rural setting?
3. What is the slope of the land within 1 km?
4. In what wind-zone area is the building?

City centre	
City outskirts	
Country with scattered windbreaks	
Open country	





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BRE Digest 401

Table 5 of BRE Digest 401 recommends a minimum tensile proof load. The table assumes each wall is at least 90 mm thick and the tie density is 2.5 per sqm. The values are for walls spanning horizontally between masonry returns or having sufficient edge ties to support the vertical edges. All loads are in Newtons.

For cladding masonry, which is vertically spanning (e.g. at a gable apex or between openings) without masonry returns or sufficient edge ties, multiply the table values by 1.72

TENSION TEST LOADS FOR REPLACEMENT WALL TIES - BRE DIGEST 401										
Basic Wind Speed to DD140 Pt 2		Up to 44 m/s			44 to 52 m/s			Above 52 m/s		
Location	Max Building Height (m)	Terrain within 1 km of site			Terrain within 1 km of site			Terrain within 1 km of site		
		Flat to 1:20	1:20-1:10	Over 1:10	Flat to 1:20	1:20-1:10	Over 1:10	Flat to 1:20	1:20-1:10	Over 1:10
City centre	10	285	358	527	398	499	736	462	579	854
	15	373	467	689	520	653	962	603	757	1116
	30	508	637	939	709	889	1311	822	1031	1521
	60	715	897	1322	999	1253	1847	1158	1453	2142
City outskirts	10	381	477	704	532	667	983	616	773	1140
	15	517	648	956	722	906	1335	837	1050	1549
	30	671	842	1241	937	1175	1733	1087	1363	2010
	60	834	1046	1542	1164	1461	2153	1350	1694	2498
Country with scattered windbreaks	10	517	649	956	722	906	1336	838	1051	1549
	15	697	875	1289	974	1221	1801	1129	1417	2089
	30	802	1006	1483	1120	1405	2071	1299	1629	2402
	60	914	1146	1690	1276	1601	2361	1480	1857	2738
Open country	10	631	792	1168	882	1106	1631	1023	1283	1892
	15	770	966	1425	1076	1350	1990	1248	1565	2308
	30	841	1055	1555	1174	1473	2172	1362	1708	2519
	60	939	1177	1736	1311	1644	2425	1520	1907	2812

There is no need to test *remedial wall ties* beyond the Digest 401 loads. Overloading to the point of failure can damage the tester, the tie, or the masonry.

Watch our one-minute video to learn how to test replacement wall ties.