

CASE HISTORY

CASTLE WARD HOUSE, NORTHERN IRELAND, U.K.



Castle Ward House is situated near Strangford, Northern Ireland. The property was constructed in 1756.

An inspection during the course of repairs revealed that one of the original timber beams in the area of the Tympanum had seriously decayed. This beam acted as a support for the upper stonework and a hanger for the lower stones. With this decay the lower stones had cracked and showed signs of falling out.

Before this beam could be replaced the structure above it had to be restrained. The constraints imposed by the National Trust restricted the solutions to this problem.

The Cintec system was chosen for the following reasons :-

1. The system had to work in a sandstone and random rubble wall.
2. The system had to be effective in areas where there were fissures within the wall. A resin system would run into these fissures and prove ineffective. A completely stress free anchor was needed.



First sign of distressed beam



External upper beam area



Internal damage of wooden beam

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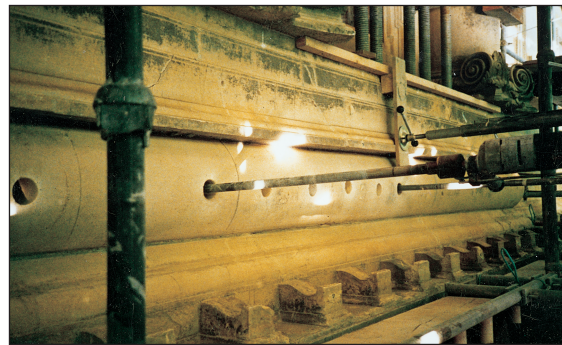
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Because of the failure of the beam the immediate problem of support was solved by using 15 x 15 x 1000 mm SHS stainless steel anchors both horizontally and vertically.

Once these anchors were installed the remains of the beam were removed and the problem of replacing it was addressed.

The span of the original beam was 9 metres, across four vertical columns, so from the point of view of physically handling the replacement beam, it was decided to construct three number three metre long beams.

These beams were constructed of 100 mm x 100mm stainless steel box sections shrouded in a 300 mm sock, with an outer sock for protection. These beams were slid into position and shuttering was installed to prevent grout overhang. 300 kgs of grout were pumped between the sock and the exterior of the beam to form a perfectly contoured support.



Drilling & securing stonework above beam



Anchor installation



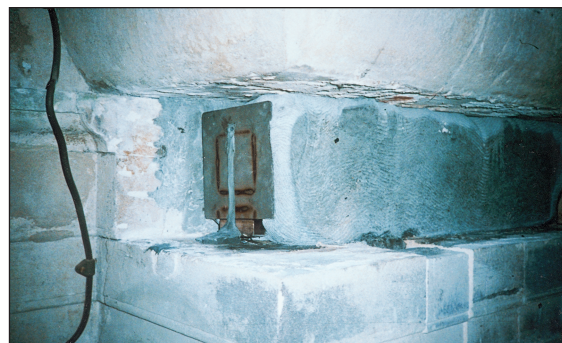
Openings cut in masonry to expose defective wooden beam prior to its removal



Entire length of 10 metres exposed



Insitu assembly of 100 x 100 mm stainless steel 10 m anchor



Beam after grout injection