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MODERN SOLUTIONS TO ELIMINATE CAPILLARITY MOISTURE FROM BRICK WALLS – COMER METHOD

BY

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Abstract. The existing stock at this time in our country is, in general, described by the old buildings built before 1990. Their degradation, from waterproofing protection point of view, noticeable by infiltrations of water, both at the level of the superstructure (roof, and the default thermal-hydro-isolation) and infrastructure (walls), is a result of multiple causes. Some of these causes were: deficient work of hydro-isolation, thereby understanding the failure in implementing details, the use of materials with poor technical characteristics or savings regarding use of materials, improperly qualified or unqualified personnel for such activities. Intervention on buildings that have such problems, in order to ensure the requirements and criteria for specific performance of the waterproofing work, should pursue aspects of analysing the current situation, diagnose the causes of infiltrations, determining solutions and how to remedy those works, in order to comply with the specifications of the quality Law 10/1995 and the general requirement of waterproofing isolation.

Key Words: Waterproofing; Comer Method; Capillarity Moisture; Brick Wall; Holes; Wedge.

1. Introduction

The described method in this paper, not considering the variant should be applied, provides a radical solving of the upward moisture problem. This is possible because it creates an insulating barrier in a cut applied at the wall. Comer method is a physical one and applies particularly in two ways: the method of milling holes and slit method.

2. Comer Method

2.1. Method of Milling Holes

In this variant of implementing the physical method, a series of holes are made in line along the wall.

The diameter of the hole depends on the type of material that is treated and the type of insulating material which will be inserted.

A first series of holes is created by a horizontal line at a constant height over the land share, and in alternate sections. In these holes a silicone mortar is

inserted. When this mortar reaches the required strength, another series of holes are made in those wall zones that have not yet been achieved.

This process continues until the total isolation between the lower and upper sides of the wall. This system is particularly expensive because of the large number of holes needed to be drilled.

2.2. Slit Method

The method is known as "Comer", by the name of the Italian company, which designed and developed it.

The method can be used for interior or exterior walls made of brick, concrete or some types of ceramic blocks.

The first stage consists in removing a certain height of the mortar from the wall. If the mortar is presented in very bad conditions, it is better to be removed before the completion of cut, to encourage, in this way, the process of evaporation. Then, a cut in the wall is made, on a specific length, with a special cutting machine which works with a chain with diamond teeth. In the horizontal slot a special foil (Fig. 1) is introduced. This foil works as a barrier against moisture (Fig. 2).

Fig. 1. – Foil with insulation characteristics and wedges for wall wedging.

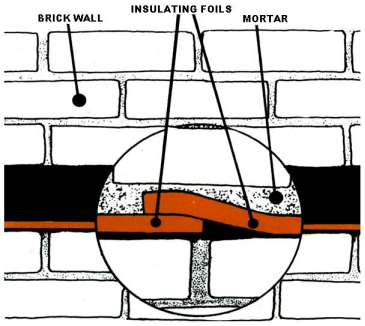

Fig. 2. – Section of a treated wall.

Depth of the cut section varies depending on the applied method, the type of the wall which must be treated and the plastic foil needed to be inserted.

In Venice, the city lagoon, due to the particular structure of buildings, in which each wall is supported by foundation piles, the insulating barrier was created by inserting sheets of polyethylene in the slit.

This type of operation has been used in several palaces attacked by lagoon's moisture, including the Palazzo Grassi. By using these films a perfect insulating barrier, with excellent dielectric properties, good chemical inertia and excellent resistance to compression is obtained.

Wedges made from a special material are then introduced, in order to ensure wall stability in the slot.

Normal procedure in such a method involves applying a mortar on insulating material, then the introduction of the plastic wedges anchorage into the slot. These wedges compress the mortar, securing insulating material and providing stability of the wall, until the mortar reaches required strength [1].

Fig. 3. – Placing wedges into the slot.

Fig. 4. – Previously described method applied on a brick wall.

In this way the wedges are first placed into the slot, and then a non-contractile mortar is injected into the notch. This mortar not only penetrates into the wedges holes and the slot but also in wall's cavities, strengthening it at the base. The

mortar's maximum injection pressure is 2 atm. It is very important to wait until the wall is dried out deeply before applying a new layer of plaster.

Wall cutting machines are used regularly, in order to apply those operations in seismic areas as Germany, Austria, Britain, France, Thailand, Czech Republic, Slovakia, Hungary, Spain and Belgium.

3. Conclusions

Some advantages of this method are: this solution is a definitive one, in terms of efficiency and durability; does not requires maintenance or continuous monitoring; feasible in a short time, without special arrangements (excavations, demolition, etc.); workable even with access from one side of the wall for wall thickness up to 1.20 m.

As a disadvantage, point out that the applicability is limited only to masonry walls of brick, BCA, capstone.

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SOLUŢII MODERNE PENTRU ELIMINAREA UMIDITĂŢII CAPILARE DIN ZIDURILE DE CĂRĂMIDĂ – METODA COMER

(Rezumat)

Fondul locativ existent în acest moment în ţara noastră este reprezentat, în general, din clădiri vechi, construite înainte de anul 1990. Degradarea acestora, din punct de vedere al protecţiei hidrofuge, manifestate prin infiltraţii ale apelor, atât la nivelul suprastructurii (acoperişuri şi implicit sistemul termo-hidroizolaţie) cât şi la cel al infrastructurii (pereţi) s-a produs ca urmare a unor cauze multiple. Câteva dintre aceste cauze au fost: executarea defectuoasă a lucrărilor de hidroizolaţie, înţelegând prin aceasta nerespectarea detaliilor de execuţie, utilizarea de materiale cu caracteristici tehnice scăzute sau recurgerea la economii de materiale, personal necalificat sau calificat necorespunzător pentru astfel de activităţi. Intervenţia asupra clădirilor care prezintă acest gen de probleme, în vederea asigurării exigenţelor şi criteriilor de performanţă specifice lucrărilor de hidroizolaţii, trebuie să urmărească aspecte legate de analiză a situaţiei existente, diagnosticarea cauzelor infiltraţiilor, stabilirea soluţiilor pentru remediere şi modul de executare al lucrărilor, pentru a respecta prevederile din Legea 10/1995 – a calităţii în construcţii – şi, în general, cerinţa privind izolarea hidrofugă.