

HIGHER TECHNICAL INSTITUTE

CIVIL ENGINEERING DEPARTMENT

DIPLOMA PROJECT

GLASS REINFORCED CEMENT
AS WALL AND FLOOR FINISHING

C/911

TZIAKOURI CHRISTIANA & VIOLARI ELLI

JUNE 2000

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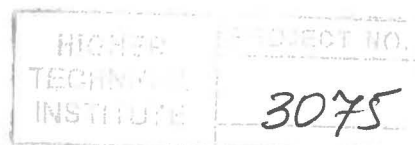
GLASS REINFORCED CEMENT AS WALL AND
FLOOR FINISHING

by
TZIAKOURI CHRISTIANA & VIOLARI ELLI

Project Report
Submitted to
the Department of Civil Engineering
of the Higher Technical Institute
Nicosia-Cyprus
in partial fulfilment of the requirements
for the diploma of
TECHNICAL ENGINEER

In
CIVIL ENGINEERING

June 2000



***To our
Friends & Family***

AKNOWLEDGEMENTS

We would like to express our gratitude to our supervisor Dr. D Sergides, Senior Lecturer, Civil Engineering Department, HTI.

We will also like to thank Mr Papadouris for his valuable information about the traditional buildings. Furthermore we would like to thank Mr Pelekanos, and Mr Kizas for their help in the experimental work and for providing us the instrument and equipment for the experiment.

Finally we will like to thank our family and friends for their help and support in all parts of the project.

HIGHER TECHNICAL INSTITUTE
NICOSIA-CYPRUS

CIVIL ENGINEERING DEPARTMENT

Academic year 1999/2000

Diploma Project Number: C/911

TITLE: Glass Reinforce Cement as Wall and Floor Finishing

OBJECTIVES:

1. A study of finishes for walls and floors used in Cyprus in traditional & Contemporary Architecture.
Methods of application, differential uses, advantages and disadvantages of each finish.
2. Study of Glass Reinforced Cement (GRC) as Wall & Floor finishing.

TERMS AND CONDITIONS:

1. The sduty is to analyse the different types of wall and floor finishes that were used in traditional buildings and that are used in contemporary buildings and furthermore to find if GRC is suitable as finishing.
2. Information and guidance on the project would be provided by the supervisor.
3. The equipment and materials used for the experimental part of the project will be provided by the Civil Engineering Department.

Stydents: Christiana Tziakouri & Elli Violari
Supervisor: Dr. D Serghides

External Assessor: Mr. A. Kyprianou

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SUMMARY

By comparing the traditional with the contemporary way of buildings we can see that they have changed significantly.

In traditional buildings the way of construction is based on the experience gained through years. The materials used for the construction of houses and so for floor finishes as well are simple and all natural, as they are the ones found ready from mother nature. The way of building varies from place to place and also from the economic criteria of the owner. Different types of buildings are found on mountains and plain areas and also in towns and villages. This is due to the materials available at each area and the climatic conditions. The finishes in any house in the traditional houses were not very important.

In contemporary buildings the buildings are completely different. They include large mouldy storey structures except from the simple houses. Also new and better material are available and now aesthetics and comfort are very important and so the finishing is a necessity.

Every new material discovered is properly examined with all respects in order to find out if it is suitable for construction, in what element of the building is more suitable for and in what climatic conditions

Glass Reinforced Cement is a new material, which has not been used widely especially in Cyprus. It is mainly composed of cement reinforced with different fibres. It is examined to find whether the fibres help to improved the resistance to strain caused by the setting of the material and the climatic conditions.

ABSTRACT

This is a study of the wall and floor finishes in Cyprus and of a new material glass reinforced cement as wall and floor finishing suitable for Cyprus.

Part-1 is the theoretical approach of the experiment. It is divided into three chapters:

1. The traditional building in Cyprus with main aspects the wall and floor construction and their finishes.
2. The contemporary buildings in Cyprus with main aspects again the wall and floor construction and their finishes.
3. The Glass Reinforced Cement's general properties and uses world-wide.

Part -2 is the experimental part of the project. On this the Glass Reinforced Cement is examined whether it has resistance to strain.

INTRODUCTION

People always needed a shelter to protect, on the one hand, both themselves and their possessions from bad weather conditions, and on the other hand, a shelter that guarantees their safeness. The improvement of the quality of life created the need for better and more qualitative shelters. Shelters, which would provide to people a more comfortable environment to live in. The development of machines has made possible the use and production of new materials, which in the past were not even considered as means for usage. Moreover, the development in the area of design made the majority of buildings as perfect places for people to live in. These were the reasons that change the traditional way of building into a more advance way, the contemporary way of building.

In regard to the traditional buildings, their construction was primarily based on the experience gained through generations due to people's limited knowledge about design. Moreover, the absence of materials obliged people to use the ones that were easily available and close to the building site. Differences between the materials used at that time can be observed in buildings, which were built on mountains, in fields and in towns, places in which people had the privilege of money. The poor quality of life, particularly in villages, led people to the construction of buildings in which the only function was for protection and not for comfort.

Nowadays, new and better materials are developed at very fast paces. Due to the mass media and the development of communication between other countries Cypriots are able to import materials and use them in their constructions. Fashion and new styles in building technology are constantly change and unfortunately Cypriots tend to follow blindly these changes. Even though the new materials appear to be stronger and more comfortable, they do not possess the right qualities to be used in the climatic conditions of Cyprus. The materials which, adjust to the Cyprus environment and guarantee insulation, and thermal comfort are characteristics that must be seriously taken into account.

As far as finishing is concerned, either for walls, floors or roofs have to follow some performance criteria. Generally speaking finishing is used to protect the constructional materials and furthermore the building envelope from weather conditions, solar radiation and humidity. It is also used to make the building envelope more stable and stronger. Finishes are also used for aesthetic reasons as to give colour and brightness and change the appearance of the building elements to the owner's taste. Furthermore finishes make buildings more comfortable. For example a floor finishing must be warm and not slippery, and for internal wall a smooth finishing is adequate.

A good choice of finishes in terms of climatic conditions that provides thermal comfort could lead to considerable energy savings. A good finishing has to be workable as well, which means to be easily applied in any case. Different properties must be present in the three different climatic zones, that is, the coastal, the mountainous and the island areas.

Every new material used in Cyprus must be examined in order for people to decide whether it has the necessary properties and also to decide in which type of building must be used.

Glass Reinforced Cement (G.R.C) is a new material, which is not commonly used in Cyprus. Its is composed by glass fibres into cement paste or concrete. The fibres are used to improve the quality of the cement or concrete respectively in all aspects. For example the strength, it's cracking resistance etc.

G.R.C has to be examined as to decide whether it is suitable to be used as mortar for wall finishing on the one hand or as concrete screed for floor finishing on the other hand. By checking the cracking resistance of suitable G.R.C samples for each case it can easily be conclude if glass fibres improve or not the quality of our finishes.