

CERAMIC FAÇADE PROVIDING ENVIRONMENTAL CONTROL – CERAMIC SOLAR SCREEN OF THE DURBAN NETHERLANDS' BANK

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Illustration 1

ABSTRACT

Norman Musgrave Eaton designed the Durban Netherlands' Bank (see illustration 1) in South Africa. He was sensitive towards the nature of building materials and cared about craft and skills. His application of ceramics was very creative, innovative and well researched. Ceramic screens were not used for the aesthetic affect alone. They were the result of the architectural approach to the challenge of Durban's heat and humidity. In this case the major consideration in the design was the climate and environment. The emphasis was on ventilation and coolness as well as regional identity.

The solar screen has been suspended from above by means of welded lengths of steel running through hollow ceramics. Additional steel rods have anchored the ceramics in its position in front of the glazed walls and structural piers. He has succeeded in handling ceramics materials with originality and inventiveness. It draws attention to itself by its quality. The clever design and use of ceramics humanized urban architecture and provided a better living condition in the South African environment.

INTRODUCTION

Great architecture is impressive from both far away and at close quarters. At a distance our eye catches the characteristic form. Close up the eye searches for different points of interest – scale detail. Durban Netherlands’ Bank (1961-65) exhibits simple and clear cubic form at a distance (see 1&2) and simple and clear ceramic screens at close quarters (see 3&4). The cubic form has been achieved by sheathing the entire building with the protective solar screen. The clarity and simplicity of the architectural expression, in particular the ceramics façade, has attracted attention. Its architect Norman Musgrave Eaton, a South African, was sensitive towards the nature of building materials and cared about craft and skills. He demanded and expected perfection. His application of ceramics was very creative, innovative and well researched.

The ceramic solar screen, seen from the street outside, utilizes the cubic form and when seen from the interior, is a source of light. Entering the building is almost like walking under the spreading branches and leaves of trees.

ENVIRONMENTAL & REGIONAL DESIGN

The unbroken expanses of ceramic screens were not used for an aesthetic affect alone. They were the result of the architectural approach to the challenge of Durban’s heat and humidity.

The climate of the north coast of KwaZulu-Natal ranges from warm to hot and humid, and the Mozambique current flowing down the coast is seldom cooler than 25 degree C. In summer many struggle with the subtropical climate. Continuous and efficient ventilation is the primary comfort requirement. Protection from sun and rain as well as prevention of internal temperature elevation during the day should affect all aspects of building design. The layout of the surrounding, planning as well as the size and location of openings/windows are crucial. Open planning and shaded free spaces between buildings help to achieve good ventilation. Openings should be positioned on both windward and leeward sides of the building to facilitate cross ventilation. Large openings should be protected from sun penetration and rain. There are demanding requirements. In this regard, the major consideration when designing the Durban Netherlands’ Bank was the climate and the environment. The task was to provide protection from the worst of Durban’s notorious summer heat and humidity (see 5).



Illustration 2



Illustration 3

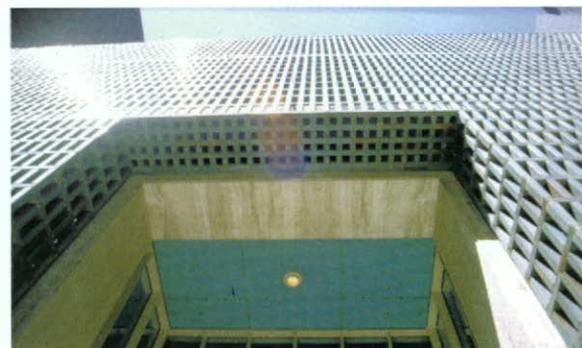


Illustration 4

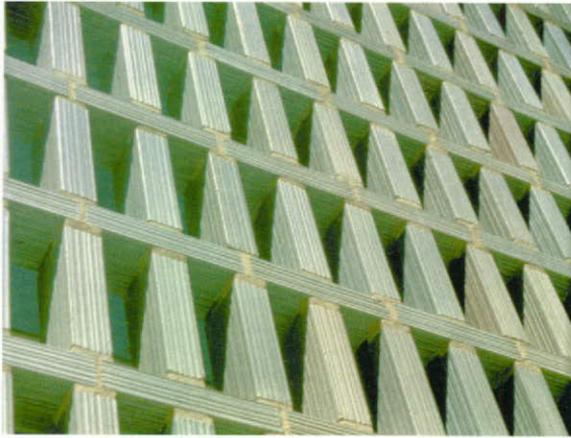


Illustration 5



Illustration 6



Illustration 7



Illustration 8



Illustration 9

The emphasis was on ventilation and coolness as well as regional identity. The ceramics solar screen, with thin vertical gaps, is similar to the reed mat and screen work of certain African tribes (see 6). In oblique light they cast thin repeated shadows.

STRUCTURAL SYSTEM

The solar screen has been suspended from above by means of welded lengths of steel running through hollow ceramics. Additional steel rods anchor the ceramics in its position in front of the glazed walls and structural piers (see 7,8 &9).



Illustration 10

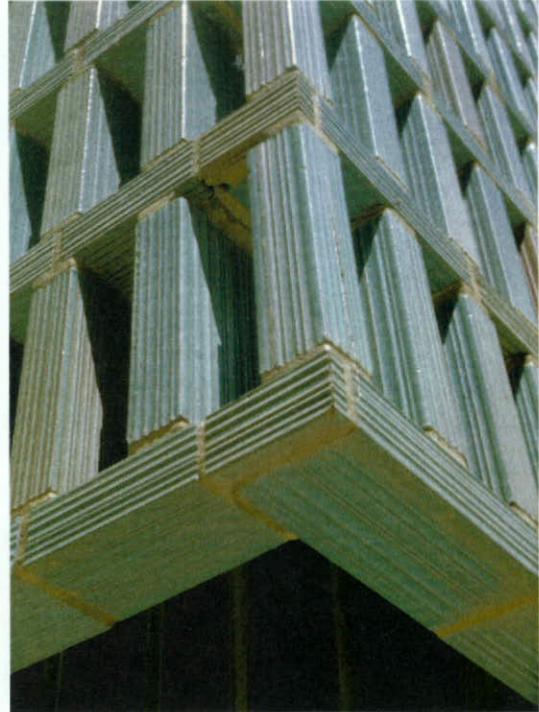


Illustration 11



Illustration 12

The solar screen has been composed of specially manufactured, fluted, hollow clay blocks of dimension approximately 300x80x50 mm (see 10 &11). The blocks have been set in regular vertical and horizontal courses. They have framed vertical openings 80mm wide and 300 mm high.



Illustration 13

TEXTURE AND COLOUR - GLAZING

The blocks have been glazed to make them impervious to Durban's corrosive atmosphere. The ceramics finish has given the blocks, and consequently the entire interior and exterior of the building, its unique texture and colouring - variegated rusty greens and browns reminiscent of weathered copper (see 12&13). One of the most important problems in the ceramic tile branch, avoiding the appearance of shades (small colour differences), became an important aesthetics objective.

TESTING QUALITY

Before the ceramics were manufactured and transported to Durban, testing exercises took place. Samples of various textures and colours were made and small prototype screens were erected in front of the Children's Art Centre in Pretoria to evaluate their functional and aesthetic suitability.

The success of the Durban Netherlands Bank façade lies in the design process that included testing of the materials and application technique as well as the definition of the controlling criteria. To avoid ceramic facade failure during the design a lot of attention was given to adequate specification of adhesive and grout as well as sufficient amount of adhesive to guarantee full coverage of blocks/tiles in addition to control joints.

It was worth the time, the money, and the effort that was spent on it (see 14). Appropriate design and application are fully worthwhile when the maintenance cost is taken into consideration.

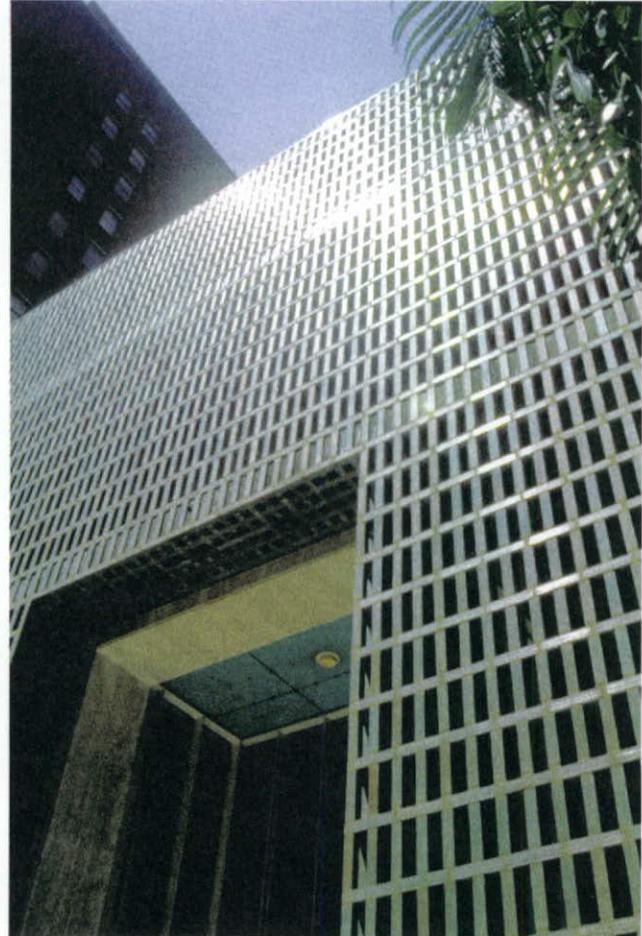


Illustration 14

Most of all if we consider maintenance costs, ceramic facades have one of the best cost-benefit relationships among systems available in the market. If they are appropriately planned, designed and specified as well installed with suitable techniques and quality control throughout the installation, the success is assured.

If ceramic facades keep their expected performance during their lifetime, many advantages arise when comparing ceramics with other finishing systems. The most important advantages are: unique aesthetics, attractive composition, cleanability, improved damp resistance, general performance, economic value and durability. The history of architecture and construction prove that ceramic tiles and the decorated clay bricks are among the most durable of man-made building materials.

UNIQUE CHARACTER

The ceramic façade draws attention as a result of its exceptional character, size, form and finish. It is not only more attractive visually than the neighbouring buildings but it also offers relief from the heat (see 15). The sheer-sided green ceramic cube has been accomplished by sheathing the building with the protective solar ceramic screen. The

suspended ceramic blocks above the marble base and extending from the roof parapet create an impression of filtered sunrays. Ceramic finish gives the blocks and the façade its unique colouring. The variety of rusty greens and browns bring the diversity of glazing and richness of tones. They create a dynamic surface full of expression perfectly accommodating natural ageing and contamination of pollution.

CONCLUSION

Eaton's concepts have been complete and perfect. He has succeeded in the handling of ceramic materials with originality and inventiveness. The clever design and use of ceramics has humanized urban architecture and provided a better living condition in the South African environment. Well researched detailing of ceramics screen has survived almost 40 years (see 16). The user of the original Durban Netherlands' Bank has been changed, currently it is Nedbank, but the Ceramic solar screen façade has not change. It still looks attractive, impressive and well preserved promoting the application of ceramics on the building facade. It has remained in excellent condition facing all South African transformation. The outstanding design and masterful application illustrate the best of ceramics in the building industry. The façade draws attention to itself by its quality.



Illustration 15

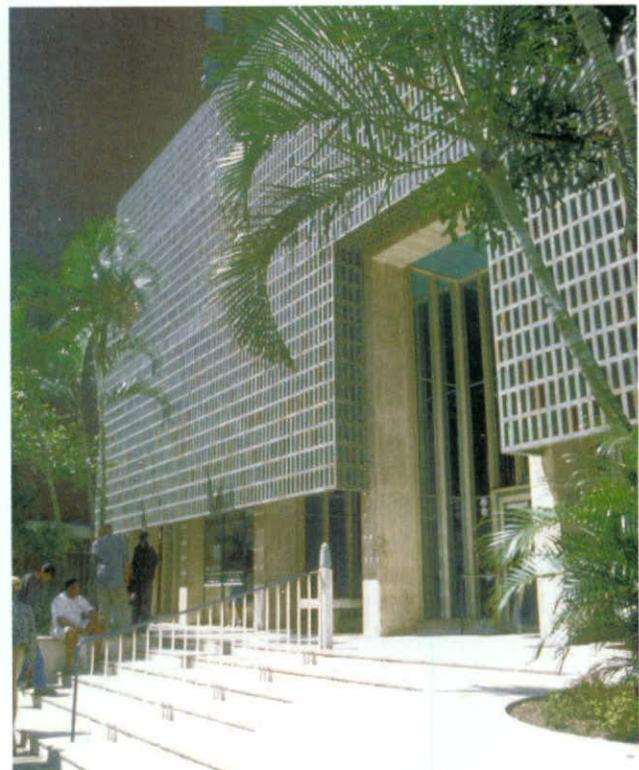


Illustration 16

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All illustrations by the author.