

ASPECTS OF CERAMIC TILE USE IN FACADE CLADDING IN SAO PAULO, SOUTH REGION OF THE MUNICIPAL AREA

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INTRODUCTION:

The use of Ceramic Tiles in Facades (CTF) is a traditional option in Brazilian architecture. Initially introduced by Portuguese settlers, as time passed it was progressively incorporated into the local architectural repertoire, mainly in cities located beside the sea, for their qualities with regard to durability, easy maintenance and wealth of colours and designs, among other characteristics.

However, their use is also characteristic in cities far from the coast. This study seeks to show the tendency of ceramic tile use on facades, focusing on buildings of a residential type in the city of Sao Paulo. The study was specifically conducted in the South Region of the capital, a city which is the major urban area of Brazil and has the highest concentration of population in the country and in the Southern Hemisphere.

METHODOLOGY:

In the first place, with a view to defining the working area in the city of Sao Paulo, it was necessary to establish certain criteria to enable determining a specific area inside the immense metropolitan district, which at present has more than 10 million inhabitants. On the other hand, residential multi-family housing was chosen as the building type in this study, developed and built by the residential real estate sector. This led to the selection of the South Region of the capital. The study was conducted over the period from 1994 to 1998.

The chosen Region, in terms of surface area, represents 49.5% of the municipal area, and has great growth potential, with a great concentration of leading tertiary activities, as well as having the population with highest income in the city area.



Figure 1: State of Sao Paulo, in the Southeast Region of Brazil.



Figure 2: Sao Paulo Metropolitan Region and location of the Sao Paulo Municipality.



Figure 3: Municipal area of Sao Paulo, depicting the city's South Region.

On the other hand, considering the total number of multi-family residential housing projects approved by the Town Council in the selected period (94-98), the number of buildings located in the South Region shows the preponderance of this region in the city.

| Year of building initiation | Multi-family residential housing in the Sao Paulo Municipal Area, without considering "flats" | Districts in the South Region | % |
|-----------------------------|---|-------------------------------|--------|
| 1994 | 429 | 191 | 44.5 % |
| 1995 | 425 | 226 | 53.2 % |
| 1996 | 391 | 157 | 40.2 % |
| 1997 | 360 | 180 | 50.0 % |
| 1998 | 275 | 136 | 49.5 % |

Source: Brazilian Company of National Resources Studies - EMBRAESP

Table 1: High-rise multi-family residential housing built in the period 1994 – 1998.

RESULTS:

After visiting 890 residential groups, only those already in use were included in the study, discarding those where construction was in progress or had stopped.

Among the main results found, it was established that ceramic tiles was used as facade cladding in 48% of the cases (330 residential groups), in the region and periods studied. For the purposes of this work, use could vary from 10% to 100% of the total facade area. It was established that in most cases (77%), tiles were used in combination with other external facing materials, including paint, concrete, stone, glass, etc.

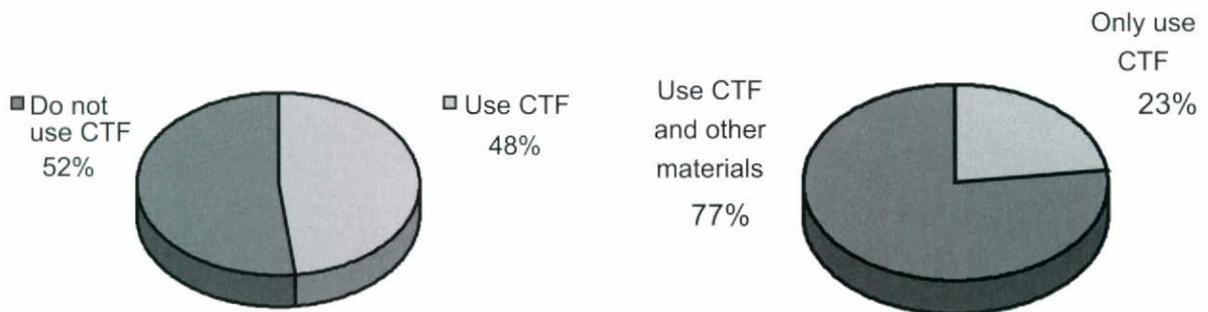


Figure 4: Percentage of use of CTF in the South Region-S.

Figure 5: Way of using CTF.

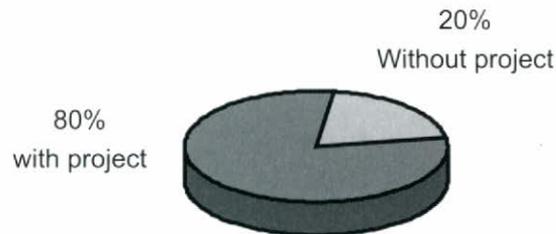


Figure 6: Execution of CTF production projects.

On the other hand, it was detected that this use diminished proportionally with the decrease in investments of the real estate sector, mainly as a result of the effects of the Real Plan crisis that affected several sectors of the Brazilian economy. However, the wide use of ceramic tiles on facades, according to the architects surveyed, who accounted for a great many of the visited building projects, is not supported by a ceramic facade cladding production project (80% of the interviewees). Moreover, developers to department salespersons intervened in the decision-taking process regarding tile use. This was reflected in the quantity used, and mainly in the final result of the facade, in some cases its use being understood as a way of achieving fast sales. In the examples set out below (Figures 8, 9 and 10), located in Sao Paulo South Region districts, the combined use of several types of tiles can be observed, from porcelain mosaic in 4 x 4 cm sizes to tiles sized 10 x 10 cm, all with absorption less than 6%.

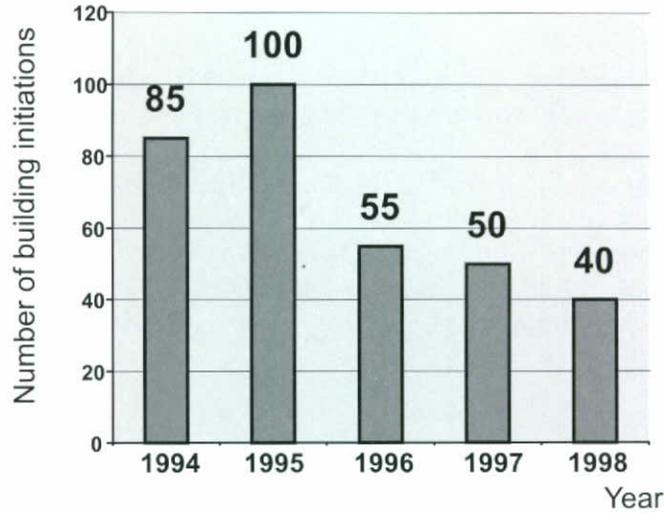


Figure 7: Use of CTF between 1994 and 1998.



Figure 8: Building in the SP Morumbi district.



Figure 9 Building in the SP Morumbi district.



Figure 10: Building in the SP Itaim district.

CONCLUSIONS

Among the main conclusions reached in this study was the notable presence of ceramic tiles in the facades of residential buildings in this representative part of the city, inferior in proportion to other cities in the Northeast of the country, but significant for their volume in the studied period. However, the use was not exclusive, because the cost factor in the developer companies established parameters of up to 30% on average, with regard to the use of ceramic tiles in facade claddings in most cases. On the other hand, there is a tendency to use small sizes, the most widely used pieces being mosaics measuring 4 x 4 cm and 5 x 5 cm. No buildings using porcelain tiles were found. On the other hand, a decrease was noticed in the use of CTF, and there is a lack of specific projects with ceramic tiles for facades by those responsible for the specification. There were also cases that presented pathologies, whose study is part of a following work.