EFFECTIVENESS OF PROMOTIONAL MATERIAL FOR GENERATING NEW PROJECTS - THE URBAN SEA, A CASE STUDY IN COLOMBIA

Germán G. Madrid
Director, SEGMENTA Consultoría / Educación. Medellín, Colombia, segmenta@une.net.co
Juan C. Rincón
Technical Director, INDURAL S. A., Medellín, Colombia, indural@une.net.co

SUMMARY

Like most flooring surfaces, concrete pavers can become fluid, motion-filled materials when viewed from overhead. How to get this unique characteristic from concrete pavers is a design concern for producers, promoters, marketers, consultants and designers. With this in mind, industry institutions and associations like the Interlocking Concrete Pavement Institute (ICPI) have published influential technical and visual information to assist designers in expressing this unique aspect of concrete pavers.

An example of influential information is "Paver Trilogy" by David R. Smith and ICPI. These three books together consist of 600 color pages showing mostly North American projects with concrete pavers and other segmental pavement materials. These books used in combination with slides and digital images are very powerful promotional materials when shown to those considering future projects.

This was the case for EAFIT University the most prestigious university and one of the largest in Medellín, Colombia. Designers decided to complete and pave its main parking lot (12,000 m^2) and to initiate a program for pedestrianizing most of the campus. ICPI promotional and related materials helped INDURAL, the largest local concrete block paving block producer with 35-years' experience, and SEGMENTA Consulting and Education demonstrate to the University and the designer architect, Juan F. Forero Architects, the advantages of using concrete pavers for this application. The design was patterned after "Jazz on Pavement" the promenade designed by Jerry Clapsaddle for the National Trade Centre in Toronto Convention early 1990s (Clapsaddle, 1994). A simple pallet enabled the designer Architect Juan F. Forero, to creatively draw "Mar Urbano" (Urban Sea). This design consisted of a series realistic waves flowing along the pavement, a metaphorical sea of knowledge reaching the shores of the University.

The repetitive paving pattern made in black, white and two shades of gray with 200 x 100 x 60 mm thick concrete pavers was set in a stretcher-bond pattern. The pattern flows across the interruptions made planting strips with trees dividing the parking lanes, as if they were wave-breakers in the process of gathering the knowledge.

This project completely changed the face of the University when approached by car. The 500 car and 125 motorcycle spaces parking lot cost 15% over the estimated cost for the asphalt alternative. The paver producer is also a contractor and sold the installed paver layer for US$ 15.5/m^2.

1. INTRODUCTION

Because concrete pavers have such intense visual appeal, they are often viewed as flooring rather than utilitarian pavement, especially when viewed from above or from oblique angles. This happens regardless of the application or the designer's intent or contractor's results. The visual difference between conventional asphalt or cast-in-place concrete and concrete pavers means a substantial visual as well as functional improvement. This visual improvement is not merely in the eye of a few observers but is unanimously agreed upon by everyone using or viewing the site. Using concrete pavers in the top level of parking buildings and roof decks avoid visually unappealing concrete joints and cracks and offer striking color, durability, reduce the degradation rate of the concrete or roofing materials under them.

Roof plaza deck, terraces and parking garages in urban environments are "the fifth facade," the one carrying the burden of being observed from the overhead (much more than any vertical wall) by occupants of adjacent buildings. They are subject to greater demands than vertical walls in that roofs need to resist wear from pedestrian and vehicular traffic, and are more subject to the extremes of climate and temperature since they directly face the sun, wind, rain and snow. In addition, horizontal paver surfaces as roofs may need to be cleaned to prevent the build up of dirt deposits and mildew in tropical climates.

Pavers have a long list of characteristics and advantages for being considered the optimum material for the fifth facade.

- Technical: Pavers provide a lasting, stable surface and insulation-covering material for roofs and cast concrete slabs. They can be walked and driven upon better results than traditional roofing materials. ICPI [1] and the Concrete Manufacturers Association (CMA) of South Africa [2] have set clear design guidelines for confident use of pavers as a roofing material.
- Aesthetic: Modularity and segmentation, the natural characteristics of pavers, gives the pavement the unique "no further cracking" characteristic that surpasses any other continuous materials like asphalt, concrete, stamped concrete, etc. (see Figures 1 and 2).
- Practical: Easy-to-clean and low-maintenance, pavers allow easy access of underlying layers and support structure.
- Cost: A paver solution is not a short-term, inexpensive solution. However, it offers a first line of defense, low-maintenance protection of roofing materials which are far more expensive and inconvenient to replace.
- Safety: It can be used and "abused," by people, cars, etc., without changing engineering, functional and aesthetic properties.

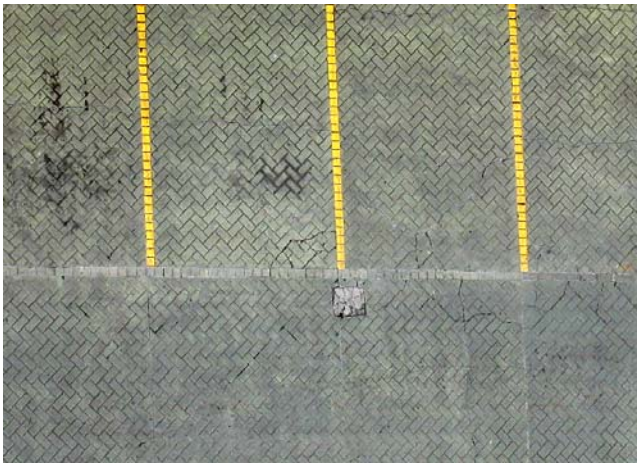


Figure 1. Stamped concrete on a parking slab, cracked in random patterns.



Figure 2. Clay veneer on a parking slab repeatedly repaired.

Large expanses of pavement found in at-grade parking lots are similar to the fifth-façade in that these surfaces are often viewed by those in nearby buildings or from higher ground. So enlightened owners, developers and designers might ask an important staring question:

1. How do we treat such large surfaces to make them beautiful, fun, environmentally and visually friendly, meaningful and even artistic?

But, immediately, a second critical question is asked:

2. At what cost?

These questions could be considered for any alternative construction component. However, because pavers are seen as a new or innovative material with strong visual characteristics, a third question arises:

3. How are the visual effects of concrete pavers realized in this project?

The answer in part comes from the pedestrian and driver who will be viewing the pavement and from where, i.e. on the pavement, next to it, from a low oblique angle or more from overhead. What will be seen, from where and why are key design questions to be answered.

If the owner, design team and/or contractor are unfamiliar with concrete pavers, they have to depend on other's experiences. For some, reaching outside one's own experiences (particularly if it's overseas) goes against the sometimes limiting, egocentric value of relying on local, self-developed or indigenous experiences. A foreign result or experience may look right but it is foreign. To apply it locally, it needs to be verified technically, as well as from a construction and performance viewpoint. Until those bridges are crossed, nothing is decided or risked. Those working in developed as well as developing countries are not immune from this attitude.

2. THE DEMONSTRATIVE EFFECT

"If others did it, maybe I can do it." This is a key designer consideration when seeing a project in another location. For this thought to become real, it needs three conditions:

- Readily available information.
- Ample, well-documented and attractive literature that reaches beyond case studies and provides a

design concept to organize the site.

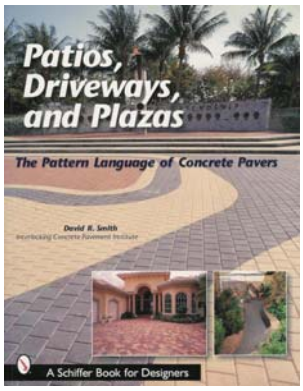
- Institutional or a personal verification site and project characteristics, specifications, construction conditions, uses and results of the project.

Those three conditions are the basis books and brochures from paver and cement associations. The most important of those projects has been the "Paver Trilogy," by David R. Smith [3, 4, 5], a set of books published by ICPI. Other recent efforts have been made by the ABCP (Brazilian Portland Cement Association) [6] and other institutions, in different formats.

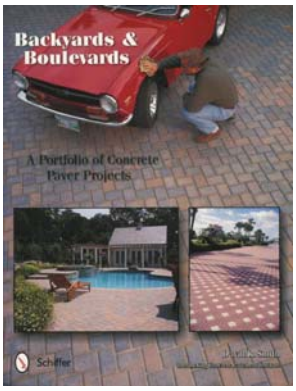
A key advantage of using the "Trilogy" is that it goes beyond "sets of slides" sold by ICPI and several other institutions as promotional and educational material with the purpose of showing the feasibility of the segmental pavement. Pictures from these types of books get incorporated into presentations which make them powerful promotional materials.

The use of such material has a variable effect. The impact depends on the development of local paver technology and how the local tradition deals with the concept of "foreign." One case could be that the simple display of successful foreign projects motivates developers, designers and even governmental offices to adopt the new technology or to consider large-scale, outstanding projects. The opposite case could be that if the projects shown are not local, they are not trusted as feasible. Those viewing the pictures aren't willing to be challenged to implement a project from concept to completion. .

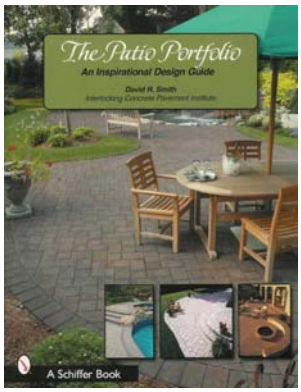
No matter the reaction, the effects of visual materials such as design idea books, technical manuals and leaflets, case studies reports, product specifications and applications, posters, magazines, etc., at least raises the viewer's awareness on new possibilities for concrete block paving.



ICPI's Patios, Driveways & Plazas [3].



ICPI's Backyards & Boulevards [4].



ICPI's The Patio Portfolio [5].



ABCP's Book Plazas, roads and patios [6].

Figure 3. Four books with hundreds of images of good projects built with concrete pavers.

3. THE URBAN SEA - A CASE STUDY ON USING PROMOTIONAL IMAGES

EAFIT University is an urban but green campus in the middle of Medellin that decided to complete and pave its main 12.000 m^2 parking lot. This was part of a larger initiative to transformation the campus into a great pedestrian area. The urban designers wanted something more substantial than a black or gray continuous area of pavement.

Landscaping was a key factor. The parking lot and circulation design allowed for large trees to provide shadow in coming years, a fundamental factor of environmental comfort in a city with tropical climate, just 5° north of the Equator. Then the planners questioned the local pavement industry: What could be

made besides asphalt and concrete, possibly with pavers, for a project of such a large scale, and within the cost range of the typical materials?

Fortunately, Medellín had the first large-scale use of color pavers in Latin America, in its San Antonio Park, a project presented to the 5th International Conference on Concrete Block Paving in Tel-Aviv, Israel, 1996 [7]. The project consisted of some 10,000 m^2 of pavers distributed in several areas. The aforementioned promotional materials (as a book and scanned images this book and other ICPI publications) helped Indural and Segmenta Consulting and Education (technical advisor for the complete block paving project) to demonstrate to the University and the architects the possibility to develop a meaningful project for almost the same price than the originally proposed asphalt pavement. Of all the images that were reviewed and all the projects that were explained in two short working sessions, the one that caught the attention of the project architect was "Jazz in the Pavement", the promenade designed by Jerry Clapsaddle for the Canada's National Trade Centre in Toronto (c.1996) and well documented in ICPI's books [6, 7] and the *Interlocking Concrete Pavement Magazine* [9].



Figure 4. Images of Jazz in the Pavement, in ICPI's book and magazine

The wave pattern inspired Architect Forero to create a realistic shore-reaching wave pattern that could flow along the parking lot, and break against the green wave breakers in what could be called "Mar Urbano" (Urban Sea). So these inspiring images set into motion a quest to gather much information about the Toronto's project to help insure successful detailing and construction of the Medellin project.

4. THE PROJECT

The paving pattern is made with black, white and two shades of gray, 200 x 100 x 60 mm thick pavers, set in stretcher-bond pattern. The pattern is repeated twice between the wave breakers (garden strips) that divide parking lanes. These long planters, built in white-aggregate black masonry units, carry the surface lighting for the parking lot and are used to disguise the drains. The original entrance in the

middle of the lot was maintained with an access way along the lot that's accessed to the right or left just after entering. There are just over 500 parking spacers and 125 motorcycle parking spaces. The motorcycles have their own entrance which can be used by cars in case of an emergency.



Figure 5. The complete Urban Sea, as seen from the opposite side of the main entrance.



Figure 6. A close-up of the north side, with the motorcycle parking area at the left.



Figure 7. A more detailed view of the waves, even with a lot of parked cars and traffic.

The University wanted to conserve expenses by using the existing gravel surface as subbase and a place a 250 mm thick base over it to support bedding sand and 60 mm pavers and bedding sand. From the base design point of view, this type of project presents paradox. Each parking space receives at most four cars a day. Traffic enters at two points and 500 cars at the same time on one lane. The parking lot was designed for some 100,000 80 kN standard axle loads with 60 mm thick pavers to make it competitive with a thin asphalt layer. However, the parking spaces do not receive as much traffic as the entrance and exit lanes. The granular base is 500 mm thick in all the parking lot, except at the entrance where the base was increased in 40% from the intersection with the asphalt pavement and for a length equal to two cars. Then this base extra thickness was reduced in 1 m to the regular thickness.

Rutting is expected at the main lane that receives most of the traffic. After one year in service, no elevation differences can be observed. The only difference is the natural staining of the wheel paths

normal to any pavement.

The existing drainage system divided the drainage areas in two along the access way. Each area has water flowing toward gutter-less planting strips. Concrete tire stops allow pedestrians to navigate around cars and allow water flow to the planting strips. Heavy rainstorms common to the area and there are sufficient slopes to move the water to the planting strips which holds excess water should the drain pipes momentarily reach capacity.

The construction of the paving block project cost 15% over the estimated cost for the asphalt alternative, but with a much more impressive appearance. Indural, the paver producer also has an installation department with ICPI Certified Concrete Paver Installer personnel. This department sold the installed sand and paver layer for US$ 15.8/m^2, the first half (built June - July, 2005, and for US$ 15.2/m^2 the second one (built December 2005 - January 2006) (an average price of US$ 15.5/m^2).

The landscaping was an important factor besides the paving of the parking space. Threes were planted in all the wave-breakers - Black Almond Tree (*Terminalia Ivorenisis* A.Chev) and Yellow Acacia (*Caesalpinia Eltophoroides* Benth) - for future shadow, with bushes and flower plants between them. Simultaneously with the parking lot, a long walkway was built (with variegated pavers in buff tones) as a transition between the parking lot and the already-built areas, creating a waving horizontal border in front of the gardens, the sport facilities, the library and other buildings. This walkway was built in transversal stretcher pattern and, step by step, is beginning to network the whole campus, as a root system to feed it. One key point is that the University calls the contractor for periodical maintenance.



Figure 8. Base material (as it looked before).



Figure 9. Finished pavement, as it looks now.



Figure 10. The four colors used.



Figure 11. Patten sample for the designer.



Figure 12. A complete pattern module.



Figure 13. Interpretation of the wave.



Figure 14. Wet entrance; no traffic marks.

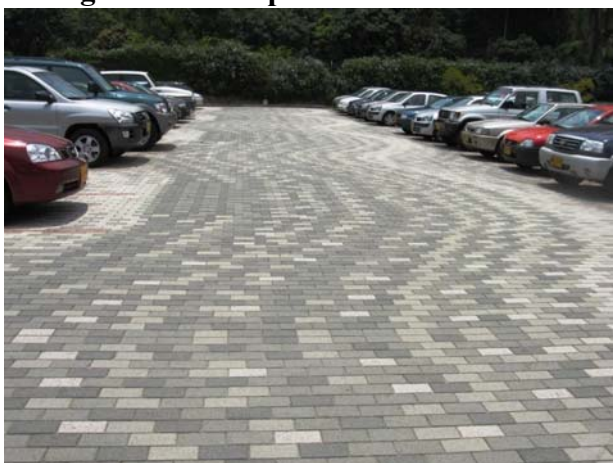


Figure 15. Transversal view.

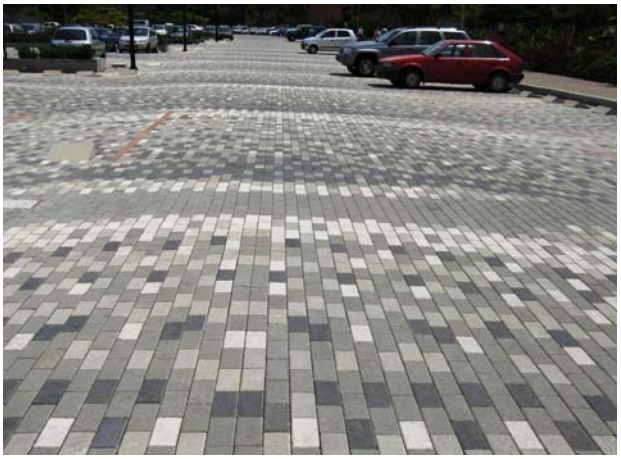


Figure 16. Longitudinal view (axis).

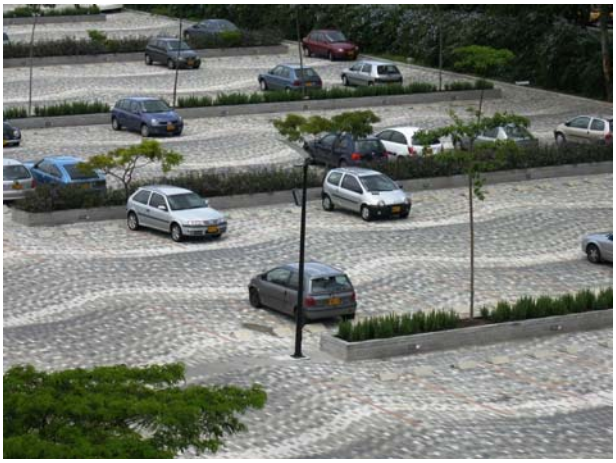


Figure 17. The parking bays.



Figure 18. The circulation strip.

5. CONCLUSIONS

The outcome of a project like this was comprehended neither by the University nor by the designer, until it was complete and the vegetation is growing. The added values go far beyond the extra cost that it imposed to the project budget. The distinctive aspect of this surface makes this area an easily spotted point when approaching or leaving the city in small planes.



Figure 19. Adjacent buildings. Library.



Figure 20. Pedestrian pathway and gardens.



Figure 21. Motorcycle parking area.



Figure 22. Motorcycle parking strips.



Figure 23. Gardens, circulation and drainage.



Figure 24. Slopes, drainage and tire-stops.

The paving-block-producing-industry is equipped to make any product the designers want. The industry is realizing a rigid catalog of shapes is not appropriate for special projects and custom colors but and tailor-made products can be offered to designers. With these manufacturing possibilities, there is no excuse for designers not to take advantage of all the possibilities that concrete pavers have as a plastic material.

The designer can be poetic, even metaphorical, writing and drawing with pavers. They are made with this "cold" and "gray" material: concrete. But the minds and the senses explode with possibilities and meanings. These allow everybody to access concrete pavers' "beauty," a fundamental human right, and very rare to find, or impossible to obtain, in poor areas of most of the third-world large cities. The work of the Interlocking Concrete Paver Institute (ICPI) contributes to develop this very characteristic within the human soul: The perception and the pursuit of beauty.

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