

# THE PATTERN LANGUAGE OF CONCRETE PAVERS

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## SUMMARY

**This paper provides an overview of a metaphorical design vocabulary within the family of segmental concrete pavement, i.e., interlocking concrete pavement, paving slabs, permeable interlocking concrete pavements and concrete grid pavements. Fundamental structure of the language is presented via various patterns. Various types of messages and moods are communicated with various patterns and these can be effective designs in a range of projects from patios and driveways to large urban renewal projects. The paper summarizes the book, *Patios, Driveways and Plazas – The Pattern Language of Concrete Pavers*” (Smith 2002). This book and paper provide some visual examples on how to differentiate designs with paver patterns, colors and textures using this design vocabulary. Many of the examples demonstrate relationships between the paver patterns and their support of and integration with the site and buildings.**

## 1. INTRODUCTION

Every expression of beauty, invention and technology relies on a vocabulary. The world is understood through spoken and written language that adopts its own structure in various parts of the world to move human progress forward. Languages help understand music, food, religion, painting, sculpture, graphic arts, films, architecture, landscape architecture and engineering. The structure behind languages enables almost endless combinations and designs in these realms.

The fundamental part of language is vocabulary, i.e., a lexicon or dictionary that helps readers and users understand meanings and define new ones. Words and sentences form the building blocks of language in all realms. The development of vocabulary and sentences in these realms results in the articulation of moods, ideas and concepts. They enable new invention and design through recombination. Whether written, verbal, visual, auditory or gustatory realms, such creativity within each supports language, culture and life.

This paper borrows from language basics to help explain the design vocabulary of segmental concrete pavement. The thesis is people pave like they talk. Just as language gives power to create an infinite variety of sentences and conversations with corresponding character, mood, tone, and feeling, the pattern language of concrete pavers gives tools to create an infinite variety of messages and moods. It is a form of writing whose paper is the earth’s surface. In addition, concrete pavers can help communicate how a place works and how to work and live in a place, making it more sustainable for human existence and enjoyment.

## 2. LANGUAGE FUNDAMENTALS

### 2.1 Nouns

Nouns are persons, places, or things. There are several patterns used to call out and emphasize these. The first one is the stack bond pattern, a grid-like arrangement of pavers whose perpendicular joints continue both directions. Stack bond defines people, places or things with its strong grid pattern. Square and/or rectangular shaped units provide the pattern building blocks. They are arranged according to three aspects – the underlying grid or field, the color of pavers and frames that sub-divide the fields – i.e., grids within the grids.

Frames are defined by varying colors, paver sizes, and textures. Figure 1 shows a stack bond to define and strengthen the importance of this backyard patio. Contrasting colors at the steps help mark the edge of the pavement.



Figure 2 below shows an intersection near a beach in Ft. Lauderdale, Florida USA. Figure 3 is a plaza in front of the National Trade Center in Toronto, fronting Lake Ontario in Canada. Both designs incorporate stack bond to define the place, in this case ocean or lake waves. The design of the National Trade Center plaza is further discussed in Clapsaddle (1998).

**Figure 1. Stack bond emphasizes places, people or and things.**



**Figure 2. Stack bond makes waves.**



**Figure 3. Varying colors in the stack bond implies moving waves.**

Figure 4 shows large frames defining the sitting areas around swimming pool. The frame and fields within them use the same sized units but with different colors. In Figure 5, the whole pool area is defined with frames and fields, using a different color and size for the frames than the fields within.





**Figure 4. Stack bond framing things like the pool and sitting areas. Note the different pattern angles.**



**Figure 5. Stack bond emphasizes the house and frames the pool. Frames and fill are created with different unit sizes.**

Figure 6 suggests an elegant design where a diagonal stack bond frames the one-color field inside it. That field then frames the rose. Like Figures 4 and 5 the frame within a frame makes the rose and the house—things and places—important. Figure 7 illustrates stack bond framing a place for activity, a giant chess game.



**Figure 6. Framing generated by the stack bond provides additional design emphasis.**

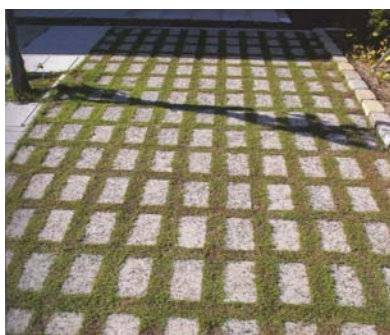


**Figure 7. Stack bond used to frame a game board.**

Segmental paving allows for subtraction or unit removal from any pattern. Subtracting pavers enables adding space for joints filled with materials such as crushed stone or grass. Runoff-reducing permeable pavements are created as shown in Figures 8, 9 and 10. Subtraction also softens the appearance which is enhanced with colors and textured surfaces.



**Figure 8.**



**Figure 9.**



**Figure 10.**

**These three figures demonstrate how stack bond can be loosened to create a softer appearance and introduce permeability.**

## 2.2 Adjectives

Adjectives modify nouns. Adjective-like patterns are variations of stack bonds and most stack bonds rely on square shaped paving units. An adjective is the parquet pattern that groups a few rectangular pavers together to make squares. Joint lines between each square run continuously in both directions making a grid. Stack bond *tells* the viewer to stay whereas the parquet pattern *asks* the viewer if they would like to stay and enjoy the place.



**Figures 11 and 12. As a modified stack bond, parquet pattern emphasizes the place but with a more subtle feel.**



**Figure 13. A K pattern appears as a random pattern but is organized around the stack bond.**

The K pattern (sometimes called ashlar or I patterns) shown in Figure 13 is another modification of the stack bond. It incorporates a repeating pattern of stacked square units surrounded by rectangular ones. This makes the field more random in appearance.

In a stack bond, changing colors and textures, or a combination of both can create contrast with grids. The two patterns in Figures 14 and 15 are identical, with the fields of squares spaced apart and pavers wrapping around them. A simple change in color enables the pavers to “jump out” and suggests movement and emphasis toward the building.





**Figures 14 and 15. Identical stack bond patterns with different center pavers create another grid over the larger units and suggest movement.**

### 2.3 Verbs

Verbs are action words. Not surprisingly, running bond, consisting of pavers set end-to-end, offset from the next course by a half a unit, speaks movement, action and direction. It makes a path to or through a place. Two running bond patterns intersect in Figure 16 to create energy in this design. Figure 17 uses running bond to direct people to different entrances at a baseball stadium.



**Figures 16 and 17 show the action and direction in running bond patterns.**

Running bond is the classic pattern found in old clay brick streets. Accidentally or intentionally it indicates the driving direction and was used for centuries. While the herringbone pattern has been used for just as long, the concrete block paving industry researched and discovered that herringbone patterns provide more structural contribution and surface stability. This has transformed the perception of the normal pattern for streets. Figures 18 and 19 illustrate the ability of running bond to bend and direct movement. Like stack bond, Figure 20 shows the visual impact of subtraction in the pattern to create a permeable pavement for a parking lot.



**Figure 20.**

**Figures 18 and 19 show the ability of running bond to direct the flow of movement. The patio pattern also makes the area appear bigger.**

#### 2.4 Adverbs

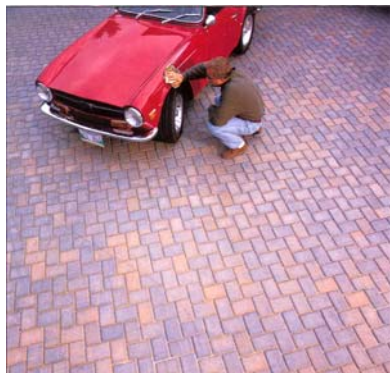
Adverbs give the action words of verbs their manner, degree and result. Herringbone patterns qualify as adverbs because of their ability to vary the manner and degree of movement. Their multi-directional rhythm can be used to vary the amount of action, movement and direction in the pavement. This is achieved by varying unit sizes, colors or pattern orientation. Figures 21 and 22 compare the impact of pattern orientation. Figure 21 shows a 90° herringbone pattern that suggests movement toward the house. Figure 22 with a 45° herringbone pattern suggests even less movement which would typically be desired in a patio environment since they are contemplative, restful places.



**Figures 21 and 22. 90° and 45° herringbone patterns communicate different degrees of movement and action.**



To create a herringbone pattern, the length of each paver needs to be at least 1-1/2 times longer than the width. Most pavers are twice as long as wide. Occasionally, herringbone will be created with units three times long as wide. The differences in movement from unit size are apparent in Figures 22, 23 and 24. Nominal unit sizes are 150 x 200 in Figure 23, 100 x 200 in Figure 24 and 75 x 200 in Figure 25.

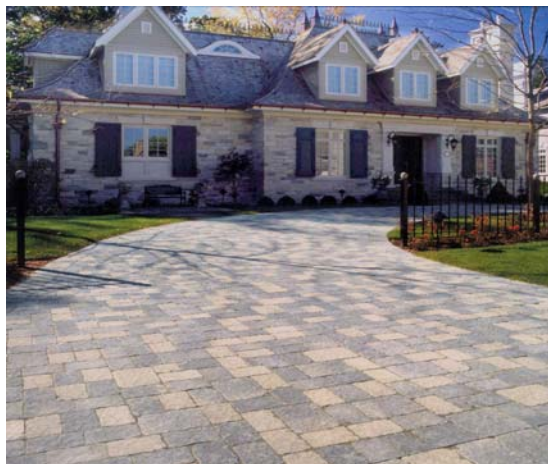


**Figures 23, 24 and 25 make clear the differences in movement based on paving unit size when placed in a herringbone pattern.**

### **3. CONVERSATION TYPES**

#### **3.1 Informal conversations from random patterns**

Random patterns often consist of three or four units of rectangles and squares grouped together. Like informal conversations, there is a loose order underlying the random appearance. Such informality encourages spontaneous exchange and an easy change in direction just as informal conversations don't always have a specific direction. Random patterns don't rely on the visual strength of continuous joint lines and hence are non-directional. Random patterns appear mostly in residential settings such as driveways, walkways and patios to communicate a certain relaxed mood about the place and perhaps the residents. Figures 25 and 26 illustrate random patterns at the front and rear of some homes.



**Figure 26 and 27. Informal conversations start at the driveway by using a random pattern and they become more frequent in the backyard patio.**



### 3.2 Salutations, discourse and intimate conversations from circles and arcs

A circular area often suggests that the viewer should move closer because the place within the circle is an important place. Concrete block paving circles are often used to suggest this at entrances, public plazas and in intimate spaces. At entrances, circles issue salutations by announcing and welcoming someone. In plazas, they emphasize something important like a view, a fountain or a monument. The focal point is a reason to visit and the setting enables discourse. In small intimate places, circles suggest drawing closer to others in communion within a protected social space. Figures 28, 29 and 30 show examples of the how a circle or arc can create conditions for these types of conversations.



**Figures 28, 29 and 30. Examples of arc and circles as places for salutations at an entrance, discourse within a city park at a water feature and intimate conversations by a river.**

Circular patterns can also be used to emphasize important site features such as a tree or pond monument within a fountain. Examples are shown in Figures 31, 32 and 33 below.



**Figure 31.**



**Figure 32.**



**Figure 33.**



### 3.3 Changing the subject with steps and edges

Introducing and closing conversations make communication memorable. Steps provide transitions from one level to another – like a conversation. Edges slow down, close and stop pavement patterns. Steps and edges both offer transitions from one place to another, transitioning moods, feelings and character.

Front steps provide a physical and mental transition from the street and driveway to the entrance door. Figure 34 shows a deliberate and grand transition. Figure 35 shows a more subtle transition in smaller stages.



**Figure 34. Grand transition**



**Figure 35. Incremental transition**

Paver border courses (i.e. soldier courses, sailor, etc.) typically define edges. Some abut to curbs, almost crashing into it. Figures 36, 37 and 38 illustrate how to soften edges at the patterns' conclusion.



**Figure 36. Edges are softened with the smaller units.**



**Figure 37 and 38. Softened edges with grass migrating into pattern.**



Figures 39 and 40 show that water provides the softest edge, enabling a melting of hard concrete into the liquid state of water.





**Figures 39 and 40. Water provides the softest edge at the Auckland, New Zealand zoo and the at a paver manufacturing plant in Germany.**

### 3.4 Expressing nuances of diction with unusual shapes and patterns

Word choice or diction is a key element in many conversations. The same holds for selecting paver shapes and colors. There are over 200 shapes of concrete pavers. Surface textures and finishes further multiply the choices. They offer different approaches from traditional squares or rectangles, offering greater variety to the vocabulary of segmental paving.

Messages can be made from the pattern or in the pavers themselves. Monument engraving equipment is used to cut words or company logos into the paver surface. The pavers then are often sold for fund-raising. Figure 41 shows a curious application of pavers at the Winnipeg, Canada zoo where animal foot prints make an impression on the paving units. Figure 42 illustrates an example of making a very plain alley interesting with a unique paver shape. Figure 43 include translucent glass lights to illuminate the paver surface. All of these are unique ways of directing one's attention to look and listen.



**Figure 41.**



**Figure 42.**



**Figure 43.**



The same word can have different meanings depending on the context and mood or color. Likewise, Figures 44, 45 and 46 show how one shape with different colors can create a three-dimensional design from a flat, two-dimensional surface.



**Figure 44.**



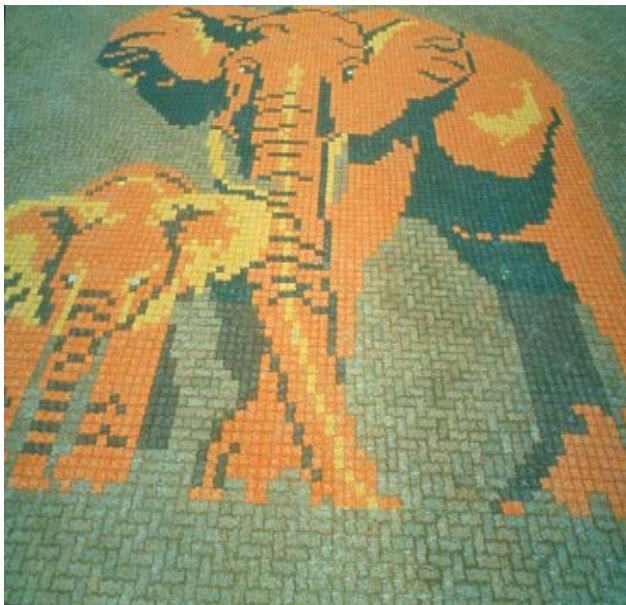
**Figure 45.**



**Figure 46.**

### 3.5 Bold statements and public addresses using murals, signs and symbols

At its core, language is pictures and symbols. There are at least two approaches to translating such signs and symbols into concrete pavers. A single shape can be used to generate patterns, symbols or a specific image as shown in Figure 47, the entrance to the Johannesburg Zoo in South Africa. A second approach is to use the paving pattern as fill and cut colored pavers to create graphics. Figure 48 shows an example that involves less attention to pattern and more attention to cutting to make all of the pieces fit together.



**Figure 47.**



**Figure 48.**

Pavement can be a mural or canvas for painting (Figure 49) as in downtown Miami, Florida, USA; a symbol (Figure 50) at a baseball park; a direction finding compass (Figure 51); a reference point (Figure 52) for finishing an automobile race; and a story making park path (Figures 53 and 54).





**Figure 49. Pavement as canvas**



**Figure 50. Pavement as symbol**



**Figure 51. Pavement as a direction finder**



**Figure 52. Pavement as reference**



**Figure 53. Pavement as a story-telling opportunity**



**Figure 54. Pavement as a story-telling opportunity**

#### 4. CONCLUSIONS

Segmental paving is a form of communication, a language with a structure and intrinsic principles on how to best relay a message to users. As the most diverse form of segmental paving in the world, concrete block paving offers the broadest opportunities for communication that supports the daily cultural and economic needs of society. The structure presented here is by no means final. Like all languages, the one for segmental concrete pavement will continue to evolve especially as permeable pavers emerge and differentiate the vocabulary further. The structure appears to be cross-cultural as it has been observed overseas as evidenced by many photographs in this paper being from places outside the United States. More importantly, segmental concrete pavement offers the strongest case for sustaining human settlement and activities, thereby improving the quality of life.

#### 5. REFERENCES

Smith, David R. 2002. *The Pattern Language of Concrete Pavers*, Schiffer Publishing Ltd., Atglen, Pennsylvania, USA.

Clapsaddle J. and Smith, D. R. 1998. "Jazz in the Pavement at Canada's National Trade Centre" in *Proceedings of the Third International Workshop on Concrete Block Paving*, Cartagena, Colombia, Columbian Cement Producers Association.