THE POTENTIAL REVOLUTION IN URBAN RENEWAL WITH CONCRETE PAVING BLOCKS

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Summary
Some of the potential in urban renewal is already being seen in paving schemes which use coloured blocks. Geometric patterns, random patterns and even chess boards are seen in various locations paved in blocks around the world. Some experience is already extant with the use of lettering and pictures with block mosaics.
The paper looks beyond current designs and proposes revolutionary major designs for cities where ambitious artworks in city squares are possible. The utilization of three dimensional paving is proposed which will include the vertical faces of buildings in future schemes. Whilst the ideas are architecturally revolutionary the structural technology for such use by concrete blocks already exists. The requirements for blocks in the future for such schemes will continue to increase and this may encourage manufacturers to assist in the introduction of these concepts.
The author believes we are in the initial stages of a quartum leap forward and this paper is intended to open a forum for many new developments based on the ideas presented which will be of excitement and benefit to all in the paving industry.
Acknowledgements. To the Chief Director NITRR for permission to publish the work.

1 INTRODUCTION

The urban environment of today have been called concrete jungles. Many cities have become so devoid of personality and human interest that "residents" now actually live elsewhere. The commuting necessitated by living on the outskirts or in dormitory towns require high capacity roads with undesirable fly-over bridge structures. Commuting generates noise and atmospheric pollution and causes serious parking problems. The transition between day and night in cities is absolute with the vibrant daytime so different to the silent unpopulated nighttime scene in the central business districts. Even shopping centres with their associated cinemas and restaurants in many cases have left the city centres in favour of more pleasing and humane environments.
Since city centres exist it seems logical to try to enhance what still remains of their potential for fun and enjoyment. Our cities, built over long periods of time and at great cost and evidencing collectively the greatest achievements of civilization in every nation and empire may thus again become the cultural, educational and social highlights of which they have proved eminently capable in the past.
Segmental block paving is already beginning to transform parts of many urban environments in various urban renewal programmes. The human-scale size of individual blocks, variety of shapes and colours offers tremendous architectural potential with proven structural adequacy. The South African design guide (1) is typical of many now used around the world. The full range of paving applications are covered from non-load associated aesthetic or protective paving, to the heaviest and most exacting industrial applications. Sufficient experience has been gained to specify segmental blocks for each and every possible urban paving use. Whilst it is true that little experience has yet been amassed in blocks for high-speed trafficking use for freeways the limited use in such applications to date suggests this possibility for use as well.

2 THE STATUS QUO

Rising fuel costs and the stress of commuting is causing many to reconsider their lifestyle. Apart from these considerations the loss of useful time in commuting in a daily schedule is significant.
Urban crime increases at a rate which seems to be almost inversely proportional to the resident population and many city centres devoid of residents are unsafe at night. Urban renewal schemes have been successful in some cities and are beginning to reverse current trends. High quality hotels built close to the city centres are social oases but few stay in them for purposes other than business and they are often empty over the weekends. These hotels are often skyscraper blocks because of the need to capitalize on the use of expensive real estate and therefore offer platforms for exceptional views of the city. Often revolving restaurants, pool decks or other socially desirable venues sit atop downtown hotel buildings. Unfortunately the view in looking down at the streets is often of poorly maintained concrete or black-top streets. Adjacent buildings of the typically older-type construction

are unattractive and cast long shadows across other buildings. Urban parklands are often limited to single block size and provide convenience only for the down-and-out.

The limited urban renewal schemes involving brightening up the typically grey colour of inner cities have included the use of patterns in paving to walkways and public squares. For some time I have been trying to influence urban planners, block marketing companies and anyone who would listen to the need to be revolutionary in considerations for renewal schemes for the inner cities. At conferences and by extracts from my thesis (2) on segmental block paving I have repeatedly proposed the need to break down the conservatism so prevalent both with urban planners and the engineering and architectural communities.

There have been some positive steps taken recently which are beginning to confirm the exciting potential of these ideas. I must compliment "S A Paving" who were bold enough to try some of these ideas and have been widely complimented for their efforts. Of special note is the new car-park at the Johannesburg zoo where not only extensive use of coloured blocks was made to identify individual parking bays, but pictures of animals were paved into the surface. Figure 1 shows a parrot paved between the car-park bays. What was just another car-park project has become an area of excitement to visitors at the zoo. Children especially, eagerly run from one animal to another as they recognize them and often drag parents and grandparents around to see these animals. By such a simple means a mundane yet purposeful car-park is now a part of the excitement which could be experienced throughout an inner city.

My ideas for urban renewal extend much further than the use of segmental blocks for pictures. I am attempting to describe these ideas here and hope to share my beliefs that these measures will revitalize our cities in a simple but practical way. An injection of individual interest in our cities is needed. The proven practice of "Hands-on" experience is proposed to encourage the involvement of as many members of the community as possible not only in the design but in the maintenance of facilities provided in urban areas. It should be obvious that we need to live and work in the most pleasant surroundings that it is possible to produce yet our cities are the very antithesis of this.

3 WHAT WE CAN DO

Ideas tend to lay dormant and require a stimulus to formalize them. For some time I realised there was much more that could be done by using the proven structural adequacy of block pavements in aesthetic applications. Two experiences caused these concepts to gel and the proposals presented here resulted from applying these two ideas in the considerations towards revolutionising inner city concrete jungles.

Figures 2 and 3 show respectively an industrial yard paved with sand bedded and jointed segmental blocks and a part of a school yard paved by the children themselves. The use of colour and architectural expertise has caused these two otherwise purely functional paved areas to be appreciated by user and passersby alike. The pavement in Figure 2 is trafficked by fork-lift trucks which induce torsional loads on the blocks within their matrix but one of the features of block paving is that of accommodating such loads without difficulty (2). The inherent elasticity of correctly specified bedding and jointing sand is an important feature of block paving. Because of this it has been described as a truly forgiving pavement allowing not only extreme design loads to be carried but yielding under misuse (3). Subsequent reinstatement of settlements caused by overloading or the installation of service ducts only requires work on the relatively inexpensive subbase layers. It must be remembered that the base and surfacing of the pavement is formed by the blocks themselves.

With blocks this most costly part of the total structure rarely requires subsequent maintenance.

In my thesis on block paving (2) a system for writing was proposed using purpose made blocks within the normal matrix. Details are shown in Figure 4. Concor Paving recognised the potential of this and patented the idea prior to introducing the new shape as standard into their range of products.

The combination of pictures and lettering now possible should allow industrial concerns to advertise in their driveways by paving their logos and writing whatever message they consider suitable. The relative ease at which blocks can be taken up and reused would allow updating of telephone numbers paved-in or changes in messages to be made.

An attempt was made at the zoo to create a three-dimensional illusion by the paving of shadow areas. The animals paved at the zoo all started out as designs on squared paper. With the use of computer-readers to identify which of the various colours are available a particular block should be easily chosen as a simple transitory step towards more professional artworks which can be made. Figure 5 shows an animal paved in the zoo car-park which almost looks as

though it is standing up rather than lying flat.

To date little advantage has been made of the possibility to pave in more than the two dimensional planes. Segmental blocks are used extensively to protect embankments from environmental distress as seen in Figure 6. The use of blocks for paving in urban areas in the third dimension will allow smoothing of the abrupt transitions in the right angles formed between the horizontal and the vertical. In terms of possible artwork in the cities this would allow purpose designed scenes to be paved-in which would flow from the horizontal paving through the transition to the vertical walls of adjacent buildings. Artists would be needed for such designs but the possibilities even to an engineer suggest a simple but revolutionary transformation of even the most mundane area in a city. This possibility is shown in conception Figure 7.

The use of fountains and flowing water has always been valuable in providing focal points in cities and serve as pleasant sound generators to mask undesirable urban noise-pollution. The waterproofing feature of correctly specified jointing material around individual blocks within their matrix could allow a truly pastoral scene to be designed (1). A properly designed mixture of flat, vertical and curved paving with artwork perhaps in the form of pictures on the vertical plane with patterns in the horizontal plane conveniently broken up with flowing water would be welcomed in an urban square. The use of the vertical plane may also be made for pump-fed waterfalls.

Because of security or undercover car parks the lower few floors of city blocks are often devoid of windows. These lower floors would provide sufficient vertical scale for such artwork. The greatest appreciation of the whole design concept of such artwork would be made by those looking down towards the ground from upper floors. The macro detail would be seen to greatest effect from the higher levels but the micro details of moving water and real shrubs and flowers perhaps planted in the movable type of containers now familiar in many cities would be appreciated at close quarters. This method of beautifying otherwise uninteresting areas will be an enhancement from all angles.

The many high level viewpoints of cities offer unique opportunities for urban artwork. The streets themselves which are either trafficked by slow moving vehicles or zoned for pedestrian areas could be improved by macro designs of a similar type to those suggested for urban squares. Moving traffic will be too close to appreciate the complete picture paved in the form of large designs or pictures. There should therefore be no reduction of traffic safety standards. Figure 8 shows a conceptualisation of this in a trafficked city street. The movement of vehicles across a suitable designed picture might even subtly suggest a "moving" picture from the advantage of higher viewing platforms. The colour-fastness of modern dyes used by manufacturers and the resistance to damage by oil of segmental blocks identify them as an ideal material for paving city streets. This fact has long been appreciated by urban engineers who have used blocks for bus and taxi parking ranks even where the more traditional tar or concrete was used for the road itself.

A brain storming session will probably produce many more cases for blocks in the urban areas but my thoughts include reflection scenes, shadow scenes and computer aided photograph-prints in city squares. A reflection scene could mirror a design on one vertical wall from a facing vertical or adjacent horizontal areas. Shadow scenes might use the shadows caused by tall buildings to be somehow reflected in the parking. The photograph-print concept might be realized in paving a coloured picture of a national leader or hero in a square named in his honour. Newsprint and television pictures comprise rows of dots of the colours and intensity needed to be viewed from a distance as a clear picture. By the same principle a photograph can be "read" out on a computer screen for colour-blocking to aid those who would pave the city square with the picture chosen. The use of writing could further immortalize the memory of the person so honoured.

I have always envisioned a modern counterpart to the Horologium Augusti in ancient Rome. This was a giant sundial. Many modern skyscrapers have tapering upper storeys or are straight sectioned throughout their height and would make ideal sundial points. The paving of a shadow-square to utilise the shadow of a tall building as a giant sundial may be possible. It could induce tourists and thereby add to the interest of the urban area.

4 INVOLVEMENT OF YOUTHS IN URBAN PROJECTS

The artwork designs possible with block paving lend themselves to design by computers. Such design work might be readily done in schools. The additional effort needed to select the correct blocks when laying a large piece of artwork might also be done by teenagers. In this hands-on way their interest in improving their immediate environment

might yield longer term benefits since a sense of involvement in the community will have been engendered.

In the first block-paving competition to be run in South Africa the animals to be paved in the Johannesburg zoo car-park were drawn onto a competition application form. Children were asked to colour the animals and with their entry provide a very small donation in support of the Zoo. Winners were asked to help in the actual paving of the animals. Their family, friends and schoolmates were all involved by the competitor's infectious enthusiasm and the donation to the Zoo together with the hands-on policy helped to instill some urban responsibility into those directly and indirectly affected by the competition. Similar competitions to design suitable block paving work with school badges and mottos to be laid at convenient sites in the school grounds and paved by the children themselves would do much to further this spirit of responsibility.

Other competitions could be envisaged where offices, flats, shops, industrial concerns and other urban enterprises could pave artwork or emblems for themselves. The total effect of such competitions would be to enhance the urban environment and cause residents or community workers to feel involved in the community. National press or television coverage could extend the effect of these urban improvement and community involvement would extend to other areas. A sense of urban pride should also be developed at the same time.

At a block paving symposium held at a converted disused elephant house at the Johannesburg Zoo, where the theme of artwork in blocks was introduced to engineers, this concept of hands-on involvement was tried with adults. It is a truism that we never "grow-up" in the sense that the fun of youth is lost and it was exciting to see the fun experienced by leaders of industry whilst helping to pave a polar bear at the entrance to the Zoo. This proved the practicality of hosting competitions and using unskilled office and factory workers to improve their own environment with block paving.

5 LONGER TERM EFFECTS OF BLOCKS IN CITIES

The proposals put forward to use blocks in urban areas will have the immediate effect of improving the urban scene. If such measures are not made soon the death of many cities will occur. Many cities today are nothing more than office blocks with workers preferring to live miles away where they can enjoy the environment. The potential of using the expertise of the "man-in-the-street" to improve the streets he uses will be realized. Since the term "street" itself is actually derived from words meaning "paved with stones" the use of blocks will cause the term city-street to have real meaning again. The human scale of the micro design together with the macro scale possible with larger scale artworks make segmental-block paving unique among the possibilities of urban renewal. The structural adequacy of block paving has been firmly established both by theory and with much practical experience (1). To this quantitative parameter we can now add the quality parameter. It is an aspect of the quality of life where artwork and architecture actually complete the urban scene by adding fine detail to urban life. It is micro detail that implies tenderloving-care, an ingredient often missed in urban scenes. To appreciate fully such details that could be provided by paving blocks it will be necessary either to walk or ride slowly or travel by overhead rail or cableways. The fast moving motorcar must be put in its correct place in urban areas. Its use in city centres may be redundant since there is much that must be appreciated at a slower pace in high-density urban areas. The term high density implies the shared use not only of buildings, roads, parks and public facilities but the shared use of transport. Public transport systems in cities are by definition the most suitable in high density areas whereas in other areas the design of buildings for single family occupation would suggest single family transport as well. It is obviously silly to consider providing one lift to each apartment in a block of flats yet we continue to expect at least one car per family in urban areas. Of course the use of motorcars outside the urban areas may be more desirable but transport around high density areas must be by public means. No other system for city centres seems practical or indeed desirable.

6 CONCLUSIONS

The concepts presented here could be described in terms of engineering with a social conscience. The use of block paving is an obvious realization of the social use of engineering concepts. I can envision a paved area where the subtle smile on the Mona Lisa can be appreciated. The technology to do this is already with us. What is needed now is the motivation of city fathers in urban renewal projects where some of these concepts will be immediately possible.

Conventional artworks in cities are often deformed by spray-paints or are no longer in the public taste since fashions change. Artwork with block

paving may be taken up and relaid if necessary at little cost in materials. Should an artwork include a picture of a state-president who subsequently falls out of favour it is an interesting possibility that he could be taken up and repaved as the new leader.

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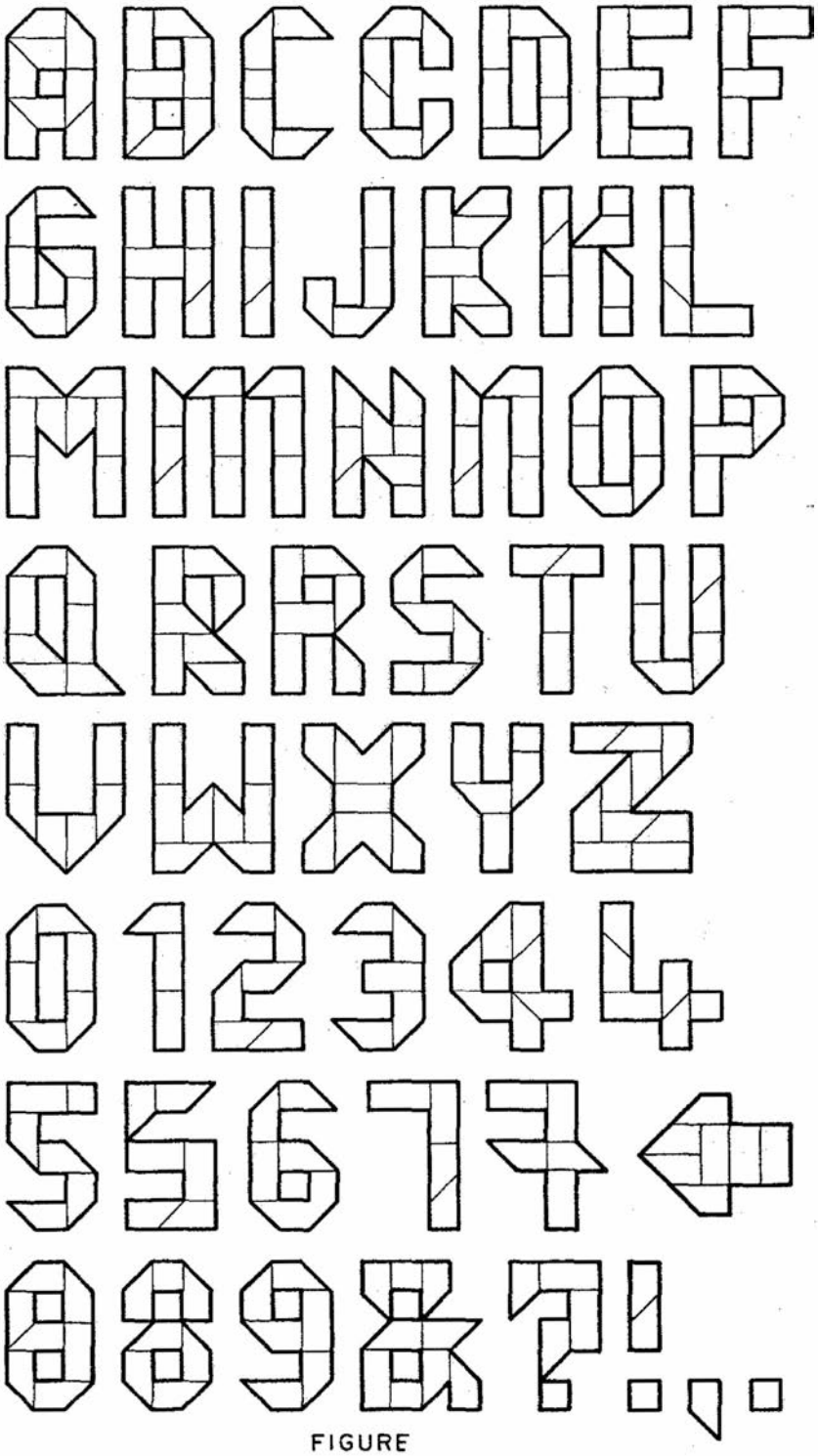

FIGURE

A LETTERING AND NUMBERING SYSTEM WITH SEGMENTAL BLOCK PAVING

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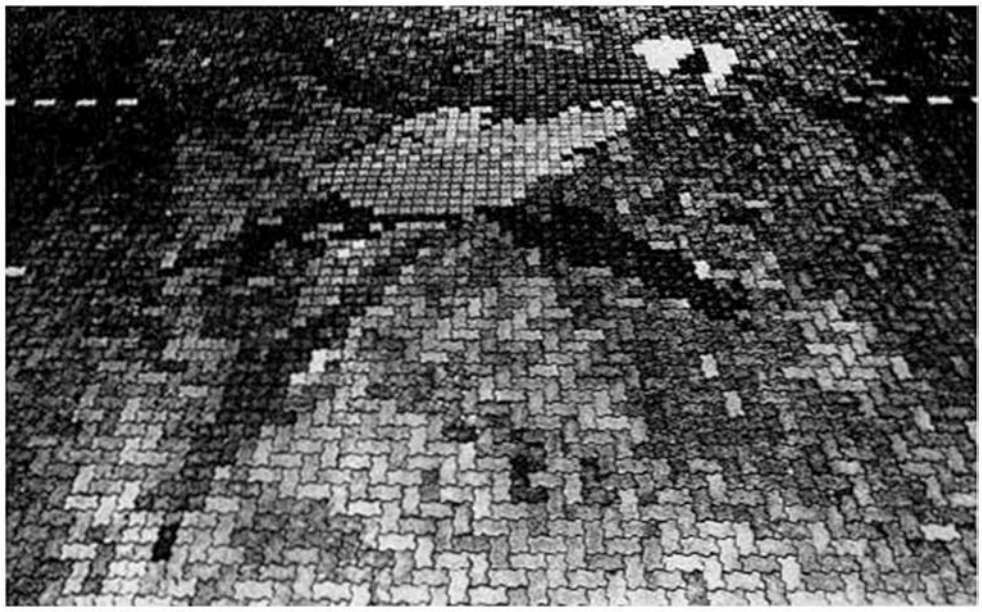

FIGURE 1 - PICTURE OF PARROT PAVED INTO THE JOHANNESBURG ZOO CAR-PARK



FIGURE 2 - AN INDUSTRIAL YARD FOR USE WITH FORK-LIFT TRUCKS

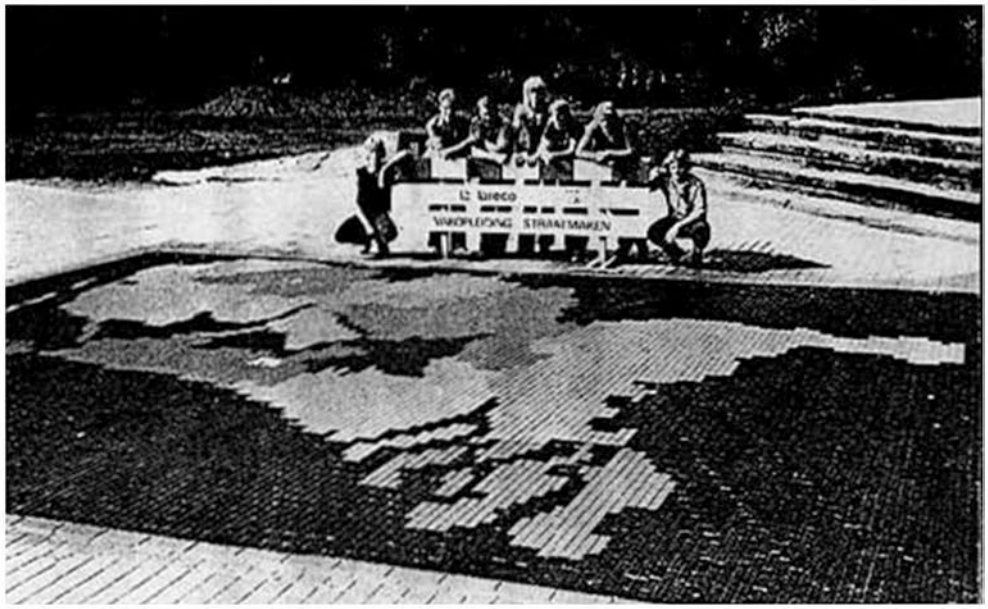

FIGURE 3 - SCHOOL YARD IN THE NETHERLANDS WITH A MAP SHOWING THE PROVINCES PAVED IN BLOCKS



FIGURE 4 - EXAMPLE OF LETTERING WITH BLOCK PAVING

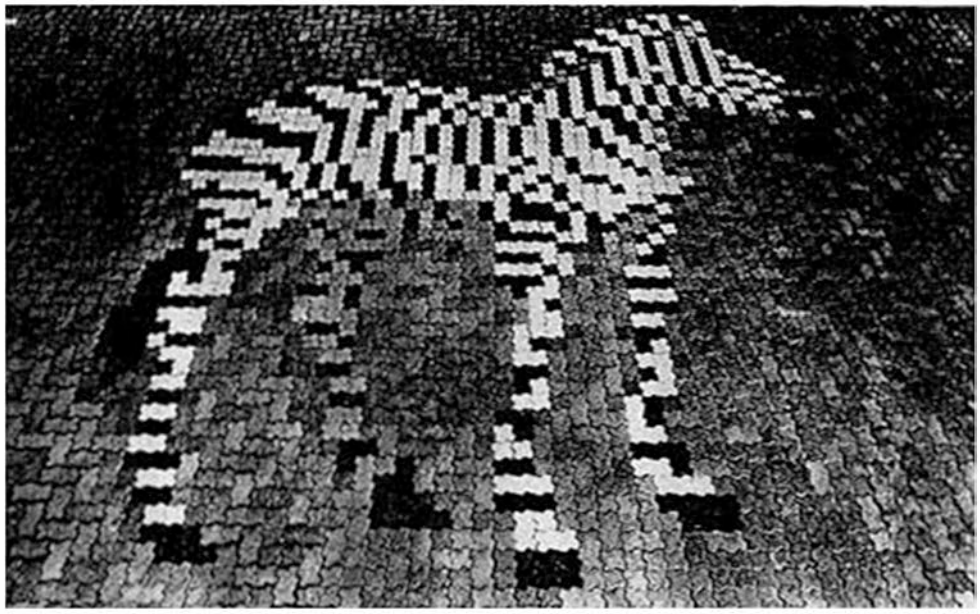

FIGURE 5 - AN ATTEMPT TO CREATE A THREE DIMENSIONAL ILLUSION IN THE BRICK PAVED INTO JOHANNESBURG ZOO CAR-PARK

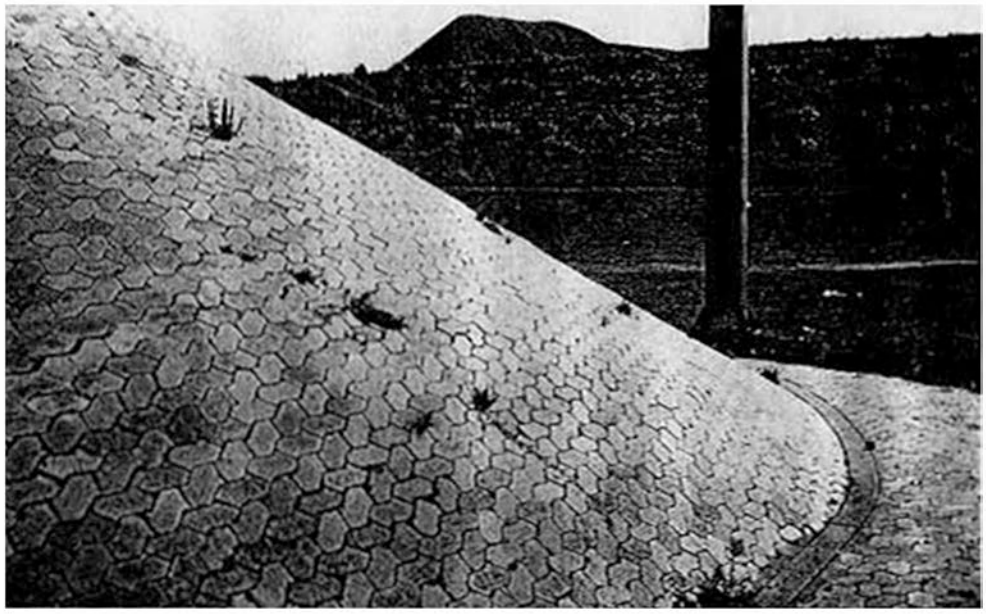

FIGURE 6 - SEGMENTAL BLOCKS USED TO PAVE IN THREE DIMENSIONAL PLANES

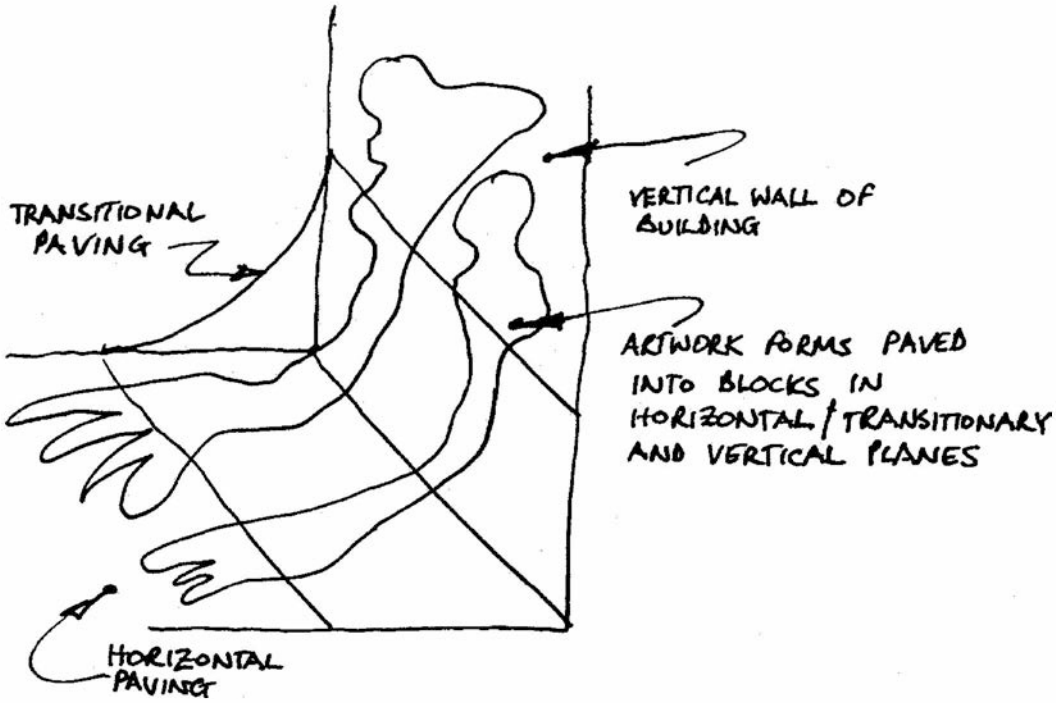

FIGURE 7 - ARTWORK POSSIBILITIES IN THE SMOOTHING BY TRANSITIONS BETWEEN THE HORIZONTAL AND THE VERTICAL

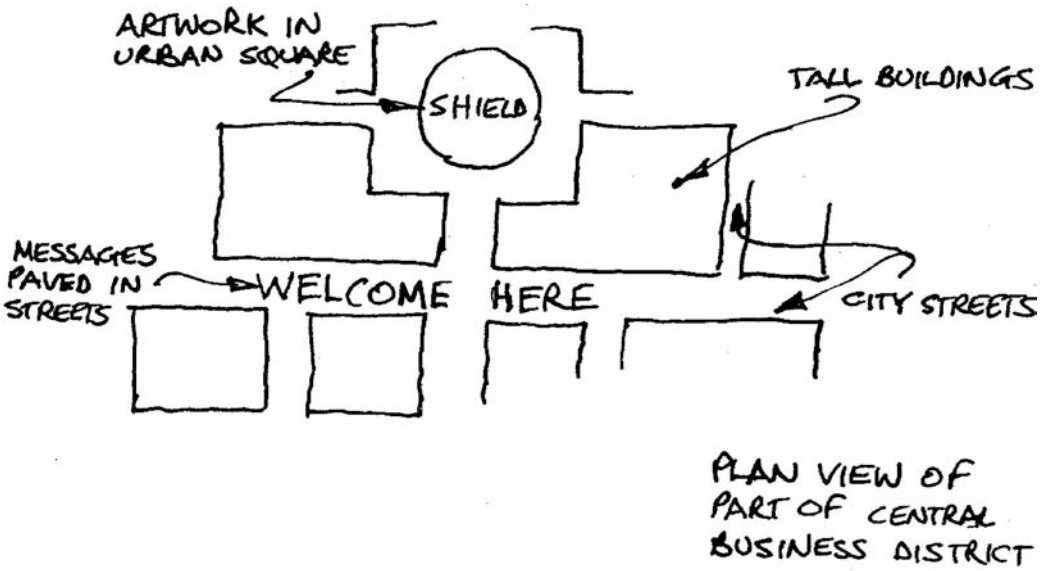

FIGURE 8 - POSSIBILITIES OF MACRO DESIGN ON MAJOR URBAN STREETS