

# CONCRETE BLOCK PAVING

*Cost comparison between concrete  
block paving and premix asphalt*



*A walk-over in cost, looks and  
durability for Concrete Block Paving*







## INTRODUCTION

This brochure gives a cost comparison of Concrete Block Paving and Premix Asphalt Paving done independently in May 2003 in the Gauteng region. The costings are based on three qualities of subgrade and three job types and sizes. Obviously the size and layout of each individual job affects the cost, and for this reason a small sketch is given to indicate what the costing is based on. The classification of subgrade and earthworks layers beneath the paving are based on UTG 2 and for ease of reference this table is reproduced in this brochure.

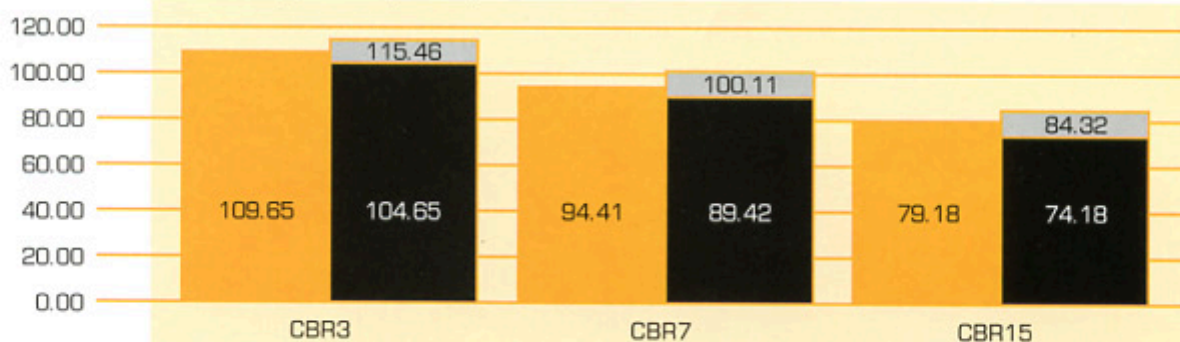
In a recent cost comparison between Premix Asphalt Paving (PAP) and Concrete Block Paving (CBP) not only did CBP prove, generally, to be the most cost effective option but, because CBP is aesthetically more pleasing and structurally superior, CBP is the preferred choice for a wide range of applications – from car parks and urban roads to heavy duty industrial areas.

## GRAPH OF COST COMPARISON BETWEEN CONCRETE BLOCK PAVING AND PREMIX ASPHALT

### Car Parks – Area 3 000m<sup>2</sup>

CBP Premix Estimated maintenance cost over 10 years

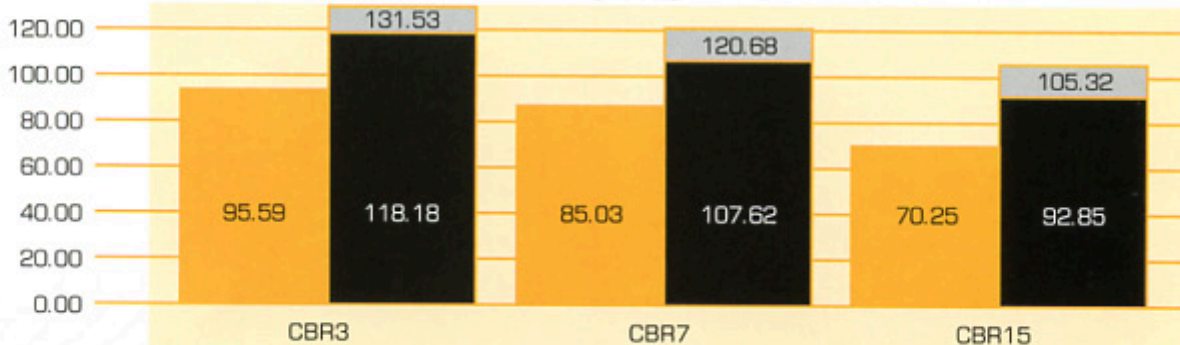
Pavement Cost R/m<sup>2</sup> Multi dwelling driveways, car parks and residential streets.



### Urban Roads – Area 5 000m<sup>2</sup>

CBP Premix Estimated maintenance cost over 10 years

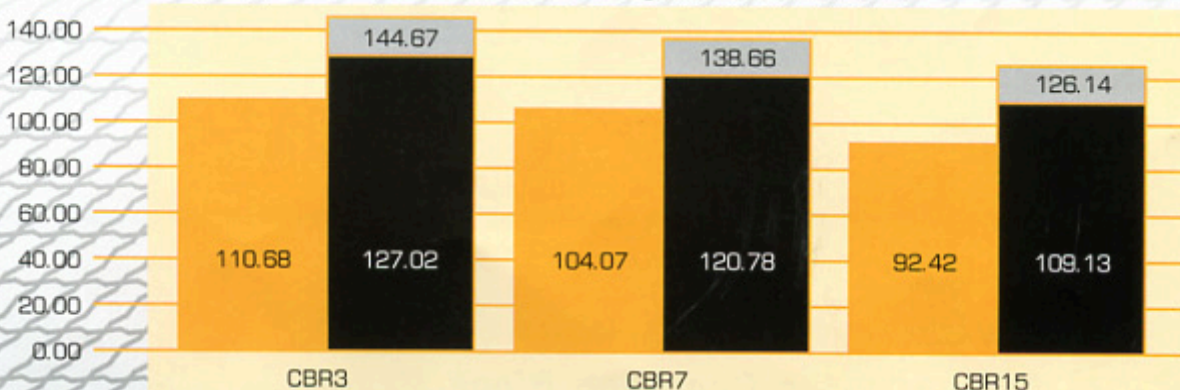
Pavement Cost R/m<sup>2</sup> Township/Estate road developments and light duty industrial.



### Heavy Duty – Area 10 000m<sup>2</sup>

CBP Premix Estimated maintenance cost over 10 years

Pavement Cost R/m<sup>2</sup> Heavy duty industrial, bus terminals and through roads in urban areas.



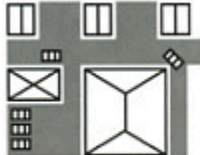


## DESIGN SPECIFICATIONS FOR COST COMPARISONS

### Car Parks – Area 3 000m<sup>2</sup>

CBP Premix

Multi dwelling driveways, car parks and residential streets.



60 - CBP 25 - Sand	25 - PAP 100 - G4	60 - CBP 25 - Sand	25 - PAP 100 - G4	60 - CBP 25 - Sand	25 - PAP 100 - G4
100 - G5	125 - G5	100 - G5	125 - G5	100 - G5	125 - G5
150 - G7	150 - G7	150 - G7	150 - G7		
150 - G9	150 - G9				
CBR3		CBR7		CBR15	

### Urban Roads – Area 5 000m<sup>2</sup>

CBP Premix

Township/Estate road developments and light duty industrial.



60 - CBP 25 - Sand	30 - PAP 125 - G2	60 - CBP 25 - Sand	30 - PAP 125 - G2	60 - CBP 25 - Sand	30 - PAP 125 - G2
150 - G5	125 - C4	150 - G5	125 - C4	150 - G5	125 - C4
150 - G7	150 - G7	150 - G7	150 - G7		
150 - G9	150 - G9				
CBR3		CBR7		CBR15	

### Heavy Duty – Area 10 000m<sup>2</sup>

CBP Premix

Heavy duty industrial, bus terminals and through roads in urban areas.



80 - CBP 25 - Sand	40 - PAP 150 - G2	80 - CBP 25 - Sand	40 - PAP 150 - G2	80 - CBP 25 - Sand	40 - PAP 150 - G2
125 - C4	125 - C4	125 - C4	125 - C4	125 - C4	125 - C4
125 - C4	125 - C4	125 - C4	125 - C4	125 - C4	125 - C4
150 - G7	150 - G7	150 - G7	150 - G7		
150 - G9	150 - G9				
CBR3		CBR7		CBR15	



The design requirements for CBP and Premix Asphalt Paving differ and for this reason the layers required for each are not the same. The final costings are influenced by design, the type of surfacing (CBP and PAP) and the size and intricacy of the job.

## NOTES ON THE SPECIFICATIONS

This brochure is intended to be used as a typical cost comparison between types of construction.

It is NOT INTENDED to be used as a catalogue design manual.

The designs used are based on:

Draft UTG 2 : 1987 - Committee of Urban Transport Authorities.

"Structural Design of Segmental Block Pavements for southern Africa."

Draft UTG 3 : 1988 - Committee of Urban Transport Authorities.

"Structural Design of Urban Roads."

The design procedures indicated are not a substitute for engineering skill and judgement and in no way replace the services of experienced professional engineering consultants.

Materials used (e.g. C4 and G7) are the typical material codes used in UTG 2 Fig. 9 and UTG 3.

The costings for the various specifications were based on the size and shape of paving indicated and assumed to be a one-off contract in central Gauteng.

Due to the many factors which may affect the actual price of any specific contract, the costings can only be used as a comparison between relative specifications.

### Extract from UTG 2 Fig. 9

Code	Material	Abbreviated Specifications
G1	Graded crushed stone	Dense-graded unweathered crushed stone; max size 37,5mm 86-88% of apparent density; fine PI $\geq 4$
G2	Graded crushed stone	Dense-graded unweathered crushed stone; max size 37,5mm 100-102% mod AASHTO; fines PI $\geq 6$
G3	Graded crushed stone	Dense-graded stone + soil binder; max size 37,5mm 98% mod AASHTO; fines PI $\geq 6$
G4	Natural gravel	CBR 80; PI $\geq 6$
G5	Natural gravel	CBR 45; PI $\geq 10$ max size 63mm
G6	Natural gravel	CBR 25; max size $\geq 2/3$ layer thickness
G7	Gravel-soil	CBR 15; max size $\geq 2/3$ layer thickness
G8	Gravel-soil	CBR 10; at in-situ density
G9	Gravel-soil	CBR 7; at in-situ density
G10	Gravel-soil	CBR 3; at in-situ density
C1	Cemented crushed stone or gravel	UCS 6 to 12 MPa at 100% mod AASHTO; Spec at least G2 before treatment; dense-graded
C2	Cemented crushed stone or gravel	UCS 3 to 6 MPa at 100% mod AASHTO; Spec at least G2 or G4 before treatment; dense-graded
C3	Cemented natural gravel	UCS 1,5 to 3 MPa at 100% mod AASHTO; Max size 63mm
C4	Cemented natural gravel	UCS 0,75 to 1,5 MPa at 100% mod AASHTO; Max size 63mm





## FURTHER ADVANTAGES OF CBP OVER PREMIX ASPHALT

The many colours and textures available in CBP allow for more versatility in looks and styles than premix asphalt. (Patterns, lines and images may be built into the paving.)

The interlocking action of CBP facilitates far better load distribution than the premix asphalt.

In the event of changes or renovations being made in the paved area, any reclaimed blocks are not wasted, but may be used elsewhere.

If services are required beneath the paving the CBP can be lifted without becoming damaged and can be re-laid without leaving any unsightly scars and at no further material costs.

Add-ons are easily made in any size to match existing paving.

CBP is more resistant to chemical attacks than premix asphalt, particularly in the case of petro-chemicals.

The maintenance costs of CBP are a fraction of those of premix asphalt.

Drainage channels may be built into the design with CBP.

Finishing off around trees, etc., may be made with a header course, which is both attractive and practical.

Safety features, which are particular to CBP, include:

- High skid resistance
- High luminance
- Rapid shedding of rainwater
- Low traffic noise levels.

## LOW MAINTENANCE COSTS

Concrete Block Paving is more resistant to wear from applied loads than premix asphalt. For this reason CBP is usually the preferred material where the following conditions apply:

- Heavy industrial loadings are applied to the surface
- Stop/start traffic
- Turning and slewing wheels
- Petro-chemicals or other contaminants in contact with the pavement surface
- Cushion or solid tyred wheels

Furthermore, it is known that asphalt surfaces need to be overlaid after some years of use. UTG 3 indicates that the period of time before an overlay is required may vary between 7 and 15 years. As the premix asphalt surface layer makes up approx. 27% to 37% of the total pavement cost, this is the amount which needs to be added at present costs if an asphalt overlay is required over the life of the asphalt pavement.





## PAVING MEMBERS (JULY 2003)

## PRODUCER MEMBERS

\*Companies which hold the SABS mark

Bamburi Special Products - Kenya	(09254) (2)824-478
Baybrick	(035) 791-1256
Bosun Brick*	(011) 310-1161
Brick & Concrete Industries - Namibia	(09264) (61) 280-4103
Brickcast Industries*	(031) 507-7094
Cape Brick	(012) 511-2006
Cast Industries*	(011) 316-2375
C.E.L. Paving Products	(021) 905-5998
Columbia - DBL*	(021) 905-1665
Concor Technicrete*	(011) 495-2200
Corobrik*	(031) 560-3911
Deranco Blocks*	(041) 463-3338
False Bay Bricks	(021) 904-1620
Infrasert*	(011) 652-0000
	(031) 705-2323
Inca Masonry Products*	(043) 745-1215
Kwena Brickforce - Botswana	(09267) 322-850
MVA Bricks*	(012) 386-0050
Neat Contech*	(046) 648-1359
Stanger Brick & Tile*	(032) 457-0237
Vanstone*	(012) 541-2056
Vibro Bricks*	(012) 374-2032
White River Cement Bricks	(013) 750-1271
Windhoek Precast Walls - Namibia	(09264) (61) 265620

## NON-PRODUCER MEMBERS

Brick King & Associates	(021) 948-6218
Inca (Cape)	(021) 904-1620

## CONTRACTOR MEMBERS

Oryan Projects	(083) 327-6877
Pave Show	(012) 346-6958
PYW Paving	(031) 903-2104
Randpave Industrial Contracts	(011) 805-1894
Roadstone Civil & Paving	(083) 266-3183
SA Paving	(011) 483-1350
Sun Paving	(031) 705-5123
The Paving Syndicate	(011) 640-3333
United Paving	(011) 886-1642
Vesles Civils	(012) 662-3030
Valcal International	(011) 867-2771



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