

Testing of Concrete Paving Blocks

by John Cairns
Director CMA



Presenter: John Cairns



Critical Considerations

Current SANS 1058

- ➡ Dimensions
- ➡ Strength – Compressive

Proposed SANS 1058

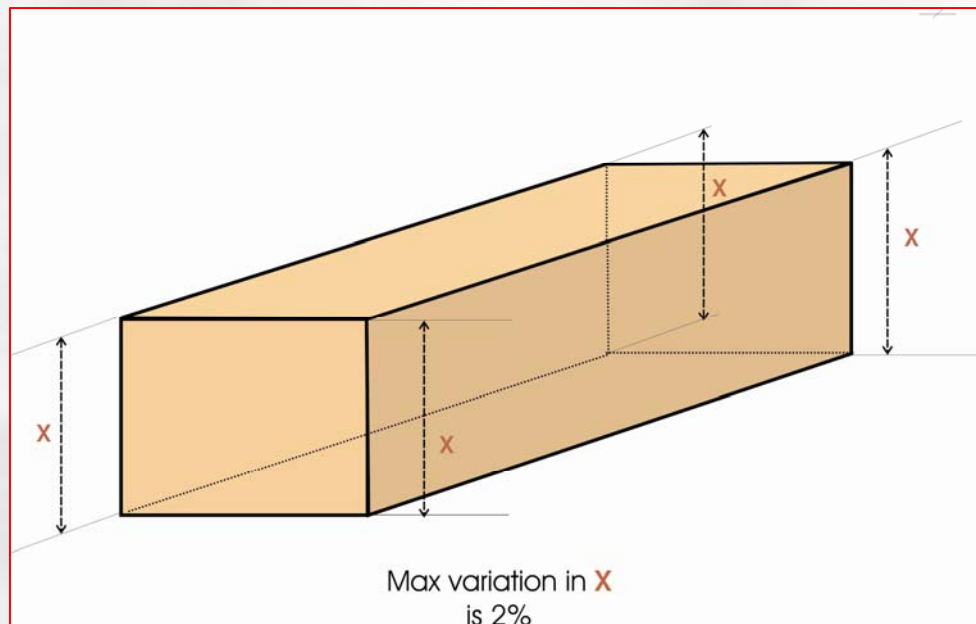
- ➡ Dimensions
- ➡ Strength – Tensile Splitting
- ➡ Abrasion
- ➡ Water Absorption



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Critical Dimensions

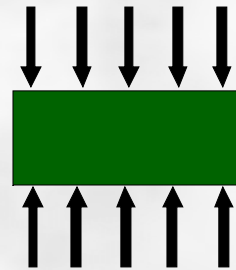
Length	$\pm 2\text{mm}$
Width	$\pm 2\text{mm}$
Thickness	$\pm 3\text{mm}$



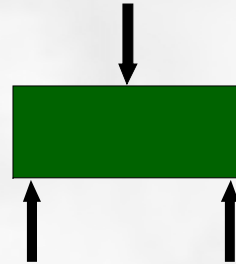
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Strength Testing

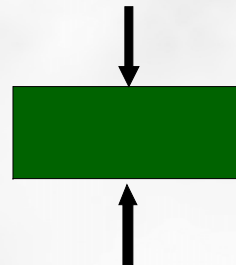
A compressive test



A flexural strength test



A tensile splitting test



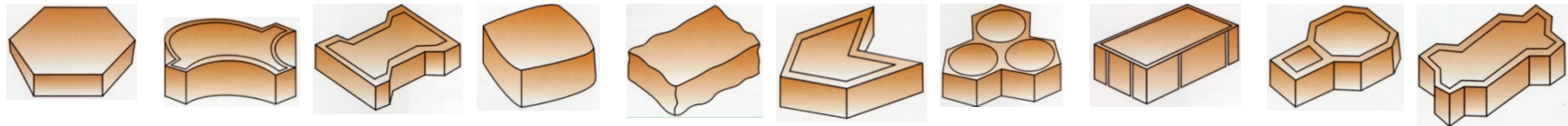
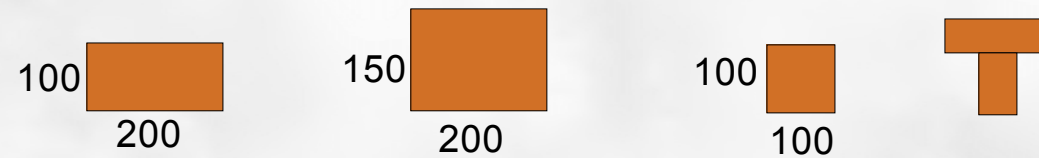
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Compressive Strength

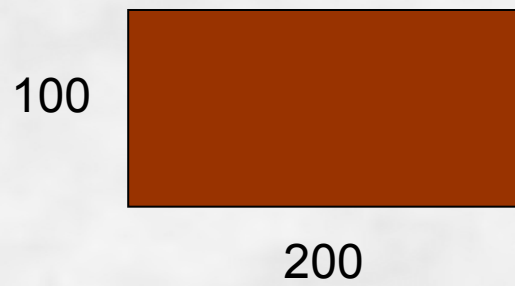
Elevation



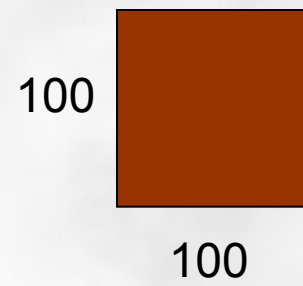
Plan



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30MPa



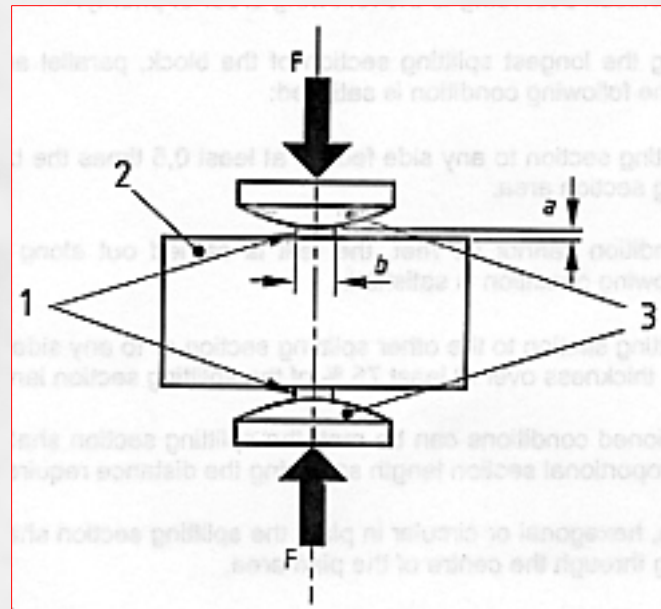
18MPa

60%



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Tensile Splitting

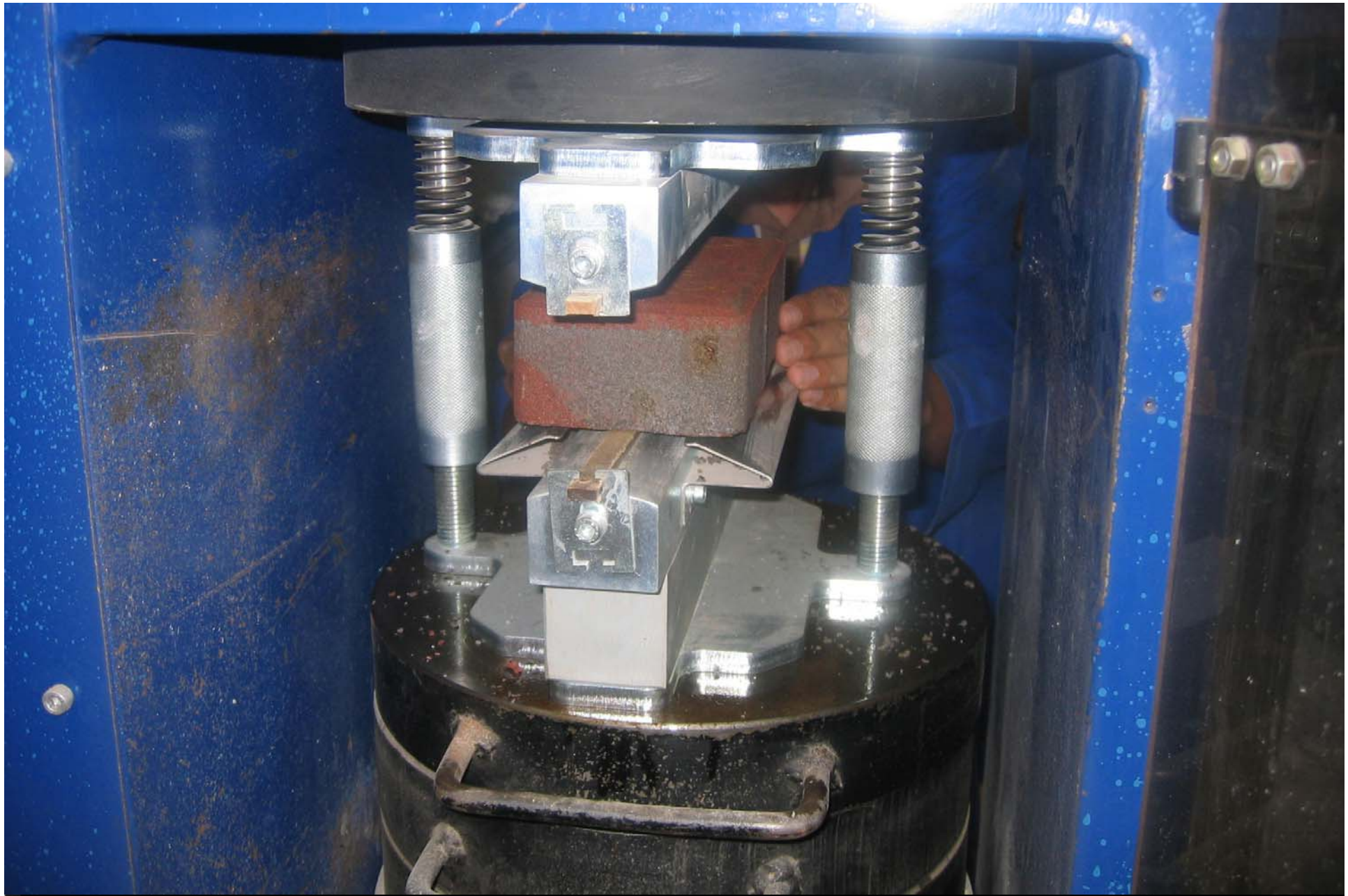


$$T = 0,637 \times k \times \frac{P}{S}$$

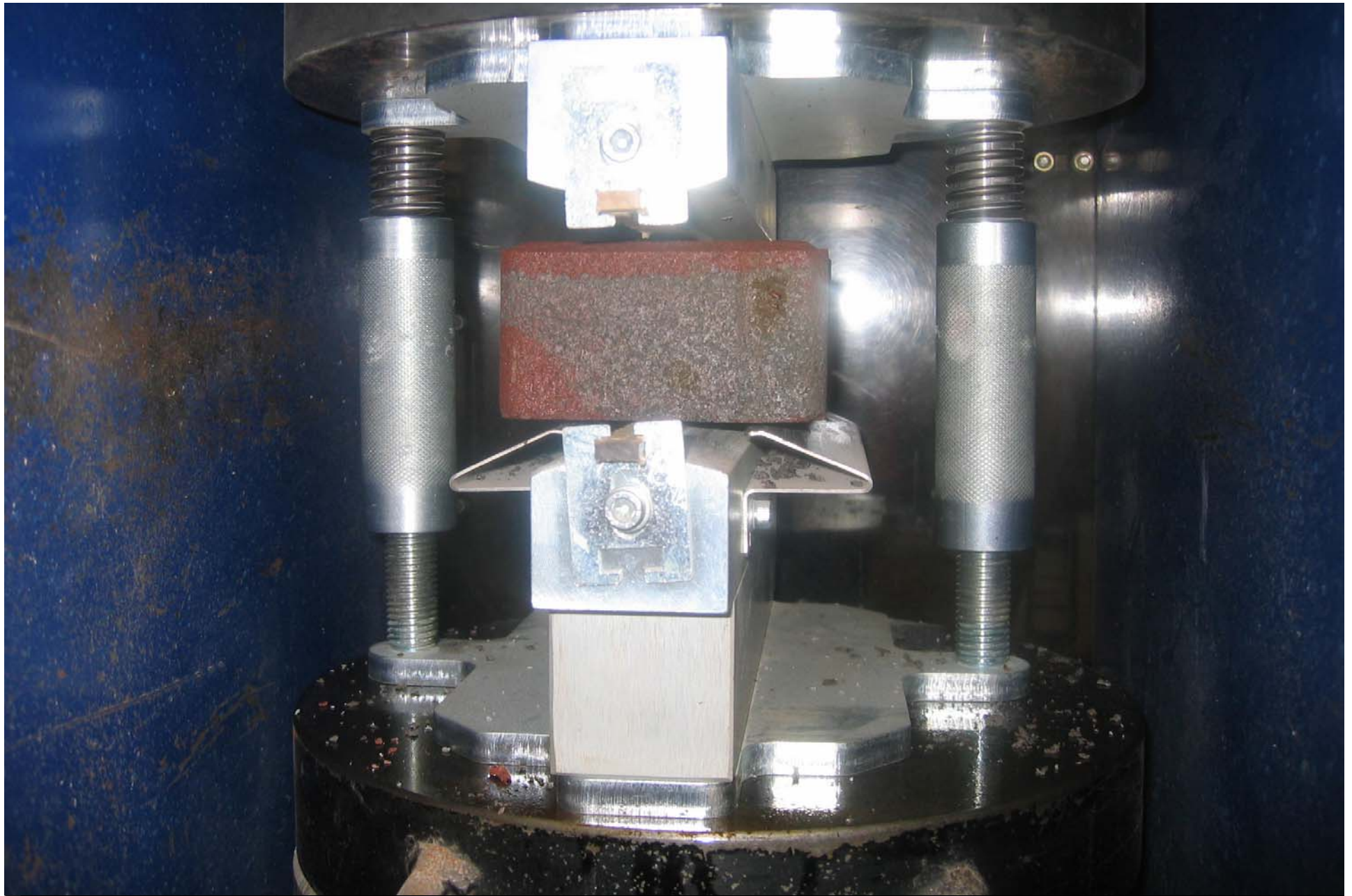
t (mm)	40	50	60	70	80	90	100
k	0,71	0,79	0,87	0,94	1,00	1,06	1,11



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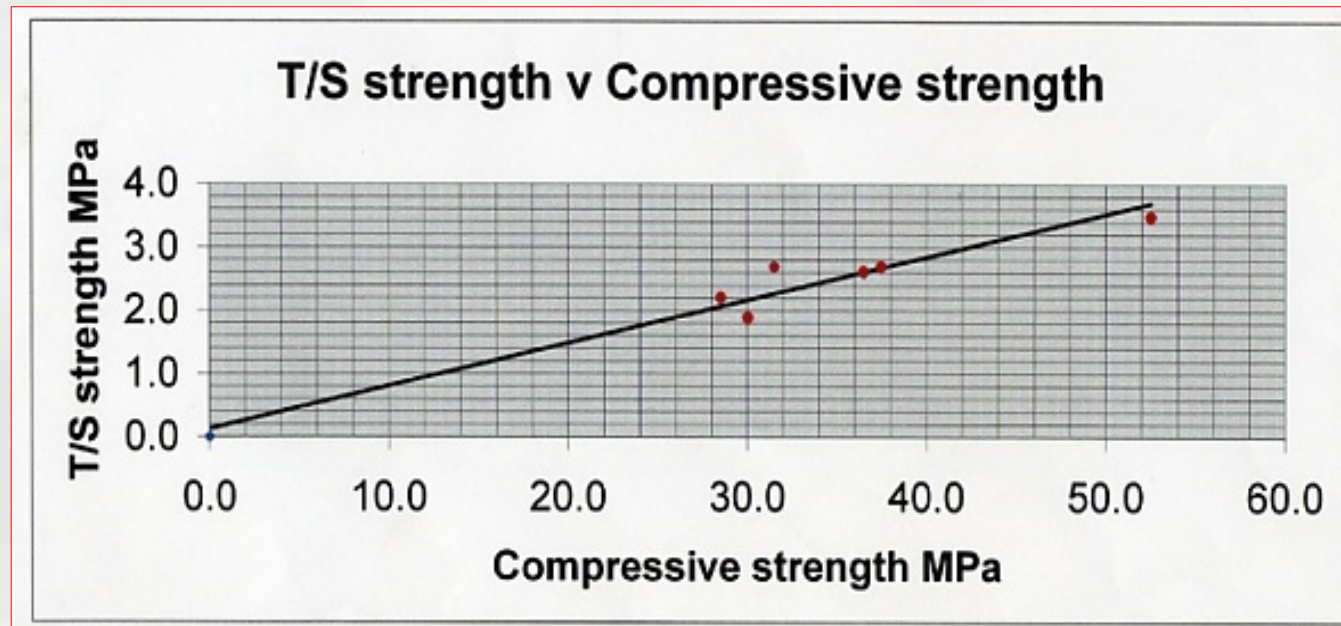


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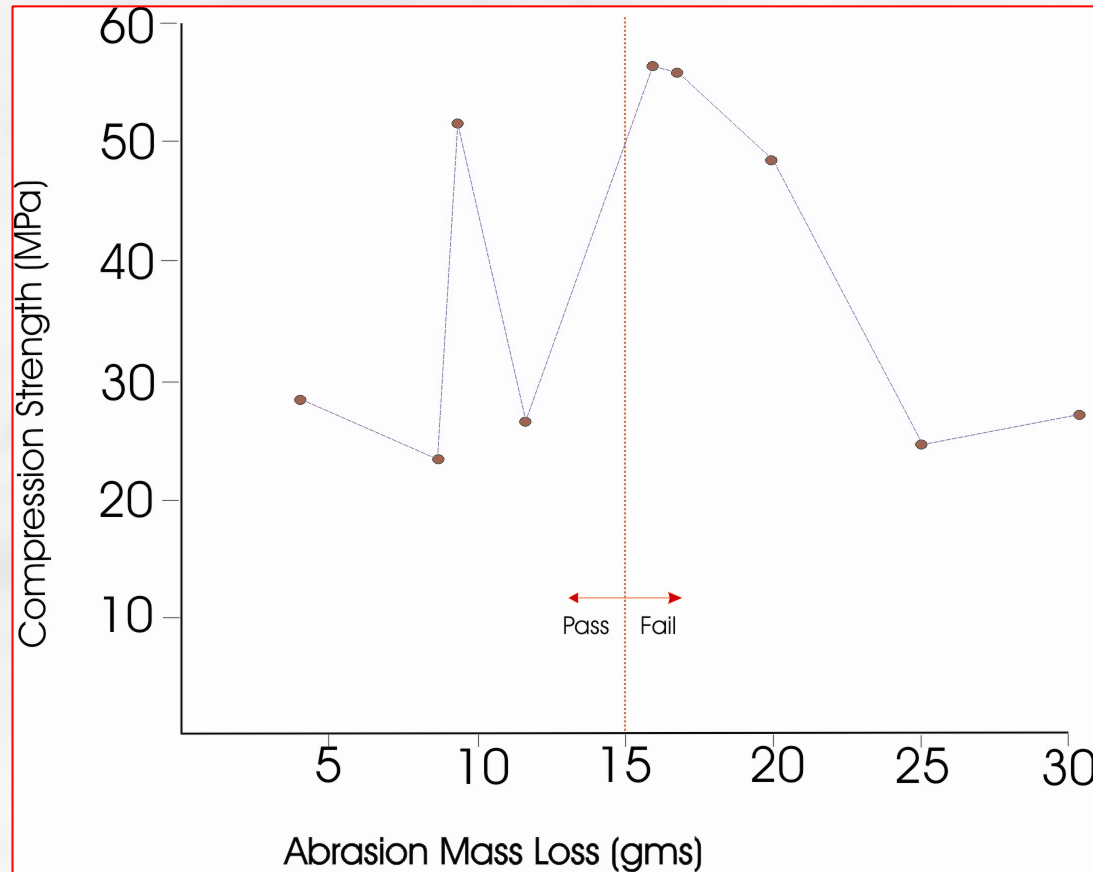
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Tensile Splitting

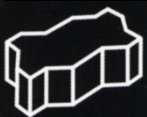


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Comparison of Compressive Strength With Abrasion Resistance



Sampl e	Comparison Strength MPa	Abrasion Mass Loss Grammes
1	23.5	8
2	24,0	25
3	51,0	9
4	49,5	20
5	27,5	12
6	57,0	16
7	29,0	4
8	28,0	31
9	57,5	17



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Abrasion Resistance Tests

- ➡ Wire Brush
- ➡ Ball Bearing MA20
- ➡ Sand Blasting
- ➡ Böhme
- ➡ Wide Wheel
- ➡ Ball Bearing AS/NZS445.9

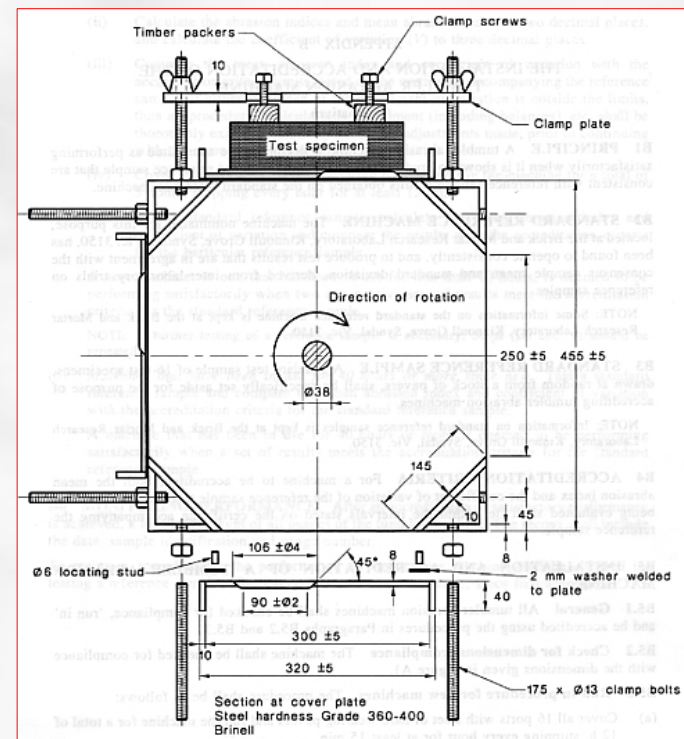
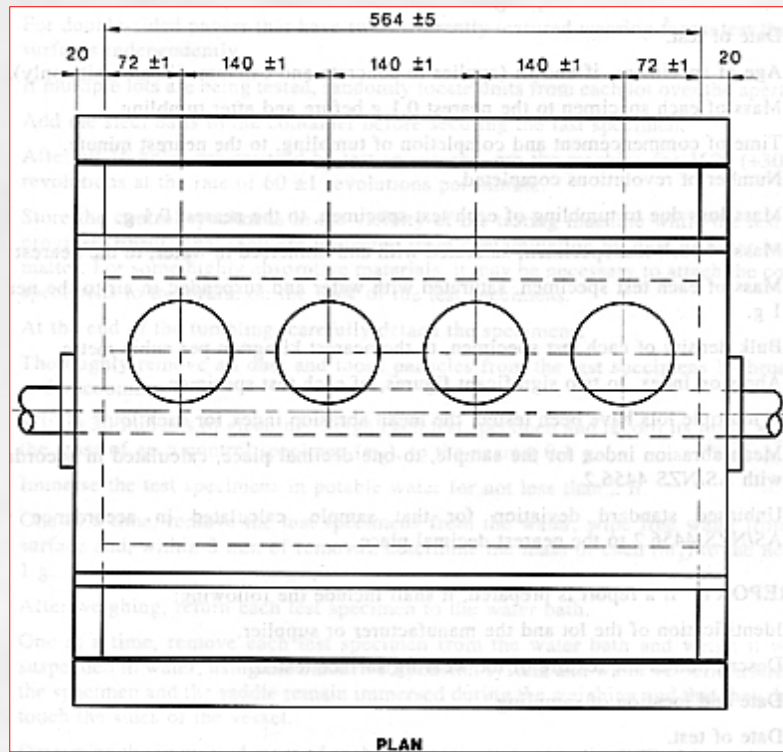


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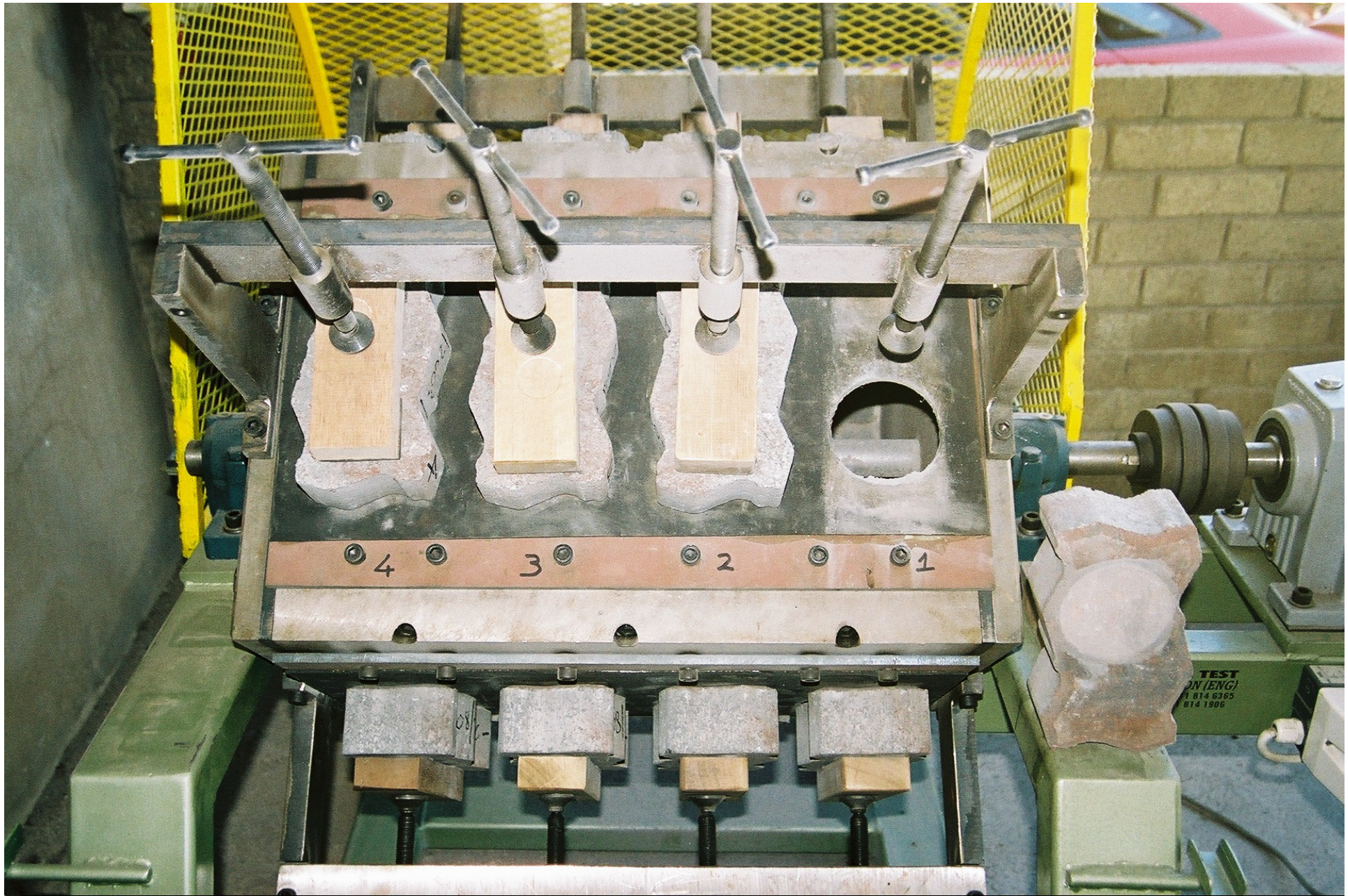


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Abrasion Testing Machine



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Australia Standard



Abrasive Index 4,0 → 7,0

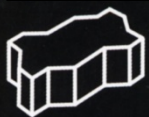
South Africa Standard



Mass Loss

12 grammes (Average)

15 grammes (Max.)



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Water Absorption

- Salt Attack
- Discolouration



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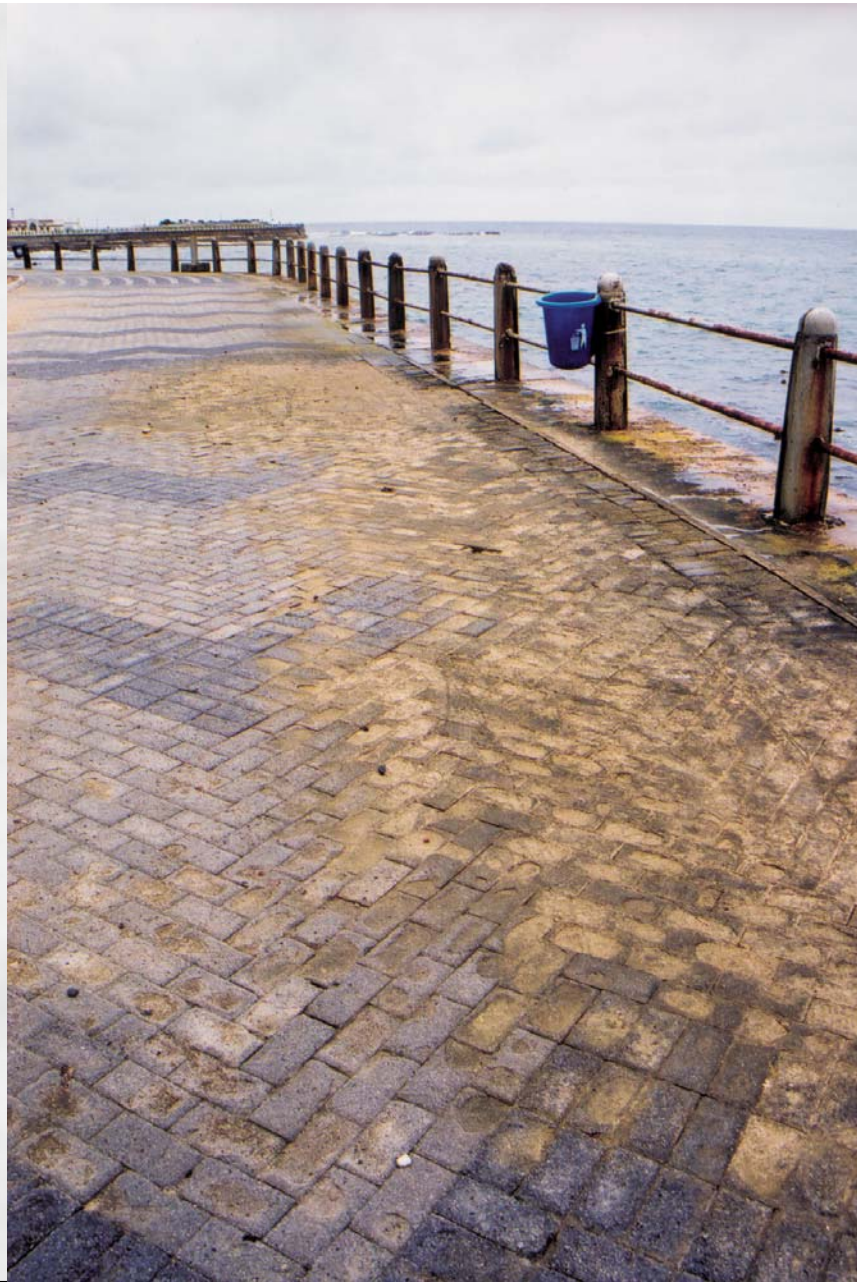
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Examples of Paving in South Africa



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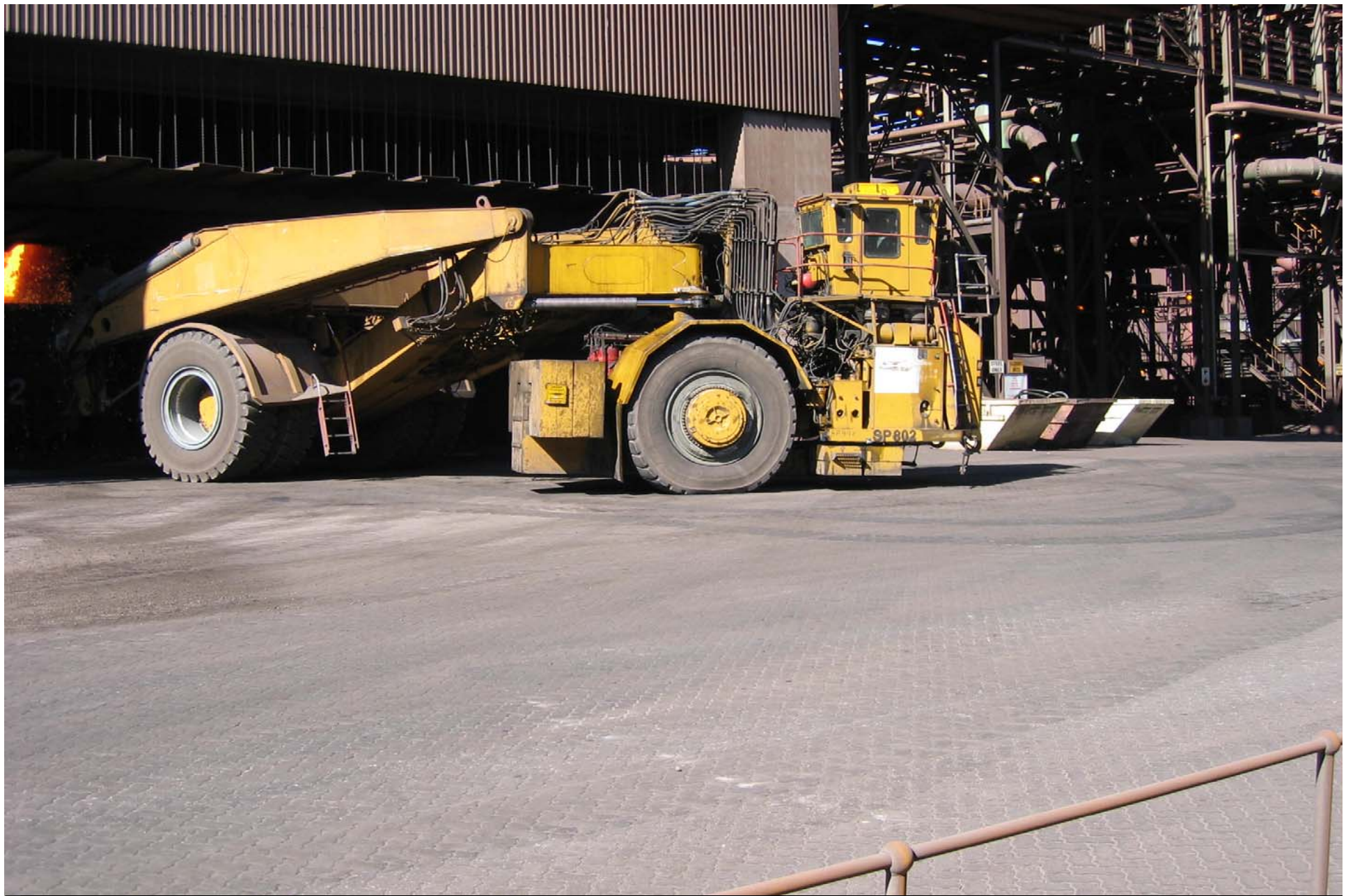
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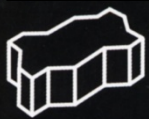


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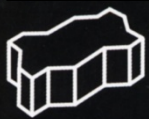


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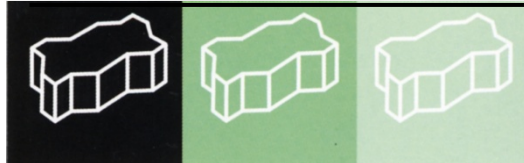
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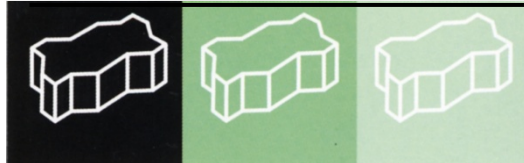


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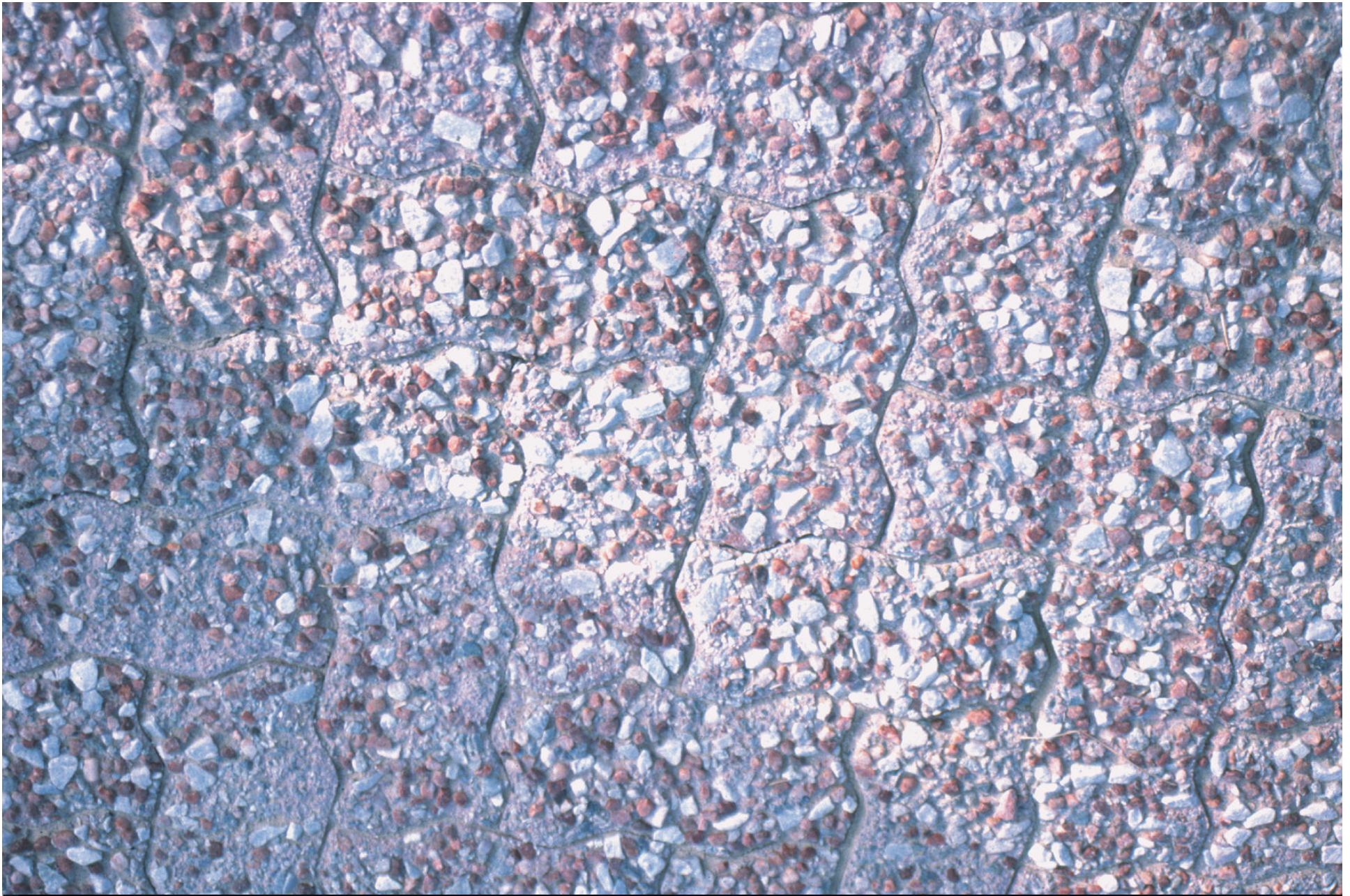


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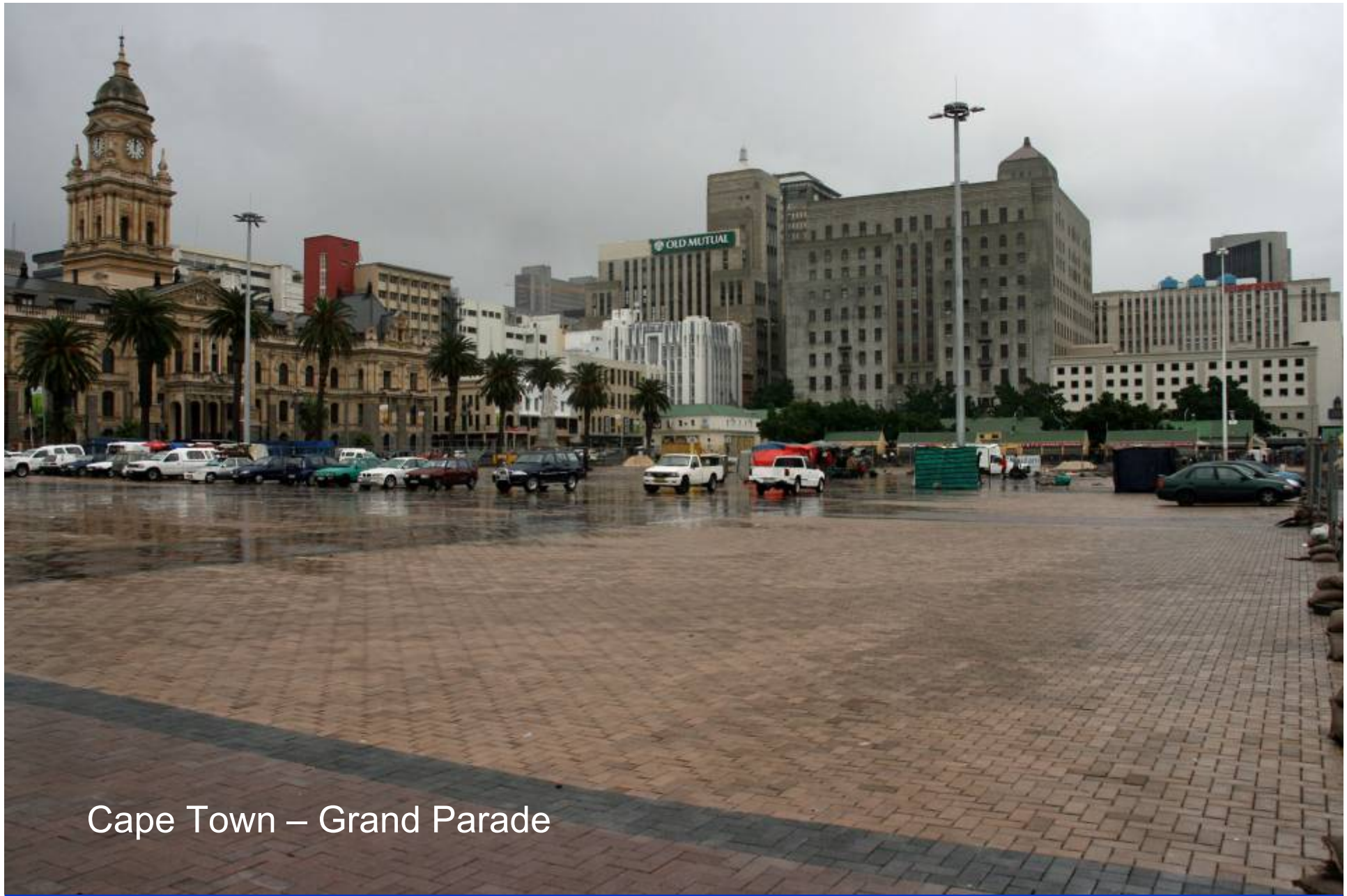
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Cape Town – Grand Parade



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Permeable Paving





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Permeable Paving





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Permeable Paving





Thank You



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