ONLINE LEARNING

PAVEMENT CONSTRUCTION

How pavement was constructed and in-situ and quality tests required

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PAVEMENT WORKS

Carried out after all the survey and alignment works, site clearing, earthwork and temporary drains have been completed/constructed

Consists of:

- Drainage layer (if required);
- Subbase (where applicable);
- Roadbase;
- Coating;
- Surfacing; and
- Shoulder.

Drainage Layer

Laid on a prepared and accepted subgrade (any damage or deterioration on subgrade shall be made good before laying drainage layer)

Material: Coarse aggregate (screened crushed hard rock), fine aggregate (screened quarry dust or sand)

Laid and compacted at MC +1 to -2% of OMC without drying out or segregation to the required width and thickness

Subgrade compaction and FDT

Prepared subgrade

Subbase

Material – natural or artificial mixture of locally available material such as sand, gravel, crushed aggregate, free from organic matter, clay lumps and other deleterious materials

Laid in 100 - 200 mm compacted thickness, compacted at MC +1 to -2% of OMC without drying out or segregation to the required width and thickness

Compaction to produce density ≥ 95% MDD

Subbase

Roadbase

Crushed Aggregate Roadbase

Material – crushed rock, crushed gravel or a mixture or crushed rock and gravel

Spread using motor grader or approved spreader at OMC ± 1%, laid in 100 - 200 mm compacted thickness, maintain uniform gradation, prevent drying out or segregation to the required width and thickness

Compaction to produce density ≥ 95% MDD

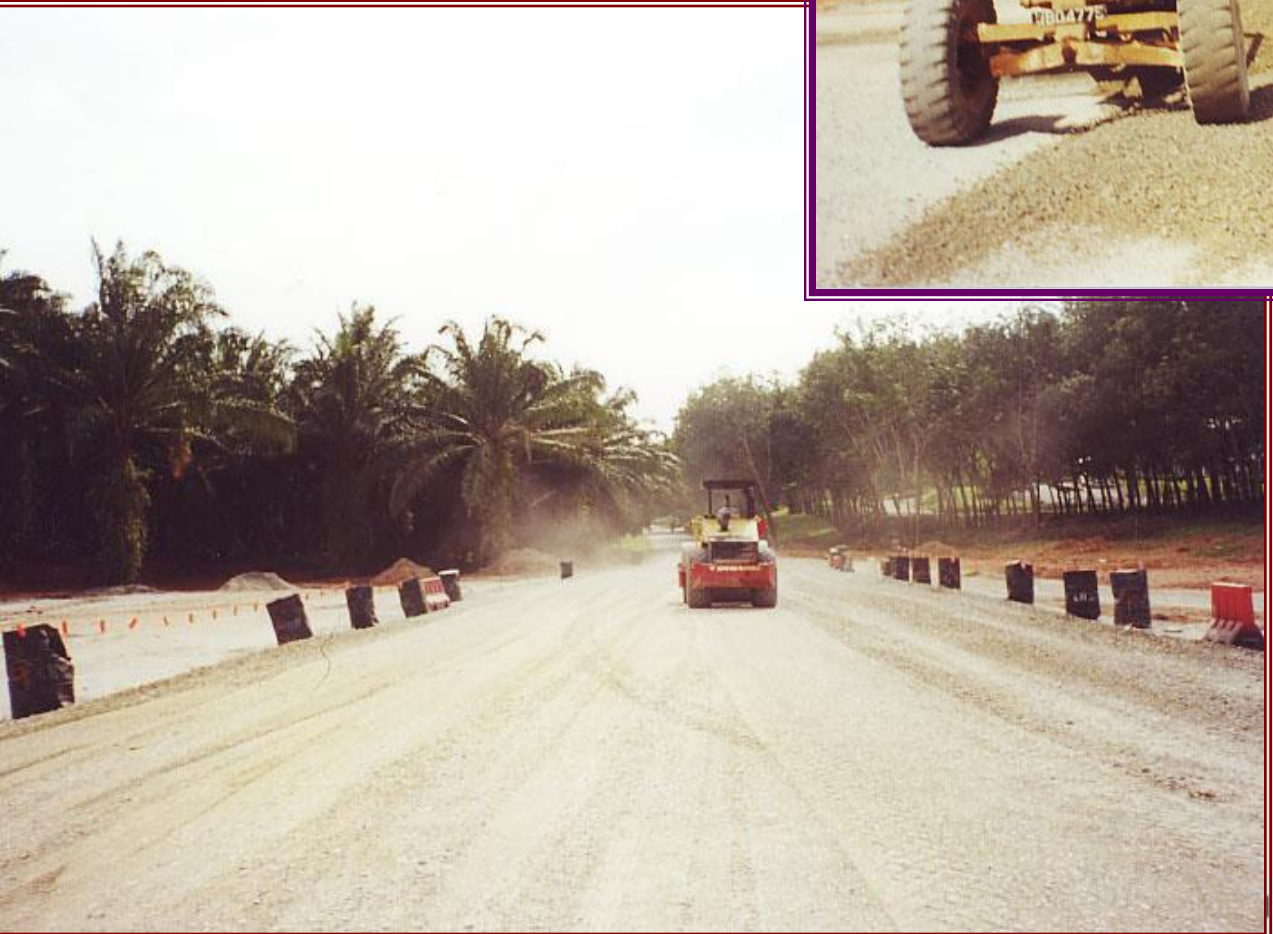
Roadbase

Bituminous Roadbase

Material – conform to the physical and mechanical quality requirement in asphaltic concrete section

Design, equipment and construction methods as specified for asphaltic concrete section.

Roadbase



FDT : Sand Replacement

FDT: Density Gauge

Coating

Two types of coating:

1. **Prime coat – liquid bitumen, sprayed onto clean unbound roadbase using pressure distributor at the rate of 0.5 – 1 liter/m^2**

   MC-70 (50°C -70°C), SS-1K (25°C - 45°C) cured for 24 hours to achieve maximum penetration

2. **Tack coat – bitumen emulsion, sprayed onto bituminous layer, rate 0.25 – 0.55 liter/m^2**

   RS-1K (25°C - 45°C)

Carried out in dry, warm weather and dry surface, prevent spattering adjacent trees, furniture etc, not to be discharged into drains, gutter, keep traffic off

Brooming

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Spraying

Prime Coat

Surfacing

Asphaltic Concrete

Binder course will be laid on the broomed, clean and prime coated roadbase.

Laying and compacting job shall be carried out in dry weather

After binder course has been properly compacted, sprayed with tack coat, wearing course will then be laid and compacted

Bituminous mix for surfacing shall pass all tests specified for aggregate, bitumen, and bituminous mixture.

Paving

Wearing Course

Compaction

Premix compaction consists of:

1. **Breakdown/initial – smooth wheel, <5 km/hr**
2. **Intermediate/principal – pneumatic, < 8 km/hr, weight ≥ 15 ton, tyre pressure ≥ 0.7 N/m^2**
3. **Final – smooth wheel, eliminate irregularities, tyre tracks**

Temperature at the commencement of rolling ≥ 120°C (+10° if harder bitumen)

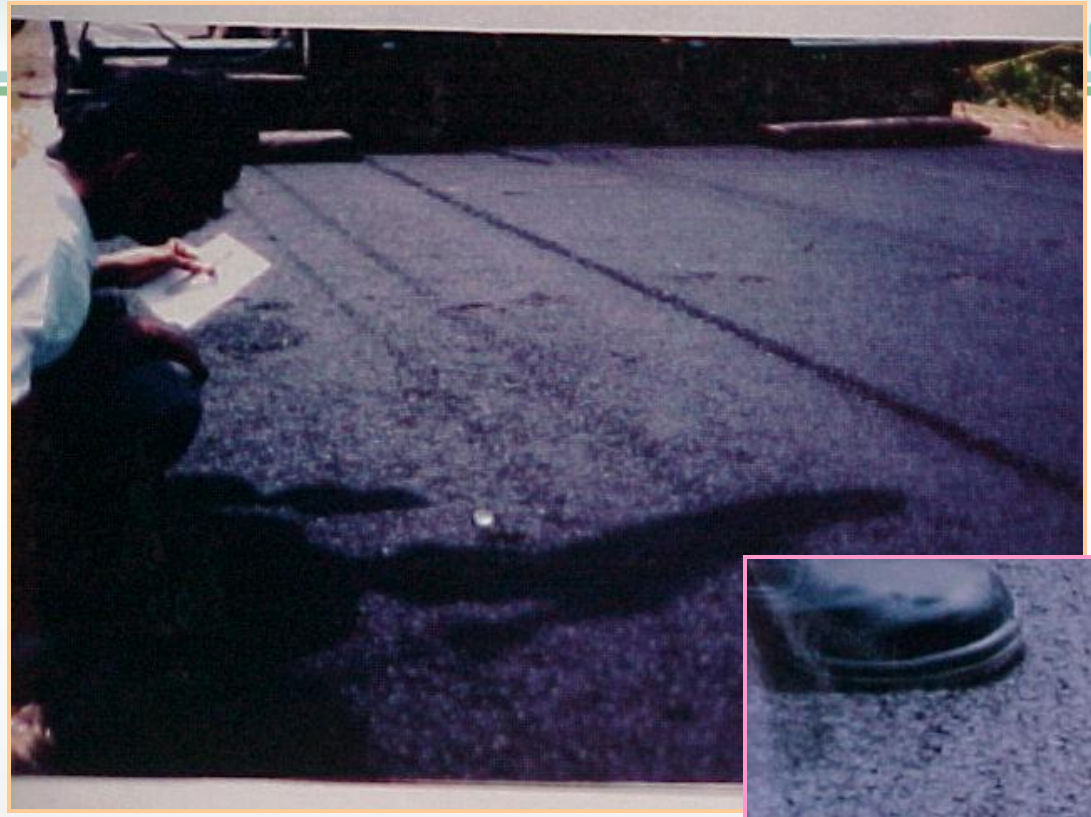
Operate longitudinal direction with driven wheels towards the paver, lower to higher edge

Passes overlapped half width of the roller

Delivered temperature

130 °C <Temp< 163°C

Truck sampling for quality control testing



Premix temperature before rolling >120°C

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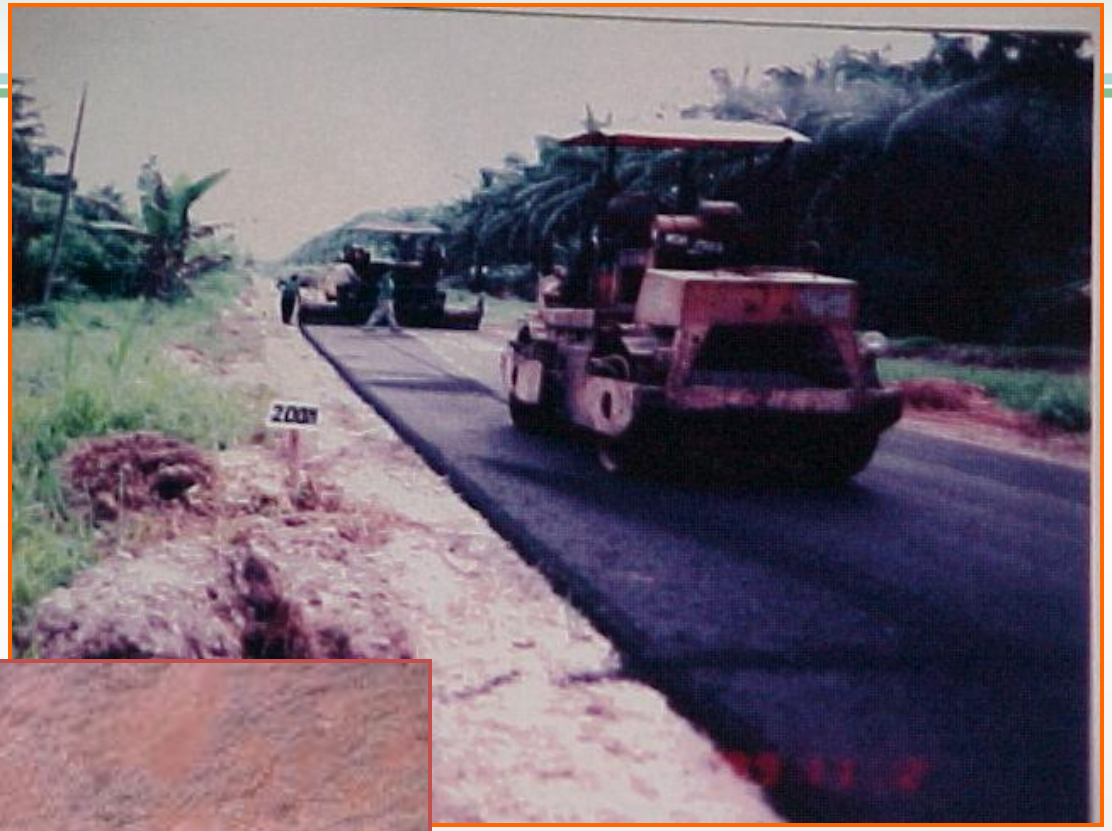
Paved thickness

Initial Rolling



Intermediate Rolling

Final Rolling

Finished Pavement

HMA Compaction

Construction joint cut back straight, brushed on with RS-1K 10-15 minutes before laying of next section, no joints along wheelpaths

Rollers, heavy vehicles shall not be allowed to stand on newly laid mix before compaction completed and thoroughly cooled and set.

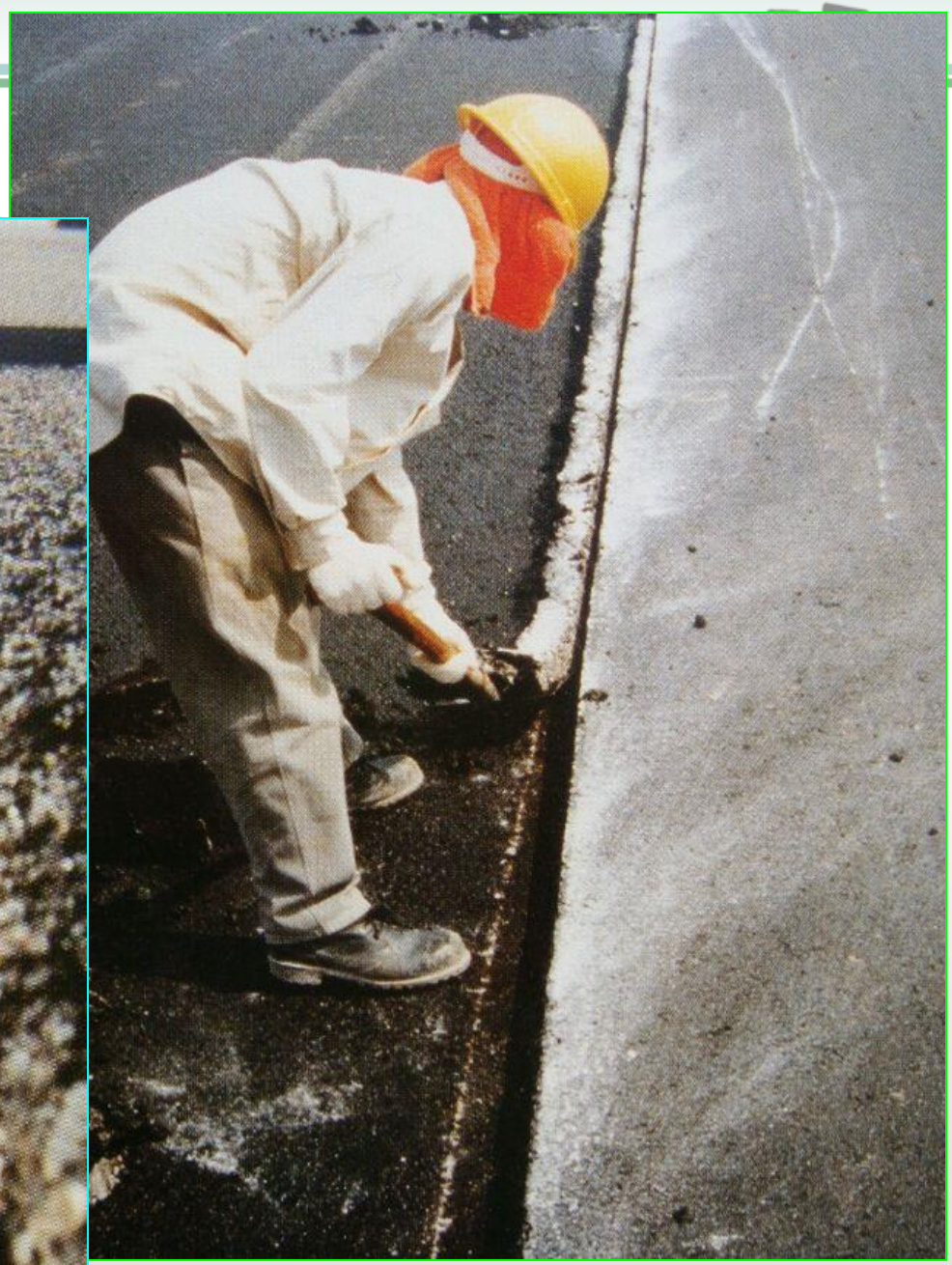
Core diameter ≥ 100mm, 1 sample every 500 m^2

tests (density, thickness, and quality), > 24 hrs

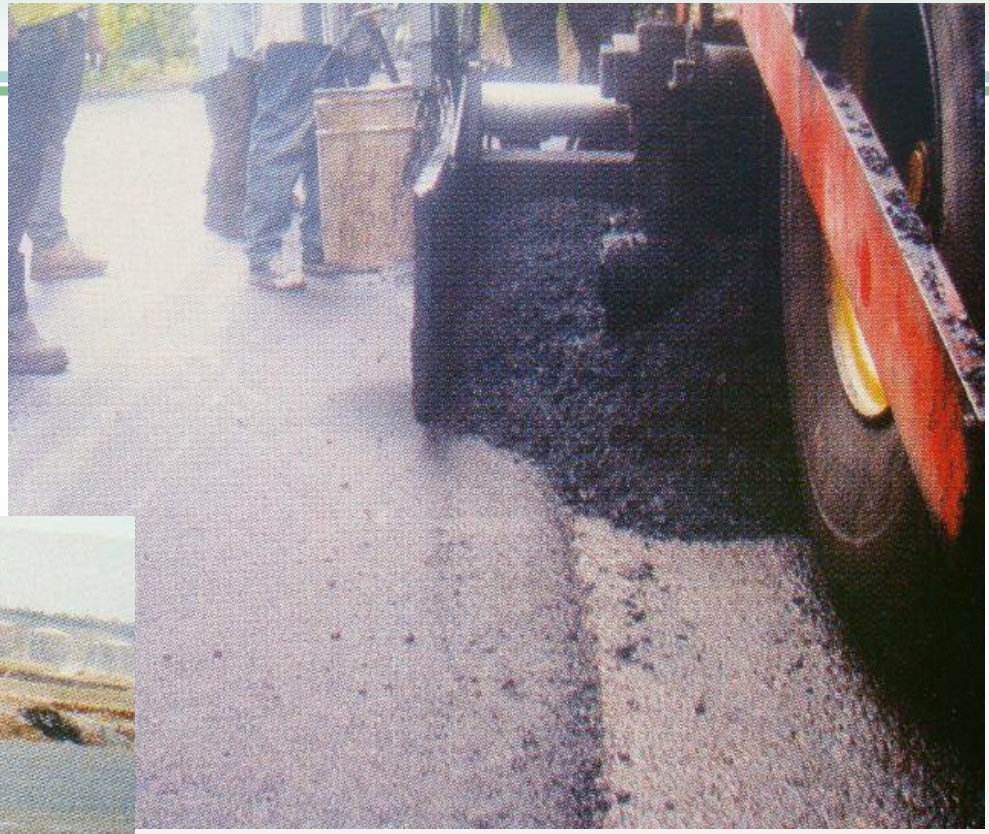
Open to traffic > 4 hrs, < 30 km/hr, no sharp turning

Compaction requirement – 90 (RB), 95 (BC), 98% (WC) of Marshall density at optimum bitumen content

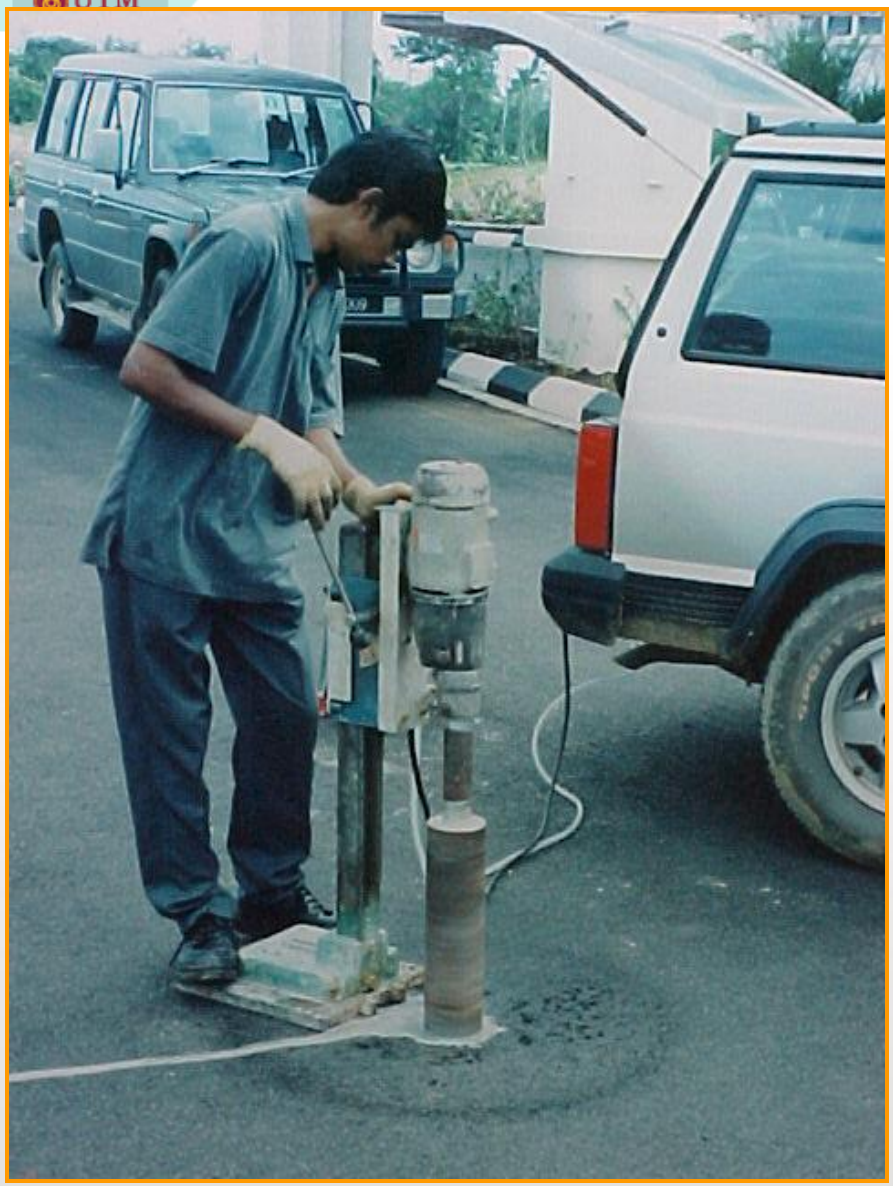
Joint

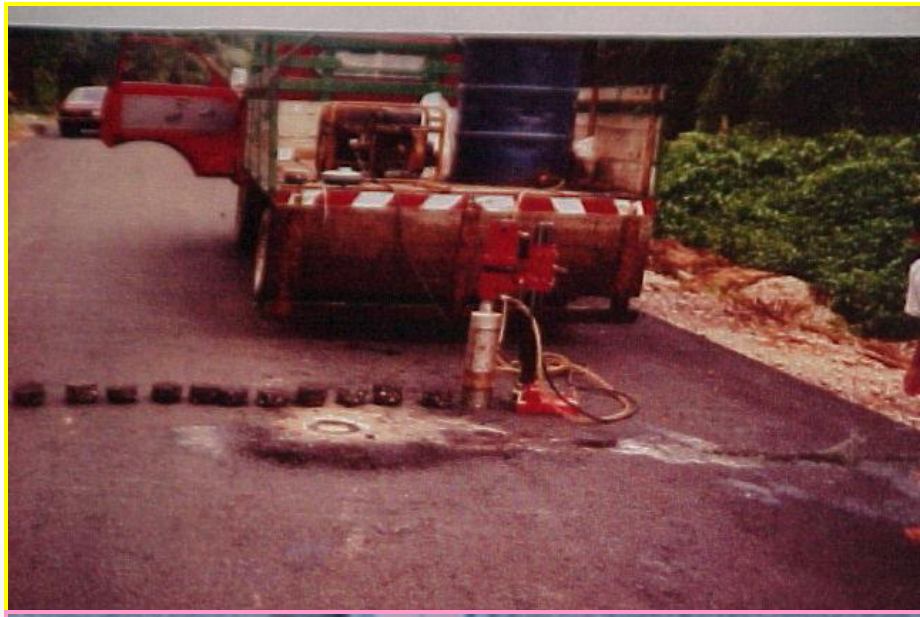


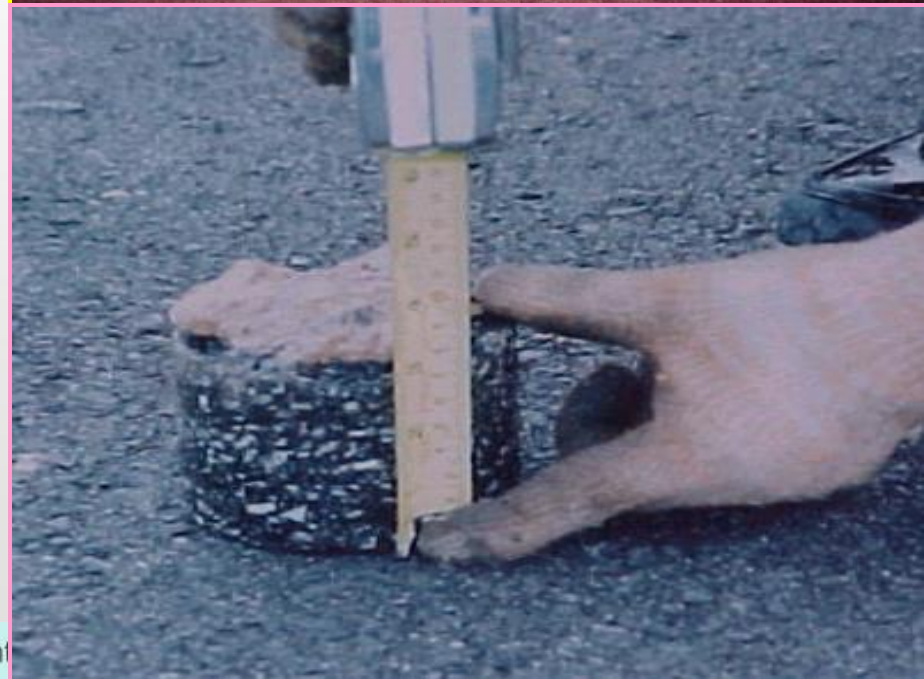
Joint compaction



Coring







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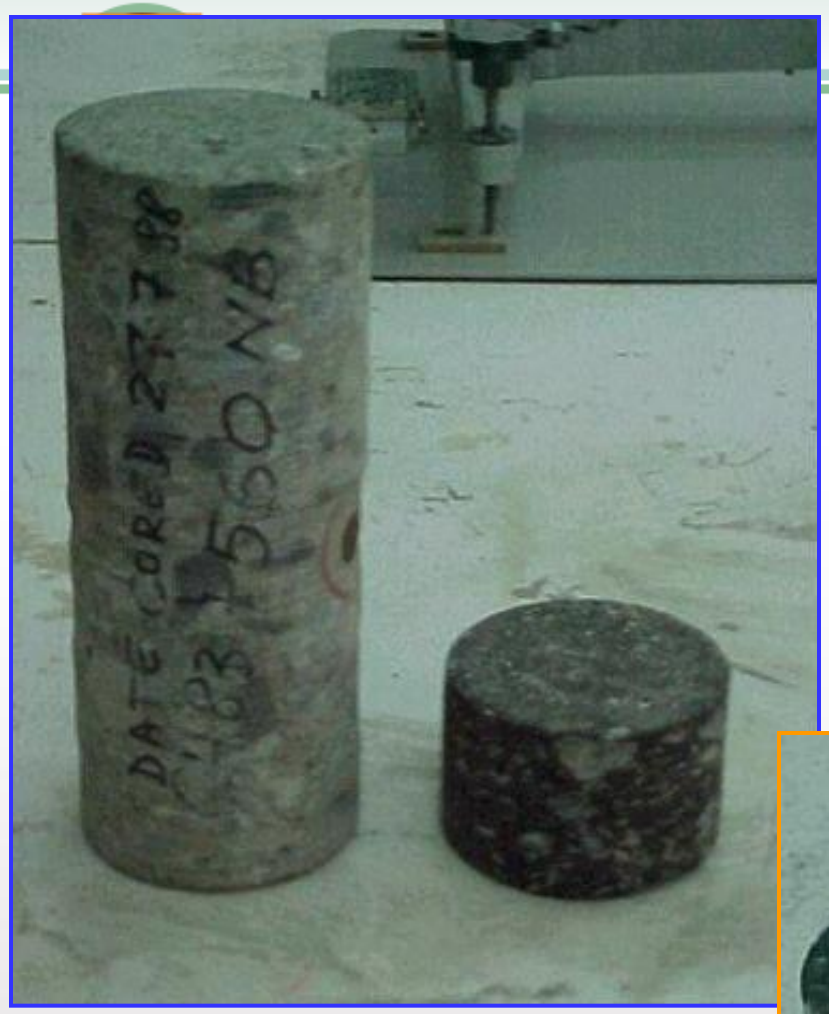
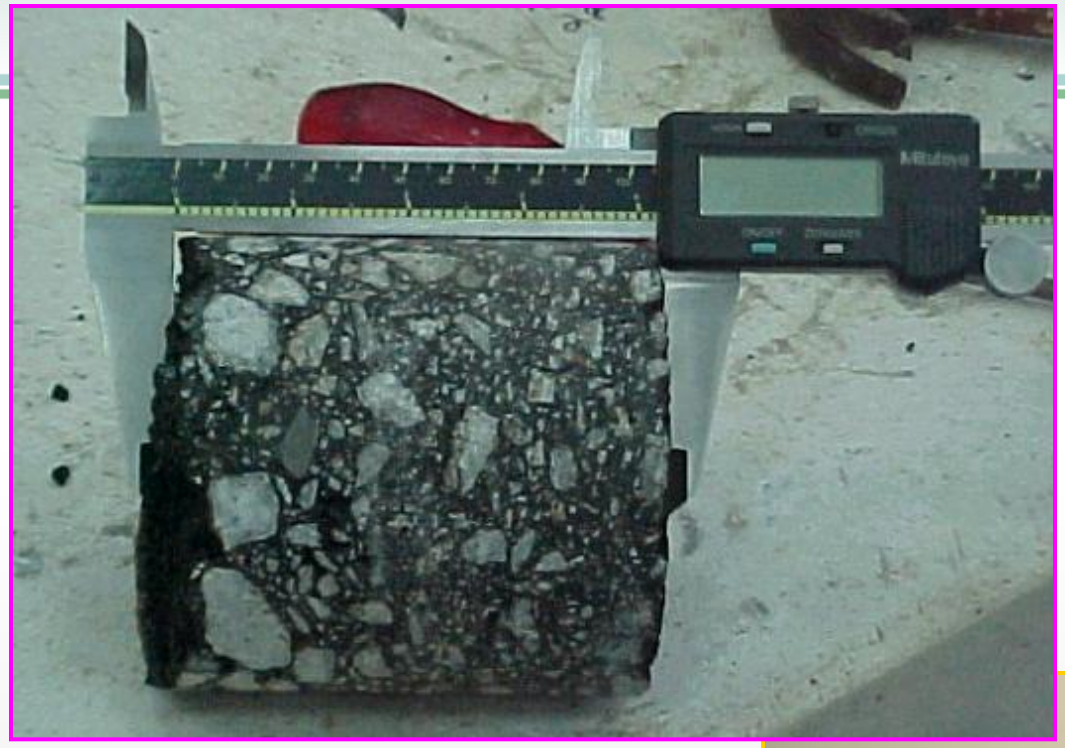
Core Samples





Check thickness and density

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Core Extraction

Core Extraction

Shoulder

Consists of furnishing, compacting and shaping earth, gravel, or paved shoulder

Paved – constructed as normal bituminous layer

Gravel – using approved material for gravel surfacing

Earth – using suitable material as described in earthwork section

Thickness of each layer according to the drawing, based on material used and compacted to the required minimum density

Top level of shoulder should be level and flushed with pavement and uniformly free draining away from carriageway.

Shoulder

Shoulder

Thank you for your attention

e-mail your questions to:

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or

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