PAVEMENT ISSUES IN INDONESIA

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Major Issues of Indonesian Pavement

1. The road pavement on North Java Corridor have early damage
   - Weak Soil Support
   - Very Heavy Traffic volume
   - High pavement temperature
   - High precipitation and poor drainage

2. Less utilization of local material, such as Buton Rocks Asphalt
   - Huge deposits
   - Not yet available an adequate technologies

2. Performance Base Contract (PBC)
1. North Java Corridor (PANTURA)
ISSUES 1: North Java Corridor

- The Corridor has a very strategic role in the social, economic, cultural and defense sector. This road section supports the acceleration and expansion of Indonesia's economic development years 2011-2025. However, almost every year the condition of the infrastructure, especially pavement always encountered problems that interfere the traffic flow.
- Mostly on alluvial soils and have weak soil support (CBR; 2 – 6 %)
- Poor drainage and also have high water level, that is around 0.5-3m from the ground surface
TYPICAL TRAFFIC VOLUME

Daily Traffic Volume (per direction)

- Number of Vehicles (without motorcycles)
- Number of Motorcycles
- Number of All Vehicles
Heavy Vehicles on North Java Corridor
REGULATION

6 ton
9 ton
9 ton

REALITY

1,60 M ~ 2,30 M

25-30 M³

Δd = 1,8 ton/M³

45-54 tonne + vehic

OVERLOADING
CIPUNAGARA BRIDGES
TYPICAL PAVEMENT CONSTRUCTION

**TYPE 1**
- Hotmix (AC), h = 10 cm
- Concrete, h = 20 cm
- 2%

Information:
- Design period is 100 million CESA on the design lane
- This construction found in the Cikampek-Pemanukan-Eretan segment
- Build between the year 2002-2007

**TYPE 2**
- Concrete, h = 27 cm
- 2%

Information:
- Design period is 50 million CESA on the design lane
- This construction found in the Jatibarang segment
- Build in the year 2004

**TYPE 3**
- AC VIC, h = 5 cm
- AC BC, h = 6.5 cm
- CMRBE, h = 16 cm
- CTRB, h = 30 cm
- 2%

Information:
- Design period is 50 million CESA on the design lane
- This construction found at the Jatibarang-Cirebon-Losari segment
- Build between the year 2006-2011

**TYPE 4**
- AC VIC, h = 4 cm
- AC BC, h = 6 cm
- AC Base, h = 12 cm
- Agg. Class A, h = 20 cm
- Agg. Class B, h = 30 cm
- 2%

Information:
- Design period is 45 million CESA on the design lane
- This construction found at the Losari-Semarang segment
- Build between the year 1997-2004
TYPICAL DISTRESS (RIGID PAVEMENT)
# Central Java (Semarang-Bulu), 2011

## Typical Roughness & Remaining Life

<table>
<thead>
<tr>
<th>Central Java</th>
<th>Year</th>
<th>Data Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Semarang-Demak</td>
<td>2011</td>
<td>CESA</td>
<td>Cumulative Equivalent Standard Axle 80 kN</td>
</tr>
<tr>
<td>Demak-Kudus</td>
<td></td>
<td>CESA ARAH BULU</td>
<td></td>
</tr>
<tr>
<td>Kudus-Rembang</td>
<td></td>
<td>CESA ARAH SEMARANG</td>
<td></td>
</tr>
<tr>
<td>Rambang-Bulu</td>
<td></td>
<td>CESA (Juta) per lajur, UR 10 tahun</td>
<td></td>
</tr>
</tbody>
</table>

### International Roughness Index (IRI)

- **IRI 4**: Routine Maintenance (Good Condition)
- **IRI 6**: Periodic Maintenance (Steady Condition)
- **IRI 8 - 12**: Improvement/Reinforcement
- **IRI > 12**: Reconstruction

### Remaining Life

- **Remaining Life Semarang Direction (Yrs)**
- **Remaining Life Demak Direction (Yrs)**
- **Remaining Life Kudus Direction (Yrs)**
- **Remaining Life Rambang-Bulu Direction (Yrs)**
- **Remaining Life East Java Boundaries Direction (Yrs)**

### STA (km Semarang)

- **2,000** to **152,000**

### CESA (Cumulative Equivalent Standard Axle 80 kN)

- **Semarang – Demak**
- **Demak – Kudus**
- **Kudus – Rambang**
- **Rambang – Bulu**
1. Research on alternative pavement technologies, using modifier on asphalt mixture or on cement concrete pavement and propose design life of 10 years or more with the existing actual load and environmental condition to avoid the cost of high traffic congestion.

2. Research on Long Life Pavement (Perpetual pavement) or Superpave 50
2. Utilization of Asbuton
2.1 Deposit of Asbuton

Asbuton Exploration in Kabungka

Asbuton Exploration in Lawele
2.2 ASBUTON PRODUCT AND USING TECHNOLOGY

![Diagram of ASBUTON product and using technology]

- **KABUNGA ASBUTON**
  - GRANULAR ASBUTON:
    - Konvensional Asbuton (5/20)
    - Mikro Asbuton (5/20)
    - Fine Asbuton (5/20)
  - ASBUTON SEMI-EXTRACTION:
    - Lasbutag/Latasbusir
    - Super Lasbutag
    - Asbumix
    - Teknobutas
    - BMA
    - Warm Mix of Asbuton
    - Cold Mix Cutback of Asbuton
    - Cold Mix Emulsion of Asbuton
  - ASBUTON FULL EXTRACTION:
    - In Progress

- **LAWELE ASBUTON**
  - GRANULAR ASBUTON:
    - B (15/20)
    - B (15/25)
    - B (20/25)
  - ASBUTON SEMI-EXTRACTION:
  - ASBUTON FULL EXTRACTION:
    - Dificult to produce
    - Asphalt Additives
    - Hot Mix Asbuton
    - Powder
    - Asbuton-Rubber
    - Hot Mix Lawele
    - LPMA
    - Butur Seal
    - Cold Paving of Hot Mix Asbuton
  - Asphalt Additive
  - Straight Asphalt
  - Substitution of Gilsonite

**THE YEAR OF PRODUCTION AND INNOVATION**

- 1980
- 1990
- 2000
- 2010
- 2013
- THE NEXT INNOVATION
1. **Asbuton processing studies** focused on the development of method and tools for the asbuton extraction (liquid) and granular asbuton, so Asbuton this type can be directly used as asphalt substitution in the asphalt mixture or as modifier.

2. **Development of pavement technology using asbuton and full-scale construction** to optimize Asbuton application for road construction.
3. Performance Base Contract (PBC)

Performance Base Contract (PBC) Will be presented by Mr. Nazib Faizal
Establishment and Operation of Technical Standards
Establishment and operation of technical standards

Institute of Road Engineering

Drafting Standards

Consensus

Standards

Directorate General of Highway

Field Application & Evaluation

Consultants

University

Contractor

Other Stakeholders
Expected Technical Supports in Relation to Japan
Expected Technical Supports in Relation to Japan

1. Human resources development
   - Training,
   - Workshop,

2. Procurement equipment
   - Asbuton Center Laboratory,
   - IRE Laboratory,

3. Research collaboration
   - Asbuton for Steel Deck Bridges
   - Modified Asphalt for Pantura Road
   - Nano technology for highway materials
Thank You Very Much