BASIC KNOWLEDGE IN ROAD CONSTRUCTION

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Types of Road in Bhutan

1. National Highways
2. Dzongkhag Roads
3. Farm Roads
1. National Highways

a. Asian Highway (Currently the existing Phuentsholing-Thimphu Highway)
b. Primary National Highway (existing East-West Highway)
c. Secondary National Highway (Currently District Roads)
2. Dzongkhag Roads

- Currently feeder Roads
- Connects a Dzongkhag centre and a Dungkhag Centre etc.

![Diagram of Dzongkhag Road with dimensions and materials](image-url)
3. Farm Roads

- Roads that link farmland areas/villages.

Note: If the traffic is less than 10-15 vpd, single layer base course should suffice.
WHAT
WE DO
IN ROAD CONSTRUCTION
MAJOR ACTIVITIES

1. FORMATION CUTTING
2. SUB-GRADE PREPARATION
3. BASE COURSE & BLACK TOPPING
4. SHOULDER
5. PERMANENT WORKS
6. BRIDGES
1. FORMATION CUTTING

- SLOPE
- GRADIENT
- GEOMETRIC
- DISPOSAL OF SPOIL
2. SUB-GRADE PREPARATION

- In order to maintain stable and durable sub-grade, uniform consolidation to be incorporated
- Sub-grade act as a cushion for other layers i.e. In order to achieve durable road sub-grade should be strong....
- Maintain proper Camber
3. BASE COURSE & BLACK TOPPING

- **Type – I (Old)**
  - Base course = 150 + 100 = 250mm thickness
  - 150mm = 40-63mm, (Rolling)
  - 100mm = 20-50mm, (Rolling)
  - Premix = 25mm + blinding material (Rolling by applying water)
  - Sand Seal coat
  - Resurfacing: 20mm

- **Type – II (New)**
  - Granular Sub-Base (GSB) – coarse graded (70mm below)
  - Wet Mix Macadam (WMM) – (40 mm, 20 mm, 10 mm & Soil) mix with water
  - Dense Bitumen Macadam (DBM) – 20mm + Bitumen
  - Asphalt Concrete – 10mm + Bitumen
  - Thickness depends upon the actual design for a road
<table>
<thead>
<tr>
<th><strong>Base Course &amp; Type - I</strong></th>
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<tr>
<td><strong>Sand Seal Coat</strong></td>
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<tr>
<td><strong>Premix: 10mm + bitumen, Rolling by applying water</strong></td>
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<tr>
<td><strong>Base Course: 150mm (20-50mm), Rolling</strong></td>
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<td><strong>Base Course: 150mm (40-63mm), Rolling</strong></td>
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<td><strong>Sub-Grade Preparation</strong></td>
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Base Course & Type - II

- **Asphalt Concrete** – 10mm + Bitumen
- **Dense Bitumen Macadam (DBM)** – 20mm + Bitumen
- **Wet Mix Macadam (WMM)**, 10 to 40mm plus soil with water & rolling
- **Granular Sub Grade** (70mm below), rolling
- **Sub-Grade Preparation**
4. SHOULDER:

- A hard area at the side of a main road, especially a motorway, where a driver can stop if there is a serious problem

- Shoulder should be strong enough to resist any types of vehicle

- Maintain proper compaction as per the design

- Width and thickness should be as per the specification
PERMANENT WORKS

- RETAINING WALL
- BREAST WALL
- RCC WALL
- CULVERT
- DRAIN
RCC Wall
Culverts
3. BRIDGE CONSTRUCTION

- RCC BRIDGE
- STEEL BRIDGE
- BAILEY BRIDGE
- WOODEN BRIDGE
Steel Bridge
Bailey Bridge
MATERIALS REQUIRED IN ROAD CONSTN.

- CEMENT
- SAND
- BOULDER
- AGGREGATES (different sizes)
- STEEL
- MESH
- BITUMEN
- GEO-TEXTITLE
- RCC HUME PIPES
WE BUILD

GOOD & DURABLE ROAD
WE PROVIDE TO ROAD USERS

• COMFORT & SAFE RIDING
• LESS OPERATIONAL COST
• IN REASONABLE TIME
FOR THE COUNTRY

BOOST UP
COUNTRY’s SOCIO-ECONOMY
DEVELOPMENT