ENGINEERS SUPPLEMENTARY POCKET BOOK NO. 5A

CHAPTER 1
PRINCIPLES OF DESIGN, PLANNING AND CONSTRUCTION
SECTION 1- BASIC CONSIDERATION

GENERAL

0101. Mobility is one of the essentials for military. Military engineers must be able to site, design and construct military roads of a permanent or semi-permanent nature, e.g. a metaled approach to a bridge, repair and maintain roads of all types. A military route is an artificially protected cross-country route selected or improved so that it can be negotiated by the number and types of vehicle required. The engineering principles of road construction and maintenance are similar to those of civilian practice, but the military engineer is usually faced with a different problem to that of the civilian. A military road is required to meet conditions laid down by the general staff. If a military route collapses when the last vehicle required to use it has passed, the construction is a technical success.

0102. Road construction is expensive in time, labor, transport, plant and materials. Therefore the aim must be to achieve what is required as economically as possible.

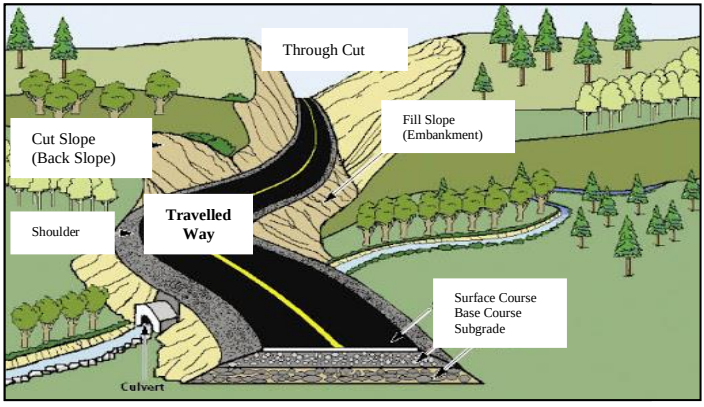

Figure 1-1: Development of a Route

0103. The alignment of any military route must:-

a. Satisfy tactical and directional requirements.

b. Conform to specifications of road capacity, which affect both standards and design-load.

c. Be located to make use of areas having the strongest and most suitable subgrade.

d. Be located where the maximum formulation of the essential areas and construction features can be achieved.

User Requirements

0104. Whether the task be that of providing a new road, or improving and maintaining an existing one, user requirements are specified by the general staff. These requirements are normally expressed under the following:

a. Starting and finishing points to be served.
b. Intermediate areas or points to be served, if any.
c. Load class of the route.
d. Type of vehicle (largest dimensions and weight).
e. Speed of movement.
f. Anticipated volume of traffic.
g. Number of traffic lanes.
h. Type of route, ie all weather or fair weather.
j. Life expected of the route and anticipated further development.
k. Completion date.

Standard For Military Roads

0105. Normal standard for military roads are given in Chapter 3. They may have to be varied:-

a. To suit local conditions in particular theatres.
b. When traffic is limited to definite types of vehicle.
c. For special vehicles, e.g. tank transporters or RAF low-loaders.

0106. Mountain Roads. Special standard for gradients in hilly country are included in Table 7, but other standards must not be relaxed because of difficulties of location or construction unless the density of traffic (vpm) may be reduced. Passing places and lay-bys are particularly important and warning signs must be erected at dangerous points, especially where the sight distance is inadequate.

0107. Coastal Roads. Coastal roads are vulnerable due to salinity, organic matters, waves therefore special considerations must be adopted for construction of coastal roads. Safety, environmental impacts, roadway and ground support subsystem, coastal defense subsystem, pavement design are the important factors to be considered in the design of coastal road.

Subgrade

0108. The most important engineering consideration is the nature and condition of the subgrade.

a. It is often necessary to improve the load-bearing capacity of the road.

b. It is almost always necessary to protect the road from the adverse effects of weather.

0109. The strength and stability of soil can be improved by:-

a. Drainage (see Section 29)
b. Compaction (see Section 29)
c. Stabilization (see Section 80)

0110. The intensity of the load on the subgrade can be reduced by superimposing a pavement. A pavement comprises one or more courses of comparatively hard material, designed to keep out water, to resist abrasion, and to form a smooth riding surface, but its primary purpose is to distribute the load.

0111. Improvement of the subgrade may require less time and effort than the construction of a greater thickness is to pavement.