HIGHER TECHNICAL INSTITUTE

NICOSIA - CYPRUS

CIVIL ENGINEERING DEPARTMENT

PLANT, EQUIPMENT AND METHODS USED IN THE CONSTRUCTION INDUSTRY

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I N T R O D U C T I O N

CONSTRUCTION ENGINEERING is an interrelated complex of operations whereby buildings and installations are erected.

The end product of construction engineering, is finished buildings and installations. In contast to industrial production, the produce in construction is stationary whereas builders and working tools (machines, mechanisms, equipment) move as required.

CONSTRUCTION OPERATIONS, may be classified according to production methods (e.g. formwork, erection, heat insulation, etc) or by the kind of materials to be processed (earth-moving, masonry, concreting and others).

According to the field of application construction operations may be divided into general, specialized and auxiliary.

Construction work is a combination of building processes, which in turn consist of several working operations performed by one or many worker.

A working operation consists of working procedures which are basic components of the building process. An example of a building process is digging foundation pits by excavations. The working operation is then filling excavator buckets with soil, and the working procedure is manipulating the controls.

COMPLEX MECHANIZATION (PLANTS) of construction and erection work is a major factor in industrialization of construction and an essential pierequisite for raising the productivity of labour.

Com Mec. means the performance of all brase and auxiliary heavy and labour-consuming operations by machines and small mechanised devices arranged according to their application, technical level and productivity. The complex mechanization of construction should ensure a specified rate of construction work and lead to better performance in terms of productivity labour input and cast of construction work.

Despite a relatively large pool of construction machines and mechanisms and a high level of prefabrication used in buildings and installations the proportion of manual labour in construction practice remains approximately 50%.

Manual labour in construction is being mechanized indirectly through transfer of a great number of construction processes from building sites to prefabrication works, and directly by continually supplying construction sites with new, more efficient machines and small mechanized devices on a large scale.

An important trend in construction machine-building is the development of construction machines based on standard subassemblies and their specialized manufacture.

Most promising in this respect are wheeled machines whose efficiency is 1.5 to 4 times greater than that of caterpillar ones.

The use of machines and trucks of high unit power at large construction sites will lead to a sharp increase in the productivity of labour, shorter constuction time and lower construction costs. For example, the use of tractor rippers of power ratings up to 370 KW, solves the problem of soil digging, lowering its cost 3-4 times.

Along with high-efficiency large-unit-power machines, very useful in practical construction is small-size machinery intended for performing labour-consuming, small volume work (small-size bulldozers, motorised carts, loaders and other and small mechanized devices, such as portable manually operated machines and mechanized tools which greatly reduce the amount of manual labour.

There is much to gain by raising the unit power of constuction machines.

C O N T E N T S