Construction Management:

Management of Equipments

Demand for more urbanization and infra structure development

Land value increasing, high rise buildings development increases

Besides human labor use of mechanized equipments is inevitable

Construction Management:

Management of Equipments

Factors:

- Size and complexity of projects
- Shortage of skilled and trained manpower
- Improve quality of work
- Economical
- Effect of climate and topography is not significant
- Supervision and control is easy

Construction Management:

Management of Equipments

Options to procure equipment

- **purchase new equipment** – huge initial investment, depreciation, major repairs, finding spare parts. Major drawbacks – uncertainty of utility after completion of project. Storing, maintaining and moving from site to site is more expensive
- **purchase old** (used equipment) – less initial investment. However, residual life, operating costs and availability of spares
- **Hiring of equipment –** better if usage for a shorter period and no certainty of its usage on completion of project

Construction Management:

Management of Equipments

Suitable option is to be selected based on:

- Prospects of continued use during its life
- Feasibility of deploying operators on equipments during idle periods
- Scope for hiring to others during idle periods
- New technology and innovations in construction leading to higher productivity

Construction Management: Management of Equipments

- Factors to consider for construction equipment selection
  - Suitability for the job with specific reference to climate and other operating conditions
  - Suitable size
  - Spare parts should be available
  - Technical consideration (strength, rigidity, reliability, maintainability)
  - Service after sales

Construction Management: Management of Equipments

Concept of time for equipment use

- Useful life – period in years during which the equipment can be economically used based on previous experience

- Operating life – period of time between manufacturing and scrapping equipment. Influenced by wear and tear, degree of care and maintenance, climatic condition

- Actual working life – (Useful time minus transportation, installation and dismantling time, time for maintenance and repair, down time due to force majeure condition, time taken to change attachment

Construction Management: Management of Equipments

Productivity of equipment – utilization factor, (60-80%)

Maintenance and spare parts – spare parts maintenance is important part. Idle equipment obstruct progress of work and also results in loss of valuable equipment hours

Types of maintenance:

- Repair maintenance
- Breakdown maintenance
- Preventive maintenance

Construction Management: Management of Equipments

- Common Construction Equipments

Excavator -

- •Digging of trenches, holes, foundations
- •Material handling
- •Brush cutting with hydraulic attachments
- •Forestry work
- •Demolition
- •General grading/landscaping
- •Heavy lift, e.g. lifting and placing of pipes
- •Mining, especially, but not only open-pit mining
- •River dredging
- •Driving piles, in conjunction with a pile driver

Construction Management: Management of Equipments

- Common Construction Equipments

Loader -

Construction Management: Management of Equipments

Common Construction Equipments

Cranes –

- A crane is a type of machine that can be used both to lift and lower materials and to move them horizontally.
- It is mainly used for lifting heavy things and transporting them to other places.
- It uses one or more simple machines to create mechanical advantage and thus move loads beyond the normal capability of a man.
- Cranes are commonly employed in the transport industry for the loading and unloading of freight, in the construction industry for the movement of materials and in the manufacturing industry for the assembling of heavy equipment.

Construction Management: Management of Equipments

- Common Construction Equipments

Cranes

Construction Management: Management of Equipments

Common Construction Equipments

Concrete Mixers

•A concrete mixer (also commonly called a cement mixer) is a device that homogeneously combines cement, aggregate such as sand or gravel, and water to form concrete.

•A typical concrete mixer uses a revolving drum to mix the components.

• For smaller volume works portable concrete mixers are often used so that the concrete can be made at the construction site, giving the workers ample time to use the concrete before it hardens.

Construction Management: Management of Equipments

Common Construction Equipments

Concrete Mixers Truck

•Special concrete transport trucks (in–transit mixers) are made to transport and mix concrete up to the construction site.

•They can be charged with dry materials and water, with the mixing occurring during transport. With this process, the material has already been mixing.

• The concrete mixing transport truck maintains the material's liquid state through agitation, or turning of the drum, until delivery.

Construction Management: Management of Equipments

- Common Construction Equipments

Concrete Vibrator

-Compacting concrete

-Air voids reduced and density improved

Belt conveyer

Dewatering equipment

Trucks

Construction Management: Management of Equipments

Common Construction Equipments

Asphalt Paver

A paver (**paver finisher, asphalt finisher, paving machine**) is a piece of construction equipment used to lay asphalt on roads, bridges, parking lots and other such places. It lays the asphalt flat and providing minor compaction before it is rolled by a roller.

Construction Management: Management of Equipments

Common Construction Equipments

ROAD ROLLER

A road roller (sometimes called a roller-compactor, or just roller) is a compactor type engineering vehicle used to compact soil, gravel, concrete, or asphalt in the construction of roads and foundations.

Road rollers use the weight of the vehicle to compress the surface being rolled (static) or use mechanical advantage (vibrating)