4.3 Material handling and erection of structures

Selection of Material Handling equipment is an important decision as it affects both cost and efficiency of handling system. The following factors are to be taken into account while selecting material handling equipment.

Material Handling equipment's are used in movement of bulk, packaged, & individual products within the limits of place of business. Material handling equipment's used for following purpose:

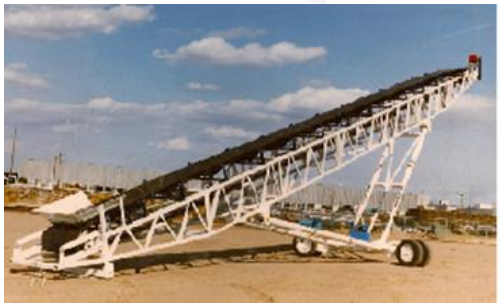
- To increase efficiency of material flow
- To reduce material handling cost
- To improve facilities utilization
- To improve safety & working conditions
- To facilitate construction processes
- To increase productivity

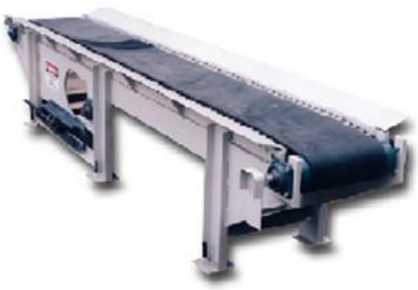
All Material handling equipment are classified in three main types, i.e

1. Conveyors: A conveyor system is a common piece of mechanical handling equipment that moves materials from one location to another in fixed path. Conveyors are especially useful in applications involving the transportation of heavy or bulky materials. Conveyor systems allow quick and efficient transportation for a wide variety of materials, which make them very popular in the material handling and packaging industries

Advantage

- Permits high capacity for moving large number of items
- Their speed is adjustable
- Handling combined with other activities such as processing & inspection is possible
- They are versatile & can be on floor or overhead
- Temporary storage of loads b/w work station is possible (particularly overhead conveyors)
- Load transfer is automatic & does not require the assistance of many operators
- Straight line paths or aisles are not required
- Utilization of the cube is feasible through the use of overhead conveyors





2. Crane & Hoists: Cranes & Hoists is a tower or derrick that is equipped with cables and pulleys that are used to lift and lower material. They are commonly used in the construction industry. Cranes for construction are normally temporary structures, either fixed to the ground or mounted on a custom built vehicle or ship.

They can either be controlled from an operator in a cab that travels along with the crane, by a push button pendant control station, or by radio type controls.

Advantages:

- Lifting as well as transferring of material is possible
- Interference with the work on the floor is minimized
- Valuable floor space is saved for truck rather than being utilized for installation of handling equipment
- Such equipment is capable of handling heavy loads
- Such equipment can be used for loading & unloading of materials

Crawler Crane:

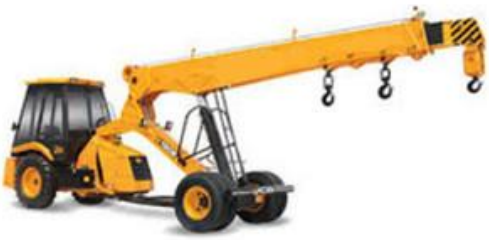
Crawler crane moves on tracks which is also called crawlers. Their main advantage is that it can move mostly on any surface of the earth it can even move on soft soils due to its crawlers as it transfers its load to a great area. That's why it can be used at unprepared sites without worrying about anything.


All Terrain Crane:

It is in those types of cranes which can travel at the same speed on the public roads as well as on the off roads. They also consist of more tires than rough terrain cranes.

Truck Mounted Crane:

It is in that types of cranes which have one engine. It means that same engine is used for undercarriage and as well as for crane. They are mounted on a rubber tires truck, which provides great mobility. Outriggers are used to stabilize the truck by extending it horizontally or vertically.

Tower Cranes

These types of cranes are the mostly used cranes in today's world. Usually, they are fixed to the ground in concrete or attached to the side of structures. They are used mostly in the construction of tall buildings.

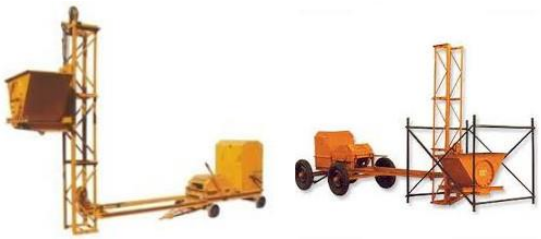
Overhead / Gantry Crane

Also refered to as a suspended crane, this type is normally used in a factory, with some of them being able to lift very heavy loads. Larger overhead cranes (also known as goliath cranes) can be found in use in shipyards and large outdoor manufacturing plants. The hoist is set on a trolley which will move in one direction along one or two beams, which move at angles to that direction along elevated or ground level tracks, often mounted along the side of an assembly area.

Floating Crane:

It is also called crane ship, crane vessel or floating crane. It is mostly used in offshore construction and they are specialized in the lifting of heavy loads. They can also be used to load or unload ships or lift sunken ships from the water. They are fixed and therefore cannot be rotated. They have a large capacity of about 9000 tons.

Tower Hoist: Tower Hoist is popularly known as Builders Hoist & is used mostly for carrying up concrete. Various models available depending upon weight to be carried and height it is to be carried. It is used mostly for carrying up concrete, and also brick, tiles, steel by exchange of bucket.



Passenger Hoist: Passenger Hoist, commonly known as outdoor elevators, provide safe and speedy vertical transport of personnel and materials.

3. **Trucks:** Hand or Powered Trucks move loads over varying paths Examples of such Trucks include Lift Trucks, Fork Trucks, Trailer Trains, & Automated Guided Vehicles

Advantages:

- They are not require to follow a fixed path of movement & therefore can be used any where on the floor where space permits
- They are capable of loading, unloading, & lifting, in addition to transferring material
- Because of their unrestricted mobility, which allows them to serve different areas, trucks can achieve high utilization