FAQ's

1. Write a note about different construction equipments and its uses.

1. Earth moving equipment
2. Hauling equipment
3. Hoisting equipment
4. Conveying equipment
5. Aggregate and concrete production equipment
6. Pile driving equipment
7. Tunneling and rock drilling equipment
8. Pumping and dewatering equipment
9. Dredging equipment

Earth Moving Equipments

The equipment which perform excavation, digging of large quantities of earth, moving them to distances, placement, compacting, leveling, dozing, grading, hauling etc., are called earth moving equipment.

Classifications:

- Excavating equipment
- Excavating and earth moving equipment

Earth Excavation Equipments

- Power shovel
- Back hoe
- Drag line
- Clam shell

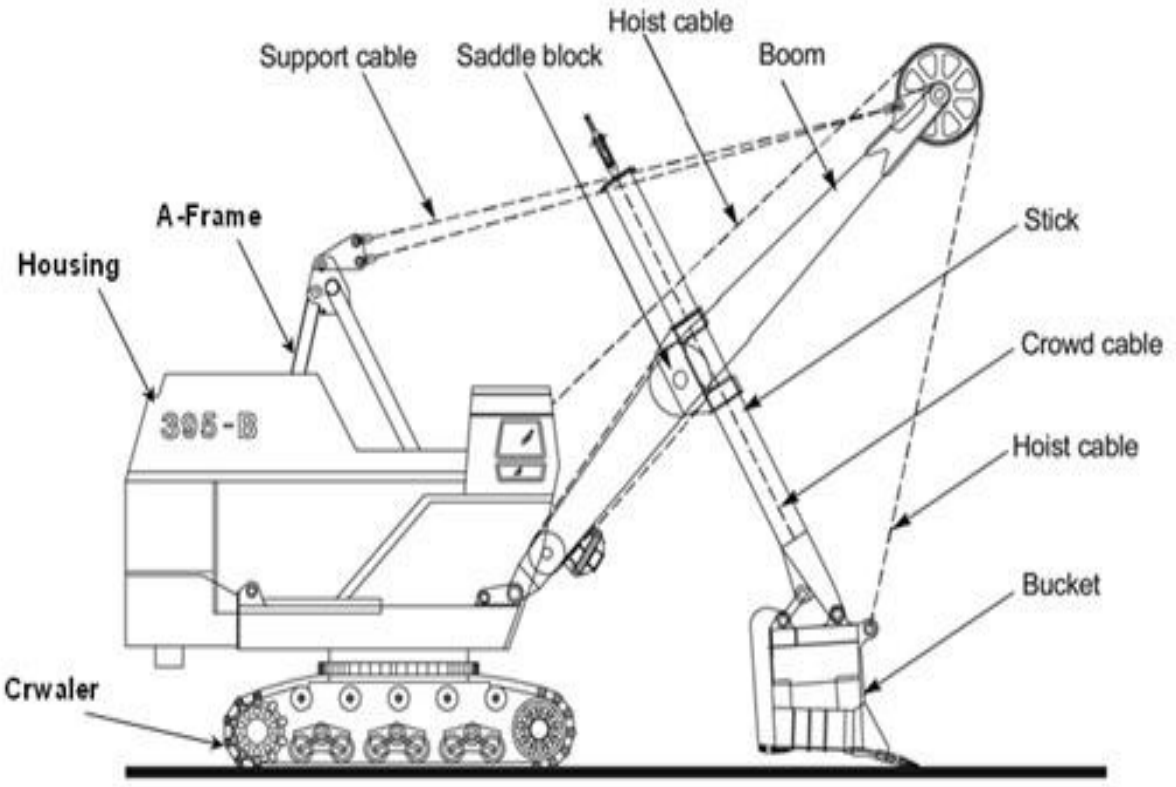
Power shovel

- Long-lasting.

- Excavate all types of earth except hard rock

Types

- Wheel mounted (high speed - firm ground)
- Crawler mounted (low speed - unstable soil)



Black Hoe

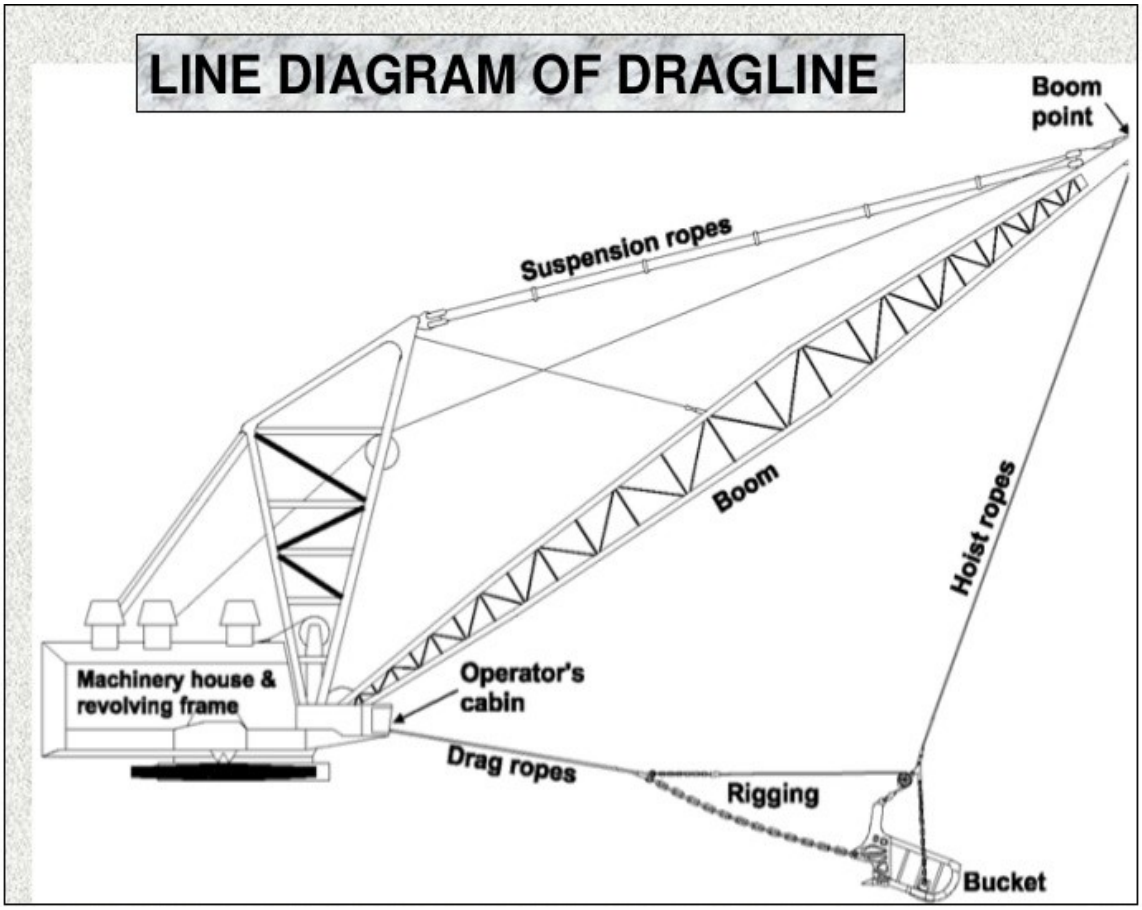
- Also termed as hoe, back shovel and pull shovel.
- Used to excavate below the surface of equipment - it caves into the ground.
- Similar to shovel except it makes inward strokes while digging.

Application

- Digging below machine level like trenches, footings, basements.
- To trim the surface (dressing).

Drag Line

- The drag line is so name because of its prominent operation of dragging the bucket against the material to be dug.
- Unlike the shovel, it has a long light crane boom and the bucket is loosely attached to the boom through cables.
- Because of this construction, a dragline can dig and dump over larger distances than a shovel can do.
- Drag lines are useful for digging below its track level and handling softer materials.
- Dragging softer material and below its track level
- It is very useful for excavating trenches when the sides are permitted to establish their angle of repose without shoring.
- It has long reaches.
- Excavation for canals and depositing on the embankment without hauling units.



Clam Shell

- This is so named due to resemblance of its bucket to a clam which is like a shell-fish with hinged double shell.
- The front end is essentially a crane boom with a specially designed bucket loosely attached at the end through cables as in a drag line.
- The capacity of a clam shell bucket is usually given in cubic meters.
- The basic parts of clam shell bucket are the closing line, hoist line, sheaves, brackets, tagline, shell and hinge.

Application

- Used for handling loose material such as crushed stone, sand, gravel, coal etc.
- Main feature is vertical lifting of material from one location to another.
- Mainly used for removing material from coffer dam, sewer main holes, well foundations etc.

Excavating & Earth Moving Equipments

1. Motor graders
2. Scrapers
3. Bull dozers
4. Tractors

Motor Graders:

- They may be either towed or motorised.
- Usually self propulsive.

Motor Graders:

Uses

- Gravel road repairing
- Road shoulder reshaping
- Bank cutting
- Ditch filling
- Base course spreading
- Material mixing
- Snow, land clearance
- Frozen top soil, asphalt breaking

Scrapers

- Compromise between best loading and best hauling machines
- Unique for long distance hauling
- It itself digs, hauls, deposit the materials in uniform thick layers

Types

- Crawler tractor pulled
- Wheel tractor pulled

Bulldozers

- Versatile equipment- essentially a heavy steel blade mounted on the front of tractor.

Uses

- ❖ Spreading earth fill
- ❖ Clearing, opening up pilot roads
- ❖ Back filling trenches
- ❖ Clearing construction sites

Tractors

- ❖ Multipurpose machines mainly used for pulling and pushing other machines for agricultural purposes.

Uses

- ❖ Clearing & excavating machinery
- ❖ Hauling & conveying machinery

Earth Compaction Equipments

1. Smooth – wheel rollers
2. Sheep – foot rollers
3. Pneumatic tyred rollers

Smooth – wheel rollers

- ➢ Plain steel rollers
- ➢ Self – propelled (5 to 25 tonnes)
- ➢ No deep compaction
- ➢ Rear wheels are larger in diameter and the front ones are wider
- ➢ Diesel engine type
- ➢ Compaction is by static weight of roller

Suitability:

- ➢ Granular soils
- ➢ Sand

- Gravel
- Crushed stones

Sheep Foot Rollers

- Hollow steel drum with projected feet mounted at 100 to 200 mmc/c
- Weight - 15 tonnes
- Speed - 25 km/hr
- Compaction is by kneading action
- In convertible rollers the foot plate can be removed
- In turn foot rollers the individual sheep foot can be changed
- Suitability:
- Clay, predominantly cohesive and impervious soil

Pneumatic Rollers

- Consists of a base platform mounted between two axles
- Tracks of the rear wheel lie inbetween the tracks of the front wheel
- Compaction is by controlling the ground contact pressure
- Weight or width of the wheel can be suitably increased

Suitability:

- Fine grained and well graded sands

Pile Driving Rigs

- Pile Driving Rigs provide basic operation of lifting the pile, holding the pile in position, hammering it into the ground or of pulling it out of the ground and guiding the pile in the desired direction of movements.
- It supports the boom, the winch, mechanism, driving hammer, the guiding leaders and a platform for mounting the auxiliary equipment such as jet pumps, drilling auger etc.,

Hauling equipments

- Hauling is defined as movement of matreials from one place to another place.
- Equipments used for this process is hauling equipments.

Types:

- ❖ Dump trucks
- ❖ Dumpers

Types:

1. Side dump truck
2. Bottom dump trucks

Side dump truck:

- Dumping is through the sides of the truck
- Suitable for hauling wet clay, sand, gravel, quarry rocks.

Bottom dump truck:

- Dumping is by opening the bottom of the truck
- Suitable for free flowing materials such as sand, gravel, dry earth, hard clay.
- Cranes
- Used in construction projects, shipping, industries etc.
- They may be electrically operated, diesel operated or diesel-electric drive.

Classification:

- Derrick cranes.
- Mobile cranes.
- Overhead or gantry cranes.
- Traveller cranes.
- Tower cranes.

Conveyor Belt

- Most popular
- Consists of a belt running over a pair of end drums supported by a series of rollers called idlers
- Middle sag is provided to prevent the spilling of materials

Advantages:

- Can handle light, heavy, dry, wet, soft, coarse materials
- High speed
- Carries horizontally and inclined
- Lighter in weight
- Controlled discharge

Screw conveyor

- Used for handling granular or pulvarised materials
- Quantity is less compared to belt conveyor.
- Low cost
- Consists of a helix mounted on a bearing at the ends and at intermediate points
- Length is 65m with an inclination upto 35 degrees

Bucket conveyor

- Material is transferred through a series of buckets.
- Length is limited to 25m
- Weight depends upon the strength of chains.
- Mainly used for handling coal.

Aerial transportation

1. Cableways
    - Used in excavation work of dams, quarries, construction etc.,
    - Loads are hoisted and moved vertically.

- Also used in transporting concrete over large area.

2. Ropeways

- Long distance movement
- Endless rope with two en towers and supported by series of pulley mounted on intermediate tower.
- Separate handling and support ropes.

Batchers:

- ✓ Proportionating the ingredients of concrete for a particular mix.
- ✓ Weigh batching is commonly used.

Types:

1. Manual batching
2. Semi - automatic batching
3. Automatic batching

Concrete mixers

- Mixing all the ingredients of concrete to make a mix of specified consistency

Factors governing mixing:

- ❖ Correct setting of machine
- ❖ Proper cleaning of blades
- ❖ Sequence of material charged
- ❖ Timely supply of water
- ❖ Direction of in - flow
- ❖ Speed and time of mixing

Types:

- ➢ Drum type mixers - tilting & non - tilting
- ➢ Pan type mixers