



PILE DRIVER



NEED FOR PILE DRIVER

Large apartments, shopping malls and the bridges across the river requires a deep foundation. Laying deep foundation with the aid of man power is impossible. For serving this purpose, the Pile Driver is used. The main difference between the drillers and Pile Driver is the driller machine can drill the holes. But the Pile Driver hammers the foundation pillar to the ground simultaneously.

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Pile Driver is used for laying deep foundation for construction of bridges and big buildings. In Pile Driver, the foundation pillar is fixed to the required destination and then it is hammered to the ground surface with the help of hydraulic mechanism.

MAIN COMPONENTS

- Crane
- Boom
- Lead
- Brace
- Hammer
- Hammer cushion
- Pile cushion
- Pile gate

CONSTRUCTIONAL DETAILS

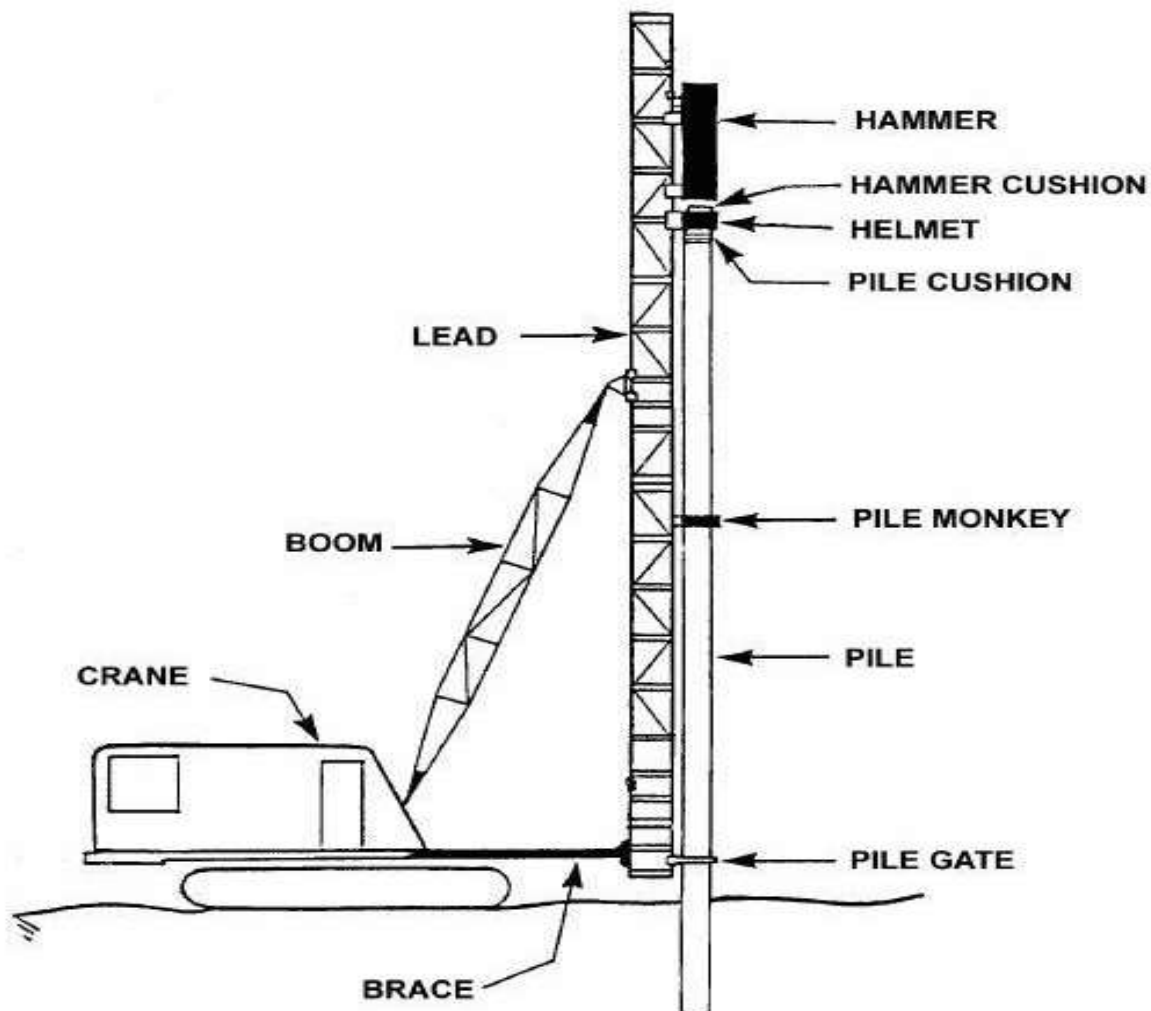
The hammer operates in a two-step cycles. First a blow of an air/steam single-acting hammer is initiated by introducing the motive fluid at constant pressure in a cylinder under the piston. The pressure increases in the cylinder and causes the ram to move upward. At a certain height (usually 50-75% of the maximum fall height), the pressure inlet valve is closed and the pressure chamber is opened to the atmosphere. The second the ram will coast upwards under its momentum for an additional distance. Towards the top of a full stroke, the piston penetrates a safety chamber formed by trapped air above the so-called relief ports, which assists in the deceleration of the piston. Upon its descent, the ram reaches a position – usually immediately



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preceding impact – where the valve opens to allow motive fluid to enter the cylinder. The exhaust is closed at the same time.

Obviously, if pressurized motive fluid enters the cylinder too soon before impact occurs, this pressure will tend to slow the fall of the ram. This effect is called pre-admission; it may have a significant effect on the striking velocity. An incorrect hammer cushion thickness, poorly adjusted valves, or an improper slide bar may cause this problem. During impact, the ram pushes the helmet and pile downwards, allowing the hammer base, columns, and cylinder (these components are also called the assembly) to fall under the action of both gravity and the reaction forces of the pressurized fluid. When the hammer base meets the helmet, a so-called “assembly impact” occurs.



Since the air/steam hammer is an external combustion hammer, its performance depends on the boiler (steam generator) or air compressor. Either unit must be of sufficient capacity to provide the operating pressures at the necessary fluid flow rate. The hammer



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specifications therefore require an operating pressure and an operating volume (e.g., cubic feet per minute or cubic meters per minute). The specified pressures must be available at the hammer, and the system losses must be minimized. Pressure losses may result from leaky or worn hoses, or in hoses of insufficient number of size or excessive length.

Single acting air/steam hammers should be used with a pile helmet inserted between the ram and the pile top. The helmet usually supports the hammer assembly, and houses the striker plate and the hammer cushion, if so required by the manufacturer. The helmet must be well matched to both pile type and hammer model. For high hammer cushion stacks (such as those commonly used with micarta and aluminum stacks), a follower or shield may be inserted between hammer and helmet; its effect is to extend the upper portion of the helmet. Such a follower or shield should only be used after obtaining approval from the engineer.

A correct cushion thickness is important for the proper performance of a hammer. Thinner than specified cushions may cause pre-admission, which cushions the blow. A taller cushion stack than recommended shortens the ram stroke. The shorter stroke will, of course, produce blows with lower energy. If the cushion thickness increases even further, then the inlet valve may not open at all, and the hammer will not run. It is very important to start with and maintain a hammer cushion thickness as specified by each manufacturer for each hammer model.

APPLICATION

- Used in construction of Bridges for foundation purpose
- Used in construction sites