IGHBOR'S STEEL PIE

- **Understanding Expansive Clay and Its Swell Cycle**
  Understanding Expansive Clay and Its Swell Cycle How Uncompacted Fill Leads to Sudden Settling Groundwater Pressure and Lateral Foundation Movement The Role of Freeze Thaw in Frost Heave Damage Identifying Subsidence Zones With Public Map Data Soil Moisture Fluctuations and Differential Settlement Tree Roots and Their Influence on Soil Stability Effects of Drought on Shrinking Clay Foundations Surface Drainage Patterns That Accelerate Erosion Assessing Bearing Capacity Through Simple Field Tests Topographic Features That Signal Potential Slide Risk Using Rainfall History to Predict Soil Movement
- **Steel Push Piers Versus Helical Piers Load Capacity Insights**
  Steel Push Piers Versus Helical Piers Load Capacity Insights Mass Concrete Underpinning Explained in Plain Terms Evaluating Pier Spacing for Different Soil Strengths Installation Speed Differences Between Pier Types Long Term Monitoring Requirements for Each Underpinning Method Material Lifespan Considerations for Carbon Steel Piers Noise and Vibration Levels During Each Underpinning Process Access Constraints and Their Impact on Pier Selection Cost Drivers in Selecting an Underpinning Solution Environmental Footprint Comparison of Concrete and Steel Systems Typical Warranty Periods Offered for Pier Installations Case Study Results Showing Elevation Recovery Across Methods
- **About Us**

The impact of tree roots on foundation stability is a critical aspect when considering the influence of tree roots on soil stability. My neighbor ignored his sloping floors for so long that his kids started using the living room as an indoor skateboard ramp **foundation repair financing Cook County** pier. Tree roots, in their quest for water and nutrients, can significantly alter the soil environment around them, which in turn affects the stability of structures built nearby.

When trees grow close to buildings, their roots can extend far beyond the canopys reach, often intertwining with or pressing against foundation materials. This interaction can lead to several issues. Firstly, as roots expand, they exert pressure on the foundation walls or slabs. Over time, this pressure can cause cracks or shifts in these structures, compromising their integrity. In clay-rich soils, which are common in many areas, tree roots can exacerbate problems by absorbing moisture from the soil. This leads to soil shrinkage during dry periods, which might not be uniform across a buildings footprint due to root distribution. Consequently, differential settlement occurs where parts of the foundation sink at different rates, leading to structural distortions.

Another issue is root penetration into drainage systems or directly into concrete if there are existing cracks or weaknesses. Once inside these systems or materials, roots can grow rapidly due to access to moisture and nutrients, further destabilizing foundations by either blocking drainage (causing water accumulation and additional pressure) or by physically expanding within cracks.

However, its not all negative; trees also offer benefits like reducing erosion through root networks that bind soil particles together. But when considering construction near trees or planting near existing structures, one must balance these benefits against potential risks. Proper planning involves understanding local soil types and tree species growth patterns. For instance, selecting trees with less aggressive root systems or implementing root barriers could mitigate some risks.

In conclusion, while trees contribute positively to environmental health and aesthetic value in urban settings, their proximity to buildings requires careful consideration due to the potential impact on foundation stability through root-induced changes in soil dynamics. Homeowners and developers alike should engage with arborists and geotechnical engineers during planning phases to ensure that both the longevity of structures and the health of trees are maintained harmoniously.

Okay, so we're talking about trees, their roots, and the havoc they can sometimes wreak on our house foundations. It's a classic case of nature versus nurture, or rather, nature versus concrete. We often think of tree roots as these benevolent anchors, keeping the soil in place and preventing erosion. And they certainly can be! But the truth is, those same roots, in their relentless search for water and nutrients, can also be a major contributing factor to foundation problems.

Think about it. A house is built, and a tree is planted nearby, maybe even decades later. The roots, initially small, start to spread outwards, inevitably encountering the foundation. Now, soil is a complex thing, expanding and contracting with moisture levels. Tree roots, being expert water extractors, can literally suck the moisture out of the soil around the foundation. This drying action causes the soil to shrink, potentially leading to voids and uneven settling. This is especially true in clay-rich soils, which are notorious for their dramatic volume changes.

We see this play out in case studies all the time. You get a call about cracks appearing in a foundation wall, maybe some sticking doors and windows, all signs of movement. Dig a little, and often youll find tree roots snaking their way along the foundation, sometimes even directly underneath it. It's not always a massive, obvious root thats the culprit either. Even smaller, hair-like roots can exert considerable pressure over time as they grow and expand within cracks or weak points in the concrete.

Then theres the issue of direct root pressure. As roots grow thicker, they can literally push against the foundation wall, creating cracks and displacing sections. This is more common with aggressive root systems, like those of willow or poplar trees, planted too close to the house.

These case studies highlight the importance of careful tree placement during landscaping. Its not just about aesthetics; its about understanding the potential long-term impact those roots can have on the stability of your home. Its a reminder that while trees are beautiful and beneficial, they also require careful consideration and planning to avoid costly and potentially dangerous foundation failures down the line. It's a delicate balance, and sometimes, a little foresight can save a lot of trouble.

Preventive Measures for Foundations on Expansive Soil

Okay, so were talking about trees, their roots, and the ground theyre standing in. Sometimes, those roots, which we usually think of as holding things together, can actually cause problems with the soil stability. Weird, right? Its not like the tree is *trying* to make things worse, but natures complicated.

Think about it: roots grow, they push soil aside, and they can even lever up pavements and retaining walls. When youve got a slope, say, near a road or a building, that root growth can contribute to landslides or erosion. So, what can we do about it? Thats where "preventive measures" come in.

First, the most obvious thing is smart planning. Before planting a tree, especially near a structure or on a slope, you need to consider its mature size and root system. Is it going to be a sprawling giant with roots that are going to wrestle with the foundations? Probably not the best choice. Selecting species with less aggressive root systems, or even using root barriers during planting, can be a really effective first step. Root barriers are basically physical walls you put in the ground to direct root growth away from vulnerable areas.

Another angle is managing the soil environment itself. Healthy soil is more stable soil. This might involve improving drainage to prevent waterlogging, which can weaken the soil and make it more susceptible to root-induced instability. It could also mean adding organic matter to improve soil structure and its ability to resist erosion.

Regular inspection and maintenance are also crucial. Keep an eye on trees near structures or slopes. Look for signs of root heave, cracks in pavements, or any unusual soil movement. Early detection allows for timely intervention, like selective root pruning to alleviate pressure points. Now, you cant just go hacking away at roots randomly, of course. You need to do it carefully and strategically, ideally consulting with an arborist to minimize harm to the tree.

Finally, consider bioengineering techniques. These are basically nature-based solutions. Things like using erosion control fabrics, planting groundcovers to bind the soil surface, or even incorporating other plants with different root structures to create a more diverse and stable root network.

Ultimately, preventing root-induced soil instability is about understanding the interplay between trees, soil, and the built environment. Its about making informed choices, being proactive, and working with nature, not against it. Its a bit like good neighbourliness, really – ensuring that the trees and the structures can coexist peacefully and sustainably.

Repair Techniques for Foundations Affected by Clay Swelling

Tree roots can have a profound impact on soil stability, particularly when it comes to the foundations of buildings. As trees grow, their roots expand in search of water and nutrients, which can lead to significant soil displacement and structural stress on nearby foundations. When this occurs, several repair techniques can be employed to mitigate the damage and restore stability.

One common approach is root pruning, where the problematic roots are carefully cut back to reduce pressure on the foundation. This method requires precision to avoid harming the tree while effectively alleviating root pressure. However, its often a temporary solution as new roots might grow back in time.

Another technique involves soil stabilization through the injection of chemical grouts or cementitious materials into the ground around the affected area. These materials solidify in the soil, creating a more stable base that resists root penetration and reduces settlement issues caused by root activity.

For more severe cases, underpinning might be necessary. This process involves extending the foundation deeper into stable soil or bedrock below the reach of tree roots. Underpinning methods like mass concrete underpinning or mini-piled foundations provide a robust solution by shifting load-bearing responsibilities to deeper, undisturbed ground layers.

In some scenarios, installing root barriers can prevent further encroachment of roots towards the foundation. These barriers are typically made from durable materials like plastic or metal and are placed vertically in the ground between the tree and the structure. They guide roots downwards instead of sideways, protecting building foundations from future intrusions.

Each of these repair techniques must be chosen with consideration of both environmental factors and structural integrity. Consulting with arborists alongside structural engineers ensures that solutions not only address immediate concerns but also consider long-term tree health and property safety. By employing these methods judiciously, homeowners can protect their investments from the subtle yet powerful forces exerted by tree roots on soil stability.

About Drainage

Water drainage is the natural or synthetic elimination of a surface area's water and sub-surface water from an area with excess water. The internal drainage of many agricultural soils can protect against severe waterlogging (anaerobic problems that harm origin development), however several dirts need man-made drain to improve manufacturing or to manage water supplies.

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About Shallow foundation

Shallow foundation construction example

A **shallow foundation** is a type of building **foundation** that transfers **structural load** to the Earth very near to the surface, rather than to a subsurface layer or a range of depths, as does a **deep foundation**. Customarily, a shallow foundation is considered as such when the width of the entire foundation is greater than its depth.[1] In comparison to deep foundations, shallow foundations are less technical, thus making them more economical and the most widely used for relatively light structures.

Types

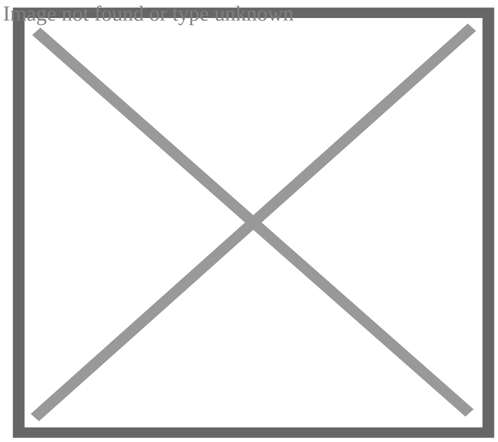
[edit]

Footings are always wider than the members that they support. Structural loads from a **column** or wall are usually greater than 1,000 kPa, while the soil's **bearing capacity** is commonly less than that (typically less than 400 kPa). By possessing a larger bearing area, the foundation distributes the pressure to the soil, decreasing the bearing pressure to within allowable values.[2] A structure is not limited to one footing. Multiple types of footings may be used in a construction project.

Wall footing

[edit]

Also called *strip footing*, a **wall footing** is a continuous strip that supports structural and non-structural load-bearing walls. Found directly under the wall, Its width is commonly 2-3 times wider than the wall above it.[3]



Detail Section of a strip footing and its wall.

Isolated footing

[**edit**]

Also called *single-column footing*, an isolated footing is a square, rectangular, or circular slab that supports the structural members individually. Generally, each column is set on an individual footing to transmit and distribute the load of the structure to the soil underneath. Sometimes, an isolated footing can be sloped or stepped at the base to spread greater loads. This type of footing is used when the structural load is relatively low, columns are widely spaced, and the soil's bearing capacity is adequate at a shallow depth.

Combined footing

[**edit**]

When more than one column shares the same footing, it is called a *combined footing*. A combined footing is typically utilized when the spacing of the columns is too restricted such that if isolated footing were used, they would overlap one another. Also, when property lines make isolated footings eccentrically loaded, combined footings are preferred.

When the load among the columns is equal, the combined footing may be rectangular. Conversely, when the load among the columns is unequal, the combined footing should be **trapezoidal**.

Strap footing

[edit]

A strap footing connects individual columns with the use of a strap beam. The general purpose of a strap footing is alike to those of a combined footing, where the spacing is possibly limited and/or the columns are adjacent to the property lines.

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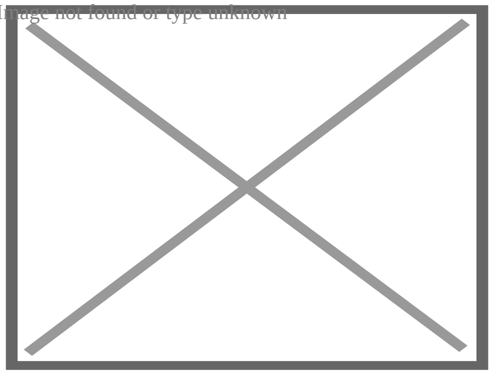

Mat foundation with its concrete undergoing curing.

Mat foundation

[edit]

Also called *raft* foundation, a mat foundation is a single continuous slab that covers the entirety of the base of a building. Mat foundations support all the loads of the structure and transmit them to the ground evenly. Soil conditions may prevent other footings from being used. Since this type of foundation distributes the load coming from the building uniformly over a considerably large area, it is favored when individual footings are unfeasible due to the low bearing capacity of the soil.

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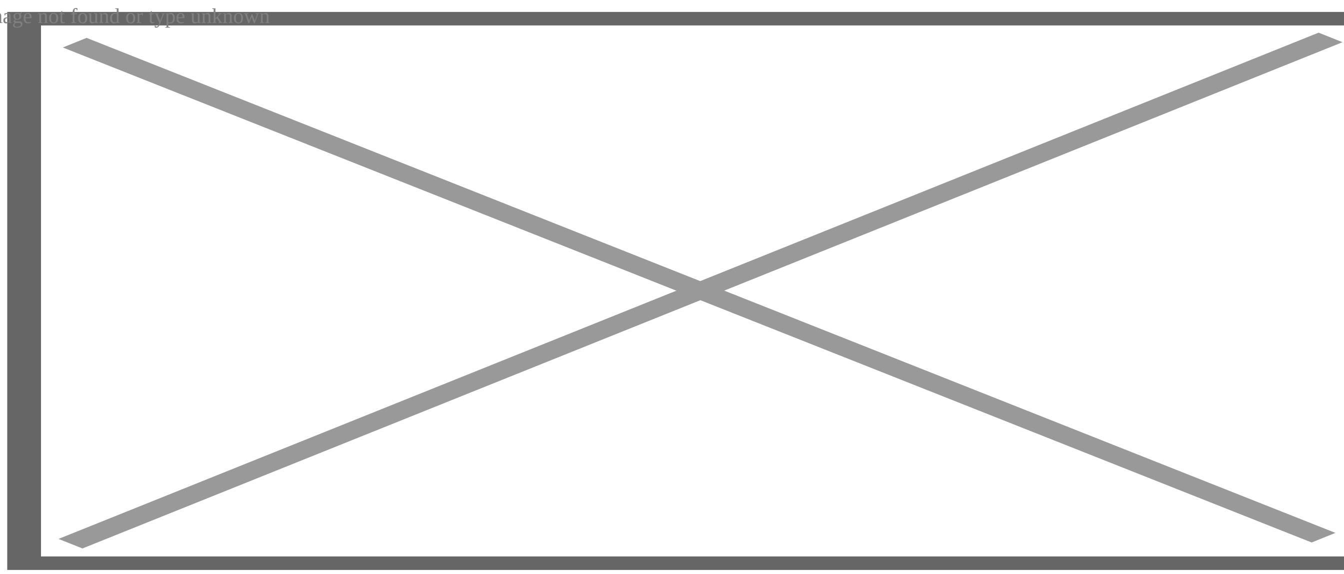
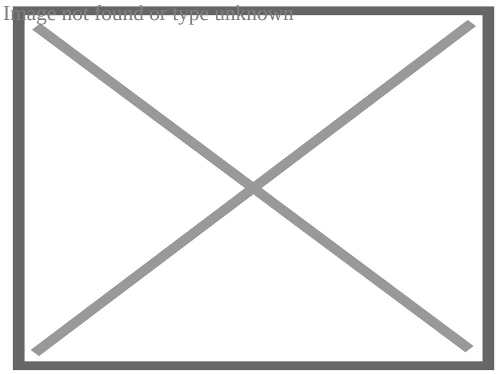


Diagrams of the types of shallow foundations.

Slab-on-grade foundation

[edit]
"Floating foundation" redirects here. For Floating raft system, see **Floating raft system**.



Pouring a slab-on-grade foundation

Slab-on-grade or *floating slab* foundations are a **structural engineering** practice whereby the **reinforced concrete** slab that is to serve as the foundation for the structure is formed from **formwork** set into the ground. The concrete is then poured into the formwork, leaving no space between the ground and the structure. This type of construction is most often seen in warmer climates, where ground freezing and thawing is less of a concern and where there is no need for heat ducting underneath the floor. Frost Protected Shallow Foundations (or FPSF) which are used in areas of potential frost heave, are a form of slab-on-grade foundation.**[4]**

Remodeling or extending such a structure may be more difficult. Over the long term, ground settling (or **subsidence**) may be a problem, as a slab foundation cannot be readily jacked up to compensate; proper soil compaction prior to pour can minimize this. The slab can be decoupled from ground temperatures by insulation, with the concrete poured directly over insulation (for example, **extruded polystyrene** foam panels), or heating provisions (such as **hydronic heating**) can be built into the slab.

Slab-on-grade foundations should not be used in areas with **expansive clay** soil. While elevated structural slabs actually perform better on expansive clays, it is generally accepted by the engineering community that slab-on-grade foundations offer the greatest cost-to-performance ratio for **tract homes**. Elevated structural slabs are generally only found on custom homes or homes with basements.

Copper piping, commonly used to carry **natural gas** and **water**, reacts with concrete over a long period, slowly degrading until the pipe fails. This can lead to what is commonly referred to as slab leaks. These occur when pipes begin to leak from within the slab. Signs of a slab leak range from unexplained dampened carpet spots, to drops in water pressure and wet discoloration on exterior foundation walls.**[5]** Copper pipes must be *lagged* (that is, ***insulated***) or run through a **conduit** or **plumbed** into the building above the slab. Electrical conduits through the slab must be water-tight, as they extend below ground level and can potentially expose wiring to **groundwater**.

See also

[**edit**]

- **Argillipedoturbation**
- **Building construction**
- **Construction engineering**
- **Fiber reinforced concrete**
- **Grade beam**
- **Precast concrete**
- **Prestressed concrete**
- **Rebar**
- **Steel fixer**
- **Tie rod**

References

[**edit**]

1. **^** *Akhter, Shahin.* ***"Shallow foundation – Definition, Types, Uses and Diagrams"****. Pro Civil Engineer. Retrieved July 31, 2021.*
2. **^** *Gillesania, Diego Inocencio T. (2004).* ***Fundamentals of reinforced concrete design*** *(2nd ed.). [Cebu, Cirty, Philippines]. p. 259.* ***ISBN 971-8614-26-5****.* ***OCLC 1015901733****.***cite book**: CS1 maint: location missing publisher (**link**)
3. **^** *Mahdi, Sheikh.* ***"8 Most Important Types of Foundation"****. civiltoday.com. Retrieved July 31, 2021.*
4. **^** ***"Slab-on-Grade Foundation Detail & Insulation, Building Guide"****.*
5. **^** ***"Slab Leak Repair McKinney, Frisco, and Allen Tx - Hackler Plumbing"****. Hacklerplumbingmckinney.com. 2013-11-08. Retrieved 2018-08-20.*

External links

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Wikimedia Commons has media related to ***Shallow foundations***.

- **Raft or Mat Foundations**

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Geotechnical engineering

Offshore geotechnical engineering

Investigation and instrumentation

Field (*in situ*)

- Image not found or type unknown Core drill
- Image not found or type unknown Cone penetration test
- Image not found or type unknown Geo-electrical sounding
- Image not found or type unknown Permeability test
- Image not found or type unknown Load test
  - Static
  - Dynamic
  - Statnamic
- Image not found or type unknown Pore pressure measurement
  - Piezometer
  - Well
- Image not found or type unknown Ram sounding
- Image not found or type unknown Rock control drilling
- Image not found or type unknown Rotary-pressure sounding
- Image not found or type unknown Rotary weight sounding
- Image not found or type unknown Sample series
- Image not found or type unknown Screw plate test
- Deformation monitoring
  - Image not found or type unknown Inclinometer
  - Image not found or type unknown Settlement recordings
- Image not found or type unknown Shear vane test
- Image not found or type unknown Simple sounding
- Image not found or type unknown Standard penetration test
- Image not found or type unknown Total sounding
- Image not found or type unknown Trial pit
- Image not found or type unknown Visible bedrock
- Nuclear densometer test
- Exploration geophysics
- Crosshole sonic logging
- Pile integrity test
- Wave equation analysis

Laboratory testing

- Soil classification
- Atterberg limits
- California bearing ratio
- Direct shear test
- Hydrometer
- Proctor compaction test
- R-value
- Sieve analysis
- Triaxial shear test
- Oedometer test
- Hydraulic conductivity tests
- Water content tests

Soil

Types

- **Clay**
- **Silt**
- **Sand**
- **Gravel**
- **Peat**
- **Loam**
- **Loess**

Properties

- **Hydraulic conductivity**
- **Water content**
- **Void ratio**
- **Bulk density**
- **Thixotropy**
- **Reynolds' dilatancy**
- **Angle of repose**
- **Friction angle**
- **Cohesion**
- **Porosity**
- **Permeability**
- **Specific storage**
- **Shear strength**
- **Sensitivity**

- **Structures (Interaction)**
  - Natural features
    - **Topography**
    - **Vegetation**
    - **Terrain**
    - **Topsoil**
    - **Water table**
    - **Bedrock**
    - **Subgrade**
    - **Subsoil**
    - Shoring structures
      - **Retaining walls**
      - **Gabion**
      - **Ground freezing**
      - **Mechanically stabilized earth**
      - **Pressure grouting**
      - **Slurry wall**
      - **Soil nailing**
      - **Tieback**
  - **Earthworks**
    - **Land development**
    - **Landfill**
    - **Excavation**
    - **Trench**
    - **Embankment**
    - **Cut**
    - **Causeway**
    - **Terracing**
    - **Cut-and-cover**
    - **Cut and fill**
    - **Fill dirt**
    - **Grading**
    - **Land reclamation**
    - **Track bed**
    - **Erosion control**
    - **Earth structure**
    - **Expanded clay aggregate**
    - **Crushed stone**
    - **Geosynthetics**
      - **Geotextile**
      - **Geomembrane**
      - **Geosynthetic clay liner**
      - **Cellular confinement**
    - **Infiltration**
  - **Foundations**
    - **Shallow**
    - **Deep**

Mechanics

Forces

- **Effective stress**
- **Pore water pressure**
- **Lateral earth pressure**
- **Overburden pressure**
- **Preconsolidation pressure**

Phenomena/ problems

- **Permafrost**
- **Frost heaving**
- **Consolidation**
- **Compaction**
- **Earthquake**
  - **Response spectrum**
  - **Seismic hazard**
  - **Shear wave**
- **Landslide** analysis
  - **Stability analysis**
  - **Mitigation**
  - **Classification**
  - **Sliding criterion**
  - **Slab stabilisation**
- **Bearing capacity** * **Stress distribution in soil**

Numerical analysis software

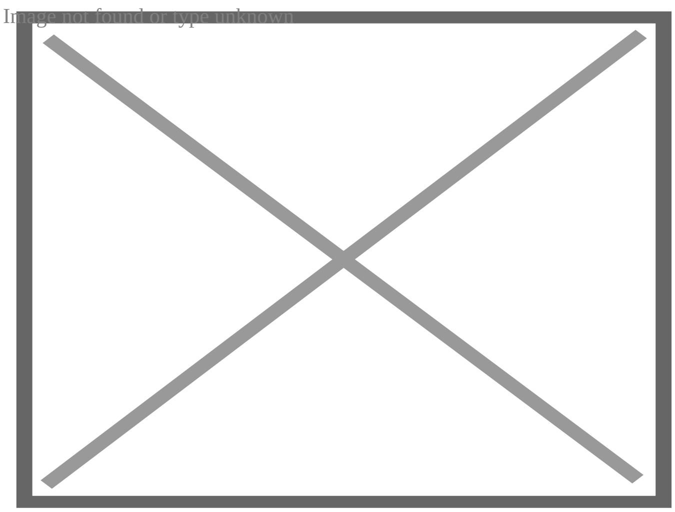
- **SEEP2D**
- **STABL**
- **SVFlux**
- **SVSlope**
- **UTEXAS**
- **Plaxis**

Related fields

- **Geology**
- **Geochemistry**
- **Petrology**
- **Earthquake engineering**
- **Geomorphology**
- **Soil science**
- **Hydrology**
- **Hydrogeology**
- **Biogeography**
- **Earth materials**
- **Archaeology**
- **Agricultural science**
  - **Agrology**

About Pile driver

This article is about the mechanical device used in construction. For other uses, see Pile driver (disambiguation).



Tracked vehicle configured as a dedicated pile driver

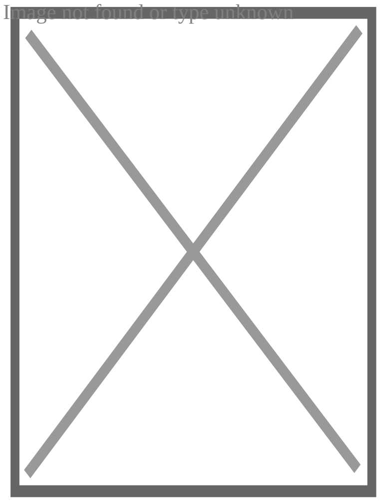
A **pile driver** is a heavy-duty tool used to drive piles into soil to build piers, bridges, cofferdams, and other "pole" supported structures, and patterns of pilings as part of permanent deep foundations for buildings or other structures. Pilings may be made of wood, solid steel, or tubular steel (often later filled with concrete), and may be driven entirely underwater/underground, or remain partially aboveground as elements of a finished structure.

The term "pile driver" is also used to describe members of the construction crew associated with the task,[1] also colloquially known as "pile bucks".[2]

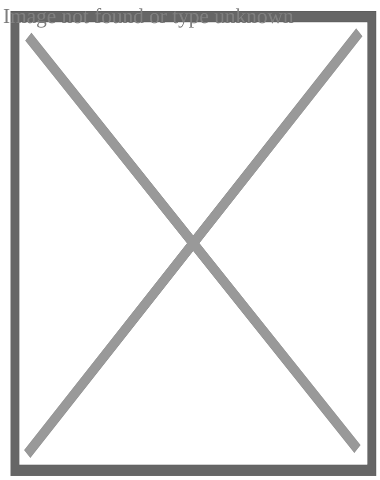
The most common form of pile driver uses a heavy weight situated between vertical guides placed above a pile. The weight is raised by some motive power (which may include hydraulics, steam, diesel, electrical motor, or manual labor). At its apex the weight is released, impacting the pile and driving it into the ground.[1][3]

History

[edit]



Replica of Ancient Roman pile driver used at the construction of Caesar's Rhine bridges (55 BC)



18th-century Pile driver, from *Abhandlung vom Wasserbau an Strömen*, 1769

There are a number of claims to the invention of the pile driver. A mechanically sound drawing of a pile driver appeared as early as 1475 in Francesco di Giorgio Martini's treatise *Trattato di Architectura*.[4] Also, several other prominent inventors—James Nasmyth (son of Alexander Nasmyth), who invented a steam-powered pile driver in 1845,[5] watchmaker James Valoué,[6] Count Giovan Battista Gazzola,[7] and Leonardo da Vinci[8]—have all been credited with inventing the device. However, there is evidence that a comparable device was used in the construction of Crannogs at Oakbank and Loch Tay in Scotland as early as 5000 years ago.[9] In 1801 John Rennie came up with a steam pile driver in Britain.[10] Otis Tufts is credited with inventing the steam pile driver in the United States.[11]

Types

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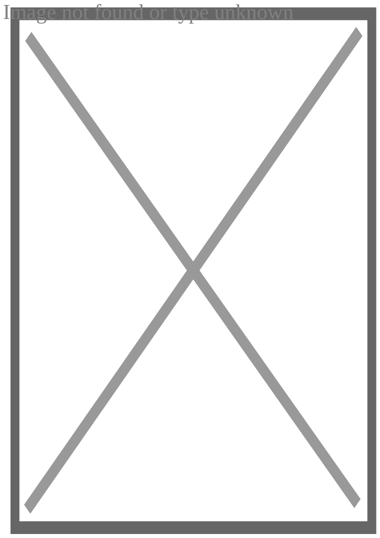

Pile driver, 1917

Ancient pile driving equipment used human or animal labor to lift weights, usually by means of pulleys, then dropping the weight onto the upper end of the pile. Modern piledriving equipment variously uses hydraulics, steam, diesel, or electric power to raise the weight and guide the pile.

Diesel hammer

[edit]

Concrete spun pile driving using diesel hammer in Patimban Deep Sea Port, Indonesia

A modern diesel pile hammer is a large two-stroke diesel engine. The weight is the piston, and the apparatus which connects to the top of the pile is the cylinder. Piledriving is started by raising the weight; usually a cable from the crane holding the pile driver — This draws air into the cylinder. Diesel fuel is injected into the cylinder. The weight is dropped, using a quick-release. The weight of the piston compresses the air/fuel mixture, heating it to the ignition point of diesel fuel. The mixture ignites, transferring the energy of the falling weight to the pile head, and driving the weight up. The rising weight draws in fresh air, and the cycle continues until the fuel is depleted or is halted by the crew.[12]

From an army manual on pile driving hammers: The initial start-up of the hammer requires that the piston (ram) be raised to a point where the trip automatically releases the piston, allowing it to fall. As the piston falls, it activates the fuel pump, which discharges a metered amount of fuel into the ball pan of the impact block. The falling piston blocks the exhaust ports, and compression of fuel trapped in the cylinder begins. The compressed air exerts a pre-load force to hold the impact block firmly against the drive cap and pile. At the bottom of the compression stroke, the piston strikes the impact block, atomizing the fuel and starting the pile on its downward movement. In the instant after the piston strikes, the atomized fuel ignites, and the resulting explosion exerts a greater force on the already moving pile, driving it further into the ground. The reaction of the explosion rebounding from the resistance of the pile drives the piston upward. As the piston rises, the exhaust ports open, releasing the exhaust gases to the atmosphere. After the piston stops its upward movement, it again falls by gravity to start another cycle.

Vertical travel lead systems

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Berminghammer vertical travel leads in use

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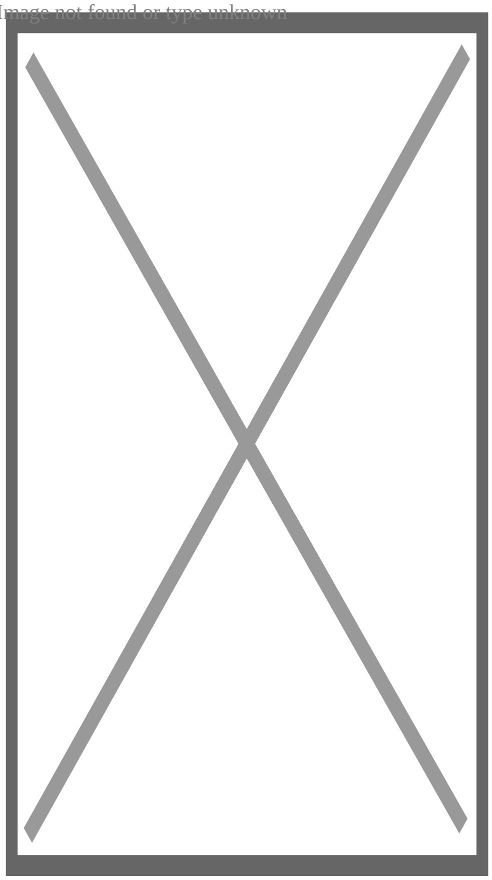

Military building mobile unit on "Army-2021" exhibition

Vertical travel leads come in two main forms: spud and box lead types. Box leads are very common in the Southern United States and spud leads are common in the Northern United States, Canada and Europe.

Hydraulic hammer

[edit]

A hydraulic hammer is a modern type of piling hammer used instead of diesel and air hammers for driving steel pipe, precast concrete, and timber piles. Hydraulic hammers are more environmentally acceptable than older, less efficient hammers as they generate less noise and pollutants. In many cases the dominant noise is caused by the impact of the hammer on the pile, or the impacts between components of the hammer, so that the resulting noise level can be similar to diesel hammers.[12]

Hydraulic press-in

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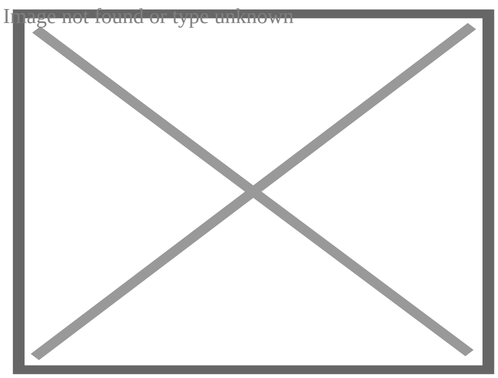

A steel sheet pile being hydraulically pressed

Hydraulic press-in equipment installs piles using hydraulic rams to press piles into the ground. This system is preferred where vibration is a concern. There are press attachments that can adapt to conventional pile driving rigs to press 2 pairs of sheet piles simultaneously. Other types of press equipment sit atop existing sheet piles and grip previously driven piles. This system allows for greater press-in and extraction force to be used since more reaction force is developed.[12] The reaction-based machines operate at only 69 dB at 23 ft allowing for installation and extraction of piles in close proximity to sensitive areas where traditional methods may threaten the stability of existing structures.

Such equipment and methods are specified in portions of the internal drainage system in the New Orleans area after Hurricane Katrina, as well as projects where noise, vibration and access are a concern.

Vibratory pile driver/extractor

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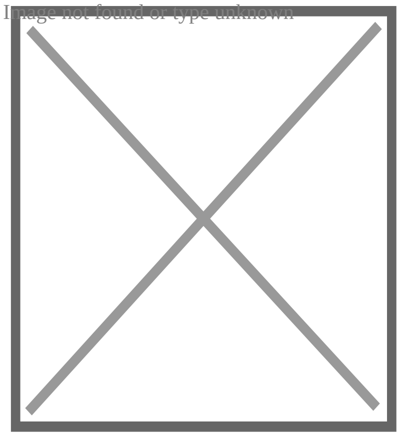
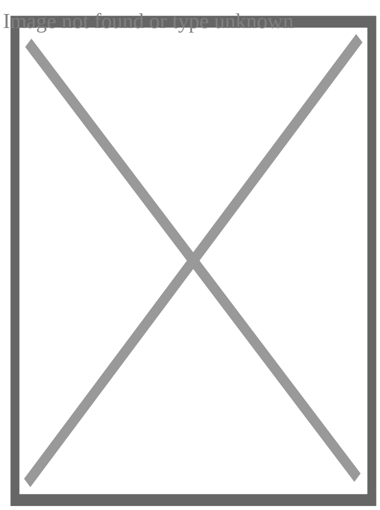


A diesel-powered vibratory pile driver on a steel I-beam

Vibratory pile hammers contain a system of counter-rotating eccentric weights, powered by hydraulic motors, and designed so that horizontal vibrations cancel out, while vertical vibrations are transmitted into the pile. The pile driving machine positioned over the pile with an excavator or crane, and is fastened to the pile by a clamp and/or bolts. Vibratory hammers can drive or extract a pile. Extraction is commonly used to recover steel I-beams used in temporary foundation shoring. Hydraulic fluid is supplied to the driver by a diesel engine-powered pump mounted in a trailer or van, and connected to the driver head via hoses. When the pile driver is connected to a dragline excavator, it is powered by the excavator's diesel engine. Vibratory pile drivers are often chosen to mitigate noise, as when the construction is near residences or office buildings, or when there is insufficient vertical clearance to permit use of a conventional pile hammer (for example when retrofitting additional piles to a bridge column or abutment footing). Hammers are available with several different vibration rates, ranging from 1200 vibrations per minute to 2400 VPM. The vibration rate chosen is influenced by soil conditions and other factors, such as power requirements and equipment cost.

Piling rig

[edit]



A Junttan purpose-built piledriving rig in Jyväskylä, Finland

A piling rig is a large track-mounted drill used in foundation projects which require drilling into sandy soil, clay, silty clay, and similar environments. Such rigs are similar in function to oil drilling rigs, and can be equipped with a short screw (for dry soil), rotary bucket (for wet soil) or core drill (for rock), along with other options. Expressways, bridges, industrial and civil buildings, diaphragm walls, water conservancy projects, slope protection, and seismic retrofitting are all projects which may require piling rigs.

Environmental effects

[edit]

The underwater sound pressure caused by pile-driving may be deleterious to nearby fish.[13][14] State and local regulatory agencies manage environment issues associated with pile-driving.[15] Mitigation methods include bubble curtains, balloons, internal combustion water hammers.[16]

See also

[edit]

- Auger (drill)
- Deep foundation
- Post pounder
- Drilling rig

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[edit]

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External links

[edit]

Image not found or type unknown

Wikimedia Commons has media related to ***Pile drivers***.

- Website about Vulcan Iron Works, which produced pile drivers from the 1870s through the 1990s

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Driving Directions in Cook County

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