

Understanding the Role of Different Piling Types in Residential and Commercial Construction

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Pilings serve an important structural role in residential and commercial construction, particularly when surface soils cannot adequately support the weight of a building. Different piling materials and installation methods address different soil conditions, structural loads, site limitations, and construction requirements.



In Louisiana, foundation planning can take on additional importance because soil conditions can vary considerably from one property to another. Soft soils, high moisture levels, settlement concerns, and changing subsurface conditions can influence how a foundation is designed.

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[Elwin Ordoyne](#), Vice President of [E.C.O. Builders Inc.](#) in Slidell, Louisiana, says understanding what happens below a structure is an important part of understanding how the structure is supported.

“Most of the foundation is eventually hidden from view, but that does not make it any less important,” Ordoyne said. “Pilings are designed to transfer structural loads into soil

layers capable of supporting those loads. The type of piling used depends on the building, the site, the soil conditions, and the engineering requirements.”

Pilings are long structural elements driven, drilled, pressed, or otherwise installed into the ground. Rather than relying entirely on soil near the surface, a piling foundation can transfer loads deeper underground.

Several types of pilings are commonly encountered in residential and commercial construction.

Timber Pilings

Timber pilings have a long history in construction and remain familiar throughout Louisiana and other coastal regions.

Typically manufactured from treated wood, timber pilings can be driven into the ground until reaching a depth and soil condition specified by the project design. Treatment helps protect the wood against decay, insects, and environmental exposure.

Timber pilings may be used for houses, camps, elevated structures, docks, and other projects where design conditions permit their use.

“Timber pilings are something many Louisiana property owners recognize because of the amount of construction that has historically taken place in wet and coastal environments,” Ordoyne said. “Their suitability still depends on engineering calculations, anticipated loads, soil conditions, and the specific application.”

Precast Concrete Pilings

Precast concrete pilings are manufactured before arriving at a construction site and are commonly driven into the ground using specialized equipment.

Concrete provides substantial compressive strength and can be used in projects requiring greater load capacity or resistance to certain environmental conditions. Reinforcement within the concrete can provide additional structural properties.

These pilings can be found beneath residential structures as well as larger commercial buildings, depending on engineering requirements.

Because precast pilings arrive at the site as completed structural elements, planning must account for transportation, equipment access, piling length, driving conditions, and available working space.

Steel Pilings

Steel piling systems can be used when structural loads, depth requirements, or site conditions call for the characteristics provided by steel.

Several configurations exist, including steel pipe piles and H-piles. Steel pilings can reach significant depths and are frequently associated with commercial, industrial, infrastructure, and



other heavily loaded structures.

The ability to extend or splice certain steel piling systems can also be useful when deeper bearing conditions are encountered.

“Commercial projects can create very different foundation demands compared with smaller residential construction,” Ordoyne said. “Building weight, equipment loads, structural configuration, soil conditions, and long-term use all become part of determining what foundation system is appropriate.”

Drilled Shafts and Cast-in-Place Systems

Not every deep foundation element is hammered into the ground.

Drilled shafts, sometimes called drilled piers or caissons depending on the design and terminology used, are created by drilling a hole into the ground and filling it with reinforced concrete.

This method can provide support for substantial structural loads and may be used when project conditions make driven piles less appropriate.

Cast-in-place piling systems follow a similar general concept of creating the structural element at the construction site rather than transporting a completed pile to the property.

The diameter, depth, reinforcement, and concrete specifications are determined according to engineering requirements.

Helical Piles

Helical piles use steel shafts equipped with helical plates resembling large screw threads. Rather than being driven by repeated impacts, the piles are rotated into the ground.

Installation torque can provide information related to soil resistance as the pile advances.

Helical systems may be used in new construction, additions, foundation stabilization, and certain repair applications. Their installation can also be useful where access for larger pile-driving equipment is limited.

The appropriate use of helical piles depends on soil conditions, structural loads, engineering specifications, and project requirements.

Soil Conditions Help Determine the Foundation

Choosing a piling system is not simply a matter of selecting a preferred material.

Soil plays a significant role.

A property can contain multiple soil layers with very different characteristics. Surface soil may appear stable while deeper layers contain soft clay, loose material, organic matter, or other conditions affecting structural support.

Geotechnical investigations can provide information about subsurface conditions. Engineers can use that information along with building loads and structural plans to determine foundation requirements.

“The building and the ground have to be considered together,” Ordoyne said. “A piling system that makes sense for one property may not be appropriate for another property only a short distance away.”

Piling depth can also vary considerably. Some projects require relatively shallow installations, while others require piles extending much deeper before appropriate support conditions are reached.

Residential and Commercial Requirements Can Differ

Residential and commercial structures can place substantially different demands on foundations.

A single-family residence may have different load requirements than a multistory commercial building, warehouse, restaurant, office building, or industrial facility.

Commercial structures may also contain heavy equipment, concentrated loads, larger structural spans, elevators, mechanical systems, or other elements affecting foundation design.

Residential construction presents its own considerations, particularly when homes are elevated, constructed in flood-prone areas, expanded with additions, or built on properties with challenging soil conditions.

Regardless of building type, piling selection is ultimately a structural and engineering decision rather than a one-size-fits-all construction choice.

Once construction is complete, most pilings disappear beneath slabs, grade beams, foundations, or the building itself. Their work, however, continues for the life of the structure.

Understanding the differences among timber, concrete, steel, drilled, cast-in-place, and helical piling systems provides a clearer picture of how foundations interact with the ground beneath residential and commercial buildings.

About E.C.O. Builders Inc.

E.C.O. Builders Inc. is a Slidell, Louisiana-based construction company involved in residential and commercial construction, renovations, additions, and related building projects throughout the region.

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