E.C.O. Builders Inc. Explains Common Causes Behind Leaning, Cracking and Failing Bulkheads

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Bulkheads along waterfront properties serve an important structural purpose by separating land from water and helping retain soil along shorelines. Over time, however, a bulkhead can begin leaning toward the water, developing cracks, separating at joints, or showing other signs of structural deterioration.



E.C.O. Builders Inc., a construction company based in Slidell, Louisiana, is providing information about several conditions that can contribute to bulkhead deterioration and the warning signs property owners may encounter.

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>
> *Elwin Ordoyne*

Bulkhead problems rarely develop from a single factor. Soil movement, hydrostatic pressure, drainage problems, corrosion, material deterioration, changing water levels, storms, installation conditions, and age can all affect structural performance.

"A leaning bulkhead is often the visible part of a problem that has been developing behind the wall for some time," said Elwin Ordoyne, Vice President of E.C.O. Builders Inc. in Slidell, Louisiana. "Soil conditions, drainage, anchoring, water pressure, and the condition of the materials all need to be considered when determining what caused the movement."

Pressure Behind the Bulkhead
A bulkhead does more than create a boundary at the edge of a property. The structure must

resist pressure from the soil retained behind the wall.

That pressure can change considerably when the soil becomes saturated.

Heavy rainfall, poor drainage, high groundwater levels, and runoff can increase the amount of water behind a bulkhead. When water cannot drain properly, hydrostatic pressure can develop against the structure.

The additional force can contribute to bowing, leaning, cracking, or movement.

Louisiana properties can experience periods of substantial rainfall, making drainage an important consideration for waterfront structures. Water trapped behind a bulkhead may place pressure on a wall from one direction while water on the opposite side creates another set of forces.

Soil Loss Can Create Hidden Problems
Soil erosion behind a bulkhead may not immediately be visible from the water.

Small openings, failed joints, damaged components, or drainage problems can allow soil to migrate through or beneath the structure. As material disappears, voids can form behind the wall.

Signs may eventually appear on the landward side.

Depressions in the yard, sinking areas near the bulkhead, cracks in nearby concrete, or gaps developing along the top of the wall can indicate movement beneath the surface.

The bulkhead itself may begin shifting as support conditions change.

Anchoring Systems Can Deteriorate
Many bulkhead systems depend on anchors, tie rods, deadmen, pilings, or other structural components to resist pressure from retained soil.

Failure or deterioration of those components can allow the wall to move toward the water.

Metal components may corrode. Wood components may deteriorate. Connections can loosen or fail. Soil surrounding an anchoring system can also change over time.

Once an anchoring component loses structural capacity, pressure that was previously distributed through the system may begin affecting other sections of the wall.

The result can appear as a localized lean initially and become more pronounced as movement continues.

Material Deterioration Varies by Bulkhead Type
Bulkheads can be constructed from wood, steel, vinyl, concrete, composite materials, or combinations of different materials.

Each material has different characteristics and potential deterioration patterns.

Wood can be affected by moisture, organisms, decay, and repeated exposure to waterfront conditions. Steel can experience corrosion. Concrete can develop cracking, spalling, or deterioration around reinforcing materials. Vinyl and composite systems can experience movement or damage associated with connections, installation, impact, or structural loading.

Age does not automatically mean failure, but older materials may require closer examination as environmental exposure accumulates.

Drainage Plays a Significant Role
Drainage is one of the less visible parts of bulkhead performance.

Rainfall and groundwater need somewhere to go.

When drainage pathways become blocked or were not properly incorporated into a system, water pressure can build behind the structure.

The problem may become particularly noticeable following extended periods of rain.

Standing water near the bulkhead, unusually wet soil, erosion patterns, or water emerging from unexpected locations can provide clues about drainage conditions.

“Water management is an important part of understanding bulkhead movement,” Ordoyne said. “A wall may appear to be the problem, but conditions behind the wall can be contributing significant pressure. Looking only at the visible surface does not always reveal the complete cause.”

Boats, Waves and Changing Water Conditions Add Stress
Waterfront structures also experience forces from the water side.

Boat wakes, wave action, fluctuating water levels, currents, floating debris, and repeated impact can contribute to deterioration.

A single event may cause obvious damage, while repeated smaller forces can gradually affect

components and connections.

Properties along navigable waterways may experience different conditions from properties along quieter canals or ponds. The surrounding environment therefore becomes part of any assessment of bulkhead condition.

Storms Can Accelerate Existing Problems
Louisiana waterfront structures are also exposed to tropical storms and hurricanes.

Storm surge, high water, wave action, wind-driven debris, saturated soil, and rapid changes in water levels can place unusual loads on a bulkhead.

A structure with existing deterioration may experience additional movement during a storm.

Damage may also remain unnoticed after water levels return to normal. Changes in alignment, newly formed cracks, soil loss, or movement around connections can indicate that conditions changed during the event.

Cracks and Leaning Should Be Viewed as Symptoms
Visible damage can provide information, but the appearance of a bulkhead does not necessarily identify the underlying cause.

A crack might result from material deterioration, soil pressure, movement, impact, or a combination of conditions. A leaning section could involve anchoring problems, drainage, erosion, structural deterioration, or changing soil conditions.

Understanding the cause requires looking beyond the damaged area.

Bulkheads operate as systems involving soil, water, drainage, structural materials, anchoring, and environmental conditions.

When one part of that system changes, visible movement can develop elsewhere.

For waterfront property owners, recognizing those relationships can help explain why a bulkhead that remained relatively unchanged for years may suddenly begin showing signs of deterioration.

A leaning wall may be the symptom.

The cause may be hidden several feet behind it.

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