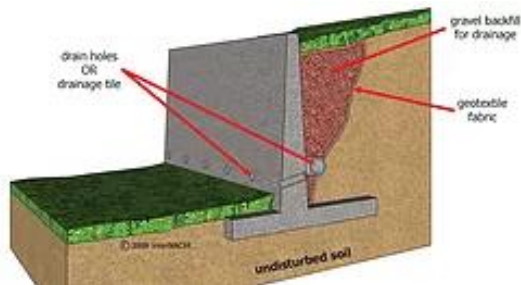


Inspecting retaining walls is a difficult process. As with a lot of systems we inspect, the most important components are not readily visible. Therefore, we have to rely on our knowledge and experience to identify and report our findings. When inspecting retaining walls several factors need to be considered.

Ownership – Who owns the retaining wall and who is responsible for routine inspections and maintenance. This can be difficult to determine as usually we do not know where the property boundaries are or in the case of common property like town homes who owns the wall and who is responsible for its maintenance. Even if it clearly belongs to the neighboring property, if adverse conditions are present and it could impact the home you're inspecting it should be brought to the attention of the client.

Location - Where is the wall located and what adverse impact could it have on the home? Is the wall accessible for repairs or replacement (think cost)?

Type – By this we mean is it attached to the home or a stand-alone feature. Those that are attached to the home in our opinion should be considered part of the home and inspected and reported on. If it's not attached to the home and it does not appear to have the potential to impact the home, should it fail, its presence should be noted and inspection is discretionary.



Construction methods – There are multiple types of retaining walls used in residential construction. The type of materials can determine what type of conditions may be present and the inspection techniques used to identify defects. In the Charlotte area you will find many different types of retaining walls, the most common for residential construction is brick/Block (CMU), poured concrete, modular block systems and wood timbers.

Common Problems –

Movement – The biggest enemy of retaining walls is water. Wet soil puts pressure on the wall. If it freezes, expansion occurs and the forces can be significant. Walls can crack and break apart or move as a single unit away from the embankment.

Poor Water Management – Properly built walls will have details such as gravel behind the wall, one or more drainage pipes behind the wall, geo-textile and weep or drainage holes at the base of the wall. Trapped water behind the wall will create pressure against the wall and over time result in movement. Equally important is proper management of surface water. Is it directed away from the wall and are proper control measures in place at the ends of the wall to prevent erosion?

Improper Construction – Each type of retaining wall system has specific construction techniques that are required to ensure the wall performs properly. Failure to follow the recommended installation guidelines can result in premature failure of the wall system. Unless we were there during construction most of these features are not visible. Sometimes you can see signs/clues of the methods used to construct the wall.

Inspection

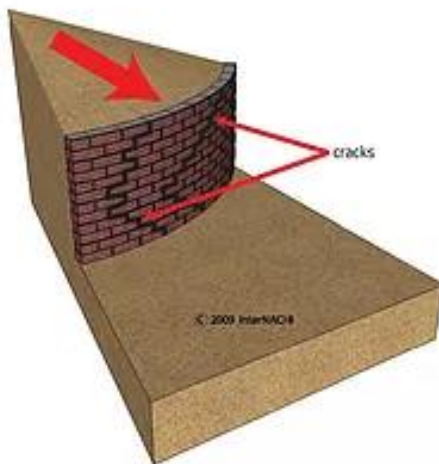
Most walls are built to slightly lean into the embankment with the top of the wall farther in than the bottom of the wall. Check to see if the wall is leaning away from the hill side, if it is movement has

occurred. In general once signs of movement are detected it should be anticipated that the wall will continue to move.

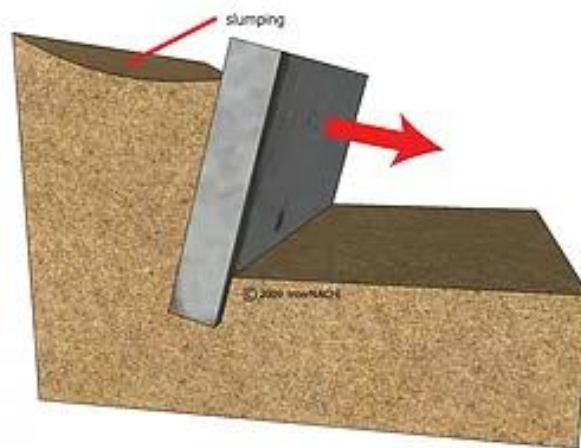
Unfortunately, movement may be slow or seasonal and it is impossible to determine the rate of movement during the short duration of a typical home inspection. This type of condition will require monitoring or may need further review by a specialist.

Check masonry or poured concrete walls for leaning, bulging, bowing or cracking. These are the most common conditions noted on these types of walls. Lack of proper type and spacing of weep holes also presents a concern.

Inspecting Retaining Walls - Things to Watch For
wall bowing



Inspecting Retaining Walls - Things to Watch For
wall not plumb and leaning away



Frost/freezing cracking does not typically result in leaning or bowing of the wall. Excessive water behind the wall will produce leaning or bowing in addition to cracking.

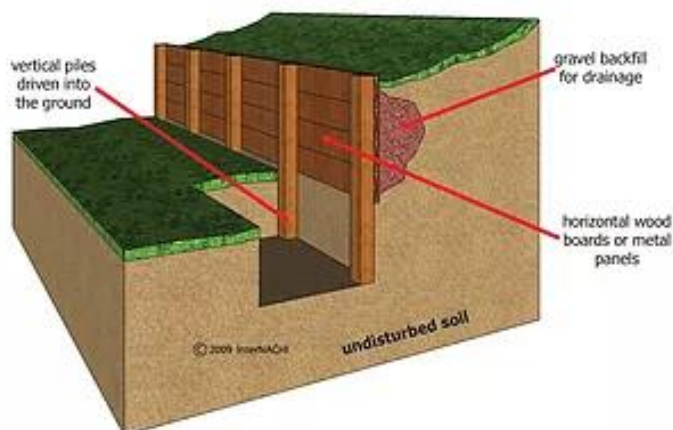
Inspect the top of the wall and look for sink holes or voids where water may flow or collect and add pressure behind the wall. Also check the ends of the wall where it terminates there should be no erosion at or near the wall and proper provisions for proper water management should be present.

Wood timber retaining walls were popular in this area especially during the 70's and 80's. Many are at or very near the end of their useful life. Wood timber walls suffer from decay. The most common location to check for decay is at the cut end of the timbers. Usually, decay starts in this area first and then progresses through out the timber. If you see organic growth such as mushrooms growing out of the wall you can assume that additional decay is present but may not be visible or detected.

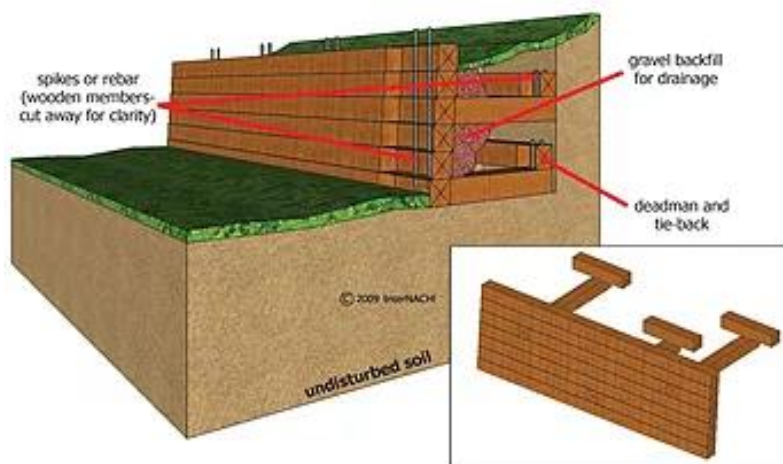
The type of timbers used can impact the life of the wall. Railroad ties and pressure treated lumber are commonly used. Rail Road ties may be new or old ties that have been removed from service. If old ties are used you should expect a shorter life span and be especially vigilant in looking for decay. Treated lumber should be rated for ground contact however, determining this is not always possible. Look for mill stamps/marks on the lumber. There have been reports of untreated lumber being stained green to simulate pressure treatment.

There are basically two different types of wood retaining walls, pile and stacked. The pile wall will have timbers driven vertically into the ground and wood planking attached to the timbers and then back filled. The stacked timber wall is just that usually 6x6 timbers stacked on top of each other. Construction details to look for on a stacked wall are, each timber should be set back slightly from the one below so it leans into the hill, there should be spikes driven into each timber to connect it to the timber below. Look for a timber placed perpendicular to the other timbers where you can only see the end. This is an indication tie backs and “dead men” have been used to help anchor the wall to the hill and resist movement.

Pile Retaining Walls (Shoring)



Wooden Retaining Wall System



Modular or precast block walls are built to a specific set of guidelines provided by the manufacture. As with the other type of walls most of the details are not visible once the wall has been completed. Some clues may be evident such as geo-textile fabric may be visible between the courses on a regular spacing. Drain piping may be visible at the bottom ends of the wall. As with the other types bowing or leaning along with erosion of the dirt bank along the top or side of the wall are conditions that may be present. Check the wall height and block type walls over 4 feet high required specific types of block and installation details.

Since these walls have a large number of open joints they are porous and water will weep between the blocks. Staining is not uncommon but you should look for signs of excessive staining or heavy localized staining this could be an indication of a drainage problem.

The bottom line is retaining walls can have an impact on the home you are inspecting and repairs can be difficult and costly.