

- The large number of unplanned repairs and expansion without studying and using materials that cause damage to iron and concrete.
- Making additional supports in sizes that the foundations or the soil cannot bear.
- Renovation by non-specialist team and unsuitable materials.
- Not taking into account during the restoration any consideration of weight, stress and safety factor.
- Cracking the load-bearing walls.

[3] Negligence in Maintenance

The concept of maintenance is missing for many reasons that we cannot limit; Western societies give maintenance an importance that may exceed the importance of building construction, and one of the manifestations of neglect of maintenance is the following : [17]

- Maintenance means periodic inspection of every element of the building, and the most important of these elements are the structural elements with modern and advanced equipment to treat any defect in its beginning, as well as attention to everything that may affect the building and its safety.
- Corrosion of iron and concrete Corrosion of steel reinforcement and concrete occurs for one of the following reasons :
 - The proximity of the foundations to the places of drainage, whether for factories or human waste.
 - Corrosion due to neglect of maintenance and immediate treatments for water leakage.
 - High ground water level without taking it into consideration during design and implementation.
 - Large loads or heavy equipment.
 - Tremors and earthquakes.
 - Change and shift in use.
 - Excavation works next to the foundations without taking precautions.
 - Leakage of water, whether from rain or other, and the occurrence of a sudden subsidence of the soil for this reason.
 - Temperatures due to nearby fires or the atmosphere and the occurrence of separation of walls.
 - Problems for neighboring buildings A nearby building may collapse, whether it is completely or partially, it may be eligible to fall. Therefore, the condition of the neighboring buildings must be taken into account, whether during design, implementation, maintenance and repairs.
 - Not relying on good reports from reliable sources regarding soil and foundation works.
 - Moisture: The movement resulting from moisture is a natural and common phenomenon that affects building components, and is one of the main sources of defects in building components and elements.
 - Motion due to moisture can occur as a separate problem or in association with other causes that produce movement, such as heat movement, which generally produces a set of symptoms.

[3] Environmental Factors

Environmental factors are among the factors that greatly affect the decline of buildings, such as : [15]

- [1] Volumetric changes that occur in the soil under the building as a result of soil compaction is mainly as a result of the convergence of soil particles, so we find that soils with large particles, such as sandy soil, whose diameter ranges from 2 mm for coarse sand up to 0.2 mm for fine sand and up to 0.06 mm for the most Fineness: Compression occurs faster than clay soils

whose part diameter is less than 0.002 mm. Therefore, we see that the landing of buildings built on clay soil takes longer time to descend than those established on sandy soil.

- [2] The effect of static loads such as those caused by the building itself.
- [3] The change in the moisture content in the soil, for example, we see a difference in the moisture content as a result of the rise and fall of the groundwater level, the difference in the level of infiltration water, or the change in the moisture percentage as a result of water absorption in the soil by the roots of plants and crops.
- [4] The effect of dynamic loads, such as those resulting from the presence of special fulcrum machines, if their location is creeping close to the building fulcrum points.
- [5] Existence of excavation works next to the building, which causes the loss of special supports due to the encroachment or flight of the soil.
- [6] The effect of vibrations, especially in soils with loose grains (loos grane-soil), such as those resulting from heavy or fast traffic.
- [7] Decomposition of the foundation as a result of the presence of organic materials or dissolved salts in the soil in high proportions.
- [8] Soil decomposition under the building.

Precautions to be taken to reduce building collapse

Failure to take technical precautions and follow engineering standards when establishing on parasitic soil without replacing the soil with good soil compaction, and not being careful about the presence of chemicals in the soil may lead to erosion and interactions of concrete and rebar, and this occurs whenever the building is close to factories and waste dumps, and neglecting tests and tests Soil stress is a major and important factor that many people neglect for many reasons, the most important of which is the desire to save and obtain licenses in a fictitious way and assign the matter to non-specialists; There is also the problem of foundation on ruins and areas of backfilling or archaeological places, as this means that there are layers of backfill that must be removed to reach the appropriate land for foundation and according to the technical reports received from construction specialists in areas prone to collapse without taking this into account during the design. [11]

There are some recommendations that should be taken into account to reduce the slump of buildings and to avoid irregular landing; It consists of the following : [9]

- [1] The accurate calculation of the actual loads of the building taking into account the dead and live loads and the forces resulting from wind pressure, vibrations and eccentric loads.
- [2] Good testing and accurate design of the type of foundation in relation to the type of soil present, provided that the stresses generated by the building are within the safety limits for the ability of the soil to bear the stresses.
- [3] Keeping the foundation level as far as possible from areas of vibration, such as areas adjacent to railways or exposed to heavy transport traffic.
- [4] Avoiding the foundation on soil whose water content changes frequently as a result of the high and low level of infiltration water, such as the soil near canals and waterways.
- [5] Avoiding excavation works, especially the deep ones adjacent to the foundations, to prevent the encroachment of the soil.
- [6] Avoid lowering the level of infiltration water, especially if the foundations are shallow.
- [7] Calculating the amount of subsidence over the life of the building and taking it into account.

- [8] Rapid treatment of any slump that arises in the building, whether by lightening the loads, treating the foundations, or injecting the soil.
- [9] Avoid establishing a single building on more than one type of soil, and in case of necessity, the building is divided as a unit into parts with breaks between them.
- [10] Taking into account the cohesion of the building as a single unit, by increasing the structural sectors for the foundations and arming the ridges with special armament.

Methods of preventing and treating the consequences of differential subsidence of the foundation : [7]

- Study the surrounding environment.
- The soil on which the building is erected should not be of a loose nature.
- Connecting the rules or using a cloth.
- Appropriate soil treatment, ie strengthening the soil.
- Laying all foundations/bases at the same level.
- Avoid foundation in soils that are subject to cycles of drought and wetness.
- Reduce the space between columns.
- Distribution of loads in a proportional and convergent manner.
- Use fallen beams whenever possible.
- Attention to the implementation of the Maidah or Saml.
- Review the design well.
- Selection of a reputable contractor.
- Providing periodic engineering inspection and supervision.
- Compaction of foundation soil before foundation implementation.
- Plant trees away from the building.
- Implementation of the drainage and plumbing system tightly.
- Stay away from orchards and primitive septic tanks.
- Commitment to the terms and conditions of construction in the region, especially the depth of foundation.
- In the case of excavation more than the level, do not try to fill in a random way again. Deal with the excavation difference or backfill the excavations using good soil (replacement soil) and in layers not exceeding 25 cm with tamping and leveling. Replacement soil layers should be tested.

Discuss the results

It is clear from the above that the reasons for the decline of low buildings do not have to be caused by a height in buildings or land area, but it has many reasons that were previously mentioned, so there are many precautions that must be taken to reduce the decline of buildings in low buildings, including: Obligation to inspect the surrounding area The building and the detection of the soil and buildings adjacent to the building and any cracks or subsidence in the surrounding buildings, in addition to resorting to specialized laboratories in geology to identify the type of soil, in order to determine the mechanism by which we will deal with this soil and the appropriate constructions, and the treatment of foundations can be achieved through The application of many techniques, the most widely used, namely: curing foundations by concrete reinforcement, curing foundations by soil injection, treating foundations

with micro piling, curing foundations using injection of expandable geopolymers, given the possible causes of differential subsidence of foundations and its impact on the overall stability and balance of structures buildings; It is necessary to take them into account when designing foundations for various structures in order to reduce the effect of differential landing to an acceptable and safe level.

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