

Causes of deterioration in building and their services construction essay



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The main purpose of this report is to discuss causes of the building deterioration, effective maintenance program for buildings and with building repair in an attempt to overcome such common building problems. In addition, it also highlights cyclical, planned and reactive maintenance programs and principles of repair. Then we have discussed about how the design, construction and maintenance affect to the building's dilapidation.

2. 0 causes of deterioration in building and their services

Substructure and superstructure is the main part of any kind of building (low rise, mid rise and high rise buildings). When we talk about the superstructure, many services include in there. Such as electricity, telecommunication system, water supply system and etc. also superstructure is give the beauty of the building and substructure gives the strength to the building. Now we check how the maintenance programs connect for above things.

All the materials are we used for the construction decay with the time being. So, if we do not consider about or not pay attention for those materials, our building may be decay faster. That is why need for the maintenance program for every and each building. This maintenance system is very essential for the building. If we do not care maintenance for any building, that particular building not is safe for the people who live or work in there and people not feel willing to be there. Also that building's life duration may decrease. So there have many deterioration factors. Therefore we must careful about the maintenance of the building. Appraisals can assess various properties of buildings and elements, the two most related ones being strength and durability. Strength reflects the ability of a structure to carry present and

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future loads, while durability refers to a duration over which the structure will be serviceable.

This deterioration effect for the building structure and for the building services. Building structure mean walls, floors, roof and etc. then services mean electricity, water supply and etc. now let we discuss what are the deterioration factors and how they effect for the building and their services.

Faulty of construction directly affect to the deterioration. During the any construction, there have many things to do. Such as dig the trenches, make the foundation, put the concrete, frame work, masonry work and etc. so those al the works should be do according to particular specification and drawings that create from architectures and engineers. This specification and drawings shows the clear, protective and efficient path for the building. If supervisors not using this specification correctly, the whole construction going wrong. So that will cause for the deterioration of that building. As s example, let us assume the specification says the trenches must be 2m depth. But workers may dig only 1. 6m. So that is an error. That error will cause for deterioration of that building. It means, after some time left that foundation may be corrupted. In that case, lack of supervision also affects. If supervisors do not supervise workers well, workers will do the works according to their willingness. So it means, supervision also should be having standard level.

This supervision and using specifications factors also affect to the building services. If the electrical supervisor work without the specification and drawings that may be very dangerous. So that is the building service

deterioration. This same to the other services also. Such as water supply, telecommunication system and etc.

But sometimes, some are failure to understand or follow the specification and drawings for their duties. This factor also affects to increase the building and building services deterioration. The lack of skill labor will also cause for this matter. In this case, there may have good supervision, accurate using of specification and drawings. But without the skill labors, which works (concrete works, electrical, water supply etc) are cannot do correctly. Therefore that will cause to the deterioration of building and their services.

Faulty of the materials will affect to building and building services deterioration. Construction materials and services are the two categories of materials. Cement, sand, aggregate and etc are the construction materials and electrical wires, pipes, lights, switches, air conditions, showers, taps and etc are the building services materials. Actually, materials will directly affecting to the building deterioration. If construction materials (cement, aggregate and etc.) are not in slandered level, we cannot expect the maximum lifetime of the particular building. Also, if we using not suitable building services materials (taps, lights and etc.), we could not get the good services from that building.

Sometimes, client may not have small amount enough money for his project. At that time he rejects some specific sub standard materials and then he reapply some low quality materials for that particular instead material. That will be one situation we use low quality materials for the construction.

Contractor also do this because for his advantage. It means, standard

materials are cost than the low quality materials. Therefore contractor may use those low quality materials.

Inadequate supervision also affect to this problem. Because of, sometimes supplier will decrease the quality of the materials. As an example, supplier will supply low quality sand for the project. So that will affect mainly for the plastering deterioration. Sometimes supervisor also does not care about what we receiving from the supplier. As an example, if supplier bring the bricks for the site. That bricks may be not in a standard level. So, if supervisor is not check those bricks that also are the building deterioration.

Lack of Storage facility also affect to the faulty of materials. In this case, supplier supplies the good materials. But site may not have well storage to store the materials. As an example, if there have taps, air conditional units and etc things and there have not good storage facility, those materials will damage or materials quality will decrease.

According to above factors and examples, we know faulty of materials will affect directly to the building and building services also.

Moisture is the most common cause for building deterioration. Moisture is more effect to the building. Not for the building services. Moisture is required for all such actions. Therefore, keeping building materials in a dry state will greatly reduce the rate of deterioration. Because of the moisture is help to some harmful growth. if plants are allowed to take root in buildings, they can cause severe cracks, not only in masonry, but also in concrete. Therefore plaster will try to crack. Also Conditions under which wetting and drying take place are the worst for the durability of building materials.

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Chemicals cause for the building deterioration. In this section only the common chemical types will be discussed. Atmospheric carbon dioxide reduces the alkalinity of concrete and will lead to depassivation of steel reinforcement. Chlorides will also lead to such reduction in alkalinity, and also promote electrolytic corrosion processes in both reinforced concrete and steel. Sulphates can attack the concrete itself, causing cracking and weakening in foundations. sulphates and chlorides can also get into concrete through polluted mixing water. Also, some chemicals must not use for the building repairs and things. Such as caustic soda should not be used because they contain soluble salts which likely can cause serious damage to walls, particularly of stone.

Structural form also one of the main factor among the building deterioration. Nature of response of the structure will depend on the form of loading, direction of the force. In the traditional form of construction, due to limitations of the strength of constructional materials, the spans of narrow spaces which resulted in a well tied structure. Hence, deterioration due to form of the structure was low.

The structure would hold large amount of weight without losing the structural stability. In comparison, the modern structures where large modules of construction begin. So range of physical movements increases rapidly. The numbers of joints are now less with large spans of construction. Flexibility of traditional structure has been replaced with hardly. The form of structural design should have a connection with the working patience and quality of construction force. For example, use of trusses to get free space

on the ground that these trusses are exactly plumb and in a straight line.

The stability of all joints depends on the truss plumb and in a line.

With the movement towards slim and tall structural elements there is a corresponding increase in slenderness percentage. The modern design criteria for brick work for load bearing walls has been developed around concepts of required thickness in relation to height and length. However, the quality of plumbness and quality of joints in the brickwork is expected to be excellent which unfortunately it is not.

Above factors causes to create stress and then that stress will distribute stresses cracking. Therefore structure's lifetime may decrease. Then we have to repair those cracking. So, that will be additional problems in maintenance.

Affect of the atmospheric for the building deterioration is various for the country to country, provision to provision and area to area. Wind, rain, sun and etc are some atmospheric elements in this world. Therefore, we have to make decision about suitable substructure and what materials use for that and what kind of materials use for the superstructure according to the atmospheric elements of the site area. Because various materials reaction to the atmospheric elements from different ways.

As an example, steel is expanding with the heat. So, when we use steel structure for any particular building, we have to consider about that factor. If we did not consider it that will be cause to the obstacle during and after the construction. Also it will disturb to the maintenance of that building. It means, the maintenance cost may go increase.

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Mostly the superstructure is uncovered for the external environment. Walls and roof is the main part of the superstructure. So, superstructure will face to the all atmospheric elements. Therefore there have enough probability to decay the walls, roof, doors and windows. Among the superstructure factors, the most sensitive factor is external fabrics and finishes. Because external fabrics and finishes will reaction highly with atmospheric elements. As a result of that, fabrics and finishes may be chip with the time. So it is the one kind of building deterioration. Also, the external fabrics and finishes are showing the beauty of every building. So, there must have good maintenance program for the superstructure to control the deterioration of the atmospheric elements.

Heat will help accelerate all deterioration processes. In addition, heat can cause expansion and subsequent compression when the heat source is lacking. Such thermal movements can weaken materials with low flexible strengths such as masonry, and cause cracking. Heat can also weaken some waterproofing materials, and cause them to lose their flexibility or even to crack. It will increase with especially in combination with direct solar radiation.

Cleaning also directly affect to the building and building services deterioration. This cleaning system should be doing in a proper way. Otherwise that may cause to increase the deterioration of the building and building services. When we live or work inside the any building, there should have well environmental. So there must have good cleaning system.

Therefore, routine cleaning operation must be a good level. But all the cleaning systems are not routine. Sweep, mop and etc are some of the <https://assignbuster.com/causes-of-deterioration-in-building-and-their-services-construction-essay/>

routine cleaning things. If the routine cleaning operation not going a proper way, the building may unclean quickly. Mostly floors and walls may face to that.

Cleaners may not have good idea or pre experience about the cleaning and cleaning materials and techniques. So they will use incorrect cleaning materials and or techniques. As an example, if any cleaner do not know the technique to clean the air condition unit or clean the escalators correctly and but he try to do that duty that air condition unit may break and escalator may be damage. So that will affect to the building services deterioration. Also if we not using the specialist man to clean the water supply system in building, that also harmful for the water supply service of building.

Also, if there have not cleaver supervision for the cleaning system, that also will case for the building and building services deterioration. Because, cleaners not doing always their cleaning duty accuracy. Therefore, always requires the well supervision for control the cleaners and the cleaning system effectively. Then we can decrease the building and building services from the deterioration.

2. 1 need of planned, cyclical and reactive maintenance program for buildings

Cyclical Maintenance of the building is very important thing to protect the building from various deterioration factors. Therefore the cyclical maintenance program plays a major role for reduce building deterioration. Some buildings that do not care building maintenance may fall into several defects which may lead to structural failures. Any inspections carried out by

either architects or surveyors should include checking for any signs of abnormal deterioration, cleaning out gutters of leaves or harmful growth, checking lighting conductors, cleaning out all voids and spaces and changing tap washers. To secure the general structural stability and life of a building, it is important to regularly inspect not only the main structural elements including foundations, walls and roofs.

Depending on the nature work of maintenance and repairs, the program of cyclical maintenance may be divided into two main categories. Those are day today maintenance and maintenance involving builder's works. The day today maintenance includes work which can be dealt by building owner without the need to employ outside labor. This consists of cleaning leaves from gutters, down pipes and drainage channels, removing plant growth from walls and checking ventilation. In addition, fire detection systems should also be checked as well as windows, doors and electrical system. It is advisable to ask cleaners to report any defects they note such as broken windows, leaks in roof, falling pieces of masonry and lime dust from spall of plaster.

The second category, which is maintenance involving builder's works, is best carried out on an annual basis by a builder who has knowledge of and sympathy towards the construction of buildings. Such works include replacing loose or broken roof tiles, gutters, down pipes and inspection of soil drainage systems. Also, testing all fire extinguishers, cleaning out ducts and air conditioning units, servicing lift and decorating and cleaning sections of the building interior are all needed in the building maintenance.

cyclical maintenance starting with daily routines and working up which involves periodic programs of daily, weekly, monthly, semiannual, annual test and every five year routines. For the every five year routines, it is the responsibility of architect or surveyor to checking any structural defects. The long term maintenance plan should be revised and updated after each checking. Any attention to the building defects should also be studied for the next report presented. Some of the tasks that the architect or the surveyor should look in the checking are cleaning out all void and spaces, checking lighting, inspecting and testing electric installation, checking any sign of abnormal deterioration and cleaning out gutters of leaves and plants.

Planned maintenance gives the owners and the property managers more time to prepare for the works and, more importantly, to secure the necessary funding. It usually starts out by a thorough condition survey to assess the current situations, identify the full extent of works required and lay down the level of expectation. Considerations include execution programs, standard of performance and reliability, as well as maintenance budget and life cycles of certain elements and facilities. Daily maintenance of essential features such as cleaning of surface water channels to avoid blockage of drains, servicing of small factors of equipment or easily wearable items such as children's play furniture are essential to ensure safe and smooth operation. A detailed plan for maintenance to be carried out everyday should be drawn up as per the equipment supplier's recommendations, needs and expectations of the owners.

Regular maintenance is the best way to ensure the continued protection and future use of a building. Such work is part of the day today responsibility of <https://assignbuster.com/causes-of-deterioration-in-building-and-their-services-construction-essay/>

all owner occupiers. Maintenance is most effective when carried out regularly, on a planned cycle. Not only should planned maintenance extend the life and preserve the appearance of your building and designed landscape, but it is most beneficial in protection terms because less historic fabric is lost in regular, minimal and small scale work than in disruptive and extensive repairs. Good maintenance needs the regular investment of small amounts of time and money, but the cost of preparing and carrying out a planned maintenance program should be far less than the costs resulting from a series of unplanned major repairs, and it will help you to plan your future financial commitments needs.

In such a case, a report containing information of updated maintenance and repair work, photos, drawings and recommendations should be prepared by a qualified expert. This is to certify that the report will be a valuable source of reference for those responsible for a building now and in the future.

However, to secure the general structural stability and life of a building, it is important to regularly inspect not only the main structural elements including foundations, walls and roofs. Proper planned, design and reactive methods and techniques of building repairs and good maintenance programs are equally important. It is a duty of owners, architects, local authorities and the public to see that an historic building is handed on to the next generation in good condition.

2. 2 relationships between design, construction, maintenance and the causes of dilapidation

There have many reasons for the building dilapidation. In first chapter, we have discussed about the building and building services deterioration factors. After that, we talk about the need of the planned, cyclical and reactive maintenance program for building through the second chapter. Now we are going to discuss about the relationship between design, construction, maintenance and the dilapidation of building.

2. 2. 1 Design

Before begin the any kind of construction, there should be a detailed design, drawings and specifications. Otherwise, we cannot start the construction.

Because we do not know how the building looks like, what the shape of the building, what are the features and etc. therefore there must is a design for any building. This design will show the building's substructure up to superstructure. It means, design will show the building's foundation up to roof. So this design is very important to the every building. Also, this design may cause to the building dilapidation. So, designers have to prepare the design very carefully. Therefore building design directly affect to the building maintenance cost.

Now a day we have seen fancy buildings in every country than the old rectangular shape buildings. In present, everyone likes to fancy and beautiful buildings. When we construct those fancy buildings, there must have good designed foundation, colorful claddings, roof and etc. but that foundation may not suitable for hold the load of the building. That will help to the building dilapidation.

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Also there must be beautiful interior decorations and things for inside the building. So, when we use fancy design things to our building, we should have planned, cyclical and reactive maintenance program for those things. As an example, if any building uses glasses instead for the building cladding, owner has to maintain that at right time period. Otherwise, if owner does not consider about the maintenance of glass, that glasses will face to the dilapidation before the maximum usage of that glasses. Therefore owner has to hold big cost for the maintenance. But if he uses another material for cladding, no need to spent big cost for the maintenance. According to the above factors, we can understand the designing is cause for the building dilapidation.

2. 2. 2 Construction

Among this section, we try to discuss about the relationship between construction and dilapidation. Mainly construction will cause to the building dilapidation than the design. When we construct any building, we have to use design, drawings and specifications. In that case, if contractor not use those documents properly for the construction, that construction may not be successful. Also it is not a safe place to live or working. As an example, if specification says the foundation depth should be 10m. But contractor may not consider following that and if he put the foundation 8m depth, that building will dilapidation quickly. Because that foundation cannot bear the live load of the entire building. So, foundation may crack after several years. So, we cannot expect the maximum lifetime the building according to the specification. The result of the not following specifications properly during the construction may affect to dilapidation.

During the construction going on, there have large probability to happen the mistakes from workers. So, those mistakes will be the reason for the buildings dilapidation. As an example, if labors not laying properly the steel bar for the slab, that slab may not be able to well accuracy. Also if reinforcement columns are not dead vertically, that building structure will be going wrong. Therefore, this is another way to happen building dilapidation.

Maintenance also the one factor for building dilapidation. Dilapidation and deterioration depend on the maintenance program. Therefore we have not any particular point to talk about the reasons of dilapidation by the poor maintenance. So, we had discusses about this topic from between above chapters.

3. 0 Conclusions

Identifying common building problems and understanding of building materials explained in this report is considered as part of the process of protect and managing historic buildings.

Most buildings today are constructed of reinforced concrete. Although this material requires the low maintenance of all common building materials to get the maximum duration its useful life beyond its estimated design life of 60 years is the most difficult. Between the various causes for deterioration in buildings, moisture is the most common and harmful reason. So, keeping the building dry. Then we can get the maximum life time of that building.

Building repair and maintenance require sufficient supervision of an experienced person to ensure that the work is carried out to a satisfactory.

All repair and maintenance should be recorded, photographed and documented for future building maintenance.