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Contractual Suggestions for the Contractor in Green Buildings

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Abstract

Many contractors are seeking to practice green buildings and to enter green market without realizing risks that might rise thereof. This paper will suggest the important issues relating to green construction contracts, to be considered by the contractor whether to include or exclude from the contract with an owner, to avoid liability. Thus, it discusses the material used in green building, guarantees for obtaining green certification, the delays in works implementation, determination of obligation and its related risk and the contractor understanding of his obligation. It concludes that the contractor should take care upon conclusion of the contract to include all the provisions that ensure the integrity of performance and to avoid liability and the Jordanian legislator shall provide legal ambit for green building construction.

Key word: green building, construction, liability, contractor

1.Introduction:

Construction contract identifies the nature of the relation between a contractor and an owner. In general, an owner may not deny the implementation of a contractor of its contractual obligation, and thus be at risk of liability, unless a contractor did not implement its obligation thereof or if it became impossible to implement the contractual obligation because of the contractor or due to defective implementation or delays.

In traditional contracts an owner establishes two contracts, one with the contractor and the other with the engineer. However, in green buildings contracts it may be different, once an owner enter into separated contracts with contractors and engineers, but there is a continuous joint liability between the contractor and the engineer, as their work needs cooperation and exchange of expertise in order to achieve the required green standards of the building. Often there is a coordinator between the contract's parties appointed by the owner to ensure joint liability and obtain green building certificate.

In the present research, we aimed to find how a green building contractor could eliminate the contractual risks of such buildings and carefully draft a clear contract thereof to avoid any further unexpected liabilities. Therefore, the present research discussed the contractual suggestions of a contractor related to the materials used as shown in the first section, guarantees for obtaining Green certification in the second section, delays in works implementation in the third section, determination of obligation and its related risk in Contractual Liability as discussed in section four and contractor understanding of its obligation as shown in section Five.

2. Materials Used

Construction materials could me classified into positive materials and negative materials. Positive materials means those materials used in the building and constructions process; whereas negative materials are the materials resulted from destruction works, debris and etc. This shall include traditional and green materials as well as renewed, reused and construction debris.

2.1Traditional and Green construction materials

Under Article 783 of the Jordanian Civil Code:

"1. If a contractor should provide the materials for the work, either in whole or in part, he shall be liable for the quality thereof in accordance with the conditions of the contract.

2. If it is the employer who is bound to provide the materials for the work, the contractor must take due care of them and observe proper technical standards in his work, and return the remaining materials to the owner, and if he makes default and the materials are destroyed, damaged or lost, he shall be liable thereof."

It is concluded from the above article that a party who should provide construction materials to implement the green building contract shall determine such materials according to the contract nature, and it shall be subject to one of the following possibilities:

2.2 The contractor shall supply in full the construction materials in addition to his work

In this assumption a contractor shall be liable to perform the work in accordance with the prepared designs (layouts) and at the same time he shall supply the materials to be used according to the specifications in the contract. [3] noting that such specifications includes all the works and used material in implementing the project subject of the contract, and constitutes the criteria that assesses contractor performance in implementing stages of the work in the project, thus the contractor must adhere to such specifications totally

Article (783/1) shows this case, i.e. the contractor should abide the provisions of the contract. Once such materials are not described in the contract, then a contractor shall return to the general provisions where he should supply an average quality materials and he shall guarantee such materials thereof. In all events, an owner or supervising engineer may test such materials and reassure that it matches the required specifications. It should also be noted that one of the most important obligations of the buyers is considered by the Jordanian Civil Code that is the guaranty of the sold material, as the buyer shall guarantee its hidden defects and thus the sale herein is constrained to the material's quality. [4]

Thus, a contractor shall be liable before the employer in terms of the quality of supplied material, so he should abide the agreed conditions and specifications thereof. If the type, color, strength and origin of the prepared material has been approved, particularly, where a contractor is liable for supplying such material according to the agreed conditions and specifications. Otherwise, if there were no specifications and conditions, a contractor should carefully select the appropriate material according to the purpose stated by a contract thereof or which is apparent from the nature of the thing, or the purpose for which it was prepared or will be prepared to. Should the prepared material be more than one type and differs in terms of quality, a contractor should select the materials which meet the required quality. However, if the quality is not agreed upon in the contract and there were no custom or other similar cases then a contractor shall abide to provide moderate material.[5]

Materials supply in green buildings is considered a significant constraint as the used materials in such buildings are usually much specified and part of which made in specialized factories, thus it is impossible to enter into an agreement with a contractor to supply the

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[3] Bdah, M. (2014). International Constructions Contracts, First edition, Darulthaqafah for Publications and Distribution, Amman, P 37.
[4] Assarhan, A., (2013). Named Contracts, Dar Thaqaffah, Amman, Jordan , P53.
[5] Ajeel, T. (2016). Al-waseet in Construction Contracts, Dar Al-Sanhoory, First edition, Beirut- Lebanon., P 125-126.

whole materials of green building. Therefore, contractor should be careful when contracting to supply in whole the green buildings materials unless he is fully aware of such materials. This is because some of such materials made in specific plants or need long time to be made or requires specific technology to be installed compared with traditional buildings. As the materials used in green buildings are often distinctive compared with traditional buildings materials. Further, it is relatively new and widely unavailable. Therefore, supply of the appropriate materials and equipment may avoid delays in project implementation. In addition, materials and equipment must be determined before a long period of time for perquisite orders. Thus, whenever a contractor enter into an agreement with an owner to supply green materials in addition to his work he shall ensure companies, manufacturers or importers of such green materials.

If a contractor needs necessary tools to perform his work according to the conditions he shall provide it at his expense either he or the employer supply it. As the work tools such as construction machines, bulldozers, trucks and other tools are required by a contractor without adding a related condition or provision to the contract, unless the agreement or custom provides otherwise.[1]

2.3 The contractor shall supply partially the construction materials beside his work

A construction contract may include the supply of traditional building materials by the contractor whereas the supply of green building materials by specialist contractors. Here, the contractor may provide part of the materials, where this assumption is prevalent in Green Buildings. The owner of a building shall enter in a contract with the contractor to work and supply some of the materials. And, of course, the materials supplied by the contractor will be traditional. For example, the contractor will supply wood, steel and electrical appliances and other materials. However, in terms of non-traditional materials, the owner will exclusively sign supply contracts with producers of such materials to supply them. Therefore, the contractor should carefully sign his contract which include provisions enforcing him to supply traditional materials, and in the case of his commitment to supply of green materials, he should know its sources and prices and its potential supply in order to prove the specifications of such green buildings materials and the reference to the name of the manufacturer in the contract so he avoids liability for breach of his contractual obligation.

There are other implicit obligations on the contractor, such as to avoid exaggeration in the use of the supplied materials and to do his best to protect it from damage, as well as to use it according to its dedicated purpose in order to abide his commitment to use such materials in the proper method to achieve the required objectives. As the contractor is specialized in construction works and professional in maintaining and use of such materials, therefore, any damage or misuse of such materials raises the contractor liability, even if it not stated by a contract. According to (Article 783/2), which provided that the contractor, upon receipt of materials from the employer, shall use and maintain these materials according to the technical engineering standards, and in the event of damage or disgracing of these materials he shall abide the joint liability with a contractor. In all cases, a contractor cannot avoid liability unless he is able to prove foreign cause.

2.4 The Contractor shall abide his work only, where materials are supplied by other resources contracted by the owner.

It means that a contractor has no obligation to supply any material, and it only commit to do its major works stipulated in the contract in terms of the implementation of all engineering works. Where a construction materials shall be provided by the owner, whether traditional building materials or green building materials. This third possibility is usually used in green building, so the contractor can avoid the liability for the supply of materials. Usually, the supply of traditional materials may come from several specialized sources, such as steel, cement, concrete, wires and other traditional materials. However, in terms of green building materials, it is supplied separately from its sources, such as the special glass, insulating flooring cork, special electric units or special lighting units or others.

In some cases, the owner may sign contracts with green buildings specialized contractors such as contractors of special ceilings installation with green plantations, special A.C systems and others. Here, on each specialized contractor to provide a statement of green materials and the method of installation and specifications in the contract so as not to cause a dispute in the future performance of the contract.

The design specifications and performance specifications are of the most important highlights in green building projects, as in most of these buildings, the specifications used in construction are non-traditional or developed materials or usually used to provide standard specifications for green buildings. Therefore, a contractor shall not be liable for the efficiency of the supplied materials while he shall be the guarantor of the efficiency of such materials in terms of meeting the standards of green buildings. However, the contractor shall be liable to the standards specified in the contract; such as the designs, the materials used in terms of its type and brand name and so on. Thus a contractor shall not be liable for negligence liability if he applied the contract's provisions even if he failed to meet the requirements of green buildings in the use of such materials. However, in terms of the materials that did not meet the green buildings' requirements, a contractor may holdback it to avoid liability thereof.

On the other hand, misuse by subcontractor of specific materials may cause a contractor's liability. One of these cases Chesapeake Bay Foundation, Inc., et al. v. Weyerhaeuser Co., No (5). In this case (First-ever LEED platinum certified building), the owner, architect and contractor of Chesapeake Bay Foundation's Philip Merrill Environmental Center litigated the subcontractor (Trus Joist MacMillan) of Weyerhaeuser Co seeking over $ 6 Million damages.

Weyerhaeuser was the subcontractor that supplied parallel strand lumber with the brand name Parallams to Clark Construction for the roof truss system, columns, and beams—many of which had been exposed to the weather. Weyerhaeuser also chose the PolyClear 2000 sealant. Within 10 years of the structure's completion, the plaintiffs alleged the weather-exposed wood elements experienced widespread rot that jeopardized the structural integrity of the building, leading to a risk to the structural integrity of the building. It included allegations of breach of contract and negligence.

This case demonstrates the risk of liability faced by a contractor because of the defendant sub-contractor fault. It is the same judgment under the Jordanian law, where Article (798) of the Civil Code stated that: "(1) a contractor may assign the work in part or in whole to another contractor unless otherwise stated in the contract or if the nature of such work required doing it himself. (2) The primary contractor shall be liable to the employer".

The primary contractor shall remain liable to the employer in terms of a sub-contractor's faults as it is caused by external party, and an employer may claim against the primary contractor for the breach of what it was agreed upon. Then, it will be the interest of the primary contractor to involve the sub-contractor in the claim thereof.[2]

2.4.1Reused and Repurposed Materials

[1]Mohammed Adnan Baqir Al-Juboury, Commitment to Guaranty in Construction Contracts, Master's Thesis, Babil University, Iraq, 2007, P41

[2]Al-Khaza'lih, Sh. (2016). Orders Difficulties in FEDIC Contracts, Dar Al-hamid for Publications P 105 .

In construction concepts, there are reused and repurposed materials, where the repurposed materials may take the form of renewing the existing building instead of building new ones. The renewed material could be defined as the material that can be re-produce itself within ten years of its production such as wool, cork, sustainable cut wood and the quick renewed materials which would be typically harvested rather than being eradicated.[1]

U.S. Green Building Council's (USGBC) Leadership in Energy and Environmental Design (LEED) rating system for Green buildings has circulated a concept for recycling through the following cases:

(1) Building reuse by keeping and maintaining the existing structures elements (walls, roofs and Tiles).

(2) Building reuse by maintaining the non-structural internal elements.

(3) Building reuse through – the objective herein is to encourage the reuse of "construction materials and products to reduce demand on new materials (non-used) and reduce loss, then reduce the effects related to non-exploited resources processing and excavation.

Some believe that the use of repurposed materials method may be difficult for many reasons:[2]

(1) Ambiguity of recycling plan.

(2) The non-structural elements, such as internal partitions and/or existing doors and the materials used in processing its parts could not be reused.

(3) The estimation of salvage value of the repurposed materials may cause financial and logistic pressure which prevents its inclusion in the project or the planned budget.

There are many examples of materials reuse in project's renewal. Often when a building is to be renewed, the internal and external walls shall be removed in whole or in part but the structure shall be remained to be utilized in the building renewal and this may include constructional, electrical and sanitary works. In addition, it may include the internal finishing, windows, doors and paintings as well as heating systems and its installation techniques and the internal design and furniture. A contractor shall ensure, by using his experience, first if it is possible to turn the traditional building into green building. In other words is it possible to reuse the remaining concrete or steel structure as a base for the new building? Because under the law, a contractor shall be jointly liable with an engineer before the owner for any clear professional defects in regard of the traditional building green eligibility. Therefore, we suggest that a contractor should study carefully the green eligibility of the old traditional building before he decided to establish such a project to avoid liability.

In addition, owners may demand to reuse the renewed or repurposed materials in the new buildings after performing the required technical processes, so a contractor should be careful when contracting to avoid risk of liability.

2.4.2 Construction Debris

In general, worldwide the built environment uses massive amounts of raw materials. The demand for raw materials for construction has gone up due, in part, to the growing demand in rapidly developing nations such as China and India. This has had the effect of depleting some of these resources as well as driving up their costs. Then, thinking of utilizing Construction Debris began, as in traditional constructions the old buildings are demolished and a new one is built. However, where shall we put the construction debris?

The Environment Protection Agency (EPA) defines the construction and demolition (C&D) waste as the debris generated during the construction, renovation and demolition of buildings, roads and bridges." [3] C&D debris, which includes all debris from building construction, renovation, and demolition, accounts for nearly 60 percent of total non-industry waste generation in the United States. The creation of new landfills is an expensive endeavor that creates new environmental concerns. As it turns out, much of this waste is recyclable. In 2006, California conducted a detailed study of the C&D waste created throughout the state and tracked its handling, which found that approximately 74 percent of C&D waste was recyclable. Much of this waste can be recycled at or near the construction site. Despite one-third of the municipal solid waste stream, the rate at which waste is produced has outpaced recycling efforts. [4]

Typically, old buildings demolition is performed by specialized contractors, by two methods:

First: random demolition by using heavy equipment and converting most of the C&D wastes to the landfills, and the second: to deconstruct the parts of the old building and take advantage of the old parts such as doors, windows and some electrical and sanitation works and others. The way to take advantage of them would be by selling them at scrap markets and expend its return in reconfiguration and reuse of old pieces.

Both methods have advantages and disadvantages; one example of demolition advantages is much cheaper and faster than deconstruction. However, there are several important disadvantages with demolition, including large amounts of C&D waste being put into landfills, large amounts of raw materials and energy used in creating new building components, and the accompanying green-house gas emissions. In terms of advantages of deconstruction, it has numerous benefits. First, the market for salvaged/recycled building materials is likely to increase due to the recent emphasis on using recycled building materials and reducing green-house gas emissions compared with demolition. However, deconstruction has several disadvantages, as indicated; deconstruction is much more time-consuming than demolition. In addition deconstruction works need specialized labors that perform such work properly to take advantage of the reuse of each part of the building.

Others managed the high cost of buildings and constructions and the significant injuries that may affect people or assets because of the defection or destruction of building, and then causing large amounts of indemnity exceeding the liability of the assigned person solely. Therefore, the protection of both the damaged person and the injury guarantor is necessary for legislator intervention in terms of establishing or enforcing compulsory insurance system against the civil liability of the contractor and the engineer as like as in other liability systems such as compulsory insurance of civil liability arising from the use of vehicles.[5]

Some believe that despite the current emphasis on demolition, deconstruction has numerous benefits.[6]

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[1] Baker M. , Cooley P. , Levi M. , McLoughlin S. and Sachs S., Green Materials and Construction, chp.9 in The Law of Green Building, ELI PRESS, USA, 2010, p 227

[22] Ibid, p221.

[3] The Environment Protection Agency, Sustainable Management of Construction and Demolition Materials, available at https://www.epa.gov/smm/sustainable-management-construction-and-demolition-materials

[4] Baker M. , Cooley P. , Levi M. , McLoughlin S. and Sachs S., Green Materials and Construction, chp.9 in The Law of Green Building, ELI PRESS, USA, 2010, p 219.

[5] Jibreel, S. (2006). Insurance on Civil Liability of the Contractor and the Engineer under the Jordanian Civil Code, Master's Thesis, Al-Albait University, Jordan., P20.

[6] Baker M. , Cooley P. , Levi M. , McLoughlin S. and Sachs S., Green Materials and Construction, chp.9 in The Law of Green Building, ELI

First: the market for salvaged/recycled building material is likely to increase due to the recent emphasis on using recycled building materials. One example is in the LEED rating system, where building can obtain points by using a certain percentage of these materials in their overall building. Second, less material waste means decreased disposal costs for owners and developers at the onset of construction. Third, deconstruction reduces the need to manufacture new building components, thereby decreasing the cost of adding them to the project and the energy needed to make them. Fourth: deconstruction will create a large market share for recycled/salvaged building materials, thus offsetting the greater cost of deconstruction when compared to traditional demolition. Fifth: new markets will be created to test materials for strength and salvageability, reclaiming/revamping the salvaged materials, and marketing and reselling these materials.

Another problem with deconstruction is worker safety. Federal regulations require that hazardous waste, including C&D waste such as asbestos, silica dust, and wood covered with lead-based paint, be removed and disposed of in specific ways. Absent special reworking, such materials cannot typically be resold. Construction workers exposed to these materials are required under federal, state, and local ordinances to wear protective gear. This adds to the cost of removing these materials. In addition, deconstruction presents higher risks to workers than their counterparts in traditional demolition. While a typical demolition worker is protected in an enclosed cab of heavy equipment while knocking down a building, deconstruction workers are exposed to dust, as well as safety problems from pulling materials down and carrying them out of a building.[1] Therefore, both EPA and the Occupational Safety and Health Administration (OSHA) have detailed rules pertaining to the protection of workers and the removal of asbestos.

Since asbestos and lead-based paint can potentially be found on many different building elements slated for deconstruction and recycling, deconstruction and demolition companies are well advised to implement a comprehensive safety program for all workers to minimize the risk of injury and illness. These safety procedures should be implemented by owners, developers and general contractors.

On the other hand, a contractor shall hire skilled construction and lifting workers with high or ordinary skills, either local or foreign workers. Once a contractor hired them he shall be liable for their default while performing their works. Should an agent have the right to hire some workers; he shall be liable for their defaults as he has contracted them. Nevertheless, they shall be subject to the contractor's instructions.[2]

Thus, the deconstruction process cope with the requirements of green buildings, and therefore tend to the need to organize the lifting and deconstruction within a legal framework, as well as to create a suitable atmosphere to focus on deconstruction processes due to its positive impact on the environment and in favor of green buildings. So it is suggested the following:

1- Impose high fees on landfills, in order to encourage all developers and owners of buildings to adopt deconstruction.
2- Legally organize of the demolition process, i.e. enforcing exclusive constraints for what to do and do not deconstruct.
3- Legally organize of the deconstruction process and enforcing constraints thereof.
4- Setting engineering bylaws in addition to laws to demonstrate the required procedures for construction materials reuse.
5- Organizing the reuse of deconstructed materials in terms of matching the specifications according to labs tests as well as testing of reused steel tension.
6- Organize the legal work conditions of deconstruction and lifting workers and issuance of the voluntary licenses required thereof.
7- Utilization of support provided by the green buildings codes in order to issue like legislations for supporting environmentally friendly practices such as deconstruction and providing credits for owners or contractors upon recycling of construction materials.

Deconstruction process copes with green buildings. However, since contracting conditions on deconstruction and its details cannot be controlled, as mentioned above, we will need complete contracting conditions related to lifting and deconstruction. Thus, we suggest adding general principles to legally organize installation and deconstruction.

It is also suggested that the government should allocate a large area, such as free zones to be dedicated for selling recycled construction materials to encourage owners, contractors and engineers adopting deconstruction instead of demolition. Further, they can reuse such tested deconstructed materials in the new buildings.

It is important to study the subject of demolition and how to deal with in green buildings, because legislators in most countries give the right to unoccupy the real-estate for the purpose of construction under specific conditions. Therefore, it is expected that these laws would encourage owners to claim for the eviction of their old buildings and build new green ones and at the same time take advantage of their old buildings debris.

For example, Article (9) of Landlords & Tenants Ordinance no. (14) for 2013 stated that: "A real estate may be evicted for the purposes of construction, rebuilding or demolition under specific conditions"

The Egyptian legislators regulated, under Article (49) of Law no. 49 for 1977, the demolition of non-residential buildings for the purpose of rebuilding and in the events of dilapidated buildings under specific conditions. For example, in case No.1025, Hearing (2/4/2000): "the Egyptian Appeal Court decided that owners of non-residential leased buildings may demolish their buildings, even if it is sound, for the purposes of rebuilding for expansion either by mutual consent with tenants or by providing the alternatives stipulated under Article (49) et seq. [3]

3. Guarantees for obtaining Green certification

3.1 Obtaining Green certificate for a new Building

Although a contractor has an essential role in obtaining LEED certificate, the construction phase under this certification involves preparations and limitation for the LEED action plan. Where a contractor shall, under LEED certificate, use environmentally friendly construction materials as well as to prepare the site of building at minimum impact on water, air, soil and underground.[4]

Therefore, a contractor shall not intercalate himself to ensure obtaining LEED certification or any other certificate as such specifications are assigned to the architect who designs the project. Thus, a contractor shall not be entitled to control the buildings design and

PRESS, USA, 2010, p 232.

[1] Ibid, p234

[2]. Alawdun, S. (2004), Liability of Consultant Engineer in terms of Civil Issues in Construction, Munsha'at Al-Ma'arif, Al-Eskandrieh, Egypt, P 196.

[3]Atieh, A. & Shafeeq, W. (2014). Building & Demolition Law with the Egyptian Appeal Court, Nas for Publications, Cairo, Egypt, P 86.

[4]Frattari, A. , Dalprà, M. & Salvaterra, G., (2012), The role of the general contractor in sustainable green buildings: The case study of two buildings in the leed certification in Italy, available: https://www.researchgate.net/publication/292400187_The_role_of_the_general_contractor_in_sustainable_green_buildings_The_case_study_of_two_buildings_in_the_leed_certification_in_italy.(Febreuary 20,2017)

matching them to the green buildings upon the request of the owner. Because it would be in the favor of the owner to deal with more than one guarantor. Obtainment of green certificate could be guaranteed by both the contractor and the guarantor of the contractor which may extend the liability of the contractor as there are multiple damages parties. Therefore, a contractor should be aware of such risk and avoid it. Given that the owner shall be entitled for damages if the contractor failed to obtain the "green building certificate", (for example losing expected credits, increased operation costs, etc.). [1]

In green buildings, in order to ensure the proper green work implementation by all parties, the warranty principle has been positively activated more than what is adopted by construction contracts, then green buildings certificates appeared which represented a guarantee instrument as it acts as a performance bond provided by a contractor or implementers to the owners or by the owner to the implementers of green construction works or by owners or implementers to the government.[2] It could also be covered according to the general rules (provisions) if an engineer or a contractor or developers of green works failed to perform their assignments. Should this be the case, a guarantor shall perform the work or the guaranty shall be attached and the work shall be performed at its expense, according to Article 967 of the Jordanian Civil Code "A creditor may claim against the principal obligor or against the guarantor or may claim against them both" therefore, the green performance bond could be strong guarantee for the treatment of failure by green buildings implementers.

Therefore, it is recommended that a contractor should set forth that he is excluded from liability against any risk related to the green building certification or the energy efficiency, since any failure in this regard shall be deemed a consequent damage. Thus a contractor should verify to prevent his liability against these damages.[3]

In some cases, the owner may ask for green certification based on specific classification, thus a contractor should add to the contract an explicit provision states that the constructions delivery is not constrained to the certification as it may be delayed by the agreed party. Otherwise, if such provision is not added to the contract, the project delivery could be delayed and then the owner may be accounted for the attachment of accrued payments. The contractor should also avoid any explicit provisions by the owner enforcing the contractor waiting until the green certificate is issued.

And that certificate shall be issued after the completion of constructions works and after occupation by owner, where it may extend sometimes to several months. Such delays shall apply in particular for measured and verified assigned projects, as construction works performance shall be assessed according to LEED certification criteria or conditions after occupation. [4] Therefore, the contracts' provisions should include payments conditions to avoid any delayed payables. For example a contractor may not desire to bind the achievement of green certificate to the basic completion of a project. Which means that the final payment shall not be released until a long period because the green certification condition has not been achieved during 18 months from the completion of the project.[5]

Green certificate could not be obtained because of the failure in meeting some of the required conditions, and then it could be obtained after amendments. In absence of Jordanian legislations related to the constructions, we shall rely on Article 785 of the Jordanian Civil Code, and then we can measure the failure in obtaining the green certificate to the defected implementation which can be repaired. According to this article, the owner may notice the contractor of repairing such defects. In green buildings, this article could be used to measure the failure case of repairing defects which caused the failure of owner to obtain green certificate. This article, however, set forth a reasonable period thereof. For instance, the repairing of complete A.C system requires longer period of time than a single A.C system for a part of a building. Of course, should the achievement of green certificate be impossible, and then the period would be superfluous. Thus, the owner will terminate the contract immediately

In other cases, a failure to obtain a green certificate could be attributed to the inexperienced contractor, thus the owner may apply to the court to get permission for commissioning a green building specialized contractor to complete shortages or repair defects in order to obtain the green certificate. Of course the other contractor shall complete the work at the expense of the first contractor according to article 785 of the Jordanian Civil Code which stipulated that: "the employer may apply to the judge for the cancellation of the contract or for leave to himself to engage another contractor to complete the work at the expense of the first contractor." Should the choose to perform the work through another specialized green building contractor, upon the approval of the court, the construction contract with the alternate contractor shall be subject to the same conditions of achieving green certification stated in the contract between the owner and the first contractor or the construction under the green criteria or according to specific code. As the owner cannot get construction of higher specifications or quality than those stipulated in the original contract. The owner may not obtain more specification than what is stated in the contract as the contractor will object according to unjustified enrichment. Therefore, the owner may obtain more specification than what is actually specified in the contract, if the cost of the second contractor is the same as the first, for example, the contractor may provide some amendments in addition to the commitment of the original one free of charge, or the owner my pay the differences.

According to the decision No. 85/313 issued by the Jordanian Cassation Court on 18/5/1985 related to the performance of a construction contract, where it has been agreed to perform a construction according to specific schemes and layouts however his work was defected and incompatible with the contract's provisions. The court indicated that "the building constructed by the defendant did not meet any technical specifications and that the building shall not afford any more floors and contains many constructional defects and violations conditions and such defects or violations shall not be repaired unless by demolition of the building. And given that Article 785 of the Jordanian Civil Code enforced the contractor complete the work in accordance with the conditions of the contract, and If it appears that he is carrying out what he has undertaken to do in a defective manner or in a manner in breach of the agreed conditions, the employer may require that the contract be terminated immediately if it is impossible to repair the work. In addition, according to Article 786 of the Jordanian Civil Code "The contractor shall be liable for any loss or damage resulting from his act or work".[6]

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[1] NASBP & SFAA, (2011). Performance Bonds on Green Building Construction available: http://www.nasbp.org/ (March 25, 2017)

[2] Shapiro, S. and Cheatham, C. (2010), Emerging Legal (Chapter14) The Law of Green Building, ELI PRESS, USA.., p 368.

[3] Perkins, M.(2009), Green Building Risks Contractors must monitor green contracts, Legal Commentary, available : https://www.consensusdocs.org (May 16,2016)

[4] O'Connor, H., (2012) Architect's Professional Liability Risks in the Realm of Green Buildings, ResearcH JournaL www.perkinswill.com / VOL 04.02, available: https://perkinswill.com (December 5, 2016)

[5] Perkins, M.(2009), Green Building Risks Contractors must monitor green contracts, Legal Commentary, available : https://www.consensusdocs.org (May 16,2016)

[6] Abu Al-Basa,l A. Constructions Contract and Supply under the Islamic *Fiqh* and the Jordanian Civil Code, PhD thesis, University of Jordan, Jordan, P 149.

3.2 Obtaining Green certificate for an old (existing) Building

Although green buildings represent the next stage of buildings, the current status shows that most buildings are not green and that such buildings will remain for the coming years. However, typically, the improvement of energy efficiency of the existing buildings involves what is called re-adaptation which may include everything from structures installation to increased insulation level in the building.[1]

Day in and day out, buildings, industrial sites, offices, campuses, government facilities and residences use and waste a colossal amount of energy. Energy is wasted in the way structures are constructed. For example, without simple but efficient insulation techniques, far too much hot air enters structures in the summer and cool air in the winter. As a result, Air-conditioning and heating systems must run longer and consume much more energy than necessary to maintain comfortable temperatures. Many existing structures have old, inefficient boilers and heating and cooling equipment. Lighting is largely through the use of incandescent bulbs which consume large amounts of electricity and threw off heat, warming up buildings in the summer and increasing loads during peak electric demand times. Even the way structures are oriented is generally with complete indifference to natural factors, such as passive solar design, overhangs, and natural light harvesting, many structures can have some free lighting and heat and reduce the amount of heat gain in the summer, further reducing heating and cooling loads. [2]

Thus, a contractor should be fully aware of how to convert the traditional building into green building and to know how to deal with its defects before contracting. Otherwise, he shall be liable for its failure.

4. Delays in works implementation

A contractor shall abide the performance of the work as agreed in the contract within the determined period. According to Article 782 of the Jordanian Civil Code the parties shall disclose the site, type and quantity of the contract and the performance method as well as the time required for completion of the works. Therefore, a contractor should abide the performance of works within the specified period.

Completion period represents the core commitment for a contractor in terms of the required project's timeline since the commencement date. If the contractor is asked to perform other duties within different periods, he shall determine such parts in a separate annex. In addition, he shall accurately determine the geographical constraints for each part to avoid any ambiguity. Thus avoid the ambiguity of parties' responsibilities in case of delivering the owner some of the accomplished works. [3]

Usually, the contracting timeline should be specified, however there debating issue: what is the decision if the parties did not determine a period for the completion of a contract? May a contractor perform the construction works any time he wishes? Indeed, there is no explicit provision in the Jordanian Legislations which dealt directly with such issue. However in all cases, the court will consult an expertise to know the required period for the completion of the construction works, and to decide if a contractor delay is reasonable or not, so a judge could decide cancellation, or compensation for delay or both either in absence of any related provision according to Article 202 of the Jordanian Civil Code: "Each of the two contracting parties shall be obliged to carry out the contents of the contract in such a manner as to achieve the lawful purpose thereof". However, these provisions are insufficient, as in the absence of green buildings related regulations a judge might assign a traditional engineer as an expert whom his experience would be inaccurate and might lead to contradiction for a single case if it is assigned to a traditional engineer or a green building specialized engineer.

4.1.Delays in work commencement

A contractor might be delayed in his contracted work commencement, which raises his liability. In this situation, the owner and the engineer provided the contractor by all the licenses, approvals and schemes, etc required thereof. Usually, in traditional buildings, a judge examines if a delay by a contractor will adversely affect the owner, so a court may decide to require the contractor to complete the work within a reasonable remaining period without cancellation and compensation, otherwise the court shall decide cancellation or compensation.

However, the employer is not obliged to wait for the end of the agreed period of work completion to use his right in the demand of in kind implementation of work or cancellation with compensation in both cases. And even, if he sees the contractor delayed in the commencement of his work so he could not perform his work on time, he may take measures that guarantee his claim without prior notice for the contractor until the end of such period.[4]

Should the implementation period be ineffective and the agreed period elapsed and the owner demanded for cancellation, then the court may decide to provide the contractor a chance for completing his works and in such case the contract will continue effective but the owner shall be compensated for delay.

The commitment of a contractor to perform his work shall be subject to the agreed period specified in the contract. However, if the period was not agreed, the contractor shall abide to perform his work within a reasonable period of time according to the nature of work unless under a force majeure, sudden accident or a third party's lapse.[5]

In an action case before the Egyptian Supreme Court, the court decided that: "the contractor shall achieve an outcome upon his commitment to abide the agreed period of time. Where the proof by an employer of the violation of a contractor of such obligation shall be deemed a proof of liability. So the contractor is liable even if he proves that he has made his best effort to implement his commitment.

4.2 Delays after work commencement

Among common mistakes of green buildings contracts providing insufficient periods for implementation, whereas upon delivery delay on time, such delay shall be the liability of a contractor.

However, a contractor cannot avoid liability of delay unless he proved an external liability such as a force majeure or a third party's lapse or an employer lapse in terms of providing the required materials or upon the amendment of materials specifications thereof or because of payments delay. [6]

Alteration of specifications may be considered a normal thing in the contract due to such particular kind of construction works and because of the different conditions that might occur during implementation. Where these works may not be completed in a satisfactory manner only through recourse to commands transformative, so as to avoid any errors or deficiency in design or drawings or BOQ, and also

[1] Howe, J. (2010). Overview of Green Buildings , (Chapter 1) The Law of Green Building, ELI PRESS, USA, p5.
[2] Fucci, F., (2010), Energy Performance Contracting for Buildings, (Chapter7). The Law of Green Building, ELI PRESS, USA, p169
[3]Bdah, M. (2014). International Constructions Contracts, First edition, Darulthaqafah for Publications and Distribution, Amman, P 123.
[4]Ajeel, T. (2016). Al-waseet in Construction Contracts, Dar Al-Sanhoory, First edition, Beirut- Lebanon., P 149-150.
[5] Abdelqadir, I., (2001), Construction Contract, Dar Al-Alfy, Egypt, Al-Mania, P 115.
[6]Shanab, M., (2004). Explanation of Construction Contracts, Munsha'at Al-Ma'arif, Al-skandrieh, P 120-121.

may need to add the emerging business achieve construction interest for the implementation of the project lined up.[1]

A green building delays could be also attributed to the inexperience of contractor in terms of some construction materials, as such materials could be insufficient or unavailable or subject to high demand or locally unapproved. Which requires being imported and so needs extended time therefore will need additional time to supply than what is mentioned in the contract.

Further, there are some materials that need longer periods than usually required and the contractor may overlook such additional period, so he might commit a fault of delay. Also some materials might need a special test different than that time required in traditional projects, such as quality certificates and others. There are also some post performance tests to be established after the completion of specific works to verify its green specifications and of course it needs longer time.

Contractors should avoid explicit provisions related to their liability against any replacement costs of any practice incompatible with green buildings criteria if the mistake was attributed to a defected design or wrong selection of materials or equipment by a designer engineer or supervisor which did not match green buildings criteria. Indeed, a contractor should ask for demolition and rebuilding of such works. . So it is important to state clearly in the contract the contractor works and the extent of his responsibility for the implementation of these actions in detail in order to protect him from carrying extra responsibilities .

However, the issue is: if the contractor lags in the implementation of works and the specified time did not elapse, what shall be the judgement? The answer should be of two parts, first: if the contract included a schedule and timelines thereof, a contractor shall be liable for any delay thereof. As we can refer to Article 782 of the Jordanian Civil Code which stated that a place, type, method and time of work performance should be described as well as its allowance.

The second part is concerned with the absent of periods of project stages from the contract and just a contract provides for total period only. So by referring to the general provisions and according to the common custom, there should be a standard reasonable period. And still there would a question what shall the judge decide in terms of a reasonable period, is it for a green building or traditional building?

5. Determination of Obligation and its related risk in Contractual Liability

The Jordanian legislator relied on a general provision that provides that a contractor shall be liable for his act and practice against any damage or loss because of his default or violation. Therefore, it is a rigorous contracting liability which cannot be avoided by the contractor through proving absence of default or error.[2] This is the aggravating contractual responsibility which cannot be denied by the contractor to prove lack of fault or negligence on his part. The exception is if the damage occurred due to an accident that cannot be avoided according to the rule (everything that cannot be avoided cannot be ensured).

Originally, the contracting liability provides for the termination of obligations upon the implementation of the contract. However, the legislator has violated this general principle in construction contracts by extending the period for ten years starting from the delivery date. [3]

The green buildings contractors should have complete experience of the risks related to green buildings, and even they should have the experience in terms of such risk management and to determine their obligations accurately and explicitly to avoid liability.

Given that the contractor and the owner entered into a contract, the liability of a contractor shall be often a contracting liability. Should the contractor violate any provision of his obligations, the owner will upon a prior notice ask the contractor to terminate the contract or to claim for compensation or both.

Therefore, there is a risk related to those contractors who implement the green buildings construction works under the form contracts. So, the contractor should never rely on form contracts, as form contracts are written on a generic basis and not specific to a project. However, form contracts can serve as an outline to raise issues and to be customized to the needs of the project. Each project is unique, and a form contract has not been developed that addresses the necessary issues of sustainability.

Although the American Institute of Architects (AIA) are including supplements regarding sustainable construction and design, there is no general consensus given their evolving nature, and there are no generally accepted forms presently available.[4]

For example, in *Southern Builders, Inc. v. Shaw Development* [5] the owner failed to receive tax incentives because the project did not achieve LEED certification in a timely manner. The owner sued, asserting that the builder was contractually required to construct a project that achieved LEED Silver certification. However, the parties relied on an AIA A101-1997 Standard Form of Agreement between Owner and Contractor as their general contract, which contains no language with respect to LEED or any other green building rating system. Although the parties eventually settled out of court, this case demonstrates the importance of drafting a contract that clearly states what party is responsible for achieving LEED certification.

Thus contractor and subcontractors should specify accurately the provisions related to their obligations and determine their assigned works.

According the well-known rule "pacta sunt servanda", once the contract contained the performance of the contractor of specific work; he should be able to perform. According to Article 786 of the Jordanian Civil Law: “A contractor shall save his act or practice against injuries or losses either by default or by violation. This means that the contractor shall be liable even if he did not commit a default or a violation. The contractor failure to implement and any delay in implementation or faulty implementation of his commitment that caused damage to the owner, the responsibility of the contractor arise unless he proves that such damage was due to foreign cause.

If we enforce Article 786 on the obligations of a green building contractor, given that it is stipulated in the contract that the building is green, the contractor shall be responsible to achieve the green building criteria. Given that the green buildings is respectively recent technology, thus the contractor should not expect to see it efficiently work, so he might be vulnerable to the owners’ risk of injury.

Among the main features for green risks management required by the contractor (as in the traditional risks) is to expect the risks related to green buildings contracts, so he should include it in the contract and to determine the exceptional clauses of such risks and whom

[1] Al-Khaza’lih, Sh. (2016). Orders Difficulties in FEDIC Contracts, Dar Al-hamid for Publications, P 25.
[2] Assarhan, A., (2013). Named Contracts, Dar Thaqaffah, Amman, Jordan, P 55.
[3] Mohammed Adnan Baqir Al-Juboury, Commitment to Guaranty in Construction Contracts, Master’s Thesis, Babil University, Iraq, 2007, P 68.
[4] Baker M. , Cooley P. , Levi M. , McLoughlin S. and Sachs S., Green Materials and Construction, chp.9 in The Law of Green Building, ELI PRESS, USA, 2010, , p 239
[5] Southern Builders, Inc. v. Shaw Development, LLC, Circuit Court, Somerset County, Maryland No. 19-C-07-11405 (filed and settled in 2007)

should be responsible for. Parties should also explain the concepts and terms of green buildings such as sustainability, green certificates and high quality performance building. [1]

The contractor should avoid liability related to default by stating that the owner should be liable upon providing him with specifications and action plans, as the contractor should perform the green building according to these specifications and plans approved by the owner or his consultants. Thus, the contractor shall not be liable for any defects related to such specifications or plans.

On the other hand, the commitment to the green criteria will represent a principle of the code of conduct and then the architect should morally abide to implement and apply the minimum requirements of green buildings criteria given its benefits for individual and society. After taking hold of this standard moral principle, it is expected to convert these ethical rules to legal rules of green binding .

Generally, a contract represents the main source of liability of contractors and construction companies as they might be vulnerable to the risk of contractual liability during the green building project which includes the following:[2]

1. Failure of green systems to achieve what is expected during its age.
2. Failure of the systems to reach the promised level of LEED certificate.
3. Wrong installation of green building systems
4. Losing expected tax credits or loans
5. Failure to adapt within the planned budget or time which caused higher costs compared with expected costs of green building.

Whereas, in terms of liquidated damages according to the Jordanian law, Article 363 provides a court shall compensate for damages caused under contractual liability at the actual value of such damage without including profit.

6. Contractor Understanding of his obligation

Consent on the work assigned to the contractor requires addressing such work in the contract or at least to be addressable. This shall be through determination of work nature, such as new construction or reconstruction. However, addressing the work is insufficient. Thus, it is necessary to show the description of work. If the assigned work is a construction, the nature of construction should be described. On the other hand, the work should be addressed in the contract itself or to include in the contract a language that allows addressing of such work in the future. [3]

The risk of green buildings is much greater than traditional buildings, and then the contractor should understand such new obligations. In some cases, specific certificates could be required such as LEED certificate. The owner may ask the contractor to assign the type of certificate which will be adopted thereof. In case the building failed to achieve such certificate, the owner shall immediately litigate the contractor. Therefore, the contractor should constraint his assignments in terms of green building project to avoid unexpected shortages liability.[4]

The contractor should understand the contracting provisions related to project delivery, since in traditional works (Design – Bidding – Construction) the project relies on plans and specifications. However, many green contracts include some language or expressions that assume the contractor liability in terms of the implementation of the project according to the standards stated by the contract. Therefore, a contractor should be careful against all contracting risks and liabilities related to green buildings.[5]

The contractor should also decline blind implementation of the owner's unreasonable demands, since green buildings require additional liabilities in addition to his commitment to achieve concrete traditional building. He shall abide to achieve the assigned green codes and certificates. Thus, in case the owner demanded cost reduction or materials replacement with cheaper and lower efficiency materials, the contractor should explicitly object or decline implementation of such works or giving the owner a notice. In all cases, should the contractor perform any harmful works that might hold green certificates, even upon the owner's advice, the contractor shall be liable for future damages thereof. Because the owner is inexperience in engineering and the contractor shall not violate architecture principles in general and green building principles in particular.

A contractor may commit another major mistake because he did not understand the language of the contract, as green contract's language might be very professional and it might get the contractor into material mistake because he did not understand its detailed commitments accurately. On the other hand, the language of the contract might be broken, ambiguous or obscure. Further, if the contractor relies on traditional form contracts as it should represent just a general framework of green buildings obligations. If the green building contractor abide to such general obligations he may become liable for additional obligations on green buildings.

Thus, a contractor should understand accurately the green contract in particular when the contract relies on traditional provisions. He has also to identify new innovative technologies raised in green contracts which its future risks and problems are not yet accurately recognized. There are some new issues which the contractor should take care with to avoid the whole liability. For instance, the roofs of green buildings are actually completely green by using sophisticated plantation and irrigation methods. However, such developed methods might cause further liability on the contractor because of adding large quantities of soil so the roof bears large weights and then become cracked. Also the contractor might be liable for water leaks due to green roofs irrigation which in turn may lead to multiple damages. Then the contractor will claim for the liability of the engineer due to design or materials, and the engineer will claim for the contractor liability and so on.

The traditional rules for buildings are set forth in the civil laws and building bylaws, and sometimes parties may point to the liability related to specific standards such as FIDIC contracts. However, in green buildings, it needs particular laws, in addition to the traditional laws, usually, specific standards or codes or typical codes such as LEED certificates or the IGCC code or other codes.

In public construction projects contracts the contractors' licenses require an approval issued by a particular authority to proof his eligibility for the performance of such constructions. If the contractor could not complete the certification procedures but he could obtain a

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[1] Perkins, M.(2009), Green Building Risks Contractors must monitor green contracts, Legal Commentary, available : https://www.consensusdocs.org (May 16,2016)

[2] Buckner Company, (2010), Liability Exposures for Green Contractors. Available: http://blog.buckner.com (March 3, 2017).

[3] Shanab, M., (2004). Explanation of Construction Contracts, Munsha'at Al-Ma'arif, Al-skandrieh,, P 73-74.

[4] Buckner Company, (2010), Liability Exposures for Green Contractors. Available: http://blog.buckner.com (March 3, 2017).

[5] Perkins, M.(2009), Green Building Risks Contractors must monitor green contracts, Legal Commentary, available : https://www.consensusdocs.org (May 16,2016)

license, he shall be prevented from practicing constructions. Further, a license shall be cancelled if it has been issued upon false information or if it is in violation to the Construction Contractors Association. The contractor shall be entitled for a license if is a member of the Jordanian Engineers Association and holding a university degree. Therefore, there is a need for a Jordanian legislation regulates the licensing procedures of green building contractors, so no accreditation is granted unless in the presence of specialized contractor[1].

Moreover, in light of great expansion of green building, the Jordanian National Building Council should issue a special Jordanian green building code pursuant to Article five of the Jordanian National Building Code No.7 for 1993 and its amendments. Upon the issuance of what we suggested of green building code, all the supervising and licensing departments of such code in accordance with Article 5/g of the Jordanian National Building Code as well as the instructions thereof in particular those issued pursuant to Article 8 of the same code: " All Ministries, Government Departments, Official and Public Institutions, Municipalities, Public and Private Shareholding Companies, Jordanian Engineers Association, Jordanian Construction Contractors Association and the Engineering Offices and Companies Body shall have to act in accordance with the provisions of this law and take all necessary measures to this end with due observance to the provisions of Article 11 of the Jordanian National Building Code No.7 for 1993.

There is no doubt that green buildings have its non-traditional mechanisms, but given the lack of experience of Jordanian constructions companies, it would be normal to face difficulties while establishing large green buildings, then there should be resorting to foreign green construction companies. However, Article 24 of the Jordanian Engineers Association entitled to the foreign green construction companies to work inside the kingdom. This Article is insufficient for introducing foreign green construction companies. Hence, such companies should be treated upon special regulations or instructions that enforce foreign companies to train Jordanian staffs of engineers, labors and.. etc.

7.Conclusion

As seen throughout this paper, basic principles of green buildings contract may significantly coincide with those of traditional constructions, however they totally defers in terms of details such as material used and guarantees for obtaining green certification. the lack of Jordanian legislations dealing with green buildings construction and the contractor desire to enter green building contracts require definitely detailed legislative and contractual processing, in other words, green building shall enjoy legal protection and the contractor shall take care upon conclusion of the contract to include all the provisions that ensure the integrity of performance and to avoid liability as suggested in this paper.

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