

# Engineering Research Journal

journal homepage: <https://erj.journals.ekb.eg/>



## The Incompatibility Between The Egyptian Civil Code and FIDIC (CONS) in Addressing Changes in Construction Contract

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**Abstract.** The construction industry in Egypt frequently employs the standard conditions of contract published by the Fédération Internationale des Ingénieurs-Conseils (FIDIC), grounded in common law principles. However, the governing legal framework in Egypt is the Egyptian Civil Code (ECC), which draws its roots from French civil law and Shari'a law. This incongruence raises questions about the compatibility and interpretation of FIDIC provisions within the Egyptian legal context. This paper uses the doctrinal research method to examine the FIDIC Conditions of Contract for Construction (commonly known as FIDIC (CONS)) in the context of the ECC, with a particular focus on Article 657, which deals with managing risks related to quantity variations. The analysis highlights similarities and differences between FIDIC (CONS) and the ECC, especially in their approach to managing risks related to unforeseeable physical conditions and design errors. The paper concludes that Article 657 of the ECC does not deviate from the principles of a unit price contract, as it does not apply to quantity increases caused by an inaccurate bill of quantities but is applicable in cases of unforeseen occurrences. However, the ECC is observed to be less accommodating toward contractors in the event of unforeseen occurrences.

**Keywords:** Article 657 of the ECC, Variation in quantity, Unforeseeable physical conditions, Design error.

### 1 Introduction

The ECC serves as a comprehensive legal structure that regulates civil affairs within the jurisdiction of Egypt. The code was drafted in 1942, but it went through multiple amendments before being passed in 1949. Abd El-Razzak Alsanhoury, an Egyptian jurist, is credited as the principal author of this legal document (1,2). The ECC encompasses a broad spectrum of civil issues, encompassing contracts, torts, property rights, personal status, and inheritance. It is widely recognized that the ECC holds a position of paramount importance among legal codes in the Middle East and North Africa (MENA) region (3,4). The ECC categorizes its rules into mandatory and supplementary types (5). Mandatory rules are linked to public policy and societal interests, meaning that parties cannot override them in their agreements. If they do, the agreement, or the conflicting part of it, will be considered null and void (5,6). On the other hand, supplementary rules act as default provisions, automatically applying to agreements unless the parties explicitly agree otherwise (6,7).

DOI: [10.21608/erj.2025.331174.1125](https://doi.org/10.21608/erj.2025.331174.1125)

Received 26 October 2024; Received in revised form 31 January 2025; Accepted 11 February 2025

Available online 01 March 2025

Egypt's construction sector is currently witnessing continuous development in mega construction projects and is predicted to continue in the future (8,9). Many of the large-scale projects carried out in the Egyptian market use FIDIC contracts (10–12), such as the Hurghada Airport, Grand Egyptian Museum III, the Cairo Metro Project, Borg El Arab Airport, Terminal Two, and all projects that are financed by the World Bank (13–15). The preference of using FIDIC is often linked to the construction stakeholders and the contract administrators become familiar with their obligations under the contract based on general conditions, and their main focus would be amendments put forward in particular conditions. In addition, FIDIC provides a number of guidance that would offer a clear interpretation of FIDIC provisions, mitigating the conflicts caused by misunderstandings (14,16,17).

While ECC is rooted in French civil law and is also heavily influenced by Shari'a law (3,5,18,19), FIDIC, particularly in its initial editions, was grounded in the Institution of Civil Engineers (ICE) conditions, which are rooted on English common law (20,21). The lack of understanding of how the applicable law affects the administration of any contract can result in numerous conflicts, particularly when the contract's root is inspired by a legal system different from the one applied (8,21,22).

Although 'FIDIC 2017' has been released, it is not widely used in Egypt's construction sector. Instead, 'FIDIC 1999' remains the preferred choice. This is mainly because stakeholders are more familiar with the 1999 edition and its detailed provisions, rather than due to any issues with the 2017 edition (23,24). The preference for 'FIDIC 1999' reflects market stakeholders' adaptation to its provisions rather than compatibility with Egypt's legal framework (24). This highlights the need to align practical application, legal conformity, and industry acceptance for successful project implementation. Therefore, this paper focuses on 'FIDIC 1999'.

FIDIC offers a variety of contract forms tailored to different procurement methods (25). In the context of this paper, the authors will focus on the FIDIC (CONS), 1999 Edition, which is apt for the design-bid-build procurement methodology (20,26). Under this form, the employer (or on behalf of) is in charge of preparing the design including drawings, specifications, and bill of quantities but it also allows for some elements to be designed by a contractor (27), the contractor is responsible for executing the work, and the engineer is responsible for monitoring and supervising the executed work and making fair determinations (20,28).

FIDIC (CONS) is based on "Re-measured" or "Unit Price Contract" framework. Within this arrangement, the contractor's payment depends on the actual executed quantities, not the estimated quantities listed in the bill of quantities (BOQ) (29). This payment method naturally introduces risks for both the employer and contractor due to potential differences between estimated and actual quantities (30). Various factors have been identified that contribute to variances between estimated and actual quantities, including design errors, unforeseen physical conditions, inaccuracies in the BOQ, and contractor defaults (2,29,31). It is unfair to hold the contractor responsible for risks that are beyond his control (2,31). ECC classified contracts according to payment method into two types: lump sum contracts under Article 658 of ECC, or remeasured contracts under Article 657 of ECC (32,33). Article 657 of ECC grants the employer the right to terminate the contract, in case the difference between estimated quantities and actual quantities leads to a major increase in contract price (2,14,34).

Several studies have explored Article 657 of the ECC in the context of FIDIC contracts. El Nemr (2017) addresses the enforceability of time bar clauses under the ECC and concludes that Article 657 is the only explicit time bar clause within the Code. He argued that Article 657 functions as a legal preclusion period applicable to situations where the estimated contract price has increased as a result of a significant exceed between the actual quantities and those estimated in the BOQ (2). However, his study primarily focused on the theoretical alignment between Article 657 and FIDIC's time bar provisions, with limited emphasis on practical applications.

Shafik et al. (2016) address the application of FIDIC contracts within the ECC framework, focusing on five main reference points: the time bar notice provision, subcontracting, interest charges, termination, and force majeure. Regarding termination, they concluded that Article 657 grants the employer the unilateral right to terminate the contract if a significant increase in quantities leads to a substantial rise in the contract price. In such cases, the employer is obligated to compensate the contractor only for the

executed work at the rates specified in the BOQ, without covering additional incurred costs or lost profits (14). Conversely, Fawzy et al. (2019) provided a different interpretation of Article 657. Their study, which focused on employer payment obligations under the ECC and FIDIC, denied the employer's right to terminate the contract under the provisions of FIDIC in reference to Article 657 (35). Hamed (2011), in his comparative research on risk provisions in FIDIC contracts and the ECC, criticized Article 657 for its misunderstanding of the nature of construction contracts concluded under a unit price framework (31). Although these studies provide valuable insights on topics like time bar, termination rights, price determination, and risk allocation under Article 657, they do not address its practical applications. Furthermore, they do not analyze the similarities and differences between the ECC and FIDIC. This gap highlights the need for further research to explore the judicial interpretations and practical implications of Article 657, especially in its interaction with international standards like FIDIC.

## 2 Problem Statement

During the literature review, it was observed that Article 657 of the ECC has been widely criticized for its shortcomings and inconsistencies, especially when compared to the provisions of the FIDIC (CONS). These criticisms focus on three main points. First, Article 657 has been criticized for misunderstanding the nature of unit price construction contracts, especially in terms of how risks related to changes in quantities are shared between employers and contractors (31). Second, the risk allocation for contract price under FIDIC (CONS) differs significantly from the approach outlined in Article 657 of the ECC (35). Lastly, the literature presents a notable contradiction interpretation regarding the application of Article 657 of the ECC in the context of FIDIC (CONS) contracts, especially concerning the employer's right to terminate the contract by referencing Article 657 ((14,35)). These contradictions raise questions about the compatibility of FIDIC provisions with the ECC. Clarifying these contradictions is crucial to ensure legal clarity and establish a more predictable contractual framework.

## 3 Research Methodology

This paper employs a doctrinal research methodology to analyze the compatibility between ECC and FIDIC (CONS) in addressing changes in quantities. Accordingly, relevant legislative and contractual provisions, literature, and court decisions were reviewed, analyzed, and compared to identify the local limitations.

The research begins by analyzing the provisions of the ECC related to changes in quantities, termination for convenience, and adjustments to unit rates. Then, the relevant provisions of FIDIC (CONS) are examined. A comparative analysis is conducted to examine the similarities and differences between ECC and FIDIC (CONS). Additionally, the application of the ECC provisions is evaluated through an adjudication by the Egyptian Court of Cassation. Finally, the findings are summarized to provide a comprehensive conclusion.

## 4 The Egyptian Civil Code

### 4.1 Discussion of Article 657 of the ECC

This article stipulates that "(1) When a contract is entered into in accordance with an estimate drawn up on a unit price basis and it becomes apparent, during the execution of the work that it will be necessary, in order to complete the agreed upon a design, to tangibly exceed the estimated price, the contractor must immediately notify the employer accordingly and inform him of the forecasted increase in price; if the contractor fails to give such notice he forfeits his right to recover the expenses incurred in excess of the estimate. (2) When the excess in the price for the execution of the designs is exorbitant, the employer may terminate the contract and stop the execution, provided that he does so without delay and

pays the contractor for the value of the work he has executed, calculated in accordance with the terms of the contract, without compensating the contractor for the profit he could have earned if he had completed the work.”

For the enforcement of Article 657, three conditions must be fulfilled as follows (2,33,35):

Condition 1: The contract type must be re-measured, and the contract price must be agreed upon (33,34). Hence, this article does not apply if the contract is based on a lump sum based on a specified design, or if the price is not determined at the beginning of the contract because Article 658 of the ECC governs contracts that are based on a lump sum whereas contracts that do not have a price agreement between the parties will be decided by the judge (2,33).

Condition 2: This article implies that the estimated contract price has increased as a result of a significant exceed between the actual quantities and those estimated in the BOQ (33,34). This article does not imply that the estimated contract price is increased as a result of a tangible surpass in the costs (2,34). This is because it is assumed that the contractor has thoroughly analyzed all relevant elements that could potentially impact the cost prior to determining the tender price. Furthermore, For the requirement to be satisfied, the quantity increase should not have been predictable when the contract was signed (2,33,34). Finally, in case the price increase is a result of exceeding quantities that were not tangible, then the contract price will be adjusted proportionally to that excessive quantity. In this case, the employer has no other choice, even if the contractor does not inform of such an increase (6,33,34).

Condition 3: The contractor has an obligation to immediately inform the employer upon becoming aware of such an increase (6,33,34). However, it is noteworthy that there is no prescribed form for such notice; it may be conveyed through various means such as electronic correspondence, physical delivery, or verbal communication. Regardless of the method chosen, the contractor bears the burden of proving that such a notice was sent (2,33). If the contractor for a certain period of time keeps silent without providing a justifiable explanation for not giving the notification, then it is considered that the contractor has implicitly relinquished his entitlement to be compensated for the exceed in price. The contractor's expected increase amount must be included in the notice. The sole entitlement of the contractor will be the anticipated increment that is specified in the notice. In case the actual increase surpasses the anticipated increase provided in the notice (33,34).

If the three above-mentioned conditions were satisfied. the tangible increase in contract price would be considered to be either insignificant or significant. Regarding the insignificant increase, though Article 657/1 did not explicitly address in detail the whole matter that results when the aforementioned three conditions are met and the excess quantity is considered to be tangible, yet insignificant, it is concluded from Article 657/2 by means of contradictory reasoning that the employer cannot terminate the contract in this situation (34,35). Therefore, whether the employer accepts it or not, the employer is obligated to pay the additional price that is equivalent to the additional quantity (6,33,34) Regarding the significant increase, if the tangible increase is significant, in this case, the employer has two options in this scenario (2,6,34).

The first option: the employer decides to keep the contract in force and demands the contractor to continue the work. In this situation, the contract price is adjusted proportionally with the significant additional quantity(2,6,34).

The second option: the employer finds that the significant rise is exhausting to him, then the employer can terminate the contract. In this situation, the employer must instruct the contractor to stop executing the work without procrastination or delay (2,33). There is no form for such notice, as it can be by e-mail, hand, or verbally. In all cases, the employer bears the burden of proving that such a notice was sent (2,33). If the employer delays in making this request without sufficient justification, the contractor may proceed with the implementation of the construction works assuming that the employer chose the first choice (2,33). In case of termination of the contract, the employer is obligated to pay the contractor for the price of work that was accomplished according to the rates specified in the BOQ rather than the contractor's actual expenses. Nevertheless, the employer is not required to compensate the contractor for any anticipated profits that the contractor would have been earned from the terminated portion of the works (2,34).

The limitation of whether the exceed in quantities, is significant or insignificant, is determined by the judge (6,33). Some scholars suggested that the increase in quantities would be considered significant if the anticipated impact is more than 10% of the accepted contract amount (33), whereas others assumed that an exceed in the accepted contract amount by more than 15% would be deemed significant, taking into account the project's nature and size (6).

It is noted that when jurists presented with an explanation and interpretation of the provisions of Article 657 concerning the reasons for exceeding the estimated quantity, they did not mention any of these reasons other than the unforeseen physical conditions that were not sufficiently expected at the time of contracting, and the error in the design (31). It means that these two reasons are the ones that are subject to the provision of Article 657 (31). The given examples are as follows:

Example 1: If the estimated quantities for underground construction are included in the BOQ, and the contractor discovers during excavation that the foundation needs to be deeper than what was estimated, resulting in a substantially greater quantity of work than stated in the BOQ, then this constitutes the tangible excess referred to in article 657. If the exceedance was expected when concluding the contract or if it was possible to expect it, the contract price will be increased by the amount of this increase and the employer has no choice (33).

Example 2: It may happen during the execution of the work that it becomes clear to the contractor that it is necessary to implement the design that has been agreed upon to carry out work that was not included in the BOQ, or to increase the quantity of work stipulated in it in a large and significant manner, such as if the contract was for the construction of a building and it became clear that it was necessary to increase the number of reinforced concrete columns or increase the thickness of the walls so that the building can be raised to the height indicated in the design (32).

So, Article 657 is applied in cases where the increase in quantities is unexpected. Therefore, this article means the increase resulting from a design error or/ and unforeseen physical conditions, and not the normal increase due to inaccurate BOQ in contracts concluded on a unit rate basis (31).

## 4.2 Evaluation of Variation in Quantity Under The ECC

If the expected contract price is surpassed as a result of a substantial increase in costs, the unit rate remains unchanging. According to ECC Article 657/1 (34), the expected contract price should only be exceeded when there has been a significant rise in the actual quantities, not when expenses have increased noticeably (2). It is assumed that the contractor evaluated all reasonable considerations that may increase the cost before setting the tender price (34)

However, as stated in Article 147/2 of the ECC, the legal system of Egypt grants parties to request a modification to their agreement under certain circumstances (14,34). Section 2 of Article 147 stipulates that: "if general exceptional events crop up and it has not been possible to predict them, and their incidence resulted in the fact that the performance of the contractual obligation, even though it has not become impossible, has become excessively onerous in such a way as to threaten the debtor with exorbitant loss, the Judge may, according to the circumstances, and after taking into consideration the interests of both parties, reduce the onerous obligation to reasonable levels, Any agreement to the contradictory is invalid."

The fulfillment of the subsequent conditions is required for Article 147/2 to become applicable (35):

1. The occurrence of a general exceptional event takes place subsequent to the contract's signature, such as, changes in legislation or economic changes;
2. The occurrence is unavoidable and inescapable;
3. The event was not been anticipated when the contract was signed; and
4. The event makes the execution of the contract extremely difficult but not impossible and threatens enormous losses (14,35).

If the aforementioned conditions had been satisfied, and the theory would be valid. The court has the authority to decrease the excessively onerous obligation to levels considered more equitable and reasonable (35,36). With respect to this, the judge has discretion; the judge retains the prerogative to either

increase the contract price or reduce the responsibilities of the party adversely impacted by the exceptional event (36,37). Nonetheless, if the judge decides to increase the contract price, it is constrained to lessen the losses incurred by the affected party, without complete reimbursement for all resultant losses (35,38).

The principle of unexpected exceptional circumstances will be relevant in case the contractor faces physical conditions that are unanticipated and increase his expenses. For example, if the land where the structure is to be constructed contains a groundwater table, that requires utilizing of a foundation that would result in higher expenses than anticipated. It should be noted that there is no distinction between if the event did not take place subsequent to the contract being signed, notwithstanding its pre-existence before the contract was executed, yet was not predicted in advance. In both situations, they are considered as not having been taken into account during the negotiation and establishment of the contract (33).

## 5 FIDIC (CONS)

### 5.1 Unforeseeable Physical Conditions Under FIDIC (CONS)

Subclause 1.1.6.8 defines the term "unforeseeable" as 'not reasonably foreseeable by an experienced contractor by the date for submission of the tender' (39,40). The determination of whether physical conditions are unforeseeable can be answered by considering the duration of the project and the statistical frequency of similar events, using historical data. For instance, an experienced contractor may be deemed capable of anticipating an occurrence that happens at a frequency of approximately once every six years if the contract duration is three years, while an occurrence that happens only once every 10 years could be considered as unforeseeable (41).

Physical condition is discussed under subclause 4.12 to mean natural physical circumstances and artificial and other physical obstructions and pollutants including hydrological and subsurface conditions but not including climatic conditions, that the contractor faces at the site while carrying out the work (20,39). However, prior to going into unforeseeable physical risks in-depth, the researchers want to elucidate specific provisions of two other subclauses that are strongly connected to the risk of unforeseeable physical conditions (39).

Under subclause 4.10, the employer must provide the contractor with all relevant information about the hydrological and sub-surface conditions on the Site in the Employer's possession before the base date, and the employer is then under an ongoing responsibility to give any data that comes into his possession after the base date (20). If the employer fails to give the contractor all pertinent data as required in the subclause, this failure will have a substantial impact on the determination of whether conditions can be deemed unforeseen as per subclause 4.12 (20). The contractor does not bear responsibility for the precision of the data (20,39).

Furthermore, subclause 4.11 stipulates that the contractor is considered to have determined the accepted contract amount based on the data, necessary information, interpretations, and satisfaction as to all relevant matters submitted under subclause 4.10 and the accepted contract amount covers all of the contractor's contractual obligations (39). After providing the required data by subclause 4.10, the employer is exempted from any formal obligations regarding the claims submitted by the contractor under the terms of this subclause (42).

According to subclause 4.12, in case the contractor faces adverse physical conditions considered unforeseeable, it is imperative that the contractor issues a notification as soon as practicable to the engineer, which may also be the notification referred to in subclause 20.1 (20,43). The objective of providing such timely notification is to afford the engineer the utmost opportunity to review the condition and evaluate the most effective method to resolve the issue (20,44). For this reason, the notification shall contain a description of the physical condition and the reason for considering it to be unforeseeable (45), and state that it is issued in compliance with subclauses 4.12 and 20.1 (41). If such notice is not issued within the specified timeframe 28 days after the contractor becomes aware (or should have become aware) as stipulated in subclause 20.1, the contractor forfeits the right to claim for an extension of the

project duration and the reimbursement of incurred expenses (20,41). Figure 1 illustrates the aforementioned procedure.

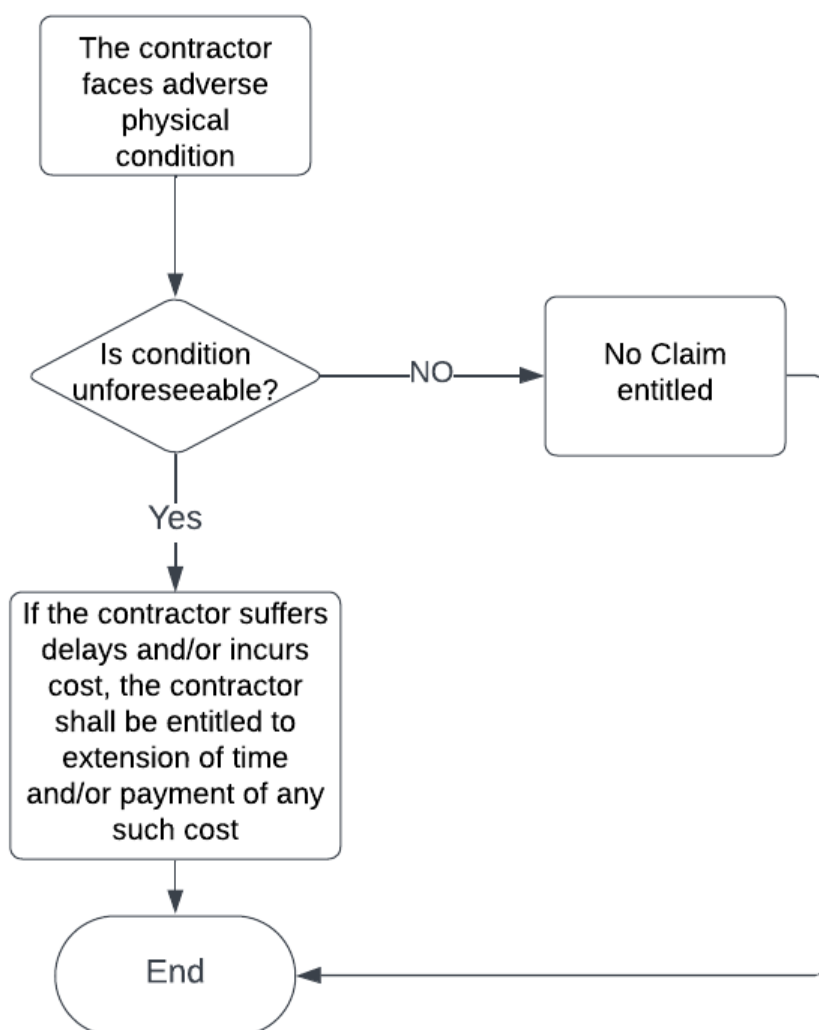


Figure 1: Handling Unforeseeable Physical Conditions Under FIDIC (CONS)

Having provided such notification, the contractor is entitled to an extension of time or/and additional payment to compensate expenses incurred arising from unforeseeable physical conditions, in comparison to the foreseeable physical conditions that could have been reasonably anticipated (which are considered to be included in the unit rates specified in the BOQ) (41). This means that the payment, that is required, equals the total amount of (41):

- a) the original contract value, namely of the scope of work that would have been needed in the event of encountering only foreseeable physical conditions.", and
- b) the extra expense related to which the physical conditions actually faced is not foreseeable. This cost is extra to the cost (considered to be part of the specified amounts (a)) that would have been incurred if the contractor had faced foreseeable physical conditions (41).

The original contract value (a) of work under foreseeable conditions is the various amounts stipulated in the contract, usually for excavation in an area where conditions are not foreseeable. The contractor may consider that the full excavation costs for unforeseeable Conditions must be paid, even if these conditions are only unforeseeable to a confined extent (41). However, subclause 4.12 provides that it is his right to pay costs to the extent that the conditions were unforeseeable (41). Therefore, it is often necessary to determine the additional time and resources required, in comparison to those required for excavating the area if it had only foreseeable physical conditions (20,41).

### 5.2 Design Error Under FIDIC (CONS)

Subclause 4.1 outlines the obligations incumbent upon the contractor. The contractor is responsible for the design (to the extent stipulated in the agreement), execution, and completion of the works (20,41). The last part of the third paragraph of subclause 4.1 specifies that the contractor bears no responsibility regarding the design of the permanent works (20,46).

Although the employer holds primary accountability for designing the permanent works, subclause 1.8 mandates that the contractor must provide a notice to the employer if the contractor detects any defects or errors in the documents intended for implementing the Works (20,47). This duty solely pertains to mistakes or defects of a technical nature. It is indicated that this does not impose a contractual responsibility on the contractor to look for such defects or errors, but only arises when any defect or error is discovered (20). Prompt notice will provide the employer with a greater chance to reduce the impact of the document's defect or error (45).

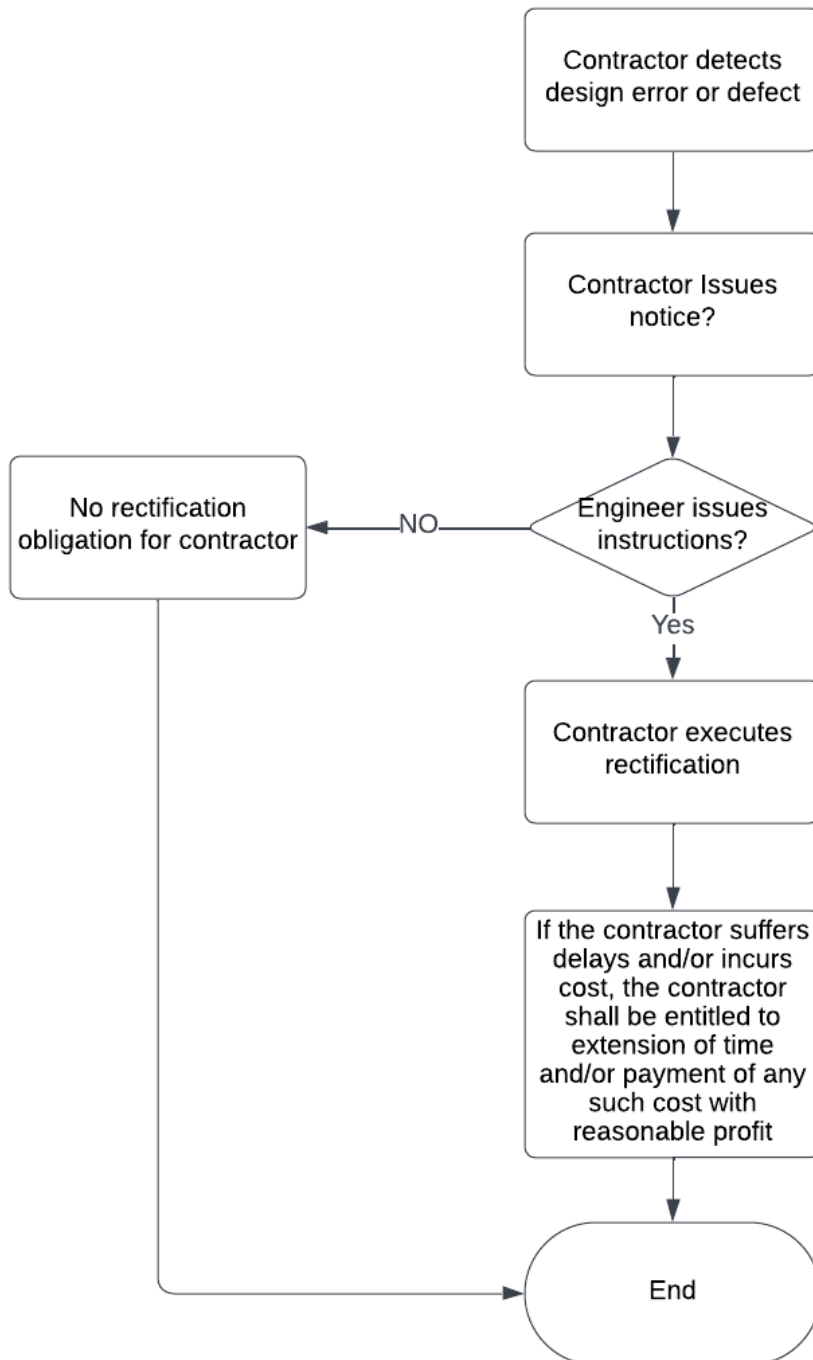


Figure 2: Handling Design Error Under FIDIC (CONS)



Subclause 17.3 enumerates eight specific sorts of events that are classified as risks borne by the employer (48). Among the risks borne by the employer, is the design error in any portion of the work by the employer (or on behalf of) (49). The distribution of risk refers to the assignment of responsibility for specific damages or losses (45).

Subclause 17.4 delineates the process to be undertaken in the case of a design error resulting in damage or loss to the works (20,50,51). It mandates that the contractor promptly informs the engineer of such occurrences. Following the issuance of this notification, the contractor is then obligated to rectify the damage or loss in accordance with the engineer's instructions (20). In the absence of such instructions from the engineer, the contractor is not under obligation to undertake any rectification measures (41,45). If compliance with these instructions results in the contractor suffering delay and/or incurring cost, the contractor shall issue further notice in order to obtain relief. This notice should be issued within the specified timeframe 28 days after the contractor becomes aware (or should have become aware) as stipulated in subclause 20.1, and should make reference to the previous notice (41,50). If there was no prior notice and no responding instructions, the contractor may not be able to depend upon a notice claiming that a design error has already caused him to suffer delay and/or bear an additional cost (41). In such case, the contractor is entitled to request an extension of project duration and/or compensation for any additional costs incurred and reasonable profit on the cost (45). Figure 2 illustrates the process for managing design errors under FIDIC (CONS).

### 5.3 Termination by Employer Under FIDIC (CONS)

Subclause 15.2 sets out all the cases in which the employer has the contractual right to initiate the termination of the contract (20,52). It is clear notice that the employer has no justification to terminate the contract if its continuation of work becomes onerous because of significant variations in the estimated quantities or contract price caused by unforeseeable physical conditions and/or design errors, but the employer still has the entitlement to terminate the contract at any time for the employer's convenience if the employer may not wish to continue the work in case of encountering unexpected difficulties (14,41). Nevertheless, there may be instances in which the employer no longer requests the completion of the project, thereby necessitating termination in such cases (14,16,53).

In accordance with subclause 15.5, the employer has the right to unilaterally terminate the contract at any time for his convenience (20,54). However, it is stipulated within subclause 15.5 that such termination by the employer is prohibited from being executed with the intention of directly undertaking the project's execution either independently or through the engagement of an alternative contractor (16,54). Upon termination, the contractor is entitled to reimbursement according to subclause 19.6. This reimbursement encompasses (54):

- a) The amounts payable for executed work according to price in the Contract;
- b) Any other expense or liability that the contractor reasonably incurred under the circumstances with the intention of finishing the works;
- c) The cost incurred for the procurement of plant and materials, either already delivered by the contractor or for which the contractor is responsible for accepting delivery;
- d) The expense associated with repatriating the contractor's labors and staff who were fully engaged in the execution of the works at the time of termination; and
- e) The expenses associated with removing equipment and temporary works from the site and returning them to the contractor's facilities in his country or to an alternative specified destination, ensuring that the incurred cost does not surpass the original expenditure (20,54).

### 5.4 Evaluation of Variation in Quantity Under FIDIC (CONS)

The contractor establishes his proposal by utilizing projected quantities outlined in the bidding documents, specifically the BOQ, which are supplied by the employer (41). The employer is required to make appropriate modifications to the contract unit rates in order to reimburse the contractor for any

variations between the actual quantities of work performed and the estimated quantities specified in the BOQ. This obligation is stipulated in subclause 12.3 (40).

Pursuant to subclause 12.3, FIDIC (CONS) allows the adjustment of the unit rate of any item if four conditions are fulfilled. The four conditions are as follows (43,55):

1. 10% or greater decrease or increase in the estimated quantity of the item in the BOQ.
2. The changed quantity of the item times the contract unit rate results in an increase of 0.01% of the accepted contract amount.
3. The changed quantity has a direct impact on the unit cost of the item, causing a change of more than 1%.
4. The item is not categorized as a fixed rate item in the agreement (56).

If the four conditions are fulfilled, the unit rate would typically be adjusted in line with the variation in cost per unit quantity, which directly results from the change in quantity (41). The objective of this subclause is to grant the Contractor relief in cases where it would be unsuitable, due to a significant variation in the quantity of work required, to demand that the contractor finish the works (or Section) under the same conditions as originally agreed upon in the tender documents (45).

## 6 Unforeseeable Physical Conditions and Design Error Under FIDIC (CONS) and ECC- Comparative Analysis

Table 1. Comparative Analysis of ECC and FIDIC (CONS) Provisions

Comparison Criteria	FIDIC (CONS)	ECC
1- Notice Duration	The contractor shall notify the engineer within 28 days after becoming aware of the issue. Failure to notify within this timeframe forfeits the contractor's rights to claim.	The contractor shall notify the employer immediately upon becoming aware of an issue. Failure to notify forfeits any claim for additional payment.
2- Detailed Claim Duration	The contractor shall submit a detailed claim within 42 days after becoming aware of the issue	The notice must contain a fully detailed impact of the event on the increasing contract price.
3- Payment Entitled to the Contractor	Payment includes the sum of executed quantities and any incurred costs due to unforeseeable conditions and design error, plus reasonable profit in the case of design error.	Payment is limited to the executed quantity based on the agreed unit rate.
4- Adjustment of Unit Rates	Subclause 12.3 allows adjustment of unit rates if there is a significant change in quantities.	Unit rates remain fixed, even for increased quantities, unless the theory of unforeseen exceptional circumstances, provided in Article 147, is applied
5- Contractor's Entitlement to an Extension of Time	The contractor is entitled to an extension of time for unforeseeable physical conditions (Subclause 4.12) and design errors (Subclause 17.4).	No explicit provision for time extension. Consequently, the contractor may incur penalties for delays unless it is proven, under Article 215, that the delay was caused by external factors beyond his control.

As aforementioned, in the event that the contractor encounters delays and/or incurs costs due to design errors as per Subclause 17.4 or unforeseeable physical conditions outlined in Subclause 4.12, the contractor is required to issue a notice to claim his entitlement to an additional payment and/or extension of time in compliance with the procedures stated in subclause 20.1 (20,41). This subclause provides that the contractor must provide notification within a prescribed timeframe of 28 days after becoming aware (or should have become aware) of the occurrence (57,58). Failure to provide a claim notification within this specified period of time results in the contractor losing any right to receive an additional payment and extension of time (2,59). Subsequently, within a timeframe of 42 days from the contractor's awareness (or should have become aware) of the occurrence, the contractor must submit a detailed claim to the engineer (60,61). The detailed claim includes all the necessary details and evidence to support the claim, including a precise calculation of the claimed additional payment and/or extension of time (20). For ECC, Article 657 provides that the contractor must provide a notice to the employer immediately, and the notice must contain a fully detailed impact of the event on the increasing contract price (2,34).

Concerning the mechanisms and proceedings regarding additional payment, FIDIC (CONS) offers comprehensive proceedings and sanctions for claiming and calculating an additional cost. FIDIC (CONS) requires that the contractor gives a fully detailed claim containing the assessment of his entitlement to the additional cost of the event within 42 days (8,20). On the other side, the ECC provides that the notice, that is sent immediately, must contain the contractor’s estimated increase amount (2,33). The contractor's entitlement is limited only to the anticipated increment specified in the notification in case the actual quantity increase surpasses the anticipated increment provided in the notice (2,34). In practice, complying with the conditions of Article 657 is difficult and impractical, as the contractor requires sufficient time to assess the occurrence (34).

Concerning the payment entitled to the contractor as a consequence of such an event, according to the FIDIC (CONS) provisions, the entitlements of the contractor are delineated as follows:

1. Expenses incurred by the contractor due to such event according to subclauses 4.12 & 17.4 and reasonable profit in case of design error according to subclause 17.4 (20,41); and
2. Amount of executed work is calculated by multiplying the quantities of actual work performed by their corresponding unit rates (20,41).

It's worth mentioning that FIDIC (CONS) allows the amendment of the unit rate for items changed in quantity (20,21). However, under ECC, The contractor's entitlement is restricted to the payment for the executed work with the same unit rate agreed upon in the contract without any amendment (2,33). This may be considered to be unfair. For example, excavation work for deeper depth is more expensive than shallow depth. However, in the event that the principle of unforeseen exceptional circumstances delineated in section 2 of Article 147 of the ECC is deemed applicable, the onerous obligation may be reduced to a reasonable level (14,34). Nevertheless, if the judge adjusts the contract price, it will only reduce the losses of the party affected by the extraordinary occurrence without fully compensating the contractor for all the losses sustained due to such event (14,35). As a result, the contractor is expected to still face some financial losses resulting from the occurrence.

Regarding the contractor's entitlement to an extension of time, pursuant to subclauses 4.12 and 17.4 of FIDIC (CONS), the contractor is entitled to an extension of time in case the contractor is delayed as a result of these occurrences (20,21). However, the ECC lacks any provision about the contractor's right to claim an extension of time (3,8). It is illogical that the contractor executes the work with increased quantities in the same period of time as the original work in the contract. Consequently, the contractor may be subject to pay delay damage. Nonetheless, Article 215 of the ECC offers a safeguard wherein a debtor, represented by the contractor in that situation, will be exempt from penalties for delays if he can demonstrate that the delay in progress was caused by an external event beyond his control (8,62). Nonetheless, the ECC lacks any explicit/specific provision regarding the contractor's entitlement to an extension of time and the procedure for obtaining such an extension (3,8). The absence of a specified completion date for the works may result in conflicts among the parties involved during the implementation of works (3). Table 1 summarizes the key differences and similarities between FIDIC (CONS) and ECC.

Table 2. Termination under ECC and FIDIC (CONS)

Conditions related to termination	FIDIC (CONS)	ECC
Is the employer entitled to terminate the contract in case the difference between estimated and actual quantities is significant?	Yes (termination for convenience)	Yes (Article 657)
the contractor is entitled to payment for:		
All works carried out until the time of termination	Yes	Yes
Costs incurred by the contractor in the expectation of completing the works	Yes	No
Costs incurred by the contractor in demobilization	Yes	No
The profit he could have earned if he had completed the work	No	No

In the scenario where the employer may not wish to complete the work in case of encountering unexpected difficulties. Within the framework of the FIDIC (CONS), the employer has the right to end the contract. In such termination, the contractor shall have the right to receive payment for all executed work, any incurred cost due to termination, and any other expense or liability that the contractor reasonably incurred under the circumstances with the intention of finishing the works (20,54). On the other side, ECC provides that the contractor will receive a payment for any work carried out according to the contract, without paying what the contractor has incurred (2,35). This may be considered to be unfair, since the contractor will incur the expense of demobilization, and the contractor may also have borne losses since the major indirect cost which is incurred at the beginning of the project are spread over smaller quantities of work than were initially agreed on (34). Table 2 provides a summary regarding the entitlement for contractor in case of termination between ECC and FIDIC (CONS).

In view of the preceding, under FIDIC (CONS) and ECC, it becomes clear that the contractor's failure to provide timely notification will impact its right to cost compensation. Article 657 of the ECC and subclause 20.1 of FIDIC (CONS) are time limitation provisions which require two conditions for the enforceability of the time limitation provision (2): First, a specific period within which the contractor is obligated to submit the notification. Second, a clear statement that failure to issue the notification within this specified timeframe will result in the contractor losing his right to claim (2,63). Pursuant to Article 657 ECC, if the contractor fails to immediately inform the employer about a rise in the contract price resulting from a substantial rise in quantity, the contractor will forfeit his right to an additional cost (2,34). On the other side, FIDIC (CONS) provides that, within a timeframe of 28 days, the contractor must inform the engineer. Failure to do so will result in the contractor relinquishing his entitlement to request any further compensation or time extension (2,8,20,64).

It is observed that the time bar clause under FIDIC(CONS) is fully consistent with the time limitation stipulated in Article 657 of the ECC. Indeed, the requirement "immediate" for notice specified in Article 657, as compared to the 28-day notice timeframe outlined in the FIDIC (CONS) contract, indicates that the ECC has a more rigorous stipulation (2).

Prior to dismissing a claim as a result of noncompliance with the stringent technicalities of the notice mechanisms, it is essential to take into account the provisions of ECC that could potentially influence the matter (18). The concept of "good faith" is a mandatory requirement for the obligations resulting from a contract as stated in Article 148/1 of the ECC, which stipulates that "A contract must be performed in accordance with its provisions and in compliance with the requirements of good faith." (2,14,65). It is argued that this may apply to the situation where the contractor reviews the information provided in recorded minutes of a meeting or similar but was never formally made (8). According to ECC, The time bar clause might not be enforceable in two situations, if the contractor delays providing the notice for a significant claim within a few days, it may result in considerable financial troubles for the contractor if the claim is forfeited due to being time-barred (65). Additionally, in situations where the employer is aware of the occurrence that led to the claim and is not suffering any hardship as a result of the delayed notice (2,66). Thus, the principle of fair dealing and good faith is acknowledged within Egyptian legislation, and consequently within the judicial system, even if not explicitly stated in the contract (65).

Furthermore, another principle addressing the obligation of good faith is the principle of abuse of rights, which they have to be linked together (67). In accordance with Article 5 of the ECC, the exercise of a right is deemed illegal if the desired benefit is out of proportion to the harm inflicted on others (68). Therefore, In the event that a legitimate claim faces rejection solely due to a minor technical violation of the notice provision, It might be considered illegal, particularly when the advantage derived from upholding the employer's contractual entitlement to obtain notification within the specified timeframe gains a benefit disproportionated to the potential financial harm incurred by the contractor (3,8).

Moreover, if a valid claim for additional payment is refused because the contractor failed to comply with contractual obligations regarding notification, then it is feasible, according to Article 179 of the ECC, that the employer has unfairly profited from the extra work, resulting in unjust enrichment (3).

The situation can be considered as such if the employer is trying to avoid compensating for additional work by relying on the contractor's failure in a procedural matter (8).

## 7 Egyptian Court Cases

In order to gather relevant case law for this paper, the authors explored the Court of Cassation website. The single associated case is Case No. 1164 of the 48th Judicial Year, adjudicated on March 12, 1984, which serves as a seminal example related to Article 657 of the ECC. The litigation originated from a contract executed on March 28, 1966, wherein an employer engaged a contractor for the supply and installation of insulation materials on various structures. Over the course of the contract, the quantities required for the insulation materials experienced a considerable increase. The contractor failed to notify the employer about this increase in quantity, which led the employer to withhold compensation and disallow the contractor from completing the remaining contractual scope of work. The employer defended this action by invoking Article 657, arguing that the contractor's failure to provide notification had effectively forfeited his right to additional remuneration.

The legal journey of this case traversed through multiple levels of the judiciary, starting with the Court of First Instance, proceeding to the Court of Appeal, and culminating at the Court of Cassation. The court ultimately ruled in favor of the contractor. Its judgment rested on an interpretation of the contract's clause, which stated that quantities stated in the BOQ were subject to increase, decrease, or omission. Therefore, the employer could not legitimately claim to be "surprised" by the increased quantities. The Court of Cassation elaborated that the essence of Article 657's notification requirement is to protect the employer from unanticipated financial obligations. In this specific case, the court concluded that since the employer had either knowledge or awareness of the likelihood of quantity variations at the time of the sign of contract, the contractor's claim for the increased the contract price was legally justifiable.

## 8 Conclusion

The analysis of Article 657 of the ECC demonstrates that it does not deviate to the foundational principles of a unit price contract. Its applicability is limited to instances where unforeseeable events lead to a substantial increase in the estimated contract price, rather than increases caused by inaccuracies in the BOQ. It is important to note that Article 657 is not a mandatory provision, allowing the contracting parties to agree otherwise. In such cases, the terms of the contract will supersede the default provisions of the ECC. This analysis highlights the difficulties that can arise when parties rely solely on ECC provisions in ad hoc contracts, instead of using the structured framework provided by FIDIC (CONS). A comparison between the ECC and FIDIC provisions on unforeseeable physical conditions and design errors shows similarities and differences. Regarding entitlements for additional payment, FIDIC is more favorable to the contractor, granting compensation for the executed quantity along with any additional costs incurred due to unforeseen events. In contrast, the ECC restricts the contractor's entitlement solely to the executed quantity, without considering any incurred costs. Moreover, the ECC's immediate notification requirement under Article 657 is stricter compared to FIDIC's 28-day notice period provided under Subclause 20.1. Furthermore, the contractor's entitlement to an extension of time under the ECC remains ambiguous, creating uncertainty for both contractors and employers in addressing delays caused by unforeseeable events. The ECC appears less supportive of contractors, particularly in instances of contract termination where the contractor bears the associated costs.

This paper recommends revising Article 657 of the ECC to improve clarity and fairness. First, Specific criteria, with clear percentage thresholds, should be defined for what is considered "tangible" and "significant" changes in contract quantities. Second, a structured notification period and submission detailed claim period should be introduced to give contractors enough time to evaluate unforeseen events. Additionally, explicit provisions for time extensions and adjusting the unit rate should be included. Finally,

contractors should be fully compensated for all reasonable costs incurred in cases of contract termination. These changes will create a more balanced and equitable framework, reducing disputes.

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