

ISTANBUL TECHNICAL UNIVERSITY ★ GRADUATE SCHOOL OF SCIENCE
ENGINEERING AND TECHNOLOGY

**A COMPARATIVE ANALYSIS OF FIDIC RED BOOK 1999 AND 2017
EDITIONS FOR CONTRACT ADMINISTRATION IN CONSTRUCTION
PROJECTS**



M.Sc. THESIS

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Department of Civil Engineering
Construction Management Programme

JUNE 2019

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**İNŞAAT PROJELERİNDE FIDIC KIRMIZI KİTAP 1999 VERSİYONU İLE
2017 VERSİYONUNUN SÖZLEŞME İDARESİ AÇISINDAN
KARŞILAŞTIRILMALI ANALİZİ**

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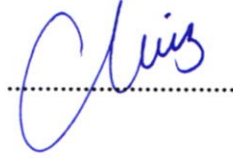
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To my family,



FOREWORD

I would like to present my deepest gratitude to my supervisor Assoc. Prof. Dr. Deniz ARTAN ILTER for her great supports, guidance, valuable time and immense knowledge. I would like to thank academicians at ITU Construction Management Programme for their contribution to my educational background and my friends who have always trusted me with their interest and love. Lastly, I would like to thank my family members for their significant encouragement.

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ABBREVIATIONS

ACE	: Association of Consulting Engineers
ACEA	: Association of Consulting Engineers of Australia
ACI	: American Concrete Institute
AIA	: The American Institute of Architects
ALC	: Alliance Contract
ASINCE	: Spanish Association of Engineering, Consulting and Technological Services
ASTM	: American Society for Testing Materials
BOOT	: Build, Own, Operate and Transfer
BoQ	: Bill of quantity
BOT	: Build, Own and Transfer
CCA	: Canadian Construction Association
CCAG	: The General Administrative Conditions of Contract
CCDC	: Canadian Construction Document Committee
CE	: Community Europe
CIDB	: Construction Industry Development Board
CII	: Construction Industry Institute
CMA	: Construction Manager as Adviser
CMc	: Construction Manager as Constructor
COAA	: Construction Owners Association of Canada
CONS	: The Conditions of Contract for Construction for Building and Engineering Works Designed by the Employer
DAB	: Dispute Adjudication Board
DBO	: Design Build Operate Contract
DIN	: Deutsche Industrie Norm
E&M	: Electrical and Mechanical
ECC	: Engineering and Construction Contract
EIB	: The European Investment Bank
ENAA	: The Engineering Advancement Association of Japan
EOT	: Extension of time
EPC	: Engineering, Procurement and Construction

EU	: European Union
FIDIC	: International Federation of Consulting Engineers
HKIA	: The Hong Kong Institute of Architects
IADC	: International Association of Dredging Companies
IBRD	: The International Bank for Reconstruction and Development
ICC	: The International Chamber of Commerce
ICE	: Institution of Civil Engineers
IDA	: International Development Association
IEM	: The Institution of Engineers
INCOTERMS	: International Commercial Terms
JCT	: The Joint Contracts Tribunal
MDB	: Multilateral Development Bank
NEC	: New Engineering Contract
NEPA	: National Fire Protection Association
NOD	: Notice of Dissatisfaction
OHSAS	: Occupational Health & Safety Assessment Series
OPS	: Operation service period
PAM	: Perhubungan Arkitek Malaysia
PMBOK	: Project Management Body of Knowledge
PSSCOC	: Public Sector Standard Conditions of Contract for Design and Build
RFI	: Request for Information
RIBA	: The Royal Institute of British Architects
SAACE	: South African Association of Consulting Engineers
TSE	: Turkish Standards Institute
UIA	: International Union of Architects
UNIDROIT	: The International Institute for the Unification of Private Law
USIC	: Swiss Association of Consulting Engineers
VOB	: The German Construction Contract Procedures
WB	: World Bank

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A COMPARATIVE ANALYSIS OF FIDIC RED BOOK 1999 AND 2017 EDITIONS FOR CONTRACT ADMINISTRATION IN CONSTRUCTION PROJECTS

SUMMARY

The construction sector is one of the important sectors in the economy of developing countries, especially in terms of the contribution it provides to the country's income and the employment it creates. The complex structure, the single and the non-replicable features of the projects distinguish the construction sector from other sectors. Also, the projects include multiple disciplines such as static, architectural, electrical and mechanical. Today, the tendency for large projects that require high budget and long-term investments in the construction sector is increasing.

The success of the projects in the construction sector depends on the successful completion of time, cost and quality. The role of the contractual obligations in the completion of the projects at the intended time, quality and cost is important. If construction contracts are prepared with care to respond to all parties involved in construction projects and all phases of the construction process, the executed project will reach the specified target.

There are many uncertainties and disagreements throughout the construction process in the construction sector, and also the sector involves different risks due to its nature. When these problems are encountered, standard contract forms have been created for reasons such as determining the appropriate method, determining the tasks of the parties and making production suitable for the job description. The standard contract forms are prepared with special conditions according to the country in which the project is performed, according to the characteristics of the project and conform to the standard structure.

The International Federation of Consulting Engineers (FIDIC) standard contract forms are among the most frequently used contracts in international construction projects. FIDIC contract forms vary according to the delivery method of the project. Commonly used among these forms are the Red Book where the design work of the project is usually the responsibility of the employer, the Yellow Book where the design is the responsibility of the contractor and the Silver Book used in turnkey projects.

Globally, the use of FIDIC contract forms has increased significantly over the last 20 years since the release of the 1999 edition of the Red Book, Yellow Book, and Silver Book. The success of FIDIC contract forms arises from the fact that they are suitable for use across a variety of legal systems; that they are well known to market participants, including financiers; and that they are proactively updated to serve their market over time.

FIDIC introduced the second edition of three main contracts in the FIDIC Rainbow Suite at the FIDIC International Users' Conference in London on 5th December 2017. The second edition brought some changes in the contract structure. The aim of this thesis is to provide an understanding of the changes and innovations in FIDIC Red Book 2017 edition contractual clauses that affect the requirements of employers, contractors and the engineers.

Literature review has been done within the scope of the thesis and the general conditions of the contract forms of FIDIC Red Book 1999 edition and 2017 edition were compared. Within the scope of the literature review, contract administration in construction projects is mentioned and general information is given about the requirements of standard type contracts and those commonly used in the sector. After that, the FIDIC standard contract forms are examined in detail and a general explanation is given about the 2017 edition.

In the study on the contract forms, the clauses and sub-clauses contained in the general terms of the FIDIC Red Book 1999 and 2017 edition are tabulated and the amendments to these clauses are mentioned. These clauses are then interpreted under general headings.

The academic contribution of this thesis aims to provide an understanding of the changes and innovations in FIDIC Red Book 2017 edition contractual clauses that affect the requirements of employers, contractors, and the engineers. The aim of the thesis for the construction sector is to adopt the new edition of FIDIC Red Book to the sector in a much shorter time, to realize the projects with this contract structure and thus to develop more successful projects.

İNŞAAT PROJELERİNDE FIDIC KIRMIZI KİTAP 1999 VERSİYONU İLE 2017 VERSİYONUNUN SÖZLEŞME İDARESİ AÇISINDAN KARŞILAŞTIRILMALI ANALİZİ

ÖZET

İnşaat sektörü ülke gelirin sağladığı katkı ve yarattığı istihdam açısından özellikle gelişmekte olan ülkelerin ekonomisinde önemli sektörlerden biridir. Karmaşık yapısı, projelerin tek ve tekrarlanamaz olması inşaat sektörünü diğer sektörlerden ayırmaktadır. Ayrıca projeler kendi içerisinde statik, mimari, elektrik ve mekanik gibi birden fazla disiplin barındırır. Günümüzde inşaat sektöründe yüksek bütçeli, uzun dönemli yatırımlar gerektiren büyük projelere eğilim artmaktadır.

İnşaat sektöründe projelerin başarılı olabilmesi zaman, maliyet ve kalite açısından başarıyla tamamlanmasına bağlıdır. Projelerin amaçlanan sürede, kalitede ve maliyetle tamamlanabilmesinde sözleşmelerin ve içerdikleri yükümlülüklerin rolü büyüktür. İnşaat sözleşmeleri, inşaat projelerinde yer alan tüm taraflara ve yapım sürecinin bütün aşamalarına cevap verecek şekilde özen gösterilerek hazırlanır, uygulanan proje belirlenen hedefe ulaşacaktır.

Sektörde yapım süreci boyunca birçok belirsizlik ve uyuşmazlıkla karşılaşmakta, aynı zamanda da sektör doğası gereği farklı riskler içermektedir. Bu sorunlarla karşılaşıldığında uygun yöntemi belirlemek, tarafların görevlerini belirlemek ve iş tanımına uygun üretim yapmak gibi nedenlerden dolayı standart sözleşme formları oluşturulmuştur. Standart sözleşme formları projenin özelliklerine, projenin gerçekleştiği ülkeye göre özel şartlarla düzenlenip standart yapıya uygun olarak hazırlanır.

Uluslararası projelerde standart sözleşme formları arasında sık kullanılanların başında FIDIC standart sözleşme formları yer almaktadır. 1913 yılında bağımsız müşavirlere duyulan ihtiyaç doğrultusunda, bir grup danışman mühendis küresel bir federasyon kurma ihtimalini görüşmek üzere bir araya gelmişlerdir ve yapılan görüşmelerin ardından ilk FIDIC tüzüğü oluşturulmuştur. Federasyon ilk sözleşme örneğini 1957 yılında yayınlamıştır. FIDIC standart sözleşme formları, inşaat sektöründe 60 yıldan fazla bir süredir uluslararası bir standart olarak geliştirilmektedir. Her türlü proje türünde tüm yasal sistemlerde dünya çapında tanınmakta ve kullanılmaktadır.

FIDIC sözleşme formları, projenin yapım metoduna göre farklılıklar göstermektedir. Bu formlar arasında yaygın olarak kullanılanlar, projenin tasarımının genelde işverenin sorumluluğunda olduğu Kırmızı Kitap, tasarımın yüklenicinin sorumluluğunda olduğu Sarı Kitap ve anahtar teslim projelerde kullanılan Gümüş Kitap'tır. Küresel olarak, FIDIC sözleşme formlarının kullanımı, Kırmızı Kitap, Sarı Kitap ve Gümüş Kitap'ın 1999 versiyonunun yayınlanmasından bu yana son 20 yılda geniş bir şekilde artmıştır. FIDIC sözleşme formlarının başarısı, çeşitli hukuk sistemlerinde kullanıma uygun olmaları, finansörler de dahil olmak üzere piyasa

katılımcıları tarafından iyi bilinmeleri ve zaman içinde sektöre daha iyi hizmet etmek için proaktif olarak güncellendiklerinden kaynaklanmaktadır.

2016 yılının başlarında FIDIC bir çalışma grubu oluşturmuş ve 5 Aralık 2017 tarihinde Londra'da gerçekleşen konferansta 18 yılın ardından FIDIC Gökkuşluğu Serisi'ndeki üç ana sözleşmenin ikinci baskısını tanıtmıştır. İkinci baskı, sözleşme yapısındaki bazı değişiklikleri de beraberinde getirmiştir. Bu tezin amacı, FIDIC Kırmızı Kitap 2017 versiyonundaki sözleşme maddelerinde gerçekleşen değişikliklerin ve yeniliklerin anlaşılmasını sağlamaktır. Bu değişiklik ve yeniliklerin işverenlerin, yüklenicilerin ve mühendislerin yükümlülüklerini ne şekilde etkilediğinin tespiti hedeflenmiştir.

Tez kapsamında literatür çalışması yapılmış ve FIDIC Kırmızı Kitap 1999 versiyonu ile 2017 versiyonu sözleşme formlarının genel koşulları karşılaştırılmıştır. Yapılan literatür çalışması kapsamında inşaat projelerinde sözleşme idaresinden bahsedilmiş, standart tip sözleşmelerin gereklilikleri ve bu sözleşmelerden yaygın olarak kullanılanlar hakkında genel bilgiler verilmiştir. Daha sonrasında FIDIC standart sözleşme formları detaylı bir şekilde incelenmiş ve 2017 versiyonu hakkında genel bir açıklama yapılmıştır.

Sözleşme formları üzerinde yapılan çalışmada ise FIDIC Kırmızı Kitap 1999 versiyonu ve 2017 versiyonu genel koşullarında yer alan madde ve alt maddeler tablolaştırılmış ve bu maddeler üzerinde gerçekleşen değişikliklerden bahsedilmiştir. Sonrasında bu maddeler genel başlıklar altında toplanmış ve bu şekilde bir değerlendirme yapılmıştır. Sözleşmenin genel koşullarında yer alan maddelerin karşılaştırılması sonrasında sözleşme idaresi, işverenin yükümlülükleri, yüklenicinin yükümlülükleri, mühendisin yükümlülükleri, değişiklik talepleri, bildirimler, hak talebi yönetimi, uyuşmazlıklar ve tahkim konularında ortaya çıkan değişiklikler yorumlanmıştır.

FIDIC Kırmızı Kitap 2017 versiyonunda risk paylaşımının ardındaki felsefe 1999 versiyonuna göre önemli ölçüde değişmemiştir. Ancak, sözleşme yönetiminde daha fazla netlik ve kesinlik sağlamak için yapılan değişiklikler, standart sözleşmeler özelinde çok radikal olabilir. Kırmızı Kitap 2017 versiyonu tüm tarafların idari yüklerini inkar edilemez bir şekilde arttıracaktır. 2017 versiyonunu kullanacak olan işverenler, yükleniciler ve mühendisler, sözleşmeden haberdar olmalarını ve en kuralcı mekanizma ile başa çıkmak için yeterli kaynaklara sahip olmalarını sağlamalıdır. Bu kaynaklar hem gerekli bildirimlerin ve diğer iletişimlerin zamanında doğru bir şekilde tanımlanmasını ve iletilmesini sağlamak hem de tarafların zamanında karar alabilmelerini sağlamak için gereklidir.

Öte yandan, yeni versiyonda uyuşmazlık çözüm kurullarının kararlarına yapılacak başvurulardan ziyade uyuşmazlığın önlenmesi ve hak taleplerinin çözülmesi konularına odaklanılmıştır. Bununla birlikte, yeni versiyonla beraber taraflar, inisiyatif alabilecek durumda bile risk almayıp kararlarını vermek için uyuşmazlık çözüm kurullarına gitme eğiliminde olabilirler. Partilerin 2017 versiyonunda tanımlanan uyuşmazlıklardan kaçınma işlevinden nasıl yararlanacaklarını zaman gösterecektir.

Sektörde FIDIC Kırmızı Kitap 2017 versiyonu kullanılarak yeni projelerin gerçekleştirilmesi biraz zaman alabilir. Devam etmekte olan projelerde hala 1999 versiyonu kullanılmaktadır. Sektörün yeni versiyonu kullanabilmesi için onu analiz edecek zamana ihtiyacı vardır. Zaman, uluslararası inşaat sektörünün 2017 versiyonundaki daha karmaşık ve kuralcı rejimi nasıl benimseyeceğini gösterecektir.

Bu tez çalışmasının akademik katkısı, işverenlerin, yüklenicilerin ve mühendislerin yükümlülüklerini etkileyen FIDIC Kırmızı Kitap 2017 versiyonu sözleşme maddelerinde meydana gelen değişiklik ve yeniliklerin anlaşılmasını sağlamaktır. Bu tez çalışmasının sektöre olan katkısı ise FIDIC Kırmızı Kitap'ın yeni versiyonunu çok daha kısa sürede sektöre benimseterek bu yeni sözleşme versiyonu ile projeleri hayata geçirmek ve böylece daha başarılı projeler ortaya koymaktır.





1. INTRODUCTION

The construction sector is an important sector especially for the economy of developing countries in terms of the contribution it provides to the country's income and the employment it creates. Due to its complex structure and the fact that the projects are single and non-replicable, it is separated from other sectors. During the construction process, many uncertainties and conflicts are encountered in the construction sector, and the sector has different risks due to its nature. When these problems are encountered, construction contracts must be prepared in accordance with the project and the contract administration should be carried out successfully in order to implement the appropriate method, to correctly determine the duties of the parties and to construct in accordance with the job description.

Today, the tendency is increasing for large projects that require high budget and long-term investments in the construction sector. The increase in the budgets of the projects brings the search for the financier to the projects. Disputes arising from the clauses of the contract and pecuniary damage as a result of disputes may also be large in projects that financed by the World Bank, the European Investment Bank, the Islamic Development Bank and other major credit institutions. In order to minimize the uncertainties and conflicts in these projects, and to understand the duties and responsibilities of the parties, internationally accepted standard type of contract forms have been formed. Credit institutions also prefer to use standard type of contract forms that internationally accepted in their projects. Standard construction contract forms are formed with special conditions according to the characteristics of the project, the procurement method and the country that it takes place and they are prepared in accordance with this standard structure. One of the widely used among these standard contract types is 'International Federation of Consulting Engineers' (FIDIC) standard contracts. FIDIC acronym stands for the French version of the name 'Fédération Internationale des Ingénieurs-Conseils'.

In accordance with the requirement for independent consultants in 1913, a group of consultant engineers met up to talk about the probability to constitute a global

federation. Upon the successful conclusion of the meeting, on 22 July 1913, the first 'FIDIC' regulation was made. The organization is based on three main principles. These principles are quality, integrity and sustainability. 59 official delegates attended the opening ceremony of the federation led by Belgium, France and Switzerland. Due to the world wars and political crises in the following years, the development of the federation remained slow until the end of the 1940s. With the participation of Australia, Canada, South Africa and the United States in 1959, FIDIC has become a truly international federation (Url-1). Only one organization from each country can be a member of the federation and Turkish Consulting Engineers and Architects Association (TürkMMMB) has undertaken the representation of Turkey as a member in 1987 (Korkmaz, 2004).

The first sample of FIDIC contracts, 'Conditions of Contract for Works of Civil Engineering Construction' was published in 1957. This example allowed the 'FIDIC Red Book' tradition to begin (Klee, 2015). FIDIC type contracts are being developed as an international standard in the construction industry for more than 50 years. It is recognized and used globally in all legal systems in every project type. In FIDIC contracts, it is aimed to prevent different interpretations of the articles and to prevent conflicts by creating a balanced risk allocation between the parties. The Red Book, Yellow Book, Silver Book, which has changed according to the construction method of the projects under the name of Rainbow Suite in 1999 by FIDIC, has been introduced as the first edition (Url-2). The second edition of the Rainbow Suite was announced in December 2017 at the International FIDIC Convention Users Conference in London. This edition successfully complements and updates the 1999 edition of the Red, Yellow and Silver books and continues to serve as standard form contracts between employers and contractors. The main purpose of making changes to these three books together with the second edition is to increase the clarity and certainty in the contract forms. These changes will lead to reduced contractual disagreements and more successful projects (Url-1).

In order to understand the changes in the FIDIC 2017 version, it is important to examine the studies in the literature, to follow the seminars which are subject to this change and to determine the deficiencies in the literature and to guide the academic studies.

1.1 Problem Statement

In the construction industry, type of FIDIC contracts, first published in 1957, have been developed as an international standard for more than fifty years. ‘The Conditions of Contract for Construction for Building and Engineering Works Designed by the Employer’ (CONS), or the ‘Red Book’ is the most common FIDIC form in use. Even today, for example, the fourth edition of the Red Book (1987) are still in practice. This book is much outdated and is not recommended for its use anymore (Klee, 2015).

Following the standard contract forms published by FIDIC in 1987 and 1999, a new version was announced at the end of 2017 with some changes in the contract form structure. This revision has significant changes. Studies are being carried out to better understand the changes in the scope of the amendments and the changes in the articles. However, there is a limited flow of information about the new version in the literature and sector.

1.2 Purpose of the Research

In the construction sector, the versions published in 1999 are still used in projects carried out with FIDIC contract types. The full understanding of the new version and its widespread use in projects will only be realized by a good analysis and adoption by the sector. In this thesis, the changes and innovations introduced by FIDIC 2017 Red Book version were analyzed and a comparative analysis was made with the 1999 version. Additional responsibilities and new risk areas for employer, contractor and the engineer were defined.

Academic studies on the new version of the FIDIC Red Book are limited. Therefore, there are problems in adapting to the new version of FIDIC books in the sector. This thesis is intended to contribute to both academia and the sector. The aim of the thesis is to provide an understanding of the changes and innovations in FIDIC 2017 Red Book contractual clauses that affect the requirements of employers, contractors and the engineers. Therefore, it is intended to contribute to the academia. The aim of the thesis for the construction sector is to adopt the new version of FIDIC Red Book to the sector in a much shorter time, to realize the projects with this contract structure and thus to develop more successful projects.

1.3 Research Methodology

Literature research was conducted within the scope of the study. Literature search based on keywords was made. The literature review covers the basic information about the construction contracts, internationally accepted types of construction contracts, detailed definitions of FIDIC contract types and changes in FIDIC Red Book 2017 edition. The study consists of three main parts. In the first part, basic information about construction contracts, Turkish Code of Obligations and international construction contracts will be discussed. Internationally accepted types of standard contracts will also be examined in this section. In the next chapter, the types of FIDIC contracts will be evaluated extensively and the general information about the FIDIC 2017 edition will be given in this chapter. In the last part of the study, comparative analysis of FIDIC Red Book 1999 edition and FIDIC Red Book 2017 edition on contract clauses will be made, the changes in the clauses will be examined and how the changes in these articles affect the parties will be discussed.

Table A.1 which is located in the appendix of this thesis compares the general provisions of the FIDIC Red Book 1999 and 2017 editions. Clauses and subclauses in the 1999 edition are listed in the first column of the table, the clauses and subclauses in the 2017 edition are listed in the second column of the table. The corresponding subclauses in the 1999 and 2017 editions in that row are compared in the third column of the table. The changes between these two editions are interpreted under general headings in the fourth part of the thesis.

2. CONTRACT ADMINISTRATION

Modern building construction requires high knowledge and experience in organization, programming, management, coordination and reporting techniques. For this reason, the relations between the owner, professional consultants, contractors, subcontractors and other participants involved in the construction process are sensible and successful construction is possible with the provision of communication and law among the participants (Tasoluk, 2006). The changing conditions with the impact of a globalizing world increase the number of large construction projects and large construction projects increase the importance of contracts. Success of contract applications is important for the overall success of the projects. In this context, the concept of contract administration emerges (Dasdelen, 2006).

In this part of the study, construction contracts will be mentioned, the basic information about construction contracts, the place of construction contracts in Turkish law and the Turkish Code of Obligations, international construction contracts will be discussed. Afterwards, detailed information will be given about FIDIC, NEC, AIA and JCT contracts from internationally accepted types of construction contracts.

2.1 Construction Contracts

2.1.1 Rudiments

It is necessary to examine the definition of contract before considering the concept of construction contracts. A contract has been defined by Sir William Anson as ‘a legally binding agreement made between two or more parties, by which rights are acquired by one or more to acts or forbearances on the part of the other or others.’ (Ashworth, 2006). According to the Turkish Language Association, the contract means a transaction of mutual consent between two or more persons, with the aim of bringing about legal consequences. Standard Construction Document CCDC-2 (Canadian Construction Document Committee) defines a “contract” as an undertaking by two or more parties to perform their respective duties, responsibilities, and obligations as pre-

scribed in the contract documents and represents the entire agreement between the parties (CCDC-2,2008). Surahyo (2017) states that five elements are important to make a contract enforceable and binding. These elements are offer and acceptance, mutual intent, consideration, capacity to contract and legality.

There are many parties in construction projects and there are many types of contracts such as construction contract, attorney agreement, loan contracts and service contract which enables the relations between the parties to be regulated. The contract between the contractor and the owner is a construction contract and concerns the construction of the project. (Aksay, 2008). According to the Public Procurement Law No. 4734, the construction contract is a written agreement between the administration and the contractor in the procurement of goods or services and construction works. On the other hand, the contract, which is a bilateral legal transaction, is examined in the legal literature under the agreement for work covering articles 355-371 of the Code of Obligations (Uyanik, 2004).

The construction contract is a mutual agreement in which a product description is made for a construction project, where production standards, production time and the price of the product are specified. In this case, it can also be said that the contract is a mutually agreed proposal stating that the contractor accepts all project responsibility. The contract documents specify the responsibilities and obligations of the contractor determined by the owner. These contracts are the owner / contractor contracts. (Hinze, 1993). Every construction work must be carried out in accordance with a contract (Yurt, 2005). The construction contracts specify the duties and responsibilities of the owner and contractor. Specifying duties and responsibilities means determining the risks that the parties take on them. Under the terms of the contract, the parties must know the risks they face and take the necessary measures. Thus, the subsequent disputes will be minimized (Korkmaz, 2004). If we consider the participants in the construction sector as the relationship between different levels of buyers and sellers; the contract is a binding agreement which requires the seller to provide a specified product and the buyer must pay for this service. This agreement is the legal relationship that will protect the rights of the parties in the court (PMBOK, 2004, p.269). Construction contracts are generally signed in writing using one of the standard forms. The use of a standard form offers many advantages, and although standard forms are not compulsory, their use should be encouraged under all possible conditions. However, it is important to note that the conclusion of a contract requires no special

formality. Instead of signing an elaborate printed document, a binding contract could be concluded through an exchange of letters between the parties. A gentleman's agreement, i.e. by word of mouth, could sometimes lead to a binding contract. (Ashworth, 2006). When it is needed to write a construction contract, it should briefly;

- **Be Clear, Concise, and Straightforward:** No need to use confusing legal language when writing contracts. Use clear language to accurately express details in an efficient manner.
- **Be Clearly Stating the Parties Involved:** Establish, by name, who the involved contractual parties are, then assign generic names to the parties, such as "Company" and "Client", and refer to the parties in that manner from that point forward in the contract.
- **Define the Reason for the Contract:** Clearly explain what the purpose is, what you hope to accomplish, why a contract is needed to be written in this situation.
- **Address Every Possible Aspect:** Break down every aspect of the particular contractual agreement into its separate components, then define what the acceptable behavior and results regarding each component.
- **End with Signatures:** Make sure you get each contractual party to sign and date the contract (Gurcanli, 2013).

One of the most important pieces to ensure a successful project is the contract documents. It bridges the conceptual image of the owner / employer of the project with the actual physical construction. In many projects, different companies or individuals, often parties that have never worked together, play the roles of owner, designer and contractor. The construction contract provides for the common bond for these parties (Hinze, 1993).

Construction documents include all building plans (drawings), specifications, schedule and supporting documents used during the completion of a construction project. The documents serve a number of purposes. First, the needs are translated into a buildable format that can be understood universally in the construction industry by an owner/employer or the developer. Secondly, they allow the owner to bid for the project and obtain permissions from the local authorities. Finally, they provide the contractor with comprehensive instructions on how the project should be constructed. The most common documents to be included in each construction contract are listed below and defined:

- signed agreement/contract (including special conditions)
- documentation including;
 - bill of quantities
 - drawings
 - specifications
 - schedules (Gurcanli, 2013).

Signed Agreement/Contract (including special conditions)

The contract document defines the commitments and rights for the project to be executed. Typically, special conditions are an extension of the contract and the general conditions. This part should specify specific requirements and clauses for each project or job.

Bill of Quantities

Bills of quantities (BoQ or BQ) are the most common form of price strategy used when the contractor undertakes construction based on the employer's complete designs. ISO 6707-2 defines a bill of quantities as a document for tendering, usually prepared in standard form, comprising both a descriptive list of quantities of works and a description of the materials, workmanship and other matters required for construction works. A BoQ is a list of items that give measured or estimated quantities and a brief description of what will be done under the contract (sometime referred to as a schedule of quantities). The quantities and descriptions are taken from the drawings and specifications and measured. (CIDB, 2010).

Drawings

The development of a set of construction documents begins with an owner/employer or a developer. If one of these owners faces the need for a new building, he or she approaches a designer. The drawings, also identified as the plans or blueprints, are the primary source by which the physical, quantitative, or visual description of the project is shown (Hinze, 1993).

The architect will draw up several sets of building plans, which the owner will revise and approve at every stage before the design continues. The building plans or drawings are the largest component. These can vary from one sheet to hundreds of pages and range from floor plans to finish selections. Plans for a medium-sized project are usually divided into several sections. The plans begin with architectural drawings and

elevations, followed by structural, mechanical and electrical drawings. The general classifications on construction projects are as per the following:

- General information and site works
- Architectural
- Structural
- Mechanical
- Electrical

The standard symbols and standard abbreviations used in that section normally start with each section of the drawings. The information regarding the scale and date drawn and the approval signature are usually attached to each drawing page.

The drawings ' general or site section gives overall information about the project, including property lines, roads, access roads and the site locations. This section identifies locations for the project. All the appropriate elevations, grade lines, slopes and boring log data are displayed. There are also details of landscape design and site utilities that are not included in the primary structure.

The finishing treatment for the various project components is shown in architectural drawings. In the case of buildings this often includes a floor plan for each project level, a specific designation for each area, different wall sections to clarify architectural treatments, the finishing schedules for the rooms, doors and windows, building elevations and reflected ceiling plans.

The structural drawings show the typical structural details to be used in the project, whether steel, concrete or wood. All major structural components, together with major connections, are shown from the foundation to the roof. The structural drawings provide numerous details of sections cut through major members to show reinforcing steel placement, anchoring details, connection between steel and concrete, etc.

The mechanical drawings show the different pipeline locations and the details of the elbows, valves, meters, controls and the like. Similarly, the electrical drawings convey information about the proper installation of the electrical components of the project (Hinze, 1993).

Specifications

The specification is another component commonly included in a number of construction documents. It is a technical requirement to complete, perform and/or carry out all small tasks or materials included in the construction projects. It adds

intelligence to the designs; specifies common standards, accepted deviations, accepted materials and the tests required for all materials.

In order to fulfill its purpose, a specification must fulfill certain basic criteria, including:

- Technical accuracy and adequacy
- Clear and definite stipulations
- Fair requirements
- A format easy to use when bidding and construction
- Enforceability of legal provisions.

For the qualitative items of a project, the technical specifications are required. This is information that the more quantitative drawings are not easily shown. Drawings are more quantitative in nature. The technical specifications are written quality descriptions of the different aspects of the project.

Specifications are usually based on construction standards and codes. Inexperienced employers at the construction site often ignore the book and focus on the drawings exclusively. This must be avoided because the specifications often include information not found on the plans. The specifications are used to modify or clarify what is shown on the drawings (Gurcanli, 2013).

There is sometimes a conflict between drawings and specifications. This can easily occur because the specification writer and the designer are seldom the same person. Therefore, the person responsible for the other document cannot be informed of a change made in any one document. When there is a large project with several specification writers and designers, drawings and specs may even conflict with each other. This discrepancy should be resolved in accordance with the contract. The contract often states that if an item is included in one of the documents, it is assumed that it is included in both documents.

Reference specifications are found in the technical specifications. This type of spec is usually used to ensure that a product complies with the test criteria accepted by the industry. The reference specifications do not only specify quality, they also establish a standard procedure for determining the acceptance of the finished product (Hinze, 1993).

The most known reference specifications are:

- American Concrete Institute (ACI)

- American Society for Testing Materials (ASTM)
- National Fire Protection Association (NFPA)
- Occupational Health & Safety Assessment Series (OHSAS)
- Turkish Standards Institute (TSE)
- Community Europe (CE)
- Deutsche Industrie Norm (DIN)

Schedules

Most of the contracts for construction include a project start date, and the conditions can change on that date. Some factors that may warrant a different start date include problems related to funding, completion and implementation of plans, project specification and municipal building permits.

The duration of the project is another item under this provision. The project duration component specifies how long the contractor must complete most of the work or substantial completion, as set out in the contract.

The parties shall calculate the term " working days " or the number of days to be expected for project completion by the contractor and the project owner. Construction contracts sometimes require updated schedules throughout construction, and could be included in the monthly payments. Valid reasons for changing the project duration, such as weather, unexpected conditions or problems with subcontractors, should be defined (Hinze, 1993).

Insurances

The contracting officer takes this part into account, as it gives the owner the guarantee that the contractor can carry out the construction contract with the means and financial support. It includes specific coverage's types, necessary bonds, and all insurance protections to the owner, the contractor and third parties (Hinze, 1993).

Other Documents

There are numerous other support documents available in addition to the list. For instance:

- Request for Information (RFI)
- Change Order Forms
- Submittals
- Progress Payment Certificates Practical Completion Notice
- As-Built Drawings

- Defects Document
- Operating and Maintenance Manuals (Gurcanli, 2013).

In the next section, the place of construction contracts in Turkish law will be discussed.

2.1.2 The code of obligations

Construction contract is a form of contract that is common in practice. The contract is not regulated in the Code of Obligations and is under the scope of contract of work (Korkmaz, 2004). The Code of Obligations is the main source of Turkish and Swiss contract law. In Switzerland, the sentence structure of the code is clear because it is understandable for the layman as one of Swiss legislators' main priorities, which also helps foreign users to understand. The Swiss law of contracts is relatively easy for users who are familiar with other systems and who speak other languages, despite some differences from other legislation, especially in the field of common law. There are many cases of Swiss contract law in procedures involving common law, especially in international arbitration.

The Code of Obligations first lays down the rules on obligations and contracts in general in Turkey and Switzerland. Chapters on special contractual relations follow this section. Chapter 7 (Articles 470 to 486 of the code) concerns contracts for works. This type of contract is defined in Article 470 of the code as 'a contract in which a contractor is obliged to work and an employer is required to pay compensation.' The chapter also includes provisions which are relevant to immovable works; such contracts for immovable works are referred to as construction contracts.

Contracting practices and specific rules may vary but without distinction the provisions of the code apply to civil engineering, mechanical work, electrical work, etc. and different forms of delivery (e.g., turn-key, multiple contracts, etc.) The provisions of Article 363 (in Turkey 471 and following articles) are also applied universally to the relationship between the employer and the contractor and between the contractor and subcontractors. Contracts with engineers or architects may contain various objects. If they are limited to the preparation of the design, the object is a product to be delivered and they are treated as contracts for works. However, if the purpose is to assist the employer in the awarding and supervision of the construction contract, the contract is normally treated as a service contract and can therefore be terminated at any time. The contract often involves a combination of both and is

defined as a 'mixed' contract that elements of both chapters of the Code of Obligations can be applied as appropriate.

In Turkish and Swiss legal traditions, the architects and engineers are employer's representatives and the employer give them their powers. As in many other civil law systems, Swiss law does not recognize the specific function of 'certification' and the role of the engineer or architect as a neutral administrator of the contract. (Gurcanli, 2013).

On the other hand, it would be appropriate to explain the characteristics of contracts for works by comparing it with similar contracts (Table 2.1). In terms of content, the contract of works is the form of contract which constitutes the obligation of performing a work, such as contract of service, mandatum and publishing contract. Unlike the contracts of service, the contractor works freely without being dependent on the owner in the contracts of work. However, in the employment contract, the worker is dependent on the employer and works under his / her management. The contractor undertakes the task of creating a work with the contract of work. The worker who works with the employment contract has no result debt. As shown in Table 2.1, wages in the works of contract should be one of the basic elements, while the mandatum can be decided with or without wages. The proxy is obliged to do the work personally in the mandatum. However, the contractor in the contract of work may get someone else to do the work unless otherwise agreed (Zevkliler,1995).

Table 2.1 : Differences between contract of service, contract of work and mandatum

Contract of Service	Contract of Work	Mandatum
Working dependent on employer	Working independently from the employer	Working independently from the employer
No result debt	There is result debt	No result debt
Fee is mandatory	Fee is mandatory	Fee is not mandatory
The worker has to do the work personally	The contractor can get someone else to do the work.	The proxy has to do the work personally

Another type of contract that the contract of work can be compared is the contract of sale which is within the scope of the contracts with the purpose of transferring the ownership (Table 2.2). If the work that will be decided to be delivered for a fee does not exist yet, it is usually mentioned that there is a contract of work. If this thing is

present at the time of the contract, it is usually mentioned that there is a contract of sale. The existence of a contract of work is accepted when the labor element is dominated. On the other hand, if the material item is dominated, the existence of the contract of sale is accepted. If the employer has the authority to give instructions to the contractor about the work, the existence of the contract of work is mentioned. However, if the contractor is free to do the work, the contract of sale is mentioned.

Table 2.2 : Differences between the contract of sale and the contract of work.

Contract of Sale	Contract of Work
Contracts with the purpose of transferring the ownership	Contracts which creates a business liability
The thing which is the subject of the contract is present at the time of the contract	The work that will be decided to be delivered for a fee does not exist yet
Material element is dominant	Labor element is dominant
Free to do the job	The owner has the authority to give instructions

The contract of work consists of three elements: the construction of a work, the wage and the agreement. The creation of the work in the construction area is discussed extensively as a new construction, making changes in an existing structure, additions to an existing structure, repairing and demolishing an existing structure. Another element of the contract is the fee that the owner must pay for the work to be constructed. The contract of work is a mutual contract. For this reason, the construction work must be committed for a fee. Issues related to fee can be determined from the beginning. The fact that the fee is not determined at first does not change the result.

A fee must be paid for the construction of the work. Construction contracts are also complete with the agreement of the parties (consensus) on the essential acts (Korkmaz, 2004).

2.1.3 International construction contracts

Construction projects are particular process or a total of several processes. It's usually an individual process. Variables relate to the positions of its participants, their tasks and relationships, external conditions (economic conditions, site conditions, climatic conditions and project risk), project management and delivery methods, procurement methods and public support.

Construction projects are exposed either by people or natural elements to hazards of various types. People, time and environmental elements play an important role here. The project itself tends to be a unique process configuration that has unpredictable impacts caused by individual risks. Large construction projects are carried out in large areas and are often difficult to perfectly safeguard. A construction project is therefore not a production line that can only be programmed to create a product smoothly within a well-defined time, quality and cost. Design errors, extremely adverse weather conditions, unforeseeable site conditions, problems related to site access and building permits, delays due to environmentalist requirements and variations are just a few examples of potential complications. This means identifying possible problems, variations and risks are important in order to effectively manage them (Klee,2015). Therefore, the structure of the contract in construction projects, especially in international projects, has a great importance for the project.

As the number of large-scale projects with multinational participation increased, contract types started to be merged. Business negotiations are easier and cheaper after successful unification. Communication and management are simplified and distrust disappears. Disputes and complications, especially in international transactions, may then be resolved with less effort. This issue is more complicated than anywhere else in construction sector. Construction was a local business in the past, with local owners and contractors designing and applying usual rules that were rigid and difficult to change or unify (Klee,2015).

The three levels of unification of contractual relations are:

- Law;
- Principles;
- Sample documents (Klee,2015).

Cross border contractual relationships between parties have a general freedom to choose the law governing their contracts. Compulsory provisions of law prevail in respect of a private right in conflict with that law. In general, if the parties to a particular contract do not have the choice of law and the contractual relationship contains an international element, it is necessary to take into account the rules of international private law in determining the relevant regulatory law. Before entering into a contract, it is advisable to choose the applicable law. Unless that happens, the

unpredicted mandatory provisions in procedural law could lead to unintended outcomes or unexpected shifts in risk allocation.

Contracting parties in an international construction project will agree on the governing law. A situation, dispute or specific problem, either in the contract or in the law, can further be encountered without a clearly defined settlement. General legal principles may often be used where there is a contractual or regulatory gap.

The UNIDROIT Principles of International Commercial Contracts and the Principles of European Contract Law are the most important for the unification of principles. These principles are a set of model rules drawn up by Europe's leading academics in contract law. The European Contract Law Principles are based on the concept of a uniform European contract law system and the European Contract Law Commission has established them. The most recent attempts are The Definitions and Model Rules of European Private Law or the Draft Common Frame of Reference, drawn up by the European Civil Code Study Group and the EC Private Law Research Group and based partly on a revised version of European Contract Law principles. A significant number of published international arbitrations have referred to the Unidroit Principles (Charrett, 2013).

The unification of sample documents is represented by trade rules such as International Commercial Terms (INCOTERMS) and sample contract forms published by FIDIC and so many others. (Klee,2015).

Incoterms are an abbreviation for International Commercial Terms. The International Chamber of Commerce (ICC) has developed these terms (Bergami,2012). The codified terms of delivery, Incoterms are a useful tool for all the economists involved in international trade transactions. The users can accurately determine to what extent each party is liable for one of the most important contractual parts: delivery. As the literature indicates, it is crucial for the physical execution of foreign trade operations, together with the security of economic agents, either the exporter or the importer, to have proper application, including detailed knowledge of the codified conditions (Popa et al, 2013). The high importance of international contract delivery conditions and the existence of various practices relating to delivery explain the concern with regard to the codification, for the industry, of certain rules within this domain. In 1936, The International Chamber of Commerce in Paris published a set of rules with international

applicability for the delivery of goods, named Incoterms 1936 (International Commercial Terms). These rules have been revised in 1953, 1967, 1976, 1980, 1990, 2000 and 2010 (Popa et al, 2013).

The other unification in the field of sample documents is standard type of contracts. Standard contract forms are those contracts which are developed for use in similar contracts in the future and which have fixed terms and are not subject to negotiation with the parties. Standard forms are the general conditions of a contract (Sozen, 2015).

At the international level, many professional unions, organizations and federations have developed their own standard contract forms. Some of the series, which consist of forms that differ according to the size of the job, type of work, delivery method of the project and revised over time according to sectoral requirements, are listed below.

- International Federation of Consulting Engineers (FIDIC)
- International Chamber of Commerce (ICC)
- World Bank (WB)
- American Institute of Architects (AIA)
- New Engineering Contract (NEC)
- Joint Contract Tribunal (JCT)
- Construction Owners Association of Canada (COAA)
- Canadian Construction Association (CCA)
- The Engineering Advancement Society of Japan (ENAA)
- The Government of Hong Kong Special Administrative Region, Hong Kong Institute of Architects (HKIA)
- Malaysia (The Institution of Engineers (IEM), Perhubungan Arkitek Malaysia (PAM), Construction Industry Development Board (CIDB))
- Singapur (Public Sector Standard Conditions of Contract for Design and Build (PSSCOC), 2008)
- German norms (Standard Terms and Conditions, Verdingnungsordnung für Bauleistungen (VOB))
- French norms (Cahiers des Clauses Administrative Generales (CCAG))

Some of the standard forms of contracts are in compliance with the Anglo-American law system (e.g. AIA, FAR, COAA, CCA, NEC, JCT, Hong Kong norms), while others comply with the continental or civil law system (German norms, French norms).

FIDIC, ICC and World Bank standard forms are designed to comply with both legal systems (Sozen,2015). In order to establish a specific standard in the contract documents, general conditions that must be provided in the arrangement of the contract and which may vary according to the work or product subject of the contract have been established (Yurt, 2005). The purpose of the contracts is to protect the interests of the parties equally, allocate risks and responsibilities in a fair manner between the parties and create a balanced environment.

In the standard contract forms, there must also be a special conditions section where project-specific information will be written, such as the names of the parties, the purpose, location, duration of the project and the amount to be paid to the contractor by the employer at the end of the work (Aydin,2015).

There are two answers to the question of why standard forms are used or preferred. It may be mandatory to use the standard form or it may be preferred because of the advantages it offers (Sozen,2015).

Necessity

In international contracts and in projects to be executed with the credits provided by international credit institutions (World Bank, European Development Fund, etc.), creditor organizations may require the projects to be tendered with the standard forms determined by them. In such a case, the FIDIC series or World Bank standard forms are a prerequisite for the use of credits (Sozen,2015).

The World Bank (WB) is run by 188 Member States and consists of two institutions: The International Bank for Reconstruction and Development (IBRD) and the International Development Association (IDA). The IBRD's objectives are to reduce poverty in countries with poor credit ratings and middle-income countries. The IDA focuses solely on the poorest countries in the world. These institutions belong to a larger body called the World Bank Group.

The World Bank was founded in 1944 and has its headquarters in Washington, DC with 9,000 employees in a total of 100 offices around the world.

The work of the WB focuses in six key strategic topics: the poorest nations in the world; fragile countries with conflicts; the Arab world; middle income countries; global issues of public goods and delivery of knowledge (Klee,2015).

In developing countries, the WB provides low-interest loans, free interest credit and grants. They support a wide range of investment in areas such as education, health, public management, infrastructure, development of financial and private sector and management of natural resources. Some projects are co-financed by governments and others by multilateral institutions, trade banks, export credit institutions and investors in the private sector. For projects in which they lend money, the WB recommends FIDIC contract forms (Klee,2015).

The European Investment Bank's obligation to use these forms in its funded projects provided an alternative impetus for the application of FIDIC forms. The European Investment Bank (EIB), which is established in 1958 by the Treaty of Rome, is an EU institution established for public and private credit. The money provided is aimed at projects to benefit Europe, keeping European Union (EU) regions in line, supporting small and medium sized projects, protecting the environment, supporting research and development, improving transport and supporting the energy industry.

The EIB is a non-profit bank with a focus on achieving policy objectives and providing long-term loans for capital investment projects, primarily for longer-term activities. However, the EIB does not grant aid. The EIB cannot lend more than 50 percent of the total project costs to member states of the EU. The financed projects are selected carefully and must satisfy stringent criteria. In the potential candidate countries, EU neighboring states and other partner countries, the EIB is also fostering sustainable development.

The European Bank for Reconstruction and Development (EBRD) provides project funding for banks, businesses and industries, and new enterprises, as well as investments in existing businesses. The EBRD also works with publicly-owned enterprises. The EBRD offers finance for loan and equity, guarantees, leasing facilities and commercial financing. Usually, up to 35% of total project costs are funded by the EBRD.

The bank only invests in projects which otherwise would not receive similar financing. The EBRD is committed to carrying out operations across the region and has participated in projects in each country. The EBRD established resident offices in all these countries to coordinate local activities. The EBRD is composed of multinational

personnel and an in-house Board of Directors with shareholders represented (64 countries plus the European Union and the European Investment Bank).

The EBRD builds partnerships with local and international companies and investors. The bank cooperates closely with all members, public and private entities and all multilateral entities involved, from Central Europe to Central Asia, in developing and investing in economic activities and in developing countries. This includes the EU, the EIB, the World Bank Group, the International Monetary Fund, the United Nations and its specialized agencies.

The EBRD signed a license agreement with FIDIC that gives free access to the harmonized general conditions of contracts for construction for entities that participate in EBRD - funded projects (Url-3). Whilst the EBRD supports the application of these Terms and Conditions, they are not mandatory and other forms of contracts internationally recognized may be used (Klee,2015).

Advantages

There are some important advantages that the use of the standard form provides beyond the necessity. The main benefits of standard type of contracts are as follows:

- Standard forms are documents prepared by an expert team, organization, or workgroup.
- These are the conditions that have emerged as a result of a long experience, the details of which have been thought out and have been revised several times. They were prepared with the knowledge and experience of the conflicts that occurred in the past. Contract language and sentence structure are often user friendly and easy to understand.
- It is placed in the contract considering all the main headings to be included in the contract and to be detailed. They can therefore also be used as a 'check list'. Standard forms reduce the likelihood of skipping an important topic or headline under the contract.
- They save time and cost in preparation and writing of contracts.
- Standard forms remind which clauses must be supplemented with special conditions. Most of the forms contain a guide for writing special conditions.
- Integrity has been established between other documents (such as tender documents, subcontracting contracts) that form the standard forms.

- Developed under the consultancy of insurance companies, these forms are integrated with insurance-related principles.
- Parties using standard forms may anticipate the risks they will have to endure. For example, in a project awarded by the FIDIC Red Book, the contractor is familiar with the risk distribution before bidding.
- Contract agreement includes templates for dispute resolution mechanism (Sozen,2015).

Gilbreath (1992) stated that there are some disadvantages of using standard contract forms. These disadvantages are listed below:

- Since the contract forms are prepared by the institutions, these institutions can prepare these forms of contract within the framework of their own interests and grant privileges to the members of their institutions. They can take sides.
- Due to the fact that the contract forms are standard and the projects are constantly changing, it can be considered that they are not suitable because they do not include specific applications that can meet the demands of the owner.
- The responsibilities between the contracting parties may vary in each project, but these responsibilities are typically reflected when the contracts are of the standard type.

2.2 Internationally Accepted Standard Type of Contracts

In this section, FIDIC, NEC, AIA and JCT standard contracts which are international standard type of construction contracts are mentioned.

2.2.1 FIDIC

FIDIC, whose French meaning is ‘Fédération Internationale Des Ingénieurs Conseils’, is the International Federation of Consulting Engineers. The French title shows the core of the founded countries; Belgium, France, and Switzerland are the founding member countries of the organization. On 22 July 1913, the first FIDIC regulation was issued. Over the years the federation has progressively become a truly global organization with member associations of countries from all parts of the world (Table 2.3). The role of FIDIC for the engineering consulting industry has become more essential today than ever before. FIDIC is also the voice of the engineering consulting

industry in a globalized world, and not just of the countries where the member association is located. For example, FIDIC partnerships with the World Bank and other multinational development banks operating in different geographic areas ensure that international standards designed by engineers are applied in order to finance and deliver the international infrastructure. The industry has joined forces with other sectors to achieve common aims through other FIDIC partnerships with the United Nations and international humanitarian organizations. Today FIDIC is the result of a century of committed leadership and volunteering. The core principles of FIDIC which are quality, integrity and sustainability remain unchanged after 100 years (Url-1). Table 2.3 shows the FIDIC member associations of countries from all parts of the world.

Table 2.3 : FIDIC member associations & associates.

Countries	Associations
Albania	Albanian Association of Consulting Engineers
Australia	Consult Australia
Austria	Austrian Consultants Association
Azerbaijan	National Engineering Consultancy Society of Azerbaijan
Bahrain	Bahrain Society of Engineers
Bangladesh	Bangladesh Association of Consulting Engineers
Belgium	Organisation des Bureaux d'Ingenieurs-Conseils, d'Ingenierie et de Consultance
Bosnia and Herzegovina	Association of Consulting Engineers of Bosnia&Herzegovina
Botswana	Association of Consulting Engineers Botswana
Brazil	Associação Brasileira de Consultores de Engenharia
Bulgaria	Bulgarian Association of Consulting Engineers and Architects
Canada	Association of Consulting Engineering Companies Canada
Chile	Asociación de Empresas Consultoras de Ingeniería de Chile
China	China National Association of Engineering Consultants
China, Hong Kong	Association of Consulting Engineers of Hong Kong, China
China, Taiwan	Chinese Association of Engineering Consultants
Colombia	Cámara Colombiana de la Infraestructura (CCI)
Croatia	Association of Consulting Companies in Construction
Cyprus	Cyprus Association of Civil Engineers (CYACE)
Czech Republic	Czech Association of Consulting Engineers
Côte d'Ivoire	Chambre Nationale des Ingénieurs Conseils et Experts du Génie Civil
Denmark	Foreningen af Rådgivende Ingeniører
Dominican Republic	Asociacion de Ingenieria y consultoria Dominicana
Colombia	Cámara Colombiana de la Infraestructura (CCI)
Croatia	Association of Consulting Companies in Construction
Cyprus	Cyprus Association of Civil Engineers (CYACE)

Table 2.3 (continued) : FIDIC member associations & associates.

Countries	Associations
Egypt	Egyptian Consulting Engineering Association
Ecuador	Asociación de Compañías Consultoras del Ecuador
Estonia	Estonian Association of Architectural and Consulting Engineering Companies
Finland	Finnish Association of Consulting Firms
France	CINOV - Fédération des syndicats des métiers de la prestation intellectuelle du Conseil, de l'Ingénierie et du Numérique / SYNTEC Ingénierie
Georgia	Georgian Association of Consulting Engineers
Germany	Verband Beratender Ingenieure
Ghana	Ghana Consulting Engineers Association
Greece	Hellenic Association of Consulting Firms
Hungary	Association of Hungarian Consulting Engineers and Architects
Iceland	Félag Rádgjafarverkfræðinga
India	Consulting Engineers Association of India
Indonesia	The National Association of Indonesian Consultants
Ireland	Association of Consulting Engineers of Ireland
Islamic Republic of Iran	Iranian Society of Consulting Engineers
Israel	Israeli Organization of Consulting Engineers and Architects
Italy	Sindacato Nazionale Ingegneri e Architetti Liberi Professionisti Italiani / Associazione delle Organizzazioni di Ingegneria, di Architettura e di Consulenza Tecnico Economica
Japan	Engineering and Consulting Firms Association, Japan
Jordan	Jordan Architects and Consulting Engineers Council
Kazakhstan	Kazakhstan National Association of Professional Engineers and Consultants
Kenya	Association of Consulting Engineers of Kenya
Kuwait	Union of Kuwaiti Engineering Offices and Consultant Houses
Latvia	Latvian Association of Consulting Engineers
Lebanon	Lebanese Association of Consulting Engineers
Lithuania	Lithuanian Association of Consulting Companies
Luxembourg	Ordre des Architectes et des Ingénieurs-conseils, d'Ingénierie et de Consultance
Malawi	Association of Consulting Engineers of Malawi
Malaysia	Association of Consulting Engineers Malaysia
Mali	Ordre Ingenieurs Conseils Du Mali (OICM)
Mauritius	Association of Consulting Engineers, Mauritius
Mexico	Cámara Nacional de Empresas de Consultoría de México
Moldova	Association of Consulting Engineers in Republic of Moldova (ARMIC)
Mongolia	Mongolian Road Association
Montenegro	Association of Consulting Engineers of Montenegro
Morocco	Fédération Marocaine du Conseil et de l'Ingénierie
Mozambique	Associação de Empresas Moçambicanas de Consultoria (AEMC)
Nepal	Society of Consulting Architectural and Engineering Firms, Nepal
Netherlands	Nlengineers
New Zealand	Association of Consulting Engineers New Zealand
Nigeria	Association for Consulting Engineering in Nigeria
Norway	Rådgivende Ingeniørers Forening
Pakistan	Association of Consulting Engineers Pakistan

Table 2.3 (continued) : FIDIC member associations & associates.

Countries	Associations
Palestinian Territory, Occupied	Engineers Association
Paraguay	Cámara Paraguaya de Consultores
Peru	Asociación Peruana de Consultoría (APC)
Philippines	Council of Engineering Consultants of the Philippines
Poland	Stowarzyszenie Inżynierów Doradców i Rzeczoznawców (SIDIR)
Portugal	Associação Portuguesa de Projectistas e Consultores
Republic of Korea	Korea Engineering and Consulting Association
Republic of Macedonia	Association of Consulting Engineers of Macedonia
Romania	Romanian Association of Consulting Engineers
Russian Federation	National Association of Construction Engineering Consultants (NACEC)
Saudi Arabia	Saudi Council of Engineers
Serbia	Association of Consulting Engineers in Serbia
Singapore	Association of Consulting Engineers Singapore
Slovakia	Slovak Association of Consulting Engineers
Slovenia	National Association of Consulting Engineers of Slovenia
South Africa	Consulting Engineers South Africa (CESA)
Spain	Asociación española de empresas de Ingeniería, Consultoría y Servicios Tecnológicos (TECNIBERIA)
Sri Lanka	Association of Consulting Engineers, Sri Lanka
Sudan	Sudanese Engineering and Architecture Consultancy Association
Suriname	Orde van Raadgevende Ingenieurs in Suriname
Sweden	Innovationsföretagen - The Federation of Swedish Innovation Companies
Switzerland	Union Suisse des Sociétés d'Ingénieurs Conseils
Thailand	Consulting Engineers Association of Thailand (CEAT)
Trinidad and Tobago	Joint Consultative Council for the Construction Industry
Tunisia	Association Nationale des Bureaux d'Etudes et des Ingénieurs Conseils (ANBEIC)
Turkey	Association of Turkish Consulting Engineers and Architects
Uganda	Uganda Association of Consulting Engineers
Ukraine	Association of Engineers-Consultants of Ukraine
United Arab Emirates	Society of Engineers (SOE)
United Kingdom	Association for Consultancy and Engineering
United Republic of Tanzania	Association of Consulting Engineers Tanzania
United States	American Council of Engineering Companies
Vietnam	Vietnam Engineering Consultant Association
Zambia	Association of Consulting Engineers of Zambia
Zimbabwe	Zimbabwe Association of Consulting Engineers

The general objectives of the federation are set out in Article 2 of the statutes:

1. Represent the consulting engineering industry globally;
2. Enhance the image of consulting engineers;
3. Be the authority on issues relating to business practice;
4. Promote the development of a global and viable consulting engineering industry;
5. Promote quality;
6. Actively promote conformance to a code of ethics and to business integrity; and
7. Promote commitment to sustainable development (“Statutes And By-Laws”, 2015).

Colgar states that FIDIC produces various documents, standard contracts, and procedures for the advantage of consultants, contractors, employers, partners, subcontractors, and their representatives in order to contribute to the development of the profession and maintain its members' balanced interests. In order to establish relationships between contracting parties, standardize terminology and ensure the unity and utility of these documents, the FIDIC provides educational manuals, position papers and guidelines regarding transaction documents (as cited in Ataseven, 2017). Model contract templates for such FIDIC documents are among the most favored in practice.

In view of the parties who have difficulties in unifying aspects of legislation and customary law on international construction contracts, Atik indicates that the FIDIC rules arise as a result of the need for an international standard contract. It is fair to say in this regard that the requirement of an internationally recognized standard contract is met within the scope of the construction contracts (as cited in Ataseven, 2017).

The FIDIC rules apply not only to international construction contracts, but also to projects which do not cover international aspects as well. The phrase "international" in the title of the above-mentioned rules was removed in the 1999 edition of the Red Book, which is one of the standard contracts of FIDIC, to enable parties of the same nationality to use the FIDIC rules.

If the contracting parties decide that standard FIDIC rules are applicable to the project, both will save time and prevent legal disputes by establishing certain circumstances that are too difficult to anticipate in the contract. However, as the standard contracts

of the FIDIC cannot always be sufficient to resolve the dispute, the parties must either specify certain additional regulations or the law to be applied for the substance of the dispute (Ataseven, 2017).

The FIDIC Contracts Committee operates under the following terms and conditions:

- To recommend to the Executive Committee (EC) which FIDIC should prepare or update the terms of the contract and related documents,
- To help the secretariat set up task groups, monitor its work at agreed intervals and conduct a final review of documents submitted to the EC,
- To help the secretariat handle requests on document interpretation,
- To collaborate with organizations interested in FIDIC conditions of contract, together with the secretariat, and
- To propose topics and lectures for training courses and seminars (Baker et al, 2009)

In practice, FIDIC forms are most commonly used for projects with an international element and are actually used globally. They are neither restricted nor intended to be used according to a specific law. The 'internationality' of the FIDIC forms can explain their worldwide success and greatness. Naturally, the decision of governing law can affect the specific application and operation of the FIDIC standard contracts for any particular project. This is why the authors have decided to seek a 'jurisdiction-neutral' approach, focusing themselves on the provisions of the forms. However, common law originates in the present FIDIC forms. Thus, the discussion of specific principles that are unique for common law jurisdictions, such as duality of the role of the contract administrator, extensions of time and liquidated damages for delay was considered not only appropriate, but also beneficial. The FIDIC Guide, published by FIDIC in conjunction with the Red, Yellow and Silver books, provides not only valuable guidance, but also a helpful overview of the draftsmen's intentions (Baker et al, 2009).

The general conditions are the core of the contracts published by FIDIC. However, the general conditions are only one element of the contract and are supplemented by various documents, which define the scope and basis of the obligations of the parties.

In the global engineering and construction industry the FIDIC contract suite takes on a unique position. In any case, there are few competitors for the title of leading international contract forms, and none are close in their record tracks over decades and

continents. In traditional terms, the FIDIC draftsmen offered a fair allocation of the risks, rights and obligations between the contractor and the employer in the form of balanced contracts with a success. The number of FIDIC agreements also offers flexibility and suitability for a wide range of projects and their contents (Baker et al, 2009).

FIDIC's official position with regard to copyright, amendments and translations is that FIDIC discourages changes in the information and services it provides and authorizes the modification, reproduction or incorporation in other places only in exceptional cases. Consent to cite from, consolidate, imitate or duplicate all or part of a FIDIC publication which incorporates records, conditions of contracts, website pages and comparable supports for data, ought to be routed to the FIDIC Secretariat. Under certain conditions, a license for preparing an amended publication shall be agreed. Specifically, the amended publication must not be published or commercially distributed for internal purposes only. FIDIC may agree to allow other parties (normally the member association), under the conditions it shall determine at its discretion in each case and for appropriate consideration (in general, in the form of a license fee), to translate the publication and publish the translated version. On the other hand, translating or publishing FIDIC publications without the agreement duly agreed by FIDIC is illegal and may be penalized. The guiding notes and sample contracts available from the FIDIC Secretariat set out the general principles under which FIDIC can grant these agreements and which should be used when interpreting any licenses given. In particular, FIDIC will not make any commitments or assume liability for completeness, correctness or adequacy for any purpose. FIDIC does not authorize translations. The translator or the publisher of the translation document is responsible for any such commitment or liability (Klee,2015).

According to the Association of Consulting Engineers (ACE), the FIDIC forms are not preferred in the UK, except on international projects. In the United Kingdom, the New Engineering Contract (NEC) and Joint Contracts Tribunal (JCT) are used, such as usage of Vergabe und Vertragsordnung für Bauleistungen (VOB) in Germany.

As indicated by Union Suisse des Sociétés d'Ingénieurs-Conseils (USIC), there are no Swiss translations and the FIDIC forms are not very popular in Switzerland, with the contracting forms differ from canton to canton. However, the Spanish Association of

Engineering, Consulting and Technological Services (ASINCE) has their own translation.

In Australia, FIDIC forms are used in public projects financed by banks, as recommended by the Association of Consulting Engineers of Australia (ACEA).

The FIDIC documents are widely applied in English in South Africa and have a very long tradition, as reported by the South African Association of Consulting Engineers (SAACE). Even in China, FIDIC forms are widely used, primarily in support of World Bank, Asian Development Bank and other global agencies (Klee, 2015).

Due to the needs of developing countries such as foreign financing needs, contract management and advanced technical knowledge needs, the use of FIDIC contracts has been facilitated in Turkey. FIDIC contracts have been used in many projects in Turkey. Usually these projects have been funded with foreign support funds. The World Bank, the United Nations Development Program, the International Bank for Reconstruction and Development, and the European Bank for Reconstruction and Development are some of credit institutions that fund projects very often in Turkey (Aydın,2015).

The books published by FIDIC which differ according to the objectives of the construction works are listed below:

- Conditions of Contract for Construction (Red Book) - Second Ed. 2017
- Conditions of Contract for Plant & Design-Build (Yellow Book) - Second Ed. 2017
- Conditions of Contract for EPC Turnkey Projects (Silver Book) - Second Ed.2017
- The Short Form of Contract (Green Book)
- Conditions of Contract for Design, Build and Operate Projects (Gold Book) - First Ed. 2008
- Conditions of Contract for Construction (Multilateral Development Bank Harmonized Ed. Version 3: June 2010 Harmonized Red Book or Pink Book)
- Client/Consultant Model Services Agreement (White Book) - 5th Ed. 2017
- Form of Contract for Dredging and Reclamation Works (Blue-Green or Turquoise Book) - Dredgers Contract; Second Ed. 2016

Detailed information on these suites of contracts is provided in the third part of the thesis.

2.2.2 NEC

A small group of young engineers gathered in 1818 in a London and founded the Institution of Civil Engineers (ICE), the first professional engineering institution in worldwide (Url-4). In 1985, the ICE carried out an essential examination of alternative design and construction contract strategies to identify requirements for good practice. ICE started in 1986 with a new contracting style and trilled in South Africa, Great Britain and Hong Kong a consultative edition during the 1990s. The New Engineering Contract (NEC), or NEC Engineering and Construction Contract was the name of that new style of contract. The NEC is the ICE's formalized system that guides the preparation of civil engineering and construction project documents with the purpose of introducing a new type of non - adversarial contractual strategy that would contribute to more efficient and smooth management projects (Gurcanli, 2013). The first NEC contract was published in 1993, which was then called the 'New Engineering Contract'. It was a fundamental departure from existing contracts for construction and engineering, written in plain language and designed to stimulate good management instead of frustrating them.

Together with a new Professional Services (PSC), Adjudicator's Contract (AC) and the set of short forms, the second edition of NEC Engineering and Construction Contract (ECC) was launched two years later. The NEC3 contract suite was developed and launched in 2005 and was followed over a decade of extensive international usage. This included a new Term Service Contract (TSC) and Framework Contract (FC) with a supply contract (SC) joined in 2010.

In April 2013, the suite was updated and expanded into thirty-nine documents including a Professional Services Short Contract (PSSC) – selected as a standard form for the appointment of project managers by the Association for Project Management – and an improved set of guidance documents. The NEC3 suite has received worldwide support from governments and the industry and has a fascinating success on delivering projects in time and on budget – including the London 2012 Olympic and Paralympic Games.

After twelve years, the next evolutionary NEC4 contract suite of the contract suite was launched in 2017 and with several hundred billion pounds of extra procurement in its trading lines. A new NEC4 Design Build Operate Contract (DBO) and Alliance Contract (ALC) have been added.

It is fundamentally distinct from other civil engineering and construction contracts because it has a core contract form, written in simple terms and with substantial bolt additions for use in a wide range of circumstances. In each case, the choice of options must be a subject of advice (Url-5).

The NEC is a legal framework for project management procedures to deal with all aspects of engineering and construction project management. It is also utilized by a wide variety of customers, consultants and contractors across the range of engineering and construction activities. Its use includes large and small projects, civil engineering and construction, both national and international (Url-5).

The drafting of the NEC has three main goals:

- To provide flexibility:
 - Multifunctional – use in engineering and construction work.
 - The responsibility for the design can lie partly or completely with both parties.
 - Options to choose pricing method of the project – lump sum, target cost, cost plus.
 - Modular contracts – core clauses, main options and secondary options on bolt.
- To produce a clear and simple contract:
 - Written in usual language, not in the terminology of construction.
 - Simple clause structure, prevents legalistic terms.
 - Minimizing subjective decisions.
 - Providing guidance and flow charts.
- To provide a document that helps to improve management of projects:
 - The ECC is both a management tool and a contract.
 - Requires an accurate and timely process for decisions.
 - Clear responsibility allocation.
 - Proactive procedures for risk management.
 - Promotes collaborative work. (Heaphy, 2010)

The NEC is being used for:

- working in engineering and building, including some or all traditional fields such as civil, electrical, mechanical and construction;

- projects where the contractor is fully responsible for design, partial design or not responsible for design;
- all standard current tendering options like target contracts, cost-reimbursable contracts, and management contracts;
- contracts in the United Kingdom and around the world (Heaphy, 2010)

There are six main option clauses and one of the following has to be selected by the employer:

- A – Priced contract with Activity Schedule
 - Lump sum contract
 - The project should be clearly defined on tender and only minimally modified.
 - Payment defined and priced by the contractor according to activity schedule.
 - The schedule of activities should be aligned with program to facilitate administration.
 - The contractor paid only for the activities that are completed.
 - Financial risk and thus reward that the contractor bears.
 - Suitable for design and construction.
 - Risks are included and paid for, regardless of if they occur.
 - Greater sureness of price
 - Contractor has an interest in cost reduction.
- B – Priced contract with Bill of Quantities
 - Remeasurement contract
 - BoQ provided by the employer, rates priced by contractor
 - Contractor paid for the amount of work which is completed per month
 - Risk of quantities and errors in BoQ is carried by employer
 - Financial risk of rates mainly carried by the contractor
 - Not suitable for design and build
 - Works shall be clear at tender stage
 - Risks are included in the BoQ and paid no matter if they occur
 - Contractor is interest in minimizing cost

- C – Target contract with Activity Schedule / D – Target contract with Bill of Quantities:
 - Target cost contracts
 - Works to set the target should be properly defined
 - Target Cost set via Activity Schedule or Bill of Quantities
 - Target Cost changes with modifications (Compensation Events)
 - More flexibility in developing its design for the employer
 - Shared financial risk between the employer and contractor
 - Contractor paid on a cost reimbursable (defined cost) basis
 - Gain / pain is shared by both of the parties (Figure 2.1).
 - Employer and contractor encouraged to control costs.
- E – Cost Reimbursable contract
 - Limited or any definition of project necessary for tendering
 - Start on site immediately or earlier
 - Contractor paid on a cost reimbursable basis
 - The employer is liable to increase costs
 - The employer benefits from all savings
 - The contractor's financial risk is limited
 - The employer has complete flexibility
 - Easier financial management after contract
 - Largely eliminated potential for claims and disputes
- F – Management contract
 - Limited definition of project necessary for tendering
 - Start on site earlier
 - The employer is at risk of increases in costs.
 - Suitable for contracts with highly qualified contractors
 - The contractor employs subcontractors directly
 - Contractor is responsible for time and quality management of subcontractors (Heaphy, 2010)

Figure 2.1 explains the relationship of risks between the employer and the contractor according to the six different type of books of NEC explained above. Contractor risk and reward is more than the other forms in 'A' which is priced contract with activity schedule. On the other hand, cost reimbursable contract has much more risk for the

employer per figure. As the risk of the employer increases, delivery of the field to the contractor and commencement speed of the contractor to the project increase too.

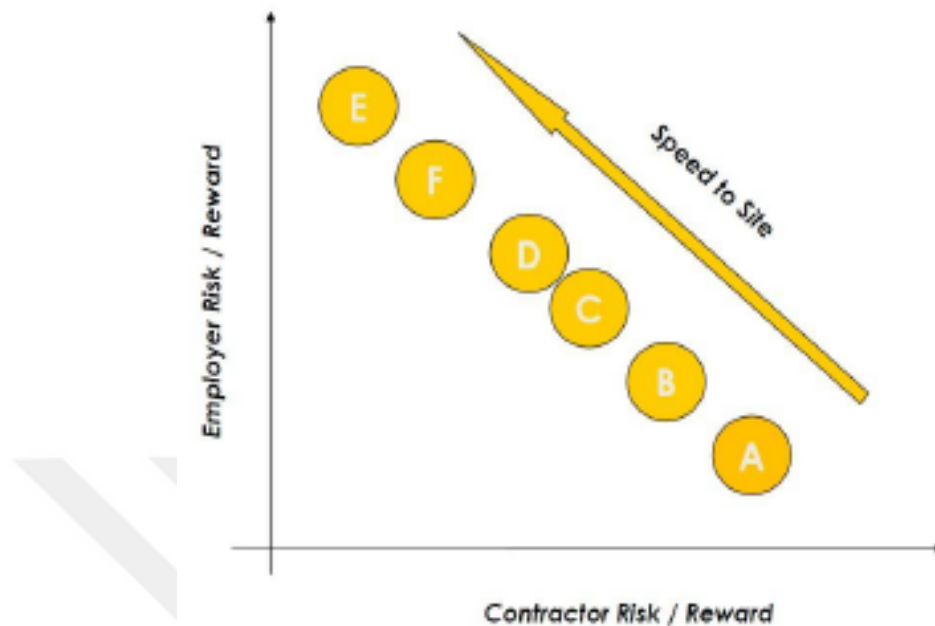


Figure 2.1 : Financial risk/reward of main options (Heaphy, 2010).

2.2.3 AIA

The American Institute of Architects (AIA) was founded by 13 architects in New York on 23 February 1857 with the aim of "promoting the scientific and practical perfection of its members and raising the professional standing" (Url-6). The American Institute of Architects is globalizing the profession of architecture. It provides resources and programs to help its members live and work outside the United States borders. Architectural, construction, and engineering services are recognized in the list of top industries with the great potentialities for export growth and inclusion into free trade in services agreements (Kane, 2000).

The AIA is a founding member of the International Union of Architects (UIA) that has widened to include professional corporations in more than a hundred countries representing approximately 1,000,000 architects. The Institute is really active in conversations about the globalization of the profession. The policy framework of the activities of the AIA is guided by the 'UIA Accord on Recommended International Standards of Professionalism in Architectural Practice' (Kane, 2000).

AIA contract documents are composed of almost 200 forms and contracts. The relationships and terms involved in design and construction projects are defined by

these forms and contracts. In the course of its 120-year history these documents have been finely drawn up by the AIA with the agreement of owners, contractors, lawyers, architects, engineers, etc. As a result, AIA contract forms have now become widely accepted as a standard in the industry. Two methods are used by the AIA to prepare contract documents:

- By “families” based on types of projects or specific project delivery methods
- By “series” based on the use of the document

According to families, AIA contract documents are separated into nine families based on the type of project or delivery method. In each family documents offer a consistent structure and text base to support the main relationships in a project for design and construction. Understanding families of AIA documents helps to select the standard forms for the project that are most appropriate.

- Conventional (A201) family: Conventional (A201) is the most frequently used family of AIA contract documents because the documents are appropriate for the standard design - bid - build delivery approach. These contract documents can be used for large or small projects. A201 (2007), ‘The General Contract Conditions for Construction’ is the key document of this family.
- Construction Manager as Adviser (CMA) family: A232 (2009), ‘General Conditions of the Contract for Construction, Construction Manager as Adviser Edition’, is the main document in this family.
- Construction Manager as Constructor (CMc) family: The primary documents of this family are organized with AIA Documents A201 (2007), ‘General Conditions of the Contract for Construction’, and B133 (2014), ‘Standard Form of Agreement between Owner and Architect’.
- Design-Build family: The primary document of this family is A141 (2014), ‘Standard Form of Agreement between Owner and Design-Builder’.
- Other AIA Documents that are based on families are ‘Integrated Project Delivery (IPD)’, ‘Interiors’, ‘International’, ‘Program Management’, and ‘Small Projects’ families.

According to series, AIA contract documents are alphabetically categorized by use or intent of documents.

- A-Series: Owner/Contractor Agreements

- B-Series: Owner/Architect Agreements
- C-Series: Other Agreements
- D-Series: Miscellaneous Documents
- E-Series: Exhibits
- F-Series: (Reserved)
- G-Series: Contract Administration and Project Management Forms (Surahyo,2017).

2.2.4 JCT

Since its establishment in 1931 by the Royal Institute of British Architects (RIBA), the Joint Contracts Tribunal (JCT) has produced standard forms of construction contracts, guidance and other standard documents for use by the building industry (El-adaway et al,2016).The first standard form of construction contract for JCT was issued in 1931 (although JCT was not mentioned until 1977). In 1937 a version of the local authorities was released Contract editions in 1939, 1963, 1980 and 1998 have been amended and published (Url-7).

The range was increased to four in 1963 by the publication of local and private versions of the ‘without quantities forms’. JCT forms have been issued and updated from 1967 through the eleven representative bodies (reduced to nine when the three three Local Authority Associations merged into the Local Government Association). The range of contract families has increased over time and has taken account of changes in industry practice, new procurement methods and legislative changes. The Latham report, published in 1994, examined the process of producing standard contract forms. The report proposed that it should only be allowed to publish in those entities whose members would sign the form. Previously, all new forms and modifications needed the consent of all nine bodies prior to being issued as JCT Forms (Url-7).

JCT is currently the major producer of all contract documents for the UK construction industry. Similarly, to the United Kingdom, JCT contracts are also preferred in Hong Kong for many private construction projects. Its general task is to develop, publish, obtain publication, review and disseminate suites of standard contract forms in both paper and electronic form, as well as tender documents and practice notes (El-adaway et al,2016).

The construction of buildings is facilitated by JCT contracts. Contracts specify the responsibilities of all parties and their obligations in the construction process, so it is clear who is responsible for doing the job, when it is done and how much work needs to be done. The JCT approach is to develop standard forms that respond to clearly defined needs and risk allocation in a way appropriate to their respective procurement methods.

JCT consists of the "families" of standard forms, guidelines and other documents suited to majority of construction projects and procurement methods.

Two key services are provided by JCT contracts:

- Reduce the cost of entering into a contract.
- Provide reference clauses in standard contracts (Url-7).

JCT contract families involve core contracts and subcontracts emphasizing the range of collaborative procurement methods employed by the construction industry.

Design-build contracts, traditional contracts, management and integrated team contracts are all provided. The adaptable and wide portfolio of JCT provides that its contracts support a wide range of construction activities, including complex and large-scale projects. The families of JCT contracts are listed below:

- **Standard Building Contract:** The JCT Standard Building Contract is intended for huge or complicated construction projects where comprehensive contractual arrangements are needed. Standard Building Contracts are suitable for projects that are obtained through the traditional method.
- **Intermediate Building Contract:** The JCT Intermediate Building Contract is intended for construction projects with all recognized industry skills, where fairly detailed contractual provisions are required, without complex construction services or other specialist work. Intermediate Building Contracts are ideal for projects obtained through the traditional method.
- **Minor Works Building Contract:** The JCT Minor Works Building Agreement is designed for smaller, basic building projects in which the work has a basic nature. Minor Works Building Contracts are ideal for projects procured through the traditional method.
- **Major Project Construction Contract:** The JCT Major Construction Contract is intended for large scale construction projects involving major works. It is

used by employers who regularly procure large - scale construction works, and contractors are experienced and able to risk more than the other JCT agreements. Major Project Construction Contracts are ideal for projects procured by the design and build method.

- **Design and Build Contract:** JCT Design and Build Contract is designed for construction projects in which both design and construction work is carried out by the contractor. Design and build projects can differ in scale, but the Design and Build Contract is usually appropriate where detailed provisions are required.
- **Management Building Contract:** The JCT Management Building Contract is designed for construction projects in which the employer nominates a management contractor for the monitoring of work. Construction is completed under a series of separate contracts for work, which are appointed and managed for a payment by the management contractor. Management building contracts are appropriate for projects procured by the management method.
- **Construction Management Contract:** The JCT Construction Management Contract is used for construction projects in which the employer appoints different separate contractors to complete the work and a construction manager to monitor work for a fee. Construction Management contracts are ideal for projects procured by the management method.
- **JCT-CE Contract:** JCT has worked together with Constructing Excellence to create the JCT - Constructing Excellence Contract. The JCT - Constructing Excellence Contract is designed for a variety of construction services and is adaptable for partnership applications and where participants want to develop collaborative and integrated work practices.
- **Measured Term Contract:** The JCT Measured Term Contract is designed to be used by employers with an ongoing maintenance flow, small works and improvement projects that a single contractor wishes to perform over a specified period. Measured Term Contracts are ideal for projects procured by the traditional method, using a measurement payment structure.
- **Prime Cost Building Contract:** The JCT Prime Cost Building Contract is intended for projects that will require an early beginning on - site, often for

changes or urgent repair (e.g. fire damage). Until the project is under way, the exact nature and extent of the work are not known, therefore complete design documents are not completed until the work begins. Prime Cost Building Contract is appropriate for projects procured by the traditional method, using cost plus or cost reimbursement payment structure.

- **Repair & Maintenance Contract:** JCT's Repair and Maintenance Contract is for use on projects involving a defined repair and maintenance program for the buildings or sites. This contract is used primarily by local authorities and other employers who periodically enter into small and medium sized contracts and who are experienced enough in not requiring an independent contracting manager.
- **Home Owner Contracts:** JCT Home Owner Contracts are specifically designed for people who are looking for advantages and the protection of a contract in the appointment of consultants or contractors.
- **JCT Contracts Complete 2016 Edition:** The JCT Contracts Complete 2016 Edition is released in two parts - JCT Contracts Complete 2016 Edition (Volumes 1-3) and JCT Contracts Complete 2016 Edition (Volumes 4-6). The JCT Contracts Complete Edition 2016 (Volumes 1-3) involves the following documents:
 - Standard Building Contract family
 - Intermediate Building Contract family
 - Minor Works Building Contract family
 - Design and Build Contract family
 - Generic Contracts (ShortSub, SubSub)
 - Collateral Warranties (CWa/F, CWa/P&T, SCWa/F, SCWa/P&T, SCWa/E)
 - JCT Homeowner Contracts

The JCT Contracts Complete Edition 2016 (Volumes 4-6) involves the following documents:

- Constructing Excellence Contract family
- Construction Management family
- Adjudication Agreement family
- Framework Agreement family

- Major Project Construction Contract family
- Collateral Warranties (CMWa/F, CMWa/P&T, TCWa/F, TCWa/P&T, MCWa/F, MCWa/P&T, WCWa/F, WCWa/P&T)
- Measured Term Contract family
- Prime Cost Building Contract family
- Management Building Contract family
- Pre-Construction Services Agreement family
- Repair and Maintenance Contract family
- JCT Tracked Change: A fully monitored change version of each of JCT's main contracts and subcontracts is provided by the JCT Tracked Change document service. The 2016 Edition Tracked Change documents indicate the variations in red from the 2011 Edition. The 2011 Edition Tracked Change documents display the changes in red from the 2005 Edition. The service provides professional advisors with information about variations to their customers and/or any construction professionals that are looking for a reference for the 2011 and 2016 editions or the 2005 and 2011 editions (Url-7).



3. FIDIC CONTRACTS

It is fair to say from the authors' own experience and an examination of articles published in legal journals that the use of FIDIC contracts worldwide has been different over the last three decades. There has been widespread use of FIDIC conditions in the Middle East as a model for their public work contracts in several countries. Southeastern Asia and Eastern Europe also have other highly active regions, in which FIDIC may contribute to the lack of commercial documentation in construction in the former Soviet bloc countries. The contracts for the FIDIC, especially the Red Book, are also widely used in Africa with common law. However, it has been surprisingly restricted in countries which have their own highly - developed domestic standards, such as the USA, the UK, Australia, Malaysia and Germany. These forms are used in international projects in markets in which contractors and consultants from these countries are active (Baker et al, 2009).

The basic structure of a FIDIC contract is the general conditions for one of its forms. However, the general conditions are just one element of the contract, supplemented by various documents defining the scope and basis of the obligations of the parties. (Baker et al, 2009). This chapter explains the suite of contracts published by FIDIC, including the eight books. It then considers the 2017 edition of FIDIC contracts.

3.1 FIDIC Suite of Contracts

In the global engineering and construction sector, the FIDIC contract suite owns a unique position. In all events, there are few competitors for the title of leading international contract forms and none close in terms of track record across decades, continents and sectors. Traditionally, the FIDIC draftsmen tried successfully to achieve a fair distribution of risks, rights and obligations between contractor and employer, with balanced contracts. The number of FIDIC agreements, both in the 'Rainbow Suite' and outside it, provides flexibility and suitability for a wide range of project types (Baker et al, 2009).

3.1.1 Conditions of contract for construction (red book)

In order to prepare a standard contract that can be used in FIDIC construction works, FIDIC has decided that the studies of the first standard contracts for the construction works in the world are prepared by organizations such as RIBA and ICE and their standard contract provisions should be utilized. As a result, FIDIC, although its original name is ‘Conditions of Contract For Works of Civil Engineering Construction’ based on the terms of the ICE contract, was published as the first edition of the standard construction contract, which was called “Red Book” in August 1957, because the name was long and the book was published with a red cover. First edition of FIDIC Red Book has been prepared based on the 4th edition of the” ICE Contract Terms. The reason for this is that the consultants in many countries in international projects financed by organizations such as the World Bank immediately after World War II use the terms of the “ICE contract”. It is totally normal that FIDIC wanted to use a work done on this subject while preparing the first "Red Book." However, the legally interesting result of all these developments is that the standard construction contracts prepared by FIDIC have a common law approach, although it is established in Switzerland which has continental law legal system (Cuhadar, 2010).

The second edition of the Red Book, which was approved by the International Federation of Asian and Western Pacific Contractors’ Associations, was published in July 1969. A supplementary section was then added as part III, which included the specific requirements for dredging and reclamation work. However, no changes were made to the text in the second edition. The Associated General Contractors of America and the Inter-American Federation of the Construction Industry approved a reprint of the Second Edition in 1973 (Bunni, 2005). It should be noted that although FIDIC's main purpose is to create a standard contract form that will be valid in the international business world, it tends to make it without leaving the provisions of the British standard construction contracts (Cuhadar, 2010).

The third edition of the FIDIC Red Book, along with the above-mentioned trend, was published in March 1977, based on the fifth edition of the “ICE contract terms”, which was published in 1973 with some innovations that included controversial and radical changes. According to the foreword of FIDIC Red Book, the general provisions that can be applied globally are grouped together in section 1; information such as payment, applicable law and valid language shall be provided in section 2 of each contract;

numerical information will be included in the appendix to tender. The third edition of FIDIC Red Book made significant changes to the previous editions. Firstly, it was the first time that the engineer who was not a contracting party was appointed by the employer and he/she would start to perform his/her duty with the approval of the employer. In addition to this, the provisions related to the law to be applied to the contract, the insurances related to third party damages and subcontractors have been introduced (Cuhadar, 2010).

The first three editions of FIDIC contracts that are explained above are under the influence of common law because of the "ICE contract terms" used by the UK and British companies. These contracts are prepared on the basis of a work model in which the design of the construction work is provided by the employer or the engineer and the contractor is responsible for the construction works only. However, FIDIC standard construction contracts have found a very common use area for both in Europe, the Middle East and Eastern countries, despite their content and provisions under common law.

The third edition of the Red Book was retained and no modifications were made until the fourth edition in September 1987 which important modifications were made and even the title of the document was changed. The term "international" has been removed for the inviting parties worldwide to use the Red Book in domestic agreements and not only international agreements. Part II of the Red Book known as the 'Conditions of Particular Application' has been enlarged and produced in a separate booklet. The corresponding numbering of the clauses connects it to Part I, so that Parts I and II contain together the conditions governing the rights of the parties and their obligations. Part II shall be drawn up specifically for each individual contract. Explanatory materials and sample clauses are included to assist the parties in the preparation of Part II, which provides the appropriate options for their use (Bunni, 2005).

In the mid-1990s, it was decided that contracts had to be fundamentally changed. The ordinary amendments could not do this. This decision led to four new forms of contracts with new concepts and terminology being issued by FIDIC in 1999, the Conditions of Contract for Construction, as a replacement to the Red Book (Ndekugri et al, 2007). These principal FIDIC contracts are commonly known as the "rainbow" suite.

The centerpiece of all FIDIC contracts is the 1999 Red Book. Applications where tenders are invited internationally are advised like the other contracts. While the contract has officially been referred to as the Conditions of Contract for Construction and FIDIC is referred to as the 'Construction Contract, its name is commonly referred to as the '1999 Red Book'. Although the 1987 contract was not supplemented by the 1999 Red Book, this book could be considered in many ways as the successor to the Red Book of 1987. The subtitle of 1999 Red Book states that the contract was drawn up for construction and engineering projects designed by the employer. Therefore, it is a contract for the general contracting procurement method (Hillig et al, 2010). The 1999 Red Book's most interesting aspect is its division into general conditions and particular conditions. (Murdoch and Hughes, 2008) General conditions include general applicability clauses and are completed with an appendix to the tender at the end of the contract. The parties must specify contract-specific data here, such as the governing law, period of time for completion or the amount of the liquidated damages. Conversely, the specific conditions enable the parties to change the terms of reference. For each project, they must be redrafted. FIDIC is included a guideline in the 1999 Red Book to draw up specific conditions which outlines circumstances under which a change of general conditions might be appropriate. This guide also includes wording examples for the particular conditions. A Microsoft Word model document with the columns in which the conditions may be inserted also helps drafters of the particular conditions. The model is included in the 1999 Red Book electronic version. Finally, it is an important background item that the legal concepts underlying the 1999 Red Book are based on common law (Hillig et al, 2010). The main characteristics of this contract are listed below:

- It is appropriate for all types of projects in which the employer or its engineer has principal design responsibility, although the design of work elements is provided for the contractor.
- The engineer administrates the contract, approves the work, certifies the payments and determines the extensions of time. Contractor payment is based on work done and rates as per a bill of quantity (standard measurement method should be specified); this reflects the likely nature of the works on site. The Red Book is most probably used for the construction and civil engineering projects.

- Risk sharing is balanced between the employer and the contractor.
- Both parties must apply the procedures to their claims, although the conditions imposed on the contractor are harder to include a "fatal" notice provision.
- The contractor has financial protection because he can demand evidence from the employer that he has the financial resources to pay the estimated contract price.
- Material on and off site may be paid, when strict criteria and the list of payment materials requested in the contractor's tender are followed (Battrick and Duggan, 2013).

In December 2017, at the FIDIC Contract Users Conference in London, a second edition of the Red, Yellow and Silver books was introduced. The 1999 editions of the Red, Yellow and Silver Books are followed up, updated and continues to serve as the main standard for employers and contractors in the international construction and engineering project field. The new versions of the FIDIC Red Book, Yellow Book and Silver Book are updates to the former 1999 editions which the industry can still use. The main objective is to improve clarity and certainty for the three contracts. These amendments would reduce disputes and lead to projects that are more successful. On the basis of this general purpose, there is a desire to reflect the best available practices and to address the problems experienced by the users of the 1999 edition during the last 18 years (Url-1). In the fourth chapter, the changes introduced by 2017 edition are examined in detail.

3.1.2 Conditions of contract for plant & design-build (yellow book)

The Yellow Book, Conditions of Contract for Electrical and Mechanical Works including Erection on Site, was firstly released in 1963. It was revised in 1980 and later in 1987 when its third edition was introduced. The standard conditions of contract for civil engineering works have always been recognized as not adequately satisfying all the requirements of electrical and mechanical engineering projects (E & M Works). For many reasons, the requirements of the two contract types differ.

The comments received from various users throughout the world after the publication of the second issue of the Yellow Book in 1980, focused on the fact that it was difficult to understand, particularly from those whose main language is not English, the legal drafting of the condition based on the Anglo-Saxon law system. Many commentators

considered that it was more important for the engineers to understand the engineering contract as a standard form, rather than the complicated legal terms generally used in the first and the second editions. It was also considered more important that the employer and the contractor could understand the conditions rather than having a project facing difficulties with legal conditions understood only by attorneys. These conditions have the project completed within the specified time and approved budget (Bunni, 2005).

Therefore, the second edition of the Yellow Book was revised extensively and the third edition of E&M Form was released in 1987. In 1988, a guide for use of each clause in the conditions was published.

As in the Red Book, the third edition of the Yellow Book was published with two parts: Part I - General Conditions and Part II - Special Conditions. However, the Yellow Book part II is significantly smaller than its Red Book equivalent and it is subdivided into two sections. Section A contains several sub clauses in which the provisions in the General Conditions refer to an alternative solution given in Part II. The provisions of Part I shall therefore apply unless an alternative solution to Part II is specified. Accordingly, if no changes are made to the provisions of Part I, Section A of Part II shall not be completed. However, in cases where alternative solutions to the standard provisions of Part I are required, Section A of Part II should be completed. Section B provides space for adding additional special conditions that may be required for a specific project.

The third edition of the Yellow Book was published in May 1988 with a series of editorial changes. At the end of the reprinted document, these amendments are listed. In many important aspects, including the numbering and the sequence of the various clauses, the third edition of the contract E&M differs greatly from the previous edition. The third edition of E&M is also significantly different from the fourth edition of the Red Book. However, a significant measure of compatibility between both forms was retained to allow their joint use for a project involving both civil and electrical and mechanical engineering works (Bunni, 2005).

The Yellow Book 1999 edition was identified as a suitable model for the implementation of private sector construction projects and is increasingly used in the provisions of public sector infrastructure works. As laid down in the title of the Yellow

1999 Book, FIDIC has proposed this for use in contracts where the contractor is responsible for the design and the electric and/or mechanical installation and/or other work that could include any combination of civil, mechanical, electrical and/or construction works (Bunni, 2005).

The main characteristics of this contract are listed below:

- It is suited for all projects in which the contractor is mainly responsible for design based on the employer's requirements, even if the employer (or his / her engineer) has provisions concerning the design of work elements.
- The engineer administrates the contract, approves the work, certifies the payments and determines the extensions of time.
- Payment is based on a lump sum price and is generally based on a schedule of milestones that the contractor has to achieve. This shows that the Yellow Book is most likely to be used for processing plant and other similar applications where a high degree of offsite production is foreseen. Payment terms can be arrange depending on the listing of such plant and equipment in the contractor's tender as in the Red Book.
- Completion testing procedures are more complex than in the Red Book.
- The Yellow Book has the following provisions in common with the Red Book:
 - Risk allocation
 - Claims by both parties
- Contractor's financial protection (Batrick and Duggan, 2013).

Many people agree that the 17-year old Yellow Book 1999 edition should be refreshed. There are very significant changes in the 2017 edition. The length of the General Conditions has almost doubled while the contract remains a lump sum. Also contract management procedures (e.g. the addition of a new advance warning mechanism and user-friendly claims and dispute resolution methods) are especially important. This represents a change in the role of the engineer, who will have to take a more proactive approach to solve problems at an early stage throughout the project (New FIDIC Yellow Book (Second Edition), 2017)

3.1.3 Conditions of contract for EPC turnkey projects (silver book)

The Conditions of Contract for EPC Turnkey Projects, Silver Book 1999 edition is a new member of the field. In order to learn the ideology and reasons behind its concept, it is best to quote from the authoritative paper prepared by Christopher Wade, the chairman of the FIDIC Contracts Committee and the leader of the Task Group, which prepared the FIDIC 1999 Conditions of Contract:

Not only is it a fact of life that many employers have always demanded “fixed, lump sum contract prices”, and that FIDIC did not have a suitable standard form to cater for such demand, but in recent years the trend has been towards private financing (not only of private investment and speculative projects, but also of public infra-structure projects). The prerequisites for obtaining private finance for a project are vastly different from those of obtaining government or other public money. Private financing requires that the project is independently viable in financial terms, and that there will be, so far as possible, an assured return on the finance provided. The lenders on a BOT or similar project will do their calculations showing the outlay over the construction period and the income over the succeeding operation period. For the return to be reasonably assured, the bases for their calculations will have to be as firm as possible. If the construction work costs more than reckoned (inclusive of any contingency allowance), then the calculations will not hold. If the construction time is longer than planned, then the income will not begin to come in on time, and the calculations will not hold. Therefore, such lenders have to ensure that the risks of cost and time overruns of the construction contract are limited as far as humanly possible. Such lenders are aware that contractors will have to charge a premium for carrying the additional risks necessary to provide the required greater security of construction cost and time. The premium in certain cases may reasonably be large. However, they would rather accept such premium and include it in their calculations before embarking on the project, than discover later on that the project is no longer viable and that they are incurring an overall loss. (as cited in Bunni,2005)

Therefore, the Silver Book is designed for use in special projects. Although the format is identical in all 3 books, the 1999 Red, Yellow and Silver Books, it can also be noted that the Silver Book differs from the absence of the engineer and its imbalanced risk distribution, which switches wide range of risks to the contractor. These distinctive features of the Silver Book should not be considered as a criticism of its basic concept and methodology. The book was specifically designed to meet the need to use private funds for infrastructure projects and was expanded as a result of requirements related to Build, Own and Transfer (BOT) and Build, Own, Operate and Transfer (BOOT) projects. The idea is to provide a combination of design,

construction and operation. The payment method of the contract is a fixed, lump-sum contract price with little or no risk of an increase in cost if and when unexpected events took place. Private finance naturally enables a financially viable project with a guaranteed return on advanced funds. A lump-sum, fixed contract with the majority of risks assigned to the contractor means that the employer pays a higher price for the project's construction. The contractor is essentially not only responsible for design and fitness for purpose standard of performance. The contractor shall also be liable to "any inaccuracy, error or omission of any kind" in the employer's requirements. As in the Yellow Book, the requirements of the employer are set out in a document indicating the purpose, scope and design of the works and other technical criteria.

The Silver Book should be taken into account by focusing on the risks that allocates to the contractor. It is for projects in which extensive negotiations are concluded before the contract is awarded. The concept must be followed by the procurement method. The Silver Book does not use criteria for allocating risk controls and their consequences. Risks are divided over many of the Silver Book subclauses such as clause 3.1, 3.5, 4.7, 4.12, 5.1, 5.8, 8.4, 17.3 and 20.1 (Bunni, 2005).

The main characteristics of the Silver Book are listed below:

- The design responsibility lies entirely with the contractor. The employer provides its requirements but these are generally in the form of a brief performance specification.
- The contractor performs all the engineering, procurement and construction often including performance tests after completion.
- The contract does not include an engineer; the employer may appoint an employer's representative.
- It is the lump sum contract that is most likely similar to the Yellow Book.

Given the above circumstances, the employer should recognize the significant costs for a contractor to produce a tender if the Silver Book is chosen. Therefore, it is hoped that employers will recognize this situation and only select a small number of contractors to tender.

Employers should allow the contractor complete freedom to carry out the works in the manner it has chosen to meet the Employer's performance criteria. If the employer cannot understand such factors, or if the time for the tender is too short to

enable the contractor to draw up an adequate tender or if significant work is underground and difficult to inspect, then it may be better for the employer to use Yellow Book with accepting additional risks and receiving a lower tender price (Battrick and Duggan, 2013).

3.1.4 The short form of contract (green book)

The last contract issued in 1999 is the Short Form of Contract or Green Book. It is recognized as much easier and shorter contract for projects that has a relatively low contract price and a short period of time.

The contract has a high degree of flexibility, but any reader can recognize the contract that is prepared by the same family, although it has 15 clauses and 10 pages in all. The clauses are short and easy to understand. Design can be carried out by either party. The engineer is not anticipated. However, the employer may appoint a representative. Payment can be made on either a remeasured basis or lump sum.

The contract contains guidelines and an agreement along with its appendix and rules for adjudication, just as with the major forms. FIDIC considers that the Green Book could work without particular conditions. However, a cautionary note can be provided by the employer if it is necessary to change the drafted contract (Battrick and Duggan, 2013).

Contents of the book are listed below:

- Agreement
 - Offer
 - Acceptance
 - Appendix
- General Conditions
 - Clause 1. General Provisions
 - Clause 2. The Employer
 - Clause 3. Employer's Representatives
 - Clause 4. The Contractor
 - Clause 5. Design By Contractor
 - Clause 6. Employer's Risks
 - Clause 7. Time For Completion
 - Clause 8. Taking-Over

- Clause 9. Remedying Defects
- Clause 10. Variations and Claims
- Clause 11. Contract Price and Payment
- Clause 12. Default
- Clause 13. Risk and Responsibility
- Clause 14. Insurance
- Clause 15. Resolution of Disputes
- Index
- Particular Conditions
- Rules for Adjudication
- Notes for Guidance
- Forms of Securities (Url-1).

3.1.5 Conditions of contract for design, build and operate projects (gold book)

One of the last gaps in the FIDIC contract toolbox is filled by the Gold Book. Their usage is growing in government departments, such as water authorities that warmly welcome the idea that foreign contractors have to bring their knowledge of water treatment and provision at profit but also, they have to deal with defects.

FIDIC has responded not only to employers who are looking to outsource, but also responds to the changing nature of contractors who are now operators. Potential disputes between contractors performing a design and build contract have been denied which have resulted in poor performance, defects and disputes while leaving the employer to struggle through a 20-year plant lifetime. The whole plan was considered completely and both parties acted responsibly with each other in order to create a balance between the construction and operating elements of the contract (Battrick and Duggan, 2013).

The main characteristics of the Gold Book are listed below:

- The contractor designs, builds and maintains for 20 years.
- The allocation of risk in the design and construction phase is the same as in the Yellow Book. However, after notice is sent to the contractor not less than 14 days, the employer shall be entitled to terminate the contract where the design-build cannot be completed before the cut-off date. If the contract data contains no cut-off date, Sub-Clause 15.3(h) gives the employers the right to terminate

the contract if the contractor has failed to complete the design and build within 182 days after the time for completion (Baker et al, 2009).

- Lump sum payment but a defined asset replacement fund and schedule that indicates the time and cost of certain asset replacements. The contractor is responsible for the costs of replacing plants and equipment other than the schedule. At the end of the 20 years, any surplus in the fund is equally divided.
- If the contractor fails to fulfill its maintenance obligations, an employer shall be entitled to deduct 5% from payments over the "operation service period" (OPS). Within the final payment to the contractor, the fund shall be released. In this period the contractor is responsible for its design and construction defects.
- For the duration of the OPS, an independent audit body is appointed to supervise the contractor and employer's performance. Although it does not have powers, the parties should consider the instructions of the audit body.
- At least two years before the end of the OPS a joint inspection is needed. The contractors who also face completion tests that similar to those at the end of the design and building phase should perform any identified work.
- From the date of design and construction, a standing DAB is established.

The key to success is the contractor who must design and build a quality plant that meets the needs of employer's demands with low operating and maintenance costs. In 2011, FIDIC published its guide to this form (Battrick and Duggan, 2013).

3.1.6 Conditions of contract for construction (harmonised red book or pink book)

For many years, various multilateral development banks have accepted the 'FIDIC Conditions of Contract for Construction, 1st Edition, 1999' within their standard bidding documents which they demand from their debtors or aid recipients. When MDBs use the FIDIC Conditions, they include additional clauses in their special conditions in order to modify the provisions of the general conditions. In many cases, these additional clauses that are specific to the MDBs, have standard wording that has to be repeated when procurement documents for a new project have been prepared. Furthermore, there have been differences between MDBs in the provisions in tender documents and additional provisions included in the Particular Conditions. The

inefficiency and uncertainty among document users have been increased and dispute possibilities have been increased. The MDBs recognized these problems as important as the benefits of standardization.

In response, the MDBs decided to harmonize internationally their tender documents. They selected the FIDIC Conditions of Contract for Construction 1st Edition 1999. They decided that a modified form should be adopted in order to include in the general conditions the standard wording that previously incorporated into the specific conditions by MDBs.

FIDIC also recognizes the significant advantage to the users of the harmonization contracts. The copyright and management of the MDB Harmonized Edition are belong to FIDIC. The harmonized edition of the MDB is for use on projects financed by the MDB. It does not replace FIDIC's 1999 construction contracts, which is still available for all users without MDB funding. In addition, some MDBs allow tenderers to choose between the Red Book and MDB harmonized editions (Bosswell, 2008).

The result is a new and different set of general conditions of FIDIC construction contract for use by bank borrowers in procurement of the kind of construction used in the historical FIDIC Construction contract. These contracts are remeasured contracts using bills of quantities with a construction supervised by “the Engineer”.

In various versions of the MDB Harmonized Contract, there has been some confusion. In fact, MDBs which are licensed with the FIDIC Harmonized Edition may use general conditions of the contract which are then included in standard bidding documents. MDBs which have license are called participating banks because they are involved in developing the MDB Harmonized Edition. In May 2005 FIDIC released the first version to the participating banks, and in March 2006 a second one was released. FIDIC also provides full contract terms with forms for particular conditions and other documents. This is available as an encrypted PDF, which ensures that all general conditions are authentic. Users are encouraged to buy this version to ensure authenticity, as the electronic version of the general conditions that is freely available may be changed.

It should be stated that the contract data and other forms of the FIDIC's MDB Harmonized Edition are modeled according to the forms in the standard bid documents of the World Bank. However, these forms are only provided as a guide and as a

convenience. Users should get the particular conditions Part A forms from the relevant bidding documents of the participating bank.

The participating banks approved "no objection" proceedings in March 2007 that would substantially expand the use of the MDB Harmonised Construction Contract. The procedure allows FIDIC to license multilateral organizations to use the general conditions of the Harmonised Construction Contract in their projects. Also, major organizations, generally FIDIC member associations have permission to prepare and publish translations (the banks are responsible for the preparation of the MDB Harmonized Construction Contract General Conditions in Spanish, French and Portuguese) (Boswell, 2008).

In June 2010, a third edition of the general conditions was published. Before their completion, drafts of these three versions of the MDB Harmonized Edition had been circulated to interested parties for comment. FIDIC has considered all comments received and included some of them.

The following participating banks took part in the preparation of the Multilateral Development Bank (MDB) Harmonised Edition of the FIDIC Conditions of Contract for Construction. It is well known that they all will adopt this FIDIC edition in their standard bidding documents.

- International Bank for Reconstruction and Development (The World Bank)
- European Bank for Reconstruction and Development
- African Development Bank
- Asian Development Bank
- Black Sea Trade and Development Bank
- Caribbean Development Bank
- Council of Europe Development Bank
- Inter-American Development Bank (Url-1)

3.1.7 Client/consultant model services agreement (white book)

One of the standard contract forms of FIDIC is separate from all others, although its cover color also refers to them. As the full title indicates, The White Book is not a construction contract at all. In order to be able to ke

ep the consultants in the area of pre-investment and feasibility, design, contract administration and project management, the FIDIC Client-Consultant Model Services Agreement is prepared. FIDIC advises that the White Book should form the basis for an agreement between the consultant and the client. It can be used both in conventional procurement or in design build projects. The White book is never the FIDIC Contracts Committee's responsibility, but it has been produced by the Client / Consultant Relations Committee since the first edition of 1990 (Baker et al, 2009).

In 2017, the fifth edition of the White Book came out. This 5th edition of the White Book has enhanced the consultant's "duty of care" obligations when providing certain customer services. Therefore, FIDIC has taken into account the following matters that are all important to consulting engineers everywhere:

- Globally up to date practice in drafting consultancy agreements.
- Fair risk balance between the consultant and the client.
- The duty of the professionals to provide due skill and care and fitness for purpose.
- Availability of appropriate insurance

FIDIC acknowledged significant pressure from certain parts of the industry to enhance the consultant's obligations to ensure that professional services and deliverables are fit for purposes. Despite the wide use of these terms worldwide, FIDIC faces problems by having no mutual understanding of due skill and care or fitness for purpose, either among clients and consultants or between legal advisers in different jurisdictions.

FIDIC has agreed that the client can expect professional services to be performed correctly and all specific contractual requirements to be met. In the case of errors or failure to satisfy requirements, the client must be entitled to an appropriate compensation from the consultant. The approach assumes the full experience and competence of the consultant in the provision of the services concerned, and the appropriate requirements are added to the new White Book. It is all about understanding the importance of the consulting engineers' services and providing the fair risk balance between the client and the consultant.

In the industry, it is well known that consultants are covered by professional indemnity insurance for their liability under contract. FIDIC is satisfied that insurance policies on professional indemnity do not cover responsibility on the consultant for insufficient

services without proof of fault. Such insurance covers liability only where the consultant fails to utilize the appropriate expertise and care required for an experienced consultant. This indicates that a consultant should be chosen with quality and experience rather than on price.

The Task Group studied the twenty standard forms of contracts that were used in other regions. It was noted that none of these forms of contracts required professional services to be fit for purpose. Also, strict liability for defects was not imposed. The standard shall be reasonable skill and care.

Additional information and the challenges that are faced due to the lack of understanding on the key issues can be found in the foreword and in other FIDIC guides.

Users of fifth edition contract are confident that common and accepted standards are used. It emphasizes the obligation for the consultant to make use of the adequate skill and care expected of an expert consultant who provides services for similar sized and complex projects. Moreover, it is stated that services are required to fulfill any purpose described in the agreement. In order to benefit both the client and the consultant, that obligation should be fully insured under any professional insurance policy. This is for the appropriate risk balance between the two parties (Roberts, n.d.).

3.1.8 Form of contract for dredging and reclamation works (blue-green or turquoise book)

FIDIC published new standard contract forms in 1999, but the contracts do not satisfy specific dredging and reclamation requirements. FIDIC was contacted about possibility of the separate FIDIC dredging contract by the International Association of Dredging Companies (IADC). Following that a Task Group was created for producing the FIDIC Dredging and Reclamation Works Form which was published in 2006.

A new edition of the work was published ten years later. The new edition reflects the practice of the book in the first edition and improved its use. In the second edition of the general contract conditions, the book offers more specific guidelines for the needs of the marine construction industry. The book also provides more specialized guidance notes to help employers. Now the book is closer to the other FIDIC contracts to ensure an adequate risk equilibrium.

The FIDIC Form of Contract for Dredging and Reclamation Works or Blue-Green Book was first published in 2001 as a trial edition. It was based on the short form of contract by the FIDIC (First edition, 1999) which is also called the Green Book. Blue-Green Book had an addition of an engineer assigned by the employer. There is no popular test edition for any industry and the FIDIC Blue - Green Book was not used significantly until its first appearance in 2006. The FIDIC Blue Book is the first edition of this new version.

Following an IADC Legal Committee meeting in 2011 comprised of the members' company lawyers, a decision has been made to improve the Blue Book.

FIDIC set up Task Group 7 (TG7) to consider improvements in the first edition with taking into consideration the IADC's suggestions on changes. John Greenhalgh chaired TG7 and Dr Roger Maddrell included the group. The original drafting team Edward Corbett & Co was also part of the group. They were all assigned by FIDIC. Marnix Vandenberghe and Tim Maddock were representing the IADC. In this way, the task group had an expert balance to represent various employers, engineers and contractors' interests. There was a double plan for a new edition:

- Make it more convenient to the user and reduce the need for particular conditions. It would make it easier for customers to suggest its use in developing markets.
- Make it specific to dredging sector in order to reduce employers' preference for other FIDIC Contracts that are not indeed suitable for marine construction.

In September 2016, FIDIC released the latest edition, which can also be used for any dredging and reclamation works as the second edition of FIDIC Blue Book. It is less suited to complex marine construction or offshore projects, as it lacks the complicated testing and processes that are often necessary for combined construction work. It is easy to use with a clear and accurate wording for non-English speakers. In addition, there have been no conflicts over the FIDIC Blue Book concerning the wording of the standard contract terms. Disputes typically arises concerning payment issues and the significance of technical specs or soil data. On the other hand, the long and complicated provisions of the other FIDIC contracts (in particular the Red, Yellow and Silver books) have led often to arguments by employers, engineers and contractors.

Most users of the Blue Book know the rest of the FIDIC Rainbow Contract Suite. Many users believe that the Rainbow Suite addresses a number of issues more accurately. Therefore, the second edition of the Blue Book contains new provisions aligning the Rainbow Suite contract.

The Blue Book is gaining popularity slowly. Its use is constantly rising since 2010. However, the FIDIC Blue Book is low in use in Australia, the UK and the original countries of the European Union. The reason is that clients and consultants prefer their own national contracts instead of any FIDIC contracts in these areas. The use of the FIDIC Blue Book seems to be only one instance in Russia. Contracts are generally based on FIDIC in Russia, Scandinavia and the Baltic countries. However, they are strongly modified which does not support the contractor and makes negotiation hard.

The Blue Book is widely used in India, Indonesia, Nigeria and the Philippines. Furthermore, there is an increasing market in Central and South America for the Blue Book contracts. Unlike the Rainbow Suite, FIDIC did not offer an official Spanish or Portuguese Blue Book versions for the industry. Therefore, the IADC will help FIDIC to produce a second Spanish and Portuguese versions of the Blue Book in the near future to promote it in regions that require the translated version.

Statistics also indicate that the clients have repeatedly used the FIDIC Blue Book to reflect their satisfaction. The value of the FIDIC Blue Book is well known and the new version which has clarified many details is also well received (Maddock and Vandenberghe, 2016).

Figure 2.2 contains a summary of which FIDIC standard type of contract can be used in which situations. If the project is straightforward, The Short Form of Contract, Green Book can be applied to the project. If it is not straightforward project and design responsibility belongs to the employer, Red Book or Pink Book can be preferred. On the other hand, if contractor designs the project and high unforeseen risks are occurred, Yellow Book is suitable. The involvement of the contractor in the maintenance and operation of the project makes the application of the Gold Book reasonable. If there are no major unforeseen risks for the employer, and the contractor has the most of the risks, Silver Book can be provided.

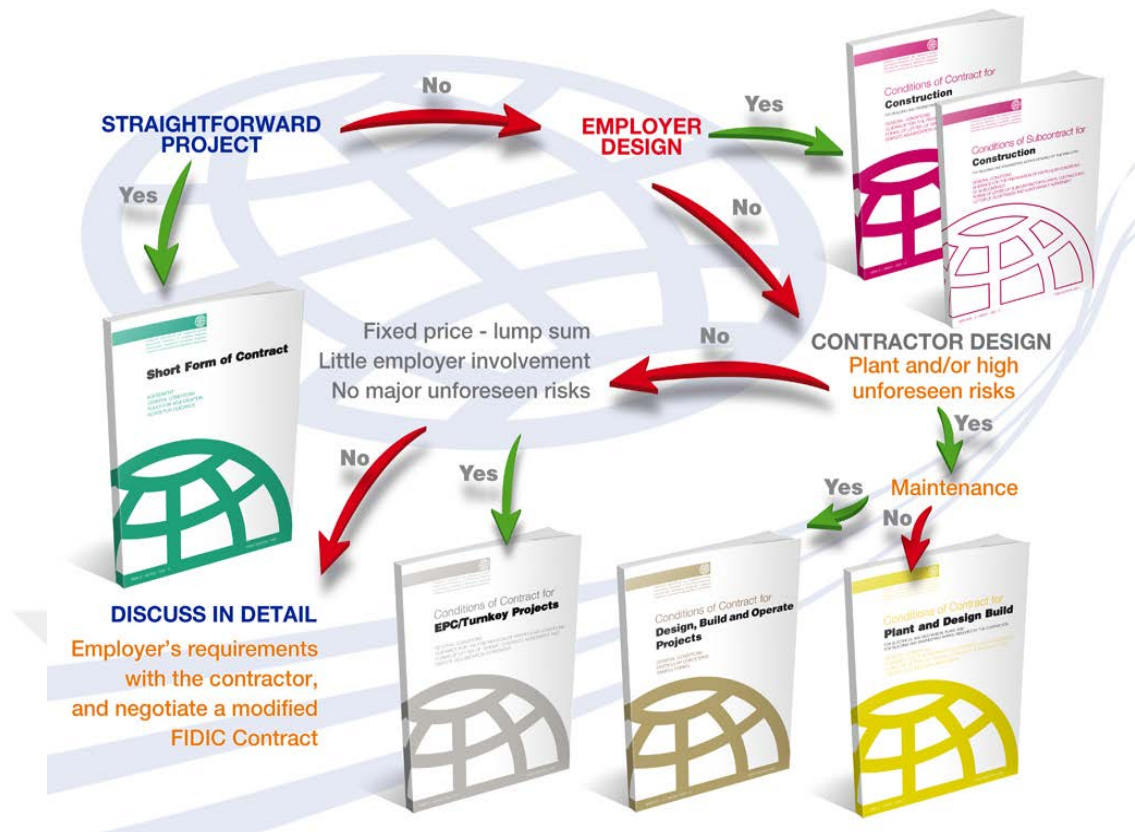


Figure 3.1 : FIDIC form of contracts (Aydın, 2015).

3.2 FIDIC 2017 Edition

FIDIC is one of the most commonly used and mainly influenced standard form of contracts. The 1999 Suite that is called the "Rainbow Suite" has been thoroughly revised to improve the "user friendliness" and concentrate more on defining tasks and obligations than on working areas. They are now commonly used for many countries for contracts. Following the 1999 edition of FIDIC Contracts, many international professionals and academics produced many books, academic papers, conferences, training workshops and developed extensive literature on the 1999 FIDIC Rainbow Suite (Alpkokin and Akti, 2018).

In early 2016 FIDIC established a working group and published three updated contracts after 18 years on December 2017, which significantly changed the 1999 version books. The updated three standard forms are widely known as Red Book, Yellow Book and Silver book, among the four 1999 Rainbow Suite. In this earlier phase the work on the major modifications introduced by contracts for the 2017 edition or on comparisons with the contracts for 1999 is very limited. There is expected to be

a lot of global interest and various conferences and workshops are held around the world (Alpkokin and Akti, 2018).

The most striking feature is their length for anyone who first selects the Second Editions. They are more than 50% longer than the 1999 edition and have 50% more words. This can indicate that much has changed. However, the second editions are conceptually almost identical to first editions, but the risk allocation only changes slightly. Instead, the new enhanced contract management arrangements and the contract restructuring are a major part of the increase in length.

Many of the changes in the Yellow Book pre-release version, which were released at the end of 2016, were preview for users. However, there are some significant differences in the Second Edition in response to feedbacks on the pre-release version (Second Editions of the FIDIC Rainbow Suite, 2018).

The new FIDIC Red Book, Yellow Book and Silver Book are updates to the former 1999 editions, still available for usage of the sector. The principal objective of all three contracts is to enhance clarity and certainty. These amendments are intended to reduce disputes and lead to better projects. This general goal underlines the recognition of the need to reflect current best practices and the problems that have arisen during the past 18 years for users of the 1999 editions.

The increased emphasis on avoidance of disputes is a key topic of the second edition. The second editions, which span 200 pages and contain 21 clauses, are much more comprehensive. The additional length results from more prescriptive provisions that achieve more clarity, transparency and certainty by detailing the step by step requirements for employers, contractors and engineers.

In Spring 2017, an updated FIDIC White Book, which aims at advising and consulting services, was also published in addition to the Red Book, Yellow Book and Silver Book. FIDIC provides a wide range of other standard contract forms as well.

All FIDIC contracts are based on the fundamental principles:

- Engineers with experience in design and construction draft FIDIC contracts.
- FIDIC contracts provide the parties with a balanced risk allocation.
- ‘The Engineer’ has a critical role in FIDIC contracts.

FIDIC has enhanced contractual provisions in the 2017 edition by making them more prescriptive and introducing step by step project and procedural mechanisms to increase clarity and reduce possible interpretative misconceptions. These indicate exactly what is expected from the employer, the contractor and the engineer during the execution of the contract.

FIDIC also tried to use a simple language when updating the three contract formats, since many users' mother tongue is not English. This approach also aims to make it easier to translate documents into other languages.

The objective of FIDIC is to improve and strengthen the application of such contractual forms in all jurisdictions, in all situations, as the recognized international standard forms of construction contract.

Although provisions have been improved for the three contract forms, each form has an unchanged overall structure. However, in the 2017 contract updates of FIDIC there are now 21 clauses of general conditions of contract rather than the 20 clauses of the 1999 contracts of FIDIC. In FIDIC 1999 the 'Clause 20: Claims, Disputes and Arbitration' was divided into 'Clause 20: Employer and Contractor Claims' and 'Clause 21: Disputes and Arbitration'. The aim is to clearly differentiate and separate the 'day-to-day' claims of the parties from the disputes and to emphasize how they have been handled under FIDIC Contracts.

The contract updates for 2017 by FIDIC were systematically reviewed and controlled by over fifty eminent and experienced professionals from all interested parties (including employers, contractors, engineers, lawyers and bilateral/multilateral development banks from across the world) especially chosen and invited by FIDIC. FIDIC carefully considered the comments and suggestions received at each review stage, and necessary modifications were made where applicable (Fahey, n.d).

In the fourth part of the thesis, the FIDIC Red Book 1999 edition and the 2017 edition will be compared in terms of clauses and sub-clauses, and then these changes will be evaluated under general headings. All three of FIDIC's 2017 contract updates have been subject to many of these modifications.



4. COMPARISON OF FIDIC RED BOOK 1999 EDITION AND FIDIC RED BOOK 2017 EDITION

In this part of the thesis, general conditions of FIDIC Red Book 1999 edition and FIDIC Red Book 2017 edition are reviewed and the general conditions of these two books are compared by examining each sub-clause. A comparison of the general provisions of FIDIC Red Book 1999 edition and 2017 edition is made in Table A.1. In the first column of the table, clauses and subclauses in the 1999 edition and in the second column of the table, the clauses and subclauses in the 2017 edition are listed. In the third column of the table, the corresponding sub-clauses in the 1999 and 2017 editions in that row are compared. Subsequently, these clauses are grouped and compared under general headings of contract management, employer's obligations, contractor's obligations, the engineer's obligations, change orders, notices, claim management, disputes and arbitration.

4.1 Comparative Analysis of FIDIC Red Book 1999 and FIDIC Red Book 2017 with Clauses

FIDIC launched the second editions of the three major forms of contract in the FIDIC Rainbow Suite at the FIDIC International Users' Conference in London on December 2017. FIDIC Red Book 2017 edition which is one of these updated contract forms now contains 21 clauses of general conditions rather than the 20 clauses of the 1999 edition. Claims and disputes are in separate clauses in 2017 edition. The increased emphasis on avoidance of disputes is one of the main issues of this edition. General conditions of the FIDIC Red Book 2017 edition is now 128 pages including the DAAB procedural rules. There are 68 pages in the 1999 edition.

Grose et al. (2017) states that there are some general changes and updates in the 2017 edition of the Red Book. These amendments are listed in the Table 4.1.

Table 4.1 : FIDIC Red Book 2017 edition.

No.	General Changes and Updates
1	Philosophy is widely similar to the 2017 Yellow Book pre-release version.
2	The risk profile of 1999 edition is commonly retained.
3	It is generally less flexible, less user friendly and more complex.
4	This edition is 50% longer than the 1999 edition.
5	The role and powers of the engineer are extended.
6	There are new definitions and “step-by-step” procedures, resulting in a greater administrative burden on the contractor and additional costs for the employer.
7	There are new time limits.
8	Symmetry between the contractor’s and the employer’s requirements.
9	There are enhanced and separate claims and disputes provisions, including the introduction of the new standing “Dispute Avoidance/Adjudication Board” (DAAB) and a focus on early dispute avoidance.

There is a limited flow of information about the FIDIC Red Book 2017 edition in the literature and the sector. However, its worldwide use will soon increase and become widespread like previous FIDIC editions.

In the next headings in this part, the changes between these two contracts are interpreted under general headings.

4.2 Contract Management

In the FIDIC Red Book 2017 edition, the huge majority of the changes are related to contract management. In this respect FIDIC's aim is to clarify the expectations and the consequences of non - compliance and provide certainty about what is expected of the parties. Dispute avoidance has been emphasized and the parties are required to deal with problems as they arise. The result is long clauses with detailed, time-limited procedures for the parties to be followed.

Examples of amendments made to the contract management are listed below:

- All communications (including ‘notices’) should be clearly defined as a specific type of communication.
- There is a significant increase to the number of situations when a party has to give a notice.
- Detailed procedures and provisions are in place about the review of contractor’s documents, engineer’s determinations, variations, termination, taking-over, payment applications, claims and disputes.
- There is greater clarity as to the role and staff of the engineer.

The Engineer is a central element of the FIDIC contracts. Probably the best example of FIDIC's approach to contract management in the second edition is the changes made to the provisions regarding the engineer's determinations (Clause 3.7). This clause in the 1999 edition included two paragraphs, it now extends to just more than three pages in the 2017 edition and contains:

- A clear obligation for the engineer to act 'neutrally' for any subject or claim.
- The decision-making process is divided into several, clear steps.
- Detailed requirements for each step in the process.
- Time limits for each step of the process and consequences if they are not followed.
- Detailed communication requirements.
- A new requirement for a party to issue a notice of dissatisfaction (NOD) within the necessary time frame, if the determination is dissatisfied otherwise the decision becomes final and binding (Second Editions of the FIDIC Rainbow Suite, 2018).

Detailed information about changes in employer's obligations is given on section 4.3 'Employer's Obligations'.

4.3 Employer's Obligations

The financial arrangements of the employer are detailed in the contract data. The provisions in the 1999 edition that require the contractor to request disclosure are typically removed according to the Clause 2.4 'Employer's Financial Arrangements'. If the contractor receives an order to execute a price variance of more than 10 percent, or if the total of the changes is greater than thirty percent of that agreed upon, or if the contractor receives not payment pursuant to sub-clause 14.7 'Payment', or the contractor becomes aware of any significant change in the financial arrangements of the employer, the contractor having not received notice pursuant to this sub clause, the contractor may apply and the employer shall provide reasonable evidence within 28 days following receipt of the application that financial provisions were made and maintained, which will enable the employer to reimburse the remainder of the contract price payable at that time. Although this section is also in the 1999 edition, the conditions have been clarified in 2017 edition.

Employer's risk categories in 1999 edition have been enlarged to include any action or default by the employer's staff or other contractors. In 2017 edition, clause 17.2 addresses concurrency for the second time. This allows for the distribution of loss or damages caused by an employer-risk event combined with causes for which the contractor is liable.

According to clause 17.5 'Indemnities by Employer', the indemnity of the employer for the contractor has been now increased to include damages or losses to property attributed to negligence, willful act or breach of contract by the employer, the employer's personnel, or any of their respective agents. The employer is also obliged to indemnify the contractor for all claims, damages, losses and costs in relation to the loss or damage to property, as a result of the event for which the employer has responsibility in accordance with clause 17.2. The liability of both parties under the indemnity provisions is proportionately decreased to the extent that the loss was contributed by the event for which the other party has been responsible.

The entitlement of the contractor to time extensions has been extended where the inadequacy or non-availability of an access route occurs as a result of a third party's changes to that access route after the base date according to EOTs (Clause 4.15 and 8.5).

The 1999 Red Book was silent on latent defect liability (It is important to say that each party shall remain liable for unperformed obligations following issue of the performance certificate). Therefore, the liability of the contractor would be subject to the approach of governing law. According to the Red Book 2017 edition clause 11.10 'Unfulfilled Obligations', the liability of a contractor for latent defects in plants shall be terminated two years after the expiry of the Defects Notification Period, unless prohibited by law (and in all cases of fraud, gross negligence, deliberate default and faultlessness).

The Red Book 1999 edition gives the contractor the right to recover cost plus profit from several relief events. However, under the Red Book 2017 edition, the amount of profit recoverable now is set at 5% in most situations in default. In case of omission of work or termination of the contract for convenience, the contractor is also now expressly entitled to recover lost profit, although a profit margin is not provided for.

The loss of profit which the contractor could have gained from doing or finishing the work is likely to be involved (Grose et al, 2017).

4.4 Contractor's Obligations

The FIDIC Red Book 2017 edition simplifies the contractor's core obligation on clause 4.1 'Contractor's General Obligations': The contractor shall perform the works in accordance with the contract. When the contract specifies that a design has to be carried out by the contractor, the resulting obligations have been expanded and now include that the design and the contractor's documents comply with the technical standards stated in the specification and laws or otherwise they shall be in accordance with the documents forming the contract.

According to the Clause 4.4 'Contractor's Documents', construction can not start until a notice of no objection is issued from the engineer in respect of the contractor documents. The contractor's requirements to ensure as-built records and operation and maintenance manuals are expanded and they are now listed separately in clause 4.4.2 and 4.4.3.

Clause 4.9 'Quality Management and Compliance Verification Systems' indicates that the contractor is required to prepare and implement a quality management system (QMS) and a compliance verification system (CVS). The contractor shall perform the reports of internal QMS audits to the engineer and submit a whole set of CVS records to the engineer in a way that is acceptable.

The programming requirements are extended to contain additional details, including logic links, floating and critical path, which have to be included in each programme according to Clause 8.3 'Programme'. Increased costs of compliance with such requirements must be considered for contractors at the tender stage. In addition, nothing in any programme will exonerate the contractor of any obligation under the new conditions to issue a contractual notice.

The contractor is not needed to ensure a separate notice of a claim for an extension of time to a delay caused by a variation according to clause 8.5 'Extension of Time for Completion'. In a main difference from the 1999 edition, the contractor has an entitlement to an extension of time for an increase of more than 10% in the estimated

quantities, if this leads to delay. Parties are required to adopt rules and procedures for concurrent delays through Special Provisions.

According to clause 10.1 'Taking Over of the Works and Sections', unless the engineer has issued a notice of no objection to the As-Built records and Operations and Maintenance Manuals under Clause 4.4, the works are not considered complete for taking over.

Clause 11.2 'Costs of Remedying Defects' states that the contractor is responsible for the correction of defects resulting from improper operation and maintenance due to matters for which the contractor is responsible (i.e. As-Built Records, Operation and Maintenance Manuals and Training).

According to clause 17.4 'Indemnities by Contractor', a new indemnity is placed enabling the contractor to compensate the employer for all errors in the design of the contractor (if applicable) resulting in the works not being fit for purpose. Specifically, the exclusion of indirect or consequential loss and the aggregate limit on liability under clause 1.15 applies to this indemnity, limiting the contractor's liability.

A contract cannot exclude liability resulting from a mandatory provision of the law. Despite this contract, it is important that a contractor and engineer are subject to decennial liability obligations as a matter of law (Grose et al, 2017).

4.5 Engineer's Obligations

FIDIC Red Book 4th Edition 1987 obliged the engineer to be fair when practicing his discretion to give decisions, opinions or consents, to express approvals or to determine a value (Sub-Clause 2.6). The decision of the engineer pursuant to Clause 67 was final and binding until arbitration had been revised. No intermediate adjudication, such as the DAB, was available.

FIDIC Red Book 1999 edition states that the engineer shall be deemed to act for the employer in exercise of its responsibilities and duties (Sub Clause 3.2).

In accordance with the sub-clause 14.6, the engineer determines fairly the amount of interim certificates that have to be given to the contractor and makes a 'fair determination' which is binding to the parties but not final (Sub-Clause 3.5). Disputes

concerning certificates, valuation and engineer determinations shall be adjudicated by a standing Dispute Adjudication Board (DAB) according to Sub-Clause 20.4.

FIDIC Red Book 2017 edition indicates that the employer shall appoint the engineer that 'shall be deemed to act for the Employer' (Sub-Clause 3.2). The engineer performs tasks which are not subject to the consent of the employer without the employer's constraints. The engineer 'shall not be deemed to act for the employer', but 'neutrally between the Parties' when carrying out his duties under sub-clause 3.7 'Agreement or Determination'. Also, the engineer 'shall make a fair determination' without the employer's consent (Sub-Clause 3.7). Determinations have a time limit of 42 days. In the case of a claim, if the engineer does not give a notice of agreement or a determination within the corresponding time limits, he shall be deemed to have given a determination to reject the claim. In the case of a matter to be agreed or determined, if the engineer does not give a notice of agreement or a determination within the time limits, the matter shall be deemed to be a dispute (Sub-Clause 3.7).

The other obligations of the engineer according to the general conditions of the FIDIC Red Book 2017 edition are listed below:

- The engineer has the duty to issue Interim Payment Certificates and has the authority of withholding those payments that he considers not to be due (Sub-Clause 14.6).
- The engineer shall be authorized to inspect and to give instructions on the areas affected by unforeseeable physical conditions according to the sub-clause 4.12. Then, the engineer is entitled to accept or to determine delays and costs incurred by the unforeseeable adverse physical event.
- The engineer shall have the authority to provide an initial response to a notice of claims from either Party in the contract in 14 days with acceptance or failure of them per Sub-Clause 20.2.2
- He may also accept or reject a detailed claim by any of the parties (Sub-Clause 20.2.4).
- According to sub-clause 20.2.3 the engineer is able to monitor current records and instructed to maintain additional records.

The FIDIC Red Book 2017 Edition increases the importance of the engineer with a solid administrative role in the contract and prescriptive and well-defined procedural steps specifying the time limits.

Clarity and deadlines for 2017 edition are an advantage for both parties as it is not possible to leave issues indefinitely pending for both the engineer and the employer, and the same procedure is in place for claims by both the employer and contractors.

The neutrality of the engineer is viewed favorably by contractors and creates confidence in the engineer who is the first one to avoid or resolve disputes before the DAB is used (Zoppis, 2018).

4.6 Change Orders

Any kind of deviation from an agreed, well-defined scope or work schedule is a variation. Fisk states that a change order is a formal document used to amend the agreed contractual agreement and is included in the project documents (as cited in Keane et al, 2010). In all types of construction projects, variations are common (CII, 1994). Managing a variation means predicting its effects and controlling or at least monitoring its costs and impact on schedules. An efficient analysis of change orders requires a comprehensive understanding of underlying issues of changes (Hester et al, 1991). Hester et al. (1991) states that the causes and effects of variations should be analyzed.

The causes of variations in the literature were examined. Keane et al (2010) indicates that these causes could be grouped based on the contracting parties such as owner-related variations, consultant-related variations, contractor-related variations and other variations.

Owner-related variations may arise based on changes in scope, financial problems of the owner, inadequate project objectives, replacement of materials, constraints to a quick decision - making process, the stubborn nature of the owner and changes in the owner's specifications.

Consultants may demand variations due to design changes by the consultant, design errors or complicated design, conflicts between contract documents, technology changes, value engineering, lack of coordination, insufficient drawing details, lack of required data by the consultant and unclear design details in specifications.

Contractor may request variations due to lack of participation in design, inaccessibility of equipment, financial difficulties for the contractor, intended profitability, different site conditions, poor workmanship, inexperience with local conditions, fast-track construction, lack of communication or strategic planning, complicated design and technology.

Weather conditions, health and safety, changes in economic conditions, socio-cultural factors and unforeseen problems are the causes of variations that are not directly related to construction participants (Keane et al, 2010).

Based on the findings from the literature review, the effects of change orders can be divided into five categories that are time related impacts, cost related impacts, quality related impacts, organizational related impacts and other impacts.

Time related impacts: Variations that are enforced when construction is ongoing or even finished generally lead to delays on project completion. Project changes may affect the progress of the project, which can affect payment of contractors to subcontractors. It is normal because the main contractor cannot pay subcontractors until they are paid by the owners (Keane et al, 2010). Also, Fisk states logistical delays may also take place as new materials and equipment are required (as cited in Keane et al, 2010).

Cost-related impacts: Demolition and reworks happen generally due to variations in construction projects (Clough and Sears, 1994). Payment delays may result in an increase in the cost of the project because of interest rates. Changes leading to increased overhead expenses need to be processed and reviewed before they can be implemented. Additional payments to the contractor could lead to changes in a construction project. Variations are seen as a major source of additional work for the contractor (O'Brien 1998). The demolition and reworks due to variation can lead to increased costs which can affect the contractor's profitability. Additional financial requirements can be made difficult for the owner. In addition, the parties may not decide on the amount of payment due to contractual uncertainty (Keane et al, 2010).

Quality-related impacts: Variations during the project can influence the quality. Regular variations can affect the quality of work negatively. Variations can directly affect the completion time of the project and the quality of the accelerated construction process (Keane et al, 2010).

Organizational impacts: Variations to construction are an important source of dispute about construction (Fisk 1997). Variations can obviously affect professional relations in a construction project, resulting in disputes and additional delays. Claims and disputes can seriously affect the general reputation of an organization. Variations can also affect the safety conditions in projects (O'Brien, 1998). Additional safety methods and precautions may be necessary for changes. Moreover, construction delays, failure to satisfy the quality standards and increased accident rates can damage the reputation of a company, deteriorate professional relationships and cause disputes between professionals (Keane et al, 2010).

There can be other effects of variations and change orders. The progress can be affected without delay by the variations. Unfavorable time impacts of changes can be compensated for by floats on construction activities and accelerated work progress.

Change orders and variations can be prevented or minimized through effective contract anticipation and execution stages, successful project management and sustainability in the relationships of the parties. In the process of contract preparation, the owner should take advantage of sufficient advisory services and manage financial resources. In addition, a qualified and experienced contractor and consultant should be appointed (Keane et al, 2010).

Even FIDIC forms cannot avoid the problem of changes and adjustments. The engineer is authorized to provide variation instructions under FIDIC 1999 Red Book and 1999 Yellow Book. The engineer's responsibilities with respect to variations tend to be restricted in the engineer's contractual agreement with the employer. For instance, in case of price or time variations, a limitation is that the engineer has to first receive the prior consent of the employer before proceeding (Klee, 2015).

The contractor generally does not have to confirm whether prior consent is given to the engineer by the employer. Whenever the engineer provides instructions beyond the extent of his authorization, this consent is considered to have been obtained.

The employer must carefully consider whether and to what extent they want to actually limit the responsibilities of the engineer. If the employer wants to control and supervise the engineer substantially, the employer must have available human resources to take fast and competent choices and assume broad responsibilities. There may be a delay from the employer if the examination and approval methods used are unreasonable and

inflexible. If the instruction is delayed, the contractor may claim extension of time and additional payment in cost, overhead and profit (according to FIDIC 1999 Red Book Sub-Clause 1.9). If the engineer is unable to fulfill his duty due to constraints on the employer's side, an engineer of this kind is a major risk.

Variations are mainly made according to the engineer's instructions. However, there are certain limitations on variations that can fall within only one of the following categories according to the FIDIC Red Book 1999 edition:

- Changes in the quantity of any item of work included in the contract.
- Quality change and other features of any work item.
- Modifications of levels, positions or dimensions of any works.
- Omission of any work if it is not carried out by others.
- Any additional work, installations, equipments or services that are required for the regular work.
- Changes to the sequence or timing of the execution of the works.

In respect of the variation process, an engineer is required to request a contractor to describe the work to be performed and a program for its execution before giving instructions for a variation. Moreover, the engineer can ask for the proposal of the contractor for all necessary program changes and the expected completion time. Also, the engineer may ask the contractor's proposal for evaluation of the variation before giving instructions for a variation.

The procedure explained above is suitable, because it can reduce possible future disputes where the impacts of a variation on cost and time are not agreed before. Without any other steps being taken by the contractor, the engineer shall determine the cost impacts caused by a change order.

According to FIDIC, the contractor can submit a written proposal to the engineer at any time to accelerate the completion, reduce the cost to the employer for the execution, maintenance or operation, increase the efficiency or value of the completed works to the employer. According to the FIDIC Red Book 1999 edition, if the implementation succeeds, the contractor will gain a 50% savings in cost as a bonus (Klee, 2015).

According to the FIDIC Red Book 2017 edition, the two methods for initiating a variation are clearly distinguished from each other in sub-clause 13.3 'Variation

Procedure'. These two methods are variation by instruction and variation by request for proposal.

This edition now enables the contractor to submit details of the works, resources and methods to be adopted; a programme for executing the variation; a proposal to modify the programme and time for completion; a proposal to modify the contract price with supporting particulars; and the amount of any time related costs. In order to meet those requirements, it is likely that a large commercial team will be required (Grose et al, 2017).

4.7 Notices

In the FIDIC Red Book 2017 edition, the provisions of the notice were revised significantly resulting in a more complicated and prescriptive set of duties to the contractor. Notice requirements appear in about 80 places in the Red Book 2017 edition. Clause 1.3 'Notices and Other Communications' states that a notice shall be in writing and described as a notice, but it does not need to refer to the clause under which it is issued. Contractors will have to ensure that sufficient resources are available to meet these requirements.

According to clause 8.4, advance warnings are implemented enabling each party to inform the other about any known or probable events that might negatively affect work performance, increase the contract price or delay the execution of the works. There is no time constraint or a specific penalty for not issuing an advance warning. Contractors should expect employers to deal with this by changing the rights of the contractor to relieve them if they do not issue an advance warning. The provision is combined with the entitlement of the engineer which is requiring the contractor to submit estimates of future events or proposals to reduce their effects. On the other hand, it would be time-consuming and costly to prepare additional estimates and proposals and potentially to integrate them into increased tender prices.

Contractors must ensure that all claims which are referred to the DAAB or have a NOD issued in relation to them, include in the Statement on Completion (except those that occur after the issue of the Taking-Over Certificate), Final Statement or any Partially Agreed Final Statement. Otherwise the employer avoids any responsibility for them according to the clause 14.14 'Cessation of Employer's Liability'. Furthermore, the

contractor has only 56 days to dispute the Final Payment Certificate (FPC) in accordance with Clause 20.2. Otherwise, no further liability is assumed by the employer and the contractor has to accept the amounts. Contractors will have to take special care to ensure that all claims in their statements are reported and the FPC's 56-day time bar is not exceeded.

Additional termination rights are applied for both parties on the 2017 edition. The most important one is that either party has a right to terminate if the other party fails to comply with a binding agreement or final and binding determination of the engineer or a decision of the DAAB and such failure constitutes a material breach (Grose et al, 2017).

4.8 Claim Management

For both parties the construction of a major project involves considerable risks. This is due to the technical nature of the work as well as the duration of the work. These risks include operations by outside forces beyond the control of the parties, significant differences in the ground conditions from those foreseen and amendments in applicable laws. During the work, the project demands are often modified. Eventually, projects are designed, built and managed by people. It is therefore necessary to note that making decisions involve a subjective element and that individuals are fundamentally unpredictable, change their minds and make mistakes (Baker et al, 2009).

Claim is described by the request of one or two parties to a contract for consideration or change on the basis of an explicit or implied provision of the contract. After the claim is issued, the owner and contractor can reach an arrangement on the claim, thereby creating a change order or revision. On the other hand, they can disagree and construction contracts dispute can arise (Diekmann and Nelson, 1985).

A key role of the any construction agreement is to assign or allocate the risks to either or both parties. The rights and liabilities of the parties are expressly defined in the contract as well as in the laws applicable. There is not any exception in the FIDIC forms. They try to assign risk and provide for an orderly mechanism in which claims between the parties is accepted and established. As noted in the FIDIC Guide:

Claims should not be regarded as either inevitable or unpalatable, and complying with claims procedures should not be regarded as being an aggressive act. Major projects give rise to major risks, which have to be dealt with if they occur. Whilst the Parties might prefer everything to remain unchanged, they should not instinctively seek to attribute blame if circumstances arise or events occur which give rise to an adjustment of the Contract Price. In these events, the claims procedures are specified so as to provide the degree of formality considered necessary for the proper administration of a building or engineering project. Complying with these procedures and maintaining a co-operative approach to the determination of all adjustments should enhance the likelihood of achieving a successful project. (as cited in Baker et al, 2009).

There are generally three types of claims. These claims are for extension of time (EOT), additional payment or both extension of time and additional payment. The cause of the claim should be identified while this claim is analyzed. The followings are the typical reasons for contractor claims during major construction projects for additional payments or extension of time for completion:

- Employer delays in the provision of the design, approval of the necessary document, instructions, delivery of the site, or obtaining the required permission.
- Errors in tender documents including defective configuration, design mistakes, site data errors.
- Preventions of the employer during tests and taking over of work.
- Unpredictable conditions such as unforeseen physical conditions on the site.
- Consequences of employer risks.
- Shared risk, for example, extremely adverse weather conditions and third party (authorities) delays.
- Other delays such as archaeological findings, instructed suspension by the employer, project termination impacts (Klee, 2015).

The claims of the contractor under the FIDIC type of contracts

Sub-clause 20.1 of the FIDIC forms sets out the general definition of claim procedure. There are procedures for claims for extensions of time for completion and/or additional payment. Contractor claims can generally be divided into two categories:

- Those specified in the contract (foreseeable events with the relevant contractual clauses)
- Others related to the contract.

According to FIDIC Red Book 1999 edition, sub clauses 8.4 and 8.5 specifically indicate claims for extensions of time for completion. Under sub clause 20.1, the contractor shall be allowed to an extension of the completion time for the purposes of sub-clause 10.1 (Taking Over of the Works and Sections) if completion is delayed by any of the following affects. One of these affects is a variation or other significant modifications of the quantity of the work item included in the contract. The other affects are exceptionally destructive climates, unpredictable shortages of staff or goods due to epidemic or government action. Delays caused by the employer, employer's staff or employer's other contractors are also causes of the time extension for the contractor.

If the contractor considers that it is entitled to extend the completion time, the contractor shall inform the engineer in accordance with sub-clause 20.1. When determining each time extension, the engineer shall review the preliminary determinations and may increase, but not decrease, the total time extension.

The claims of the employer under the FIDIC type of contracts

According to FIDIC Red Book 1999 edition, sub clause 2.5 of the FIDIC forms sets out the general definition of claim procedure for the employer. The claim is anticipated as payment and/or extension of the notification period of defects. The employer's claims can be divided into two categories as contractor's claims. These are claims that specified in the contract and other related to contracts (Klee, 2015).

In FIDIC 2017 edition, the claims and disputes provisions have been reorganized and extended to two clauses, clauses 20 and 21. It is intended both procedurally and psychologically to separate these issues.

Under 1999 edition, the claims of the contractor were governed by clause 20.1 and the claims of the employer by clause 2.5. The provisions in these clauses are unbalanced, with the contractor claims being subject to more detailed and supposedly stricter arrangements. Under the second edition, there is now one clause which applies to claims (Clause 20) and the provisions are mutually beneficial for both parties: For claims of both the contractor and the employer, the same procedure applies equally. Several other important changes exist:

- There are now two possible time-barring provisions for time and money claims: The first requires a claim to be notified within 28 days of becoming

aware of a claim or circumstance, the second requires a party to submit an entirely detailed claim within 84 days.

- The period for submitting a fully detailed claim was extended to 84 days from 42 days (of becoming aware of the event or circumstance that gave rise to the claim).
- Despite time constraint, the engineer shall agree or determine the validity of any notice of claim pursuant to clause 3.7. The claimant party may, as part of this process, argue that a late notice or a fully detailed claim is justified. Detailed provisions on the timetable and procedure for agreement or determination of claims have also been introduced.
- In addition to claims for time and money, a third category of claims was introduced, which should be referred for agreement or determination directly to the engineer under clause 3.7 (Second Editions of the FIDIC Rainbow Suite, 2018).

4.9 Disputes and Arbitration

A 'dispute' is now defined per clause 1.1.29. The definition is far from simplicity, and inevitably leads to a conflict as to what constitutes a 'dispute'. Disputes are now in their own clause, 'Clause 21: Disputes and Arbitration' in 2017 edition. New 'Dispute Avoidance/Adjudication Board' (DAAB) provisions for the promotion of good contract management were made. Major features of the DAAB are listed below:

- The DAAB is assigned as a standing board with a function to avoid disputes. In accordance with new 'Avoidance of Dispute' provisions, the DAAB may now provide informal assistance if the parties collectively request it. The parties are not obliged to act on the advice of the DAAB and, during this informal process, the DAAB is not bound by any future dispute. This process is not applicable when the engineer makes a determination.
- The reference to the DAAB after the issue of a NOD relating to an engineer's determination shall be subject to a 42-day time bar.
- Time limit to the issue of a NOD regarding a DAAB determination is 28 days. Otherwise the decision of the DAAB shall become final and binding.

However, there is no time to refer disputes to arbitration after such a NOD has been issued.

- A party may refer a non-compliance with any DAAB decision to arbitration directly. The power of enforcement of that decision is granted to the arbitral tribunal.

FIDIC Red Book 2017 edition clause 21.5 'Amicable Settlement' mirrors clause 20.5 of the Red Book 1999 edition but the time period for amicable settlement has been decreased from 56 days to 28 days.

According to the clause 21.6 'Arbitration', ICC arbitration is preserved. Any dispute concerning which the decision of the DAAB has not become final and binding shall be finally resolved through international arbitration, unless amicably settled and subject to sub-clause 3.7.5 'Dissatisfaction with Engineer's Determination', sub-clause 21.4.4 'Dissatisfaction with DAAB's Decision', sub-clause 21.7 'Failure to Comply with DAAB's Decision' and sub-clause 21.8 'No DAAB In Place'.

In an aim by FIDIC to encourage parties to use the DAAB procedure, arbitrators can now consider the extent to which a party has failed to cooperate with the other party in the establishment of a DAAB. Unless the decision is final and binding, the arbitrators have the power to open up an engineer's determination or DAAB decision relevant to a dispute. Any award that requires payment from one party to the other shall be paid immediately without additional certification or notice (Grose et al, 2017).

Figure 4.1 and 4.2 summarizes the claim and dispute resolution procedures in two editions of the FIDIC Red Book. According to these two figures, comparison of claim and dispute resolution procedures of 1999 and 2017 editions can be done easily. The period for submitting a fully detailed claim has been extended from 42 days to 84 days. In addition, the engineer has a time constraint for notice of determination according to the 2017 edition. Under sub-clause 3.7.5 in 2017 edition, the party which is dissatisfied with the determination of the engineer shall give a notice of dissatisfaction to the other party within the 28 days after receiving the engineer's notice of determination. If the party shall not refer to the DAAB within 42 days after the NOD, such NOD shall no longer be valid under sub-clause 21.4.1. The decision of DAAB shall be given within 84 days after receiving the reference. If one party has a dissatisfaction with DAAB's decision, there is a 28-day time period for giving a NOD to the other party under sub-

clause 21.4.4. After that both parties must attempt to settle the dispute amicably before the arbitration. However, if there is not any agreement between the parties, arbitration procedure may be commenced on or after the 28 days from NOD. This time period is decreased from 56 days to 28 days in 2017 edition.

At the end of this part of the thesis, the general evaluations in this part are summarized in Table 4.2. The summary of the comments for each general heading in this section are given in the table.

Table 4.2 : Changes in the FIDIC Red Book 2017 edition under general headings.

General Headings	Comments
Contract Management	The huge majority of the changes in the FIDIC Red Book 2017 edition are related to the contract management. It is important to provide certainty about the parties' obligations and to make clear the consequences of non-compliance. The result is long clauses with detailed, time-limited procedures for the parties.
Employer's Obligations	According to sub-clause 2.4 'Employer's Financial Arrangements', the employer sets out his arrangements in the contract data under 2017 edition. The contractor can only request evidence of ability to pay if arrangements change, there is no payment or there are variations in excess of 30% or a single variation over 10%.
Contractor's Obligations	The 2017 edition of the FIDIC Red Book clarifies the key duties of the contractor under sub-clause 4.1 'Contractor's General Obligations'. Risk allocation between the employer and the contractor is not changed dramatically under this edition.
Engineer's Obligations	The FIDIC Red Book 2017 edition enhances the engineer's importance with a strong administrative position in the contract as well as prescriptive and well-defined procedural steps that specify the time constraints.
Change Orders	According to the 2017 edition of the FIDIC Red Book, there is an obvious distinction between the two techniques for starting a variation under sub-clause 13.3 'Variation Procedure'. 'Variation by instruction' and 'Variation by request for proposal' are these two methods.
Notices	The notice provisions are revised leading in a more complex and prescriptive set of responsibilities towards the contractor.

Table 4.2 (continued) : Changes in the FIDIC Red Book 2017 edition under general headings.

General Headings	Comments
Claim Management	There is one clause which applies to claims under the 2017 edition (Clause 20). In the 1999 edition, employer’s and contractor’s claims are in different clauses (Sub-clause 2.5 and 20.1). The requirements in these sub-clauses are unbalanced in the 1999 edition. The provisions are mutually beneficial for both parties in the 2017 edition. For claims of the employer and the contractor, the same procedure applies equally.
Disputes and Arbitration	Disputes are in their own clause (Clause 21) in the 2017 edition. New ‘Dispute Avoidance/Adjudication Board’ is assigned as a standing board with a function to avoid disputes. The DAAB may ensure informal assistance if the parties collectively request it.

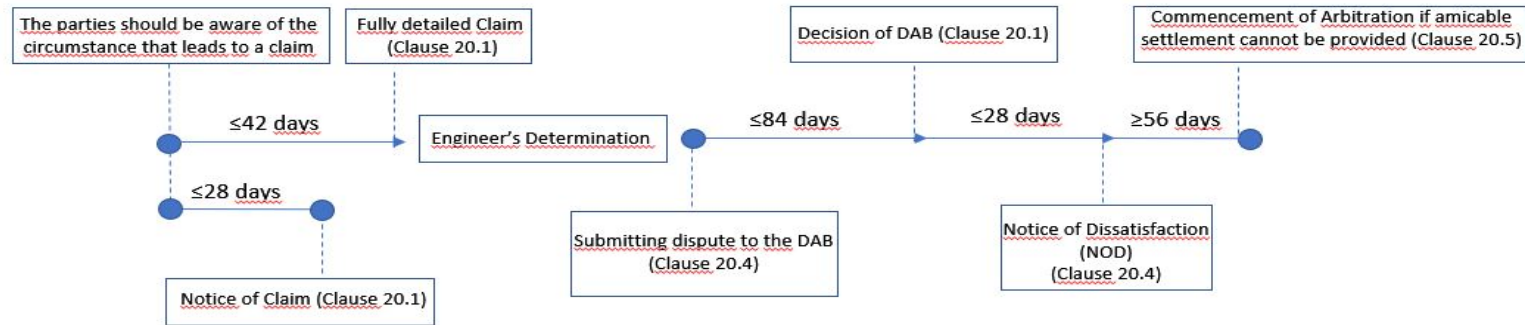


Figure 4.1 : Claim and dispute resolution procedures in FIDIC Red Book 1999 edition.

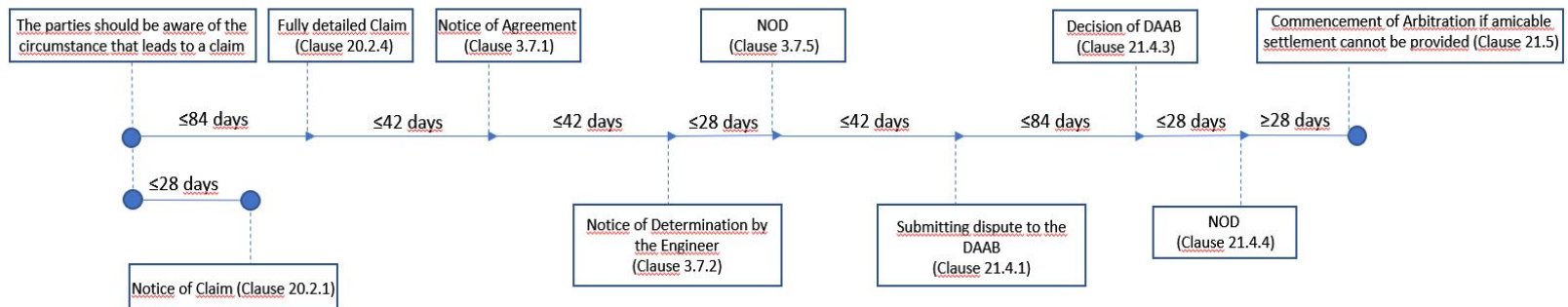


Figure 4.2 : Claim and dispute resolution procedures in FIDIC Red Book 2017 edition.

5. CONCLUSION

The projects which reach the target in terms of quality, time and cost in the construction sector are considered successful. Furthermore, a successful project is a project in which claims are resolved. Disputes that increase the duration and cost of work and which prevent the project completion on time increase over time and cause the project to fail. In the completion of the projects at the intended time, quality and cost, the role of contractual requirements is important. If the construction contracts are prepared by taking care of all the parties involved in the construction projects and all stages of the construction process, the executed project will reach the determined target.

It is important to identify potential problems, variations and risks in construction contracts in order to manage them successfully. Consequently, the contract structure is very important for the projects, particularly in international projects. Many professional unions, organizations and federations are developed their own standard contract forms at international level.

The FIDIC contract suite has a unique position in the global engineering and construction sector. FIDIC has added a new version of the standard type contract forms which are taken out in a long time for the construction projects to reach the target as desired. FIDIC 1999 edition contract forms are updated and the second edition of the Rainbow Suite is released at the end of 2017. With the update, FIDIC aims to ensure that projects reach a more successful contract structure. The most widely used book among these updated books is the Conditions of Contract for Construction (Red Book).

Studies are being carried out to better understand the changes in the clauses. However, in the literature and sector, there is a limited flow of information on the new edition. It is realized that there is not enough academic study about the 2017 edition when the literature review is done. The aim of the thesis is to understand the amendments in the new edition of the FIDIC Red Book. The other aim is to adopt the new edition of FIDIC Red Book to the sector in a much shorter time, to realize the projects with this contract structure and thus to develop more successful projects. For these purposes,

literature review is performed and general conditions of FIDIC Red Book 1999 edition and 2017 edition are examined. In the introduction of the thesis, the problem is defined, the purpose, scope and method of the study are stated. In the second part of the thesis, construction contracts are mentioned with the review of the literature. The basic information about construction contracts, the place of construction contracts in Turkish law and the Turkish Code of Obligations, international construction contracts are discussed. Afterwards, detailed information is given about FIDIC, NEC, AIA and JCT contracts from internationally accepted types of construction contracts. Third part of the thesis explains the suite of contracts published by FIDIC, including the eight books. It then considers the 2017 edition of FIDIC contracts. At the fourth part of the thesis, general conditions of FIDIC Red Book 1999 edition and FIDIC Red Book 2017 edition are reviewed and the general conditions of these two books are compared by examining each sub-clause. Subsequently, these clauses are grouped and compared under general headings of contract management, employer's obligations, contractor's obligations, the engineer's obligations, variation order and claim management. While comparing the general conditions of the contracts, the clauses and sub-clauses which mentioned the same issues in the 1999 edition and 2017 edition are written together. The explanation about the amendments between these two editions are provided next to the related clauses in the table.

Twenty years have passed since the first Rainbow Suite editions were first published. A large number of people have done a great deal of work for the second editions over a long time and the sector will take time to analyze the results. In fact, it took years in some jurisdictions for parties to move from the old FIDIC contracts to the first editions of Rainbow Suite. Therefore, it is normal for this second edition to take some time to be adopted by the sector. Although some amendments reflect only developments in the construction sector since 1999 and current best practices, others are more original. Under the FIDIC Red Book 2017 edition, the philosophy behind risk allocation is not changed dramatically. However, the amendments made to contract management in order to provide clearer and more certainties could be very radical in the case of standard contracts.

The FIDIC Red Book 2017 edition will undeniably increase all parties' administrative burdens. Contractors, employers, and the engineers who use the 2017 edition will have to make sure they are well aware of the contract and have enough resources to cope

with the most prescriptive mechanism. These resources are essential both to ensure the proper identification and forwarding of the necessary notices and other communications in time and to ensure that the parties are able to take decisions on time. Failure to do so is clearly laid down in the contract and could have serious consequences. The focus is increasingly on the avoidance of disputes and on the settlement of claims rather than on the reference to the decisions of the dispute boards. However, the parties can tend to be less vulnerable by leaving to the DAB to make their decisions for even those who can take initiatives. The time will show how the parties are prepared to take advantage of the dispute avoidance function defined in the 2017 edition.

The great majority of changes relate to contract management in the FIDIC Red Book 2017 edition. In this regard, FIDIC objective is to clarify the expectations and consequences of non-compliance and to ensure that the parties are aware of their expectations. All communications including notices shall be defined clearly as a specific communication type. In addition, the number of cases where a party has to give a notice significantly increases.

The FIDIC Red Book 2017 edition involves more clarity about the engineer's role and staff. In the FIDIC contracts, the Engineer is a key element. The changes to the provisions concerning the engineer's determinations are probably the best example of FIDIC's approach for contract management in the 2017 edition. The engineer's determination in the 1999 edition sub-clause 3.5 contains two paragraphs, and now in the 2017 edition it is in sub-clause 3.7 and expands to more than three pages. The engineer now has an obvious obligation to be neutral on all subjects or claims. There are a couple of clear steps in the decision-making process. There are detailed requirements for each step in the process. There are also time constraints for each step and if they are not followed, there will be implications. In this edition, a party is required to issue a Notice of Dissatisfaction (NOD) within the time frame required if the determination is dissatisfied. The decision would otherwise be final and binding.

The 1999 edition of Red Book allows the contractor to recover cost plus profit from various relief events. Under the 2017 edition of Red Book, the amount of recoverable profit is now set at 5 percent in default situations. The contractor is now also entitled to recover lost profit in the event of omission of work or termination of the contract for convenience.

FIDIC Red Book 2017 simplifies the main obligation of the contractor under sub-clause 4.1 'General Contractor Obligations'. In accordance with the contract, the contractor must carry out the works. When the contract stipulates that the contractor must execute the design, it has extended its obligations to include that the design and documents of the contractor meet the technical standards set out in the specification and law or otherwise comply with the documents forming the contract.

According to the FIDIC Red Book 2017 edition sub-clause 13.3 'Variation Procedure', the two methods for initiating a variation are obviously separated from each other. These two methods are variation by instruction and variation by request for proposal.

This edition now requires the contractor to submit details of the works, resources and methods to be implemented; a program to perform the variation; a proposal to change the program and time for completion; a proposal to change the contract price with supporting details; and the amount of any time-related costs. A large commercial team is probably required to fulfill these requirements.

For both parties in the 2017 edition, additional termination rights will be applied. Both parties have the right to terminate if a binding agreement or the final binding determination by the engineer or a decision of the DAAB has not been complied with by the other party.

Time will tell how the international construction industry will receive the more sophisticated and prescriptive regime in the 2017 edition. Meanwhile, the updates should not be ignored by even the users of the 1999 edition. The changes made in the 2017 edition give a good insight into the problems of the 1999 edition.

REFERENCES

- Aksay, S.** (2008). *Construction Contracts And Contractor Selection Criterias* (Master's Thesis). Istanbul Technical University, Istanbul.
- Alpkokin P. and Akti S.** (2018). Claims and Adjudication under 2017 Edition FIDIC Contracts. *5th International Project and Construction Management Conference (IPCMC 2018)*, North Cyprus: Cyprus International University, Faculty of Engineering, Civil Engineering Department, November 16-18.
- Ashworth, A.** (2006). *Contractual Procedures in the Construction Industry*. Fifth Edition, Pearson Education, Ltd., Harlow
- Ataseven, B.** (2017). Dispute Resolution Within the Frame of FIDIC Rules. *Goksu Safi İsik Attorney Partnership*. Retrieved December 9, 2018, from http://www.goksusafiisik.av.tr/Articletter/2017_Winter/GSI_Articletter_2017_Winter_Article4.pdf
- Aydin, D.** (2015). *Review of Extension of Time and Additional Payment in the Public Procurement Authority (KIK) and FIDIC Turnkey Contracts* (Master's Thesis). Istanbul Technical University, Istanbul.
- Baker, E., Mellors B., Chalmers S. & Lavers, A.** (2009). *FIDIC Contracts: Law and Practice*. Fifth edition, Informa Law from Routledge, Oxon.
- Battrick, P. & Duggan P.** (2013). The Rainbow Suite The 1999 FIDIC Suite. *FIDIC*. Retrieved January 5, 2019, from <http://fidic.org/sites/default/files/FIDIC-rainbow-suite-2012.pdf>
- Bergami, R.** (2012). Incoterms 2010: The Newest Revision of Delivery Terms. *Acta Universitatis Bohemiae Meridionalis*, 15 (2), 33-40.
- Boswell P.G.** (2008). Changes to the FIDIC Construction Contract General Conditions, 1st Edition, 1999. *FIDIC*. Retrieved January 10, 2019, from http://fidic.org/sites/default/files/cons_mdb_changes_8apr08.pdf
- Bunni, N.** (2005). *The FIDIC Forms of Contract*. Third Edition, Blackwell Publishing Ltd, Oxford.
- CCDC-2.** (2008). *Canadian construction document committee – Stipulated price contract*.
- Charrett, D.** (2013). The Use of the UNIDROIT Principles in International Construction Contracts. *Loots&Charrett*. Retrieved December 25, 2018, from <http://lootsandcharrett.com>
- CIDM, Construction Industry Development Board,** (2010). *Inform Practice Note #21 Bills of Quantities (BoQ)*. Retrieved from <http://www.cidb.org.za/publications/Documents/Practice%20Note%2021.pdf>

- Clough, R. H. & Sears, G.A.** (1994). *Construction Contracting*. Sixth Edition, Wiley, New York.
- Construction Industry Institute (CII).** (1994). *Pre-project planning: Beginning a project the right way*. CII, University of Texas at Austin, Austin, Tex.
- Cuhadar, O.** (2010). *The Fundamental Obligations Of The Employer In Fidic Conditions Of Contracts For Construction* (Master's Thesis). Bahcesehir University, Istanbul.
- Dasdelen, A.** (2006). *The Construction Law In The Education Of Construction Management* (Master's Thesis). Istanbul Technical University, Istanbul.
- Diekmann, J. E. & Nelson, M. C.** (1985). Construction Claims: Frequency and Severity. DOI: 10.1061/(ASCE)0733-9364(1985)111:1(74)
- El-adaway, I., Fawzy, S., Allard, T. & Runnels, A.** (2016). Change Order Provisions under National and International Standard Forms of Contract. DOI: 10.1061/(ASCE)LA.1943-4170.0000187.
- Fahey S.** (n.d.). FIDIC Rainbow Suite ed.2017. *FIDIC*. Retrieved January 28, 2019, from http://fidic.org/sites/default/files/press%20release_rainbow%20suite_2018_03.pdf
- Gilbreath, R. D.** (1992). *Managing Construction Contracts Operational Controls For Commercial Risk*. John Wiley & Sons, Ltd, New York.
- Grose M., Heywood M., Cowling B., Hall A.** (2017). FIDIC Red Book 2017 A MENA Perspective. Retrieved February 1, 2019, from <https://www.clydeco.com/insight/article/fidic-red-book-2017-a-mena-perspective>
- Gurcanli, G.E.** (2013). Contract Administration Lecture Notes, Istanbul Technical University Faculty of Civil Engineering Construction Management Department
- Heaphy, I.** (2010). *The NEC 3rd Edition Engineering And Construction Contract Introduction And Critical Appraisal* [PowerPoint slides]. Retrieved from <https://www.hkis.org.hk/hkis/general/events/NEC-Overview.pdf>
- Hester W., Kuprenas, J. A. & Chang, T. C.** (1991). *Construction changes and change orders: Their magnitude and impact*, University of California, Berkeley.
- Hillig, J.B., Dan-Asabe, D., Donyavi, S., Dursun, O. & Thampuratty, A.** (2010). Fidic's Red Book 1999 Edition: A study review. DOI: 10.1680/mpal.2010.163.3.129
- Hinze, J.** (1993). *Construction Contracts*. McGraw-Hill Inc., USA
- Kane, K.** (2000). Global Partnerships: The Continuing Education System of the American Institute of Architects. *Higher Education in Europe*, Vol. XXV (3).
- Keane, P., Sertyesilisik, B. & Ross A. D** (2010). Variations and Change Orders on Construction Projects. DOI: 10.1061/(ASCE)LA.1943-4170.0000016.

- Klee, L.** (2015). *International Construction Contract Law*. First Edition, John Wiley&Sons, Ltd.
- Korkmaz, A.** (2004). *Construction Contracts and Contractor Selection Criterias*, (Master's Thesis). Istanbul Technical University, Istanbul.
- Maddock T. & Vandenberghe M.** (2016). A Review of the FIDIC Blue Book (Second Edition). *FIDIC*. Retrieved January 10, 2019, from <http://fidic.org/sites/default/files/Blog/%20pdf/article-a-review-of-the-fidic-blue-book-second-edition-145-2.pdf>
- Murdoch, J. & Hughes W.** (2008). *Construction Contracts Law and Management*. Fourth Edition, Taylor&Francis, New York.
- Ndekugri, I., Smith, N. & Hughes W.** (2007). The Engineer Under FIDIC's Conditions of Contract for Construction. *Construction Management and Economics*, 25, (791-799).
- New FIDIC Yellow Book (Second Edition).** (2017). *Herbert Smith Freehills*. Access date: 05 January 2019, <https://www.herbertsmithfreehills.com/latest-thinking/new-fidic-yellow-book-second-edition>
- O'Brien, J. J.** (1998). *Construction Change Orders*. McGraw-Hill, New York.
- PMI, Project Management Institute,** (2004). *A Guide to the Project Management Body of Knowledge (PMBOK Guide)*. Third Edition, Project Management Institute, Inc., PA
- Popa, I., Belu, M. G. & Paraschiv, D. M.** (2013). Global Logistics, Competitiveness And The New Incoterms. *Annals of the University of Oradea, Economic Science Series*, 22 (2), 159-166.
- Roberts M.** (n.d.). Review of The New FIDIC Suite Of Agreements (ed.2017). *FIDIC*. Retrieved January 10, 2019, from <http://fidic.org/content/review-new-fidic-suite-agreements-ed2017>
- Second Editions of the FIDIC Rainbow Suite** (2018). *Holman Fenwick Willan*. Access date: 28 January 2019, <http://www.hfw.com/Second-Editions-of-the-FIDIC-Rainbow-Suite>
- Sozen, Z.** (2015). *Administration of Construction Contracts*. Legal Publishing, İstanbul.
- Statutes And By-Laws International Federation of Consulting Engineers*. FIDIC, 2015, <http://fidic.org/Statutes>
- Surahyo, A.** (2017). *Understanding Construction Contract*. Springer International Publishing AG., Cham, Switzerland. (E-book)
- Tasoluk, T.** (2006). *The Construction Contract Administration And Evaluation Of The Construction Contract Administration In The Turkish Public Work Regulations* (Master's Thesis). Istanbul Technical University, Istanbul.
- Uyanik, N.** (2004). *Contract Administration In Construction Projects*. Beta Publishing, Istanbul
- Yurt, A.** (2005). *Contract Administration* (Master's Thesis). Istanbul Technical University, Istanbul.

Zevkliler, A. (1995). *Code of Obligations Private Debt Relations*. Fifth Edition, Fakulteler Publishing, Izmir

Zoppis, E. (2018). *FIDIC-ACEG European Regional Infrastructure Conference* [PowerPoint slides]. Retrieved from <http://www.aceg.ge/fidic-regional-conference-presentations>

Url-1 < <http://fidic.org> >, access date 05.03.2018.

Url-2 < <http://www.tmmmb.org.tr> >, access date 05.03.2018.

Url-3 < <http://www.ebrd.com> >, access date 05.11.2018

Url-4 < <http://www.ice.org.uk> >, access date 26.12.2018

Url-5 < <http://www.neccontract.com> >, access date 29.12.2018

Url-6 < <http://www.aia.org> >, access date 30.12.2018

Url-7 < <http://corporate.jctld.co.uk> >, access date 05.01.2019



APPENDICES

APPENDIX A: Comparison of FIDIC Red Book 1999 edition and FIDIC Red Book 2017 edition



APPENDIX A

Table A.1 : Comparison of FIDIC Red Book 1999 edition and FIDIC Red Book 2017 edition.

FIDIC Red Book 1999 Edition		FIDIC Red Book 2017 Edition		Comparison Between 1999 and 2017 Editions
1	GENERAL PROVISIONS	1	GENERAL PROVISIONS	<p>In the 1999 edition, definitions are divided into groups. Definitions are defined under the headings like 'The Contract', 'Parties and Persons', 'Dates, Tests, Periods and Completion', 'Money and Payments', 'Works and Goods' and 'Other Definitions'.</p> <p>In 2017 edition, the definitions are sorted alphabetically and new definitions are added. The new definitions are 'Advance Payment Certificate', 'Advance Payment Guarantee', 'Claim', 'Compliance Verification System', 'Conditions of Contract', 'Contract Data', 'Cost Plus Profit', 'DAAB or Dispute Avoidance/Adjudication Board', 'DAAB Agreement', 'Date of Completion', 'Delay Damages', 'Dispute', 'Employer-Supplied Materials', 'Engineer's Representative', 'Exceptional Event', 'Extension of Time', 'General Conditions', 'Joint Venture', 'JV Undertaking', 'Key Personnel', 'month', 'No-objection', 'Notice', 'Notice of Dissatisfaction', 'part', 'particular conditions', 'Programme', 'QM System', 'Review', 'Special Provisions'.</p>
1.1	Definitions	1.1	Definitions	
1.2	Interpretation	1.2	Interpretation	<p>Sub-paragraphs (e), (f), (g), (h), (i), (j) are added to the sub-clause. According to additions to this sub clause, the wording 'may' means optional, 'shall' means mandatory. 'Consent' means that the parties agree or give permission for the requested matter. 'Execution of the works' means the construction and completion of the works and the correction of defects.</p>
1.3	Communications	1.3	Notices and Other Communications	<p>Notice subject is added to this sub-clause. Approximately eighty locations in the 2017 edition include notice requirements. The term "notice" is now described and differentiated from other communication methods. In addition, all notices and communications must not be unreasonably withheld or delayed.</p>
1.4	Law and Language	1.4	Law and Language	<p>There are no changes in this sub-clause.</p>

Table A.1 (continued): Comparison of FIDIC Red Book 1999 edition and FIDIC Red Book 2017 edition.

FIDIC Red Book 1999 Edition		FIDIC Red Book 2017 Edition		Comparison Between 1999 and 2017 Editions
1.5	Priority of Documents	1.5	Priority of Documents	Although there is no change in the ranking, particular conditions are divided into two 'Part A-Contract Data' and 'Part B-Special Provisions'. They are listed one under the other in the 2017 edition. JV Undertaking has been added to the end of the ranking (if the contractor is JV). In 1999 edition, it is stated that the contractor should give the necessary instructions if he finds the contradiction in the documents and in 2017 edition the contractor should give notice to the engineer if he determines this situation.
1.6	Contract Agreement	1.6	Contract Agreement	In 1999 edition, within 28 days of receiving the Letter of Acceptance, the contract parties shall enter into a contract agreement unless otherwise agreed. In 2017 edition, within 35 days of receiving the letter of acceptance by contractor, the parties shall enter into a contract agreement, unless they otherwise agree. If the contractor is JV, the authorized representative of each member which participates the JV shall sign the contract.
1.7	Assignment	1.7	Assignment	There are no changes in this sub-clause.
1.8	Care and Supply of Documents	1.8	Care and Supply of Documents	In 1999 edition, unless stated otherwise in the contract, six copies of each contracting document shall be supplied to the engineer by the contractor. A copy of the contract, the publications mentioned in the specifications, the contractor's document, the drawings, changes and other communications provided under the contract are kept on the site. Employer's Personnel shall be entitled at all reasonable times to access all those documents. In the 2017 edition, the contractor shall supply the engineer with one original paper, one electronic copy and additional paper copies as indicated in the contract data of each contractor's document. The contractor shall keep a copy of the contract, records under sub-clause 6.10 (Contractor's Records) and sub-clause 20.2.3 (Contemporary Records), publications in the specification, contractor's documents, drawings, variations, notices and other communications given on the site at all times under the contract.

Table A.1 (continued): Comparison of FIDIC Red Book 1999 edition and FIDIC Red Book 2017 edition.

FIDIC Red Book 1999 Edition		FIDIC Red Book 2017 Edition		Comparison Between 1999 and 2017 Editions
1.9	Delayed Drawings or Instructions	1.9	Delayed Drawings or Instructions	There are no changes in this sub-clause.
1.10	Employer's Use of Contractor's Documents	1.10	Employer's Use of Contractor's Documents	<p>In 1999 edition, the documents of the contractors and other design documents produced by (or on behalf of) the contractor shall not be used, copied or notified to the third party by (or on behalf of) the employer without consent of the contractor and for purposes other than those permitted in this sub clause.</p> <p>In 2017 edition, the employer is entitled to copy, utilize and communicate contractor documents in the event of the contract termination in accordance with sub - clause 15.2 (Termination for Contractor's Default). In addition, the employer is entitled to copy, use and communicate the contractor's documents for which payment is received by the contractor according to sub-clause 15.5 (Termination for Employer's convenience), sub-clause 16.2 (Termination by Contractor) or sub-clause 18.5 (Optional Termination).</p>
1.11	Contractor's Use of Employer's Documents	1.11	Contractor's Use of Employer's Documents	There are no changes in this sub-clause.
1.12	Confidential Details	1.12	Confidentiality	<p>In 2017 edition, additional information is added to the sub clause. Without the prior consent of the employer, the contractor shall not publish any contract details. No data shall be disclosed by the employer to a third party, except in the exercise of employer's rights as required in sub-clause 15.2 (Termination for Contractor's Default).</p>

Table A.1 (continued): Comparison of FIDIC Red Book 1999 edition and FIDIC Red Book 2017 edition.

FIDIC Red Book 1999 Edition		FIDIC Red Book 2017 Edition		Comparison Between 1999 and 2017 Editions
1.13	Compliance with Laws	1.13	Compliance with Laws	In 2017 edition, additional information is added to the sub clause. In order to enable the employer to obtain any authorization, permit and/or approval, the contractor shall provide support and all documentation within the times indicated in the specification. All approval, licences and/or permission obtained by an employer shall be complied with by the contractor. In the event of the contractor being delayed and/or incurred in cost because of the delayed or inadequate access by the employer, the contractor shall have the right to EOT and/or the payment of such costs plus profit. When the employer incurs additional costs in connection with the failure of the contractor, the employer shall have the right to take the costs by the contractor.
1.14	Joint and Several Liability	1.14	Joint and Several Liability	There are no changes in this sub-clause.
		1.15	Limitation of Liability	Additional subclause is added to the 2017 edition. With this subclause, none of the parties shall be liable to the other party for any loss of use of any works, loss of profit, loss of any contract or any indirect or consequential loss or damage that the other party may suffer. In all cases of fraud, gross negligence, deliberate default or misconduct by a defaulting party, this subclause shall not limit the liability.
		1.16	Contract Termination	Additional subclause is added to the 2017 version. Subject to any mandatory requirements under the law of the contract, no action by any party shall require the termination of any contract other than as stated in the subclause.
2	THE EMPLOYER	2	THE EMPLOYER	
2.1	Right of Access to the Site	2.1	Right of Access to the Site	There are no changes in this sub-clause.

Table A.1 (continued): Comparison of FIDIC Red Book 1999 edition and FIDIC Red Book 2017 edition.

FIDIC Red Book 1999 Edition		FIDIC Red Book 2017 Edition		Comparison Between 1999 and 2017 Editions
2.2	Permits, Licences or Approvals	2.2	Assistance	Although the title changes, the content remains the same in the 2017 edition.
2.3	Employer's Personnel	2.3	Employer's Personnel and Other Contractors	In 2017 edition additional information is added to the sub clause. It may be the contractor's responsibility to request that the employer remove any person who is found to have practiced corrupt, fraudulent, collusive or coercing, on the basis of reasonable evidence.
2.4	Employer's Financial Arrangements	2.4	Employer's Financial Arrangements	In 2017 version additional information is added to the sub clause. If the contractor receives an order to execute a price variance of more than 10 percent, or if the total of the changes is greater than thirty percent of that agreed upon, or if the contractor receives not payment pursuant to sub-clause 14.7 (Payment), or the contractor becomes aware of any significant change in the financial arrangements of the employer, the contractor having not received notice pursuant to this sub clause, the contractor may apply and the employer shall provide reasonable evidence within 28 days following receipt of the application that financial provisions were made and maintained, which will enable the employer to reimburse the remainder of the contract price payable at that time. Although this section is also in the 1999 edition, the conditions have been clarified in 2017 edition.
2.5	Employer's Claims	2.5	Site Data and Items of Reference	FIDIC Red Book 2017 edition sub-clause 2.5 states that, the employer shall have provided the contractor before the base date with all relevant information on site topography, hydrological, climatic and environmental conditions at the site. Also, all such data which enter into the employer's own possession after the base date shall be promptly made available to the contractor. The original survey control points, lines and reference levels shall be clarified on the drawings and/or in the specification or issued by an engineer notice to the contractor.

Table A.1 (continued): Comparison of FIDIC Red Book 1999 edition and FIDIC Red Book 2017 edition.

FIDIC Red Book 1999 Edition		FIDIC Red Book 2017 Edition		Comparison Between 1999 and 2017 Editions
		2.6	Employer-Supplied Materials and Employer's Equipment	FIDIC Red Book 2017 edition sub-clause 2.6 states that, if the materials and/or equipment provided by the employer are specified in the specification for use by the contractor in performing works, the employer shall make such material and/or equipment available for the contractor in accordance with the details, times, arrangements, rates and prices specified in the specification. While any of the contractor staff operates, drives, uses, or controls the equipment of the employer, the contractor shall be responsible for each item of equipment of the employer.
3	THE ENGINEER	3	THE ENGINEER	FIDIC Red Book 2017 edition sub-clause 3.1 is a new sub clause. This sub clause indicates that the engineer who fulfills the tasks assigned the engineer in the contract must be appointed by the employer. In order to act as an engineer under the contract the engineer shall have the full authority. Where the engineer is a legal entity, a natural person employed by the engineer shall be appointed and empowered, under the contract, to act on behalf of the engineer. The engineer shall have appropriate qualifications, experience and competence as an engineer under the contract, and fluently follow the ruling language defined in sub-clause 1.4 (Law and Language). If the engineer is a legal entity, the engineer shall give a notice of acting on behalf of the parties designated and authorized by the natural person. Until this communication has been received by both parties, the authority will not take effect. Similarly, the engineer shall notify such authority of any termination.
3.1	Engineer's Duties and Authority	3.2	Engineer's Duties and Authority	There are no changes in this sub-clause.

Table A.1 (continued): Comparison of FIDIC Red Book 1999 edition and FIDIC Red Book 2017 edition.

FIDIC Red Book 1999 Edition	FIDIC Red Book 2017 Edition	Comparison Between 1999 and 2017 Editions		
3.3	The Engineer's Representative	<p>In accordance with sub-clause 3.4 (Delegation by the Engineer), the engineer may appoint the representative of the engineer and assign him the authorization necessary to operate on behalf of the engineer on the site, except to replace the representative of the engineer. Sub-clause 3.1 (Engineer) is to be followed up by the engineer's representative (if designated) and located at the site for as long as the construction is run on site. If a representative of the engineer is to be temporarily absent from the site while the work is carried out, the Engineer shall appoint an equivalent, experienced and competent substitute and notice of such replacement shall be given to the contractor.</p>		
3.2	Delegation by the Engineer	3.4	Delegation by the Engineer	<p>In 1999 edition, the assignment, delegation or cancelation shall be made in writing and shall not take effect until both parties receive copies. However, the engineer shall not delegate the authority to decide any matter under sub-clause 3.5 'Determinations', except as otherwise agreed by both parties.</p> <p>In 2017 edition, the engineer shall give notice to both parties for delegation. The assignment, delegation or cancelation shall be made in writing and shall not take effect until both parties receive copies. The engineer shall not delegate the authority to act in accordance with sub-clause 3.7 (Agreement or Determination) and/or issue a correction notice under sub-clause 15.1 (Notice to Correct). In the event that the engineer does not respond within 7 days of received notice of contractor reversing or altering the instruction or the notice of assistant, the engineer shall be deemed to have confirmed the instructions or a notification of an assistant.</p>

Table A.1 (continued): Comparison of FIDIC Red Book 1999 edition and FIDIC Red Book 2017 edition.

FIDIC Red Book 1999 Edition		FIDIC Red Book 2017 Edition		Comparison Between 1999 and 2017 Editions
3.3	Instructions of the Engineer	3.5	Engineer's Instructions	In 2017 edition additional information is added to the sub clause. If it is not stated and the contractor declares the instruction a variance or does not conform with the applicable laws or reduces the security of works, the contractor shall give the engineer a notice of reasons immediately and before starting any work related to the instruction. If the engineer has not answered this notice within 7 days, the engineer shall be deemed to have revoked the instructions. The contractor shall otherwise comply with the conditions of the engineer's response and shall be bound by them.
3.4	Replacement of the Engineer	3.6	Replacement of the Engineer	If the engineer cannot take action in the event of death, illness, disability or renouncement, the employer may now quickly replace the engineer on a temporary basis.
3.5	Determinations	3.7	Agreement and Determination	Engineer's function in handling the claims of the parties and other matters covered by the contract is further explained in accordance with the sub-clause 3.7 (Sub - Clause 3.5 of the 1999 edition), using a step by step method with time limits. These steps are listed below: <ul style="list-style-type: none"> - Consultation with the parties to encourage them to reach agreement - Determination in the absence of agreement - Effect of the agreement or determination - Dissatisfaction with the determination.
		3.8	Meetings	The new version in sub-clause 3.8 'Meetings' is a development in the FIDIC 1999 editions of the optional clause. It now covers both future activities and/or other work-related issues. The engineer is required to record the meeting but no requirement exists for this record to be accepted by the contractor or other attendees. The contractor or other participants should therefore immediately and in writing indicate any differences in the record from their understanding of the meeting.

Table A.1 (continued): Comparison of FIDIC Red Book 1999 edition and FIDIC Red Book 2017 edition.

FIDIC Red Book 1999 Edition		FIDIC Red Book 2017 Edition		Comparison Between 1999 and 2017 Editions
4	THE CONTRACTOR	4	THE CONTRACTOR	
4.1	Contractor's General Obligations	4.1	Contractor's General Obligations	According to 2017 edition, the requirement in sub-clause 4.1 'Contractor's General Obligations' that the fitness for purpose obligation shall be defined in the employer's requirements. The obligation shall be 'ordinary purpose' in the absence of a definition.
4.2	Performance Security	4.2	Performance Security	The performance security provisions have been restructured in accordance with sub-clause 4.2. A new provision is currently in place that allows the security amount to be increased or decreased if variations cause an increase or decrease of the contract price above a specified threshold. There is also new wording indicating that any amount received by the employer by claiming under the performance security is to be considered in the final payment certificate. Otherwise in the case of termination, it must be considered in the valuation of payment due after termination.
4.3	Contractor's Representative	4.3	Contractor's Representative	The representative of the contractor is responsible for issuing and receiving notices and other communications under sub-clause 1.3 according to the sub-clause 4.3 'Contractor's Representative'.
4.4	Subcontractors	4.4	Contractor's Documents	Sub-clause 4.4 of the Red Book 2017 edition now specifies that a component of the works may be designed by the contractor and thus this sub-clause lays down provisions on the submission and review of design of the contractor.
4.5	Assignment of Benefit of Subcontract	4.5	Training	Sub-Clause 4.5 of the Red Book 2017 edition addresses the training of employer's personnel by the contractor where the specifications require such training.
4.6	Co-operation	4.6	Co-operation	The 2017 edition provides the contractor with a claim option if it suffers delay and/or incurs costs.

Table A.1 (continued): Comparison of FIDIC Red Book 1999 edition and FIDIC Red Book 2017 edition.

FIDIC Red Book 1999 Edition		FIDIC Red Book 2017 Edition		Comparison Between 1999 and 2017 Editions
4.7	Setting Out	4.7	Setting Out	
4.8	Safety Procedures	4.8	Health and Safety Obligations	Sub-clauses 4.7 'Setting Out', 4.8 'Health and Safety Obligations' and 4.9 'Quality Management and Compliance Verification Systems' preserve the same character as the 1999 edition, but are enhanced and further prescribed in the 2017 edition.
4.9	Quality Assurance	4.9	Quality Management and Compliance Verification Systems	
4.10	Site Data	4.10	Use of Site Data	There are no changes in this sub-clause.
4.11	Sufficiency of the Accepted Contract Amount	4.11	Sufficiency of the Accepted Contract Amount	There are no changes in this sub-clause.
4.12	Unforeseeable Physical Conditions	4.12	Unforeseeable Physical Conditions	<p>The provisions in sub-clause 4.12 'Unforeseeable Physical Conditions' in the 2017 edition have been restructured and added further to details in the step by step format, in order to clarify which conditions are expected for the contractor and the engineer. These steps are listed below:</p> <ul style="list-style-type: none"> - Notice by the contractor - Inspection and investigation by the engineer - Instruction by the engineer - The contractor's right to claim for any delay and cost - Agreement/determination of the claimed delay and cost.
4.13	Rights of Way and Facilities	4.13	Rights of Way and Facilities	There are no changes in this sub-clause.
4.14	Avoidance of Interference	4.14	Avoidance of Interference	There are no changes in this sub-clause.

Table A.1 (continued): Comparison of FIDIC Red Book 1999 edition and FIDIC Red Book 2017 edition.

FIDIC Red Book 1999 Edition		FIDIC Red Book 2017 Edition		Comparison Between 1999 and 2017 Editions
4.15	Access Route	4.15	Access Route	Sub-clause 4.15 assigns the contractor a higher level of risks in the 2017 edition because the contractor must take all necessary measures to prevent the damage to any road or bridge by contractor's traffic or the personnel of the contractor. A contractor is entitled to claim time and money if the extent of an access route's non-suitability or non-availability arises as a result of the employer or a third party's changes to that access route after the base date.
4.16	Transport of Goods	4.16	Transport of Goods	There are no changes in this sub-clause.
4.17	Contractor's Equipment	4.17	Contractor's Equipment	According to the 2017 edition, the contractor shall give a notice to the engineer of the date on which any major item of contractor's equipment is delivered to the site in addition to any notice given under sub-clause 4.16. This notice is given within 7 days from the date of delivery. It shall determine whether the equipment is owned by the contractor, a subcontractor, or another person and shall identify the rental or the leasing entity if rented.
4.18	Protection of the Environment	4.18	Protection of the Environment	There are no changes in this sub-clause.
4.19	Electricity, Water and Gas	4.19	Temporary Utilities	There is no change that affects the structure of the sub-clause. There are only a few additions to the sub-clause.
4.20	Employer's Equipment and Free-Issue Material			

Table A.1 (continued): Comparison of FIDIC Red Book 1999 edition and FIDIC Red Book 2017 edition.

FIDIC Red Book 1999 Edition		FIDIC Red Book 2017 Edition		Comparison Between 1999 and 2017 Editions
4.21	Progress Reports	4.20	Progress Reports	Monthly progress reports are prepared by the contractor and submitted to the engineer in six copies in the 1999 edition, unless otherwise specified in the particular conditions. In 2017 edition, each progress report is submitted in one paper original, one electronic copy and additional paper copies as indicated in the contract data.
4.22	Security of the Site	4.21	Security of the Site	There are no changes in this sub-clause.
4.23	Contractor's Operations on Site	4.22	Contractor's Operations on Site	There are no changes in this sub-clause.
4.24	Fossils	4.23	Archaeological and Geological Findings	Although the title changes, the content remains the same in the 2017 edition.
5	NOMINATED SUBCONTRACTORS	5	SUBCONTRACTING	Clause 5 in the 2017 edition now deals with subcontracting (both ordinary and nominated subcontractors) and therefore Clause 5 is included the provisions that set out in sub-clause 4.4 and 4.5 of the 1999 edition.
		5.1	Subcontractors	In the 2017 FIDIC contract updates, a new arrangement is provided to limit the value of subcontracted work for a particular contract. The default maximum limit in this sub-clause shall be all of the works if nothing is stated in the contract data.
5.1	Definition of "nominated Subcontractor"			
5.2	Objection to Nomination			
5.3	Payments to nominated Subcontractors	5.2	Nominated Subcontractors	The provisions for nominated subcontractors are restructured and details on the contractor's right to object and payments to nominated subcontractors are added.
5.4	Evidence of Payments			

Table A.1 (continued): Comparison of FIDIC Red Book 1999 edition and FIDIC Red Book 2017 edition.

FIDIC Red Book 1999 Edition		FIDIC Red Book 2017 Edition		Comparison Between 1999 and 2017 Editions
6	STAFF AND LABOUR	6	STAFF AND LABOUR	
6.1	Engagement of Staff and Labour	6.1	Engagement of Staff and Labour	There are no changes in this sub-clause.
6.2	Rates of Wages and Conditions of Labour	6.2	Rates of Wages and Conditions of Labour	There are no changes in this sub-clause.
6.3	Persons in the Service of Employer	6.3	Recruitment of Persons	Sub-clause 6.3 in the 1999 edition prevented the contractor from recruiting employer's personnel and in the 2017 edition, the employer and the engineer have a similar obligation imposed with regard to the contractor.
6.4	Labour Laws	6.4	Labour Laws	There are no changes in this sub-clause.
6.5	Working Hours	6.5	Working Hours	If working outside in ordinary working days and hours is required, the contractor must give a notice to this effect instead of an advice.
6.6	Facilities for Staff and Labour	6.6	Facilities for Staff and Labour	Additional information in the 2017 edition is that if any accommodation or facilities are found elsewhere than the stated location, the contractor must quickly remove them at the risk and cost of the contractor.
6.7	Health and Safety	6.7	Health and Safety of Personnel	There are no changes in this sub-clause.
6.8	Contractor's Superintendence	6.8	Contractor's Superintendence	There are no changes in this sub-clause.

Table A.1 (continued): Comparison of FIDIC Red Book 1999 edition and FIDIC Red Book 2017 edition.

FIDIC Red Book 1999 Edition		FIDIC Red Book 2017 Edition		Comparison Between 1999 and 2017 Editions
6.9	Contractor's Personnel	6.9	Contractor's Personnel	The engineer now has the additional right to request the removal of the personnel that is employed from the employer who has committed corruption or fraud.
6.10	Records of Contractor's Personnel and Equipment	6.10	Contractor's Records	The contractor's record keeping obligations are improved in 2017 edition and include equipment, personnel, plant, materials and temporary works. Also, the contractor shall indicate the work, location and working day.
6.11	Disorderly Conduct	6.11	Disorderly Conduct	There are no changes in this sub-clause.
		6.12	Key Personnel	It only applies if such personnel are specified in the employer's requirements. The important element of this provision is the strict regulation of their appointment and presence. They are named in the tender and the consent of the engineer is required for replacements and dismissals. They must also be based on the site throughout the works. This may be to avoid excessive change of the contractor's important employees and to provide their focus to the project.
7	PLANT, MATERIALS AND WORKMANSHIP	7	PLANT, MATERIALS AND WORKMANSHIP	Only the obligations of 7.1 in relation to plant manufacture, production and material production, as well as the execution of the works were applied in the 1999 edition.
7.1	Manner of Execution	7.1	Manner of Execution	It now includes manufacture, supply, installation, testing and commissioning and repair of plant; the production, manufacture, supply and testing of materials; and other operations and activities in the execution of the works.

Table A.1 (continued): Comparison of FIDIC Red Book 1999 edition and FIDIC Red Book 2017 edition.

FIDIC Red Book 1999 Edition		FIDIC Red Book 2017 Edition		Comparison Between 1999 and 2017 Editions
7.2	Samples	7.2	Samples	Inappropriately, the 1999 edition required the submission of samples for testing in the same way as documents. This has not been remedied completely. A detailed procedure is laid down at clause 7.5 when an inspection sample is rejected, but there are no time limit or inspection procedure when the problem does not lead to a failure to reject the sample.
7.3	Inspection	7.3	Inspection	There are no changes in this sub-clause.
7.4	Testing	7.4	Testing by the Contractor	<p>In addition to the previous provisions, the contractor must now supply the electricity and water necessary for testing on a temporary basis and his staff must be adequately skilled to ensure that testing is performed correctly. The contractor shall give a notice to the engineer of the time and place of the planned tests. This notice should be given to allow the employer's staff to attend at a reasonable time. This is a change from the 1999 edition but the only thing in the clause indicates that the employer's staff will be present instead of the engineer. Later provisions all concern the engineer and, if it does not appear, impose penalties. Although in 1999 edition, the contractor and the engineer are required to agree on test times and places, the contractor now simply notifies the engineer of a reasonable amount of time.</p> <p>The engineer is required to issue a variation order (VO) in a new provision in which he wants to change the position or the details of the tests specified. The engineer had previously been required to report his intention to attend the tests for at least 24 hours. It was extended to 72 hours.</p> <p>The employer shall now have the right to claim costs incurred by the contractor as a consequence of a delay.</p>
7.5	Rejection	7.5	Defects and Rejection	In accordance with Subclause 7.5, further provisions have been included in order to reflect best practice which require the contractor to submit a proposal for remedying defects and allow the engineer to review such proposals.

Table A.1 (continued): Comparison of FIDIC Red Book 1999 edition and FIDIC Red Book 2017 edition.

FIDIC Red Book 1999 Edition		FIDIC Red Book 2017 Edition		Comparison Between 1999 and 2017 Editions
7.6	Remedial Work	7.6	Remedial Work	<p>This subclause provides an alternative solution in which the engineer does not reject the defective element. In addition to the 1999 edition, the contractor has to repair or remediate any plants or materials or any other work, instead of removing them as before. One reason of this change is its application in accordance with a cross-reference in sub-clause 11.1 'Completion of Outstanding Work and Remedying Defects'.</p> <p>The contractor is entitled to cost and time in 2017 edition if the cost of remedying the loss or damage is caused by an act by the employer and an extraordinary event occurs pursuant to sub-clause 18.4.</p>
7.7	Ownership of Plant and Materials	7.7	Ownership of Plant and Materials	<p>The provisions on the passing of property which were in compliance with the laws of the country that applied under the 1999 edition now apply if they are compatible with the obligatory provisions of the country's laws. The preceding rules regarding the passing of ownership are extended to allow for this ownership when the contractors pay the amount set aside under sub-clause 14.5 for the plant and materials.</p>
7.8	Royalties	7.8	Royalties	<p>There are no changes in this sub-clause.</p>
8	COMMENCEMENT, DELAYS AND SUSPENSION	8	COMMENCEMENT, DELAYS AND SUSPENSION	
8.1	Commencement of Works	8.1	Commencement of Works	<p>The only significant change in this sub-clause is that in the 2017 edition, the engineer is required to provide the contractors 14-day notice indicating the commencement date. In 1999 edition, the notice period is only 7 days.</p>
8.2	Time for Completion	8.2	Time for Completion	<p>There are no changes in this sub-clause.</p>

Table A.1 (continued): Comparison of FIDIC Red Book 1999 edition and FIDIC Red Book 2017 edition.

FIDIC Red Book 1999 Edition		FIDIC Red Book 2017 Edition		Comparison Between 1999 and 2017 Editions
8.3	Programme	8.3	Programme	<p>The work execution programme of the contractor is an important project management tool for the work, and therefore Sub-clause 8.3 is updated with additional requirements for the initial programme and all revised programmes that are submitted to the engineer.</p> <p>These additional requirements include the starting date of works; the dates on which the contracting party is requiring access to the site or parts of the site; the critical path and any logical activity float; rest days and holidays; key dates of plant and material delivery; and the actual progress made towards completing the work in the revised programmes.</p> <p>The contractor is now to include proposals to overcome the effects of any delay in the progress of work in the support report for each submitted programme. The engineer has a specified period to review any submitted programme and may give a notice that the programme does not fulfil or does not reflect actual progress, so that the contractor is obliged to submit the revised programme. If such notification is not given within the period specified, a notice of no-objection shall be deemed to be issued and a submitted programme shall become a programme which the contractor will follow and on which the employer's staff may focus.</p>
		8.4	Advance Warning	<p>This new clause requires both parties to provide each other with an advance warning of any known or future events which could affect the work of contractor's staff, the execution of the works, increase the cost of the contract price, or delay works. Then the mechanism suggests that the engineer should invite the contractor to submit a proposed variation in order to prevent or reduced the effects of the reported event. In case of failure to comply with this provision, there is no enforcement provided.</p>

Table A.1 (continued): Comparison of FIDIC Red Book 1999 edition and FIDIC Red Book 2017 edition.

FIDIC Red Book 1999 Edition		FIDIC Red Book 2017 Edition		Comparison Between 1999 and 2017 Editions
8.4	Extension of Time for Completion	8.5	Extension of Time for Completion	According to sub-clause 8.5, it is now specified that the contractor has no obligation to follow the claims procedure in relation to the extension of time for variations. The meaning of "exceptionally adverse climatic conditions" in the 2017 edition is added under paragraph 8.5 (c). It can avoid some of the problems that arose with the interpretation of this wording in the 1999 edition. A new paragraph in sub-clause 8.5 deals with the issue of a concurrent delay, which often arises in practice. FIDIC does not establish a mechanism to evaluate the extension of time in these circumstances, but enables the parties to incorporate this mechanism in the special provision and provides guidance in the notes published for preparation of special provisions.
8.5	Delays Caused by Authorities	8.6	Delays Caused by Authorities	There are no changes in this sub-clause.
8.6	Rate of Progress	8.7	Rate of Progress	The main amendment to this clause is to add a final paragraph, providing for the revised methods including acceleration procedures to be covered by Subclause 13.3.1. It represents an important change that only seems to allow the engineer to instruct the acceleration to reduce delays resulted by causes listed in sub-clause 8.5.
8.7	Delay Damages	8.8	Delay Damages	The main change to this clause is that the new final paragraph is included. Sub-clause 8.8's first paragraph clearly indicates that, there is a cap on delay damages as mentioned in the contract data. The new paragraph shows that in the case of fraud, gross negligence, deliberate default or reckless misconduct by the contractor the limit will be lifted.
8.8	Suspension of Work	8.9	Employer's Suspension	In 2017 edition, the date and reason for the suspension are specified by an additional requirement.

Table A.1 (continued): Comparison of FIDIC Red Book 1999 edition and FIDIC Red Book 2017 edition.

FIDIC Red Book 1999 Edition		FIDIC Red Book 2017 Edition		Comparison Between 1999 and 2017 Editions
8.9	Consequences of Suspension	8.10	Consequences of Employer's Suspension	The contractor was previously only entitled to cost in 1999 edition. In 2017 edition, there is an entitlement to cost plus profit.
8.10	Payment for Plant and Materials in Event of Suspension	8.11	Payment for Plant and Materials after Employer's Suspension	There are additional requirements for proving the payment entitlement for plant and materials in 2017 edition.
8.11	Prolonged Suspension	8.12	Prolonged Suspension	In both sub-clauses 8.12 and 8.13, improvements are provided, but they do not affect the structure of the sub-clause.
8.12	Resumption of Work	8.13	Resumption of Work	
9	TESTS ON COMPLETION	9	TESTS ON COMPLETION	Sub-clause 9.1 has been improved by requiring the contractor to provide a detailed test programme to the engineer. When it is determined by the contractor that the test is successfully completed, the test results shall be submitted with a certified report. In each instance, the engineer may then check what was submitted and inform the contractor of any failures to comply with the contract requirements. Clause 9.2 addresses delayed tests whether the employer or the contractor causes the delays. If the tests are unduly delayed by the engineer or a cause that is the responsibility of the employer, then clause 10.3 applies. This situation was a problem in 1999 edition and was not solved. Clause 10.3 sets the 14-day prevention threshold and does not cover the excessive delay. The subject is the cause of the delay rather than the duration of the delay.
9.1	Contractor's Obligations	9.1	Contractor's Obligations	
9.2	Delayed Tests	9.2	Delayed Tests	
9.3	Retesting	9.3	Retesting	There are no changes in this sub-clause.

Table A.1 (continued): Comparison of FIDIC Red Book 1999 edition and FIDIC Red Book 2017 edition.

FIDIC Red Book 1999 Edition		FIDIC Red Book 2017 Edition		Comparison Between 1999 and 2017 Editions
9.4	Failure to Pass Tests on Completion	9.4	Failure to Pass Tests on Completion	Failure to pass tests on completion in accordance with sub-clause 9.4 is extended to include rejection of a section rather than the entire work. The employer is intended to recover his money if the rejected section is omitted under clause 13.3.1.
10	EMPLOYER'S TAKING OVER	10	EMPLOYER'S TAKING OVER	
10.1	Taking Over of the Works and Sections	10.1	Taking Over of the Works and Sections	According to sub-clause 10.1, the contractor has to provide as-built records and/or operation and maintenance manuals and/or to carry out training of the employer's personnel. Unless a notice to no-objection is given in respect of records, manuals and/or training, the work will not be ready to be accepted by the employer.
10.2	Taking Over of Parts of the Works	10.2	Taking Over of Parts	There are no changes in this sub-clause.
10.3	Interference with Tests on Completion	10.3	Interference with Tests on Completion	There are no changes in this sub-clause.
10.4	Surfaces Requiring Reinstatement	10.4	Surfaces Requiring Reinstatement	There are no changes in this sub-clause.
11	DEFECTS LIABILITY	11	DEFECTS AFTER TAKING OVER	
11.1	Completion of Outstanding Work and Remedying Defects	11.1	Completion of Outstanding Work and Remedying Defects	In 2017 edition, additional information is added to the sub-clause. The contractor and the employer's staff shall jointly inspect the defect or damage after the notice is given by the employer to the contractor. After that, a proposal for the necessary corrections shall be prepared and submitted by the contractor. And the second, third and fourth paragraphs of sub-clause 7.5 'Defects and Rejection' shall apply.

Table A.1 (continued): Comparison of FIDIC Red Book 1999 edition and FIDIC Red Book 2017 edition.

FIDIC Red Book 1999 Edition		FIDIC Red Book 2017 Edition		Comparison Between 1999 and 2017 Editions
11.2	Cost of Remedying Defects	11.2	Cost of Remedying Defects	<p>In the 1999 edition, the contractor is notified promptly by the employer and sub-clause 13.3 'Variation Procedure' shall apply if and to the extent that such work is attributable to any cause other than that specified in this sub-clause.</p> <p>In 2017 edition, where a contractor considers work to be attributable to any other reason, the contractor must give the engineer a notice promptly and the engineer shall proceed to agree or determine the cause in accordance with sub-clause 3.7 'Agreement or Determination'. If it is agreed or determined that the work is attributable to a cause other than those listed in this sub-clause, sub-clause 13.3.1 'Variation by Instruction' must apply.</p>
11.3	Extension of Defects Notification Period	11.3	Extension of Defects Notification Period	There is no change that affects the structure of the sub-clause.
11.4	Failure to Remedy Defects	11.4	Failure to Remedy Defects	There is no change that affects the structure of the sub-clause.
11.5	Removal of Defective Work	11.5	Remedying of Defective Work off Site	When the contractor requests the removal of the item on the site for remediation of defects there is new requirement under sub-clause 11.5 for the contractor that the information on the item of plant, the fault, the transportation, insurance, the planned remedial work duration and reinstallation should be provided by giving a notice.
11.6	Further Tests	11.6	Further Tests after Remedying Defects	The sub-clause 11.6 provisions are enhanced by requiring the contractor to submit a repeat test proposal to the engineer. After that the engineer must give notice to the contractor's proposal with agreeing or instructing the necessary repeat testing.

Table A.1 (continued): Comparison of FIDIC Red Book 1999 edition and FIDIC Red Book 2017 edition.

FIDIC Red Book 1999 Edition		FIDIC Red Book 2017 Edition		Comparison Between 1999 and 2017 Editions
11.7	Right of Access	11.7	Right of Access after Taking Over	Sub-clause 11.7 requirements in 2017 edition are extended by requiring the contractor to give a notice with details of what and when the access is required. The employer should respond within the specified period of time. If such access is delayed unreasonably, the contractor has a new right under this sub-clause to make claims.
11.8	Contractor to Search	11.8	Contractor to Search	In 2017 edition, the sub-clause indicates that if the contractor fails to perform the search in accordance with this sub-clause, the search may be carried out by the employer's personnel. The contractor must be given a notice of the date when such a search will be performed and the contractor may attend at the contractor's own cost.
11.9	Performance Certificate	11.9	Performance Certificate	According to the 2017 edition, this sub-clause has additional requirements. If the performance certificate is not issued by the engineer within 28 days, the performance certificate shall be deemed to be issued on the date 28 days after the date on which it should be issued.
11.10	Unfulfilled Obligations	11.10	Unfulfilled Obligations	Additional requirement is added to the sub-clause in 2017 edition. The contractor is not liable with regard to the plant for any defects or damage occurring more than two years following the expiry of DNP for the plant except in any case of fraud, gross negligence, deliberate default or reckless misconduct.
11.11	Clearance of Site	11.11	Clearance of Site	There is no change that affects the structure of the sub-clause.

Table A.1 (continued): Comparison of FIDIC Red Book 1999 edition and FIDIC Red Book 2017 edition.

FIDIC Red Book 1999 Edition		FIDIC Red Book 2017 Edition		Comparison Between 1999 and 2017 Editions
12	MEASUREMENT AND EVALUATION	12	MEASUREMENT AND EVALUATION	
12.1	Works to be Measured	12.1	Works to be Measured	Clause 12 still include the measurement and evaluation of the works in the 2017 edition. New provisions exist under sub-clause 12.1 and sub-clause 12.3, which require the parties to apply sub-clause 3.7 'Agreement or Determination' if the contractor and the engineer are unable to agree to measure the work, or to use a new rate/price to evaluate the works.
12.2	Method of Measurement	12.2	Method of Measurement	
12.3	Evaluation	12.3	Valuation of the Works	
12.4	Omissions	12.4	Omissions	In 1999 edition, the contractor must give a notice to the engineer accordingly with supporting particulars. Upon receipt of this notice, the engineer shall proceed to agree or determine the cost, which shall be included in the contract price, in accordance with sub-clause 3.5. In the 2017 edition, the contractor shall provide the proposal to the engineer with supporting details pursuant to subclause 13.3.1.
13	VARIATIONS AND ADJUSTMENTS	13	VARIATIONS AND ADJUSTMENTS	
13.1	Right to Vary	13.1	Right to Vary	According to sub-clause 13.1, prohibition on omitting any work to be performed by others in the 1999 edition is now qualified by permitting the parties to agree to such a variation. This new qualification is balanced by an appropriate new provision in accordance with sub-clause 13.3.1 'Variation by Instruction' which states that the contractor will be allowed to recover loss of profit and other losses/damages if the parties agree to that omission. In addition, the contractor's right to object to an instructed variation is also supplemented by new grounds. If the varied work is unforeseeable that it will adversely affect the ability of the contractor to fulfill health and safety and/or environmental obligations, the contractor shall have the right to object.

Table A.1 (continued): Comparison of FIDIC Red Book 1999 edition and FIDIC Red Book 2017 edition.

FIDIC Red Book 1999 Edition		FIDIC Red Book 2017 Edition		Comparison Between 1999 and 2017 Editions
13.2	Value Engineering	13.2	Value Engineering	<p>In order to give full optionality to the parties as to how the costs, benefits, delay of the value engineering proposal of a contractor under sub-clause 13.2 should be shared among the parties, the wording is amended to refer to details that can now be agreed between the parties under the particular conditions.</p>
13.3	Variation Procedure	13.3	Variation Procedure	<p>Sub-clause 13.3 is reorganized into two parts in 2017 edition: Sub-clause 13.3.1 'Variation by Instruction' and Sub-clause 13.2 'Variation by Request for Proposal'. If the contractor has been asked to make a variation proposal, but then no variation is instructed, the contractor has a new right to claim the costs of preparing the proposal.</p> <p>In addition, there are now new provisions requiring the variation procedure of sub-clause 13.3 to be followed under a number of sub-clauses. These sub-clauses are listed below:</p> <ul style="list-style-type: none"> - Sub-Clause 4.7.3 'Agreement or Determination of rectification measures, delay and/or cost', for the measures to be taken by the contractor to correct an error in the reference items provided by the employer. -Sub-Clause 8.7 'Rate of Progress' as regards the instruction given by the engineer to revise the working method or to accelerate progress towards reducing delays caused by matters for which the contractor would be entitled to an extension of time. -Sub-Clause 13.6 'Adjustments to Law Changes', for any necessary changes to the works which are resulting from changes to the laws. -Sub-Clause 17.2 'Liability for Care of Works,' for the rectification by the contractor of loss/damage resulting from any of the causes listed in this sub-clause.
13.4	Payment in Applicable Currencies			

Table A.1 (continued): Comparison of FIDIC Red Book 1999 edition and FIDIC Red Book 2017 edition.

FIDIC Red Book 1999 Edition		FIDIC Red Book 2017 Edition		Comparison Between 1999 and 2017 Editions
13.5	Provisional Sums	13.4	Provisional Sums	According to the 2017 edition, if the engineer directs the contractor under this sub-clause, the instruction may include a requirement that the contractor submit quotations from the contractor's suppliers and/or subcontractors for the work items to be performed or the plant, materials, works or services to be purchased. After that, the engineer is entitled to reply by notifying the contractor either to accept one of these quotations or to revoke instruction. If the engineer fails to respond within 7 days of the quotations being received, the contractor shall have the right to accept any such quotation at the discretion of the contractor.
13.6	Daywork	13.5	Daywork	In 2017 edition, the contractor must submit one or more quotations from the suppliers and/or subcontractors of the contractor to the engineer prior to ordering goods for such work. After that, the engineer is entitled to reply by notifying the contractor to accept one of these quotations. If the engineer fails to respond within 7 days of the quotations being received, the contractor shall have the right to accept any such quotation at the discretion of the contractor.
13.7	Adjustments for Changes in Legislation	13.6	Adjustments for Changes in Laws	The contractor is now added the right of claim in case of changes to permits, permissions, licences, approvals obtained for the works under sub-clause 13.6 'Adjustments for Changes in Laws' in the 2017 edition. There is also a reciprocal element between the parties. If the change in law gives rise to reduced costs for the contractor, the employer may now claim the reduction in the price of the contract.
13.8	Adjustments for Changes in Cost	13.7	Adjustments for Changes in Cost	In order to give flexibility to the parties to agree to the method of calculating the adjustment to the contract price arising from changes in labour, plant and materials, The complex formula under sub-clause 13.8 in 1999 edition is now replaced in 2017 edition by a reference to a "Schedule of cost indexation" in the contract. If the contract does not include such a schedule, it is now stated that the provisions of this sub-clause do not apply.

Table A.1 (continued): Comparison of FIDIC Red Book 1999 edition and FIDIC Red Book 2017 edition.

FIDIC Red Book 1999 Edition		FIDIC Red Book 2017 Edition		Comparison Between 1999 and 2017 Editions
14	CONTRACT PRICE AND PAYMENT	14	CONTRACT PRICE AND PAYMENT	
14.1	The Contract Price	14.1	The Contract Price	There are no changes in this sub-clause.
14.2	Advance Payment	14.2	Advance Payment	Sub-clause 14.2 is reorganized and further details are added in a step by step format. Therefore, the expectations of the contractor, employer and the engineer with regard to the guarantee of the advance payment, making the advance payment and repaying the advance payment are made clear.
14.3	Application for Interim Payment Certificates	14.3	Application for Interim Payment	The 1999 edition dealt with interim payment certificate applications. This terminology is now disappeared. Now there's a statement followed by the IPC. The statement was previously required in 6 copies of paper. Only 1 hard 'original' with an electronic copy is now required. Then a list of items to be included in the statement follows. These are extended to include provisional sums, any release of retention money and the amount that the employer is entitled to pay for use of temporary utilities. There is (as opposed to the 1999 edition) no specific reference to such amounts in the list of items which are to be included in the statement, because sub-clause 21.4.3 requires that any money awarded by a DAAB shall be paid without the requirement for any certification or notice. Nevertheless, contractors should include such amounts as this will bring into effect the right to interest under sub-clause 14.8, which performs from the date of the decision. There is no provision for interest payment if DAAB award is not included in this way. The element of subjectivity is included in the requirements for the first time.

Table A.1 (continued): Comparison of FIDIC Red Book 1999 edition and FIDIC Red Book 2017 edition.

FIDIC Red Book 1999 Edition		FIDIC Red Book 2017 Edition		Comparison Between 1999 and 2017 Editions
14.4	Schedule of Payments	14.4	Schedule of Payments	<p>Under the 1999 edition, the engineer was only entitled to revise its payment schedule if progress was lower than anticipated. Now if it differs, he can modify it. This opens the way to forward payments if progress which is made by the contractor is better than expected. Unfortunately, the contractor does not have any provision to trigger this correction process.</p> <p>Where the engineer decides to invoke the process, the contractor at least has the advantage of being consulted and the advantage of the engineer that is acting in a neutral and fair manner. If the schedule simply provides for monthly fixed payments, there may be a dispute as to what progress is assumed in the payment schedule. The main obligation of the contractor is to complete the programme on time, not necessarily comply with the programme. If it decides to change the way it achieves a timely completion, this does not mean that the agreed payment schedule is inappropriate.</p> <p>Payments for plant and materials intended for the works are examined in the sub-clause 14.5.</p>
14.5	Plant and Materials intended for the Works	14.5	Plant and Materials intended for the Works	<p>As in the 1999 edition, the 2017 edition entitles the parties to agree that plants and materials may be paid for when shipped or delivered. The contractor enables the evidence in his payment application and the amount should finally be included in the IPC. Under the 1999 edition the term 'determination' was used without cross-reference to the clause 3.5. The amount could be included after this determination was made. The clause now refers to Clause 3.7 'Determination' in order to be clarified. As a result, the engineer has 84 days to take a decision that would have been made immediately. And the amount cannot be included in the next IPC any more. Furthermore, only 80% of the value of the items is to be included in the IPC. The provision was intended to make early payments for the contractor, but the amended provision does the opposite.</p> <p>In addition, the requirement to guarantee a bank before an engineer determines a payment is replaced by a promise of guarantee.</p>

Table A.1 (continued): Comparison of FIDIC Red Book 1999 edition and FIDIC Red Book 2017 edition.

FIDIC Red Book 1999 Edition		FIDIC Red Book 2017 Edition		Comparison Between 1999 and 2017 Editions
14.6	Issue of Interim Payment Certificates	14.6	Issue of IPC	<p>Under the 2017 edition, the clause now provides, as a condition precedent, that the contractor appoints the contractor's representative.</p> <p>Under the subclause 14.6.1 'Content of IPC', the contractor is now entitled to a copy of each IPC. Also, it is indicated that the engineer shall explain any differences between the amount applied for and the amount certified. The requirement for the engineer remains to issue the IPC for such amount as he 'fairly' considers due, so that while sub-clause 3.7 is moved from 'fair' to 'neutral' (Clause 14.13 includes the same requirement for issue of the IPC).</p> <p>Under sub-clause 14.6.2 'Withholding (amounts in) an IPC', another useful addition from the point of view of contractors is that the engineer is now obliged to clarify why amounts are withheld. Any amount determined under subclause 3.7 is also covered by the IPC. Although no specific statement to this effect exists here, this provision actually reflects another significant improvement from the point of view of the contractor. Basically, every claim by the employer is now covered by Sub-Clause 3.7. Thus the situation under the 1999 edition where a deduction is sometimes made for an employer claim before the contractor has the opportunity to argue the point, is now resolved.</p> <p>Under sub-clause 14.6.3 'Correction or modification', there is a provision detailing what the contractor is obligated to do if he does not agree with the IPC. Following the submissions of the contractor, the engineer has the opportunity to include corrections in the IPC. If the engineer does not do corrections or the contractor is still dissatisfied, the contractor is entitled to ask the engineer to deal with the matter under sub-clause 3.7. The contractor makes this request without a time limit.</p>
14.7	Payment	14.7	Payment	<p>As before, the employer's payment time shall run after the contractor makes the application. This time is 56 days for all IPC's except the Final Payment Certificate. The sub-clause contains two separate payment deadlines under the IPC. These time limits are 56 days after the engineer receipt for normal ones and 28 days after the employer receipt where the IPC is issued as result of a partially agreed final statement under clause 14.13.</p>

Table A.1 (continued): Comparison of FIDIC Red Book 1999 edition and FIDIC Red Book 2017 edition.

FIDIC Red Book 1999 Edition		FIDIC Red Book 2017 Edition		Comparison Between 1999 and 2017 Editions
14.8	Delayed Payment	14.8	Delayed Payment	Interest on late payment is due as 1999 edition. The rate is calculated at 3% above different base rates. Under the 1999 edition, the base was the discount rate of the central bank of the country of currency of payment. It is now based on the rates paid to borrowers at the location for payment. If there is no such rate, the rate is based on the country of the currency of payment. Payment shall now be made without a contractor's notice being required.
14.9	Payment of Retention Money	14.9	Release of Retention Money	This provision under 2017 edition is marking a significant negative change in the case of contractors. The payment was certified outside the normal IPC process by the engineer during the 1999 edition and should have been made immediately. It is now to be included in a statement for an IPC. This means a refund delay of at least 56 days.
14.10	Statement at Completion	14.10	Statement at Completion	Under the 2017 edition, the specific categories are now explained in detail, including claims that the engineer and the DAAB are still considering.
14.11	Application for Final Payment Certificate	14.11	Final Statement	Sub-clause 14.11 is restructured and the wording is changed to clarify the steps to be followed by the contractor.
14.12	Discharge	14.12	Discharge	The 1999 edition provided the contractor for a complete and final discharge which only came into effect once all outstanding claims were met. This is now limited in that the discharge covers all agreed amounts but can exclude only limited elements of the claims of the contractor. Only items for which DAAB or arbitration is underway may be excluded. Therefore, claims under clause 3.7 that are still being dealt with by the engineer cannot be excluded. Even if the contractor fails to provide it as the amount certified in the Final Payment Certificate is paid and the Performance Security returned, the discharge will be deemed to be submitted and will be effective. Since the FPC cannot be issued until the discharge is granted, this provision is ineffective.

Table A.1 (continued): Comparison of FIDIC Red Book 1999 edition and FIDIC Red Book 2017 edition.

FIDIC Red Book 1999 Edition		FIDIC Red Book 2017 Edition		Comparison Between 1999 and 2017 Editions
14.13	Issue of Final Payment Certificate	14.13	Issue of FPC	Similarly, to sub-clause 14.11, sub-clause 14.13 'FPC Issue' is changed to set out the engineer's expectations with respect to the the final statement or partially agreed final statement.
14.14	Cessation of Employer's Liability	14.14	Cessation of Employer's Liability	As in the 1999 edition, the employer's liability is constrained by what is contained in the Final Statement, unless there is anything new after the work is done. An additional exemption for the employer is included in the 2017 edition. The employer shall be exempted from any amounts that the contractor may wish to claim, unless the contractor makes claims pursuant to clause 20.2 within 56 days of the receipt of the final payment certificate. Contractors must ensure that all claims are immediately commenced. The cessation of liability of the employer shall not apply in the case of his indemnification obligations or in case of fraud, deliberate default or reckless misconduct as in the 1999 edition. The addition to the list of 'gross negligence' may have significantly different outcomes depending upon the law applicable to the contract.
14.15	Currencies of Payment	14.15	Currencies of Payment	The 2017 edition adds two provisions to those in the 1999 edition. One sets out how to allocate currencies in the evaluation of variations. The second deals with the currencies to be paid for performance damages.

Table A.1 (continued): Comparison of FIDIC Red Book 1999 edition and FIDIC Red Book 2017 edition.

FIDIC Red Book 1999 Edition	FIDIC Red Book 2017 Edition	Comparison Between 1999 and 2017 Editions
15	TERMINATION BY EMPLOYER	15
	TERMINATION BY EMPLOYER	<p>The provisions pursuant to clause 15 are restructured and further details are added in a step by step format to clarify the steps to be followed before the employer terminates the contract. Steps are listed below:</p> <ul style="list-style-type: none"> - The contractor’s default/failure - Notice to correct - The contractor’s default/failure - Employer’s notice of intention to terminate (It is not required in the event of bankruptcy, corruption or fraud on the part of the contractor. The contract can be terminated immediately.) - The contractor’s further default/failure - Employer’s notice of termination - Immediate termination. <p>New rights of termination are added. For instance, the contractor’s failure to comply with a binding determination or decision by the Dispute Avoidance / Adjudication Board (DAAB) constitutes a material breach of the contract. Two new sub-clauses are added in 2017 edition to clarify and add certainty in the situation in which the employer terminates the contract: Sub-Clause 15.6 'Valuation after Termination for Employer’s Convenience' and Sub-Clause 15.7 'Payment after Termination for Employer’s Convenience'.</p>

Table A.1 (continued): Comparison of FIDIC Red Book 1999 edition and FIDIC Red Book 2017 edition.

FIDIC Red Book 1999 Edition		FIDIC Red Book 2017 Edition		Comparison Between 1999 and 2017 Editions
15.1	Notice to Correct	15.1	Notice to Correct	<p>Sub-clause 15.1 is intended to provide the contractor with an opportunity and a right to remedy its previous and identified failure. It was generally understood under the FIDIC 1999 edition that the engineer would give a notice to correct specifying what was wrong, how to fix it, and a time to fix it. Most of the arguments emerged about the time to fix it. The new wording provides for a notice to correct specifying what is wrong, the necessary contract clause, and a period for fixing it. How to resolve the issue is now in the domain of the contractor. Consequently, the engineer's complaints about what the contractor proposes to do to solve the problem will probably be argued most likely in the time. Failure to comply with a notice to correct authorizes the employer to give notice of intention to terminate, provided now that such failure constitutes a material breach of the contractor's obligations under the contract (sub-clause 15.2.1)</p>
15.2	Termination by Employer	15.2	Termination for Contractor's Default	<p>Sub-Clause 15.2.2 'Termination' in the 2017 edition gives the contractor 14 days within which to remedy the matters indicated in the notice of intention to terminate the contract. This gives the contractor an additional 14 days to comply with the notice to correct. After the expiry of the 14 days, the employer may then give the contractor a second notice to terminate the contract immediately.</p>
15.3	Valuation at Date of Termination	15.3	Valuation after Termination for Contractor's Default	<p>There is no change that affects the structure of the sub-clause.</p>
15.4	Payment after Termination	15.4	Payment after Termination for Contractor's Default	<p>There is no change that affects the structure of the sub-clause.</p>

Table A.1 (continued): Comparison of FIDIC Red Book 1999 edition and FIDIC Red Book 2017 edition.

FIDIC Red Book 1999 Edition		FIDIC Red Book 2017 Edition		Comparison Between 1999 and 2017 Editions
15.5	Employer's Entitlement to Termination	15.5	Termination for Employer's Convenience	Another important modification is the employer's right to terminate the contract pursuant to clause 15.5 in order to carry out the work himself or arrange the works for another contractor to carry out. The most likely reason that the employer will want to terminate is because of the change in the market, no longer need for the project, loss of money or a cheaper contractor.
		15.6	Valuation after Termination for Employer's Convenience	In 2017 edition, under sub-clause 15.6, the contractor shall submit detailed supporting particulars of the value of the work done and the amount of any loss of profit or other losses and damages as a result of sub-clause 15.5 'Termination for Employer's Convenience'. After that, the engineer has to agree or determine the amount and issue a payment certificate for the amount that is agreed or determined.
		15.7	Payment after Termination for Employer's Convenience	Until the amount due pursuant to sub-clause 15.6 has been paid by the employer, the employer may not perform any part of the work or arrange of the work for any other entity. This amount must be paid within 112 days (16 weeks) after the contractor's submission is received by the engineer.

Table A.1 (continued): Comparison of FIDIC Red Book 1999 edition and FIDIC Red Book 2017 edition.

FIDIC Red Book 1999 Edition	FIDIC Red Book 2017 Edition	Comparison Between 1999 and 2017 Editions
16	SUSPENSION AND TERMINATION BY CONTRACTOR	16
	SUSPENSION AND TERMINATION BY CONTRACTOR	<p>Similarly, the termination provisions pursuant to clause 16 are restructured setting out the steps to be taken before the contractor terminates the contract. Steps are listed below:</p> <ul style="list-style-type: none"> - The employer’s default or failure - The contractor’s notice of intention to terminate (The contract can be terminated immediately in the event of bankruptcy, corruption or fraud on the part of the employer.) - The employer’s further default or failure - The contractor’s notice of termination - Immediate termination <p>New rights of termination are added. For instance, if the contractor does not receive a notice of the commencement date within a specified time period, the contractor will have a right to terminate the contract. Another example is where the employer’s failure to comply with a binding determination or decision by the Dispute Avoidance/Adjudication Board (DAAB) constitutes a material breach of the contract.</p>

Table A.1 (continued): Comparison of FIDIC Red Book 1999 edition and FIDIC Red Book 2017 edition.

FIDIC Red Book 1999 Edition		FIDIC Red Book 2017 Edition		Comparison Between 1999 and 2017 Editions
16.1	Contractor's Entitlement to Suspend Work	16.1	Suspension by Contractor	<p>The main changes and additions to Clause 16 are the new basis for suspension and termination. These main changes are listed below:</p> <ul style="list-style-type: none"> - Non-compliance of the employer with a final and binding determination of the engineer and binding or final DAAB decision constitutes a material breach of the employer's obligations under the contract (Sub-Clauses 16.1(d) and 16.2.1(d)). - The contractor is entitled to give a notice to the employer to terminate the contract in case the non-receipt of a notice of the commencement date under Sub-Clause 8.1 'Commencement of Works' within 84 days after receiving the Letter of Acceptance (Sub-Clause 16.2.1(f)). It protects the contractor against the financial impact of price and rate fluctuations during a long delay until construction begins
16.2	Termination by Contractor	16.2	Termination by Contractor	<ul style="list-style-type: none"> - Under sub-clause 16.2.1(j), the contractor is entitled to give a notice to the employer to terminate the contract in case the engagement of the employer in corrupt, fraudulent, collusive or coercive practice at any time in relation to the works or to the contract. This creates the employer's parity with the contractor. In the 1999 edition, the employer was entitled to terminate if an inducement or a reciprocal agreement was given or offered by the contractor. - Termination under sub-clause 16.2.1(c) is no longer limited to the non-payment of interim payment certificates and relates to a failure by an employer to pay the advance, interim or final payment. - Termination under sub-clause 16.2.1(e) now requires that a substantial failure of the obligations of the employer and this failure must provide material breach of the employer's obligations under the contract. - Termination under sub-clause 16.2.1(i) regarding bankruptcy and insolvency is expanded.
16.3	Cessation of Work and Removal of Contractor's Equipment	16.3	Contractor's Obligation After Termination	There is no change that affects the structure of the sub-clause.

Table A.1 (continued): Comparison of FIDIC Red Book 1999 edition and FIDIC Red Book 2017 edition.

FIDIC Red Book 1999 Edition		FIDIC Red Book 2017 Edition		Comparison Between 1999 and 2017 Editions
16.4	Payment on Termination	16.4	Payment after Termination by Contractor	There is no change that affects the structure of the sub-clause.
17	RISK AND RESPONSIBILITY	17	CARE OF THE WORKS AND INDEMNITIES	The sub-clauses in 2017 edition are re-ordered and the provisions are clarified to more accurately reflect FIDIC's intention for the provisions of this clause and to avoid some of the difficulties experienced by users.
17.1	Indemnities	17.1	Responsibility for Care of the Works	Sub-Clause 17.1 'Responsibility for Care of the Works' now deals with the contractor's responsibility for care of the works. Sub-Clause 17.2 'Liability for Care of the Works' includes when and where the contractor is liable and not liable for any loss or damage caused to the works. Sub-Clause 17.3 now concerns intellectual and industrial property rights.
17.2	Contractor's Care of the Works	17.2	Liability for Care of the Works	
17.3	Employer's Risks	17.3	Intellectual and Industrial Property Rights	
17.4	Consequences of Employer's Risks	17.4	Indemnities by Contractor	Sub-clause 17.1 in the 1999 edition is now divided into sub-clause 17.4 'Indemnities by Contractor' and Subclause 17.5 'Indemnities by Employer'.
17.5	Intellectual and Industrial Property Rights	17.5	Indemnities by Employer	
17.6	Limitation of Liability	17.6	Shared Indemnities	There is a new sub-clause 'Shared Indemnities' in the 2017 edition. The limitation of liability provisions under sub-clause 17.6 in the 1999 edition are moved to a new sub-clause under clause 1 in the 2017 edition.
19	FORCE MAJEURE	18	EXCEPTIONAL EVENTS	Clause 18 'Exceptional Events' in the 2017 edition now indicates the subject matter that was covered by clause 19 'Force Majeure' in the 1999 edition. The change in terminology from "Force Majeure" to "Exceptional Event" is consistent with the development of FIDIC's Conditions of Contract for Design, Build and Operate Projects, first edition 2008 (Gold Book).

Table A.1 (continued): Comparison of FIDIC Red Book 1999 edition and FIDIC Red Book 2017 edition.

FIDIC Red Book 1999 Edition		FIDIC Red Book 2017 Edition		Comparison Between 1999 and 2017 Editions
19.1	Definition of Force Majeure	18.1	Exceptional Events	In 2017 edition, one change made at sub-clause 18.1 is the separation of strikes and lockouts.
19.2	Notice of Force Majeure	18.2	Notice of an Exceptional Event	There is no change that affects the structure of the sub-clause. There are only a few additions to the sub-clause.
19.3	Duty to Minimise Delay	18.3	Duty to Minimise Delay	In 2017 edition, if an exceptional event has an ongoing effect, the party concerned shall issue further notices describing the effect every 28 days after the first notice under sub-clause 18.2 'Notice of an Exceptional Event'. When the affected party stops to be affected by the exceptional event, the affected party shall immediately notify the other party. If the party concerned fails to do so, the other party may notify the party concerned that the other party considers that the performance of the party concerned is no longer avoided with causes by the exceptional event.
19.4	Consequences of Force Majeure	18.4	Consequences of an Exceptional Event	There is no change that affects the structure of the sub-clause.
19.5	Force Majeure Affecting Subcontractor			
19.6	Optional Termination. Payment and Release	18.5	Optional Termination	In 2017 edition, the engineer shall proceed to agree or determine under subclause 3.7, after submission of supporting details of the value of work carried out by the contractor. The engineer must issue a payment certificate under subclause 14.6 'Issue of IPC' for the amount that is agreed or determined without the need for the contractor to submit a statement.

Table A.1 (continued): Comparison of FIDIC Red Book 1999 edition and FIDIC Red Book 2017 edition.

FIDIC Red Book 1999 Edition		FIDIC Red Book 2017 Edition		Comparison Between 1999 and 2017 Editions
19.7	Release from Performance under the Law	18.6	Release from Performance under the Law	In 1999 edition, the question arose as to whether a contractor was relieved of certain legal or physical obligations or of the contract as a whole only. It seems more obvious that this is an all or nothing clause. If it is invoked, the result is termination of the contract.
18	INSURANCE	19	INSURANCE	The contract updates in the 2017 edition now covers insurance, and the provisions are revised to align with similar provisions under clause 19 of FIDIC's Gold Book.
18.1	General Requirements for Insurances	19.1	General Requirements	Clause 19 and the relevant tender information in contract data are now far more prescribed in terms of insurance requirements. This may lead to a more careful examination of what is a key feature of the contract in many applications. In clause 18 of the 1999 edition, the use of the term 'insuring party' for the allocation of the insurance obligations between the parties allows for flexibility. The new regulations in the clause 19 remove the approach of the 'insuring party', almost every obligations rest with the contractor. In addition, the earlier flexible approach allowed the terms to be overridden by specific insurance terms agreed between the parties prior to the date of Letter of Acceptance. The new clause 19 now also loses this additional flexibility. The mechanism is now to add memoranda to the Letter of Acceptance.
18.2	Insurance for Works and Contractor's Equipment	19.2	Insurance to be provided by the Contractor	The new professional indemnity insurance requirements of sub-clause 19.2.3 will deserve careful examination of the tendering contractor with its professional insurance consultant.
18.3	Insurance against Injury to Persons and Damage to Property			

Table A.1 (continued): Comparison of FIDIC Red Book 1999 edition and FIDIC Red Book 2017 edition.

FIDIC Red Book 1999 Edition		FIDIC Red Book 2017 Edition		Comparison Between 1999 and 2017 Editions
18.4	Insurance for Contractor's Personnel			
20	CLAIMS, DISPUTES AND ARBITRATION	20	EMPLOYER'S AND CONTRACTOR'S CLAIMS	In the 2017 edition, clause 20 provisions only relate to claims. New clause 21 now deals with disputes. Also, the claims of the contractor and the claims of the employer are now treated in exactly the same manner.
20.1	Contractor's Claims	20.1	Claims	Sub-clause 20.1 describes how a claim can be for time and/or money as well as how time and money cannot be claimed. The final paragraph of sub-clause 20.1 provides the procedure for claims not for time and/or money to be followed. The time and/or money claims are covered under sub-clause 20.2.

Table A.1 (continued): Comparison of FIDIC Red Book 1999 edition and FIDIC Red Book 2017 edition.

FIDIC Red Book 1999 Edition	FIDIC Red Book 2017 Edition	Comparison Between 1999 and 2017 Editions
20.2	Claims for Payment and/or EOT	<p>Sub-clause 20.2 describes the step by step procedure to be followed for the employer's and contractor's claims for time and/or money. The steps for the procedure are listed below:</p> <ul style="list-style-type: none"> - Notice of Claim (the 28 days time bar provision of the 1999 edition is retained to apply to both contractor's and employer's claims) - The initial reply of the engineer to the notice of claim. - Requirement to keep 'contemporary records' (now it is defined under this sub-clause) - Submission of the 'fully detailed claim' (also it is now defined under this sub-clause) and claims of continuing effect - Agreement or determination of the claim (by reference to sub-clause 3.7) <p>There are new provisions to address the situation where the initial response of the engineer is that the notice of claim is time-barred, but the claiming party believes circumstances justify the late notice. In this case, the claiming party is obliged to include these points in the fully detailed claim, and the engineer is obliged to proceed with the claim's agreement or determination taking into account the claiming party's points. In the 2017 edition, FIDIC realizes that it is more appropriate that the arguments of the claiming party regarding the timing of its notice of claim should first be considered during the claim agreement or determination process. If either party is not satisfied with the determination of the engineer, the problem may then be referred for decision to the DAAB.</p>
21	DISPUTES AND ARBITRATION	<p>The provisions of new clause 21 'Disputes and Arbitration' are based on those set out in sub-clauses 20.2 to 20.8 of the 1999 edition. The confidence of the parties in the agreed individuals who will serve on the DAAB is a very important factor in the success of the dispute avoidance/adjudication procedure. Also, it is important that choice of DAAB members are not enforced by one party. The provision is now made in contract data for each party to nominate three potential DAAB Members ensuring that both parties have equal opportunities to nominate potential DAAB Members. If the parties cannot agree on a DAAB member, sub-clause 21.2 'Failure to Appoint DAAB Member(s)' applies.</p>

Table A.1 (continued): Comparison of FIDIC Red Book 1999 edition and FIDIC Red Book 2017 edition.

FIDIC Red Book 1999 Edition		FIDIC Red Book 2017 Edition		Comparison Between 1999 and 2017 Editions
20.2	Appointment of the Dispute Adjudication Board	21.1	Constitution of the DAAB	It was common for an unwilling party to try to obstruct the appointment of the dispute board by failing to agree on members, by failing to agree on its fees or by failing to sign the DAB agreement. In order to avoid these problems, sub-clause 21.1 enables the appointing entity stated in the contract data (if nothing is indicated, the president of FIDIC) to designate the DAAB member(s), set the fees, and a DAAB agreement will be deemed to be signed with the parties. A new provision in respect of award costs is added in accordance with sub-clause 21.6 in order to encourage parties to cooperate with each other in the appointment of the DAAB.
20.3	Failure to Agree Dispute Adjudication Board	21.2	Failure to Appoint DAAB Member(s)	There is no change that affects the structure of the sub-clause. There are only a few additions to the sub-clause.
		21.3	Avoidance of Disputes	The new sub-clause 21.3 'Avoidance of Disputes' is added to the 2017 edition to enhance the DAAB's role in assisting the parties with any disagreements and so avoid them becoming dispute. This sub-clause enables the parties to refer an issue to the DAAB jointly. They may jointly request assistance from the DAAB and/or request to discuss informally and attempt to resolve any issues or disagreements that may be arisen with the parties. Additionally, the General Conditions of the Dispute Avoidance/Adjudication Agreement and the DAAB Procedural Rules is improved by including further express provisions regarding the role of the DAAB in assisting the parties in avoiding disputes.
20.4	Obtaining Dispute Adjudication Board's Decision	21.4	Obtaining DAAB's Decision	Under sub-clause 21.4 'Obtaining DAAB's Decision', the step by step procedure for disputes shall be followed. These steps are listed below: <ul style="list-style-type: none"> - Referral to the DAAB (within a stated time period of the NOD, if sub-clause 3.7 in the 2017 edition applied to the subject matter of the dispute) - The parties' obligations after referral of the dispute - The DAAB's decision - Dissatisfaction with the DAAB's decision

Table A.1 (continued): Comparison of FIDIC Red Book 1999 edition and FIDIC Red Book 2017 edition.

FIDIC Red Book 1999 Edition		FIDIC Red Book 2017 Edition		Comparison Between 1999 and 2017 Editions
20.5	Amicable Settlement	21.5	Amicable Settlement	In 1999 edition, arbitration may begin on or after the fifty-sixth day after the day on which notice of dissatisfaction was given, even if no attempt at amicable settlement was made. In 2017 edition, arbitration may begin on or after the twenty-eighth day after the day on which notice of dissatisfaction was given, even if no attempt at amicable settlement was made.
20.6	Arbitration	21.6	Arbitration	There is no change that affects the structure of the sub-clause. There are only a few additions to the sub-clause.
20.7	Failure to Comply with Dispute Adjudication Board's Decision	21.7	Failure to Comply with DAAB's Decision	Sub-clause 21.7 'Failure to Comply with DAAB's Decision' is based on sub-clause 20.7 of the 1999 edition, together with appropriate changes to the recommendations included in the 'FIDIC Guidance Memorandum to Users of the 1999 Conditions of Contract' dated 1st April 2013.
20.8	Expiry of Dispute Adjudication Board's Appointment	21.8	No DAAB In Place	There is no change that affects the structure of the sub-clause.



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