

Level 1

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G

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Construction

Management

Acceptance,

Tests and

Taking Over

Contractual Risk Framework, Allocation and Assessment in International Construction Project - An Example of FIDIC GCs

Contractual Risk Descriptions

Errors, omissions, ambiguities, inconsistencies, inadequacies or other defects in the Contractor's design for which the Contractor is responsible

Faults, errors, defects or omissions in the design carried out by or on behalf of the Employer or which may be contained in the Employer's

Contractor's failure to submit Contractor's Documents in accordance with the Programme, or submission of non-compliant Contractor's

Problems in the Contractor's delivery of Goods, including transport and handling of all Goods, customs clearance, permits, etc

Employer's failure to deliver the Employer-Supplied Materials and/or Employer's Equipment in accordance with the Contract

Obstructions or restrictions of access routes to the Site resulting in delays or impeding execution of the Works

Contractor's failure to obtain the required permits, permissions, licences and/or approvals and other documents required for compliance with

Employer's failure to obtain the required permits, permissions, licences, and/or approvals and other documents described in the Employer's

Employer's failure to give the Contractor right of access to, and possession of, all parts of the Site in accordance with the Contract due to the

Employer's failure to give the Contractor right of access to, and possession of, all parts of the Site in accordance with the Contract (excluding

Loss or damage occurs to the Works, Goods or Contractor's Documents during the period when the Contractor is responsible for their care

Employer's rejection of Plant, Materials, design or workmanship found to be defective or otherwise not in accordance with the Contract

Employer's failure to issue the Taking-Over Certificate (including for Sections, Parts, or key Milestones) in accordance with the Contract

Contractor's assignment of the whole or any part of the Contract or any benefit or interest in or under the Contract without the Employer's consent

Employer's assignment of the whole or any part of the Contract or any benefit or interest in or under the Contract without the Contractor's consent

Inadequate capacity of the Contractor's Subcontractors, including nominated Subcontractors, adversely affecting the progress or quality of the

Employer's restrictions on the maximum percentage of subcontracting or non-allowance of subcontracting on specific part of Works

Contractor's failure to carry out remedial work, or to remove from the Site and replace any defective Plant or Materials as instructed

Loss or damage occurs to the Works, Goods or Contractor's Documents from the causes not attributable to the Contractor (Variations included)

Restrictions or limitations of the Contractor's selection of manufacturers, suppliers or subcontractors of Goods, Material or service

1.9 / 5.1

1.9 / 2.5 / 4.7

4.10 / 5.1

1.9 / 4.7

5.8

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5.2 / 5.6 / 5.7

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2.6 / 8.5

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School of Construction,

Property and Surveying

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Errors in the Employer-provided items of reference for which the Employer is responsible (Variations included)

Insufficient time for the Contractor to scrutinize Employer's Requirements and verify data therein (items of reference included)

Errors in the Employer-provided site data and items of reference (Variations excluded)

Late issuance of the Employer's design documents, causing delay or disruption to the Works

Requirements on the local content or restrictions of countries of origin

Defects in Employer-Supplied Materials and/or Employer's Equipment

Employer's failure to provide temporary utilities in accordance with the Contract

Temporary utilities not satisifying for the performance of the Works

Unreasonably long review period or absence of limits on the number of reviews for Contractor's Documents

Level 2

Design Management

Procurement

Management

Level 3

Design Criteria

Design Obligations

Contractor's Documents

Procurement and

Delivery

Nominated Suppliers or Subcontractors

Employer-Supplied Materials and Employer's **Equipment**

Pre-Construction

Site Conditions

Site Management

HSSE

Construction Process

Management

Tests on Completion

Performance Guarantees

Tests after Completion

Defect Liability and Final

Acceptance of the Works

Priority of Contract

Documents

Assignment

Subcontracting

Variations

Claims and Dispute

Resolution

Termination

Limitation of Liability

and Indemnities

Insurance

Financial Risk and **Cash Flow**

> Measurement and

> > Valuation

Payment

Rate of Progress

Delay Damages

Defects Notification Period

Quality Management and Compliance Verification

System

Special Warranty

Requirements

Human Resource

Management

Local Government

War, Rebellion, etc

Release from

Performance under the

Changes in Laws

Changes in Cost

Riot, Strike, etc

Exceptionally Adverse

Climatic Conditions

Natural Catastrophes

Public Health

Emergencies and Simila

Munitions, Explosive

Materials, etc

3: The Contractor is entitled to either Extension of Time only; or Cost only.

content. Therefore, the scores of these items are not included in this table.

from the end) and the reference weight value (second-to-last column).

2: The Contractor is entitled to Extension of Time and Cost, but has no entitlement to profit.

Cost

Management

Schedule

Management

Quality

Management

Other Functions

Political Risks

Legal Risks

Economic Risks

Social Risks

Environmental

Risks

Other Risks

respectively.

General Conditions.

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Contract

Management

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Works

Variations initiated by the Employer

Requirements

Documents

applicable Laws accordingly

reason attributable to the Contractor

those attributable to the Contractor's responsibility)

Unforeseeable physical conditions (Variations excluded)

Delays caused by archaeological and geological findings

Contractor's improper operations on Site

Contractor's failure to cooperate in accordance with the Contract

Unnecessary or improper interference with the public by the Contractor

Specific risks of forces of nature which are allocated to the Contractor

Contractor's failure to comply with health related requirements

Contractor's failure to comply with safety related requirements

Contractor's failure to comply with security related requirements

Delays in carrying out tests attributable to the Contractor

Delays in carrying out tests attributable to the Employer

Delays in Tests on Completion attributable to the Contractor

Delays in Tests on Completion attributable to the Employer

Delays in Tests after Completion attributable to the Contractor

Delays in Tests after Completion attributable to the Employer

Contractor's failure to pass the Tests after Completion

Unreasonable provisions regarding Performance Damages (rate and/or CAP)

Contractor's failure to pass the Tests on Completion

Contractor's failure to comply with environmental protection related requirements

Remedial work which is urgently required for the safety of the Works that caused by the Employer

Remedial work which is urgently required for the safety of the Works that caused by Exceptional Event

Contractor's failure to provide or maintain adequate Contractor's Equipment for the execution of the Works

Employer's early possession or use of any part of the Works before issuance of the Taking-Over Certificate

Payment of Performance Damages by the Contractor due to failure to attain any of the guaranteed performances

Contractor's failure to remedy defects for which it is responsible during the Defects Notification Period

Employer's failure to issue the Performance Certificate in accordance with the Contract

Conflict, ambiguity or discrepancy in the documents forming the Contract

Variations proposed by the Contractor incorporating value engineering

Variations arising from adjustments due to the changes in Laws after the Base Date

Variations arising from changes of technical standards and regulations after the Base Date

Variations arising from errors in the Employer's Requirements

Absence of dispute resolution mechanisms under the Contract

Termination for the Employer's convenience

Termination by the Contractor for the Employer's default

Unreasonable limitations of liability for the Contract

Contractor's failure to fulfill indemnity obligations

Employer's failure to fulfil indemnity obligations

Forfeiture of securities, guarantees or bonds

Contractor's Delay in progress of the Works

Unreasonably long Defects Notification Period

Contractor's failure to provide sufficient labour

Adjustments due to the changes in cost

Subcontractors

actions in response thereto

1. The Contractor may obtain profit through Variations or Claims and, where applicable, is entitled to Extension of Time and Cost.

5. The Employer requires the Contractor to compensate for direct losses, while the Contractor bears the delay and cost consequences.

6: The Employer requires the Contractor to compensate for both direct and part of indirect losses, or the Contractor bears very serious consequences.

4. The Contractor bears the delay and cost consequences, and the Employer makes no claim against the Contractor.

7:If the Contractor breaches such provisions, the compensation payable may exceed the contractual limitation of liability

Suspension of the Works attributable to the Employer

Unreasonably high daily rate or maximum amount of Delay Damages

Imposed Delay Damages due to delays attributable to the Contractor

Extension of the Defects Notification Period attributable to the Contractor

Replacement of Contractor's Personnel not in compliance with the Contract

Unforeseeable delays caused by interference or other actions of public authorities

Release from performance under the law governing the Contract

Unforeseeable delays caused by exceptionally adverse climatic conditions

Requirements of any special warranty beyond the standard Defects Notification Period

Unforeseeable delays caused by shortages of personnel or Goods due to governmental actions

Adjustments due to the changes in Laws after the Base Date (Variations arising therefrom excluded)

attributable to the Contractor's use of such munitions, explosives, radiation or radioactive materials

Unforeseeable delays caused by war, hostilities (whether war be declared or not), invasion or act of foreign enemies

Unforeseeable delays caused by rebellion, terrorism, revolution, insurrection, military or usurped power, or civil war

Unforeseeable delays caused by natural catastrophes such as earthquake, tsunami, volcanic activity, hurricane or typhoon

This table represents the first edition of "Contractual Risk Framework, Allocation and Assessment in International Construction Project - An Example of FIDIC GCs". The explanatory documents and related

research findings in both English and Chinese will be successively released on https://www.yutingchen.co.uk/publications and through the "Global Engineering Business Service" WeChat official account

The framework and descriptions of the contractual risks presented in this table are developed based on project management, contract management, and risk management theories, together with the FIDIC 2017

Yellow Book. The Contractor's share of risk is scored by a seven-point scale, increasing progressively from 1 to 7. Items with a score of "0" indicate that no corresponding sub-clauses exist under the FIDIC

Items highlighted in green represent contractual risks with threshold values or those requiring a yes/no determination. Each green-labelled item has its own scoring principle and depends on the specific contract

The risk-weighting scores also adopt a seven-point scale, defined as follows: 1 = very unimportant; 2 = unimportant; 3 = somewhat unimportant; 4 = moderately important; 5 = fairly important; 6 = important; 7 = very important. When determining the weights of contractual risks for a specific construction project, it is recommended that the proportions of scores 1 to 7 be approximately 5%, 10%, 20%, 30%, 20%, 10%, and 5%, respectively. The risk weights presented in this table are general reference values developed from the Contractor's perspective, based on the FIDIC 2017 Yellow Book. In determining these weights, comprehensive considerations have been given to a range of factors, including: the characteristics and nature of the project itself, the geographical location of the works, the probability of risk occurrence, the

The overall risk allocation to the Contractor based on the 2017 Yellow Book (shown in the last column) is calculated as the product of the Contractor's share of risk in the FIDIC 2017 Yellow Book (fourth column)

severity of potential consequences, differences among various forms of contract, the Employer's credibility, the difficulty of resolving risks once they arise, and the Contractor's own competence.

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Changes in quantities of the Works (Variations excluded)

Adjustment of unit rates

of the Advance Payment

Arbitration (or litigation) seat/place is in the Country of the Works

Contractor's non-compliance with the governing law or other applicable Laws

Corrupt, fraudulent, collusive or coercive practice by the Contractor

Losses not covered under any insurance specified in the Contract

Statutory insurance required by applicable Laws or local regulations

Absence or unreasonable profit percentage stated in the Contract

Unreasonable deductible amounts under the insurances

Fraud, gross negligence, deliberate default or reckless misconduct by the Contractor

Contractor's failure to effect or maintain insurance in accordance with the Contract

Employer's failure to effect or maintain insurance in accordance with the Contract

Unreasonable amount of securities, guarantees or bonds required by the Employer

Absence of Advance Payment for Plant and Materials intended for the Works

Unreasonable time period for processing or issuing Interim Payment Certificates

Employer's failure to release Retention Money in accordance with the Contract

Employer's failure to issue Interim Payment Certificates in accordance with the Contract

Unreasonably low rate of financing charges payable for delayed payment by the Employer

Imposition of timeline/target for other Milestones or Sections in addition to the Completion

Rejection by the Employer of the Contractor's programme submitted under the Contract

Unreasonable provisions for Retention Money (the amount/ratio and the release of Retention Money)

Employer's failure to make payments for reasons attributable to the Contractor in accordance with the Contract

Employer's failure to pay amounts due upon termination for Contractor's default in accordance with the Contract

Employer's failure to pay amounts due upon termination for Employer's default in accordance with the Contract

Unreasonably long period for the Employer to review the Contractor's programme, including the initial and revised programmes

Contractor's failure to submit a Quality Management System, or to implement a Compliance Verification System in accordance with the Contract

Restrictions in hiring, using or arrangement of human resource (eg. require to hire local personnel or restrict to hire or use foreign personnel)

Unforeseeable delays caused by riot, commotion or disorder by persons other than the Contractor's Personnel and any other employees of the

Unforeseeable delays caused by shortages of personnel or Goods caused by epidemic, or other public health emergency, or by governmental

Unforeseeable delays caused by munitions of war, explosive materials, ionising radiation, or contamination by radioactivity, except as may be

Principles for Scoring the Contractor's Share of Risk and Distribution of Risk Allocation under the 2017 FIDIC General Conditions (Red, Yellow and Silver Books)

Contractor and Subcontractors; or by strike or lockout not solely involving the Contractor's Personnel and other employees of the Contractor and

Unreasonable minimum amount required for Interim Payment Certificates

Contractor's noncompliance with provisions of the Contract or applicable Laws regarding tax

Unclearance or unreasonableness in provisions regarding the instalments for Schedule of Payments

Variations arising from Unforeseeable physical conditions

Contractor's remedial work of defects not attributable to the Contractor during the Defects Notification Period

Employer's instructions to accelerate the rate of progress to recover delays not attributable to the Contractor

Unreasonably strict time limits for giving Notices of Claim and for submission of the fully detailed Claim

Termination by the Employer for Contractor's default (excluding termination beyond the Contractor's limitation of liability)

Contractor's infringement of intellectual property, industrial property, or patent rights (except where indemnified by the Employer)

Absence of provision requiring the Employer to provide evidence of financial arrangements and to notify the Contractor of any material changes

Unreasonable proportion of Provisional Sums, or unreasonable percentage for overhead and profit when Provisional Sums are used

Unreasonably amount or inappropriate timing of the Advance Payment, or unreasonable commencement point and rate of recovery for repayment

Improper proportion of payment in local currency; strict control of foreign exchange in the Country of the Works

Requirements