



# **PREPARATION OF GUIDELINES TO HAVE SOPHISTICATED CONTRACTOR'S ALL RISK [CAR] INSURANCE POLICIES**

BY

W. P. G. D. R. SENANA YAKE

Supervised by

Dr. L. L. EKANAYAKE

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DEPARTMENT OF CIVIL ENGINEERING  
UNIVERSITY OF MORATUWA  
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## Abstract

Risk is the measure of likelihood of specific unwanted event and its negative consequences that gear to drawbacks of the project. When analyzing the risk, the probability of occurrence and its impacts are reviewed. Commonly used risk responsive measures are the Facing, Taking, Mitigating, Avoiding, Transferring and Sharing.

Construction industry is a sector wherein very poor attitude focused on risk management. The negative impacts of poor management of risks significantly affect time and cost overruns as well as the quality aspects also.

Construction risk and construction insurance run together as the possession of Contractor's All Risk (CAR) Insurance Policy has become a mandatory requirement according to the ICTAD and FIDIC CoC.

The insurance companies admit huge risks to a lower premium and in the mean time Contractors try to bring down the insurance premium as much as possible to increase their profit margin. Hence CAR insurance policies are embedded with many of the strict conditions that relieve the insurers from their liabilities in many instances and the issued CAR insurance policies are not project specific. Neither Employers nor Contractors thoroughly go through such ambiguous terms stipulated in the CAR insurance policies, before an official agreement is made with insurance companies.

The objective of this research is to establish the guidelines to have a sophisticated CAR insurance policy in Employer, Contractor and Project aspects in road projects based on the merits and demerits of the prevailing CAR insurance policies as well as the views of professionals, their knowledge and suggestions gathered through a questionnaire survey.



Twenty two nos. of CAR insurance policies of different major road projects located In different zones [*representative sample*] in Sri Lanka, were collected and analyzed. And one Hundred and Eighty Nine numbers of Questionnaires were also analyzed.

Based on the aforementioned analysis, guidelines were prepared and all achievements are depicted under the Clauses 5.2.1 and 5.2.2.

Key Words: CAR, Contractor, Employer, Insured, Insurer, Loss or Damage, Risk

## **Dedication**

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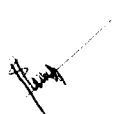
**This dissertation report is dedicated to my beloved parents who always backed me up from my birth to this moment.**



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## Declaration

I hereby affirm that this dissertation report is an outcome of my own effort for the best of my knowledge and it contains my own work done for the fulfillment of requirement for the higher Degree of Master of Science in Construction Project Management. It does not include any written material previously submitted for the award of any preliminary degree, higher degree or diploma of a university or any other institution of higher education, or published by any other person or institution except where acknowledgment and references are made in the text.



Senanayake W. P. G. D. R.

Department of Civil Engineering

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I certify that the above statement is correct.

***UOM Verified Signature***

Dr. L. L. Ekanayake

Construction Management Unit

Department of Civil Engineering

14<sup>th</sup> December 2009

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# Contents

List of Tables.....	viii
List of Figures. ....	ix
List of Appendices.....	x
Abbreviations .....	xi

## **Chapter 01 - Introduction.....1**

1.1 Background .....	1
1.2 Problem Definition.....	3
1.3 Objective .....	3
1.4 Framework/ Scope Limitations .....	4
1.5 Structure of the Report .....	4



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## **Chapter 02 - Literature Review.....5**

2.1 Introduction .....	5
2.2 Risk management in construction industry .....	5
2.2.1 The Benefits of Systematic Risk Management.....	8
2.2.2 Systematic Approach on risk management.....	8
2.2.2.1 Risk Identification.....	10
2.2.2.2 Risk Analysis .....	12
2.2.2.3 Risk Response.....	13
2.2.3 Risk transferring or sharing through the Contract .....	15
2.2.4 Risk transferring or sharing through Sub Contractors .....	15
2.2.5 Risk transferring or sharing through Insurance .....	16
2.3 Construction Insurance.....	16

---

## Contents

---

List of Tables.....	viii
List of Figures.....	ix
List of Appendices.....	x
Abbreviations.....	xi
<b>Chapter 01 - Introduction.....</b>	<b>1</b>
1.1 Background.....	1
1.2 Problem Definition.....	3
1.3 Objective.....	3
1.4 Framework/ Scope Limitations.....	4
1.5 Structure of the Report.....	4
<b>Chapter 02 - Literature Review.....</b>	<b>5</b>
2.1 Introduction.....	5
2.2 Risk management in construction industry.....	5
2.2.1 The Benefits of Systematic Risk Management.....	8
2.2.2 Systematic Approach on risk management.....	8
2.2.2.1 Risk Identification.....	10
2.2.2.2 Risk Analysis.....	12
2.2.2.3 Risk Response.....	13
2.2.3 Risk transferring or sharing through the Contract.....	15
2.2.4 Risk transferring or sharing through Sub Contractors.....	15
2.2.5 Risk transferring or sharing through Insurance.....	16
2.3 Construction Insurance.....	16





2.3.1	General Covers under the CAR Insurance Policy.....	17
2.3.1.1	Contract Works .....	17
2.3.1.2	Removal of Debris, Dismantling and Demolishing.....	17
2.3.1.3	Third Party Insurance.....	18
2.3.2	Workman Compensation Insurance (WCI) Policy .....	18
2.3.3	Construction Plant, Machinery and Equipment Policy.....	18
2.3.4	Development of CAR Insurance Policy.....	19
2.3.5	Contractor’s All Risk Insurance Policy .....	19
2.3.6	Employer arranged CAR Insurance Policies .....	20
2.3.7	Overview of Key Definitions of CAR Insurance Policies.....	21
2.3.7.1	The Insured .....	21
2.3.7.2	Period of Insurance .....	21
2.3.7.3	Sum Insured .....	21
2.3.7.4	Policy Excess/ Deductible.....	22
2.3.8	Premium Calculations.....	22
2.3.9	Insured Obligations.....	23
2.3.10	Intimation of Loss or Damage .....	24
2.3.11	Assessment of Loss/ Damage .....	25
2.3.12	Minimum Conditions to be fulfilled by Claims.....	25
2.3.13	Exemptions of CAR Insurance Policies.....	26
2.3.13.1	Physical Risks Exempted.....	26
2.3.13.2	Other General Exemptions.....	26
2.3.14	Change in risk .....	27
2.3.15	Insurance after the Defect Liability Period.....	27
2.4	Summary .....	28

<b>Chapter 03 - Methodology of Study.....</b>	<b>29</b>
3.1 Introduction .....	29
3.2 Analysis of Prevailing CAR Insurance Policies.....	29
3.3 Analysis of Questionnaire Survey .....	30
3.4 Summary .....	31
<b>Chapter 04 - Analysis of Data.....</b>	<b>32</b>
4.1 Introduction .....	32
4.2 Analysis of Prevailing CAR Insurance Policies.....	32
4.2.1 Premium of CAR Insurance Policies .....	32
4.2.2 Analysis of Common Clauses of Insurance Policies and General Risks Covered.....	33
4.2.3 Other Special Additional Risks Common in CAR Insurance Policies .....	34
4.2.3.1 Warranty Concerning Camps and Stores.....	34
4.2.3.2 Warranty Concerning Sections .....	35
4.2.3.3 Special Conditions Concerning Removal of Debris from Land Slides .....	36
4.2.3.4 Loss or Damage to Crops, Forest and Cultures .....	36
4.2.3.5 Overtopping of Cofferdams .....	37
4.2.3.6 Vibration, Removal of Weakening of Support .....	37
4.2.3.7 Contract Documents.....	39
4.2.3.8 Inland Transit.....	39
4.2.3.9 Property in Offsite Storage .....	40
4.2.3.10 Special Conditions Concerning Underground Cables, Pipes and Other Facilities.....	40
4.2.3.11 Serial Losses .....	41
4.2.3.12 Strike Riot and Civil Commotion Endorsement.....	42

4.3	Analysis of Responses Received to Questionnaire Survey .....	43
4.3.1	Analysis of Results .....	43
4.4	Summary .....	72
<b>Chapter 05 - Conclusion and Recommendations.....</b>		<b>73</b>
5.1	Conclusion.....	73
5.2	Recommendations .....	75
5.2.1	Guidelines to be followed at bidding stage.....	75
5.2.2	Guidelines to be followed at pre-construction stage; at the time insurance agreement is made.....	75
5.3	Recommendations for Future Research .....	78
References.....	.....	79



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[www.lib.mrt.ac.lk](http://www.lib.mrt.ac.lk)

## **List of Tables**

---

Table 1	-	Typical risk allocation in construction projects	page 11
Table 2	-	Analysis of premium charged	page 33
Table 3	-	Reponses received for Questionnaire Survey	page 46



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## List of Figures

Figure 01	-	Illustration of responses received for Query 1	page 47
Figure 02	-	Illustration of responses received for Query 2	page 48
Figure 03	-	Illustration of responses received for Query 3	page 49
Figure 04	-	Illustration of responses received for Query 4	page 50
Figure 05	-	Illustration of responses received for Query 5	page 51
Figure 06	-	Illustration of responses received for Query 6	page 52
Figure 07	-	Illustration of responses received for Query 7	page 53
Figure 08	-	Illustration of responses received for Query 8	page 54
Figure 09	-	Illustration of responses received for Query 9	page 55
Figure 10	-	Illustration of responses received for Query 10	page 56
Figure 11	-	Illustration of responses received for Query 11	page 57
Figure 12	-	Illustration of responses received for Query 12	page 58
Figure 13	-	Illustration of responses received for Query 13	page 59
Figure 14	-	Illustration of responses received for Query 14	page 60
Figure 15	-	Illustration of responses received for Query 15	page 61
Figure 16	-	Illustration of responses received for Query 16	page 62
Figure 17	-	Illustration of responses received for Query 17	page 63
Figure 18	-	Illustration of responses received for Query 18	page 64
Figure 19	-	Illustration of responses received for Query 19	page 65
Figure 20	-	Illustration of responses received for Query 20	page 66
Figure 21	-	Illustration of responses received for Query 21	page 67
Figure 22	-	Illustration of responses received for Query 22	page 68
Figure 23	-	Illustration of responses received for Query 23	page 69
Figure 24	-	Illustration of responses received for Query 24	page 70
Figure 25	-	Illustration of responses received for Query 25	page 71

## **List of Appendices**

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- Appendix 1 - Questionnaire Form
- Appendix 2 - Sample Analysis Sheet of a CAR Insurance Policy



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## Abbreviations

ADB	-	Asian Development Bank
ASCE	-	American Society of Civil Engineers
BoQ	-	Bill of Quantity
CE	-	Chief Engineer
CEB	-	Ceylon Electricity Board
CoC	-	Conditions of Contract
CPD	-	Continuing Professional Development
DAB	-	Dispute Adjudication Board
DLP	-	Defect Liability Period
FIDIC	-	International Federation of Consulting Engineers
GCC	-	General Conditions of Contract
GoSL	-	Government of Sri Lanka
ICTAD	-	Institute of Construction Training and Development
ILA	-	Independent Loss Adjuster
JICA	-	Japan International Corporation Agency
LS	-	Lump Sum
MDB	-	Multilateral Development Bank
N/A	-	Not Available
NHSP	-	National Highways Sector Projects
OH	-	Over Heads
PCC	-	Particular Conditions of Contract
PD	-	Project Director
PII	-	Professional Indemnity Insurance
PS	-	Provisional Sum
RDA	-	Road Development Authority

RoW	-	Right of Way
RRM	-	Random Rubble Masonry
SBD	-	Standard Bidding Document
SRCC	-	Strike Riot and Civil Commotion
WB	-	World Bank
WCI	-	Workmen Compensation Insurance



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# CHAPTER 01

## Introduction

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### 1.1 Background

Risk is the measure of likelihood of specific unwanted event and its negative consequences that gear to drawbacks of the project.

Akintoye and Maclead (1996) describes risk in relation to construction as a variable in the process of a construction project whose variations results in uncertainty as to the final cost, duration and quality of the project.

Managing risk involves creating awareness of uncertainty, quantifying the risks and managing the controllable risk and minimizing the impact of uncontrollable risks by risk allocation/ apportionment (Liu *et al.*, 2003).

Performing a risk analysis, similarly task hazard analysis is a mandatory need, not only for construction projects but also in other type of projects at the inception to achieve the project objectives successfully.

The impact of risk can be measured as the likelihood of occurrence of a specific unwanted event and its unwanted consequences or loss (Mills, 2001). When analyzing the risks, the probability of occurrence and its impact to the project are reviewed. The probability of occurrence of some risks is high; but their impacts may be low. The probability of occurrence of some risks is very low; but their impacts have great influence to the project. At the beginning of any project, risk responsive measures have to be addressed for the risks that have negative influence to the project.

In case of road projects, site visits have to be performed in more specific manner before bidding. Before bidding, some risks can be indentified and risk responsive measures could be assessed. Then the Contractor can forecast the required responsive measures, their availability, applicability and cost. The cost of risk responsive measures can be absorbed in the Contractor's proposed bidding amount and there will not be many issues in implementing the risk responsive measures for identified risks during the project execution. And there will not be drastic cost and time overruns, if the said process is completed more systematically.

Issues arise in case of risks that are not identifiable or quantifiable during the risk identification; **sudden and unforeseen**. Even in some of the identified risks also, probability and impacts are impossible to predict.

Following risk responsive measures are available to deal with the risks.

- Option 1 - Facing/ Taking the Risks
- Option 2 - Mitigate/ Avoid the Risks
- Option 3 - Transfer the Risks
- Option 4 - Share the Risks

The consequences of taking or facing risks may negatively affect the project in cost, time and qualitative manner. If the extents of negative effects of risk taking or facing are high, aggressive results may be encountered.

Risk mitigation or avoidance is one of the well suited methods in dealing with the risks. If risks can be avoided entirely, it causes to have a more distinct project. In this aspect, all project conditions must be fulfilled in more comprehensive manner and sophisticated planning tools and techniques have to be adopted; but it is seldom done in Sri Lanka.

In general, the Option 1 and Option 2 cannot be practiced completely. Planning for Option 1 and Option 2 is not viable in cost and time aspects in the face of project principals; Employer and Contractor. In case of construction projects, the principals mostly look over the Option 3 and Option 4; either transferring or sharing.

In current practice, it is mandatory to obtain a CAR insurance policy that covers principals and their properties, contract works and third party liabilities and in the meantime the allocated cost provision in BoQ may be inadequate to have a comprehensive CAR insurance policy. In this situation, role of insurer comes into the scene. The principal invites the insurer to transfer or share the risks that tentatively occurs during the execution of the project.

Under these circumstances, the insurers separately carry out a risk analysis by their own. The insurer also keeps track of possible risks of the project and the extent of risks to be encountered during the project execution. By analyzing the factors such as site condition, other contract documents; fundamentally BoQ, insurer offers their CAR insurance policy.

In the theory of insurance, the insurer's liability exists with sudden and unforeseen events. The principal must understand that insurer takes or share the risks to a small monetary

portion (premium) compared to the sum insured. The domestic insurance companies do not take the risks fully. Portion of the risk is shared with other party; with reinsurance company or another local partner. Automatically, there is an influence from their re-insurance company on the terms of the insurance policy. Since the insurance companies are also carrying out a profit oriented business, their intention is to gain the profits admitting huge risk to a small monetary benefit that may create a tendency for them to relieve their liabilities.

As a result, CAR insurance policies come with many conditions that relieve the insurer from their liabilities. Insurers embed strict conditions and even small risks cannot be covered during the project run, even though considerable premium is paid to them. This ambiguous terms stipulated in the CAR insurance policy, should be thoroughly studied by the Employer, Contractor or other project agencies; the Engineer, before officially agreeing with said policies.

## 1.2 Problem Definition

The prevailing CAR insurance policies in Sri Lanka are embedded with many strict conditions that relieve the insurers from their liabilities and the issued CAR insurance policies are not project specific. No researcher has previously given attention on these aspects in a comprehensive manner. Therefore, this research addresses to prepare the guidelines to have sophisticated and project specific CAR insurance policies in Employer, Contractor and Project aspects for road projects.

## 1.3 Objective

The objective of this research is to establish the guidelines to have sophisticated CAR insurance policies in Employer, Contractor and Project aspects in road projects based on the merits and demerits of the prevailing CAR insurance policies as well as views of professionals, their knowledge and suggestions.

## 1.4 Frame Work/ Scope Limitations

CAR insurance policy is a contractual necessity of all construction projects; not limiting to the highway construction projects; Architectural projects, Infrastructure projects, etc.

*In connection with highway construction projects, in addition to the CAR insurance policy, following insurance schemes are also available.*

- Workmen Compensation Insurance (WCI) Policy
- Construction Plant, Machinery and Equipment Insurance Policy
- Professional Indemnity Insurance (PII) Policy

*In similar manner to the CAR insurance policy, there are many shortcomings engaged with the aforementioned insurance schemes too.*

The scope of this research is limited only for CAR insurance policies of highway construction projects in Sri Lanka.

## 1.5 Structure of the Report



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The thesis comprises of following five chapters,

- Chapter 1: Depicts the introduction of the report highlighting the background, problem statement, objectives, frame work and the summary of the report.
- Chapter 2: Contains the literature studied on the risk management and construction insurance.
- Chapter 3: Methodology of the research and mechanism of data collection are described.  
Analysis of Twenty Two numbers of Prevailing CAR Insurance Policies and One Hundred and Eighty Nine Numbers of Completed Questionnaires
- Chapter 4: Presents the data analysis based on the prevailing CAR insurance policies and the Questionnaire Survey.
- Chapter 5: Contains conclusion, recommendation and further research areas.

## CHAPTER 02

### Literature Review

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#### 2.1 Introduction

Literature review focuses on previous literature on general risk management, risk management in construction industry, basics of construction insurance as well as risk transferring and sharing techniques through insurer.

#### 2.2 Risk management in construction industry

The articles or any other written correspondences are slightly lesser on risk management practices of the civil engineering projects compared to the other industries.

The idea of risk originated from the mathematics associated with gambling in seventeenth century. The royal society study group (1983:1992) definitions began with risk as “the probability that a particular adverse event occurs during a stated period, or results from particular challenges.”

According to the BS 4778, risk is defined as “combination of the probability or frequency of occurrence of a defined hazard and the magnitude of the consequences of the occurrence.

McKim (1992) and Healey *et al.* (1982) have expressed risk as an exposure to economic loss or gain arising from involvement in the construction process. According to Moavenzadeh (1976), risk is an exposure to loss only. Akintoye and Maclead (1996) describes risk in relation to construction as a variable in the process of a construction project whose variations results in uncertainty as to the final cost, duration and quality of the project. But as per the Hayes *et al.* (1986), risk and uncertainty are part of all construction work regardless of the size of the project.

Most of the Contractors make their emphasis on risks associated with costs. The Project Management Institution (PMI) classifies the risks into four categories; Technical Risks, Organizational Risks, Project Risks and External Risks (TOPE risks). Either one or combination exists in every construction project. Risk can be managed at a reasonable cost



depending on whether the construction firms decide to Mitigate, Accept, Avoid or Transfer (abbreviated as the MAAT options).

The major constraints to effective compliance on risk management were implementation cost, educational barriers and poor attitude to change. While PMI (2004) classified risks into TOPE categories, Smallman (1999) suggested risks may be grouped into two categories; covering direct risk (Human, Organization and Technological (HOT) and indirect risk (Regulatory, Infrastructure and Political (RIP)).

Carmichael and Gartell (1994) defined risk management as the discipline of awareness of potential risk, the assessment of quantification of them and the action taken to reduce or remove them where possible.

Managing risk involves creating awareness of uncertainty, quantifying the risks and managing the controllable risk and minimizing the impact of uncontrollable risks by risk allocation/ apportionment (Liu *et al.*, 2003).

In general, the construction industry deals with continuously varying of instances dealing with many of the unknown, unexpected, undesirable and unpredictable factors. Most of the Contractors' view on risk is as an enemy that adversely affects the successful completion of the project in terms of cost, time and quality. Few Contractors see risk as an opportunity to make profit and not something that will always have negative impacts.

Of many industries in the market, construction industry is the sector where very poor attitude is focused on risk management. Less attention on risk management may turn the potential profitable projects into a loss making project. This situation significantly affects time and cost overruns. Target deadlines cannot be achieved.

There are no definite hard and fast tools and techniques to analyze the risk. Mainly project principal; Employer and Contractor, have different perspectives on risk management based on their experience, attitude, background, etc. One unsurprising factor is the strict time schedules that reasons for not using the risk analysis and management techniques of construction projects.

Hartman (1996) found that both parties; Employer and Contractor, must have a clear and similar understanding of the risk. The project principal should share understanding of their

accountability on the risk events. If not, each party may tend to argue on their liability and responsibility.

However, all should understand, risk management is one of the primary keys to success. In actual practice, the time and cost incurred to risk management is not a wastage compared to their potential losses and incurred additional cost of reinstatement. The knowledge on construction management gears better approach on risk management.

Unforeseeable hazards are imminent in the construction industry. Once hazards are identified, an analysis must be carried out to work out the probability of their occurrence and the impacts. Issues arise in case of risks that are not identifiable and quantifiable; *sudden and unforeseen*.

It is wise to use a combination of risk identification from foresight and hindsight experienced in previous similar projects. The knowledge gained from previous experiences of similar projects, affords different sort of experiences as each project has its own individual identity, characteristics and no two projects are identical. Hence previous experience has an influence in assessing the risks correctly, but their significance and can only be used as a guideline.

The other theoretical method, which is based on the theories of probability, has more serious constraints that can be best illustrated by reference to the well established example that typifies the probability calculations.

The theory of probability is best suited to situations involving large numbers. However large number of similar events does not usually occur in construction. In such instances risk-assessment involving the likelihood of occurrence has to be based only on few occurrences.

There was a boom in Sri Lanka's Construction industry after the reforms of open economy concept as the new investors looked for new business opportunities born through this concept. With rapid growth of construction industry, new foreign Contractors and consultancy firms arrived in Sri Lanka. Most of construction and consultancy firms were private organizations. There are few state-owned organizations who stepped into the construction industry. This brought new challenges on risk management in the construction industry of Sri Lanka.

The best practice is to document the risk management lessons learned to avoid previous mistakes. Although there are many CPD courses in country's construction industry in connection with construction management, surprisingly little attention has been focused on risk management in construction. It shows that there is a gap between active risk management practices in country's construction industry and there is a lack of awareness and knowledge resulting in no exact trend of risk management.

### 2.2.1 The Benefits of Systematic Risk Management

High levels of uncertainty are obvious in construction projects. As a result, there are many assumptions from the feasibility stage up to the bidding stage. Systematic risk management helps to quantify the uncertainty. But, according to Bing (1999), in the absence of such uncertainty, confidence can be increased by knowing where the risk is coming from, how extensive that uncertainty is, and what the potential consequences are.

Having systematic risk management gears to identify certain risks and risk reduction policies. The cost of risk reduction or sharing policies may be absorbed in estimates enabling realistic estimates.

The goals of risk management may therefore differ from one decision maker to another to encompass one or more of the following objectives; ensuring survival of the firm, increasing the market value of the firm, influencing the subsidiaries and Employer, increasing profitability, reducing cash flow volatility, reduce earnings volatility, reducing taxes and enhancing reported results. Fetami *et al.* (2000) noted that complexity, speed of construction and location may contribute to inherent risk within a construction project. Construction firms should certainly require the better and closer understanding as to from where and what those risks originates and to make better judgments on how to manage them.

### 2.2.2 Systematic Approach on risk management

Zou *et al.* (2007) recognized that managing risks in construction projects as a highly important process in order to achieve project objectives in terms of time, cost, quality, safety and environmental sustainability.

The success level of any construction project may well be argued as the ability of project participants to deal with surprises in cost effective manner.



Systematic approach for risk management will be risk clear, formally describing them, leading them easier to deal. According to Godfrey (1996), systematic risk management helps to;

- Identify, Assess, and Rank risks making the risks explicit.
- Focus on major risks of the project.
- Make informed decision on the provision for adversity, e.g. mitigation measures;
- Minimize the potential damages in which worst consequences happen.
- Control the uncertain aspects of construction projects.
- Clarify and formalize the company's role and the role of others in the risk management process.
- Identify the opportunities to enhance project performance.



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If the risks are not identified, it cannot be controlled, transferred or otherwise managed (Bajaj, 1997). Therefore, the very first step is to hold a risk survey for risk identification and subsequently those identified risks are analyzed and thereupon appropriate responses to be determined. There are no hard and fast theories on risk management. Instantaneous tools and techniques can also be applied. Risk management is not an on-off activity; it is a continual process to be applied from the inception and throughout the life of the project. Risk Management can be viewed in three stages (Jafari and Anderson, 1995).

1. Risk Identification
2. Risk Analysis
3. Risk Response

### 2.2.2.1 Risk Identification

Many have argued that the construction industry is poor at carrying out risk identification (Flanagan and Norman, 1993; Baker *et al.*, 1999).

This is the first and essential step in risk management and is possibly the most complicated. Identification of risk sources and its components, and consideration of influence factor on the project (listing according to the priority) are the major components.

The better approach is to identify risks at the commencement of the contract enabling all parties to know their stand point than to argue on their liability and responsibility after the event. Assembling a risk review team representing key stakeholders in the project will provide a way to identify and collect large number of risk factors and communicate them within the project team.

Risk Identification should be carried out as a part of a project initial definition process together with project planning, budgetary allocations and scheduling; not only by the Contractors but the Employers too. Not limiting to the cost oriented approach, the risk identification assist a choice on strategies to response to risks. If risks are identified and managed from the very inception of project, the consequences to the end product will be less as the expenditures to implement changes to the project is less at the project inception.

Risk factors generated by the project agencies can be considered more valued than that of done by outsourced personnel to the project. The panel inclusive of Employer and the Contractor, can judge the project specific risks in estimating and tendering stage. The cost incurred on risk reduction and avoidance as well as risk retention to be absorbed to the estimates reducing vague arguments either with Employer or Engineer during the project run.

Risk identification is not simple and becomes more intricate. It is not possible to explore all possible risks in a construction project since some risks are project specific, time dependent as well as results of Acts of God. But previous experiences on this subject may reduce the complexity of this subject. The techniques backed by expert judgments largely affect to achieve more accurate outcome; lessons learned from past experiences.

Contractors traditionally focus on high mark up to cover construction risk. But, owing to the competitive nature of construction industry with existence of many Contractors, keeping higher mark up would be no longer effective; Contractor may lose the project. Acquisition of a right judgment on risk identification is highly important to design subsequent responses properly.

The intensities and varieties of risks will be changed when the company operates in overseas. This is most complex because of lack of knowledge on country's environment and local partners.

**Table 1 - Typical Risk Allocation in Construction Projects**

<b>Risk Allocation</b>	<b>Risk Description</b>	<b>Insurable/ Non-insurable</b>
<b>Contractor</b>	Labor and Equipment Productivity	Non-insurable
	Quality of Work	Non-insurable
	Labor, equipment and material availability	Non-insurable
	Safety	Insurable/ Non-insurable
	Defective Material	Non-insurable
	Contractor Competency	Non-insurable
	Inflation	Non-insurable
	Actual quantities of work	Non-insurable
	Labor disputes	Insurable/ Non-insurable
<b>Employer</b>	Differing site conditions	Insurable/ Non-insurable
	Defective design	Non-insurable
	Site access/ right of way permits and ordinances	Non-insurable
	Changes in government regulations	Non-insurable
	Delay payment on contract	Non-insurable
	Changes in Risk	Insurable/ Non-insurable
<b>Shared</b>	Financial failure-any party	Non-insurable
	Change order negotiations	Non-insurable
	Contract-delay resolution	Non-insurable
<b>Undecided</b>	Acts of God	Insurable/ Non-insurable
	Third-party delays	Non-insurable

### 2.2.2.2 Risk Analysis

Risk analysis is the quantification of risks according to the magnitude and frequency or time frame of each event. Simply, probability and impact of risks are assessed. The event/occurrence is a single incident or an aggregation of incidents. Following techniques can be used for risk analysis.

- Code optimization (which is based on subjective information)
- Sensitivity analysis
- Montecarlo Simulation (Songer, 1997)
- Kinetic tree analysis (which allows the estimated probability of each alternative to be recorded and the probability of sequence of events to be determined (Denhall *et al.*, 1986).

The likelihood or the probability of an adverse event is usually expressed in terms of number of such events expected to occur in a year (Godfrey, 1996). The consequence of an adverse event, sometimes called damage, is often explicit in monetary terms.

There are some risks in which probability of occurrence is low, but their negative impacts to the project are high or vice versa. Hence there are no theories to judge the probability of occurrence. Determination of probability of occurrence is mainly based on the assumptions governed by the experience. Then there may be adverse outcomes associated with incomplete assumptions made on it. As an example, underground conditions may be anticipated. But their likelihood and impact are hard to predict in precision. Under these circumstances only, the necessity of contingency allowance is arisen. Although some events can be recognized in advance, the impacts cannot be quantified. As an example, industrial disputes, delayed decisions or change orders.

The impact of risk can be measured as the likelihood of occurrence of a specific unwanted event and its unwanted consequences or loss.

$$RI = L * C \quad \text{where} \quad \begin{aligned} RI &= \text{Risk Impacts} \\ L &= \text{Likelihood; and} \\ C &= \text{Consequences (Mills, 2001)} \end{aligned}$$

### 2.2.2.3 Risk Response

Risk Response consists of the selection and implementation of appropriate risk treatment strategies. But each identified risk cannot be treated and only the potential risks that have greater impact to the project must be treated. The formation of appropriate treatment strategy depends upon the severity of impact, organization resources capacity and cost of those possible treatments.

In a risk allocation survey, respondents were asked to place risk allocation in construction into three categories (Roozbeh, 1995).

- Allocation of risk to the Contractor.
- Allocation of risk to the Employer.
- Or sharing the risk by both Contractor and Employer.

In similar survey carried out by ASCE in 1979, shows that Contractors were less willing to accept or share the risk. Instead they preferred the Employer to accept those risks.

Clauses 2, 3, 4 and 17 of ICTAD SBD2 CoC and FIDIC 2006 March Edition (MDB Harmonized Edition) CoC define the ownership of some obligation, risks and responsibilities of each party to contract.

If there is no logical approach on risk management, once the Contractor completes the tender estimates, some contingency component is added to the estimated bid to face the risk. But this is only an allocation of monetary provision without logical risk analysis. This process invariably shows that Contractor understand that there are project risks. The absorbed contingencies are the result of past experiences obtained in similar projects.

This contingency allowance is often called as the risk premium. Risk premium of construction projects is introduced to protect the Contractor from unforeseen eventualities. The percentage or the amount allocated on behalf of risk premium depends on the risk exposure experienced by each firm. Accordingly they are in a position to determine the likelihood of occurrence and its impacts. The realism of contingency plans varies as the project proceeds; in most cases it is subjected to increase. Most of the critical decisions should be taken in this stage as allocations of contingencies are considered to counter the risk in this stage. Even though this step is complicated and difficult, it becomes a computational need to reach for holistic approach to make the project success.

Employer understands that there are certain risk in connection with cost overruns due to cost escalations and new variations. The typical mitigation measure is to put contingency clause adding 10~20% to the estimated cost. But, in a field as complex as construction, this simple contingency clause is totally inadequate to defend against possible other risks. Risk cannot be eliminated entirely, but it can be minimized, transferred or retained (Burchett, 1999).

There are many ways to respond to risk; some of which may be used in combination. The risk response measures should address the followings.

- Facing/ Taking the Risks
- Mitigate/ Avoid the Risks
- Transfer the Risks
- Share the Risks

Risk comes in different scenarios and subjected to variations instantaneously depending on the situation. Employers are mostly focused on eliminating the risk on project scope and objectives. Contractor should determine whether they should retain, reduce, share or transfer the risk at the inception.

The ASCE found that Contractors are reluctant to accept or even share the risk. But Contractors are not relieved from his liability for the construction risk. The Contractors' competence is the key factor for the risks that is to be borne by them. Facing or taking the risks is highly vulnerable to the Contractor in terms of cost, time and quality aspects. As the extents of consequences cannot be determined precisely, aggressive results may be encountered. Hence Contractors hardly tend to take the risk, only in the absence of other options or the possible financial loss is little, likelihood of occurrence is negligible and the transfer is uneconomical.

Risk mitigation or risk avoidance is a recommendable option in dealing with risks. If the risk can be avoided entirely, it causes to have a more distinct project. In this aspect, all the project conditions must be fulfilled in more comprehensive manner and sophisticated planning tools and techniques have to be adopted; but it is seldom practiced in Sri Lanka.

Some countries and some zones in the world are identified as high risk areas for construction. These include places where earthquake take place, war zones, etc. Some Contractor and Engineer organizations do not bid for the construction in these areas to avoid risk.



In the meantime some Contractors and Engineer organizations avoid using unproven or untested method or techniques of construction for their work to avoid the risks. Risk mitigation includes the use of different construction techniques, redesign of projects, advanced site investigations, etc.

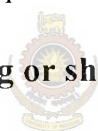
In general, the Option 1 and Option 2 cannot be practiced completely. Planning for Option 1 and Option 2 is not viable in cost and time aspects in the face of project principal. Hence, in case of construction projects, principals mostly look for transferring or sharing options.

According to Perry and Hayes (1982), four methods are used by Contractors in risk transferring viz. relationship between Employer and Contractor, Sub Contractor, Design Team and Insurer.

Contractors are frequently relying on three methods in transferring or sharing the risks.

1. Through modifying the contract conditions to Employers or other parties.
2. Through Sub-Contracting to Sub Contractors.
3. Through insurance policies to insurance companies.

### 2.2.3 Risk transferring or sharing through the Contract



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Indemnity through contract arises out of specific agreements requiring one party to indemnify and hold harmless another party from all liability for damages arising out of a specific event.

- Contractor's and Employer's obligations and responsibilities are separately described in the CoC.
- PCC define project specific obligations.
- Contingency portion is allocated in the BoQ summary page.
- Issuing addendums in bidding stage.

### 2.2.4 Risk transferring or sharing through Sub Contractors

In today's scenario, of the risk transferring oriented systems, there is a huge tendency of subletting all work packages involved in a project to sub Contractors and main Contractors undertake only a contract management role. Most of the Contractors turn on "back to back" sub contract agreements to the main contract.

### 2.2.5 Risk transferring or sharing through Insurance

Most efficient and effective way is to allocate the risk to a party who is in a best position to accept it. There are circumstances where the size of compensation undertaken through a contract of indemnity or other way is larger than the Contractor can afford or fulfill through his own resources. In such a case Contractor may choose to shift the liability attached to another party; insurer (usually insurance company) and the contract of indemnity is then in the form of an insurance policy.

Construction insurance encompasses all contracts of indemnity within the activities of insurances of the construction industry where insurance is chosen as the medium through which liabilities are shifted.

But all construction risks cannot be insured. Of the identified risks, only extracted insurable risks can be insured.

### 2.3 Construction Insurance

Accidents are inherent consequences of construction contracts. The responsibility for injuring, loss or damage and the financial impact of such injury, loss or damage must be determined.

Insurance acts a major role in construction projects where things going wrong are eventually normalized by the insurer.

Risk management and construction insurance run together. No single can be discussed alone. In Sri Lanka, still there is not much attended on structured construction insurance. Attention drawn on systematic approach for risk management through insurance in construction industry is still inadequate in Sri Lanka. In current project scenario, insurer's role comes more widespread.

Insurance policy is the set of terms and conditions imposed by the Insurer to the Insured defining sum insured, how insurer's liability exists, insured obligations, risk covered, exemptions, extent of covers, deductible/ excess, etc. The terminology of insurance is linked with legal terms of common law.





Construction Project Insurance Policies mainly concern following insurance schemes.

- Contractor's All Risk Insurance (CAR) Policy
- Workmen Compensation Insurance (WCI) Policy
- Construction Plant, Machinery and Equipment Insurance Policy
- Third Party Insurance Policy

### **2.3.1 General Covers under the CAR Insurance Policy**

#### **2.3.1.1 Contract Works**

This cover indemnifies the Contractor against the damages occurred to the Contractor's permanent works completed, partially completed works with associated temporary works during construction period and up to end of Defect Liability Period.

#### **2.3.1.2 Removal of Debris, Dismantling and Demolishing**

This is one of the common clauses of every CAR insurance policy despite the type of project, contract value, the insurer, etc. Principals give their concern to this clause at the time when insurance agreement is made as there are many substantial claims under these clauses. This clause commonly includes;

- Removal of Debris
- Dismantling
- Demolishing

Earth slips are abundant in Road Rehabilitation Projects. The cases of removal of debris may be considerable and it is a repeated activity in case of road projects because of inclement weather. The extent of damage may be in a wide range from small scale to large scale. Some earth slips possess continuation effects at same specific places becoming land slide prone area. If the road project goes through the land slide prone area, the extent of damage and subsequent cost involvement may be extensive. Even in a little rain, either large number of local collapses or major landslides are the result.

Sometimes flood damages also badly affect the construction site in the mode of removal of mud and silt, washing off the construction materials or the damages to completed works and partially completed works.

For partially damaged works, sometimes the remaining portion may not be usable and those remaining portions may have to be demolished to prevent further collapses or the remaining portion may be propped up or shored. Removals of debris, dismantling or demolishing and shoring or propping are collective unforeseeable occurrences that are to be covered under this clause.

### 2.3.1.3 Third Party Insurance

Both Contractor and Employer may face claims from third parties alleging injury to person or property. The Contractor shall without limiting his or Employer's obligations and responsibilities insure against liabilities for death or injury to any person or loss or damage to any third party property so that the liability of the Contractor for causing injury to third party bodily injury or property damage of third party is covered.

The obligation of the principals' is to make effect Third Party Insurance "throughout the execution of the works" i.e. "against liability on third parties but not the works" and this should exist up to end of DLP.



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### 2.3.2 Workman Compensation Insurance (WCI) Policy

The Contractor shall indemnify the Employer against all losses and claims in respect of death of or Injury that may arise out of or in consequence of the execution and completion of work and the remedying of any defects to workman.

### 2.3.3 Construction Plant, Machinery and Equipment Policy

This section covers the accidental damages on the Construction Plant, Machinery and Equipment. Generally the premium depends on the valuation done for Plant, Machinery and Equipment to be insured, considering the present value less depreciation, at the time insurance proposal is made. But generally Contractors tend to underestimate with the intention of reducing the premium.

### 2.3.4 Development of CAR Insurance Policy

A CAR Insurance Policy was first issued for the Construction of Lambeth Bridge over the Thames river in England as long ago as 1929. But such policies were rare until the boom in construction industry following the 1939/45 war.

The demand for wide cover on the works was made mandatory with the arrival of Second Edition (January 1950) of the Institute of Engineers GCC.

In today's context, possession of CAR insurance policy is a contractual requirement according to the ICTAD and FIDIC Conditions of Contract. Both ICTAD SBD2 CoC and FIDIC 2006 March Edition CoC contains indemnity clauses; Clauses 18 of ICTAD SBD2 CoC and FIDIC 2006 March Edition CoC. Each PCC defines the necessary amendments to the general insurance clauses particular to each project.

In good old day's contracts, it was sufficient only to indemnify the contract works and the Contractor's resources; Manpower, Material, Plant and Machinery. But with the complexity of the project structures, Employer identified that he does not have a room to insure and subsequently Employer redefined that CAR insurance policy should be taken in joint names of principals; Employer and Contractor.

As explained above, depending on the PCC's stipulated terms, other insurance categories may be there. In some projects, PCC compels to take even Professional Indemnity Cover under the CAR insurance policy.

### 2.3.5 Contractor's All Risk Insurance Policy

The term "*All Risk*" is a misleading form of short hand termed saying that every loss or damage covered by the CAR insurance policy. But the term "*all risk*" does not imply that each and every loss encountered due to any of the risk is simply covered. Insurance policy covers only the "damage to the property insured" from "accidental loss" or "the loss or damage occurred from sudden and unforeseen accidents."

CAR insurance policy can be obtained either for an individual construction contract or on an annual basis whereby all contracts undertaken by the company is insured for a value individually below an agreed sum.

There are no standard insurance policies in insurance field. Insurer or underwriter use their own insurance terms but subjected in accordance with the insured interests and requirements.

Individual policies are based on sum insured (estimated contract value and additional percentage) and annual policies are normally based on an estimated turnover on the annual works to be completed.

Under both annual and individual policies, CAR insurance policy cover applies not only for the contract works and works in progress, but also for all materials incorporated, temporary works that are dismantled and removed as the permanent works are completed, like shuttering, timbering, formwork, contractor's camp premises, etc.

The insured property can and should be covered during transit to the site. Some policies extend to cover the forgoing items while at any premises within the geographical limits of the policy; mostly say within the territorial limits of the country.

The typical policy provides cover for the cost incurred in reinstating of damages, removal of debris and cost of demolition.

### 2.3.6 Employer arranged CAR Insurance Policies & Dissertations



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On very large projects where large numbers of sub Contractors are employed as a consortium, rather than having individual CAR insurance policies depending on the work scope of the each sub contractor, one Umbrella CAR insurance policy is the pertinent method of covering all main Contractor and the sub contractors as well. This sort of Umbrella CAR insurance policies are arranged by the Employer so as to the similarity of cover for all contracting parties, the proper annotation of the Employer's interest and the adequacy of overall protection and control settlement of claims.

## 2.3.7 Overview of Key Definitions of CAR Insurance Policies

### 2.3.7.1 The Insured

The insured should be in the name of principals; Contractor and Employer. In some instances, additional parties are included such as Sub-Contractors.

Generally on the demand side, insured may try to purchase an insurance policy as low cost as possible, but fail to cover wide variety of risks. On the supply side, insurers do not cater as much insurance as possible covering wide range of risks to a low premium.

There is a general view that insurer and insured are the counter parties and there is no collaborative culture. And also no corporation between Contractors and insurance companies exists in general attitude.

### 2.3.7.2 Period of Insurance

Generally CAR insurance policy covers the total project duration and the DLP. The premium depends on this factor too. If the Contractor has any time extension granted, period of insurance should also be extended paying an extra premium to the insurer for the extended period.

There are some insurance policies that are on annual basis covering contract works for one year and subjected to renewal instead of project basis.

### 2.3.7.3 Sum Insured

It is paramount factor to determine sum insured. Otherwise serious losses may be encountered for both Contractor and Employer. Since the responsibility rests upon the Contractor in reinstating loss or damages mostly, Contractor solely depend upon the sum insured. Most of the Contractors are not financially strong and cannot afford to carry heavy uninsured loss.

In the contracts of three decades back, the sum insured was the estimated contract price and most often the amount was inadequate. To bridge this gap, the FIDIC 1987 CoC, compels the Contractors to insure additional 15% of the estimated contract price. Unless the additional sum insured, the variations that are usual most of the contracts, cannot be covered.

In all occasions when the sum insured exceeds, the insurer should be duly notified and get an extra cover.

Adequate care should be taken to determine the sum insured. Sum insured should not be only the total BoQ amount. There should be additional amount also to be insured to cover “*any additional costs of and incidental to the rectification of loss or damage including professional fees and the cost of demolishing and removing any part of the Works and of removing debris of whatsoever nature*” according to the FIDIC 1987 Edition. As has been described above, indemnity clause of FIDIC 1987 Edition clearly depicts that sum insured should be 15% excessive of estimated BoQ amount. But latest FIDIC 2006 March Edition does not state the extent of additional amount. There is a tendency of insuring a reduced sum by the Contractors with the intention of reducing the premium. Under these circumstances, there will be a risk of all the associated project risks not being covered by the insurance.

#### **2.3.7.4 Policy Excess/ Deductible**

It is common in almost all the CAR insurance policies and for each and every claim, excess/deductible is applied and the extent depends on the amount of claim or nature of activity or occurrence. The first portion of each and every claim has to be borne by the insured. For greater impact of risk, CAR insurance policy offers higher deductible and vice versa. This excess conditions imposed, compels the Contractor to execute reasonable precautions against the damages as Contractor is aware that he is liable to bear this first portion. This portion can be considered as self insurance portion of the insured.

Some insured voluntarily accept the substantial excess that is considerably higher, as the counter effect is the reduction of premium for the particular policy.

#### **2.3.8 Premium Calculations**

In reality, insurance company involved with the business has very much of uncertainty. They take the responsibility of high risks to a very low premium compared to the project value. The premium is normally computed as a percentage of sum to be insured. There is no specific percentage that depends on the insurer's ability of risk taking, nature of project specific risks, prevailing economic situation, exclusion clauses and the insurer's experience with



respective insured, etc. In minimum risk areas, it may vary 0.05-0.35 % of sum insured and high risk areas (first class risk), it may vary within 15% to 20% of sum insured.

Some insurers offer provisional premium at the inception and premium is adjusted by returning, if any or by additional premium charged, once the insured disclose his annual turnover.

The professional insurers deploy his risk engineer to carry out a risk analysis and accordingly, insurer adjust the premium that suit to cover the possible risks specific to the project. It should be understood that no insurance policy will cover all risks as the insurer too is running a profit oriented business.

### 2.3.9 Insured Obligations

Contractor and Employer would be collectively strong in negotiating with the insurer. Then insurer's conventional CAR insurance policies may be well argued, and project specific risks that were observed jointly to be transferred or shared, can be covered to a satisfactory level.

Having a CAR insurance policy does not relieve the Contractor from his obligations and it is not intended to follow substandard methodologies, poor management and supervision of the Contractor expecting monetary assistance from the insurer for each and every loss or damage that may arise due to Contractor's negligence. The insured is required to take "all reasonable precautions" to avoid loss or damage. Possessing an insurance policy does not allow insured to trial short cuts. No negligence and carelessness is expected from the insured. The theory is, the insured should process in same manner in despite he is insured or not.

Insured is expected to provide accurate intimations on the projects at the time proposal is first made to the insurer on the risks that are deemed to form the basis of the policy. Any inaccuracies, misinterpretation or hidings will afford insurer opportunity to avoid the claims. Disclosure of all material facts is essential.

The information required to insurer is not readily available or not in the form, they require. At the time, actual claim is arisen, insurer investigates more deeply on the information provided to him and if there are ambiguities on the facts originally provided, assessing claims are not easy.

Exposure of all material facts in good faith is the prime obligation of both insurer and the insured, at the time the insurance proposal is discussed.

The terms of the policy should be approved by the Employer. Contractor must produce the specimen policy and ultimately once the Employer agreed, Contractor should furnish originals of agreed insurance policy and produce the receipt for payment of the premiums. The Employer should also be more sensible, when he receives the terms of the specimen policy, as he too is benefited and he may understand the extent of coverage.

But in prevailing practice, insurer tries to maximize their profit imposing many constraints. Hence the Contractor should be vigilantly and study the terms and exclusion clauses stipulated in the policy before entering to the legal agreement with the insurer rather than seen the policy once there is a loss or damage for which he feels to recover the reinstatement cost from insurer. Thereupon, insured is aware on uninsured risks and seek precautionary measures or any other risk transferring or sharing techniques other than insurance.

Choice of insurer should not solely be depend on the basis of low premium only. Risk survey will pin point hazardous factors. Reputation, financial stability and past records on insurer's perspectives on settling similar claims are the other essential factors to be considered.

Before issuing the CAR insurance policy, some insurer's gather information on how long the Contractor has been in business, Contractor's experience in similar type of work, details of pervious insurances held by him, the type of claims lodged in previous years. Besides with the increasing number of insurance companies, they may also be more flexible to the insured.

If there is availability of other policy that covers the same risk, the CAR insurance policy will not pay until other policy is exhausted.

### **2.3.10 Intimation of Loss or Damage**

In the event that may give rise to a claim, insured should facilitate the insurer to investigate the incident as the facts are still fresh in site as well as mind of all personal concerned in event. There is a maximum time period stipulated in the CAR insurance policy during which the incident should be notified to the insurer. Otherwise, entitlement of insured becomes void; generally within 14 days of the incident.



### 2.3.11 Assessment of Loss/ Damage

The indemnity may be repair, re-instatement or replacement of any property loss or damaged or monetary payments of the same amount. But in practice, it is normally a monetary payment.

In case of insurance, insurer's liability exists only for actual replacement up to the original status. The insurer does not possess liability for the cost of alternations, additional, improvements or overhauls at the time of reinstating of the loss or damage and not liable for any modification, any material change from original material, etc. Claim settlement cannot be more than the insured amount of respective risk category. It should be understood that insurer's liability exists only to settle the loss of original condition. As an example, if there is a failure of RRM wall, insurer pays only the replacement cost of RRM wall that was originally existed. No modification is allowed; any replacement of concrete together with structural enhancement is not indemnified as well as insurer will not pay for the cost of repairing or replacing the property that is defective in materials or workmanship.

The Insurer appoints an Independent Loss Adjuster who is deemed to act impartially on behalf of principals to assess the claims. However there is a general view in the industry that loss adjusters are not impartial, even though they are to be deemed as impartial, as far as they are financially benefited by the insurer. The ILA may seek the assistance of other professionals who are experts on relevant fields. Those professionals include Lawyers, Quantity Surveyors, Project Managers, Accountants, etc. It is necessary to appoint a qualified professional as an ILA who possesses diversified knowledge and experience on Civil Engineering and Construction Insurance rather than having inexperience personnel.

Appointing inexperience personnel only to comply with the requirement affects badly for both insurer and insured in following manner.

- Claim evaluation may not reflect actual loss, either less or more.
- Claim evaluation may be biased to either insurer or insured.

### 2.3.12 Minimum Conditions to be fulfilled by Claims

- The loss or damage must occur during the existence of the CAR insurance policy. Once the policy lapses, cover does not exist unless the policy is extended.

- The CAR insurance policy is limited to the loss or damage within the site or adjacent to site.
- The event should be notified to the insurer within the stipulated time mentioned in the insurance policy.

### 2.3.13 Exemptions of CAR Insurance Policies

#### 2.3.13.1 Physical Risks Exempted

- Damage to wear, tear, rust and mildew during the execution of CAR insurance policy since insurer observe those as a trade risk or uninsurable.
- The CAR insurance policy does not cover loss or damage arising out of fault, defect, error or omission in design and defective workmanship as well. These exclusions are clear as the insurer is prepared to cover risks of loss or damage to the works during construction.
- The faults, defects, errors and omissions that are the outcomes of professional negligence. In such cases, there is a separate insurance policy named Professional Indemnity Insurance.



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#### 2.3.13.2 Other General Exemptions

These exceptions normally appear in CAR insurance policies due to various reasons.

- Some risks are uninsurable.
- There is a limit up to which insurer pays the claims, but not beyond the defined limit. This is termed as “limit of indemnity.” It is generally limited per event; in insurance jargon “occurrence.” In connection with, third party damages despite the number of claim events, the indemnity amount will be limited to the total aggregate amount mentioned per “occurrence” or “total aggregate of occurrence.”

- The insured retained deductibles/ excesses mentioned in the policy. Those are intended to be de-attached from the insurer by small claims. In some cases, high excesses are imposed as the feature of the risks has adverse impacts by compelling the Contractor to take reasonable precautions against them.
- Some risks are covered through some other insurance policies. To avoid the duplication of cover and overpayment, premium of those have been ignored. Eg. there is a separate insurance policy for Professional Indemnity Insurance and those are not insured in the CAR insurance policy.
- Some risks are inevitable, unavoidable or deliberate.
- Due to the lack of information, some risks are not insured.

#### 2.3.14 Change in risk

Any change in risk during the execution of the project should be notified to the insurer. It may be either a change of physical site condition, introduction of variation or an increment of BoQ quantities. Accordingly assessed risk at the time of insuring may be changed and then insurer will adjust his premium; mostly additional premium has to be paid. This change of risk should be informed by the insured in utmost good faith. In today's culture, most things are sensible on monetary provisions. Due to the reluctance of paying an additional payment, insured does not duly notify the insurer. If the insurer or ILA is experienced personnel, he may request revised BoQ, change orders, other variations to the contract, etc. in regular intervals.

#### 2.3.15 Insurance after the Defect Liability Period

The object of CAR insurance policy is to cover the loss or damage arising out during the construction period. Once the Defect Liability Certificate is issued, the liability of loss or damage passes to the Employer. Beyond the DLP, it is the responsibility of the Employer to arrange his own insurance policy. But in Sri Lankan practice, the Employer does not maintain their own insurance policy beyond the DLP for Highway projects. This is key area in which Employers should focus. Some risks are imminent even during service period of the

highways. The frequent examples are the land subsidence or earth slips. Once these sorts of incidents occur, in some instances, Employer is not wealth to implement even temporary measures due to monetary deficits resulting in enormous hindrance to the road users. Some temporary measures remain for many years without permanent solutions. Employer does not focus on insuring the highways either focusing to save insurance premiums or their attitude to rely on the conventional practices. Negative impacts of non-implementing of post construction insurance schedules may surely be higher than the cost of insurance premium that could have been spent.

## 2.4 Summary

Risk is the measure of likelihood of specific unwanted event and its negative consequences that gear to drawbacks of the project resulting cost and time overruns as well as quality aspects too.

Risk Management can be viewed in three stages.

1. Risk Identification
2. Risk Analysis
3. Risk Response



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Out of the risk responsive measures viz. Facing, Taking, Mitigating, Avoiding, Transferring and Sharing, Contractors tend to transfer/ share the risk to a party who is in a best position to accept it and then insurer's role comes in to the scene.

Possession of CAR insurance policy has become a mandatory requirement according to the ICTAD and FIDIC CoC. The CAR Insurance policy indemnifies the Contractor against the damages occurred to the Contractor's permanent works completed, partially completed works with associated temporary works and other project specific risks and liabilities for death or injury to any person or loss or damage to any third party property during the construction period and up to end of Defect Liability Period.

CAR insurance policy stipulates the set of terms and conditions defining sum insured, how insurer's liability exists, insured obligations, risk covered, exemptions, extent of covers, deductible/excess, etc.

## CHAPTER 03

# Methodology of Study

### 3.1 Introduction

In compliance with the literature studies on the construction risk and the construction insurance as summarized in Clause 2.4, methodology of research, data collection and analysis were done in two different modes in order to achieve the objectives.

- Analysis of Prevailing CAR Insurance Policies
- Analysis of Questionnaire Survey

### 3.2 Analysis of Prevailing CAR Insurance Policies

With a view of finding merits and demerits of the prevailing CAR insurance policies issued to highway projects, CAR insurance policies were subjected to analyze.

Twenty two nos. of CAR insurance policies of different major road projects located in different zones [*representative sample*] in Sri Lanka, were analyzed. CAR insurance policies were collected mostly from the Employer organization as well as from the Contractors' organizations.

The main indemnity clauses of prevailing CAR insurance policies that have been issued by different insurance companies in Sri Lanka were precisely gone through highlighting the sum insured, premium charged, risk covered, extent of covers and deductible/ excess, etc.

Road Projects in which CAR insurance policies were subjected to review are as follows.

- Balangoda-Bandarawela Road (A4 and A16)
- Kandy-Mahiyangana Road (A26)
- Nittambuwa-Kandy Road (A1)
- Panaduara-Ingiriya Road (A8)
- Ingiriya-Ratnapura Road (A8)
- Maradankadawala-Jayanthipura Road (A11)
- Bandarawela-Welimada Road

- Ampara-Karativu Road (A31)
- Wellawaya-Siyambalanduwa Road
- Bandarawela-Haliela Road
- Habarana-Kantale Road (A6)
- Ella-Wellawaya Road
- Diyatalawa-Bandarawela Road
- Nuwaraeliya-Badulla Road (A5)
- Puttalama-Nochchiyagama Road (A12)
- Nawakkuli-Mannar Road (A32)
- Padeniya-Puttalama Road (A10)
- Jayathipura-Thirukkondiyamadu Road (A11)
- Galle-Deniyaya Road
- Peliyagoda-Puttalama Road (A3)
- Ambalangoda-Elpitiya Road
- Matara-Wellawaya Road (A2)

### 3.3 Analysis of Questionnaire Survey



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The second method was to collect the views, knowledge and suggestions of professionals in highway sector on Risk Management and CAR Insurance Policies by distributing a questionnaire.

To overcome the present deficiencies in future CAR insurance policies, highway sector professionals' views, knowledge and suggestions on Risk Management and CAR Insurance were gathered through the Questionnaire Survey.

The initial questionnaire was subjected to revisions according to the guidelines given by the supervisor, as the original questionnaire was mostly deviated from the objective as well as it was not user friendly.

Final questionnaire (refer the Appendix 1) is prepared to grab the key issues for collecting the highway sector professionals' views, knowledge and suggestions on Risk Management and CAR Insurance Policies. And final questionnaire is more specific with the objective and is in a user friendly manner. It can be filled without consuming a longer time.

Three hundred twenty six numbers of questionnaires was distributed via Electronic mail and Facsimiles. Respondents represented different organizations; Employers, Engineers and majority from Contractors organization. In addition, respondents' experiences are ranging from two years to thirty five years in different disciplines of civil engineering viz. highway construction, construction management, quantity surveying, etc.

### 3.4 Summary

Twenty two numbers of prevailing CAR insurance policies that are issued for major road projects located in difference zones of the country, issued by difference insurance companies, were analyzed to observe the merits, demerits, etc.

Three hundred and twenty six numbers of questionnaires were distributed to collect the views, knowledge and suggestions of professionals on Risk Management and Insurance.



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## CHAPTER 04

### Analysis of Data

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#### 4.1 Introduction

Based on the data collected through the planned methodology depicted in Clause 3.4, this chapter concerns thorough analysis on the twenty two numbers of prevailing CAR insurance policies and one hundred eighty nine numbers of completed questionnaires.

#### 4.2 Analysis of Prevailing CAR Insurance Policies

##### 4.2.1 Premium of CAR Insurance Policies

During the analysis of CAR insurance policies, it could be noted that project principals duly comply with the indemnity clauses stipulated in the Contract Document. Principals have to pay some considerable premium in obtaining CAR insurance policy. The premium depends on the sum insured that is contract value with other additional percentage specified in the contract. According to the analysis done based on the prevailing CAR insurance policies, it reveals that percentage of premium varies from 0.05% to 0.35% of sum insured as depicted in Table 02.

Table 02 - Analysis of Premium Charged

No.	Project	Sum Insured/Rs.	Premium Charged/Rs.	Percentage of Premium	Remarks
1	Project 1	1,269,666,917	2,604,555	0.21%	
2	Project 2	586,996,789	2,082,810	0.35%	Highest Premium
3	Project 3	448,634,896	1,089,197	0.24%	
4	Project 4	1,115,023,144	2,736,068	0.25%	
5	Project 5	1,139,908,392	2,763,538	0.24%	
6	Project 6	891,950,000	1,494,016	0.17%	
7	Project 7	2,464,182,340	7,587,735	0.31%	
8	Project 8	1,236,751,497			Premium charged N/A
9	Project 9	1,440,448,092			Premium charged N/A
10	Project 10	1,243,250,548	1,092,717	0.09%	
11	Project 11	539,954,186	1,437,448	0.27%	
12	Project 12	2,594,058,195	2,948,676	0.11%	
13	Project 13	352,133,865	1,046,450	0.30%	
14	Project 14	5,850,318,269		0.00%	
15	Project 15	2,413,385,242	2,973,779	0.12%	
16	Project 16	6,008,650,533	2,973,779	0.05%	Lowest Premium
17	Project 17	4,224,344,056	4,217,668	0.10%	
18	Project 18	188,251,056	266,351	0.14%	
19	Project 19	5,176,330,075	7,139,195.29	0.13%	
20	Project 20	504,227,975	1,701,330	0.34%	
21	Project 21	2,143,539,818	3,955,946	0.18%	
22	Project 22	45,133,503	230,351	0.51%	

\* Project names are not mentioned and the order in the Table 02 differ from the list of roads illustrated in the page 29 and 30 in order to avoid the identification specific insurers.

## 4.2.2 Analysis of Common Clauses of Insurance Policies and General Risks Covered

### Major Risks Covered

- **Contract Works**

This covers the contract permanent works, partially completed works and associated temporary works including all materials to be incorporated bound in the Contract Documents. Generally all BoQ Items are indemnified under this clause.

- **Clearance of Debris and Cost of Demolition**

Removal of debris and cost of demolition that are the resultant of loss/ damage, are not included in the contract BoQ. Since those are unforeseeable in construction projects, contract indemnity clauses itself provide Contractor to cover those risks thorough the CAR insurance policy. Clearance of debris consists of debris resultant either from earth slips or flood and demolition of structures.

- **Third Party Damages**

Any other affected parties who are the victims of contract works except the project principals are indemnified under this cover. This includes third party property damages and bodily injury of persons.

### 4.2.3 Other Additional Common Risks Covered in CAR Insurance Policies

#### 4.2.3.1 Warranty Concerning Camps and Stores



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This is one of the common clauses in most of the CAR insurance policies. The definition includes Contractors office, Accommodation if any, Engineer's office, Employer's office, Laboratory, Stores, etc.

Insurer is in a position to relieve their liability by interpreting the conditions related to return period of the flood and the maximum distance from the fire walls.

The general condition embedded in this clause is that the camps should be located to withstand minimum 20 years flood. Insurer indemnifies only the losses encountered resulting from flood/ precipitation that arise with more than 20 years return period. In general, Contractors build their camps by concerning this effect by selecting the premises in a considerably higher elevation. It is a Contractor's choice to make his camps in premises where no damage is expected from flood/ precipitation.

The most severe and possible damage is expected from fire. The coverage for fire is necessity in case of camps, stores, etc. The general condition imposed in connection with fire insurance is that the considered fire damage should be located 50m away from the fire walls provided

that adequate fire prevention is available. However, in actual practice fire walls do not exist at all in any of the road projects. But, insurer possesses a room to disregard the fire claim based on this condition.

Notwithstanding anything, there is a possibility of firing whole camp premises without having a room to evacuate a single property. Determination of a maximum claimable amount per event is much more important in case of fire damage. Prior to obtaining the CAR insurance policy, the insured should become aware of the assessment of the total value of the building, and the furniture and equipment to be occupied. The maximum claimable amount per event should be total building value, furniture and equipment cost with some contingency allowance. Ad-hoc under estimations expecting to reduce the premium paid to the insurer will not adequately compensate, once the actual claimable event occurs.

#### 4.2.3.2 Warranty Concerning Sections

The indemnity clause; warranty concerning sections is one of the most vital clauses of CAR insurance policy of road projects. Of the twenty two nos. of policies reviewed, only one policy has excluded this clause. The application of this clause means that the insurer would only be liable for loss or damage that has taken place to the road works within the stipulated distance. The specified total distance is defined as a continuous stretch in which maximum loss can be assessed per event or occurrence. In case of road projects, all CAR insurance policies contain this clause with the intention of limiting their liability. In some policies, the total distance is limited even for least 200m. As an example, due to inclement weather, there may be erosion or washing away of base course material, embankments or any other completed or partially constructed works scattered along the road. With the presence of the captioned clause, even though the loss or damage occurred in entire road, insurer assesses only the loss/ damage occurred only for the length considered in the CAR insurance policy further subjected to the excess/ deductible. In view of insured, this indemnity clause does not console for the total damage. During the pre negotiations, insured should negotiate either to maximize the total length of section considered or exclude this clause. But in today's context, insurer does not exclude this section and therefore the length of the section should be maximized as much as possible. Other alternative is that, instead of one section considered, number of sections can be increased depending on the demand of the insured. As an example, one insurance policy considered a section of 3km subjected to maximum number of 8

sections per event/ occurrence. The second option is much more favorable to the project in case of major damage. Even for small rain, the total damage section will exceed the length 200m. Most of the CAR insurance policies, the length of the section considered is less than 1km that is not adequate in case of major damages.

#### 4.2.3.3 Special Conditions Concerning Removal of Debris from Land Slides

Removal of debris that is the resultant of landslides is indemnified by the insurer except the following.

- Removal and disposal costs of debris resulted by landslides occurred beyond the Right of Way; Employer's boundary. Insurer's liability exists only for the debris that occurred within the RoW. In case of earth slips that occur beyond the RoW, insurer's liability exists only for the clearance and disposal cost of debris that are within the RoW.
- Expenses incurred for the reinstatement of eroded slopes viz. Protection walls and retaining walls.

In some CAR insurance policies, higher excesses can be observed. But instantaneous assessment of damage may be within the excess. Hence, for the frequent damages of which impact is low, the deductible/ excess amount should be decreased as much as possible. As an example, for a highway rehabilitation project that lies through mountainous terrain, there may be local frequent earth slips that can be removed within a few hours of the day by deploying few machinery hours.

#### 4.2.3.4 Loss or Damage to Crops, Forest and Cultures

Of the twenty two numbers of CAR insurance policies analyzed, only two insurance policies indemnify the damages to crops, forest and cultures. Normally most of the Contractors do not focus as this is a general exempted clause. In a country like Sri Lanka in which agriculture is the major component of country's economy, the agricultural lands are scattered everywhere in the country. Not only agricultural lands, but industrial crops also; Tea, Rubber and Coconut spreads in the country. As such in road rehabilitation projects, damages are imminent to the agricultural lands directly or indirectly. If the road lays in a low land through a paddy field, the agricultural plants may be subjected to damage in different modes; in case



of heavy rain, either prime coat or the base material may be washed off and deposit on the paddy resulting no harvest. In roads running via hill country, the possibility of harming the tea plantation is there by washing away of debris. In addition to the above, there may be other unpredictable events that cause to damage the crops, forest and cultures. But no single party neither the Contractor nor the Employer focus deeply on this aspects. There may be a slight increment of insurance premium, but having paid an additional premium, its positive impacts to the projects are enormous. Unfortunately, still the project principals do not consider on this cover as this is a common exclusion clause in all most all the CAR insurance policies or with the intention of reducing the premium. This risk can be freely identified if risk identification is done before obtaining CAR insurance policy. Even if crops, forest and cultures are third party properties, no room exists to indemnify through the third party insurance cover as this exclusion is specially stated in the endorsement that supersedes.

#### 4.2.3.5 Overtopping of Cofferdams

Construction of structures, bridges and culverts are common work scope of road rehabilitation projects. High flood level can be expected during the rainy season of the project. The cofferdams may be overtopped and both temporary works and the partially completed works are liable to be damaged incurring massive losses to the Contractor. As the replacement cost is huge, this exclusion is endorsed in all most all the CAR insurance policies. Having paid an additional premium, the subjected risk can be indemnified.

But this is necessary only for road projects that include construction of bridges crossing major water courses wherein flood level is comparatively high. If the bridges crosses the waterway in which water level is liable to rise up during the rainy season, this cover is necessary. This can be logically approached either by analyzing metrological statistics of the area or can be judged by collecting the historical data from the suburb senior citizens. The high flood level can be determined and height of the cofferdams can be decided to withstand the flood in which maximum return period is 20 years.

#### 4.2.3.6 Vibration, Removal of Weakening of Support

This is another important clause of all CAR insurance policies. Vibration effect that resulting from deploying heavy earth moving machines, spreads to a certain distance in transverse direction of the road. The houses, structures, commercial buildings and the residents may be

affected by the vibration effect. There may be propagation of new cracks or severity of existing cracks may increase. But depending on the extent of vibration and the condition of the existing structure, the existing structure may be impassable.

But, insurer includes that insurer liability exists only when,

- Damage resulted either by the total or partial collapse.

During the compaction of road layers, due to vibration effects there may be a possibility of propagating of cracks varying from minor to wider. Always there are conflicts between the Engineer and the Contractor on “*who is responsible.*” Although there is a propagation of new cracks or the enhancement of existing cracks arisen due to the deployment of heavy machinery, still the structure is in a serviceable condition and there is no partial or total collapse. On the condition “total or partial collapse,” insurer can reject the claims.

- The Contractor should adopt adequate loss preventive measures.

The practicable loss preventative measures are that, during compaction close by the structures, less thick layers can be put and use the Vibrating Roller in static mode. But this method prolongs the time of completion and some quality aspects may not be achieved. Contractors hesitate to follow such specific loss prevention measures in practice. Hence the insurer is in a position to freely refuse such claims.

- Prior to commencement, condition report should be prepared for each adjoining structure in which the insured feels endangered.

In today’s construction practice, Contractor prepares a condition report that includes sketch of the structure, existing condition of the house, existing cracks and their position enclosed with photographs. Once the initial condition report is available, pre and post condition can be compared and subsequently it can be identified “*who is liable for the damage.*”



#### 4.2.3.7 Contract Documents

This requirement is imposed by FIDIC 2006 March Edition. This indemnifies the Architects, Surveyors and Consultant Engineers, legal and other fees that incur to reinstate the consequences upon the destruction of or damage to the Contract Document, and other important documents that are not indemnified in any other mean.

Depending on the contract nature, complexity of the documents may be highly time and cost dependant. Architects, Surveyors and Consultant Engineers fees are being gradually increased. Hence reproduction cost during the execution of the project is enormously high and adequate indemnification should exist to cover the involved cost factor.

Since there are several back-ups on the initial Contract Documents in the Employer's and Engineer's office, the indemnification should specially be available for design and construction drawing performed in the project office.

#### 4.2.3.8 Inland Transit

Highway rehabilitation projects are remotely located outside the capital. Therefore, it is necessary to transport key Materials, Plant, Machinery and Equipment from the capital. In some occasions, Materials, Plant, Machinery and Equipment are brought from some other completed projects. The general CAR insurance policy indemnifies only the accidental damages that occur within the contract site. It is necessary to have additional coverage for the damages that are in a transition period from either harbour, manufacturing company or some other project. The risk involvement during the transportation has to be insured. In case of road project, the major plants and equipment are Asphalt Concrete Plant, Concrete Batching Plant and Crusher Plant and Asphalt Pavers of which value is more than Rs. 25 Million each.

Without quoting ad-hoc values, it should be considered the present value of the Machinery, Plant and Equipment. In case of used Machinery, Plant and Equipment, considering the depreciation, the present value should be assessed considering the depreciation.

In addition, depending on the mobility of each Plant, Machinery and Equipment, the expected maximum coverage per event should be assessed. Out of the Asphalt Concrete Plant, Crusher Plant, Concrete Batching Plant (mobile) and the Asphalt Paver, only Concrete Batching Plant (mobile) and the Asphalt Paver are possible to transport at once without dismantling.

Higher the value out of the Concrete Batching Plant (mobile) and the Asphalt Paver should be taken into consideration in deciding the expected maximum coverage per occurrence.

#### **4.2.3.9 Property in Offsite Storage**

This indemnity is not included in all CAR insurance policies. This is mostly suited for the Contractors who maintain centralized storage unit for all of their projects. Until transporting to the relevant projects, those are temporarily stored. Since this general CAR insurance policy covers only the specific project location, either material or machinery that are temporarily basis in outside the contract site, are not indemnified. For a large scale project, the necessity of offsite storage becomes essential. According to the analysis, some of the Contractors are interested in covering for the risk of offsite storage. It is observed that those who import the resources and temporarily store in their central store at capital are keen on having this cover.

#### **4.2.3.10 Special Conditions Concerning Underground Cables, Pipes and Other Facilities**

In all highway projects, this becomes a most compulsory cover. Generally there is enormous numbers of underground service lines in which comprehensive details are seldom available. This becomes most critical, when the construction works are going through the urbanize areas. Contractors have high responsibility involvement of avoiding the damages by adopting precautionary measures. For the service lines that have been carried out in good old days, As-built drawings that illustrate the depth and the off sets of underground service lines are not available. It is a Contractor's responsibility of knowing the availability of service lines inquiring from the relevant utility authorities of the project area with the assistance of the Employer prior to starting the excavation. If As-built drawings are available, the site personnel should be aware and required measures should be taken vigilantly during the excavation. In the absence of As-built drawings, Contractor can carry out a trial pit and verify the layout of the existing of utility lines. Since the consequential damages create huge claims that are not indemnified, the Contractor should pay specific attention on this risk.

Hence, this is a mandatory cover and either no excess should be there or the excess should be as minimum as possible.

If the consequential damages can be indemnified, it is much more fruitful in the project aspects as the value of consequential damages are very much excessive compared to the

physical damages. As an example, damage and disconnection of overhanging CEB line may cause to interrupt the production of the suburb industrial zone. Hence, the consequential losses (indirect cost); loss of opportunity is excessive compared to direct loss (physical damage); reconnection of disconnected line.

#### 4.2.3.11 Serial Losses

Of the CAR insurance policies that were subjected to review, only one Contractor obtained the cover for the serial losses. During the construction, serial losses may happen. Due to unforeseeable ground condition, there are repetitive failures even in the same location for which no immediate prevention measures are possible to be adopted. Repetitive earth slips or the land subsidence at same location is the frequent examples.

Insurer interprets it in different ways. Once the first incidents occur, the next incidents are foreseeable and principals should look on the preventive measures at their earliest. But in practice, it is difficult to adopt immediate preventive measures as the process consumes considerable time to investigate the possible causes and apply proper technical solutions. But the CAR insurance policies do cover only the first four losses reducing the extent of coverage from 100%, 80%, 60% and 50% subjected to the defined excess. Beyond the fourth loss, the further losses are not generally indemnified and have to be borne by the principals. In case of serial losses, there should not be a limit for coverage as the Contractor's obligations is not included deeper investigations and preventive measures since it is not the Contractor's work scope. It takes longer time. Contractor should negotiate to obtain the coverage at least 50% of the loss for the continuation of events beyond the fourth loss.

In some of the insurance policies, the serial losses are covered under the clause called 72 Hour clause. The loss or damage that occurs during the 72 consecutive hours will be considered as one single loss or damage (one event) subjected to the deductible. Insured has the option to select the commencement time provided that no two events over lap. This option is more beneficial to the Contractor as any extents of damages are covered without limiting to the percentage of assessment as depicted in preceding paragraph.

#### 4.2.3.12 Strike Riot and Civil Commotion Endorsement

The cover for Strike Riot and Civil Commotion (SRCC) and Terrorism Endorsement exist in all CAR insurance policies. In country's industrial culture, there are frequent calling upon of strikes. The crucial case of strikes is the vulnerable disciplines of strikers and they may tend to damage the principals' properties. As this is envisaged by most of Contractors, SRCC cover becomes common clause in all CAR insurance policies.

Once this particular clause in question, is patiently gone through, it can be understood that it covers very limited scope and there are many exclusions. In simple terms, SRCC covers only the loss of or damage to the property insured directly by the willful act of any strike or group of strikers. And loss of or damage caused by the lawfully constitute authorities; as an example, Police, in preventing or attempting to prevent such act of strikes too is covered.

It should be understood that the SRCC excludes the loss or damages caused from partial or total cessation of work and permanent or temporary dispossession. Generally due to the strike or riot, the opportunity expected by performing the works may be lost. In addition to the physical damages, there is an idling of Contractor's resources. There is no way of recovering incurred idling cost of resources through the SRCC. Sometimes, if the strike lasts longer period; say one week, the unforeseen losses resulting from the cession of works will be excessive. In the insurer's point of view, the partial or total cessation of work is a consequential loss and then the insured should foresee this sort of losses.

## 4.3 Analysis of Responses Received to Questionnaire Survey

### 4.3.1 Analysis of Results

Of the Three Hundred and Twenty Six numbers of Questionnaires, one Hundred and Eighty Nine numbers of responses were received for each and every query of Section 3 of Questionnaire and some of which are graphically shown below.

#### Query 1

According to your experience, what is the most applicable option in dealing with risks?

Eliminate the Risks	2%
Mitigate the Risks	7%
Facing/ Taking the Risks	5%
Transfer the Risks	59%
Share the Risks	19%
No Response	8%



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#### Query 3

Why do your highway construction project/ projects, truly want to have CAR Insurance Policy? [You may tick one or more]

Employer's requirement	16%
Contractor's own interest	22%
Contractual requirement	62%
Legal requirement	

**Query 4**

Which of the following insurance policies are your current project/ projects, being used?

[You may tick one or more]

Contractor's All Risk (CAR) inclusive of Third Party (TP)	100%
Third Party (TP) separately	
Workmen Compensation Insurance (WCI)	100%
Plant, Machinery and Equipment Insurance	100%
Professional Indemnity Insurance (PI)	32%
Marine Insurance	

**Query 11**

According to your experience on current practice, before issuance of CAR Insurance Policy, do the insurers request following contract documents? [You may tick one or more]

Conditions of Contracts	23%
Project Specifications	
Contract Drawings	5%
BoQ	9%
Only BoQ summary page	63%



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**Query 15**

What is the most suitable mode of payment for CAR Insurance Policy in the highway construction project BoQ's?

Provisional Sum	64%
Lump Sum	29%
Any other	7%



**Query 20**

Your pre-negotiations with insurer before obtaining final CAR Insurance Policy really focus on. [You may tick one or more]

Only to fulfill the contractual requirement	61%
Only to reduce the premium	22%
Only inclusive and exclusion clauses	
Only deductibles/ excesses	
Not at all of the above	
Generally all of above	17%



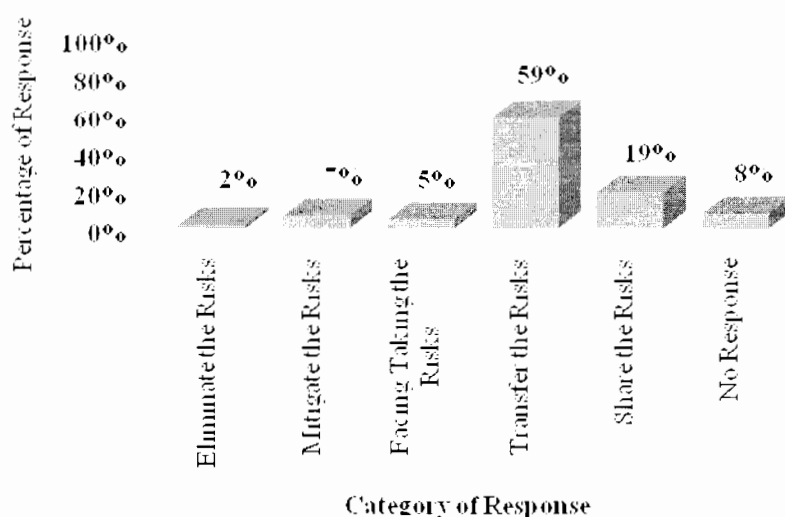
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Table 3 - Responses received for Questionnaire Survey

Query No.	Query	Percentage of Response (%)				
		Yes	No.	Neutral	Do Not Know	Irrelevant
2	Are contractual clauses on insurance in FIDIC and ICTAD Conditions of Contract sufficient to cover the risks of highway construction projects?	17	42	16	23	2
5	Do you really carry out the risk analysis by your own in order to cover those through CAR Insurance Policy?	21	73		6	
6	Do you hold a joint site inspection with the participation of the Employer, the Engineer and the Contractor to ascertain the possible risks before obtaining the final CAR Insurance Policy?	88			5	7
7	Before obtaining CAR Insurance Policy, do you convey all project insurance terms stipulated in the contract documents to the insurer?	61	8	13	18	
8	Do you want to cover consequential losses through CAR Insurance Policy?	16	27	35	22	
9	Before obtaining CAR Insurance Policy, do you convey your other insurance needs gained through past experiences to the insurer?	29	14	41	16	
10	For obtaining CAR insurance policy, do you hold a competitive bidding among insurers?	84	5	2	9	
12	When do you plan to purchase CAR Insurance Policy, do you need third parties (eg. Agents and Brokers) assistance to gather information and knowledge on it?	38	51	7	4	
13	Are wordings in CAR Insurance Policies difficult and complicated, therefore have you to turn on intermediary bodies, (Eg. Agents, Brokers and Loss Adjusters).	47	42	8	3	
14	Is allocated BoQ amount of your current highway construction project/ projects sufficient to have sophisticated CAR Insurance Policy?	37	46	11	6	
16	Do you feel that premium charged by insurance companies to issue CAR Insurance Policies are expensive in Sri Lanka?	45	23	12	20	
17	Can you retain the premium of CAR Insurance Policy and manage the risks by yourself effectively.	14	67	5	14	
18	In Sri Lanka, do you feel that insurance companies are familiar with the background on highway construction projects?	12	63	3	22	
19	Do you feel that the insurance companies deploy qualified professionals on highway construction, in assessing claims?	9	69	7	15	
21	After introduction of variation to the original work scope, do you duly inform the insurer and get cover for those too?	7	81	2	10	
22	Do you extend the period of CAR Insurance Policy, if the time extension is granted by the Employer?	91	3	1	5	
23	Do you consider past records, financial stability and the quality of service of your insurer before obtaining CAR Insurance Policy?	64	29	3	4	
24	Do you consider about the past records, financial stability and the quality of service of re-insurer of your insurer?	3	72	7	14	4
25	Ultimately do you satisfy your CAR Insurance Policy and insurer's service of your project/ projects?	31	56	5	8	

**Query 1: According to your experience, what is the most applicable option in dealing with risks?**



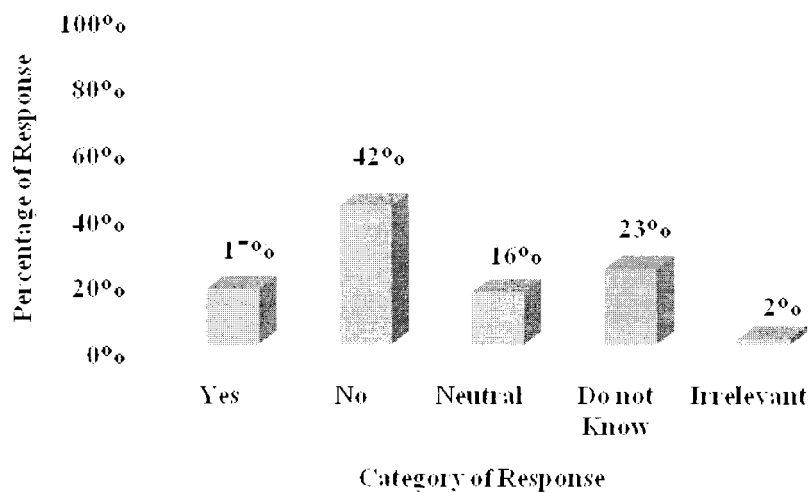
**Figure 01 - Illustration of responses received for Query 1**

Of the respondents, considerably low percentage 2%, 7% and 5% wishes to eliminate the risks, mitigate the risks and facing the risks respectively.

59% of respondents wish to transfer the risks and in the meantime 19% respondents desire to share the risks. The collective outcome of the 4<sup>th</sup> and 5<sup>th</sup> responses; 78%, is very much higher than that of the collective outcome of the 1<sup>st</sup>, 2<sup>nd</sup> and 3<sup>rd</sup> responses; 14%.

It is crystal clear that industry professionals understand either risk transferring or the risk sharing is the most applicable options over the other available options. The cost and time impact for eliminating, mitigating and the taking of risks are excessive and it is somewhat challenging task to both Contractor and Employer.

**Query 2: Are contractual clauses on insurance in FIDIC and ICTAD Conditions of Contract sufficient to cover the risks of highway construction projects?**



**Figure 02 - Illustration of responses received for Query 2**

Of the respondents 42 % says that contractual clauses on insurance in FIDIC and ICTAD CoC are insufficient to cover the risks of highway construction projects and in the meantime only 17% agrees with it.



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FIDIC and ICATD CoC are published for all construction contracts despite the type of the projects; Architectural Projects, Infrastructure projects, etc. Hence it stipulates the common and minimum insurance requirements for all sorts of projects. The risk associated with highway construction is not specifically focused by the indemnity clauses of the FIDIC or ICATD CoC. In Sri Lanka, the highway construction projects are mostly funded by the overseas funding agencies like ADB, JICA, WB, etc. Funds are received in the modes of loans or the donors. Along with the loan or the donor, it is imposed to use the International Condition of Contracts such FIDIC CoC. And for the GoSL funded projects, the ICTAD CoC has to be used.

The majority's dissatisfaction; 42%, reveals the necessity of another mechanism through which project specific risk in highway construction projects have to be identified and insured.

### Query 3: Why do your highways construction project/ projects, truly want to have CAR Insurance Policy?

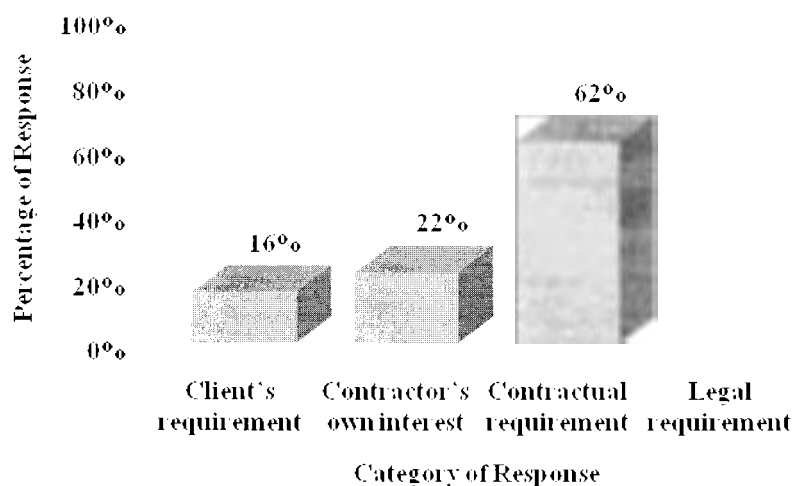
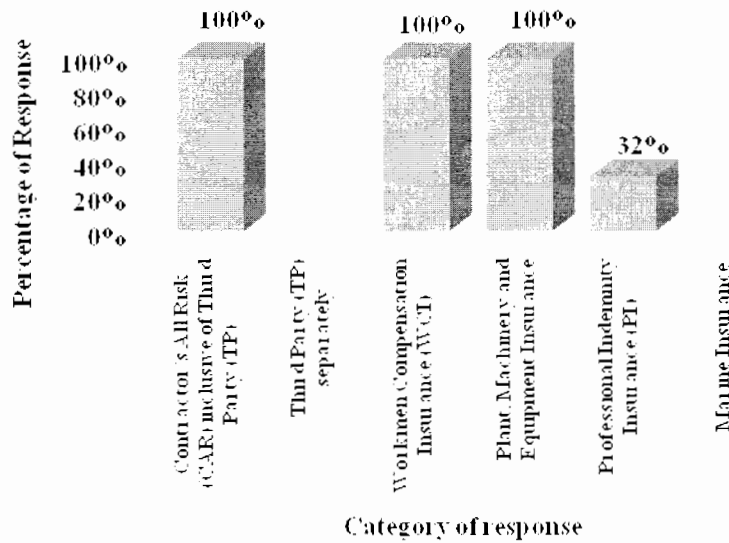


Figure 03 - Illustration of responses received for Query 3

62% of respondents say that they obtain the CAR insurance policy with the intention of fulfilling the contractual requirement. As the CoC make the CAR insurance policy a mandatory requirement to commence the construction physically, all Contractors are compelled to take this cover. This is only the fulfilling of contractual requirement, no thorough concerns are made on the content of the policy. Only 22% of respondents state that they have their own interest of obtaining CAR insurance policy. Comparison of these two figures highlights that only few considers on having CAR insurance policy as their own obligation and others do not want to comply with it, unless there are contractual stipulations.

**Query 4: Which of the following insurance policies are your current project/ projects, being used?**

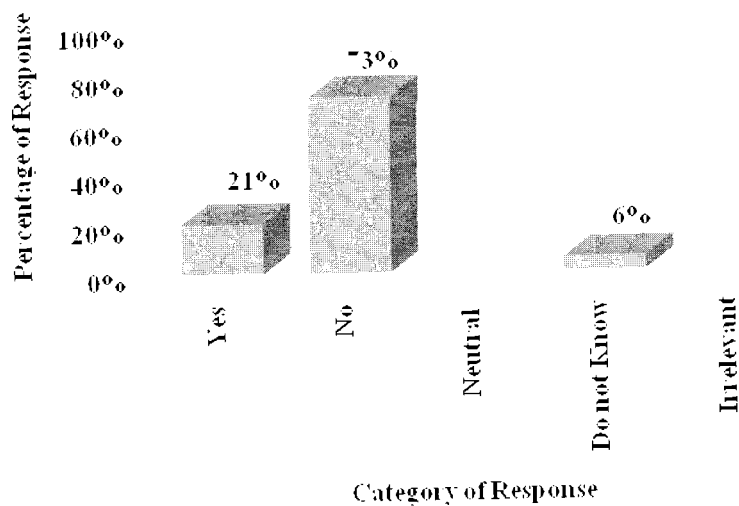


**Figure 04 - Illustration of responses received for Query 4**

All project principals have to comply with the contract indemnity clauses that impose minimum insurance requirements. Hence all Contractors are compelled to get the cover for above insurance schemes.

In most instances, third party insurance cover is obtained with CAR insurance policy and some contract documents impose the Contractor to take Professional Indemnity Cover too.

**Query 5: Do you really carry out the risk analysis by your own in order to cover those through CAR Insurance Policy?**

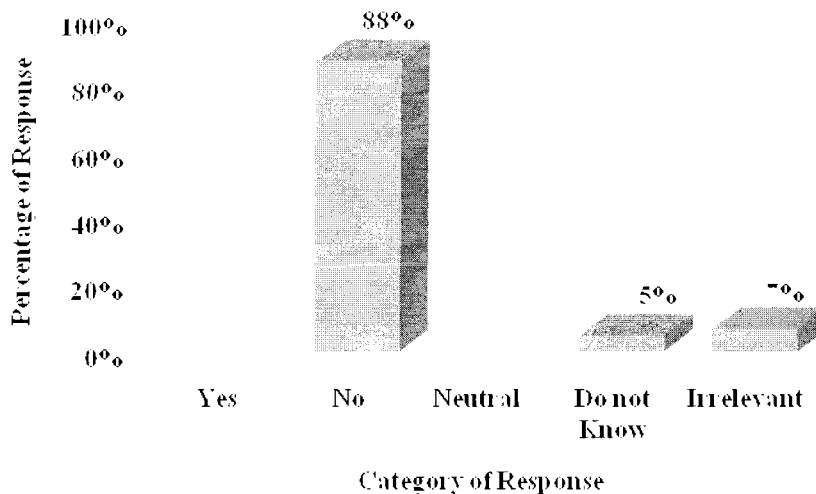


**Figure 05 - Illustration of responses received for Query 5**

This query can be considered as the most vital query in this questionnaire. Risk and insurance are interrelated matters. As the project risk is expected to be covered through the CAR insurance policy, before dealing with the insurance, the risks for which liability is expected to be transferred or shared should be precisely identified. Hence risk analysis is an essential prerequisite before having a CAR insurance policy. Of the respondents, 73% mentioned, they do not comply with this requirement. This is the main issue, Sri Lankan construction industry still does not focus adequate attention. Without carrying out a risk analysis, having a CAR insurance policy will not cater fruitful results. At first, risk identification must be done and out of the identified risks, insurable risks should be extracted to transfer or share with insurer. This is the systematic way of approaching to have a sophisticated CAR insurance policy. Only 21% of respondents comply with this requirement and they are in a confident level to retrieve the insurable risks and convey those to insurer. Under these circumstances, insurer cannot offer any ineffective CAR insurance policy as they wish and the chances of having redundant and void insurance policy are prevented.

In highway construction projects, many of the risks exist throughout the road stretch. There are location specific risks even in the same project. As explained above, risk analysis is the key to have sophisticated CAR insurance policy.

**Query 6: Do you hold a joint site inspection with the participation the Employer, the Engineer and the Contractor to ascertain the possible risks before obtaining the final CAR Insurance Policy?**



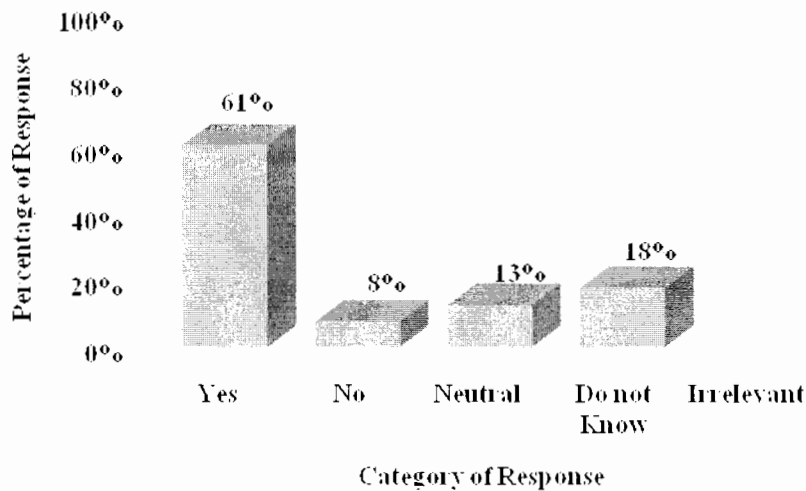
**Figure 06 - Illustration of responses received for Query 6**

In overview of the project, the CAR insurance policy is in the name of project principals. Engineer assists to run the project in an impartial manner. It is an obligation of all project agencies to ascertain all project specific risks. Holding a joint site inspection with the participation of Contractor, Employer and the Engineer is compulsory. The collective effort of all project agencies to ascertain the site specific risks will surely enhance the accuracy of risk identification. This process will minimize the unnecessary disputes during the execution of the project on ***“who should be liable.”*** But 88% of the respondents states that no joint site inspection is held at all. The fundamental process of risk management is not carried out by any of the project agencies leading to lack of information; no actual site specific risk, under estimation or over estimation of risks.

Insurer may try to persuade the insured with their hypothetical terms. Having a joint site inspection and identification of insurable risks is a basic need to be followed and this is a handy approach of obtaining a proper CAR insurance policy that addresses project specific risks.



**Query 7: Before obtaining CAR Insurance Policy, do you convey all project insurance terms stipulated in the contract documents to the insurer?**



**Figure 07 - Illustration of responses received for Query 7**

Currently highway construction projects are mostly governed by ICTAD and FIDIC CoC. Clause 18 of ICTAD SBD2 CoC and FIDIC 2006 March Edition represent the indemnity and the insurance terms. It stipulates the minimum and general indemnity requirements of the project. The CAR insurance policy should cover at least those minimum requirements. Those minimum requirements should be furnished to the insurer at the time negotiations are held, 61% of respondents comply with this requirement and whereas 8% of respondents do not oblige. This may happen due to the lack of knowledge on Contract Documents or the less attention on CAR insurance policy. 61% shows satisfactory evidence of which Contractors obey with minimum and general insurance requirement. Collectively, 39% of respondents show negative responses on this aspect.

### Query 8: Do you want to cover consequential losses through CAR Insurance Policy?

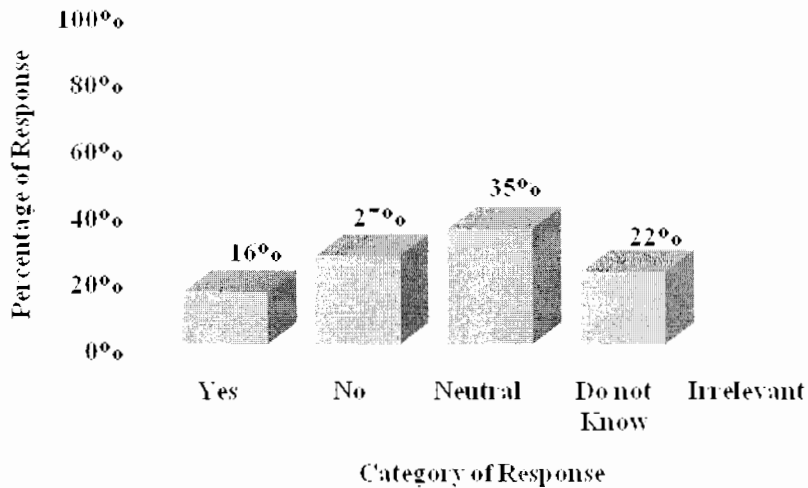


Figure 08 - Illustration of responses received for Query 8

Consequential losses are the losses that occur subsequent to the direct losses or damages. The assessments of initial losses may be low. But the value of the consequential losses may be excessive. As an example, in case of third party damage; damage of fiber optics cable, the value of the physical damage may be less. But disconnection of fiber optics cable can adversely affect to disconnect the communication. There is obvious loss of opportunity due to the interruption of communication due to physical damage. The claim on the loss of opportunity is excessive. Consequential losses can totally turn out the Contractor's financial position, if huge claim arises.

In similar manner, there are interconnected indirect/ consequential losses of each and every loss or damage. General insurance policy indemnifies only direct losses or damages; not the consequential losses.

If the insured needs to cover consequential losses, having paid an extra premium, it can be indemnified. But, according to the responses, it seems that understandings on indirect/ consequential losses are in a minimal level. Only 16% of respondents consider to cover the consequential losses through the CAR insurance policy.

**Query 9: Before obtaining CAR Insurance Policy, do you convey your other insurance needs gained through past experiences to the insurer?**

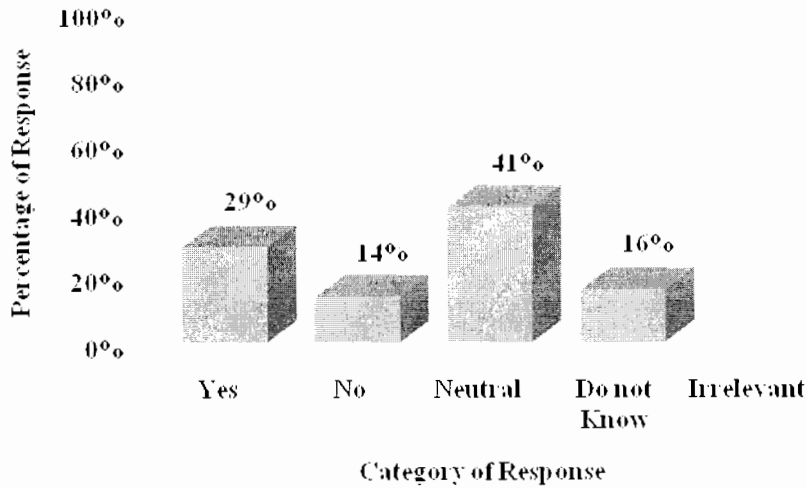
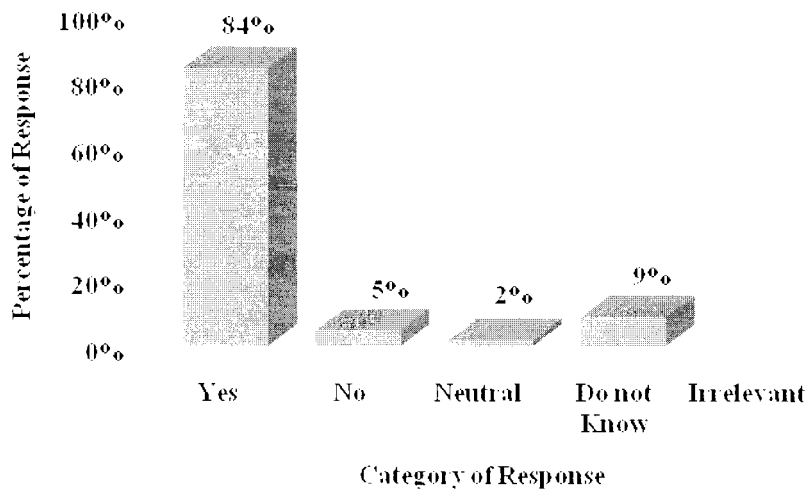


Figure 09 - Illustration of responses received for Query 9

Application of past experiences gained on the insurance subject is highly valued in obtaining CAR insurance policies. The deficiencies encountered in past insurance matters should be overcome in future insurance policies. The additional insurance needs gained in handling past insurance matters and identifying invalid covers where actual site specific needs that were absent in previous insurance policies and should be taken into consideration. Of the total respondents, only 29% uses their previous insurance experiences and in the meantime 41% of respondents are in neutral position. The 41% shows that they do not have adequate experience on previous insurance matters. In similar manner to law, insurance terms too are built up on case studies. Hence previous involvements on insurance matters would be much beneficial in dealing with present insurance matters.

**Query 10: For obtaining CAR insurance policy, do you hold a competitive bidding among insurers?**



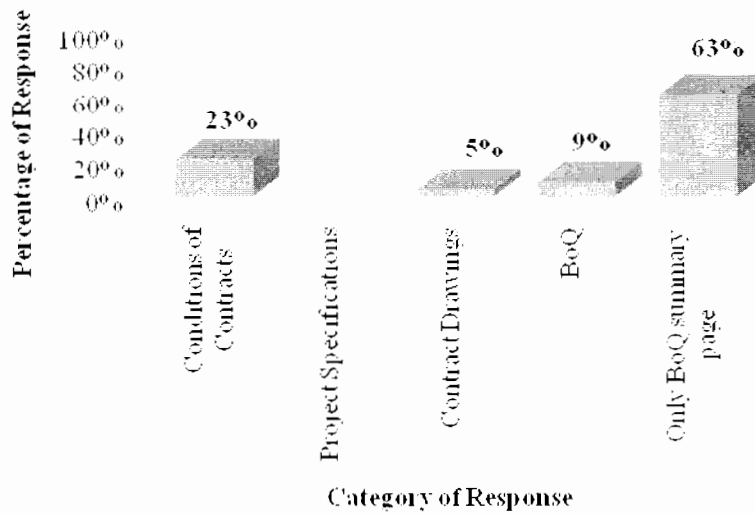
**Figure 10 - Illustration of responses received for Query 10**

Similar to the general tender process, for having an insurance policy in current scenario, competitive bedding is held amongst the insurers. This occasion is the greatest opportunity of insured to bargain the insurer persuading his unnecessary demand. Insured should convey all contractual requirements, other specific needs gained through the past experiences and other project specific risks to the insurer. Following those needs, all insurers would offer a competitive insurance policy covering risks that are of interests to the insured and which have already been known to all bidders. Although they offer lowest acceptable bid, the content of the policy should be gone through very precisely. The experience insurance professional employed by the insured should follow patiently and recognize the merits and demerits of it. The end result is that 84% of respondents follow the competitive bidding procedure to select the insurer.

If competitive bidding is held amongst insurers, insurer tries to offer the lowest bid embedding strict conditions. The worst case is that with a low premium, insurer cannot transfer or share the risk to their reinsurance company and as a result local insurer tries to bear all risk, but they are not in a position to afford the huge claims.

If the insured does not satisfy content of the policy fully or partially, the ambiguous clauses should be pointed out and eliminated or gain additional covers. This is the ultimate instance where insurer's bargaining power is superseded by the demands of the insured.

**Query 11: According to your experience on current practice, before issuance of CAR Insurance Policy, do the insurers request following contract documents?**



**Figure 11- Illustration of responses received for Query 11**

72% of respondents mentioned that the insurer request only either full BoQ or the summary page of BoQ at the time insurer offer the CAR insurance policy. It means that they do not much concern on other contract documents viz. CoC, PCC, Project Specification, Particular Specification, Contract Drawings, etc. as the premium calculation mostly depends on the sum insured. Insurer request only BoQ summary page in which each sub bill values are shown. Today's insurance market is also highly competitive and there are new insurers stepping to the industry. With the intention of retaining present customers, accessing new customers and due to the time constrains, insurers do not focus all contract documents unless the insured points out other contract documents.

Even though the insurer does not request other specific clauses, the insured should provide other necessary project documents or other insurance needs. If those are not provided, insurer tends to limit insured opportunities by inserting restricted clauses; as an example higher deductible/ excess. Without studying these data, once the CAR insurance policy is obtained, there is no room to simplify it later. Insurer may express, so long as the insured did not provide the necessary contract documents and the premium charged depend on the anticipated risk by the insurer, no alternations are possible during the execution of this project unless the additional premium is paid. Insurer simply focus the summary page of BoQ and

based on that premium is charged and general CAR insurance policy that is not project specific, is issued without making any necessary clarification from the insured.

**Query 12: When do you plan to purchase CAR Insurance Policy, do you need third parties (eg. Agents and Brokers) assistance to gather information and knowledge on it?**

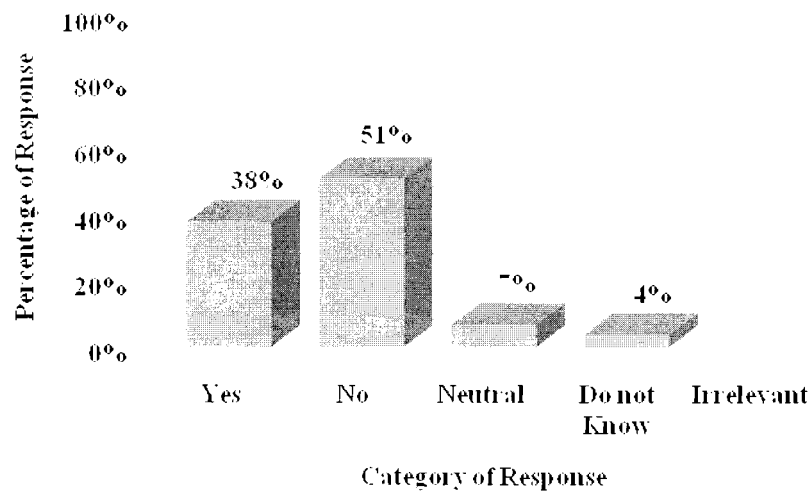
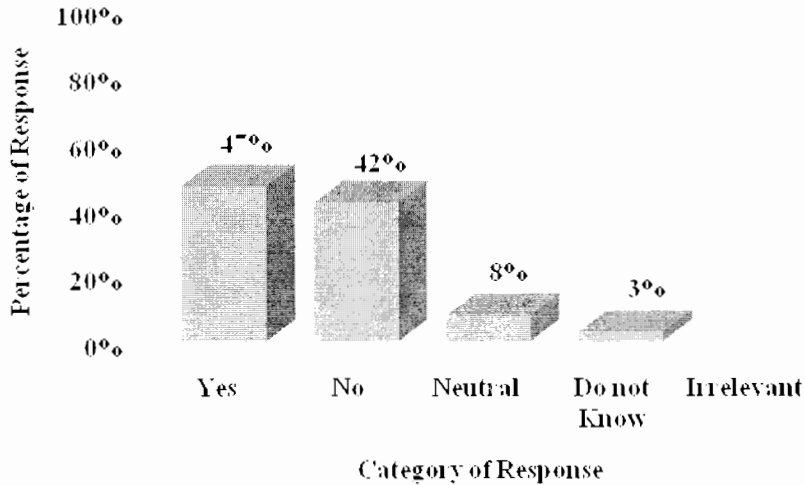


Figure 12 - Illustration of responses received for Query 12

38% of the respondents noted that insurance wordings are complicated to understand where as 51% of respondents say that they do not require third parties who are the expertise on this subject for assistance, at the time CAR insurance policy is obtained. 38% is too considerable and it shows that insured unawareness and the lack of knowledge on the subject. They are incapable of applying for a CAR insurance policy alone. Collectively 49% compared to 51% is considerable and it depicts the necessity of third parties assistance to gather knowledge and information on insurance subject.



**Query 13: Are wordings in CAR Insurance Policies difficult and complicated, therefore have you to turn on intermediary bodies, (Eg. Agents, Brokers and Loss Adjusters)?**

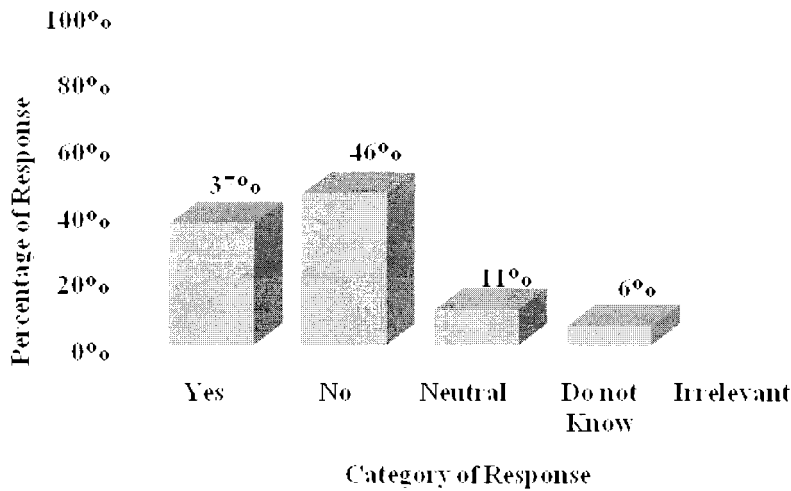


**Figure 13 - Illustration of responses received for Query 13**

Unlike in general English language, the insurance terms consist of law terms and wordings that are uncommon to understand by inexperienced new comers. If wordings can be understood in their true meaning, necessary alternations can be done in accordance with principals' needs. Experienced and senior professionals could easily understand them. If the Contractor assigns this task to an inexperienced professional, those unnecessary and complex wordings could not be interpreted correctly resulting an ineffective CAR insurance policy. Fruitful outcome could not be expected. End results will be the inclusion of unnecessarily strict conditions enabling the insurer to deny the insured claims. 47% of respondents say policy wordings are complicated and 42% respondents say, not. It deems that majority has a difficulty of clarifying the wordings of the insurance policy. Based on above, majorities' opinion is to get assistance from some intermediary body who possess expertise knowledge on the subjected matter. Those experts will be the experienced industry professionals such as Project Managers, Senior Engineers, Insurance Brokers, etc. Rather than agreeing to a complex document that is difficult to interpret due to ambiguous wordings, it is more beneficial to seek assistance of the experienced professionals.



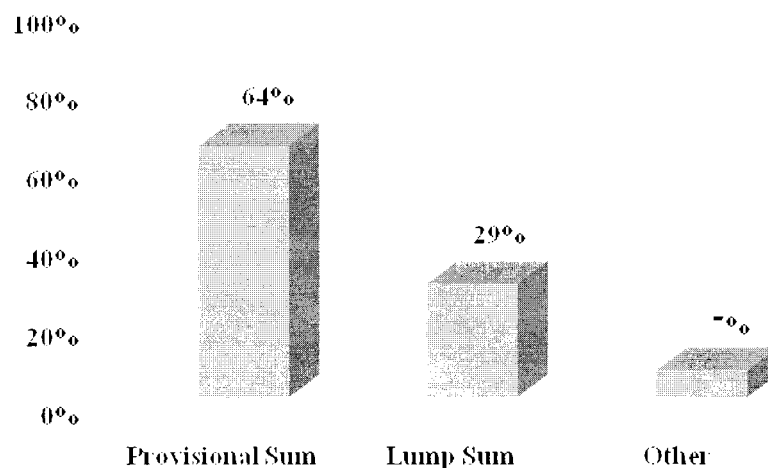
**Query 14: Is allocated BoQ amount of your current highway construction project/ projects sufficient to have sophisticated CAR Insurance Policy?**



**Figure 14 - Illustration of responses received for Query 14**

The determination of rate of insurance item is really an important task of Quantity Surveyor and ad-hoc underestimates may lead losses to the Contractor. 46% of respondent says that allocated amount is not sufficient to have sophisticated CAR insurance policy. 37% says that amount allocated is sufficient. Perhaps, this 37% decides the rate for insurance item after due evaluation of the insurance industry. The higher percentage of 46% depicts that they do not have proper mechanism to decide the amount of insurance and they just depend on ad-hoc judgments and as a result they ultimately express their dissatisfaction on the project BoQ. By going through at least the previous insurance policies, insured can approximate the amount of insurance premium.

**Query 15: What is the most suitable mode of payment for CAR Insurance Policy in the highway construction project BoQ's?**



**Figure 15 - Illustration of responses received for Query 15**

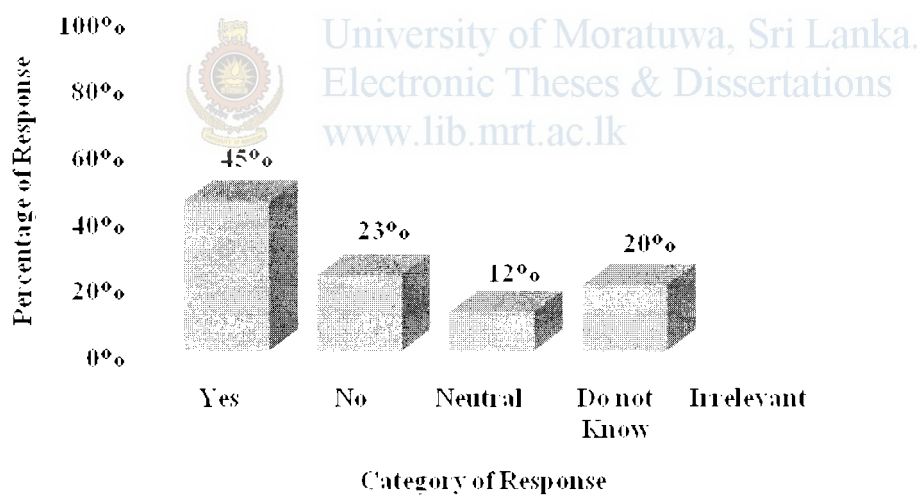
In contract BoQ, there is a provision to purchase an insurance policy. The unit of allocated sum is in two modes; PS or LS.

The allocated budget can be adjusted according to the Employer's interest in case of PS. The PS amount is decided by the Employer and put in the BoQ in the procurement stage. In this category, if the Contractor has positive attitude on risk management and construction insurance, PS is truly an advantage as they can get insurance policy that covers many of the involved project risks. In these instances, what the Contractor does is, they obtain an insurance policy without considering the premium. Thereupon, they add their OH/Profit component (Mark up) declared in the contract document and forward to the Employer. If the Employer agrees with that policy, he may tend to approve the policy and the Contractor is deemed to pay premium proposed by the insurer despite whether it exceeds the allocated sum in the project BoQ or not.

LS can be defined as problematic scenario. The amount is determined by the Contractor at the bidding stage. Lump Sum is the definite amount that is not subjected to change unless there is special authority from the Employer.

Even if the insurance premium together with Contractor's OH/Profit exceeds the amount of LS item, the Contractor receives only the allocated sum in the BoQ unlike in PS item. It is a common practice of the Contractors to make the expense as least as possible, since they can retain higher profit margin. Contractor's intention is to receive any sort of CAR insurance policy offered by the insurance company to a low premium. Unfortunately, lower premium results in the plenty of strict insurance terms in which insurer freely avoid their liability even for small claims. As such, in this mode, Contractor's attention on risk management is highly influence and Employers should thoroughly go through the specimen insurance policy to check whether the required risks are covered or not. If not, Contractors try to earn maximum profit and ultimately there may be unnecessary argument on the liability and responsibility of who should pay or bear the risk during the execution of the project.

**Query 16: Do you feel that premium charged by insurance companies to issue CAR Insurance Policies are expensive in Sri Lanka?**



**Figure 16 - Illustration of responses received for Query 16**

According to the analysis done based on actual insurance policies, insurance companies claim 0.05-0.35% of sum insured. As has been explained above, if the Contractor decides lower amount unknowingly, he doesn't have an opportunity to increase the BoQ amount once the project is awarded. Since the insured expect some profit margin in this item too, higher premium reduces anticipated profit margin of the insured. In this sense, the insured feels the premiums charged by the insurance companies are expensive. 45% of respondents state that the premium charged is expensive and 23% says not. 12% of respondents are in neutral position and 20% of respondents do not know whether the premium is expensive or not.

Majority of respondents; collectively 55% of respondents do not have logical and analytical approach on the premium charged by insurers. Due analysis of premium charged in previous projects will emerge at least approximate judgments on premium charged avoiding underestimations or overestimations. Accordingly, it is not difficult and lengthy process to approximately decide the insurance premium during the bidding stage. A considerable percentage; 55% depicts, they are unaware on this simple computation or they adopt short cut methods to complete the tender. By following this practice, both insured loss and possessing ineffective CAR insurance policy are able to be overcome.

**Query 17: Can you retain the premium of CAR Insurance Policy and manage the risks by yourself effectively?**

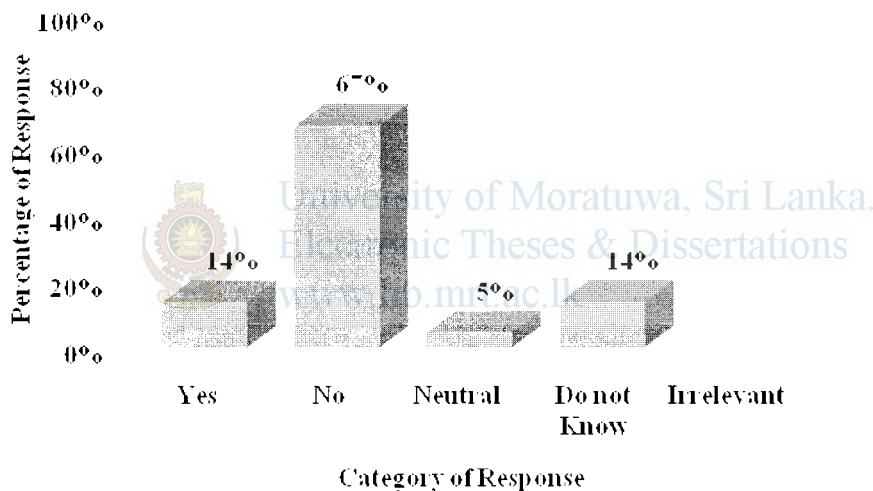
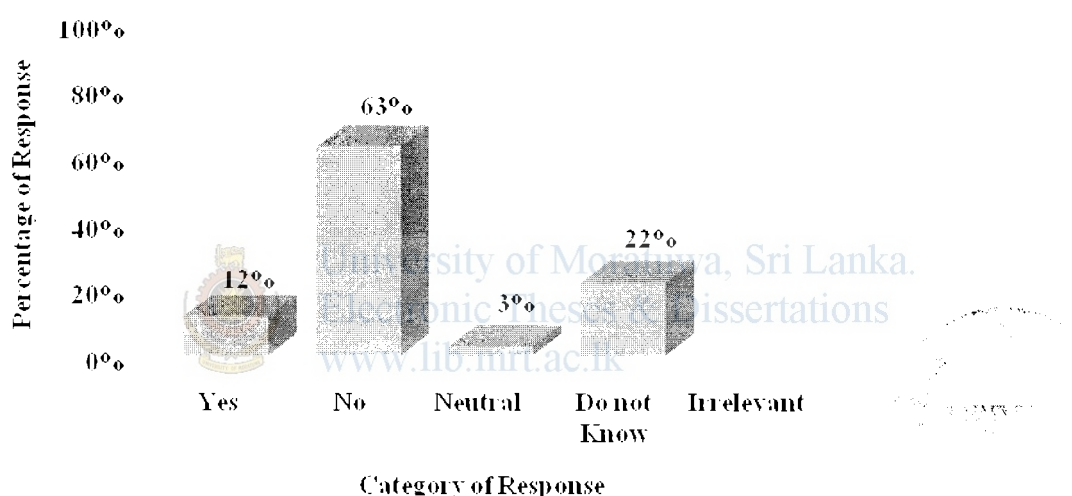


Figure 17 - Illustration of responses received for Query 17

67% of respondents state that they are not in a position to retain or take the risks by their own. In allusive manner, they agree with risk transferring or sharing to another party who is willing to take risk. This judgment is almost enough to understand the importance of insurance. Most Contractors understand that the cost incurred for the risk retaining process is surely expensive than that of either risk transferring or sharing. Since the risk is uncertain, Contractors do not want to retain this as their sole responsibility. Risks retaining represents either taking all reasonable precautions for the anticipated risks or bearing all reinstatement cost by the Contractor, if any loss or damages encountered. The risk retaining is not financially viable to the Contractor at all and this is challenging task to the Contractor. But 14% respondents say that they are in a position to retain risk. But there are deep concerns on the back ground of them, most of them represent the Engineer/ Consultancy services.

Generally consultant view is to take all reasonable precautions to overcome the losses or damages. But during construction, practically, adopting all reasonable precautions will not be realistic all the time. In view of above, majority agree to transfer or share the risk rather than retaining. Additional planning tools and techniques for risk avoidance should be adopted. If the severity of damages is high, reinstatement cost is unbearable to the Contractor. With that understanding, 67% of respondents are reluctant to retain the risk instead they are in a view of risk transferring or sharing.

**Query 18: In Sri Lanka, do you feel that insurance companies are familiar with the background on highway construction projects?**



**Figure 18 - Illustration of responses received for Query 18**

Insurance companies are financial organizations and there are plenty of professionals who are experts on business, financial, marketing, human resources management, etc. But, there are few professionals who bear civil engineering background. Compared to the Life, Vehicle, Business, Manufacturing insurances, there are considerably lesser number of construction insurance and this is also a reason for employing few professionals those who have either civil engineering or the construction experience. And most of the insurance companies outsource the civil engineering professionals only when they require.

But considerably higher premium can be earned in one CAR insurance policy at once compared to number of life, vehicle, or other property insurance. But insurance companies have less interest on CAR insurance policies as the less existence of construction projects.

Therefore they do not have construction background and insurer depend only on the standard policies and wordings with slight alterations.

**Query 19: Do you feel that the insurance companies deploy qualified professionals on highway construction, in assessing claims?**

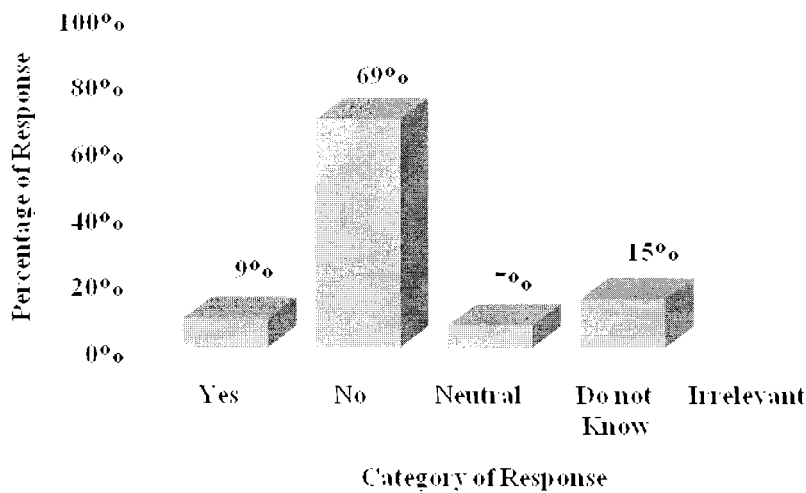


Figure 19 - Illustration of responses received for Query 19

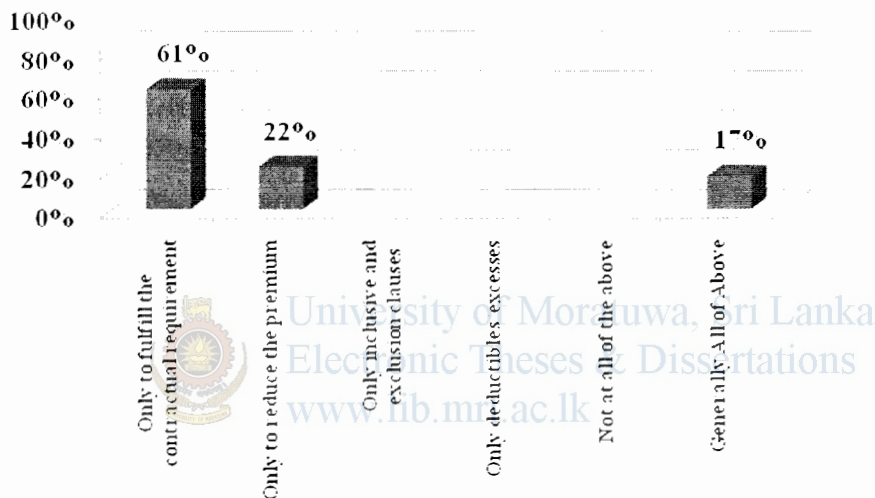
69% of the respondents state that insurance companies do not employ qualified professionals to assess the claims. This situation leads to underestimation or overestimation of claims. As a victim, the insured is entitled only for actual reinstatement cost; neither an underestimated nor overestimated. Employment of insurance officers who do not have either construction experience or the contract management experience may give rise to unnecessary disputes. In some occasions, misjudgment or underestimation may need to proceed before insurance ombudsman or the courts. Lack of knowledge of Civil Engineering/ Construction/ Construction Management affects in assessing claims as they make their effort to interpret the policy wording with impracticable arguments. The wording “*Reasonable Precaution*” is subjective and can be interpreted in different way. One loss adjuster shall see the precautionary measures taken by the insured are adequate while another loss adjuster shall see the precautionary measures taken, are inadequate. However, the person assigned by the insurer to investigate, should look into the matter in a sensible manner.

Under these circumstances, the victim is not compensated adequately or victim is not compensated at all. Assessment of damage should be in qualitative, quantitative and impartial manner with necessary supporting documents that should be comprehensive to defend before



an experienced panel of judges; DAB, Panel of Arbitrators or the Courts. Contractor should have a right to request, if necessary, the method of evaluation done by the insurer. Generally insurers are reluctant to issue their method of evaluations to the insured. It is a right of the insured to request from the insurer to employ qualified, experience and impartial professional to assess the claims on practicable basis without biasing to insurer, insured or any other third party influence.

**Query 20: Your pre-negotiations with insurer before obtaining final CAR Insurance Policy really focus on,**

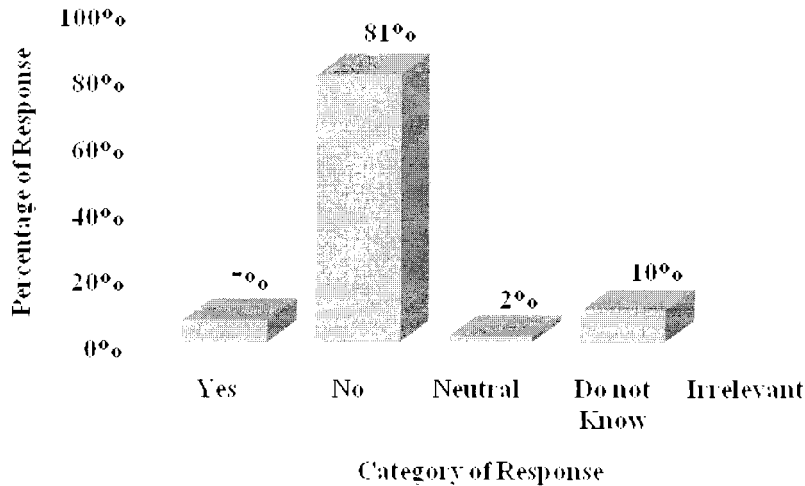


**Figure 20 - Illustration of responses received for Query 20**

Generally, all Contractors are profit oriented and they may expect profit in each and every BoQ item. Lower the insurance premium greater the profit to Contractor. The counter point is that lower the premium greater the strict conditions too. During the pre-negotiation stage, the insured try their best to bring down the premium for increasing the profit margin. In practice, insurance companies too are ready to offer CAR insurance policies to any premium. Therefore, during the pre-negotiations, the insured should evenly discuss the matters that are inter connected; not only the premium but also contractual stipulations, whether actual risks are covered or not, exclusion clauses of the policy, excess/ deductible, etc. not limiting to the profit orientation. Even though lower premium makes the insured pleasure at the inception, during the execution of the project, insurance policy having strict conditions may limit the opportunities of claiming even frequent losses. For an example, higher excess will reduce the opportunity of claiming many possible small losses.



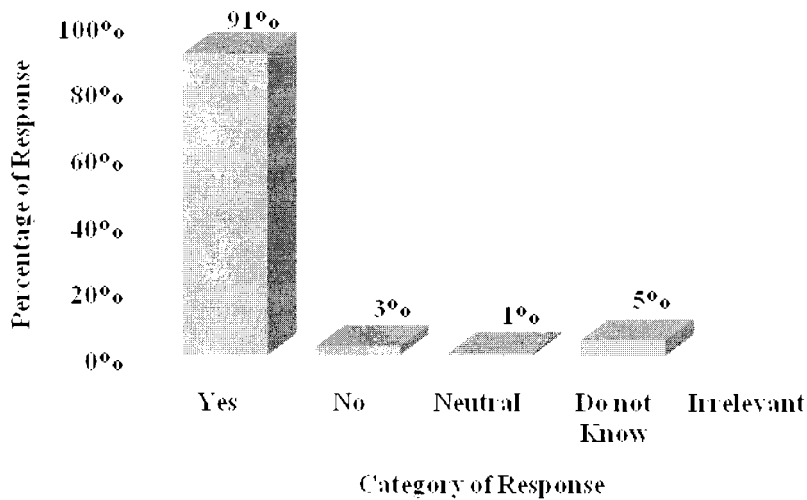
**Query 21: After introduction of variation to the original work scope, do you duly inform the insurer and get cover for those too?**



**Figure 21 - Illustration of responses received for Query 21**

Introduction of variations are unavoidable in contracts. So long as, variation orders are introduced during project run and CAR insurance policy is issued only for the original work scope, there is no liability for variations by the original CAR insurance policy. Hence loss or damage to the variation items has to be borne by the insured, as no insurer's liability exists. But 81% of respondents do not inform the new variations to the insurer. Once there is a new variation to be insured, it is obvious that insurer demands an additional premium. With the intention of saving an additional premium; either the Employer or the Contractor does not intend to notify the variations. Sometimes, risks associated with new variations are excessive and loss or damages may be very high. Once there is an introduction of a variation order, it should be duly notified to the insurer and it is the obligation of all project agencies. Only 7% of respondents oblige with this requirements. If the insurer is diligent, he may request revised BoQ from time to time, if any. Trying to save the additional premium that is to be paid in lieu of variation, may lead to huge losses to the contract than that of the saved additional premium. Hence, without undue delay, variations should be notified to the insurer with the consent of the Employer.

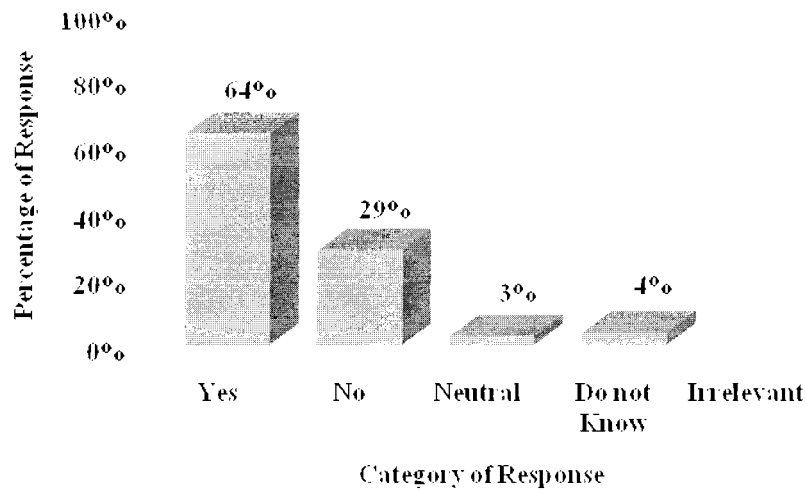
**Query 22: Do you extend the period of CAR Insurance Policy, if the time extension is granted by the Employer?**



**Figure 22 - Illustration of responses received for Query 22**

The CAR insurance policy covers only the original contract period and the Defect Liability Period. Not only the date, some insurers mention even the time of the expirations. Insurer's liability does not exist even a one second after the expiration. Hence once the time extension is granted, it is essential to extend the cover for the extended period with the consent of the Employer. In order to comply with this requirement, insurer claims an additional premium depending on the period of extension. Not extending the CAR insurance policy for the extended period may result in additional cost of reinstating the losses or damages, if any loss or damage occurs during the extended period. If it is not extended, during the extended period, principals have to carry out the works with their own risk. Working with principal's own risk may lead unexpected additional cost incurred and but no Employers or the Contractors are in a position to take this sort of unnecessary financial burden. 91% of respondents comply with this requirement by extending the CAR insurance policy during the time extension.

**Query 23: Do you consider past records, financial stability and the quality of service of your insurer before obtaining CAR Insurance Policy?**



**Figure 23 - Illustration of responses received for Query 23**

Financial stability and the way of handling claims of insurer is another important factor in deciding the insurer. As the insurer too is expecting a profit oriented business, they do not simply assess the claims and pay. There are some insurers who always try to deny their liability in every strict manner, even though there are few grounds on insured rights. In the meantime, there are some insurers who always act in impartial manner and they do not hesitate to settle the claims without any unnecessary and impractical argument. With a view of maintaining cordial business relationship, some insurers tend to settle the claims on ex-gratia basis, although the liability is not with the insurer.

Financial stability of the insurer is another key factor. During the course of policy validity, if the insurer declares bankruptcy, the CAR insurance policy becomes invalid. Overview of latest annual report of an insurer may reveal their financial stability; but this is seldom followed in the country because of time constraints and the lack of awareness.

Some insurers hesitate to believe the information provided by the insured and the assessments done by the insured may be subjected to drastic alternations; in most cases reductions.

Hence, it is necessary to study the past records, the pattern of claim assessments, financial stability, etc. prior to making the legal agreement with the insurance company.

**Query 24: Do you consider about the past records, financial stability and the quality of service of re-insurer of your insurer?**

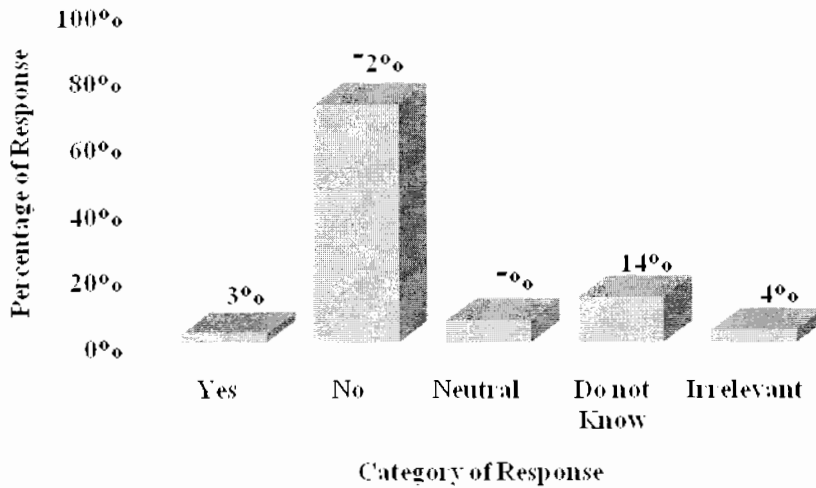
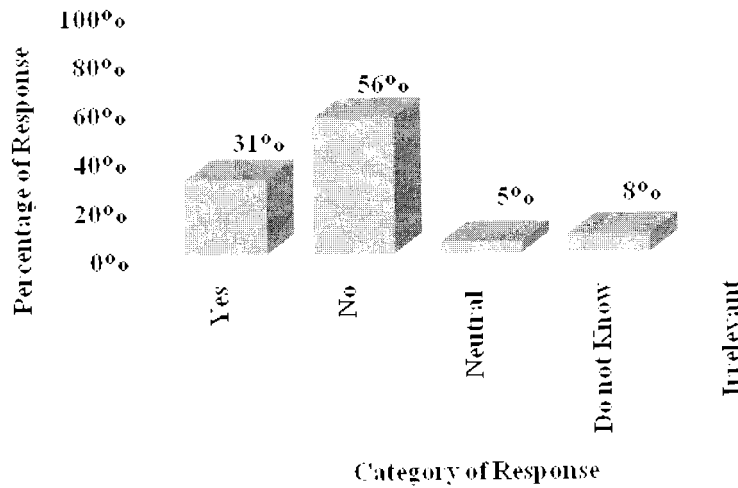


Figure 24 - Illustration of responses received for Query 24

In general understanding, insurer bear the risk of total sum insured to a premium that is very low compared to total sum insured. Accordingly insurance companies are not in a position to come up with this sort of huge risk by their own due to their financial incapacity. The risk associated with the project is re-insured in overseas insurance companies who are willing to take such risk on behalf of their local agents. Pertain to the internal agreement of the local insurance company and the re-insurance company, huge claims will be forwarded to the re-insurance company subjected to an excess that is in the sense higher amount compared to the excesses in the CAR insurance policy. Vigilance on the re-insurer too are required, as Contractor may lose their opportunity to claim huge lose or damages, if re-insurer fails to settle them to the insurer. In case of huge claims, insurer forwards them to the re-insurance company. To afford this, re-insurance company should be in sound financial stability. But 72% of respondents neither query nor they are in a sufficient understanding on the re-insurance procedures. The insured may feel this is unnecessary. This is because the lack of awareness on the subject. The insured has right to query from the insurer about their re-insurer and his financial stability.

**Query 25: Ultimately do you satisfy your CAR Insurance Policy and insurer's service of your project/ projects?**



**Figure 25 - Illustration of responses received for Query 25**

Ultimately 56% of respondents do not satisfy their prevailing CAR insurance policy. Even if the 61% of respondents convey legitimated insurance needs to the insurer and 84% of the insured hold competitive bidding during which the insured has bargaining power, majority of insured are not satisfied with their CAR insurance policy. Even though they conveyed the project insurance stipulations, it is a minimum requirement; it cannot afford other site specific needs once the event occurs. By under utilizing the bargaining power of insured at competitive bidding stage, the insured focuses only to reduce the premium. Insured does not give much attention on the conditions in the policy. Majority of the respondents does not comply with the requirement of identifying insurable risks upon having risk analysis after the joint site inspection. 73% of respondents do not carry out prior risk analysis and 88% of respondents do not hold a joint inspection. Instead insured takes cover for the risks that are irrelevant to the project.

47% of respondents say policy wordings are complicated due to the difficulty of understanding, lack of knowledge and the unfamiliarity of this subject.

Ultimately collective outcome is that the 56% of respondents' dissatisfaction on their own CAR insurance policy even though insured had sufficient opportunities to prevent this happening.

## 4.4 Summary

### Analysis of Prevailing CAR Insurance Policies

The premium paid to insurer depends on the sum insured that is contract value together with other additional percentage specified in the contract. It is found that percentage of premium varies from 0.05% to 0.35% of sum insured.

### Major Risks Covered

- Contract Works
- Clearance of Debris and Cost of Demolition
- Third Party Cover

### Other Additional Common Risks Covered in CAR Insurance Policies

- Warranty Concerning Camps and Stores
- Warranty Concerning Sections
- Special Conditions Concerning Removal of Debris from Land Slides
- Loss or Damage to Crops, Forest and Cultures
- Overtopping of Cofferdams
- Vibration, Removal of Weakening of Support
- Contract Documents
- Inland Transit
- Property in Offsite Storage
- Special Conditions Concerning Underground Cables, Pipes and Other Facilities
- Serial Losses
- Strike Riot and Civil Commotion Endorsement

### Analysis of Responses Received to Questionnaire Survey

Of the Three Hundred and Twenty Six numbers of Questionnaires distributed, One Hundred and Eighty Nine numbers of responses were received and each response was thoroughly analyzed as shown under the Clause 4.3.



## CHAPTER 05

# Conclusion and Recommendations

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### 5.1 Conclusion

Risk transferring or risk sharing is the most applicable and popular option in dealing with risk rather than risk avoidance and risk taking. Risk retaining is not financially viable to the Contractor at all times and this is somewhat challenging task to the Contractor as it means that either to take all reasonable precautions for the anticipated risks or bearing all reinstatement cost, if any loss or damage occurred. Contractor may choose to shift their liability attached, to another party insurer (usually insurance company) and the contract of indemnity is then in the form of an insurance policy.

Before obtaining CAR insurance policy, risk analysis is not done either by the Contractor or the Employer to ascertain the insurable risks and thereupon to transfer the insurer or share with insurer. Instead Contractors purchase insurance policies only to comply with the contractual needs stipulated in the contract documents and they try their best to bring down the premium for increasing the profit margin despite the actual risks specific to the project. Under these circumstances, even though the insured purchase a CAR insurance policy, it will become ineffective.

Allocated amount in BoQ is not sufficient to have sophisticated CAR insurance policy. There is no proper mechanism to decide the amount of insurance and the insured rely on ad-hoc judgments. Either Employer or the Contractor does not put the provision in BoQ for having a sophisticated CAR insurance policy and otherwise less provision will cause to have very restricted policies in which only limited risks are covered.

Most pertinent unit of insurance item is PS rather than LS. Assessment of percentage of premium charged in prevailing highway construction projects varies within 0.05% to 0.35% of the insured.



**In addition to the above, following notable conclusions were achieved.**

- The road length considered at a time to assess the claim is limited in some occasions even maximum 200m section per occurrence in some CAR insurance policies.
- Loss or damage to Crops, Forest and Cultures are not covered except few projects.
- Insured is not keen to obtain available As-built drawings of the underground utilities from the relevant utility authorities before executing the underground excavation.
- In case of serial losses; repetitive incidents, insurer will not compensate beyond fourth loss. Beyond the fourth loss, it has to be borne by the project principals.
- In most instances, although there is propagation of cracks of adjacent structures, there is no partial or total collapses, and the structure is in a serviceable condition. Hence the insurer is in a position to freely refuse such claims.
- In SRCC cover, only direct physical damages are indemnified. Loss of opportunity that is most likely in riots and strikes due to the partial or total cessation is not covered.
- At least few possible consequential losses of which impacts are highly effecting to the project are not covered at all in any of the CAR insurance policy.
- Majority has a difficulty of clarifying the wordings of CAR insurance policy due to uncommon and uncomfortable terminology. Majorities' opinion is to get assistance from some intermediary bodies who are experts on the subject.
- Since the premium calculation is mostly dependent on the sum insured, the insurer request only full BoQ or the summary page of the BoQ, at the time insurer offer their terms without concerning other contract documents.
- Insurers do not employ qualified professionals who possess either civil engineering or the construction insurance experience, to assess the claims and as a result, assessment is not qualitative, quantitative or impartial.

- With the intention of saving an additional premium; either Employer or Contractor does not intend to notify on variations even though the risks associated with new variations are excessive.
- Insured are not interested in studying the past records, the pattern of claim assessments, financial stability, etc. prior to make the agreement with the insurance company and they neither query nor they are in a sufficient understanding on the re-insurance procedures. Whenever the insurer offers unrealistically low premium and they are not in a position to share or transfer the risk to their reinsurance company. As a result local insurer tries to bear all risk, even though they are not in a position to afford massive claims.

## 5.2 Recommendations

Following notable guidelines can be tabled based on the conclusions achieved. It is further sub-divided in accordance with the stage of the project. viz. bidding stage, pre-construction stage, etc. Some guidelines are repeated in more than one stage as those can be conformed in different stages.

### 5.2.1 Guidelines to be followed at bidding stage

- During the pre-tender negotiations, the Contractor should propose the unit of the insurance item as PS instead of LS, since LS unit can be further altered on Employer's interest depending on the risk covered and the premium charged by the insurer.
- As far as the percentage of premium varies from 0.05% to 0.35% of sum insured, minimum 0.35% of tentative sum insured has to be allocated for the relevant BoQ item either by Employer or Contractor in case of PS and LS respectively.

### 5.2.2 Guidelines to be followed at pre-construction stage; at the time insurance agreement is made

- Before obtaining the CAR insurance policy, risk analysis must be done either by Contractor alone or collectively by all project agencies. After having a joint site

inspection, project specific risks should be identified and out of those, insurable risk should be extracted to transfer to the insurer or share with insurer.

- The insurable risks extracted through the risk analysis and other insurance needs based on past experiences should be conveyed to the insurer at the time CAR insurance policy is tendered through competitive bidding disclosing all material facts. Further the Contractor must sensibly furnish all contractual stipulations imposed; indemnity clauses of the CoC, relevant pages of specification, relevant contract drawings in addition to the summary page of BoQ.
- The limit of indemnities mentioned in the CAR insurance policy schedules or endorsements should be thoroughly checked whether those are for any single event or for the total aggregate of events.
- It should be studied the past records, the way of claim assessments, and financial stability of not only the insurer but also re-insurer prior to make the final insurance agreement.
- Since the insurance terminology is uncommon and uncomfortable, Contractor should seek the expertise of third parties who are capable to pinpoint the merits and demerits of the insurance policy.
- In case of fire claims, the condition of fire wall is an obvious unnecessary clause and it should be excluded during the negotiation stage as no fire wall system is available in the highway construction projects. Based on the condition of fire wall, insurer keeps a room to exclude their liability to reject the fire claims.
- In case of property damages based on crack propagation, the condition; partial or total collapse should be eliminated.
- The road length considered at a time to assess the claim in any single event, should be maximized at least for half a length of the road either continuously or sectional wise.
- Since the earth slips varying small scale to large scale, are inherent in mountainous terrain roads, the excess/ deductible should be as least as possible; can be



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recommended less than Rs. 5,000.00 per occurrence; insurers do not offer less than this amount according to the CAR insurance policies perused.

- Highest flood level and return period should be determined by evaluating the meteorological statistics at least for major water courses along the project road. This will gear to adjust the return periods stipulated in CAR insurance policies.
- Cover for loss or damage to Crops, Forest and Cultures is an essential cover and this should be additionally endorsed.
- Since the serial losses are beyond the Contractor's control and the immediate preventive measures are not admissible, Contractor should negotiate to obtain the cover at least 50% of the assessed amount for the continuation events beyond the fourth loss.
- Since general CAR insurance policy covers only the specific project location, additional cover should be endorsed to indemnify the material and machinery that are temporarily at outside the contract limits and in the transition stage as well.
- Project principals must precisely consider getting the cover for at least few possible consequential losses of which negative impacts are enormous to the project.
- In SRCC cover, it is rather important to obtain cover not only for direct physical damages, but also the loss of opportunity due to the partial or total cessation of work at least for one day's work done.

In addition, following guidelines can be recommended to grab maximum benefit of the CAR insurance policies during construction.

- Since the insurance terminology is uncommon and uncomfortable, Contractor should seek the expertise of third parties who are capable to pinpoint the merits and demerits of the insurance policy at the time claim negotiations are held.

- The limit of indemnities mentioned in the CAR insurance policy schedules or endorsements should be thoroughly checked whether those are for any single event or for the total aggregate of events.
- Insured should request from the insurer to employ qualified, experience and impartial professional to assess the claims.
- At the inception of the project, the Contractor should obtain available As-built drawings of the underground utilities from the relevant utility authorities and the construction works; especially excavation, should be carried out vigilantly based on the As-built drawings as the consequential loss claims may be huge.
- It is an obligation of the insured on due notification of variations to have subsequent additional cover having paid an extra premium.

### 5.3 Recommendations for Future Research

Further research can be focused in following research areas,

- Analysis of prevailing WCI, Construction Plant, Machinery and Equipment, PII insurance schemes and preparation of guidelines to have sophisticated aforementioned insurance policies for road projects.
- Analysis of prevailing CAR insurance policies and preparation of guidelines to have sophisticated CAR insurance policies for architectural projects.

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## **List of Appendices**

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- Appendix 1 - Questionnaire Form
- Appendix 2 - Sample Analysis Sheet of a CAR Insurance Policy



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Appendix 1 - Questionnaire Form



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# Questionnaire Survey on Risk Management and CAR Insurance Policies in Highway Construction Projects in Sri Lanka

**W. P. G. D. R. Senanayake**  
Department of Civil Engineering  
Faculty of Engineering  
University of Moratuwa  
E-mail: [ranga.senanayake@yahoo.com](mailto:ranga.senanayake@yahoo.com)  
Mob: +94 77 7842263

Supervised by Dr. L. L. Ekanayake

## Section 1 – General Information of Yourself



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[1] Name: \_\_\_\_\_

[2] Designation: \_\_\_\_\_

[3] Organization: \_\_\_\_\_

[4] Address: \_\_\_\_\_

[5] Phone: Office: \_\_\_\_\_ Mobile: \_\_\_\_\_

[6] E-Mail: \_\_\_\_\_

### [7] Your experience related to construction industry

- 0-5 Years    6-10 Years    11-15 Years    16-20 Years    20+ Years





## Section 2 – General Information of Your Organization

### [1] Your organization represents

Employer  Engineer/Consultant  Contractor  Sub-Contractor

Other, please specify,

---

### [2] How long do your organization in the field of highway construction?

0-5 Years  6-10 Years  11-15 Years  16-20 Years  20+ Years

### [3] Present qualification (ICTAD Grade),

Please specify, if applicable, 

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## Section 3 – Views on Construction Risk and CAR Insurance Policy

### [1] According to your experience, what is the most applicable option in dealing with risks? [You may tick one or more]

- Eliminate the Risks
- Mitigate the Risks
- Facing/Taking the Risks
- Transfer the Risks
- Share the Risks

### [2] Are contractual clauses on insurance in FIDIC and ICTAD Conditions of Contract sufficient to cover the risks of highway construction projects?

Yes  No  Neutral  Do not Know  Irrelevant





**[3] Why do your highway construction project / projects , truly want to have CAR Insurance Policy? [You may tick one or more]**

- Client's requirement
- Contractor's own interest
- Contractual requirement
- Legal requirement

Other, pl. specify,

**[4] Which of the following insurance policies are your current project / projects , being used? [You may tick one or more]**

- Contractor's All Risk (CAR) inclusive of Third Party (TP)
- Third Party (TP) separately
- Workmen Compensation Insurance (WCI)
- Plant, Machinery and Equipment Insurance
- Professional Indemnity Insurance (PI)
- Marine Insurance

Other, pl. specify,

**[5] Do you really carry out the risk analysis by your own in order to cover those through CAR Insurance Policy?**

- Yes    No    Neutral    Do not Know    Irrelevant

**[6] Do you hold a joint site inspection with the participation the Employer, the Engineer and the Contractor to ascertain the possible risks before obtaining the final CAR Insurance Policy?**

- Yes    No    Neutral    Do not Know    Irrelevant



**[7] Before obtaining CAR Insurance Policy, do you convey all project insurance terms stipulated in the contract documents to the insurer?**

- Yes  No  Neutral  Do not Know  Irrelevant

Other, pl. specify, \_\_\_\_\_

**[8] Do you want to cover consequential losses through CAR Insurance Policy?**

- Yes  No  Neutral  Do not Know  Irrelevant

**[9] Before obtaining CAR Insurance Policy, do you convey your other insurance needs gained through past experiences to the insurer?**

- Yes  No  Neutral  Do not Know  Irrelevant

**[10] For obtaining CAR insurance policy, do you hold a competitive bidding among insurers?**

- Yes  No  Neutral  Do not Know  Irrelevant

**[11] According to your experience on current practice, before issuance of CAR Insurance Policy, do the insurers request following contract documents? [You may tick one or more]**

- Conditions of Contracts
- Project Specifications
- Contract Drawings
- BoQ



Other, pl. specify, \_\_\_\_\_

**[12] When do you plan to purchase CAR Insurance Policy, do you need third parties (eg. Agents and Brokers) assistance to gather information and knowledge on it?**

- Yes  No  Neutral  Do not Know  Irrelevant



**[13] Are wordings in CAR Insurance Policies difficult and complicated, therefore have you to turn on intermediary bodies, (Eg. Agents, Brokers and Loss Adjusters).**

Yes  No  Neutral  Do not Know  Irrelevant

**[14] Is allocated BoQ amount of your current highway construction project / projects sufficient to have sophisticated CAR Insurance Policy?**

Yes  No  Neutral  Do not Know  Irrelevant

**[15] What is the most suitable mode of payment for CAR Insurance Policy in the highway construction project BoQ's?**

Provisional Sum  Lump Sum

Other, pl. specify,



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**[16] Do you feel that premium charged by insurance companies to issue CAR Insurance Policies are expensive in Sri Lanka?**

Yes  No  Neutral  Do not Know  Irrelevant

**[17] Can you retain the premium of CAR Insurance Policy and manage the risks by yourself effectively.**

Yes  No  Neutral  Do not Know  Irrelevant

**[18] In Sri Lanka, do you feel that insurance companies are familiar with the background on highway construction projects?**

Yes  No  Neutral  Do not Know  Irrelevant



**[19] Do you feel that the insurance companies deploy qualified professionals on highway construction, in assessing claims?**

Yes  No  Neutral  Do not Know  Irrelevant





**[20] Your pre-negotiations with insurer before obtaining final CAR Insurance Policy really focus on, [You may tick one or more]**

- Only to fulfill the contractual requirement
- Only to reduce the premium
- Only inclusive and exclusion clauses
- Only deductibles/excesses
- Not at all of the above

Other, pl. specify, \_\_\_\_\_

**[21] After introduction of variation to the original work scope, do you duly inform the insurer and get cover for those too?**

- Yes
- No
- Neutral
- Do not Know
- Irrelevant



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**[22] Do you extend the period of CAR Insurance Policy, if the time extension is granted by the Employer?**

- Yes
- No
- Neutral
- Do not Know
- Irrelevant

**[23] Do you consider past records, financial stability and the quality of service of your insurer before obtaining CAR Insurance Policy?**

- Yes
- No
- Neutral
- Do not Know
- Irrelevant

**[24] Do you consider about the past records, financial stability and the quality of service of re-insurer of your insurer?**

- Yes
- No
- Neutral
- Do not Know
- Irrelevant

**[25] Ultimately do you satisfy your CAR Insurance Policy and insurer's service of your project/ projects?**

- Yes
- No
- Neutral
- Do not Know
- Irrelevant

Appendix 2 - Sample Analysis Sheet of a CAR Insurance Policy



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## Project Name: Project X

Principal - RDA and Contractor A

Sum Insured - 2,464,182,340.44

Premium Charged - 7,587,734.940

Percentage of Premium - 0.308%

### General Risks Covered

No.	Description of Risk	Limit of Coverage	Deductible/Excess of each coverage	Remarks
1	Permanent and temporary works including all materials to be incorporated		Rs.100,000 of each and every occurrence of a claim	
2	Construction Plant and Equipment			Separate cover
3	Earthquake, Volcanism, tsunami, storm, cyclone, Flood, Inundation, Landslide			No cover
4	Third Property Party Cover	Min Rs. 3,000,000 per occurrence	10% or Minimum Rs. 10,000.	No limit for total aggregate.
5	Bodily Injury/death of Any Person	Min Rs. 3,000,000 per occurrence	10% or Rs. 25,000 whichever is greater of each and every occurrence of a claim	No limit for total aggregate. But affected property should be more than 15ft away from where excavation/cutting/ digging occurs

### Additional Co

No.	Additional Coverage
1	Warrenty co stores
2	
3	
4	
5	Vibration, R of Support
6	Property of
7	Special conc safety meas precipitation innundation
8	
9	Inland Tran
10	Special conc underground other faciliti
11	Riot and Str
12	Terrorism E
13	Serial Losse
14	Extra charge works, work and express
15	Cover for d
16	Special conc removal of c





	Special Condition Imposed	Limit of Coverage	Exclusions	Deductible/Excess	Remarks
	20 Years return period of flood	Max. up to 50,000,000 for each individual unit for any one occurrence			
	72 Hour Clause				No limit
	Maximum length considered at once				No sectional warranties
			Overtopping of Cofferdams		No cover
		Min Rs. 3,000,000 per occurrence		10% or Minimum Rs. 10,000.	
	Excluding Northern and Eastern Provinces	Max. up to 25,000,000 for each individual unit for any one occurrence		Rs.100,000 of each and every occurrence of a claim	
	10 Years return period			Rs.100,000 of each and every occurrence of a claim	loss or damage from water wocources as a result of not immediately removed by the insured is not indemnifiable.
			Damages to crops, forests and cultures		No cover
		Max. 50,000,000 per conveyance		10% or Min Rs. 150,000 for each and every occurrence of a claim	
		Min Rs. 3,000,000 per occurrence		10% or Minimum Rs. 10,000.	
		Max. 25,000,000,000		Rs.100,000 of each and every occurrence of a claim	Limit of coverage is not specified whether it is per occurrence or a total aggregate
					No cover
					No cover
		Max. up to 10,000,000 for each individual unit for any one occurrence		Rs.100,000 of each and every occurrence of a claim	
					No cover
				Rs. 250,000 of each and every occurrence of a claim	Limit of coverage is not specified