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**SAFETY AND HEALTH COSTING BY MEDIUM AND SMALL CLASS
CONTRACTORS**

AMRAN BIN ASAN

**A project report submitted in partial fulfillment of the requirements for the award
of the degree of Master of Science (Construction Management)**

**Faculty of Civil Engineering
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NOVEMBER 2008

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*Specially dedicated to
Ayahanda- Bonda, Isteri Intan Zulina, Anakanda,
and Keluarga Tersayang*

ACKNOWLEDGEMENT

“Dengan Nama Allah Yang Maha Pemurah
Lagi Maha Penyayang”

Praise to Allah that with His blessing I managed to complete this thesis successfully. I would like to take this opportunity to express my heartfelt thanks and gratitude to my supervisor, Mr. Bachan Singh Besawa Jagar Singh and PM Aziruddin Ressang who has been a constant guide right from the start of this thesis. He has given much insight and through his experience has guided me until the completion of this thesis. His professional guidance, advice and concern have enabled this thesis to be written and submitted as a partial requirement for the Masters of Construction Management programme.

I am also indebted to my loving parent and family members whom have been giving their support, assistance and motivation in completing this thesis. My sincere appreciation also extends to all my colleagues and others who has been directly and indirectly involved in providing assistance and support in the completion of this thesis. It is my hope and wishes that with the completion of this thesis, it would contribute a small portion of knowledge to others and hopefully this thesis would deliver the true meaning accordingly.

ABSTRACT

The construction industry is known to be one of the most challenging industries. It is also considered to be the key indicator to the growth of the country. But one of the problems plaguing the construction industry is the accident that frequently occurs that resulted in deaths or disability. The workers are frequently exposed to risks of being injured during their routine work. The problems exist for larger class contractors as well as medium and small class contractors. The problem is that for works carried out by the medium and small class contractors, the safety and health items are not fully defined. This study is carried out to study the provisions regarding safety and health in the “preliminaries items” of contract documents, the factors considered by contractors when pricing for projects that do not clearly defined the safety and health items and to identify the cost allocations for the safety and health for the project carried out by the contractors.. This study is carried out in the states of Melaka, Negeri Sembilan and Johor involving contractors who are registered under class C, D, E and F with the ‘Pusat Khidmat Kontraktor (PKK)’. The study is carried out through questionnaires and interviews. The data are analyzed using average index. From the study, it was found that the safety and health provisions in preliminaries items are inadequate for projects undertaken by Class E and F contractors. The factors considered by the contractors when pricing the project that do not clearly defined safety and health are time and programmed, hazards from existing structure, knowledge of existing off-site condition and knowledge of existing on-site conditions. The cost allocations for safety and health for the project carried out by the contractors is around three to four percents out of contract sum.

ABSTRAK

Industri pembinaan merupakan diantara industri yang mempunyai pelbagai aktiviti yang mencabar. Perkembangan industri ini juga turut dijadikan sebagai penanda aras bagi kemajuan dan pembangunan sesebuah negara itu. Namun begitu diantara masalah yang tidak dapat dielakkan di dalam industri ini ialah kerapnya berlaku kemalangan yang mengakibatkan kecederaan dan kematian. Pekerja sering-kali terdedah kepada risiko kecederaan semasa aktiviti kerja harian. Masalah ini bukan sahaja terdapat pada aktiviti kerja kontraktor kelas tinggi tetapi juga pada kontraktor kerja kelas pertengahan dan rendah. Masalah yang paling ketara bagi kontraktor kerja kelas pertengahan dan rendah ialah item berkaitan keselamatan dan kesihatan pekerjaan tidak ditakrifkan dengan sepenuhnya di dalam tender dokumen. Oleh itu, untuk tujuan penyelidikan ini, tiga objektif utama telah dibentuk iaitu untuk mengenal pasti sebarang peruntukan berkaitan item keselamatan dan kesihatan pekerjaan di bahagian “kerja awalan’ kontrak dokumen, mengenal pasti faktor yang diambil kira oleh pihak kontraktor untuk tujuan penghargaan tender bagi tujuan keselamatan dan kesihatan pekerjaan bagi mana-mana tender yang tidak memasukkan perihal item ini di dalam tender dokumen dan untuk mengenal pasti berapakah jumlah peruntukan yang dibelanjakan oleh pihak kontraktor bagi tujuan keselamatan dan kesihatan pekerjaan pada projek pembinaan yang dijalankan. Kajian kes telah dijalankan terhadap kontraktor di Negeri Melaka, Negeri Sembilan dan Johor Utara sahaja serta berdaftar dengan Pusat Khidmat Kontraktor. Daripada analisa yang dibuat, didapati bahawa item keselamatan dan kesihatan pekerjaan adalah tidak jelas dan tidak lengkap pada bahagian “kerja awalan” bagi kontraktor kelas E dan F. Faktor-faktor yang diambil kira bagi mana-mana tender yang tiada penakrifan item ini secara jelas dan lengkap ialah jangka-masa kerja pembinaan projek, bahaya dari stuktur binaan sedia ada, pengetahuan berkaitan keadaan persekitaran di luar dan keadaan persekitaran di dalam tapak cadangan projek. Manakala peruntukan kos yang disediakan untuk tujuan keselamatan dan kesihatan pekerjaan ialah diantara tiga hingga empat peratus daripada nilai keseluruhan kontrak kerja binaan.

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CHAPTER 1

INTRODUCTION

1.1 Introduction

The construction business is one of the most rapidly expanding industries in the world and also in Malaysia today. The demand for new housing fuels the economy and helps people realize their dreams, while the desire for new business enterprises makes it possible for those with ambition to produce the goods our society requires. New construction sites have sprung up in virtually every city and every town across the country.

Unfortunately this accelerated pace has put those on the frontlines of the industries in harm's way. Construction workers must deal with unrealistic deadlines, shoddy materials, and difficult work situations so that they may fulfill their contracts for new structures. This has the double effect of not only increasing the risk of everyday workers but to also decrease the quality of the structures they build.

The construction industry continues to kill and maim more of its workers each year than almost any other industry. In a project based industry, accidents rates will be vary from project to project. Each project is unique, and each project types has its own

characteristics, method of working, material employed and technique for construction and these characteristics also vary from country to country.

A reviewed of the international literature reveals that the same types of work-related deaths, injuries and illnesses occur in construction industries all over the world. What is apparent is that the construction industry fails to learn from its mistakes and still fail to prevent these illnesses. The same method of working that have been used for generations are still being used, giving rise to the same hazards and ultimately resulting the same incidence of death, injury and illness.

Improvements in safety and health will not occur unless new methods of working that reduce known safety and health risks are developed. However, this is likely to require that the industry's structural and cultural barriers to the adoption of new methods of working be overcome.

1.2 Problem Statement

In Malaysia, based on SOCSO report in 2006 only, out of total of 58,321 industrial accidents, 3,686 were come from the construction industry. Accidents at construction sites can often results serious injuries or death. At construction sites, accidents and dangers can be prevented by implementing rigid and enforcement safety practices such as an employment of Safety and Health officers. Nevertheless in Malaysia according to Occupational Safety and Health Act and Regulation (Act 514) was stated that the employment of safety and health officer enforced only for the construction project with contract price exceed twenty million Ringgit Malaysia.

Towards that this research try to identify emphasized on the safety and health carried out by client and contractors toward medium and small class construction projects. By referred on Occupational Safety and Health Act 1994 it was clearly emphasized that the clients have the responsibility with protecting the safety, health and welfare of people engaged or employed cooperated with the contractors to carry out the duty of safety and health on sites.

Both parties have a duty to secure the safety, health and welfare of the persons and protect the person at works against risks to safety and health arising out of the activities of persons at works. Table 1.0 shown the numbers of employment in Malaysian Construction Industry since 1970-2005. The numbers of workforce are increasingly yearly and by year 2005 an estimated of 775,300 workforce in industries as equal to 3.10 % out of 25 millions Malaysian populations.

<i>Year</i>	<i>No s Of Workforce</i>		<i>Year</i>	<i>No s Of Workforce</i>
1970	91,000		1988	340,000
1971	102,000		1989	377,000
1972	114,000		1990	424,000
1973	127,000		1991	465,000
1974	143,000		1992	507,000
1975	160,000		1993	544,000
1976	169,000		1994	597,600
1977	182,000		1995	717,100
1978	197,000		1996	796,000
1979	212,000		1997	876,100
1980	269,000		1998	765,300
1981	299,000		1999	748,800
1982	318,000		2000	755,000
1983	442,600		2001	769,900
1984	442,300		2002	770,600
1985	429,400		2003	779,900
1986	382,000		2004	770,600
1987	354,600		2005	775,300

Table 1.1: Overall statistic Employment In The Malaysian Construction Industry

Source: Master Builders Associate Malaysia (MBAM)

Table 1.2 Clearly shown the statistics of different classes of contractors which were registered with *Pusat Khidmat Kontraktor* (PKK) Malaysia. From the statistics it's shown that 91.63% of total number of civil works contractors are from contractors class C to F and 8.37 % are contractor class A and B. This figure shows that the majority numbers of civil contractors in Malaysia are medium and small class contractors.

State/ Class	A		B		C		D		E		F	Total		overall
	B	BB	B	BB	B	BB	B	BB	B	BB	B	B	BB	
JOHOR	76	18	42	24	108	27	337	147	149	92	3103	3815	308	4123
KEDAH	90	17	55	18	71	19	138	57	43	8	2434	2831	119	2950
KELANTAN	119	9	93	23	121	16	199	62	74	31	2480	3086	141	3227
MELAKA	29	6	23	8	33	12	113	82	32	31	1185	1415	139	1554
N.SEMBILAN	36	5	24	13	55	10	277	70	162	24	2387	2941	122	3063
PAHANG	61	9	47	15	115	15	245	80	82	63	2220	2770	182	2952
PERAK	51	15	50	18	96	16	233	77	110	61	2802	3342	187	3529
PERLIS	17	1	14	2	19	3	42	29	2	4	1087	1181	39	1220
P.PINANG	75	23	49	23	41	15	144	74	54	29	1397	1760	165	1925
SABAH	164	50	67	60	42	32	102	305	51	186	2540	2966	633	3599
SERAWAK	118	40	53	68	30	58	67	74	81	103	1004	1353	343	1658
SELANGOR	290	126	162	118	227	116	324	522	72	141	4560	5635	1023	6658
TERANGGANU	107	5	89	12	171	16	293	51	92	9	2396	3149	92	3241
W.P	350	209	187	156	238	150	318	205	67	106	1671	2831	826	3657
TOTAL	1583	533	955	558	1367	505	2832	1835	1071	888	31266	39075	4319	43394
OVERALL	3629				39765									
%	8.37%				91.63 %									

*B = Bumiputra *BB=Non-Bumiputra

Table 1.2: Shown statistic of civil work contractors in Malaysia till October 2007
Source : Statistic Of Civil Works Contractor _ Pusat Khidmat Kontraktor (PKK) Malaysia.

Figure 1.1 shows the number of accidents reported to SOCSO from years 2000 to 2006 with average ranged in between 3500 to 5000 cases yearly. It's show that the accident in the construction industry is still high in every year.

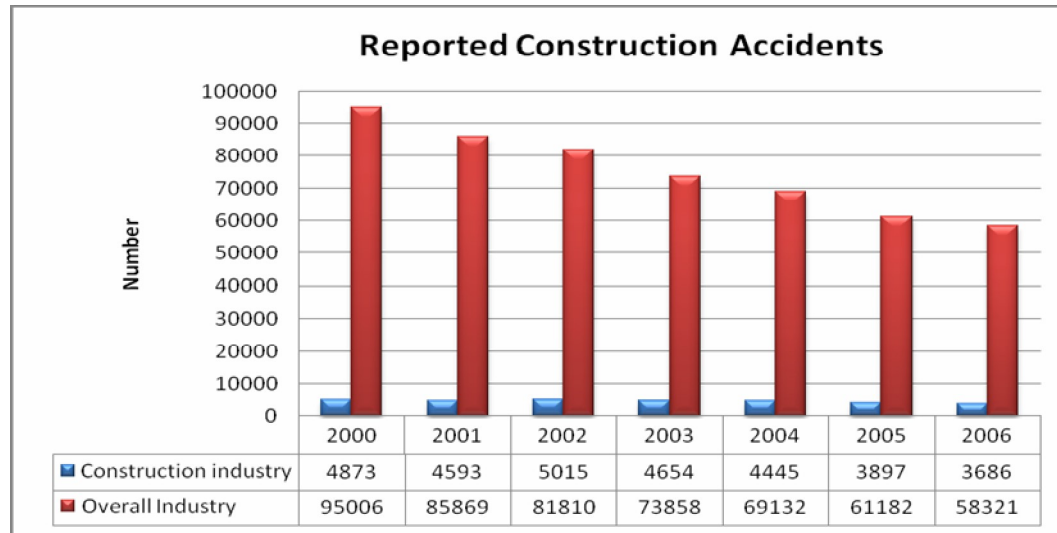


Figure 1.1 Number Of Construction Industrial Accidents 2000-2006
Source : SOCSO Annual Report

Table 1.3 shows the detail statistic of comparison number of reports toward construction industries and overall industry in overall numbers of cases, permanent disable reports and death reports yearly based on year 2000 to 2004. It's were clearly shows that an average of 6% total of cases are from the construction industry and an average of 5.70% and 12% are from permanent disable and death report respectively.

BIL	INDUSTRY	2000	2001	2002	2003	2004
A	Number Of Cases Reported:					
	Overall Industry :	95,006	85,869	81,810	73,858	69,132
	Construction :	4,873	4,593	5,015	4,654	4,445
	% Of Construction To Overall :	5.13 %	5.35 %	6.13 %	6.36 %	6.43 %
B	Permanent Disable Reported :					
	Overall Industry :	12,468	11,152	11,335	9,871	9,381
	Construction :	642	618	652	566	566
	% Of Construction To Overall :	5.15 %	5.54 %	5.75 %	5.73 %	6.03 %

C	Death Reported :					
	Overall Industry :	1,004	958	858	822	846
	Construction :	159	89	88	95	77
	% Of Construction To Overall :	15.84 %	9.29 %	10.26 %	11.56 %	9.10 %

Table 1.3: Shown no of accidents in construction industry as compared to total industry injuries : 2000-2004

Source : SOCSO Malaysia (Annual Report)

In practiced we were aware and accepted that in the construction industries, preventing the risk of accident does not start when work begins on site. By carried out good design and planning in the pre-build phase, preparing of tender documents phase. The architects, designers, and planners can significantly reduce the risk of accident during the site construction stages. All employers have legal duties to fulfill on the minimum basic requirements for person works on site.

Every years based on SOCSO annual report statistics shown that thousands of numbers of construction accidents cases reported in Malaysia, hundreds of them having permanents disability and nearest hundred are death reported. The OSHA (Occupations Safety and Heath Administration) assumes that there will be over a few hundred of construction workers that will suffer a work-related fatality this year while many others will undergo substantial physical injuries which could have been avoided.

By referring the statistic types of classes of contractor in Malaysia, the majority of construction companies in Malaysia are from medium and small class contractors. Medium and small class contractors are unlikely to have professional occupational safety and health advisors or staff and may lack the knowledge and resources that they need to implement safety and health management activities, such as training, undertaking risks assessments and performing routine inspections and audits.

Furthermore, the engagement of expensive occupational safety and health advice or services from external consultants may seem to be an unnecessary expense. The pressure associated with cost-cutting and business survival in a cutthroat industry mean that occupational safety and health is likely to be low on a medium and small construction company's list of priorities.

International research confirms that medium and small construction businesses are poorer than larger organizations in implementing formal occupational safety and health programmes (Eakin 1992). Unsurprisingly, occupational injury rates vary inversely with the size of construction firms, with medium and smaller companies reporting higher injury frequency rates (McVittie et al. 1997)

In order to protect medium and small contractor workers during the construction stages, we strongly believe that a clear provision of items regarding safety and health with allocations of some amount of costs shall be considered in the construction contract documents and with the experiences and knowledgeable contractors towards the safety and health, will result in their workers being more protected from hazard and risk with their routine of works carried out on site. In achieving a "developed country" by year 2020, Malaysian construction industries shall be seriously considered for the proper implementation of occupational safety and health exercises on site by way of properly defined and allocation of safety and health items in the preliminaries section of tender documents towards medium and small class contractors.

1.3 Aim And Objectives

The aim of this study is to provide a general perspective of safety and health costing by medium and small class contractors in the construction industry. In order to achieve this aim, three objectives have been outlined:

1. To study the provisions regarding safety and health in the preliminaries items of contract documents.
2. To identify the factors considered by the contractors when pricing for projects that do not clearly defined the safety and health item.
3. To identify the cost allocations for safety and health for the project carried out by contractors.

1.4 Scope Of Study

The scope of this study is focused on contractors executing building works and civil works and who are registered with *Pusat Khidmat Kontraktor* (PKK) Malaysia under Class C, D, E and F. The study is on works with contract value not exceeding RM5,000,000.00. The study centers on construction contract document used with JKR (PWD) Standard Form – 203/203A Series and the Traditional Procurement Method. The study is carried out on projects in Melaka, Negeri Sembilan And Johor only.

1.5 Expected Findings

At the end of the research my expectation and finding will results as below:

1. The provisions regarding safety and health in the Preliminaries items of contract document can be determined.
2. The factors considered by the contractors when pricing for projects that do not clearly defined the safety and health can be identified. \
3. The cost allocations for safety and health for the project carried out by the contactors can be identified.