

**EXTENDED OVERTIME AND THE EFFECT TO LABOUR  
PRODUCTIVITY IN CONSTRUCTION : WORKERS  
PERSPECTIVE**

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**A master's report submitted as a partial fulfillment of the  
requirement for the award of the degree of  
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PERSPECTIVE

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**This study is specially dedicated to my  
beloved parents, supervisor, classmates,  
colleagues and all my close friends for  
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## **ABSTRACT**

Extended Overtime is a very common scenario in the construction industry in many parts of the world to accelerate the project schedule. Many contractors have been adopting this method in order to make up for the late changes and project delays. But as a Client, we often look into the three most essential criteria which are cost, quality and time in any project undertaken. This study aims to look into three related objectives which include the need of extended overtime in the construction, the consequential impact of extended overtime and the overall impact of extended overtime in the construction industry. The study identifies that overtime is needed to accelerate the project and also as a result of change work and shortage of materials. The surveyed workers indicate their tiredness, laziness as they are required to work overtime but are motivated by extra earnings. The study shows three major overall impacts of extended overtime on construction performance are premium wages, lower productivity and increase of accidents rates.

## ABSTRAK

Kerja lebih masa dalam jangka masa yang panjang sudah menjadi scenario yang biasa di dalam industri pembinaan di mana-mana tempat bertujuan untuk mempercepatkan progres projek. Ramai kontraktor menggunakan cara ini untuk mempercepatkan kerja mereka. Tetapi, bagi seorang klien, mereka biasanya akan lihat kepada tiga criteria utama iaitu kos, kualiti and masa dalam mana-mana projek yang dikendalikan. Projek ini bertujuan untuk meneliti dan mengkaji tiga objektif yang berkaitan dengan pembinaan, iaitu keperluan untuk kerja lebih masa, impak kerja lebih masa yang berlanjutan terhadap pekerja dan impak keseluruhan kerja lebih masa di dalam industri pembinaan. Kajian menunjukkan bahawa kerja lebih masa diperlukan untuk mempercepatkan perjalanan projek dan juga berikutan factor seperti kelewatan bahan dan perubahan. Keputusan soal selidik menunjukkan bahawa responden mengalami keletihan dan malas walau bagaimanapun tertarik dengan pendapatan lebih secara keseluruhan. Kajian menunjukkan bahawa impak keseluruhan ke atas pembinaan adalah premium gaji, produktiviti rendah dan meningkatnya kadar kemalangan.

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## **CHAPTER 1**

### **INTRODUCTION**

#### **1.1 Background**

The construction industry is dynamic in nature due to the increasing uncertainties in technology, budgets, and development process which resulted in building projects are becoming more and more complex and difficult. Despite this, one seem to remain is the three main criteria which are cost, quality and time have always been the priority in every project undertaken.

In order to make sure these three criteria can be achieved positively, a well planned project management skills which include adequate communication, control mechanisms, feedback capabilities, troubleshooting, coordination effectiveness, decision making effectiveness and monitoring must be implemented. Many times we heard that the typical project overruns especially in relation to time and cost (often overruns its cost estimate). Overruns are common on government and commercial projects, even when changes in the design are taken into account. One

reason this happens is because cost estimating traditionally fails to take into account the possibility risk that the work will actually cost more (or less) than budgeted by even prepared by the most competent estimate.

Besides cost, quality is also an important item to be taken care of. Delivering a completed project within cost and time may not be sufficient if quality did not take into consideration. House owners, for example, will be very disappointed with the developer as the owners have spent a sum of money which are not worth the quality of the completed home. To make matters worst, cost and quality actually comes parallel. To build a quality house may required quite a high cost of budget. Therefore, developer will try their very best to build a house which are of acceptable range of quality and is still within their budget. Apart from this, the developer will ensure the deliverance on time so as to avoid problems associated with delay such as LAD. Various measures and actions have been taken to ensure prompt delivery of construction output.

In today's construction industry, overtime has frequently become the planned schedule from the onset of a project. This is occurring for at least two reasons. First, with a shortage of skilled labours in many parts of the country, the premium pay associated with overtime has become a necessity to attract the required workforce. Second, it has become common for business-savvy owners to request an accelerated project schedule in order to move their product to market sooner. These owners recognise the financial benefit of an early project completion despite the increased cost associated with schedule acceleration.

## 1.2 Problem Statement

Overtime achieves schedule acceleration by increasing the amount of hours worked by labor beyond the typical 40 hours worked per week. Past research indicated that labor productivity can be negatively impacted by overtime, causing problems such as fatigue, reduced safety, increased absenteeism, and low morale (Horner and Talhouni 1995). Additionally, the extra work performed under the implementation of overtime comes at an increased cost, commonly time and a half.

As overtime is used more extensively for long durations it is important for contractors and owners to understand the associated impact to labor productivity. Understanding the effects of overtime is quite difficult because the factors affecting productivity in the overtime situation are numerous.

Normally extended overtime is frequently used to meet tight project targets from owners, and to make up for late changes and project delays. Extended overtime is defined as using more than 40 hours per week for more than two consecutive weeks. (Overtime Subcommittee 2004).

According to Bodek (1985), productivity, in general, represents the conscious growth of a society or an organization in its ability to improve the value, the quality of its products or its services. The success of a company can probably be more clearly measured by its productivity growth than by its growth in profits. However, productivity is theoretically defined as a ratio between output and input. In the context of construction industry, the output is the structure or facility that is built or some component thereof. The major inputs into the construction process include manpower, materials, equipment, management, energy and capital.

The above statement can be illustrated by an example, contractors in labor intensive fields such as the mechanical or electrical trades generally allocate 33–50% of a project's total budget to labor costs (Hanna 2001). Of the typical project cost components (material, equipment, and labor), labor is considered the project element containing the most risk. The other cost components (material and equipment) are predominately determined by market price and are consequently beyond the influence of the project management. As a result, the management of labor and its productivity becomes paramount in determining the success of a project.

Within narrow limits, labours expand energy at an accepted pace established by long periods of adaptation. When the hours of work per day or per week are changed, there is an adjustment period. Some studies have also revealed that extended overtime operations result in a sharp drop in productivity initially, followed by a fairly substantial recovery by the end of the first week. The recovery level of productivity may then hold fairly steady for a period of two to three weeks but show a steady decline for the following two to three weeks. After five to six weeks of operations, there is a further drop in productivity which levels out at a low point after nine to twelve weeks of sustained overtime operation. It should be understood that this condition results from normal reactions and does not reflect the effect of other adverse factors such as labor, climate, and poor management.

Is the similar situation occurred in Malaysia? Is extended overtime is a common practice in Malaysia and whether the extended affect construction productivity in selected construction firm? A study should be carried out to investigate the problems.

### **1.3 Aims and Objectives**

Many a times, overtime has been frequently used in many part of the construction phases as an inducement to attract labor and to accelerate schedule performance. While there may be positive short-term benefits to working an overtime schedule, the long-term consequences are typically viewed as detrimental.

This study focuses on obtaining views from construction workers and to analyse the impact of extended overtime on workers in selected site in Klang Valley. The aim is supported by the following objectives:-

1. To study the need or drive of extended overtime in project undertakings.
2. To study the consequential impact of extended overtime to labour productivity in construction industry.
3. To analyse the overall impact of extended overtime in construction environment.

### **1.4 Scope of Study**

Previous studies concentrated on the matters separately. For example work on productivity and productivity in construction. Overtime has been studied in other areas such as manufacturing. The work on overtime and extended overtime in construction and its impact on productivity almost non-exist. The study focuses on obtaining views from workers. The study identify factors overtime is required in

the construction phases and to study and analyse the consequential impact of extended overtime and the overall impact of extended overtime in the construction industry.

## **1.5 Research Methodology**

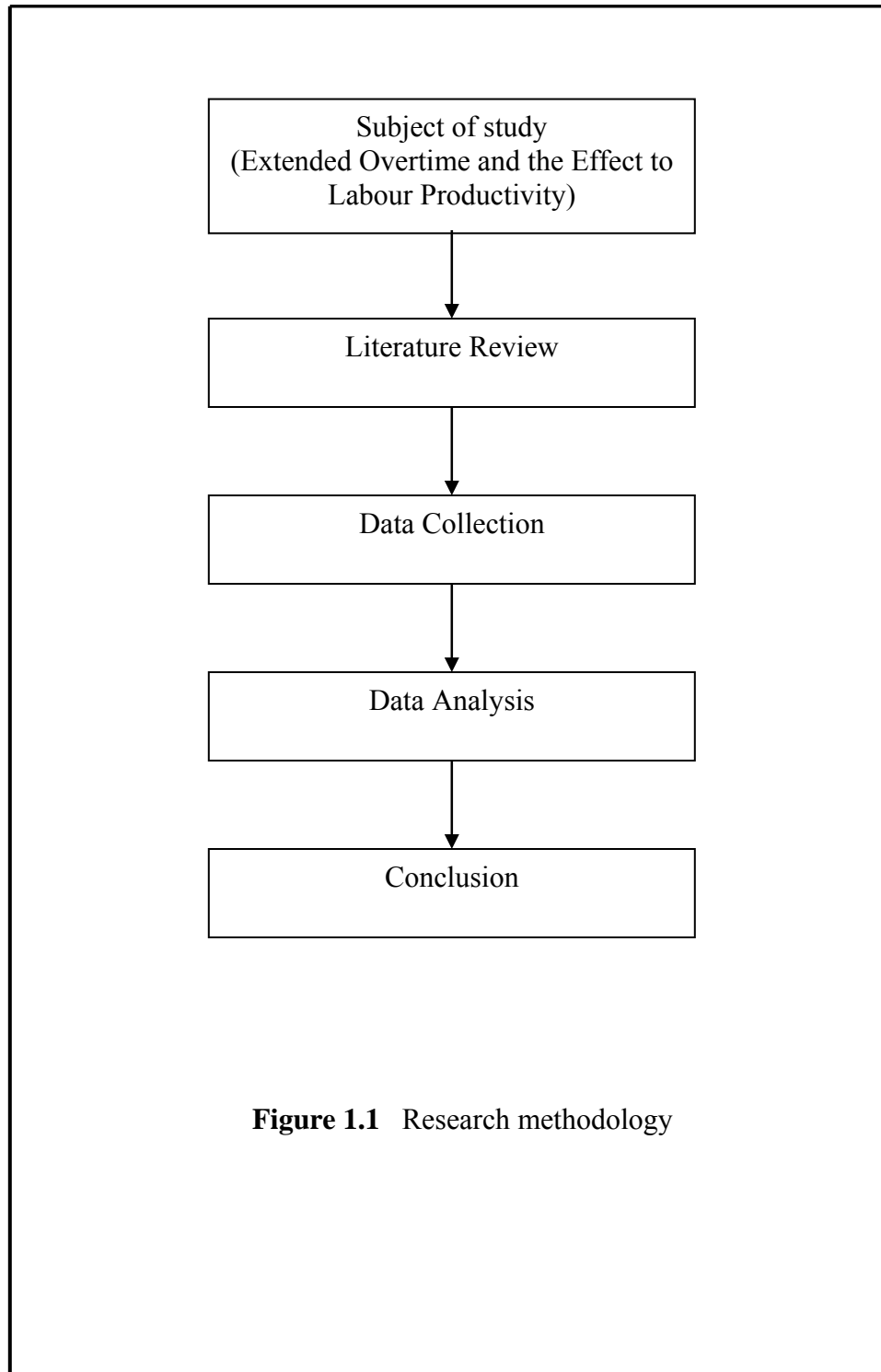
This section discusses methodology of the research. This will help to realize the aim of the study in the light of the existing knowledge and investigation evidence. In achieving these aim and objectives, the essential stages of methodology are performed. The major processes involved in conducting this study are shown in Figure 1.1. These include subject of study, the literature review, data collection, data analysis and conclusion.

The preliminary insight of the subject data for this study will collect through a literature review and the use of a questionnaire survey targeted at contractors and subcontractors. The literature review was conducted through books, internet and leading construction management and engineering journals. In this stage, factors why extended overtime is required and the impact of extended overtime to labour productivity encountered in a construction industry were identified. Other related factors that overall affect the labour productivity will also be identified.

*Data collection:* Primary data collection via questionnaires. The data collected through questionnaire surveys will be analysed. Findings and conclusion will be derived based on the analysis.

*Data analysis:* The gathered data will be analysed to derived the answer for this study.

*Conclusion :* Recommendation will be suggested to further enhanced the objective of this study.



**Figure 1.1** Research methodology

## **1.6 Organisation of the Research**

This dissertation is structured into 5 chapters and briefly described as follows.

Chapter 1 presents an introduction to the subject, background and the specific problem associated with it. This chapter also specifies the aim and objectives, the methodology of conducting this study and a brief summary on the structure of the research.

Chapter 2 emphasizes on the related issues on overtime and extended overtime in construction industry from available literature review which included definition of overtime and extended overtime; productivity; factors affecting productivity; studies in other Asean countries related to labour productivity; labour productivity measurement in construction industry; and effect of extended overtime on productivity.

Chapter 3 looks into the details on data collection process that involved in the study which included introduction, methods of data collection, primary and secondary data collection, analysis method used and summary.

Chapter 4 discusses the process of the data analysis to achieve the aim and objectives of this study which included introduction, analysis of data, presentation of tables and bar charts and conclusion.

Chapter 5 summarises findings and presents overall conclusion for this study.

## **CHAPTER 2**

### **OVERTIME AND EXTENDED OVERTIME**

#### **2.1 Introduction**

There is very little evidence of study on extended overtime and its impact on productivity in construction. In fact, previous studies concentrated on the matters separately. For example work on productivity and productivity in construction. Overtime has been studied in other areas such as manufacturing. Therefore, this study will focus on obtaining views from workers by identifying factors overtime is required in the construction and to study and analyse the consequential impact of extended overtime and the overall impact of extended overtime in the construction industry.

In this chapter, the definition of productivity and factors affecting construction productivity is discussed. Then is followed by some studies of labour productivity in Asean countries and lastly the labour productivity measurement in the construction industry.

## **2.2 Overtime**

Overtime is defined as the work performed over 8 hours/day or 40 hours/week. Overtime can occur in a variety of schedules including: 5 days of 10 hour worked per day [5(10)s, 7(8)s, 6(10)s, or 7(10)s] ( Awad S. Hanna 2005 ).

Short-Term Overtime is using up to 50 or 60 hours per week for one or two weeks and is used to meet specific project targets or to minimize downtime during a plant shutdown, There are added costs for this Short-Term Overtime, but productivity and safety can be controlled by increased supervision and planning. When overtime is used for more than two weeks, the effects of Extended Overtime start to take effect. Fatigue from longer hours of physical labor, overextended supervision, shortages of materials, increased accidents and other issues are all factors. Workers start to take personal days off and turnover increases. Eventually, the work completed each week approaches the level that could have been completed in 40 hours.

## **2.3 Extended overtime**

Extended Overtime is using more than 40 hours per week for more than two consecutive weeks. (Overtime Subcommittee 2004). The impact of Extended Overtime is a significant reduction in productivity, more accidents and increased costs. Over 30 years of research has consistently proven these results. In addition, a recent survey confirmed that most industry leaders agree. With premium wage rates and reduced productivity, the total cost impact of extended overtime can increase project labor costs by more than 80%. It is also true that extended overtime on

construction projects increases costs and reduces labour productivity, increases the risk of injuries and fatalities and increases absenteeism and turnover.

According to Business Roundtable Construction Committee Report, the use of extended overtime significantly increases the cost of construction projects which leads to reduced investment in capital projects in the U.S. and increases foreign competition for production. When large projects start to use extended overtime they affect all other projects in the area. To compete for skilled labours, other projects will also use overtime or other high cost incentives. The local construction labor market is disrupted and chaotic and all projects will incur higher costs. Reducing the use of extended overtime on U.S. construction projects will improve cost effectiveness and benefit all owners, contractors and building trades. More cost effective construction projects will be more competitive and result in increased market share.

Extended overtime is frequently used to meet tight project targets from owners, make up for late changes and project delays and attract skilled labor to a projects. Some owners and contractors consider extended overtime as necessary and required to meet the demands for faster schedules or to staff their projects. However, it is crucial that the use of extended overtime be controlled.

When a project in an area is placed on an extended overtime basis, the movement of workers from other projects in the area to the overtime job creates an "auction" atmosphere. Other jobs go to overtime to hold their labor, and a bidding process is established. The local labor supply is fairly constant, and the additional productive capacity of transient workers is offset by the reduced productivity of all workers on an overtime schedule. Usually, a major portion of the increase in numbers of workers in the affected area is a result of permit workers in the crafts

who are less proficient or poorly qualified. Disruptions created by unwilling or poorly qualified labours, longer working hours each week, increased absenteeism, and reduced effectiveness due to fatigue reduce the productive output of labor materially. On extended overtime, the reduced productivity of workers for a week's work is equal to or greater than the number of overtime hours worked. It is an evidence that the premium cost for overtime hours, plus the loss in productivity for the total hours worked, results in an unreasonable inflation of the unit labor cost. Time, local labor climate, management actions, and job location are all factors which affect the cost of overtime operations.

Many projects are completed successfully without the use of extended overtime. The owners and contractors on these projects have taken a strong corporate stand against extended overtime on their projects and have required project teams to use better alternate approaches to meet the objectives. Combined with effective front-end planning, this “just say no” approach to extended overtime is an effective method for limiting overtime and saving costs. When project teams have adequate time and resources for front-end planning, they have many alternate approaches to meet their objectives. The key is to require that teams consider the alternates before they recommend Extended Overtime. While it may not be possible to eliminate all Extended Overtime, the goal is to make it the “last choice” vs. the “firstchoice”

This section has shown that overtime has been adopted worldwide for the purpose of accelerating construction work. This nonetheless create quite reasonable concern among construction practitioners that this may affect productivity especially on workers. This is explore in the following section.

## 2.4 Definition of Productivity

There are two definitions of productivity that relate to construction, one that defines productivity in terms of the amount of work produced and one that defines productivity in terms of dollar value of the work produced (Schexnayder and Mayo, 2004). Productivity is output per worker-hour or dollar value per worker-hour. Contractors usually prefer the work-output-related because they can make changes to affect the worker-hours of effort. They can change crew size or change the mix of equipment, so they prefer the work-output-related definition. At the same time, they recognize that in reality they are dealing with dollar output because all outputs relates to the amount the owner will be billed. Schedules are developed in crew days or worker-hours, so it is natural to define productivity as units of output in relation to effort. The government measures the country's productivity in dollar output per worker-hour or total cost per unit of output (Schexnayder and Mayo, 2004). Either definition is acceptable. The following formula is

$$\text{Productivity} = \frac{\text{Units of output (or output dollar value)}}{\text{Worker-hour}}$$

**(Equation 2.1)**

The American Association of Cost Engineers however defines productivity as a “relative measure of labour efficiency, either good or bad, when compared to an established base or norm”. Whereas the bureau of Labour Statistics of United States of America has defines labour productivity as the ratio of output to labour hours (BLS, 2000). One of the challenges I measuring productivity is the unit of measurement depends on the construction activity. A concrete placement activity

may be measured in cubic meters of concrete placed per hour, whereas a structural steel placement activity may be measured in linear meter of steel placed per hour. Using relative values of productivity rather than absolute values solves this problem (Goodrum and Haas, 2004).

According to Tenah (1985), productivity is theoretically defined as a ratio between outputs and inputs. The Bureau of Labour Statistics of United States of America stated that a measure of productivity is more specifically an expression of the physical or real volume of goods and services (outputs), related to the physical or real quantities of inputs (labour, energy, capital). In the context of construction industry, the output is the structure or facility that is built or some component thereof. The major inputs into the construction process include manpower, materials, equipment, management, energy and capital. As productivity in construction been explored, the next step is to ensure factors affecting construction activity.

## **2.5 Factors affecting Construction Productivity**

The manager who chooses to lead in the area of productivity finds himself confronted with many different subjects. There are many factors that affect construction labour productivity. These include a wide range of subjects, such as hours worked per day, open shop labour, and new earth-moving equipment. It should be helpful to identify and then categorize the various factors.

### 2.5.1 Kern Philosophy

According to Kern (1982), labour productivity factors can be divided into three groups. The worker must “want to” do a good job, “know how to” do the job and be “allowed to” do a good job. Management controls most of the constraints on all three categories. The “want to” factors are goals, which include job content, interpersonal atmosphere, compensation, working conditions, physical capability, and society. The “know how to” factors are education and training. The “allow to” factors are organization, raw materials, tools, information, and time to act. Table 2.1 shows a listing of these labour productivity factors.

**Table 2.1:** Labour Productivity Factors

WANT TO	KNOW HOW TO	ALLOW TO
Goals	Education	Organization
Job content	Training	Raw materials
Interpersonal atmosphere		Tools
Compensation		Information
Working conditions		Time to act
Physical capability		
Society		

Adapted from Lynn D. Dorsey in Kern (1982)

Improvements of the “allow to” factors are a fruitful area of management attention. Information availability has important impact on a worker’s productivity. A crew of highly motivated, well-trained, well-supplied men can remain completely idle without information. The crew must know what to do before they can even get started. Manpower needs to be allocated properly to project tasks to be most effective. The task should be well defined, which implies good design

information being available. Other associate tasks should not be constrain the task at hand. It can be concluded that Kern's Philosophy is centred on grouping factors into 'want to', 'know how to' and 'allow to'. The Neil Philosophy will explore further the matter.

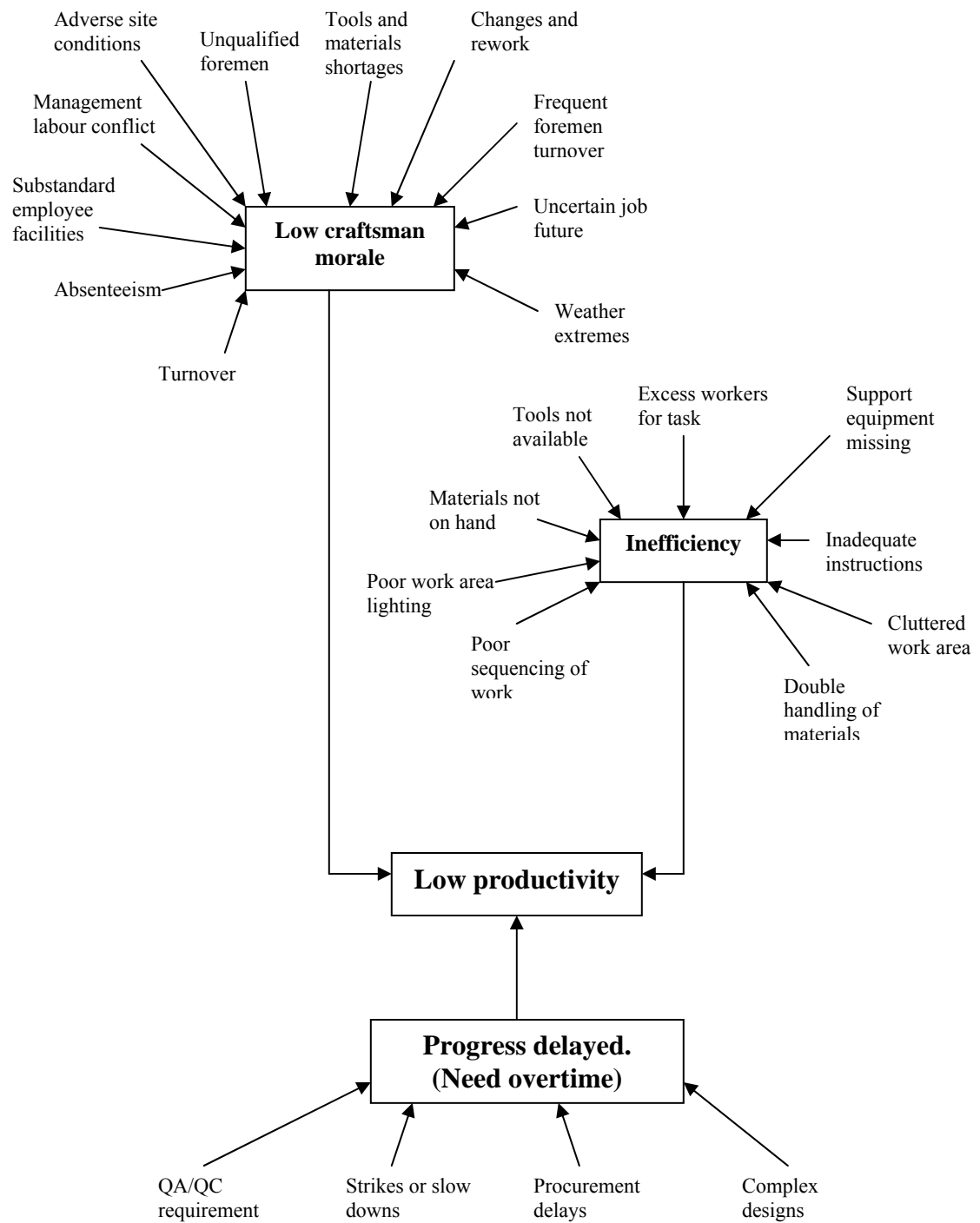
### **2.5.2 Neil Philosophy**

Neil (1982) has identified many of the factors that affecting the construction labour productivity. It can be seen that many of these detracting factors are of a type that good management can eliminate or ameliorate. Obviously, all nonproductive time could never be eliminated. So, what is the practical limit of direct work time that can be achieved? There is no exact answer, of course, but research has suggested that it can approach 55%. If true, there is ample room for productivity improvement among most labour crews.

Based on the above arguments, what are some of the actions that management can take? Time lost to workers while instructions are being given or while they are waiting are prime target for management improvement action. If a company develops and maintains a manual of construction procedures that are standard throughout the firm, the necessity for new and detailed instructions for each work item can be greatly reduced. Such standard operating procedures would outline actual methods for accomplishing all common tasks, whether it be warehousing of materials or the pouring of concrete in a slab. Waiting time can be reduced by better scheduling of work to ensure that the labour, materials and equipment are available simultaneously and one element is not waiting on the other. Efficient site layout is important. The area for check-in and check-out of

employees should be located to minimize travel time to and from work locations. Laydown areas for construction materials should be as close as possible to place of use to prevent costly movement time or doubling handling. Construction water, air, gas and other services lines should be located for quick and easy access. These are but a few of the many management actions possible.

Figure 2.1 shows the factors that affecting the construction productivity as identified by Neil (1982).



**Figure 2.1:** Low productivity problem. Adapted from Neil (1982)

## **2.6 Labour Productivity Factors Studies In Asian Countries**

Several researchers have carried out some works through surveys in issues related to construction labour productivity in some of the Asian countries. Through these studies, construction labour productivity issues encountered by these countries that affecting productivity were identified. To ease the understanding, the discussion will be based on each country in Asean.

### **2.6.1 Singapore**

In the paper presented by Lim and Alum (1995) titled “Construction Productivity: issues encountered by contractors in Singapore”, the construction industry in Singapore is greatly concerned about its low level of productivity. A survey was conducted in Singapore related to productivity issues encountered by contractors at construction sites by Lim and Alum (1995). Respondents were asked to rank a list of 17 problems that could affect construction productivity. The authors then classified the 17 items into the following three categories; manpower, management and environment. The first category is related to manpower. Either the factors are originated from the workers or company/organisations, these factors seem to affect productivity quite significantly.

#### **1. Manpower**

- Recruitment of supervisors;
- Recruitment of workers;
- Labour turnover;

- Absenteeism;
- Communications problems with foreign workers;
- Alcoholism and similar problems among workforce;
- Labour disruption;

The second category will be the management where labour productivity will decrease when these factors occur at the site.

## 2. Management

- Materials shortages;
- Delays in materials deliveries to site;
- Disruption of power/water supplies;
- Stop-work orders because of site accidents;
- Stoppages because of work being rejected by consultants;
- Stop-work order because of infringements of government regulations;
- Stoppages because of disputes with owners/consultants;
- Stoppages because of insolvency of subcontractors/suppliers;

While the third category is the environment which will affect the productivity quite significantly.

## 3. Environment

- Health;
- Inclement weather.

All these issues may be happened in Malaysian construction industry as Singapore is our neighbouring country. There are many similarities characteristics of the both countries are such as weather, labour market, government regulations, availability of materials, and etc. Thus, the above mentions factors may be useful to this study. As the situation in Singapore is discussed, what about in other countries? This is explore in the following section.

### **2.6.2 Hong Kong**

Work in Hong Kong also reveal reasonable findings in related matter. According to Ng *et al.* (2004), in their paper titled “Demotivating factors influencing the productivity of civil engineering projects”, workers on civil engineering projects are frequently confronted with problems that could lead to demotivation. Demotivation is caused not simply by lack of motivators and motivation but the existence of certain situations that cause dissatisfaction and discourage individuals from pursuing desired goals.

To identify the main demotivators affecting civil engineering workers and their impact on productivity, a questionnaire survey was carried out in Hong Kong. The survey questionnaire consisted of three parts. The first part concentrated on potential demotivators, and respondents were asked to rate their significance. In the second part, respondents were requested to estimate the time loss caused by each demotivators identified. As demotivation cannot be systematically detected, it would be difficult to quantify the actual time loss accurately. To ensure adequate reliability, respondents were asked to summarize the time spent on rectifying errors, waiting for materials, etc during the week when survey was conducted. The

final part of the questionnaires aimed to elucidate the reasons for demotivation and time loss.

Ng *et al.* (2004) found that the morale of workers on the seven Hong Kong civil engineering sites visited relatively low, with demotivation occurring due to extensive rework, overcrowded work areas, problems in crew interfacing, availability of tools, delays in inspection, availability of materials, and incompetence of site foremen.

The results indicate that the total time lost in the seven civil engineering projects surveyed due to demotivation of workers ranged from 5.1 to 13.6 man-hours/week – the most significant time lost being caused by lack of materials availability, overcrowded work areas, and rework. These could be a result of ineffective management and poor communications on site. Should management have been sensitive to these demotivators, it is possible that their impact could have been reduced.

The study also shows that project value was found to have negative correlation with the time loss due to demotivation, indicating that as project size increases time loss decreases. Managers also need to be aware that a higher time losses can occur during the immediate stages of projects. As projects are progressing towards their peak in site activity, more activities/workers will be involved and coordination and communication problems will be inevitable. By paying more attention to workers and construction works at this stage, it may be possible for project managers to address these problems before they grow further.

### **2.6.3 Indonesian**

Kaming *et al.* (1997) in their paper titled “Factors influencing craftsmen’s productivity in Indonesia” revealed that craftsmen in Indonesia spend on average 75% of their time working productively. The five specific productivity problems are identified as lack of materials, rework, absenteeism, lack of equipment and tools and gang interference. The investigation of the problems influencing craftsmen’s productivity was carried out on 27 medium and high-rise building sites surveyed in Indonesia. Three main groups of craftsmen (93 bricklayers, 81 carpenters, and 69 steel benders) some 243 workers in total, participated in the comprehensive structured survey of production problems conducted over a 4-month period. The study instruments included craftsmen questionnaires and an activity sampling survey. Lastly, the following section will look into the labour productivity measurement in the construction industry.

## **2.7 Labour Productivity Measurement in the Construction Industry**

Construction productivity can be measured in different ways. The particular form adopted depends on the type of information desired. Measuring of construction productivity is not an easy task. It is difficult to find a homogeneous measure for the outputs due to tremendous diversities in type, size, and quality of construction products as well as variations in the resources utilized in their production (Tenah, 1985). The different inputs are also measured in different ways and expressed in different units. Their quantities vary according to the type, size, quality, and geographical location of the structure. In order to limit the potential

problems created by the heterogeneity of the outputs, productivity statistics for the construction industry are generally categorized by similarities of project characteristics, essentiality, construction type, labour and material requirements, geographical location, total costs and factor costs. Most of the methods that have been used to measure construction productivity are based on labour productivity, cost or price data, profits or models. Tenah (1995) found that neither of these systems has provided satisfactory and reliable analysis of construction productivity.

Undoubtedly, confusion regarding productivity can be caused by the myriad of different ways to define it. A common measurement of construction productivity is factor productivity (Thomas et al., 1990) which is defined as

$$\text{Factor Productivity} = \frac{\text{Physical Output (Units)}}{\text{Labour (\$) + Circulating Capital (\$) + Fixed Capital (\$)}}$$

**(Equation 2.2)**

Labour productivity is the most available data as labour productivity is the easiest to measure. It is normally expressed in man-hours as mentioned earlier in this chapter. It is calculated as man-hour per unit of production, and the total man-hours expended in production. The latter includes direct and indirect man-hours. Direct man-hours are defined by the Bureau of Labour Statistics, United States of America as including all man-hours involved in actual production and included in the accounts procedure as direct labour costs. Indirect man-hours are also defined as other man-hours involved in production except general administration, office engineering and sales.

Tenah (1985) said that the major shortcoming of labour productivity is its inability to indicate the performance of other factors. The impact of other inputs such as equipment, work methods, and management on output as well as on labour performance itself, is obscured. Thus labour productivity does not accurately measure labour contribution in the process and offer a satisfactory assessment of changes in productivity. Changes in productivity are caused by a variety of factors and not only labours. For labour productivity to be representative of the total input, it would be necessary for the labour time involved in production to be so large, in relation to the other inputs, that changes in labour input would be the only means of appreciably influencing the level of output.

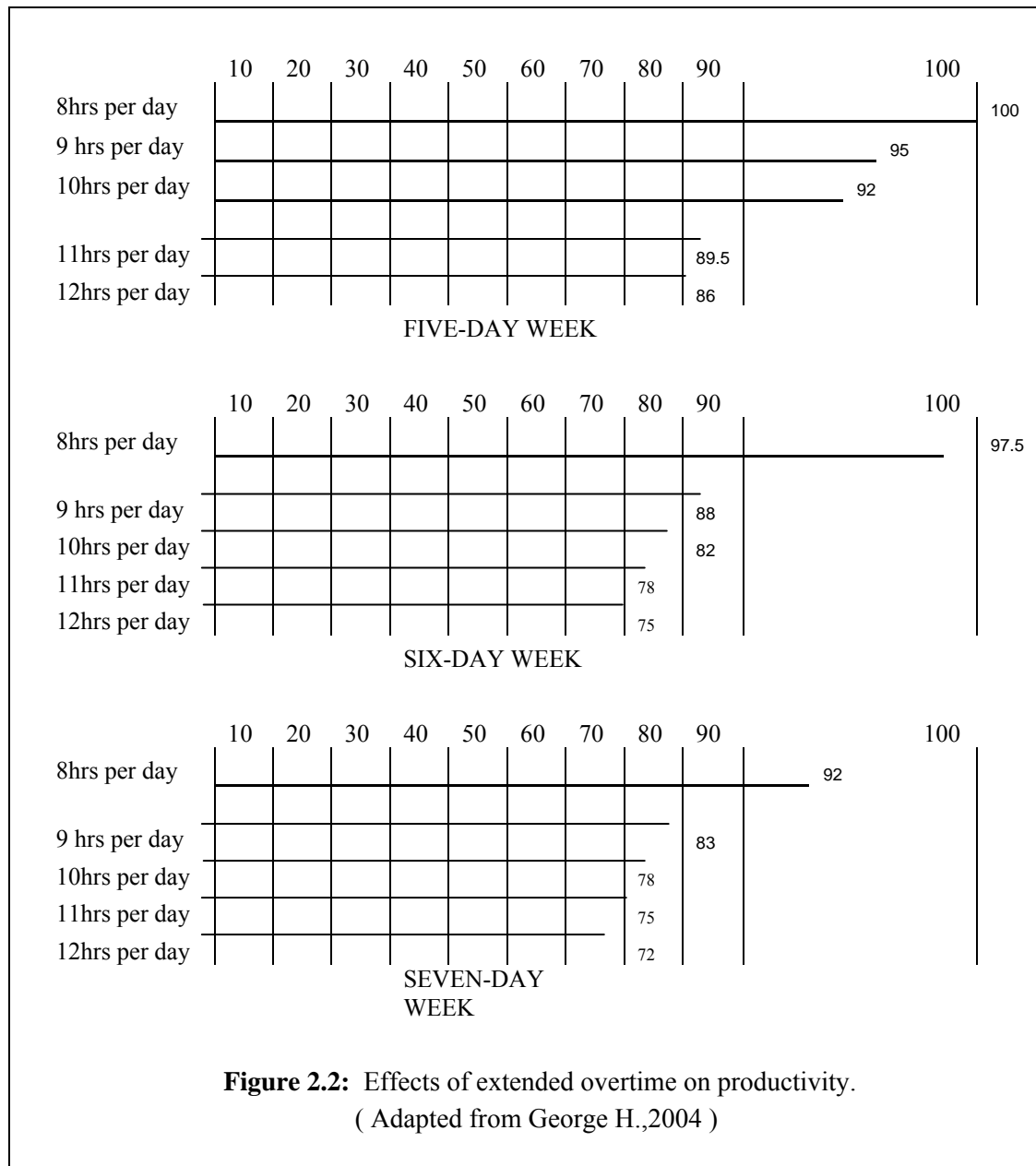
## **2.8 Effects of extended overtime on productivity**

Overtime is a major variable impacts on labour units. The effect of work performed beyond the normal workday must take into consideration efficiency and fatigue. Most contractors abide by an eight-hour, five-day week. There are many combinations that range from thirty-two to forty work hours per week. A normal workweek exists only when construction progress meets all its milestones and does not require overtime hours.

The need to extend hours beyond the normal workweek can be required due to several factors including weather, improper management, other trades or even your own company's performance. Review the job's specifications that relate to overtime. Some project may prohibit or even assess penalties if such overtime work is performed. Restricted access to the job site can impact overtime work and create added costs.

Overtime pay is only one aspect of working extended hours. The estimator must take into consideration the effects of extended work hours to include a fatigue factor. By simply adding the increased labor rate to those hours above the normal work week does not cover the loss of labor hours brought on by fatigue. (George H.,2004)

On rare occasions overtime may increase work performance as there will likely be less interference when other trades have left the job site. Studies, however, by both trade associations and the government clearly document that overtime typically reduces productivity. Accidents, absenteeism and mistakes increase. The problem of fatigue is directly proportional to the amount of overtime worked. These studies have found that no matter what the employee's incentive is, fatigue reduces productivity. Studies have also shown that the fatigue produced by overtime work affects work done on regular time as well. Requiring an individual to work seven days a week on a regular basis is foolish. The overall effect on performance is counterproductive. Most contractors will attempt to avoid the excessive costs of overtime. (George H.,2004)



From the Figure 2.2 above, it can be concluded that the longer the working hour involved by the worker in a week, the lower the work productivity of the worker.

## **2.9 Summary**

Literature review is one of the essential stages to identify and formulate the problems in the study. The literature review discusses the issues related to overtime and extended overtime in construction industry from available literature review which included definition of overtime and extended overtime; productivity; factors affecting productivity; studies in other Asean countries related to labour productivity; labour productivity measurement in construction industry; and effect of extended overtime on productivity.

After studying the details on the overtime and extended overtime in the construction industry, it is realized that it has an impact to the labour productivity because of the fatigue factors. Other impact such as absenteeism and also increase in premium wages are also significant.

## **CHAPTER 3**

### **METHODOLOGY**

#### **3.1 Introduction**

Chapter 3 embrace the preview for method of data collection in an orderly manners in the aspects of how the data were collected, where the data is to be source and how the design till implementation of the questionnaire. The research methodology serves to explain and achieve the objectives mentioned in Chapter 1.

### **3.2 Methods of Data Collection**

Data collection is considered as the important stage in gathering all required information form the fundamental in achieving main objectives of the study. Basically, the main or primary data were collected from:

- 1) Questionnaires survey – the data collect through questionnaire survey delegated to the foreign workers of different trades of work involve in the construction project.
- 2) Interview – may be from on-the-spot interview with the workers.

Secondary data are collected from literatures review on books, journal, articles and seminar conference, website which emphasize on the construction and labour productivity. The secondary data reviewed prepared the platform for the formulation of questionnaire.

### **3.3 Primary Data Collection**

The primary data in this study were gathered through questionnaires distributed to the foreign workers in the construction project. The questionnaires to examine the aspects identified in the literature and meant to fulfill the objectives pre-determined.

During the questionnaire's preparation stage, questionnaires were designed and are aimed to enable amore objectives responses rather than superfluous views that contained no concrete substance or justification. The questionnaire has been designed in order to obtain a wider range of views towards the study. The questionnaire has been designed in such a way that simple and straightforward. Respondents only need to circle or choose his responding answer. The sample of the questionnaire can be referred to in APPENDIX A.

The questionnaires structure framed based on three types of answering techniques, namely rating-based, selective based and open-ended format. Rating-based format, respondents were instructed to rate their opinion for a specific fact by making a 5-point scale ranging from Totally Disagree to Strongly Agree or from Very often to Never. Secondly, selective-based questions only required respondents to tick in the appropriate box or boxes.

The structured questionnaires for this study would cover 3 sections,

- 1) Section 1: The background of the respondents such as nature of work, number of years experience in construction, country of origin, length of years in Malaysia and length of years in construction.
- 2) Section 2: The second part comprises the workers experiences of working overtime and extended overtime and to find out their opinion whether working on an extended overtime will make them feel tired and annoyed.
- 3) Section 3: Third part would be would be the question to investigate the need of extended overtime in project, the consequential impact of extended overtime and ascertain consequential influence on the labour productivity.

In this study, there are 50 sets of questionnaires being prepared and distributed to the respondents with different trades of work from a particular construction site in Seri Kembangan. The chosen respondents for the study are those in the nature of work such as bricklaying, plastering work and concreting work.

### **3.4 Secondary Data Collection**

Secondary data are from literature review discussed in Chapter 2. These data are important to generate and design the questions for the questionnaires of primary data collection. All secondary data are obtained from journal paper, seminar paper of conference, books related to the studies of construction and productivity.

### **3.5 Analysis Method**

The data are pre-processed using the Microsoft Excel for Microsoft Professional Windows XP for the data analysis. The analysis of the data from the receivable feedback from the questionnaire quantitative stimulation in using Microsoft Excel for instance in average index calculation and generation of chart and graph.

*Average Index Formula:*

$$\text{Average Index} = \frac{\sum \beta x n}{N} \quad (1)$$

Where,  $\beta$  is weighting given to each factor by respondents;  
 $n$  is the frequency of the respondents;  
 $N$  is the total number of respondents.

With the rating scale as below: (Majid & McCaffer, 1997)

- 1 = Never/totally disagree ( $1.00 \leq \text{Average Index} < 1.50$ )
- 2 = Rarely/disagree ( $1.50 \leq \text{Average Index} < 2.50$ )
- 3 = Sometimes/neutral ( $2.50 \leq \text{Average Index} < 3.50$ )
- 4 = Often/agree ( $3.50 \leq \text{Average Index} < 4.50$ )
- 5 = Very often/strongly agree ( $4.50 \leq \text{Average Index} < 5.00$ )

### 3.6 Summary

The instrument used to collect data required for the study was face to face questionnaires survey. The questionnaire was designed into various sections to achieve the objectives of this study.

A survey has been carried out with the foreign workers from different trades of work to gather relevant information in this study. During the questionnaires survey, we encountered many obstacles such as:-

1. Respondents rely on other party to answer the questionnaires because most of them are foreign workers, e.g Indonesians, Bangladeshis.
2. Time limitation because only during workers break time survey is conducted.

The information collected was summarized for further study that will discuss in details in Chapter 4.

## **CHAPTER 4**

### **RESULTS AND ANALYSIS**

#### **4.1 Introduction**

Data from questionnaire are analysed to find out the response of the workers on their working experiences of working extended overtime, the consequential impact of extended overtime and the consequential influence on labour productivity in order to achieve the prescribed objectives mentioned in Chapter 1.

Out of 50 questionnaires distributed, 60% responds rate of 30 respondents feedback that comprise of workers from different nature of work such as bricklaying, plastering work and concreting work. Only workers who experienced working extended overtime are taken into consideration in this questionnaires analyzing.

## **4.2 Analysis of data**

The logical step after collecting all the information and data needed from the questionnaires is to analyse the gathered data. Although the need and impact of extended overtime were investigated by many researchers but most of it were conducted in overseas. A survey in Malaysia using the information available from overseas is important to identify the actual need and impact of extended overtime to labour productivity in our construction industry.

Average Index is used to present the output of the survey. The aim of this procedure is to establish the relative significant for the various need of extended overtime and establish the relative significant of each consequential impact and overall impact of extended overtime in the construction.

## **4.3 Findings and Discussion**

The analysis of questionnaire was categorized into 3 sections. The method for analyzing the response of questionnaire survey was carried by calculating the Average Index of each need of extended overtime; the consequential impact of extended overtime and the overall impact of extended overtime in construction.

#### 4.4 Analysis of the need of extended overtime in construction

This section presents first stage of analysis which determine the most significant of the need for extended overtime in construction.

**Table 4.1 : Analysis result of the need of extended overtime**

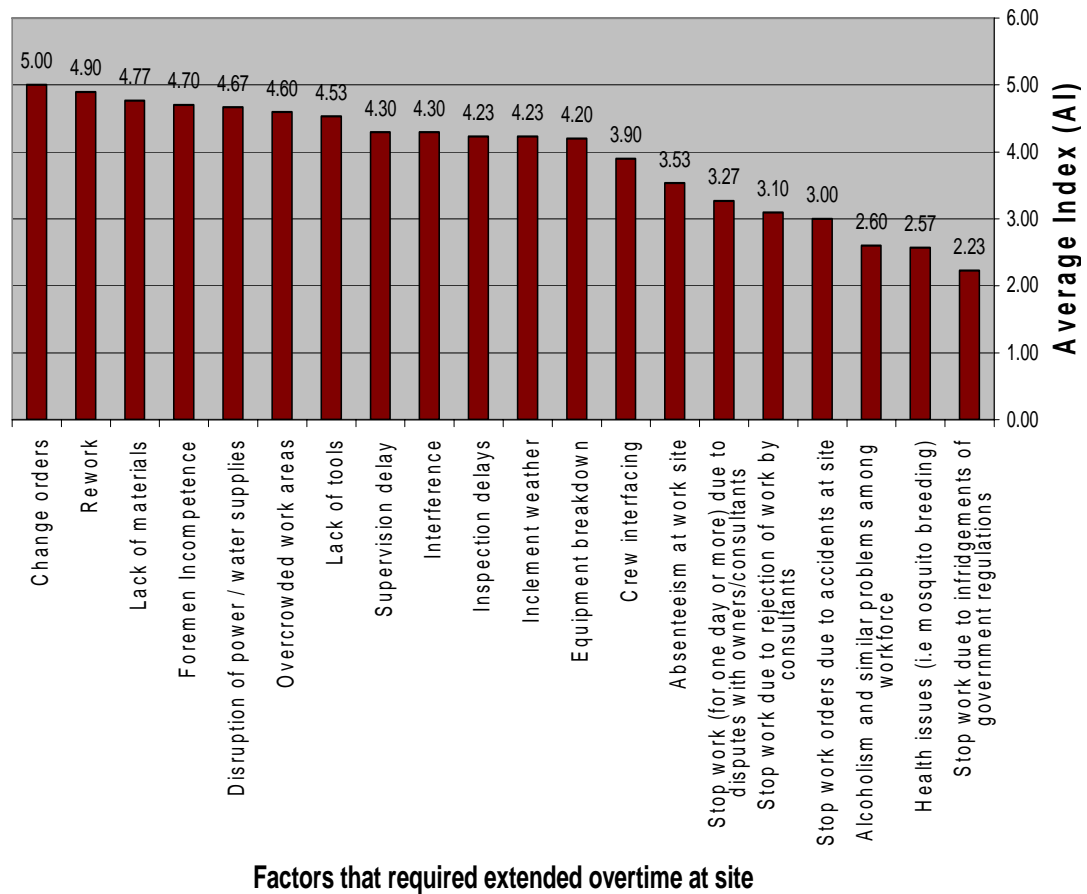
NO	The NEED/DRIVE for Extended Overtime	Average Index	Classification	Rank
1	Change orders	5.00	Strongly agree	1
2	Rework	4.90	Strongly agree	2
3	Lack of materials	4.77	Strongly agree	3
4	Foremen Incompetence	4.70	Strongly agree	4
5	Disruption of power / water supplies	4.67	Strongly agree	5
6	Overcrowded work areas	4.60	Strongly agree	6
7	Lack of tools	4.53	Strongly agree	7
8	Supervision delay	4.30	Agree	8
9	Interference	4.30	Agree	9
10	Inspection delays	4.23	Agree	10
11	Inclement weather	4.23	Agree	11
12	Equipment breakdown	4.20	Agree	12
13	Crew interfacing	3.90	Agree	13
14	Absenteeism at work site	3.53	Agree	14
15	Stop work (for one day or more) due to disputes with owners/consultants	3.27	Neutral	15
16	Stop work due to rejection of work by consultants	3.10	Neutral	16
17	Stop work orders due to accidents at site	3.00	Neutral	17
18	Alcoholism and similar problems among workforce	2.60	Neutral	18
19	Health issues (i.e mosquito breeding)	2.57	Neutral	19
20	Stop work due to infridgements of government regulations	2.23	Disagree	20

Table 4.1 indicates that there are many factors that lead to the extended overtime in construction. Most of the factors listed above achieving the Average Index of more than 3.50 to not more than 5.00 rating scale region. This falls in the classification category of Strongly Agree. From the table above, there are seven factors that falls in the category of Strongly agree that rated by the workers. All these factors have the Average Index of above 4.50 rating scale region. Change orders ranked first with the Average Index of 5.00, followed by rework (Average Index 4.90). Then is tailed by lack of materials (A.I 4.77) and foremen incompetence (A.I 4.70), disruption of power and water supplies (A.I 4.67) and overcrowded work areas (A.I 4.60). The it is followed by lack of tool with A.I 4.53.

Supervision delay and interference which shared the same A.I 4.30 are the other factors which has the Average Index of above 3.50 but below 4.50. These factors are categorized as the Agree classification. This is then followed by inspection delays and inclement weather which has the same A.I of 4.23, equipment breakdown A.I 4.20, crew interfacing (A.I 3.90) and absenteeism at work site (A.I 3.53).

Other factors which has the classification of Neutral and Disagree are very minimal and can be ignored. Therefore, majority of the respondents agreed that top 3 major factors that causes extended overtime work at the site would be the change orders by the management, rework due to the lack of information by the management and also the lack of materials at the site. This can be also clearly shown in the form of chart as below:-

### The NEED of extended overtime



**Figure 4.1 :** The need of extended overtime

#### 4.5 Analysis of the consequential impact of extended overtime to labour productivity

**Table 4.2 :** Analysis result of the consequential impact of extended overtime

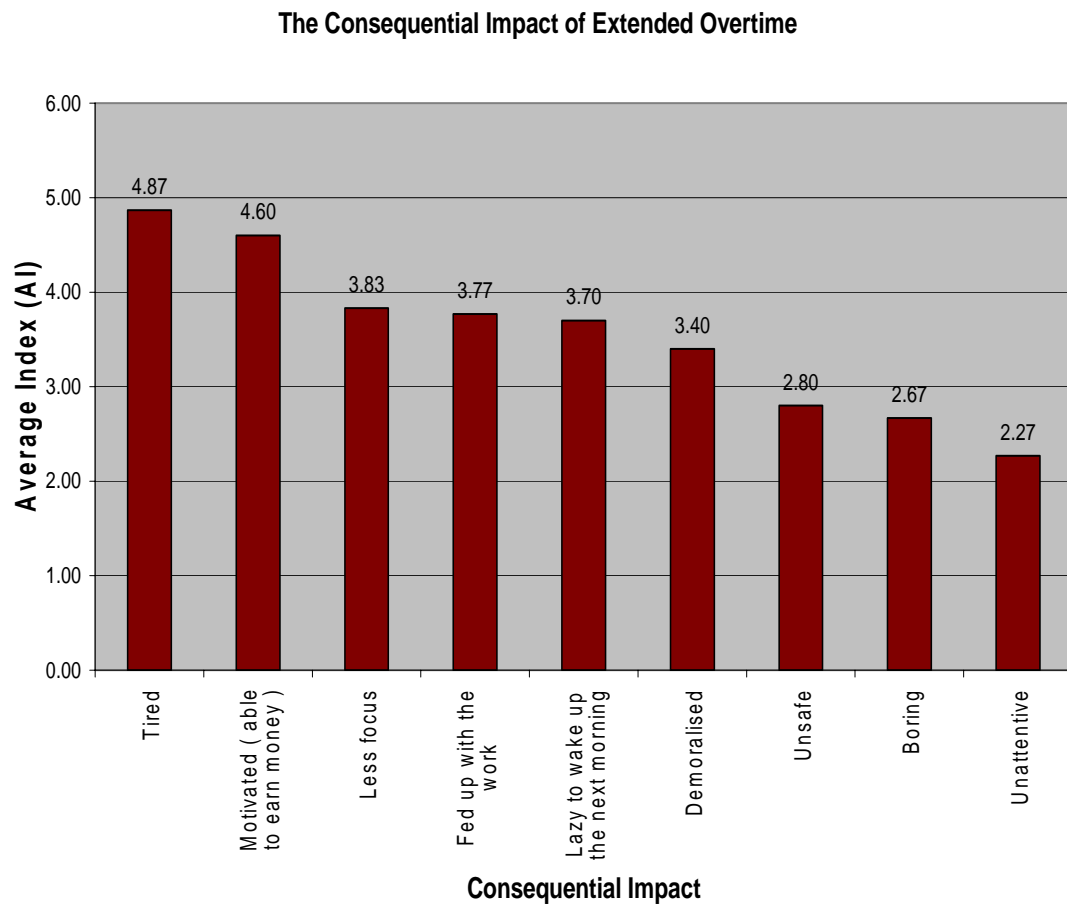
NO	CONSEQUENTIAL IMPACT of Extended Overtime	Average Index	Classification	Rank
1	Tired	<b>4.87</b>	Strongly agree	1
2	Motivated ( able to earn money )	<b>4.60</b>	Strongly agree	2
3	Less focus	<b>3.83</b>	Agree	3
4	Fed up with the work	3.77	Agree	4
5	Lazy to wake up the next morning	3.70	Agree	5
6	Demoralised	3.40	Neutral	6
7	Unsafe	2.80	Neutral	8
8	Boring	2.67	Neutral	9
9	Unattentive	2.27	Disagree	10

Table 4.2 also indicates that there are many factors that lead to the consequential impact of extended overtime in construction. Some of the factors listed above achieving the Average Index of more than 3.50 to not more than 5.00 rating scale region. From the table above, there are only two factors that fall in the category of Strongly agree that rated by the workers. All these factors have the Average Index of above 4.50 rating scale region. Tired has the Average Index of 4.87 which ranked first in this category followed by motivated with Average Index of 4.60. Then it is tailed by less focus (A.I 3.83) which are one of the three other factors that fall under the Average Index scale region of 3.50 to 4.50. This falls in the classification category of Agree.

Besides the impact of less focus, there are other factors which has the Average Index of above 3.50 but below 4.50 which are categorized as the Agree classification such as fed up with the work with Average Index of 3.77 followed by lazy to wake up in the morning (A.I 3.70).

While there are three other factors which falls into the category of neutral with the Average Index of between 2.50 to3.50 which are boring (A.I 2.67), unsafe (A.I 2.80) and demoralized (A.I 3.40). Other factor which has the classification of Disagree is only one, which is unattentive (A.I 2.27) and can be ignored.

Therefore, majority of the respondents agreed that top 3 major factors that has the consequential impact of extended overtime which are tired and less focus, but motivated because of the extra income the workers could earn. This can be also clearly shown in the form of chart as below:-



**Figure 4.2 :** The consequential impact of extended overtime

#### 4.6 The overall impact of extended overtime

**Table 4.3 :** Analysis result of the overall impact of extended overtime

NO	OVERALL IMPACT of extended overtime	Average Index	Classification
1	Premium wages	<b>5.00</b>	Strongly agree
2	Lower labour productivity	<b>4.93</b>	Strongly agree
3	Increase accidents	<b>4.73</b>	Strongly agree
4	Increase absenteeism	4.40	Agree
5	Quality of work decrease	4.33	Agree
6	Higher incidence of faulty workmanship	4.00	Agree
7	Labour unrest	3.90	Agree
8	Greater competition of labour pool	3.47	Neutral

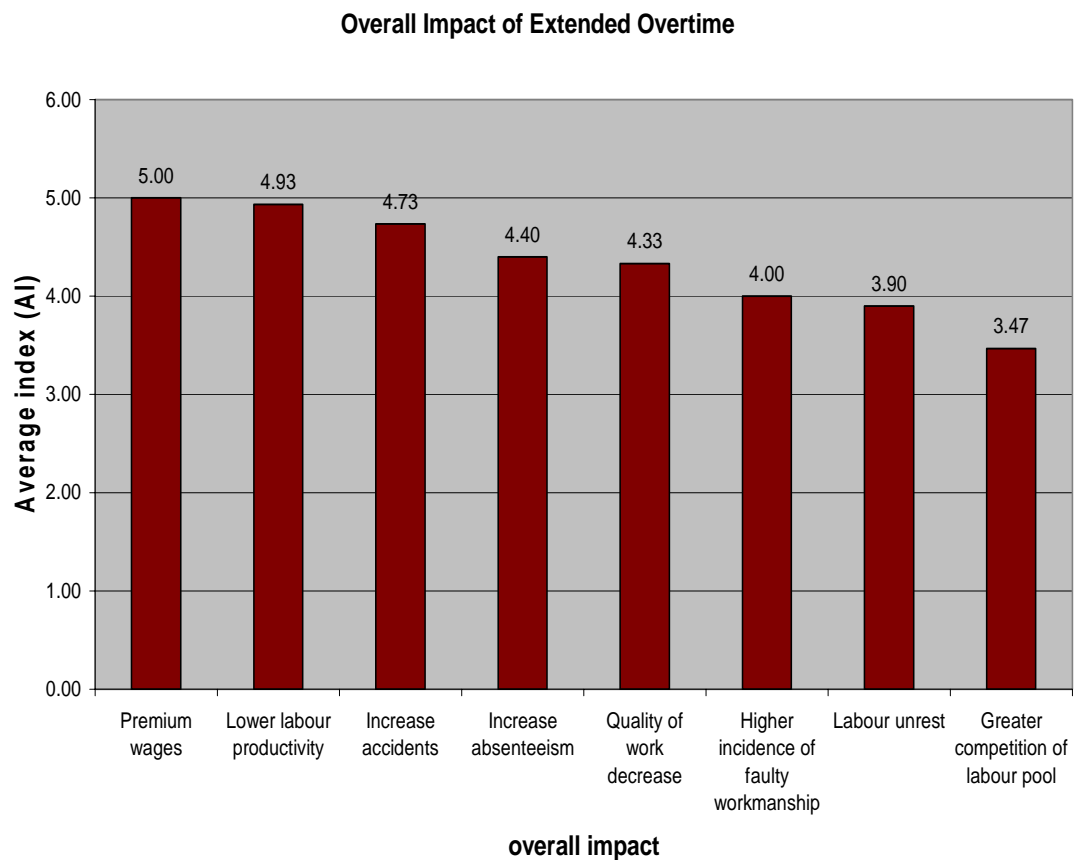
Table 4.3 indicates that there are many factors that lead to the overall impact of extended overtime in construction. Almost all the factors listed above achieving the Average Index of more than 3.50 to not more than 5.00 rating scale region except one factor which has the Average Index below 3.50 rating.

From the table above, there are three factors that fall in the category of Strongly agree that rated by the workers. All these factors have the Average Index of above 4.50 rating scale region. Premium wages with Average Index of 5.00, followed by lower labour productivity (A.I 4.93) and increase accidents (A.I 4.73).

The other factors which has the Average Index of above 3.50 but below 4.50 are increase absenteeism with Average index of 4.40, followed by quality of work decrease (A.I 4.33). Then it is tailed by higher incidence of faulty workmanship with Average Index of 4.00, followed by the labour unrest at Average Index of 3.90. These factors are categorized as the Agree classification.

Other factor which has the classification of Neutral is only one which is greater competition of labour pool with the Average Index of 3.47 and can be ignored.

Therefore, majority of the respondents agreed that top 3 major factors that has the overall impact of extended overtime which are premium wages, lower labour productivity and increase accident rates in job site. This can be also clearly shown in the form of chart as below:-



**Figure 4.3 :** The overall impact of extended overtime

## 4.7 Conclusion

This survey reveals the most significant of the need of extended overtime, the consequential impact of extended overtime and also the overall impact of extended overtime in construction (Table 4.1 to Table 4.3).

From the result and analysis, it can be concluded that change orders, rework and lack of materials has resulted the need of extended overtime in the construction at this selected site (refer Table 4.1).

Besides, the consequential impact of extended overtime is also significant. Workers who are involved in the extended overtime do feel tired and less focus at the next day of work but on the other hand, they felt motivated because they are able to earn extra income (Table 4.2).

The overall impact of extended overtime has also contributed to the analysis. The premium wages, the labour productivity lower and the increase of accidents at the work site are the top three most significant impact to the extended overtime in construction (refer Table 4.3).

From this survey, it is clear that it is proven that working extended overtime shall have an impact to the labour productivity in the construction.

## **CHAPTER 5**

### **DISCUSSIONS AND CONCLUSION**

#### **5.1 Introduction**

This chapter presents findings for the study that had been carried out. The aim of the study is to identify factors leading to why overtime is required in the construction phases and to study and analyse the consequential impact of extended overtime and the overall impact of extended overtime in the construction industry. A holistic approach of study and investigation issues related to factors and impact of extended overtime had led to the establishment of three objectives that helped to achieve the aim of this study which are presented in Chapter 1.

In order to realize the aim and objectives of this research, a research methodology was identified, which help to accomplish the issues, is investigated. The essential tasks have been identified in this methodology including literature reviews, questionnaires survey and data analysis.

### **5.1.1 Literature review**

A comprehensive literature review was conducted that led to identification the need for extended overtime, the consequential impact of extended overtime and the overall impact of extended overtime.

### **5.1.2 Questionnaire survey**

The questionnaire was design using the findings obtained from the literature reviews, previous research and study. The questionnaire was obtained from face to face interview with the labourers of different trades of work. Data collected from the questionnaire survey had validated the findings and a brief explanation on the questionnaire survey is discussed in Chapter 3.

### **5.1.3 Data analysis**

Data collected from questionnaire survey were used to validate the issues investigated and appropriate analysis method were carried out to achieve these objectives. The results obtained from the analysis will be discussed in this Chapter 5. Conclusion was drawn from the analysis in order to establish the objectives of this study.

## **5.2 Summary of findings**

The research on the issues related to the effect and impact of extended overtime to labour productivity using the research methodology explained earlier helped in the establishment of the objectives of the study. From the analysis presented in Chapter 4 using Average Index, conclusion was drawn to establish the issues investigated for this study, which includes;

- 1) The establishment of significance of the need of extended overtime in project undertakings.
- 2) The establishment of the most significant consequential impact of extended overtime to labour productivity.
- 3) The establishment of the overall impact of extended overtime in construction environment.

A brief explanation on the findings drawn from the above is discussed in the next section;

### **5.2.1 Discussions on the need of extended overtime in project undertakings**

Most of the respondents agreed about all the selective factors under the effect of extended overtime to labour productivity. From the results gathered from the analysis, the 3 major factors that may require the workers to work extended overtime are the change orders, rework and also the lack of materials. Change

orders by the Client normally will effect the work flow of the job at the site. Most of the times, Client do not understand the crucial time in the working progress of the site. They always think that they are the decision maker and they are the paymaster, therefore they can do whatever they like and whatever they want anytime. The Clients normally tend to change their decision and the details of the drawing have to change as well. Therefore, Contractors have to obey to the request by the Client and issue a change order instruction to the workers. Most of the time, work has been done to the certain portion of the building and change orders will definitely effect the flow of the work. As a result, workers are definitely require to work overtime in order to complete the job.

Change orders also comes hand-in-hand with rework. If the previous task has been completed before the change orders, therefore the workers have to rework and redo the task based on the latest details of the drawings. Rework procedure is also sometimes due to the workers fault or the management fault. It will also affect the flow of the work at the site. The next factor would be the lack of materials at the site. This is a very important issue in every construction sites. Time of the work has been preplanned and put into the work schedule. With the schedule, work progress can be monitored closely. If any of the materials are delivered late or not according to the delivery schedule, it will definitely affect the progress of the job. For example, the shortage of steel bars and cement will definitely slow down the job at the site. Work cannot finish on the same day, therefore workers need to work extra time in order to speed up the work. It is very important that delivery of materials 'just in time' to the site should be practiced in all other construction sites.

### **5.2.2 Discussions on the consequential impact of extended overtime to labour productivity**

The analysed result of the consequential impact of extended overtime has been highlighted. It is concluded that the 3 major impact were the tiredness and less focus of the workers at the next working day. It is undeniable that working overtime for a long hours and long period will make someone tired. But to these workers, even though tired, they are willing to take up the job because on the other hand, they felt motivated because they could earn extra income. Most of the foreign workers come to Malaysia to work in the construction industry because the construction industry are able to provide a lot of job opportunities. Many of the foreign workers are able to earn quite a sum of salary when in the construction. Besides, they are also skillful workers and are able to work long hours. Though working long hours may be good for the company, but some workers feel that after working overtime for a very long period, they are not able to produce an optimum output to their work because of the tiredness and less focus during working hour. This is also not a good sign as the workers tend to make mistakes in their scope of work because of their less focus, they might met into accidents at the site.

### **5.2.3 Discussions on the overall impact of extended overtime in construction environment**

The overall impact of extended overtime also has a significant impact to the labour productivity. Working extended overtime will eventually have an impact of premium wages to the company. Though it incur higher cost, but job can be delivered earlier. Therefore, it is a win-win situation. From the analysed result also,

it is shown that extended overtime has an overall impact on the lower productivity rate of the workers and increase the accidents rates in job site. This is true because when a worker worked overtime for a long period, he will be less focus and his work productivity rate would not be at an optimum rate. And as a result of less focus and tiredness, the workers tend to make mistakes and he might also met with accidents at the job site. So therefore, we can conclude from the response gathered and analysed that the overall impact of the extended overtime shall be the premium wages, lower labour productivity and increase accidents rate at site.

### **5.3 Conclusion**

In overall, the respondents agreed that extended overtime is required in the construction when these 3 major factors such as change orders, rework and also lack of materials at site. The respondents were using the work schedule as a guideline and this schedule must be followed closely. Change order often goes hand in hand with rework. Especially big projects, change orders often occur and a very careful planning and monitoring by the planners are required. Besides change of work, lack of materials at site too will affect the site work quite significant. Therefore, in order to achieve the project objective in delivering on time, work must be worked extended hours.

The consequential impact of extended overtime such as tiredness, less focus but motivated are the 3 major impact gathered from the respondents. Most of the workers felt that even though they are tired, they felt motivated because able to earn some extra income. Many workers do enjoy working overtime due to the earnings they are able to make, but some workers do not favour that as according to

them, they prefer having a good rest after a hard days work. It is undeniable that working extended overtime will make someone tired and less focus the next day of work.

From the analysed data, the overall impact of extended overtime in construction environment can be analysed. Premium wages, lower labour productivity and increase of accident rates are the 3 major overall impact that are gathered from the analysis. Many contractors do not like extended overtime as it will incur premium wages of the workers. But work must be completed within the scheduled time, therefore the only way is to work overtime. In many cases, the productivity of the workers will decrease due to the working on an extended overtime. As a result, in some cases, accidents at site might happen and this will bring losses to the company due to stop work order by the authority.

#### **5.4 Limitation of the study**

In this study, there are few limitations:-

1. Sample of the survey is too small.
2. Respondents rely on other party to answer the questionnaires because most of them are foreign workers, e.g Indonesian, Bangladeshis.
3. Small sample survey also due to time limitation. Only during workers break time survey is conducted.

With these findings stated above, the aim of this study is considered successfully achieved. However, due to the limitations stated above, it was not possible for this dissertation to investigate into great details. Therefore, it is advisable that the findings of the study should be considered as indicative rather than definitive.

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**APPENDIX A**

**SURVEY FORM  
FOR RESEARCH ON  
“EXTENDED OVERTIME AND THE EFFECT TO LABOUR  
PRODUCTIVITY”**

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As a final year student in MSc. (Construction Management) from Faculty of Civil Engineering, University Technology of Malaysia (UTM), to do a research for final year project is required. As such this survey form is to obtain some data that are relevant to this research. Your participation by being one of the respondents to help in this research is really appreciated. You can be rest assured that **ALL THE INFORMATION IN THIS SURVEY WILL BE STRICTLY CONFIDENTIAL.**

Thank you.

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**Part A : Background of the worker**

**Name of company** : \_\_\_\_\_

**Nature of work** : \_\_\_\_\_

**Number of years experience** : \_\_\_\_\_ **years**

**Country of origin** : \_\_\_\_\_

**Length in Malaysia** : \_\_\_\_\_ **years**

**Length in construction** : \_\_\_\_\_ **years**

**Part B : Extended Overtime to Labour Productivity***\*(please circle your answer)*

1. Have you worked overtime before?  
A. YES                      B. NO                      If YES, please proceed to No.2
2. How many total hours of overtime you have worked?  
A. less than 10hrs    B. 10-20hrs    C. 21-30hrs    D. 31-40hrs    E. >40hrs
3. How often you worked more than 40hrs per week for MORE THAN 2 WEEKS?  
A. YES                      B. NO
4. Do you sometimes get annoyed for working extended overtime?  
A. YES                      B. NO
5. Do you think working extended overtime will make someone tired?  
A. YES                      B. NO
6. Working overtime are normally requested by the organization. Do you agree?  
A. YES                      B. NO

**Part C : The NEED / DRIVE for Extended Overtime**

There are many factors or causes that required labours to do overtime. In this studies, analysis is to be made to investigate the need of extended overtime in project, the consequential impact of extended overtime and ascertain consequential influence on the labour productivity.

Please use the scale below to rate the degree of consent of the following statement based on your experiences.

*\*(Please circle your answer)*

<b>5</b>	Very often / Strongly agree
<b>4</b>	Often / Agree
<b>3</b>	Sometimes / Neutral
<b>2</b>	Rarely / Disagree
<b>1</b>	Never / Totally disagree

No.	NEED / DRIVES for extended overtime	Rank				
		5	4	3	2	1
1	Lack of materials	5	4	3	2	1
2	Lack of tools	5	4	3	2	1
3	Equipment breakdown	5	4	3	2	1
4	Rework	5	4	3	2	1
5	Inclement weather	5	4	3	2	1
6	Crew interfacing	5	4	3	2	1
7	Interference	5	4	3	2	1
8	Absenteeism at work site	5	4	3	2	1
9	Supervision delay	5	4	3	2	1
10	Foremen Incompetence	5	4	3	2	1
11	Overcrowded work areas	5	4	3	2	1
12	Inspection delays	5	4	3	2	1
13	Change orders	5	4	3	2	1
14	Health issues (i.e mosquito breeding)	5	4	3	2	1
15	Disruption of power / water supplies	5	4	3	2	1
16	Stop work orders due to accidents at site	5	4	3	2	1
17	Alcoholism and similar problems among workforce	5	4	3	2	1
18	Stop work due to rejection of work by consultants	5	4	3	2	1
19	Stop work due to infridgements of government regulations	5	4	3	2	1
20	Stop work (for one day or more) due to disputes with owners/consultants	5	4	3	2	1

**Part D : The CONSEQUENTIAL IMPACT of Extended Overtime**

No.	IMPACT of Extended Overtime	Rank				
		5	4	3	2	1
1	Tired	5	4	3	2	1
2	Fed up with the work	5	4	3	2	1
3	Demoralised	5	4	3	2	1
4	Lazy to wake up the next morning	5	4	3	2	1
5	Unattentive	5	4	3	2	1
6	Less focus	5	4	3	2	1
7	Sick	5	4	3	2	1
8	Motivated (because able to earn money)	5	4	3	2	1
9	Boring	5	4	3	2	1
10	Unsafe	5	4	3	2	1

**Part E : The OVERALL IMPACT of Extended Overtime**

No.	OVERALL IMPACT of Extended Overtime	Rank				
		5	4	3	2	1
1	Premium wages	5	4	3	2	1
2	Lower labour productivity	5	4	3	2	1
3	Increase absenteeism	5	4	3	2	1
4	Increase accidents	5	4	3	2	1
5	Higher incidence of faulty workmanship	5	4	3	2	1
6	Labour unrest	5	4	3	2	1
7	Quality of work decrease	5	4	3	2	1
8	Greater competition of labour pool	5	4	3	2	1

Lastly, I would like to take this opportunity to thank you for your valuable and kind support.