CONSTRUCTION PRODUCTIVITY INFLUENCING FACTOR IN THE KINGDOM OF SAUDI ARABIA

BY

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This thesis, written by **Khaled Ali Ayyatt** under the direction of his thesis advisor and approved by his thesis committee, has been presented and accepted by the Dean of Graduate Studies, in partial fulfillment of the requirements for the degree of **MASTER OF SCIENCE IN CONSTRUCTION ENGINEERING AND MANAGEMENT**

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I dedicated this thesis to my beloved mother, father then to my beloved wife, two child, 3 sisters, 2 brothers and all of those who have been there for me whenever I needed them.

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ABSTRACT

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Thesis Title : **[Construction Productivity influencing factor in the Kingdom of Saudi Arabia.]**

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The construction industry has developed in fast track and become the 2nd important economic activity in the Kingdom of Saudi Arabia (KSA) after the oil industry. It contributes more than 11% of the Kingdom of Saudi Arabia income, and around 28% of its manpower working in the construction industry.

Productivity is the soul of the construction industry with the main input of Money, Manpower, Material, and Machinery (4M). Manpower is considered the main determinant of the construction productivity.

The construction industry in Kingdom of Saudi Arabia faces a big challenge which is the low productivity in the construction projects. Therefore, there is a need for an academic research construction productivity improvement.

The main aim of this research is to identify the factors that influencing construction productivity in KSA, then to rank those factors based on their relative important index.

A questionnaire survey was established with 81 influencing factors, and distributed to the expert and the practitioners in the Eastern Province. The results were analyzed using the Statistical Package for the Social Sciences (SPSS) software and the relative important index (RII). Using the (RII) the following 10 factors were found as the most important

factors that influencing the construction productivity: (1) Good planning and scheduling for project tasks (2) Availability of experienced site management (3) Availability of experienced technical staff (4) Availability of Skilled labor (5) coordination between staff(site supervision) (6) Availability of suitable materials (7) Delayed delivery of materials by the supplier (8) Limited financial liquidity of the company (9) Availability of supervisors and managers for monitoring and measuring productivity on a regular basis (10) Payment delays by owners. It is recommended that more research to be done in the future, studying the factors that influencing the construction productivity as they perceived by labors and site supervisor, as well as identifying ways to improve it.

ملخص الرسالة

الاسم الكامل: خالد علي رحال عياط

عنوان الرسالة: العوامل المؤثرة في انتاجيات المشاريع الانشائية في المملكة العربية السعودية

التخصص: هندسة و أدارة التشييد

تاريخ الدرجة العلمية: مايو 2017

لقد تطورت الصناعات الانشائية بطريقة سريعة و اصبحت في المرتبة في المملكة العربية السعودية بعد الصناعات البترولية . إنها تساهم في 11% من الدخل القومي للسعودية و بالاضافة الى ان حوالي 28% من القوى العاملة في السعودية تعمل في مجال الصناعات الانشائية .تعد الإنتاجيات روح الصناعات الإنشائية مع وجود المدخلات الاربعة الرئيسية و هي السيولة المالية , القوى العاملة , المواد و الالات و تعتبر القوى العاملة هي المحدد الرئيسي بالنسبة لإنتاجيات المشاريع الإنشائية .

الهدف الرئيسي لهذا البحث هو تحديد و تعريف العوامل التي تؤثر على إنتاجيات المشاريع الإنشائية في المملكة العربية السعودية و من ثم ترتيب هذه العوامل حسب أهميتها النسبية . و قد تم عمل مسح يتكون من 81 عاملا ثؤثر في الانتاجيات و قد تم توزيع هذا المسح على عدد من أصحاب الخبرة و المتخصصين في مجال المقاولات و المشاريع الإنشائية في المنطقة الشرقية . بعد ذلك تم إدخال النتائج بواسطة برنامج احصائي تحليلي (SPSS) و معامل الأهمية النسبي و قد تم تحديد العوامل العشرة الأكثر تأثيرا في الإنتاجيات في المشاريع الإنشائية بواسطة معامل الاهمية النسبي و هذه العوامل كالتالي: اولا : التخطيط الجيد لمهام المشاريع . ثانيا : توفرة ادارات المشاريع ذات الخبرة. ثالثا : توفر الموظفين اصحاب الخبرات الفنية. رابعا : توفر العمالة الماهرة. خامسا : التنسيق بين المجموعات و مشرفين المجموعات بالطريقة المناسبة سادسا : توفر المواد المئمة والمناسبة في المشاريع سابعا : تأخر توريد المواد من طرف الموردين ثامنا : السيولة المدودة .تاسعا : توفر المشرفين و المدراء القادرين على متابعة وقياس الانتاجيات في المشاريع بشكل يومي. عاشرا : تأخير الدفعات بواسطة المالك.

و بناء على ذلك فإنه يوصى بإجراء المزيد من الأبحاث في المستقبل حول العوامل المؤثرة في الإنتاجيات حسب وجهة نظ ر و فهم القوى العاملة و المشرفين في المواقع و كما يجب عمل أبحاث و التعريف بالطرق المتاحة لتحسين هذه الإنتاجيات .

CHAPTER 1

INTRODUCTION

Construction is one of the most important sources of economic activities (El-Gohary & Aziz, 2014) for the kingdom of Saudi Arabia, especially in the last decade, Over the previous 30 years, the construction field in Saudi Arabia has developed in fast track which attracted many contractors, management companies, consultant, and experts around the world, it become one of the most important economic activity for the nations)(Hughes & Thorpe, 2014, Odesola, Otali, & Ikediashi, 2013), Al-saleh 1995). The construction industry is the 2nd source of investment after the oil industry. Its contributes over "11 %" of the Saudi Arabia income. Around "28%" of the Saudi Arabia manpower works in the construction industry (Al-saleh 1995), which indicates the important of the construction industry to the nation economic strength (AL-Mathami 2015).

Productivity is the soul of the construction industry. Productivity depends on many factors such as manpower tools, materials, and equipment. However, manpower is considered the most important factor, as without it you can't utilize the other productivity resources, also it the main determinant of the activity productivity, also its variable and susceptible for improvement. There is a big problem appear in the construction site due to the poor productivity in Saudi Arabia construction projects, which cause a delay in the construction projects of Saudi Arabia (Assaf & Al-Hejji, 2006). Therefore, there is a need to study the factors that influencing the productivity in the Saudi Arabian construction industry, and how to improve them. "Productivity has become a key area of focus among

academia and industry over the last decade attributable to its strong potential in benefiting the construction industry" (Ranasinghe, Ruwanpura, & Liu, 2012).

1.1. Problem Statement

There is a big competition among construction companies in the Saudi Arabian market. The competition has increased in the last few years due to the kingdom Saudi Arabia economic conditions. For that reason many construction companies started to adopt a system in order to assign productivity for the construction activities in their projects. They study the factors that influence Productivities at construction site and office, then how to improve the construction project productivities in order to survive in the market due to the high competition.

1.2. Research Aim and Objectives

The aim of this thesis, therefore, is to identify, and evaluate factors which are affecting and influencing productivity of the construction projects in Kingdom of Saudi Arabia / Eastern Province.

The objectives of the research reported in this thesis may be summarized as follows:

1. To identify the factors that influence productivity of the construction projects in Saudi Arabia.
2. To classify those factors based on their relation to the main groups (labor, management, etc.).

3. To rank those factors due to the importance index in order to get the most important factors.

1.3. Thesis structure

The thesis begins with a literature review in order to review the factors that influencing the construction productivities in many countries then present the methodology of the research which is including a survey concentrating in the local factors that affecting the construction productivity in the Kingdom of Saudi Arabia / Eastern Province, then analyzing the data, and discussion of the obtained result, then finally this research will be finalized with conclusion and recommendations in order to improve the local labor productivities in the construction projects.

CHAPTER 2
LITREATURE REVIEW

2.1 Previous Studies in Construction Productivity

There have been such many studies directed to identify the factors that influencing construction productivity in the developed and developing countries. In this thesis the concentration is in the gulf area; Oman (Jarkas, Al Balushi, & Raveendranath, 2015), Bahrain (Jarkas, 2015), Qatar(Jarkas, Kadri, & Younes, 2012), Kuwait (Jarkas & Bitar, 2012), & Iran (Ghoddousi & Hosseini, 2012) those countries experience severe weather similar to Saudi Arabia at which the hot weather and the high humidity during summer season is one of the most factors affecting the productivity and the labor safety in the construction project (Moohialdin 2016). Other studies were conducted on countries with limited resources such as Jordan (Hiyassat, Hiyari, & Sweis 2016) and Palestine (Gaza strip (Enshassi, Mohamed, Abu Mustafa, & Mayer 2007, west bank (Mahamid 2013)).

Number of factors that have been studied in each research ranges from 23 factors (Jarkas & Radosavljevic, 2013) to 83 factors (Dai, Goodrum, Maloney, & Srinivasan, 2009). All of them have selected the most affecting factors in their area to be included in the survey. Some studies concentrated on contractors' point of view (Mahamid, 2013) and others studied the contractors, consultants, and the clients' perspective (Bekr. (2016)). Some researchers studied were conducted on concrete projects only to figure out the factors that could affect the productivity of labors & how to improve it (Sasaki, Uno, Hashimoto, & Date, 2016) while other studied concentrated on residential projects

(Abdul Kadir, Lee, Jaafar, Sapuan, & Ali, 2005). On the other hand, some of the studies compared the improvement factor for the productivity between the local and the foreign laborer county (Kim & Shin 2013). Other studies concentrated in one factor during their studies, such as (Shin, Kim J., KimT. & KimG. (2013)) who concentrated in the motivation of foreign laborer in construction field and how it will affect the construction productivity, (Abrey & Smallwood, 2014) studied the effects of unsatisfactory working conditions on productivity in the construction industry.

Productivity is generally defined as the quantity which is produced during a fix unit of time comparing to the input items which were been consumed. It is noted that it was mentioned in the literature as follows:

Table 1 : different definition for the productivity from the literature review

Productivity definition	**Reference**
The ratio of the output to the input	Thomas & Sudhakumar, 2013
"It's the measure of the rate at which work is performed, it's the ratio of production output to what is required to produce it, or it's the total output per one unit of total input"	(Hiyassat, Hiyari, & Sweis, 2016)
"It's the output per worker or output per labor –hr."	Ghanem 2016
"Is the ratio between total outputs expressed in dollars and total inputs expressed in dollars as well".	(Arditi & Mochtar, 2000)
"The maximization of output while optimizing input"	(Naoum, 2016)

The most known definition for the productivity is ratio of output to the input (Thomas & Sudhakar, 2013), and this definition will be adopted in this thesis.

For the productivity influencing factors & how to rank it due to its important many research has conducted i.e. (Naoum, 2016) has conducted a literature review on the factors influencing the labor productivity on construction sites, and he designed his literature review under five main headings, which is including 46 factors, and the main headings was the "pre-construction activities; then "activities during construction"; then "managerial and leadership issues", then motivational factors, and organizational factors., then a survey was conducted with a 36 main contractor project manager.

In a study which was conducted in Qatar, using Relative importance index RII, Jarkas et al (2012) selected the top 10 out of 35 affecting factors on productivity. They found that skill of labor was the most influencing factor while proportion of work subcontracted was given the 10^{th} rank. In order to understand the large numbers of factors affecting the productivity, most of the researchers classified them into categories and subgroups. For instance, Jarkas, Al Balushi, & Raveendranath, (2015) and Jarkas, Kadri, & Younes, (2012) reported 4 main groups of important factors: 1. Labor. 2. Technological. 3. Management 4. Exogenous. While Kazaz & Acıkara (2015) suggested the following main categories: 1. Organizational 2. Economic 3. Socio-Psychological 4. Physical; then they rank in two ways, which they found that the organizational category was the most important in both ways.

Jarkas & Bitar, (2012) and Jarkas (2015) distributed the influencing factors into 4 major groups: 1. External 2. Technological 3. Labor/ human 4. Management. While (El-Gohary & Aziz (2014) suggested the following 3 groups: 1. Human / labor 2. Industrial 3. Management. The industrial includes 11 factors where the Construction technology (construction method and material) ranked as the most important, then the

constructability which is include the integration between the design and the construction then weather effect which including the high / low temperature, high humidity, etc.. then how is the project far from the city or the nearest to the city after that the specification of the project and the project scale,, then the availability of the daily work load, then the interruptions which includes design changes and the variation during the executions of the project, also its include the height of the place that the labor working on it, then the total work hours in the project (total project duration), and the last important factor was the type of the project, which include residential and industrial projects.

Bekr (2016) stated that it must be divided to: 1. Labor group 2.Technical factor 3.Project factor 4. Materials & Equipment factors 5. Financial Factor, while ((Kim & Shin 2013).divided the influencing factors in the 3 main categories 1.Economic 2.Social 3.Psychological, then the study compared between the local Korean labor and the Chinese laborer and in the ranking of the economic group both Chinese and Korean labor agreed that the wages of the labor is the most important.

Ghoddousi & Hosseini (2012) and Enshassi, Mohamed, Abu Mustafa, & Mayer (2007) expounded their order criteria by categorizing the influencing factors in to 7 and 10 main groups respectively. Ghoddousi & Hosseini (2012) reported the main 7 groups as the following: 1. Tools /Material, 2. Method of Construction or Construction Technology, 3. Planning/ Management, 4. Supervision, 5. Redo the works, 6. Weather, and 7. Jobsite Conditions. Enshassi, Mohamed, Abu Mustafa, & Mayer (2007) reported the main 10 groups as the following: 1..Manpower Group, 2. Leadership Group, 3. Motivation Group, 4. Time Group, 5. Materials/Tools Group, 6. Supervision Group, 7. Project Group, 8. Safety Group 9,. Quality Group and 10. External Group.

The influencing factors that were identified differ from researcher to another. However, they mostly agreed about the human and managerial group, which will be the two of the most important main category in this thesis in addition to the weather and material/equipment category and the project related group factors.

In the previous research, a numerous number of influencing factors were mentioned in each research. In this thesis, the most repeated factors in various countries (Palestine, Jordan, Malaysia, India, Singapore, etc.)) Including one PHD dissertation in KSA are summarized in Table 2. While the most repeated factors in the GCC countries are summarized in Table 3.

In this study, the 32 influencing factors in GCC countries which are listed in table 3 were considered as the most important factors to be studied in this research and the remaining were taken from the research in the other countries.

Table 2: The construction productivity factors from different previous study.

INFLUENCING FACTOR	R8	R31	R27	R10	R 25	R24	R32	R1	R11	R4	R9	R3	R16
Lack of local /foreign labor in the market	√					√		√	√				
Labor / supervisor absenteeism	√	√				√	√	√		√		√	√
Labor / staff relations	√	√				√				√		√	
planning and scheduling	√	√				√	√			√			√
communication and coordination between construction parties	√						√			√			
Issuance of	√	√	√				√	√					

INFLUENCING FACTOR	R8	R31	R27	R10	R 25	R24	R32	R1	R11	R4	R9	R3	R16
construction drawing													
disruption of power supplies	√							√			√		
disruption of water supplies	√							√					
Project size	√								√				
Labor low wages	√	√				√	√						
Financial condition of contractors	√			√		√				√			
low quality of row materials	√	√	√			√	√			√	√	√	
Labor strike		√					√	√					
craftsmen turnover		√				√	√						√
Disregard to craft worker suggestion / ideas		√					√				√		
Poor temporary facility at the site		√					√				√		
maintenance of tools/ equipment and plants		√					√			√			
lack of recognition of good and efficient workers		√					√						
Disputes with consultant / client causing stoppage of work		√	√	√			√	√					
High quality of required work			√									√	
Project goals and milestone		√	√		√		√						
Drawing error		√	√				√				√		
Interference		√	√				√						
owner financial condition				√		√							
High cost of foreign labor				√				√					

INFLUENCING FACTOR	R8	R31	R27	R10	R 25	R24	R32	R1	R11	R4	R9	R3	R16
Poor estimation				√						√			
Design and buildability related issue					√			√	√				√
work environment					√			√					
constrains on worker performance					√						√		
Experience and training					√					√			
control system on site					√					√			
site mangers involvement at contract stage					√					√			
Sub-contractor involvement					√			√				√	
Labor disloyalty					√					√		√	
Delay of material delivery by supplier		√					√	√		√			√
Crafts unaware of safety precautions		√					√						
Lack of experience of supervisor		√					√						
Lack of team spirit among craftsmen		√					√						
Lack of weekly evaluation meeting		√					√						
foreign worker				√				√					
coordination with consultant staff								√		√			
Project location from city								√	√				
Centralized decision making by headquarter								√		√			

INFLUENCING FACTOR	R8	R31	R27	R10	R 25	R24	R32	R1	R11	R4	R9	R3	R16
slow response of consultant to verify progress claim certificate/doubts raising from drawing		√						√			√		
Labor age									√			√	
work at heights									√			√	
services offered for a labor									√	√		√	
Different languages foreign labor / staff										√	√		
crew size											√		
poor quality used power tool		√									√		
lack of superintendent experience						√					√		
Labor personal problem												√	
periodic meeting with labor												√	
Lack of training												√	
working 7 days /week without taking holiday												√	
Noisy site												√	

Table 3 : The construction productivity factors in GCC countries.

Factor \ Country / year	Qatar /2012	Kuwait/2012	Bahrain /2015	Oman/2015	Iran/2012	Kuwait /2013
Skill of labor	√	√	√	√	√	
Shortage of materials	√	√	√	√	√	√
Labor supervision	√	√	√	√		

Country / year Factor	Qatar /2012	Kuwait/201	Bahrain /2015	Oman/20	Iran/2012	Kuwait /2013
Shortage of experienced labor	√	√			√	
Communication between site management and labor	√	√	√	√		√
Lack of construction manager's leadership	√	√				
Harsh weather (High/ low temperature, High humidity, heavy rain, sand storm, etc.)	√	√	√	√	√	√
Delay in responding to "Requests For information" + inspection delay	√	√	√	√	√	√
Lack of providing labor with transportation	√	√	√			√
Proportion of work subcontracted	√	√	√			
Unsuitability of storage locations	√	√			√	
Rework	√	√	√	√	√	√
Motivation of labor	√	√	√	√		
Physical fatigue	√	√	√	√	√	
Lack of training offered to labor	√	√				
Lack of incentive scheme	√	√	√			√
Working overtime	√	√	√	√		√
Payment delay	√	√	√	√		√
Clarity of technical specifications	√	√	√	√	√	√
Coordination level among design disciplines	√	√	√	√		
Labor interference and congestion	√	√	√	√	√	√
Design complexity level	√	√	√	√		√
Construction method	√	√	√	√		
Confinement of working space	√	√	√	√		
Sequencing problems	√	√	√	√		
Unavailability of tools + equipment	√	√	√	√	√	√
Stringent inspection	√	√		√		√
The extent of variation orders during execution	√	√	√	√		√
Site restricted access	√					
Late arrival and early quit	√	√	√			
Accident due to poor safety		√		√		√
unforeseen ground conditions			√	√		

2.2. Identification and explanation of the chosen Productivity influencing factors

From the literature review, it was found that there are many factors influencing labor productivity in construction projects. More than 100 factors were identified. An initial study by interviewing 4 project managers, it was found that some of these factors were considered did not have that much direct influence in construction productivity, e.g. financial strength of the country, political situation, etc. Therefore, the number of the influencing factors was decreased to 81 factors which were categorized into six main groups.

2.2.1 Labor related factors

The first group was the labor-related factors. This includes the availability of skilled labor and technical staff, which were considered as the most important factors that affecting labor productivity. The absenteeism of a supervisor also affect productivity, since he is the one who distributes the work for the groups, and he should monitor and control the work progress in order to achieve the required target. On the other hand, the absenteeism of labors will affect the group since many groups mostly consist of 2 people (1 mason + 1 helper), (1 carpenter + helper), etc. Some groups consist of 3 people (1 mason + 2 labors), specially when there are a work in high level (above the scaffolding). Other groups consist of 4 people, especially when they are fixing heavy materials, for example the cement board fixation group consists of 4 people (2 carpenters + 2 helper), and so the absenteeism of one labor, carpenter, or mason will cause a problem for the group, and will affect their productivity. The absenteeism here means the repeated absenteeism, for example 2 times a week. However, a normal absenteeism can be compensated.

If an employer provides his labor with proper salary, which is suitable with their scope and the life level in the country where they are working, then the labor will become more motivated which will affect their productivity positively.

Providing the labor with great care and support including the health insurance and the insurance against the work accident, will let them feel more comfortable during their duty which will affect their productivity in a positive way.

If the employer shows a high commitment to the labor rights including their yearly vacation, yearly ticket, overtime, and if he provides them with acceptable living level and accommodation this will result in increasing and improving the site productivity in general.

Otherwise if no commitment to the labor rights and the employer didn't care for their personal problem then this will lead for the labor strikes which will affect the productivity negatively.

The coordination between supervisors is also important. If the work were done without coordination, then many groups will damage other groups work and many activities will be redone again.

"The motivation program is defined as the Internal and external factors that stimulate desire and energy in people to be continually interested and committed to a job, role or to make an effort to attain a goal".

"Motivation results from the interaction of both conscious and unconscious factors such as the (1) intensity of desire or need, (2) incentive or reward value of the

goal, and (3) expectations of the individual and of his or her peers. These factors are the reasons one has for behaving a certain way".

If the employee becomes motivated then he will have the feel that it's important to be loyal for his company which means that he will work and feel happy that he is working with this company and he will try to exceed what is expected from his side to be done.

Rework is defined as doing the work again and this happen due to many reason e.g. the poor quality of the executed work if it's done without following the site activities proper sequence, or without following the proper method of statement or specifications, other reason for the rework is the error in the drawing due to many reason or the multiple revision of the drawing which will cause a decrease in the amount of the site productivity.

The age of the labor is affecting the productivity of the activity in both sides (Positively or negatively) since that some activities need technical experience, which mean if the labor is elder its better, but some activities need the younger labor more e.g. heavy materials handling.

Poor communications between foreign labor with different languages , since you understand that all the construction activities is team activities, so it's better to have the group e.g.(mason + helper) , (2 carpenter + 2 helper), etc. who are talking the same language for easier understanding and communication.

Availability of the skilled supervisors and foreman who understand how to measure the productivity is very important factor, since if you have this kind of

supervisor / foreman it's easier to control the site job, from the other side one of the factor which have a bad effect in the construction activities productivity is the turnover of the labor and supervisor, because if you keep changing your team after they become familiar with the job then your team productivities will get negative effect, because the group will not get benefit from the learning curve theory, and every new team will need time to be familiar with the activity.

Late arrival, early finish and unscheduled break for work which mean that if the labor will come late for his job and he leave the job earlier than what is scheduled for him and he has unscheduled break during the 8 hours duty then the productivity will be affected negatively.

The overtime affects productivities positively if it were used properly, for limited number of groups as per site requirement. However, if it is opened for all groups then it will affect productivities negatively, because the labor will be tired from long time of working, which will cause them a physical fatigue.

Finally, in the labor-related factors the Lack of training offered to the labor will affect the site construction productivity e.g. lack of training offered for the labor for the safety issue it will cause to a problem if some labors get injury and the work stopped for that group.

2.2.2 Administration and managerial factors

The 2nd group is the Administrative and Managerial factors which consist of 22 factors. The 1st factor was the proper planning and scheduling for the project activities, where

good planning mean the proper sequence of the activities, the proper relationship and dependency between the project task / activities. The 2nd, 3rd, 4th factors in this group show the importance of the availability of experienced site management and their experience in monitoring the site productivity in regular basis. This will keep the site under the control of the site management, which will lead to increase the site productivity generally.

High level of coordination between the construction project / contract parties, the coordination in the construction is the soul of the construction process; because there are many parties in the construction and the coordination between them is very important in order finalize any construction project in the best final shape. The coordination between the contractor parties itself (contract department, the site management, & site execution groups), in the other hand the coordination between the contractor, consultant, owner, management company, etc. where the mistake will be decreased and since there are a proper coordination process then no delay in the respond for the submitted request for inspection, shop drawing, as built drawing, material inspection request and any other process need for the coordination between the construction parties.

The proper coordination also will decrease the number of times of plan changing for the contractor himself, and the proper coordination between the designer and the contractor will decrease the number of drawing revisions, where the lack of the approved plans / drawings and frequent revision in drawing means that the work will be repeated and the site will be delayed in general.

A lack of management flexibility with regards to raising salary and promoting employees, which is a factor related to the responsibilities and authorities of the site management. Some construction companies in KSA have an excessive centralization of the decision-making process, which delay the construction process in general and will limit the authorities of the site management. The site management can't issue an increment to the site employee nor can't it give any rewards for the site people, which would affect site productivities negatively.

Poor communication between managers and labor, where the management don't know about the labor personal problems and the site problems, accommodation problem, so it's better to hold a meeting monthly between the site management and the labor to let the labor feel of the respect from the available management. If the management have a monthly meeting with their labor and lessen to their complains and try to solve their problems, then that will result in increasing of their loyalty to the company and the site management.

Job security this is one of the most important for the employee in order to be satisfied, because if he feel safe and secure with his company then he will be more productive.

Disruption of power and water services in the site is one of the big problems that some management didn't give their attention for it, but its causing a big problem e.g. if there are a shortage of the generators in the site then the electrical load will exceed the available in the site and many activities in the site depends mainly in the electrical power (e.g. cutting and cheesing) and other activities will depend mainly in the availability of

the water in the site e.g. Plaster, so the disruption of this two main resource will decrease the site productivity.

Lack of supervision means that the groups will not be under the full control of the site supervisor, because of the dilution of the supervision.

Proportion of work subcontracted differ from company to other where some companies give most of the work for the subcontractor and this will affect the productivity negatively since you can't control the subcontractor same if you are working with your team, but other companies will subcontract the work which need specialist people only. Restricted site accesses. Some government projects and Aramco projects have a restricted site access.

2.2.3 Material and equipment factors

The 3rd group is related to the materials and equipment and consists of 7 factors where the 1st factor is the availability of the suitable and approved materials in the site, so the process of the productivity will move smoothly, other factor is the delay which caused by the supplier and this is due to many reason, may be due to the supplier procedure or the improper planning from the supplier for the materials availability or due to the delay of the payment from the contractor.

Difficulties in sourcing materials of required quality inside Saudi Arabia, some client or consultant will require special materials with high quality which is not available in KSA market or its available with limited quantities (the supply will be on order only), but this need a proper planning from the procurement department of the contractor in order to

consider this materials as a long lead materials and requested 2 or 3 months prior to start the related activities.

Availability of modern construction plant and equipment and the availability of an efficient equipment and tools is very important in order to increase the site productivity e.g. if one group need a small bobcat, but the available is JCB and the work need to be done in restricted area where the JCB can't move their properly, so the availability of this proper machinery will increase the productivity of this group.

Heavy materials handling without machinery. This factor will lead to physical fatigue of the labor and may cause an injury for others, which would delay the site progress.

2.2.4 Financial factors

The 4th group is related to the financial factors that affecting the construction productivities where the 1st factor is the Limited financial liquidity of the company where is the liquidity is defined as the ability of the company to convert the available asset to a money when they need it. Where the 2nd factor is the delay of the payment by the owner to the contractor which will affect the financial strength of the building contractor specially in buffering the future financial challenges from the other side it will cause a delay of payment from contractor to the supplier which will cause a delay in the progress, because the supplier will not deliver the required materials in the required time in case of the payment delay.

The availability of cash flow with the contractor will help to get any unscheduled material/ tools in time which will help the contractor in improving his labor productivities and it will decrease the unproductive time.

Time of paying salary its one of the most sensitive factor since the people will not receive their salaries on time then they will feel that they were de-motivated to do the work which will affect the productivity negatively.

2.2.5 Project factors

The 5th group which is related to the project and it consist of 20 factors starting with the poor initial evaluation for the project cost and the poor cost management during the project implementation this will lead to cost cutting from the contractor side and it will decrease the level of the quality for the project.

Other factor is the improper planning of work schedule for the religious holidays, specially for Ramadan duty in KSA where the Number of working hours will be decreased to 6 working hours instead of 8 hours and the productivity of the labour will decrease by the half.

Failure to consider the project location, terrain, and other environmental conditions, where some project is locating very far from the city or in the middle of the desert where you need more time to deliver your materials, and you have to consider the weather in your schedule, because during the sand storm days all the external activities (out of the building) and some internal (inside the building) activities need to stop, other example in the windy days you can't allow your tower Crain to execute the job normally.

Excessive complexity in project design where the architectural (designer) add more complex features / items to the design. This needs more professional and experienced people to execute the job, other factor are that a company executes that type of project for the 1st time.

The job site is too noisy/dusty and there was a low level of lighting/poor ventilation/poor housekeeping/ limited access. This is mostly normal in construction projects. Another factor is an accident happened in the site due to poor safety and health conditions/instruction at site, which will influence the productivity negatively. If any group gets injuries in the site, then new groups need to be trained to do the same job. This will take time and will affect the site productivity.

Unforeseen condition. This factor is very important, especially if the built area of the project is very big where the soil investigation did not cover all the areas. After proceeding new building excavation, cavities were found under the foundation. This problem needs time to solve.

Variation order during the execution could also cause a delay for the site progress. The variation e happens due to many reasons. One reason is the site actual condition that requires additional items, which were not included in the approved drawings/specifications. Other reasons include; drawing errors or poor coordination between the design disciplines, and new requirement from project owner.

2.2.6. Weather Related Factors

The last group number to be mentioned is the weather-related factors, which is include the high temperature. This is a normal condition in the summer of KSA with high humidity, especially in the Eastern Province. Another factor is sand storm, which is affecting open areas in KSA, where the project located in the desert.

Heavy rains, although it is rarely happened in the eastern region, and fog are some other weather-related factors affecting construction productivity.

CHAPTER 3
Research Methodology

3.1. Data Collection

This thesis started with a deep literature review discussing many studies done in different countries and the concentrate will be on the factors influencing the project (project-related factors). The survey consists of two parts. The 1st part is about general information about the respondent (Name, specialization, experience years, etc.). The 2nd part contains 81 influencing factors. These influencing factors were divided into 6 groups. These are: labor related factors, administrative and managerial factors, materials and equipment factors, project related factors, weather factors, and financial factors.

The respondent will be asked to fix the degree of importance for the mentioned factors using Likert scale from 1 to 5 where 1 not important factor, 2 very low important factor, 3 average important factor, 4 very important factor, & 5 Extremely important factor. For the purpose of analysis and ranking of the influencing factor the importance index will be used. And this index were used by many researcher in order to identify and rank the importance of the influencing factor in the construction productivity i.e.. [(Jarkas, Kadri, & Younes, 2012), & (Enshassi, Mohamed, Abu Mustafa, & Mayer 2007).

The survey will be distributed to the Eastern Province contractor in order to get the degree importance of the influencing factors from the perspectives of the contractor different level from the general manager (GM) ,chief executive officer (CEO),projects manager, project manager, site manager, construction manager, project engineer, and site engineer, so it can be used by the local and international contractors, consultants, owners,

specially by the contractors projects managers in order to get the maximum profit from the labor force in the construction projects.

Contractors in Saudi Arabia has been classified in the 1st, 2nd, 3rd class (grade) by government agency by doing a study and Assessment of a contractor's financial situation, technical expertise, administrative and execution capabilities. Table 1 shows the classification limits of contractors in Saudi Arabia / Eastern Region, while Table 4 shows number of registered contractors based on MOMRA.

Table 4 : Classification limits of contractors in KSA, (MOMRA, 1435)

Trade	**Project Value Limit (Million) SAR**		
	First	Second	Third
Buildings	280 more than	280	70

Table 5: Number of registered Contractors in KSA/Eastern Province, (MOMRA, 1438)

	First	**Second**	**Third**	**Fourth**	**Fifth**	**Total**
Buildings	18	21	38	103	129	309

The target population included the local and international contractors who is working in eastern province and classified by **Ministry of Municipal and Rural Affairs (MOMRA). The classification criteria for the contractor are based on (1) financial strength and situation of the contractor (2) his previous experience and technical skills (3) administrative** and execution capabilities. As a result, the number of the

classified under the 1st, 2nd, 3rd class building contractor 18, 21, 38 respectively, with a total of 77 classified contractors (MOMRA, 2017). To make sure that the sample which is taken was a representative sample statically for the population of the eastern province building contractor, the formula which in formula shown in Equation 1 was used (Hogg and Tannis, and Zimmerman, 2015).

$$n = \frac{m}{1+(\frac{m-1}{N})} \qquad (1)$$

Where: *n* represent the sample size of the limited, *m* represents the sample size of the unlimited and *N* represent the sample size of the available Population. On the other hand, *m* is estimated by Equation 2.

$$m = \frac{z^2 \times p \times (1-p)}{\varepsilon^2} \qquad (2)$$

Where: *z* is the statistic value for the confidence level used, as its clear in the below table.

Table 6: confidence level related to z value

Confidence level	Z value to be used
99%	2.575
95%	1.96
90%	1.645

p is the value of the population proportion which is being estimated; and ε is the sampling error of the point estimate.

Since the value of *p* is unknown, Sincich *et al.* (2002) and Hogg and Tannis, and Zimmerman, 2015). Suggest a conservative value of 0.50 be used so that a sample size that is at least as large as required be obtained.

Using a 95% confidence level, that is 5% significance level, the unlimited sample size Of the population, *m* is determined by Equation 2 as follows:

$$m = \frac{(1.96)2 * 0.50 * (1-0.50)}{(0.05)2} = 385$$

Therefore, for the total number of 77 classified contractors under the 1st, 2nd, and 3rd categories, i.e. *N*, the representative sample size of the population required is quantified by Equation 1 as shown below:

$$n = \frac{385}{1+\left(\frac{385-1}{77}\right)} = 385/5.99 = 64.27 = 65 \text{ contractor company}$$

Consequently, a total of 70 chosen contractors from the MOMRA list of classified building contractors were invited to participate in the survey and followed up by direct contacts, phone Calls and frequent reminders. However, feedback from: 17 as 1st grade category; 15 as 2nd grade category; and 21 as third grade category contractors, was obtained, for a total of 53 contractor which is approximately representing 82% of the calculated sample size with 85 completed questionnaires since I received more than one respond from the same contractor from different engineer and different projects .

This rate is supported by Babbie (1992), who stated that as a rule of thumb 50% is adequate while McNeil, and Chapman (2005), Saunders et al. (2003), Gillham (2000), Tashakkori and Teddlie (1998) ,and Fellows , and Liu (1997) agreed that30_40% is acceptable because few people respond to questionnaires.

Number of 47 respondent which is considered more than 50% of the respondents are considered as senior officially within their Organizations, ranging from CEO (chief executive officer) to project managers, With a minimum 10 years of experience in the construction industry.

The 81 factors surveyed, as indicated previously, were classified into the 4 following primary groups: (1) management; (2) technological; (3) labor; and (4) exogenous. In order to determine the rank of each factor surveyed relative to all factors explored, the data collected were analyzed using the "Relative Importance Index" (RII) technique (Kometa *et al.*, 1994; Kumaraswamy and Chan, 1995; Fugar and Agyakwah-Baah, 2010). The RII for each factor explored was calculated by the formula shown in Equation 3.

$$RII\,(\%) = \frac{5(n5)+4(n4)+3(n3)+2(n2)+n1}{5(n1+n2+n3+n4+n5)} \times 100 \qquad (3)$$

Where n5 are the number of the respondent who selected 5 which is mean extremely important, n4 are the number of the respondent who selected 4 which is mean very important, n3 are the number of the respondent who selected 3 which is mean moderately important, n2 are the number of the respondent who selected 2 which is mean somewhat important, and at the last n1 are the number of the respondent who selected 1 which is mean not important.

The rank of each group was further established by quantifying the average value of the relative importance indices for all factors classified within; the higher the average value, the stronger the effect of the group (Enshassi *et al.*, 2007).

3.2. Limitations

In this research the time was limited; so many limitations were affecting the result of this thesis analysis as mentioned below:

1) The questionnaire was distributed and sends for the contractors only.

2) It was limited to the building contractor only.

3) It was limited to the eastern region only.

3.3 Data collection and analysis:

This thesis started with a deep literature review about the factors that affecting the construction productivities in different countries including some gulf countries Oman, Bahrain, Kuwait, Qatar where there a similarity in the weather conditions and the same nationality labor is working there mainly from other Asian countries (India, Pakistan, Philippine, Indonesia, Bangladesh, etc.). Then a questionnaire was structured from more than hundred questions then it was distributed into 6 main groups (Labor-related, Administrational and Managerial, Materials & Equipment, Financial, Project-related, and weather-related factors.). After that a round 4 interviews done with 4 experienced project managers (more than 20 years of experience) and 14 questionnaire was distributed in order to check and assess the clarity, interpretation, appropriateness, and comprehensibility of the questions, and to determine the efficiency of the questionnaire. This done in two of the biggest residential projects in eastern region (Saudi Arabia National Guard Housing) which is related to Saudi Arabia National Guard and the main contractor there is Saudi Bin Laden Group and subcontracted by AXAL Arabia Construction Company (1^{st} class) and Maytas (Indian company). This project is located in the main road between Dammam -Khobar city, and it is consist of 750 villas which is distributed into 2 types (700 soldier villas and 50 officer villas) with a service buildings (6 normal size mosque with one Juma mosque plus 6 schools and one clinic, etc ….).

This project is ongoing and a round 1200 extension which is still on hold. The 2nd project is AJYAL Project which is related to ARAMCO as client and subcontracted to many companies (Azmeel (1st class), Synohydro (Chinese company), CRCC (Chinese railway construction company), Arabtec L.C.C., Effeco, etc.) which is consist of 2800 Villas distributed into the mentioned main contractors).

After that the number of the question was decreased to 81 questions. It was then published online on Monkey survey on (https://www.surveymonkey.com/r/RT9FYPR). It was also distributed by email and Social Media. Hard copies were also distributed to targeted site engineers, Project engineers, construction Managers, Project Managers, General Managers (Civil, Electrical, & Mechanical). After that a round 85 responses gotten from the eastern region engineer. 85 responses were received and summarized into the **Statistical Package for the Social Sciences (**SPSS). SPSS can be used by academic researchers. It is also used by market researchers, health researchers, survey companies, government, education researchers, marketing organizations, and data miners to analyze the survey.

CHAPTER 4
Results and Analysis

The aim of this thesis is to study the influencing factors in the construction productivity and to rank those factors due to its importance in influencing the construction productivity. Due to the substantial number of the factors they were analyzed by group then the mean of each group were compared. Finally, the most ten important factors are discussed in more detail.

4.1 Labor–related factors:

Since the labor is the most important factor in construction productivity, that group is considered as one of the most important groups to be studied and analyzed. During the analysis it was found that the availability of the experienced technical staff and the skilled labor is the two most important factors as its clear in the descriptive statistical analysis in table # 7 which shows the No. of respondent for each factors and the mathematics mean of the respondent answer and the minimum and maximum which shows by Numbers range from (1-5) due to the degree important as mentioned before (1 : not important, 2 : somewhat important, 3 moderately important, etc….) , from the perceived of the respondent. Lastly, the standard deviation which is used to check the confidence of the information and it's the measure which is used to quantify the dispersion from the mean for as a set of data.

The analysis included the relative importance (RII) for each factor. It was noted that the experience staff and the skilled labor have the most important effect in the productivity in the labor –related factors with RII of 88 % & 86.82% respectively which

the same result of ((Jarkas, Kadri, & Younes, 2012), (El-Gohary & Aziz, 2014), (Enshassi, Mohamed, Abu Mustafa, & Mayer 2007) , & (Jarkas, 2015) where they got that the skilled labors factor has the 1st rank in influencing the labor productivity, but in the total factors that influencing the construction productivity it were found in 3rd and 4th rank respectively which the same result of ((Bekr 2016) & (Mahamid, 2013)) where the lack of experienced labor factor has the 4th rank within the total factors, from the other the skilled and experienced labor can give better result and productivity, where the unskilled labor can affect the site productivity negatively since there output mostly will be rejected by the consultant during the work inspection.

The coordination between staff (site supervision) as well as the availability of skilled supervisors and foremen in order to measure labor productivity have the 3rd and 4th rank in the same group with RII 86.59% & 81.88% respectively. Also it is ranked as the 5th, 12th rank overall which still in advance comparing with the total of 81 factors. The coordination between the supervisor meaning that the supervisor always available in the site, which will affect the labor productivity positively. From the other hand the availability of skilled supervisors and foremen in order to measure labor productivity will keep the construction site under control and in case of any delay a recovery plan will be the solution since the site supervision have the ability to measure the site productivity in proper way.

Labor and supervision absenteeism ranked as the 5th over its group and 15th over the total investigated factors with RII of 80.47%.

Availability of employee accommodation and acceptable living standards and Employer commitment to labors' rights (vacation, air ticket, etc.) which is considered from the simplest rights for the labor who left his country in order to work and earn a living. It was ranked as the 6th and 7th factors respectively within the group over the 20 factors and 22th and 23th over the total factors with RII 78.35% and 78.12% respectively.

Next is Re-work due to many reasons (e.g. Poor quality due to poor workmanship, drawing error, drawing revision, etc.) This is ranked as the 8th factor over its group and 31 over all factors with RII 77.65 %. The cost of the rework can be reduced by the implementation of experienced management in general and specialized in quality control, also it can be reduced using experienced site personnel who understand the work and have the ability to do the work properly from the 1st time with acceptable quality. Reducing the rework hours and cost will lead directly to improve the productivity.

Labor and staff loyalty for the company was ranked as 9th factor over the labor-related factor and 33 among all the factors investigated with RII 77.41 %., it's clear that the long-time success of any company depends on the quality of their employee and their loyalty for the company since that will increase the productivity of the employee and the company will gain more profit.

Labor strikes from my point of view is one of the most critical factors that affecting the productivity, specially the long-term strike, since its stopping the work completely or partially and its decreasing the effect of the learning curve, so no more improvement for the labor productivity. It's ranked as 10th factor that's affecting the

productivity among the labor related factors and the 37th over all the investigated factors with RII 76.71 %.

Ability to provide great care and support (including health insurance) to the workers which is considered as one of the simplest right for the labor was ranked as 11th between its group factors and 39th over all the factors with RII of 76.71%.

Late arrival, early finish and/ or, unscheduled break for work it's one of the sensitive factors specially in KSA construction site, but its ranked 12th over the 20 factors of the labor related group and the 42th over all the six groups with RII of 75.29%.

Labor physical fatigue, Labor and supervision turnover, which is ranked as the 13th and 14th respectively over its group and 45th and 57th respectively over all investigated factors with RII of 74.35 % and 72.24% respectively.

Availability of motivation program it seems to be not much important factor among KSA or as per the engineer and managers perceived in Eastern region sites since it's ranked as 15th factor among its group and the 59th over all factors with RII of

72.00 %.

Lack of training offered to labor, Salary amount (level) of the labor, Poor communication between foreign workers (different languages), Labor personal problems and labor age were located in the last quarter among their group with 16th, 17th, 18th, 19th, and 20th respectively and in the last quarter among the total factors with 62th, 66th,77th,78th, and 79th among the 81 factors with RII of 71.53%, 70.59%, 64.94%, 63.76%, and 63.29 Respectively.

Table 7: Descriptive statistics for labor related factors

Labor-related factors influencing the construction productivity					
	N	Min.	Max.	Mean	Std. Deviation
Availability of experienced technical staff	85	3	5	4.4	0.58146
Availability of Skilled labor	85	2	5	4.3412	0.66463
coordination between staff(site supervision)	85	3	5	4.3294	0.67943
Availability of skilled supervisors and foremen in order to measure labor productivity	85	2	5	4.0941	0.73393
Labor and supervision absenteeism	85	2	5	4.0235	0.77115
Availability of employee accommodation and acceptable living standards	85	2	5	3.9294	0.88356
Employer commitment to labors' rights (vacation, air ticket, etc.)	85	2	5	3.9176	0.88924
Re- work due to (poor quality, drawing error, drawing revision, etc.)	85	2	5	3.8706	0.98547
Labor and staff loyalty for the company	85	1	5	3.8588	1.05957
Labor strikes	85	1	5	3.8353	0.98618
Ability to provide great care and support (including health insurance) to the workers	85	2	5	3.8	0.91026
Late arrival, early finish and/ or , unscheduled break for work	85	1	5	3.7647	0.94676
Labor physical fatigue	85	1	5	3.7176	0.94632
Labor and supervision turn over	85	2	5	3.6118	0.8323
Availability of motivation program	85	1	5	3.6	1.01419
Lack of training offered to labor	85	1	5	3.5765	0.94335
Salary amount (level) of the labor	85	2	5	3.5294	0.78054
Poor communication between foreign workers (different languages	85	1	5	3.2471	1.09006
Labor personal problems	85	1	5	3.1882	1.02926
Labor age	85	1	5	3.1647	0.92385

Table 8: Other descriptive statistics value for labor related factors with ranking

Descriptive Statistics- Labor related factors					
	Range Statistic	Mean Std. Error	Variance Statistic	RII	Rank
Availability of experienced technical staff	2	0.06307	0.338	88.00%	1
Availability of Skilled labor	3	0.07209	0.442	86.82%	2
coordination between staff(site supervision)	2	0.07369	0.462	86.59%	3
Availability of skilled supervisors and foremen in order to measure labor productivity	3	0.07961	0.539	81.88%	4
Labor and supervision absenteeism	3	0.08364	0.595	80.47%	5
Availability of employee accommodation and acceptable living standards	3	0.09584	0.781	78.59%	6
Employer commitment to labors' rights (vacation, air ticket, etc.)	3	0.09645	0.791	78.35%	7
Re-work due to (poor quality, drawing error, drawing revision, etc.)	3	0.10689	0.971	77.41%	8
Labor and staff loyalty for the company	4	0.11493	1.123	77.18%	9
Labor strikes	4	0.10697	0.973	76.71%	10
Ability to provide great care and support (including health insurance) to the workers	3	0.09873	0.829	76.00%	11
Late arrival, early finish and/ or unscheduled break for work	4	0.10269	0.896	75.29%	12
Labor physical fatigue	4	0.10264	0.896	74.35%	13
Labor and supervision turn over	3	0.09028	0.693	72.24%	14
Availability of motivation program	4	0.11	1.029	72.00%	15
Lack of training offered to labor	4	0.10232	0.89	71.53%	16
Salary amount (level) of the labor	3	0.08466	0.609	70.59%	17
Poor communication between foreign workers (different languages)	4	0.11823	1.188	64.94%	18
Labor personal problems	4	0.11164	1.059	63.76%	19
Labor age	4	0.10021	0.854	63.29%	20

4.2. Administration and managerial–related factors:

The administration and management is consist of many factors which is include the planning and scheduling, controlling, and organizing, etc….but the think that the planning is the basic component of the administration and management is seems to be O.K. since in the analysis of this group it was found that the Good planning and scheduling for project tasks is the 1st factor over its group which consist of 22 items and the 1st rank over all the analyzed 81 factors with RII of 89.18% and the highest mean of 4.4588 and all respondent agreed that there were a 5 factors ranging from 3 (moderately important) up to 5 (extremely important) and this one is the 1st factor of that 5 factors where the frequencies will be discussed lately. And this finding support the result of Naoum(2016) & Bekr (2016), where they found that Poor planning and scheduling / Ineffective project planning is the 1st ranked factor over all the analyzed factors in their research.

Availability of experienced site management which will affect the site productivity positively and its one of the most essential factors for the success of the companies in the construction site and it's important to keep the site under the high management control, it was ranked as the 2nd factor over its group and 2nd factor among all the investigated factors with RII of 88.24% and it's the 2nd factor which is ranging between 3 (moderately important) and 5 (extremely important) as per the perceived of the eastern region experts and practitioners.

Availability of supervisors and managers for monitoring and measuring productivity on a regular basis is one of the most critical factors in order to keep the construction site under control and proper monitoring, and its ranked as the 3 rd item within its group and the 9th over all the investigated items with RII of 83.76 %, so it's still

one of the most 10 important factors that will be discussed and analyzed later. Also its support the research of (Ghoddousi & Hosseini, 2012) where they found that factor is the 2nd factor among all the investigated factors in Iran.

High level of coordination between the construction project/contract parties in order to execute the project with full understanding of the contractual rights of their company, and to keep their company rights in case of a new variation raised in the site. It was ranked as the 4th factor over its group and the 17th over all the investigated 81 factors with RII of 79.29% and this agreed with (Mahamid, 2013), where it was ranked as the 2nd factor over the investigated factors and (Improper project coordination) ranked as 7th factor over all the investigated factors in (Thomas & Sudhakumar, 2014) research in India.

Site activity proper sequence is one of the most sensitive factors in the construction sites, since the proper sequence of the site activity will lead for a work with high or acceptable quality and it will decrease the rework which will affect the productivity positively and increase it, and it was ranked as the 5th factor among its group and the 25th of over all the analyzed factor with RII of 78.12 and which is agreed the research of (Mahamid, 2013) where it was ranked as the 8th factor.

Lack of supervision is also important factor since the lack of supervision will decrease the control in the produced quantity of work and it will allow the operatives / labors to have unscheduled rest and more unproductive time, which will affect the construction site productivity negatively. Here the high importance of this factor is clear, since it's ranked as 6th factor among 22 factors on its group and 27th factor over all factors with RII of 78.12 %. And this supporting the result of (*Jarkas et al 2012, Jarkas et al*

2015, Jarkas, Al Balushi, & Raveendranath, 2015, Jarkas, Kadri, & Younes, 2012, and Enshassi, Mohamed, Abu Mustafa, & Mayer 2007), which is shows that this factor is one of the first 5th factors among the investigated factors in their analysis in Kuwait, Bahrain, Oman, Qatar, and Gaza strip respectively.

Lack of experience among managers in measuring productivity the reverse of this factor was mentioned and discussed in the same group with its effect in the productivity and in control the site and its ranked 7th factor within its group and the 29th between the total of 81 factors investigated in this research with an importance factor (RII) of 77.65 % and this consistence with the result of (Durdyev, Ismail, & Bakar, 2013) in **Turkmenistan** where it was ranked as the 9th factor**.**

Lack of approved plans is a sensitive factor since no work will be allowed to start officially in the site without the approved drawing. Also, if the work has done without approved drawing it will be under the risk and the responsibility of the contractor which will lead for the rework, if the work was rejected by the consultant engineer or architectural. It's known that the dismantling of some work will take more effort than executing that work. In this research Its ranked as the 8th factor among its group and 30th factor over all the 81 factors with a relative importance indices of 77.65% and this agreed with the result of (Thomas & Sudhakumar, 2014) research in India where it was ranked as the 5th factor.

Lack of management flexibility with regards to raising salary and promoting employees still have a negative influence in the site people since there are no flexibility will mean that the people will become de-motivated and this will affect the loyalty of this people so the productivity will be decreased, here its noted that this factor still one of the

1st 10 factors in its group and ranked as the 9th factor and as 34th factor with RII of 77.18%.

Delay due to RFI respond and strict inspection it was ranked as 10th factor among its group and 40th among all the 81 investigated factor with RII of 76.00 %, this factor is depending in the relationship, trust and coordination between the consultant and contractor.

Table 9: Descriptive statistics for Administration and managerial factors

Administration and managerial factors influencing the construction productivity					
	N	Min.	Max	Mean	Std. Dev.
Good planning and scheduling for project tasks	85	3	5	4.4588	0.62779
Availability of experienced site management	85	3	5	4.4118	0.60344
Availability of supervisors and managers for monitoring and measuring productivity on a regular basis	85	3	5	4.1882	0.64539
High level of coordination between the construction project/contract parties	85	1	5	3.9882	0.93215
Site activity proper sequence	85	2	5	3.9059	0.79617
Lack of supervision	85	2	5	3.9059	0.88133
Lack of experience among managers in measuring productivity	85	1	5	3.8824	0.86481
Lack of approved plans	85	1	5	3.8824	0.86481
Lack of management flexibility with regards to raising salary and promoting employees	85	1	5	3.8588	0.88846
Delay due to RFI respond and strict inspection	85	2	5	3.7765	0.80735
Equal opportunity of advancement	85	1	5	3.7294	0.95604
Frequent revisions of drawings	85	1	5	3.7294	0.9435
Excessive centralization of the decision-making process	85	1	5	3.7176	0.85373
Frequently changing plans	85	1	5	3.7059	0.97374
Nepotistic rewarding of unqualified employees	85	1	5	3.6941	0.97619
Disruption of power services	85	1	5	3.6706	0.87815
Job security	85	1	5	3.6353	1.06734

Administration and managerial factors influencing the construction productivity					
	N	Min.	Max	Mean	Std. Dev.
Poor communication between managers and labor	85	1	5	3.6353	0.99818
Overtime for labor and staff	85	1	5	3.6235	1.01156
Disruption of water services	85	1	5	3.4824	0.99537
Restricted site access	85	1	5	3.4235	0.98048
Proportion of work subcontracted	85	1	5	3.2824	0.94632
Valid N (list wise)	85			3.7994 68182	

Table 10: Descriptive statistics for Administration and managerial factors

Descriptive Statistics: Administration and Managerial related factors					
	Range Statistic	Mean Std. Error	Variance Statistic	RII	Rank
Good planning and scheduling for project tasks	2	0.0680	0.394	89.18%	1
Availability of experienced site management	2	0.0654	0.364	88.24%	2
Availability of supervisors and managers for monitoring and measuring productivity on a regular basis	2	0.07	0.417	83.76%	3
High level of coordination between the construction project/contract parties	4	0.1011	0.869	79.76%	4
Site activity proper sequence	3	0.0863	0.634	78.12%	5
Lack of supervision	3	0.0955	0.777	78.12%	6
Lack of experience among managers in measuring productivity	4	0.0938	0.748	77.65%	7
Lack of approved plans	4	0.0938	0.748	77.65%	8
Lack of management flexibility with regards to raising salary and promoting employees	4	0.0963	0.789	77.18%	9
Delay due to RFI respond and strict inspection	3	0.0875	0.652	75.53%	10
Equal opportunity of advancement	4	0.1037	0.914	74.59%	11
Frequent revisions of drawings	4	0.1023	0.89	74.59%	12
Excessive centralization of the decision-making process	4	0.0926	0.729	74.35%	13
Frequently changing plans	4	0.1056	0.948	74.12%	14
Nepotistic rewarding of unqualified employees	4	0.10588	0.953	73.88%	15

Descriptive Statistics: Administration and Managerial related factors					
	Range Statistic	Mean Std. Error	Variance Statistic	RII	Rank
Disruption of power services	4	0.09525	0.771	73.41%	16
Job security	4	0.11577	1.139	72.71%	17
Poor communication between managers and labor	4	0.10827	0.996	72.71%	18
Overtime for labor and staff	4	0.10972	1.023	72.47%	19
Disruption of water services	4	0.10796	0.991	69.65%	20
Restricted site access	4	0.10635	0.961	68.47%	21
Proportion of work subcontracted	4	0.10264	0.896	65.65%	22

4.3. Material and Equipment related factors:

Construction tools and equipment are constantly being developed to make every stage of house building easier, quicker, cheaper and safer.

If you have decided to project manage yourself build there'll be some stages where you'll need to arrange equipment or construction tools for work to progress.

It is essential as part of your project planning and management that you plan ahead to ensure that equipment is on site and ready for use when it's required. The tradesmen and subbies working on your site should have most of the equipment they need but discuss requirements with them before they start work to ensure that you both know what is needed, when and who will provide it.

Tables 10 and 11 are showing the descriptive statistics for the materials and equipment factors that affecting the construction site productivity in Kingdom Of Saudi Arabia / Eastern Province.

The availability of suitable materials on the site is one of the most crucial factors to do the work, because if the materials were not available at site no work will be done which mean no progress / productivity, and if the available materials were not the suitable materials then this will lead for the rework incase that work or materials were rejected by the consultant. Its ranked as the 1st factor in its group and 6th among all the 81 factors with RII of 86.35 %. Also delayed delivery of materials by the supplier ranked as the 2nd factor in its group and the 7th over all analyzed factors with RII of 85.18%, and these two factors result are supporting the result of (Thomas & Sudhakumar, 2014) in India when it gained the 1st and the 2nd ranking on his research.

Difficulties in sourcing materials of required quality inside Saudi Arabia and the availability of efficient equipment and tools were ranked as the 3rd and 4th factors in their group and ranked 21st, and 35th over all the 81 factors with RII of 78.59%, and 77.18% respectively.

Heavy material handling without machinery can be consider as a safety factor since it can cause an injury for the labor, but it's still an important factor within its group and it was ranked as 5th factor on its group and ranked 49th factor between the 81 factors with relative important indices of 73.88 %.

Availability of modern construction plant and equipment and lack of reliable companies offering construction equipment and tools for hire it were ranked as the 6th and 7th factors within its group and 53rd 58th over all available factors which is investigated and analyzed with RII of 73.18 and 72.24 respectively.

Table 11: Descriptive statistics for Materials and Equipment factors

Materials and equipment factors influencing the construction productivity	N	Min.	Max.	Mean	Std. Deviation
Availability of suitable materials	85	2	5	4.3176	0.74341
Delayed delivery of materials by the supplier	85	1	5	4.2588	0.98986
Difficulties in sourcing materials of required quality inside Saudi Arabia	85	1	5	3.9412	0.93035
The availability of an efficient equipment and tools	85	1	5	3.8471	0.85225
Heavy material handling without machinery	85	1	5	3.6941	1.00028
Availability of modern construction plant and equipment	85	1	5	3.6588	0.9329
Lack of reliable companies offering construction equipment and tools for hire	85	1	5	3.6118	0.95237

Table 12 : Other descriptive statistics for Materials and Equipment factors with ranking

Materials and equipment factors influencing the construction productivity					
	Range Statistic	Mean Std. Error	Variance Statistic	RII	Rank
Availability of suitable materials	3	0.08063	0.553	86.35%	1
Delayed delivery of materials by the supplier	4	0.10737	0.98	85.18%	2
Difficulties in sourcing materials of required quality inside Saudi Arabia	4	0.10091	0.866	78.82%	3
The availability of an efficient equipment and tools	4	0.09244	0.726	73.18%	4
Heavy material handling without machinery	4	0.1085	1.001	76.94%	5
Availability of modern construction plant and equipment	4	0.10119	0.87	72.24%	6
Lack of reliable companies offering construction equipment and tools for hire	4	0.1033	0.907	73.88%	7

4.4. Financial related factors:

“Financial Management is an essential part of the economic and non-economic activities which leads to decide the efficient procurement and utilization of finance with profitable manner. In the olden days, the subject Financial Management was a part of accountancy with the traditional approaches. Now a days, it has been enlarged with innovative and multi dimensional functions in the field of business with the effect of industrialization, Financial Management has become a vital part of the business concern and they are concentrating more in the field of Financial Management. Financial Management also developed as corporate finance, business finance, financial economics, financial mathematics and financial engineering. Understanding the basic concept about the financial management becomes an essential part for the students of economics, commerce and management”. (Paramasivan C., SubramanianT. 2000)

Limited financial liquidity of the company is the most important factor for the contractor, because if the contractor has the ability to convert his assets into money at the required time then it will help him to have cash money at the required time. This factor was ranked as the 1st factor in its group and its ranked as the 8th factor within the total investigated factors with RII of 84.00%, also Payment delays by owners it’s an critical factor specially if the contractor can’t manage the work financially without the client payment and its ranked as the 2nd within its group and 10th factor among all analyzed factors with a relative importance indices of 83.06 %.

Limited cash flow is also important factor since its ranked as the 3rd, 11th factor within its group and over the total factors respectively with RII 82.12%.

Time of paying salary it's an important factor for the employee to be motivated, at the time many companies are not paying the salary of the employee on time in Kingdom of Saudi Arabia and this is reflecting on their morale and productivity, so you can find that this factor was ranked as 4th over its group and ranked 13th over all investigated factors with RII of 81.18%.

Financial strength of building contractors, Delays in contractor payments to suppliers, and Cost cutting activities to reduce overall cost to contractor were ranked as 5th, 6th, and 7th factors among its group and were ranked as 14th, 28th, and 61st over all the investigated factors with RII of 80.71%, 77.65%, and 71.53% respectively.

Table 13: Descriptive statistics of Financial related factors

Financial related factors influencing the construction productivity					
	N	Minimum	Maximum	Mean	Std. Deviation
Limited financial liquidity of the company	85	2	5	4.2	0.78376
Payment delays by owners	85	1	5	4.1529	0.85225
Limited cash flow	85	2	5	4.1059	0.72413
Time of paying salary	85	1	5	4.0588	0.96797
Financial strength of building contractors	85	2	5	4.0353	0.79353
Delays in contractor payments to suppliers	85	2	5	3.8824	0.87847
Cost cutting activities to reduce overall cost to contractor	85	1	5	3.5765	0.94335

Table 14: Other descriptive statistics for financial related factors with ranking

Descriptive Statistics					
	Range Statistic	Mean Std. Error	Variance Statistic	RII	Rank
Limited financial liquidity of the company	3	0.08501	0.614	84.00%	1
Payment delays by owners	4	0.09244	0.726	83.06%	2
Limited cash flow	3	0.07854	0.524	82.12%	3
Time of paying salary	4	0.10499	0.937	80.71%	4
Financial strength of building contractors	3	0.08607	0.63	77.65%	5
Delays in contractor payments to suppliers	3	0.09528	0.772	81.18%	6
Cost cutting activities to reduce overall cost to contractor	4	0.10232	0.89	71.53%	7

4.5 Project related factors:-

Poor cost management during project implementation and Poor initial evaluation of project costs were ranked as the 1st and 2nd factors among their group and 18th and 19th respectively over all factors with RII of 79.06 and 79.06 respectively.

Poor initial evaluation of project costs and Poor cost management during project implementation will cause a financial problem for the construction site management and personnel because if they exceeded the budget during the month then the work may be will stop for any small item need to buy by cash but the cash money is not available.

Coordination level among design disciplines and Clarity of technical specifications is two of the most important factors for the execution of any construction projects, because the proper coordination between the civil, architects, and electromechanical (MEP) group in the design stage will prevent many problems to happen in the future during the execution of the project. Same for the specification if it

was clear then it will decrease the mistake and it will prevent the rework, so these two factors ranked as the 3rd and 4th factors in their group and ranked 24th and 26th among the total factors with RII of 78.12 % and 78.12 % respectively.

Accident due to poor safety and health conditions is one of the critical factors that affecting the construction site productivity, because if any accident happened in the site then it will cause death or injuries for the labor that is working there, then the work will stop. From the other hand you need to train another labor to do the same activity which was been executed by the injured or death group or labor, so the cost of applying all safety and health procedure is less than the cost of an accident, so this factor ranked as 5th factor within the group which is still considered from the 1st quarter of this group and ranked as 32nd factor among its group.

High quality of required work and Construction method are ranked with 6th and 7th factors within its group 41st factor and 48th factor within the total factors respectively with relative importance indices of 75.53% and 73.88% respectively.

High quality of required work factor is related and depends in the required quality from the owner and his representative and the acceptable quality for the consultant, the required high quality of the work the less productivity well be gain.

Unavailability of storage place, poor planning of work schedules for public and religious holidays including Ramadan, and Variation order during execution are three of the important factor that influencing the construction site productivity which ranked 8th, 9th, and 10th factors among its group, and ranked as 51st, 60th, and 63rd respectively among

all investigated factors with a relative importance indices of 73.41%, 71.76%, and 71.53% respectively.

Table 15: Descriptive statistics for project related factors.

Financial related factors influencing the construction productivity					
	N	Min	Max	Mean	Std. Deviation
Poor cost management during project implementation	85	2	5	3.9529	0.77006
Poor initial evaluation of project costs	85	1	5	3.9529	0.88514
Coordination level among design disciplines	85	2	5	3.9059	0.95896
Clarity of technical specifications	85	1	5	3.9059	0.86772
Accident due to poor safety and health conditions	85	1	5	3.8706	0.94854
High quality of required work	85	2	5	3.7647	0.79653
Construction method	84	1	5	3.7024	0.94141
Unavailability of storage place	85	1	5	3.6706	0.99269
Poor planning of work schedules for public and religious holidays including Ramadan	85	1	5	3.5882	1.06116
Variation order during execution	85	1	5	3.5765	1.05081
Work at high level	85	1	5	3.5647	1.04023
Failure to consider the project location, terrain, and other environmental conditions	85	1	5	3.5294	1.00698
Company execute that project for 1st time	85	1	5	3.5176	0.98333
Low level of lighting / poor ventilation / poor housekeeping / limited access	85	1	5	3.5059	0.89474
Excessive complexity in the project design	85	1	5	3.4824	0.92081
Unforeseen conditions	85	1	5	3.3412	1.00656
Availability of site facility (prayer room, smoking place, dining room, etc...)	85	1	5	3.2941	1.02148
Project scale	85	1	5	3.2824	1.11922
Type of the project	85	1	5	3.1647	1.12172
The job site is too noisy / dusty	85	1	5	3.0941	1.07597

Table 16: Other descriptive statistics for project related factors with ranking

Descriptive Statistics: Project related factors					
	Range Statistic	Mean Std. Error	Variance Statistic	**RII**	Rank
Poor cost management during project implementation	3	0.08353	0.593	**79.06%**	**1**
Poor initial evaluation of project costs	4	0.09601	0.783	**79.06%**	**2**
Coordination level among design disciplines	3	0.10401	0.92	**71.76%**	**3**
Clarity of technical specifications	4	0.09412	0.753	**70.59%**	**4**
Accident due to poor safety and health conditions	4	0.10288	0.9	**69.65%**	**5**
High quality of required work	3	0.0864	0.634	**70.35%**	**6**
Construction method	4	0.10272	0.886	**61.88%**	**7**
Unavailability of storage place	4	0.10767	0.985	**70.12%**	**8**
Poor planning of work schedules for public and religious holidays including Ramadan	4	0.1151	1.126	**77.41%**	**9**
Variation order during execution	4	0.11398	1.104	**66.82%**	**10**
Work at high level	4	0.11283	1.082	**71.53%**	**11**
Failure to consider the project location, terrain, and other environmental conditions	4	0.10922	1.014	**71.29%**	**12**
Company execute that project for 1st time	4	0.10666	0.967	**65.65%**	**13**
Low level of lighting / poor ventilation / poor housekeeping / limited access	4	0.09705	0.801	**63.29%**	**14**
Excessive complexity in the project design	4	0.09988	0.848	**65.88%**	**15**
Unforeseen conditions	4	0.10918	1.013	**73.41%**	**16**
Availability of site facility (prayer room, smoking place, dining room, etc...)	4	0.11079	1.043	**77.65%**	**17**
Project scale	4	0.1214	1.253	**78.12%**	**18**
Type of the project	4	0.121	1.258	**78.1**	**19**

Descriptive Statistics: Project related factors					
	Range Statistic	Mean Std. Error	Variance Statistic	**RII**	Rank
		67		**2%**	
The job site is too noisy / dusty	4	0.1167	1.158	**73.18%**	**20**

4.6 Weather related factors:

Weather is considered as one of the external force which we can't control, but we can fix extra days for the harsh weather days when the labor can't do any work during these days or no one can reach the site e.g. the heavy rain which fallen in eastern region during 2017 in February.

Sand Storms and Heavy Rain are the most critical factors that affecting the eastern region as its perceived by the experts and practitioners as they rank it the 1st and 2nd factors on its group and 16th and 20th factors respectively among all the investigated factors with RII of 79.76 % and 78.82 respectively, may be the sand storm will have the most effect in the productivity of the project which is located in the dessert, because its open area.

High Humidity and high temperature are the 3rd and 4th which considered as important factor, but may be considered as a normal factor from the practitioners and the expert of the eastern province, so they rank it after the sand storm and the heavy rain. It's also ranked as 36th and 38th over all the investigated 81 factors with RII of 76.94% and 76.71% respectively.

The fog is considered as the less important in its influencing in the construction productivity where its ranked as the 5th factor among its group and 73rd over the 81 factors which investigated and analyzed with RII of 65.88%.

Table 17: Descriptive statistics for weather related factors

weather related factors influencing the construction productivity					
		Min.	Max.	Mean	Std. Deviation
Sand Storms	84	2	5	4.0119	0.82862
Heavy Rain	84	2	5	3.9524	0.9171
High Humidity	85	1	5	3.8353	1.06734
High temperature	85	1	5	3.8353	1.03334
Fog	84	1	5	3.3333	1.07919

Table 18: Other descriptive statistics for weather related factors with ranking

Descriptive Statistics					
	Range Statistic	Mean Std. Error	Variance Statistic	RII	Rank
Sand Storms	3	0.09041	0.687	76.71%	1
Heavy Rain	3	0.10006	0.841	76.71%	2
High Humidity	4	0.11577	1.139	78.12%	3
High temperature	4	0.11208	1.068	79.29%	4
Fog	4	0.11775	1.165	65.88%	5

4.7 Productivity total influencing factors and the group ranking:

Table18 is showing the total factors that analyzed and ranked due to its relative important indices and including the group of each factor with the ranking as per the perceived of the experts and practitioners of the eastern region in Kingdom Of Saudi Arabia.

The top 10 ranked factors that influencing the productivity of the construction site labors are (1) Good planning and scheduling for project tasks (2) Availability of experienced site management (3) Availability of experienced technical staff (4) Availability of Skilled labor (5) coordination between staff(site supervision) (6) Availability of suitable materials (7) Delayed delivery of materials by the supplier (8) Limited financial liquidity of the company (9) Availability of supervisors and managers for monitoring and measuring productivity on a regular basis (10) Payment delays by owners.

Table 19: Other descriptive statistics for weather related factors with ranking

Descriptive Statistics: Productivity total influencing factors			
	Group	RII	Rank
Good planning and scheduling for project tasks	Administration and Managerial	89.18%	1
Availability of experienced site management	Administration and Managerial	88.24%	2
Availability of experienced technical staff	Labor	88.00%	3
Availability of Skilled labor	Labor	86.82%	4
coordination between staff (site supervision)	Labor	86.59%	5
Availability of suitable materials	Materials and Equipment	86.35%	6
Delayed delivery of materials by the supplier	Materials and Equipment	85.18%	7
Limited financial liquidity of the company	Financial	84.00%	8
Availability of supervisors and managers for monitoring and measuring productivity on a regular basis	Administration and Managerial	83.76%	9
Payment delays by owners	Financial	83.06%	10
Limited cash flow	Financial	82.12%	11
Availability of skilled supervisors and foremen in order to measure labor productivity	Labor	81.88%	12
Time of paying salary	Financial	81.18%	13
Financial strength of building contractors	Financial	80.71%	14
Labor and supervision absenteeism	Labor	80.47%	15

Descriptive Statistics: Productivity total influencing factors			
	Group	RII	Rank
Sand Storms	Weather	79.76%	16
High level of coordination between the construction project/contract parties	Administration and Managerial	79.29%	17
Poor cost management during project implementation	Project related	79.06%	18
Poor initial evaluation of project costs	Project related	79.06%	19
Heavy Rain	Weather	78.82%	20
Difficulties in sourcing materials of required quality inside Saudi Arabia	Materials and Equipment	78.59%	21
Availability of employee accommodation and acceptable living standards	Labor	78.35%	22
Employer commitment to labors' rights (vacation, air ticket, etc.)	Labor	78.12%	23
Coordination level among design disciplines	Project related	78.12%	24
Site activity proper sequence	Administration and Managerial	78.12%	25
Clarity of technical specifications	Project related	78.12%	26
Lack of supervision	Administration and Managerial	78.12%	27
Delays in contractor payments to suppliers	Financial	77.65%	28
Lack of experience among managers in measuring productivity	Administration and Managerial	77.65%	29
Lack of approved plans	Administration and Managerial	77.65%	30
Re- work due to (poor quality, drawing error, drawing revision, etc.)	Labor	77.65%	31
Accident due to poor safety and health conditions	Project related	77.41%	32
Labor and staff loyalty for the company	Labor	77.41%	33
Lack of management flexibility with regards to raising salary and promoting employees	Administration and Managerial	77.18%	34
The availability of an efficient equipment and tools	Materials and Equipment	77.18%	35
High Humidity	Weather	76.94%	36
Labor strikes	Labor	76.71%	37
High temperature	Weather	76.71%	38
Ability to provide great care and support (including health insurance) to the workers	Labor	76.71%	39

Descriptive Statistics: Productivity total influencing factors			
	Group	RII	Rank
Delay due to RFI respond and strict inspection	Administration and Managerial	76.00%	40
High quality of required work	Project related	75.53%	41
Late arrival, early finish and/ or unscheduled break for work	Labor	75.29%	42
Equal opportunity of advancement	Administration and Managerial	74.59%	43
Frequent revisions of drawings	Administration and Managerial	74.59%	44
Labor physical fatigue	Labor	74.35%	45
Excessive centralization of the decision-making process	Administration and Managerial	74.35%	46
Frequently changing plans	Administration and Managerial	74.12%	47
Construction method	Project related	73.88%	48
Heavy material handling without machinery	Materials and Equipment	73.88%	49
Nepotistic rewarding of unqualified employees	Administration and Managerial	73.41%	50
Unavailability of storage place	Project related	73.41%	51
Disruption of power services	Administration and Managerial	73.18%	52
Availability of modern construction plant and equipment	Materials and Equipment	73.18%	53
Job security	Administration and Managerial	72.71%	54
Poor communication between managers and labor	Administration and Managerial	72.71%	55
Overtime for labor and staff	Administration and Managerial	72.47%	56
Labor and supervision turn over	Labor	72.24%	57
Lack of reliable companies offering construction equipment and tools for hire	Materials and Equipment	72.24%	58
Availability of motivation program	Labor	72.00%	59
Poor planning of work schedules for public and religious holidays including Ramadan	Project related	71.76%	60
Cost cutting activities to reduce overall cost to contractor	Financial	71.53%	61
Lack of training offered to labor	Labor	71.53%	62
Variation order during execution	Project related	71.53%	63
Work at high level	Project related	71.29%	64

Descriptive Statistics: Productivity total influencing factors			
	Group	RII	Rank
Failure to consider the project location, terrain, and other environmental conditions	Project related	70.59%	65
Salary amount (level) of the labor	Labor	70.59%	66
Company execute that project for 1st time	Project related	70.35%	67
Low level of lighting / poor ventilation / poor housekeeping / limited access	Project related	70.12%	68
Excessive complexity in the project design	Project related	69.65%	69
Disruption of water services	Administration and Managerial	69.65%	70
Restricted site access	Administration and Managerial	68.47%	71
Unforeseen conditions	Project related	66.82%	72
Fog	Weather	65.88%	73
Availability of site facility (prayer room, smoking place, dining room, etc...)	Project related	65.88%	74
Proportion of work subcontracted	Administration and Managerial	65.65%	75
Project scale	Project related	65.65%	76
Poor communication between foreign workers (different languages)	Labor	64.94%	77
Labor personal problems	Labor	63.76%	78
Labor age	Labor	63.29%	79
Type of the project	Project related	63.29%	80
The job site is too noisy / dusty	Project related	61.88%	81

4.7.1 Productivity group average importance indices and the group ranking:

From the below table 20 you can note that the financial group was occupied the 1st rank among the total 6 groups with an average relative importance indices of 80.03% for the investigated 7 factors that related to the financial group then the next group was Material and Equipment which consist of total 7 factors with average relative importance indices of 78.08%, then Administration and Managerial, and labor related groups which ranked surprisingly the 3rd and the 4th groups respectively with average relative importance

indices 75.99% and 75.80, where it was expected that the labor group will be the 1st or the 2nd group, because of the high important of the labors in the construction operations .

Weather group were ranked as the 5th group with 5 factors and with Average RII of 75.34% and lastly the project related group which consist of 20 factors and has a relative importance indices of 71.74 %.

Since the importance index (RII) was ranging from 61.88% up to 89.18% then it was distributed into 4 groups:

- 1st group with a relative importance index ranging from (82.5-90), and the factors within this group has considered to have a very strong effect in the construction productivity.
- 2nd group with a relative importance index ranging from (75-82.5), and the factors within this group has considered to have strong effect
- 3rd group with a relative importance index ranging from (67.5-75), and the factors within this group has considered to have moderate effect
- 4th group with a relative importance index ranging from (60-67.5), and the factors within this group has considered to have week effect.

If the 1st and 2nd group where taken as a total for the factors which have a very strong and strong effect It's clear from table 21 that the financial will be ranked as 1st group with 85.71% (No. of the factors with very strong and strong effects divided by the total number of the factors within the group itself, then its noted that the weather group will be ranked as 2nd group with a total of 80% (No. of the factors within the 1st and 2nd group

divided by the total number of factors within the group itself), then the labor group was ranked as the 3rd group with a total of 60% , after that the materials and equipment group was ranked as the 4th group with a total of 57.14 % , then the administration and managerial group was ranked as the 5th group with a total of 45.46 %, and at the last the project related group with a total of 30 % of its factor has (very strong + strong effects) in the construction productivity.

Other method in order to compare the groups effect was shown in table 22 which were calculated by dividing the total factors from each group by the total number of the factors (81) and the result for the groups which has (very strong + strong effects) in the construction productivity as shown below :-

- Labor 1st with 14.81 %
- Administration and managerial 2nd with 12.34 %
- Financial and Project related factors 3rd with 7.41 %
- Materials and Equipment with and Weather 4th with 4.94%

Table 20: overall group average RII and the ranks of the 6 productivity groups.

Group	Number of factor surveyed	Average RII	Rank
Financial	7	80.03%	1
Material and Equipment	7	78.08%	2
Administration and Managerial	22	75.99%	3
Labor	20	75.80%	4
Weather	5	75.34%	5
Project Related	20	71.74%	6

Table 21: comparing the number of factor to each group total factors

Main group	No. of factor / 1st group	% factor No. / Total factor per group	No. of factor / 2nd group	% factor No. / Total factor per group	No. of factor / 3rd group	% factor No. / Total factor per group	No. of factor / 4th group	% factor No. / Total factor per group
Labor	3	15.00%	9	45.00%	5	25.00%	3	15.00%
Administration and Managerial	3	13.64%	7	31.82%	11	50.00%	1	4.55%
Materials and Equipment	2	28.57%	2	28.57%	3	42.86%	0	0.00%
Financial	2	28.57%	4	57.14%	1	14.29%	0	0.00%
Project related	0	0.00%	6	30.00%	9	45.00%	5	25.00%
Weather	0	0.00%	4	80.00%	0	0.00%	1	20.00%

Table 22: comparing the number of factor to the total factors (81)

Main group	No. of factor / 1st group	% factor No. / 81 (Total factor)	No. of factor / 2nd group	% factor No. / 81 (Total factor)	No. of factor / 3rd group	% factor No. / 81 (Total factor)	No. of factor / 4th group	% factor No. / 81 (Total factor)
Labor	3	3.70%	9	45.00%	5	25.00%	3	15.00%
Administration and Managerial	3	3.70%	7	31.82%	11	50.00%	1	4.55%
Materials and Equipment	2	2.47%	2	28.57%	3	42.86%	0	0.00%
Financial	2	2.47%	4	57.14%	1	14.29%	0	0.00%
Project related	0	0.00%	6	30.00%	9	45.00%	5	25.00%
Weather	0	0.00%	4	80.00%	0	0.00%	1	20.00%

4.8 Discussion:

By making a general check in the top 10 factors which has the most important effect in the construction project productivity in the Eastern Province of Kingdom of Saudi Arabia Its clear that there are many issues to be improved in order to improve the productivity of the construction sites in the eastern Region, because its locally and internationally main goal for studying the productivity and the influencing factors.

In this research it is clear that the improvement must be started with improving the planning and scheduling for the project task, there are many ways to improve that factor 1st point that it can be improved by making a periodic training for the site planner to improve their abilities and to keep in track with any new planning scheduling software , from the other hand it can be done by giving a periodic courses for the site planner / engineers in order to keep them updated with any new information in their specialization and to increase their experience, other way is to hire more experienced people in the planning since most of the planner and engineer in the Saudi market are foreign.

One of the most important factor which need for improvement is the skill and the experience of the site management, because if the site management have a good experience and they are skilled people it will be easier to control the project and deal with the problem which will appear and fix a solution for it. From the other hand the need to improve the experience of the technical team of the project in order to finalize a clear specification and coordinated drawing for the project in order to decrease the rework in Eastern Province construction projects, if the rework cost decrease this mean that the

rework working hours already decreased which mean that there are an improvement in the site productivities.

Other factor that need to be improve is the skilled labor and we have many ways in order to improve that factor, 1st method is to recruit a skilled labor from their own countries by sending a specialized people to test the recruited labor each by his specialization, other way is by giving a periodic training for the labor in order to increase the effect of the learning curve, because the skilled labor will be more productive and more confidence in their job and their work will not have any quality problem, so it will not be rejected by the consultant engineer which will decrease the rework and the delay which will result from that rework.

The coordination is one of the most important word in the construction operations because the coordination will prevent any future problem, so the companies in the Eastern Province must keep a system in order to check the level of the coordination between the supervisor by attending a periodic meeting in order to coordinate and prevent the possible problem in the site or to solve any problem appeared in the site directly.

The procurement is one of the most important component of the engineering division, so it's better to recruit an experienced engineer in this part, because the availability of the suitable materials will increase the productivity of the site and it will decrease the rework working hours. The availability of suitable materials with qualified people will not give the chance for the consultant engineer to reject the inspected work. From the other hand the availability of an experienced procurement engineer will solve the problem of the delay of the delivered materials by the supplier, since the experienced

procurement engineer will make a proper coordination between the accounting department and the material supplier in order to prevent the supplier from getting excuse to delay the delivery of the materials. From the other hand, he will make a proper ahead schedule for the materials delivery with the supplier and the planning department.

The need to have an experienced site supervisor in the construction project appeared, because of the boom which is happened in the local market, so its required to have a periodic training for the company supervisor in order to get an experience how to control the site and how to measure the productivities in daily, weekly, & monthly basis, so the construction project will be under the high management control.

5. Conclusion

The thesis aim is to identify and explore the influencing factors in the construction productivity then rank it based on its relative importance indices. The ranking was done for 81 factors in the perceived of the Eastern Province experts and practitioners. Then the influencing factors was categorized and distributed under the following main 6 groups: (A) labor related group. (B) Administration and Managerial group. (C) Material and Equipment group. (D) Financial group. (E) Project related group. (F) Weather group.

From the other point of view and from the obtained result it was found that the top 10 factors ranked over all 81 factors were distributed as per the following distribution:

- 3 factors are related to the labor group.
- 3 factors are related to the Administration and Managerial group.

- 2 factors are related to the financial group.
- 2 factors are related to Material and Equipment group.

The most important factors are the Management related factors and the labor factors since the labors are the main component of any construction operation and the management is the most essential part in order to control the project productivities and keep the projects in track.

The important of the gained result not only to keep it as a resource for future literature review, but also to fill a gap of knowledge of the influencing factors that affecting the construction productivity in the Eastern Province in Kingdom of Saudi Arabia. Which can be used by the local and the international contractor, consultant, owner, and the policy maker to improve the construction projects productivity which is appear as a local and international need that a day due to the boom which is happened locally and internationally for the construction projects.

6. Suggestions for Further Studies

- The important of the gained result not only to keep it as a resource for future literature review, but also to fill a gap of knowledge of the influencing factors that affecting the construction productivity in the Eastern Province in Kingdom of Saudi Arabia
- It's recommended that more study to be conducted in the labor productivity in KSA and how to improve it.
- Other research to study the crafts men and foreman perspective for the influencing factors that affecting the labor productivities.

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Appendix A

Dear participant,

This survey will be used as a part of Master Thesis in King Fahd University for Petroleum and Minerals (KFUPM), The collected information is for research purpose only.

The aim of this study is to identify and prioritize the factors that influencing the productivity in construction projects in Saudi Arabia / Eastern Province (Region) based on the contractor perspective. In order to achieve the aims, this survey will gather information about the importance of the influencing factors in the productivity in Eastern Province construction projects.

The body of survey consists of two parts; **the first part** is general information about the respondent and his esteemed company. **The second part** assesses the importance degree of the influencing factors in the construction productivity in KSA / Eastern Province provided by the contractors.

Your contribution in this regard is highly appreciated.

Name : Khaled Ali Ayyatt
ID # : g201410320
E-mail: eng.ayyatt@hotmail.com
mobile number : 966566300251

Part 1: General information
Company name:
Project Type :- ◯ Residential Building ◯ Commercial Building . ◯ Industrial building (Power plants, refineries) ◯ Others (please specify)
Average job size (Million of Saudi Riyals) ◯ Less than one ◯ 1-10 . ◯ 10-50 ◯ More than 50
Classifications of your esteemed company : ◯ Class 1 ◯ Class 2 ◯ Class 3 . ◯ Class 4 ◯ Class 5
Respondent's name (Optional) :
Position/ specialization :
Experience in construction projects / years :
Experience in construction projects in KSA / years :
Nationality (Optional):
Respondent's E-mail :
Respondent's Fax: Mobile phone :

Productivity Questionnaire

Influencing factors on the Construction Industry in Saudi Arabia

Instructions: Check (√) one of the boxes in each item below according **to the important of each factor** in influencing construction productivity **in your project.**

Q1	**How important is the following labor-related factors in influencing construction productivity:**	Not important	Somewhat important	Moderately important	Very important	Extremely important
1	Availability of Skilled labor	☐	☐	☐	☐	☐
2	Availability of experienced technical staff	☐	☐	☐	☐	☐
3	Labor and supervision absenteeism	☐	☐	☐	☐	☐
4	coordination between staff(site supervision)	☐	☐	☐	☐	☐
5	Salary amount (level) of the labor	☐	☐	☐	☐	☐
6	Ability to provide great care and support (including health insurance) to the workers	☐	☐	☐	☐	☐
7	Poor communication between foreign workers (different languages)	☐	☐	☐	☐	☐
8	Availability of skilled supervisors and foremen in order to measure labor productivity	☐	☐	☐	☐	☐
9	Employer commitment to labors' rights (vacation, air ticket, etc.)	☐	☐	☐	☐	☐
10	Availability of employee accommodation and acceptable living standards	☐	☐	☐	☐	☐
11	Labor and staff loyalty for the company	☐	☐	☐	☐	☐
12	Availability of motivation program	☐	☐	☐	☐	☐
13	Re- work due to(poor quality , drawing error , drawing revision , etc.)	☐	☐	☐	☐	☐
14	Labor age	☐	☐	☐	☐	☐
15	Late arrival , early finish and/ or , unscheduled break for work	☐	☐	☐	☐	☐
16	Labor personal problems	☐	☐	☐	☐	☐
17	Labor strikes	☐	☐	☐	☐	☐
18	Labor and supervision turn over	☐	☐	☐	☐	☐
19	Labor physical fatigue	☐	☐	☐	☐	☐
20	Lack of training offered to labor	☐	☐	☐	☐	☐

Q2	**How important is the following administrative and managerial factors in influencing construction productivity:**	Not important	Somewhat important	Moderately important	Very important	Extremely important
1	Good planning and scheduling for project tasks	☐	☐	☐	☐	☐
2	Availability of experienced site management	☐	☐	☐	☐	☐
3	Availability of supervisors and managers for monitoring and measuring productivity on a regular basis	☐	☐	☐	☐	☐
4	Lack of experience among managers in measuring productivity	☐	☐	☐	☐	☐
5	Poor communication between managers and labor	☐	☐	☐	☐	☐
6	High level of coordination between the construction project/contract parties	☐	☐	☐	☐	☐
7	Frequently changing plans	☐	☐	☐	☐	☐
8	Frequent revisions of drawings	☐	☐	☐	☐	☐
9	Lack of approved plans	☐	☐	☐	☐	☐
10	Lack of management flexibility with regards to raising salary and promoting employees	☐	☐	☐	☐	☐
11	Nepotistic rewarding of unqualified employees	☐	☐	☐	☐	☐
12	Excessive centralization of the decision-making process	☐	☐	☐	☐	☐
13	Disruption of power services	☐	☐	☐	☐	☐
14	Disruption of water services	☐	☐	☐	☐	☐
15	Overtime for labor and staff	☐	☐	☐	☐	☐
16	Lack of supervision	☐	☐	☐	☐	☐
17	Delay due to RFI respond and strict inspection	☐	☐	☐	☐	☐
18	Site activity proper sequence	☐	☐	☐	☐	☐
19	Job security	☐	☐	☐	☐	☐
20	Equal opportunity of advancement	☐	☐	☐	☐	☐
21	Restricted site access	☐	☐	☐	☐	☐
22	Proportion of work subcontracted	☐	☐	☐	☐	☐

Q3	How important is the following materials and equipment factors in influencing construction productivity:	Not important	Somewhat important	Moderately important	Very important	Extremely important
1	Availability of suitable materials	☐	☐	☐	☐	☐
2	Delayed delivery of materials by the supplier	☐	☐	☐	☐	☐
3	Difficulties in sourcing materials of required quality inside Saudi Arabia	☐	☐	☐	☐	☐
4	Availability of modern construction plant and equipment	☐	☐	☐	☐	☐
5	The availability of an efficient equipment and tools	☐	☐	☐	☐	☐
6	Lack of reliable companies offering construction equipment and tools for hire	☐	☐	☐	☐	☐
7	Heavy material handling without machinery	☐	☐	☐	☐	☐

Q4	How important is the following financial factors in influencing construction productivity :	Not important	Somewhat important	Moderately important	Very important	Extremely important
1	Limited financial liquidity of the company	☐	☐	☐	☐	☐
2	Payment delays by owners	☐	☐	☐	☐	☐
3	Limited cash flow	☐	☐	☐	☐	☐
4	Financial strength of building contractors	☐	☐	☐	☐	☐
5	Delays in contractor payments to suppliers	☐	☐	☐	☐	☐
6	Time of paying salary	☐	☐	☐	☐	☐
7	Cost cutting activities to reduce overall cost to contractor	☐	☐	☐	☐	☐

Q5	How important is the following project-related factors in influencing construction productivity:	Not important	Somewhat important	Moderately important	Very important	Extremely important
1	Poor initial evaluation of project costs	☐	☐	☐	☐	☐
2	Poor cost management during project implementation	☐	☐	☐	☐	☐
3	Poor planning of work schedules for public and religious holidays including Ramadan	☐	☐	☐	☐	☐
4	Failure to consider the project location, terrain, and other environmental conditions	☐	☐	☐	☐	☐

5	Excessive complexity in the project design	☐	☐	☐	☐	☐
6	Company execute that project for 1st time	☐	☐	☐	☐	☐
7	The job site is too noisy / dusty	☐	☐	☐	☐	☐
8	Low level of lighting / poor ventilation / poor housekeeping / limited access	☐	☐	☐	☐	☐
9	Accident due to poor safety and health conditions	☐	☐	☐	☐	☐
10	Unforeseen conditions	☐	☐	☐	☐	☐
11	Variation order during execution	☐	☐	☐	☐	☐
12	Work at high level	☐	☐	☐	☐	☐
13	Project scale	☐	☐	☐	☐	☐
14	Type of the project	☐	☐	☐	☐	☐
15	Availability of site facility (prayer room, smoking place, dining room, etc. . .)	☐	☐	☐	☐	☐
16	Unavailability of storage place	☐	☐	☐	☐	☐
17	High quality of required work	☐	☐	☐	☐	☐
18	Clarity of technical specifications	☐	☐	☐	☐	☐
19	Coordination level among design disciplines	☐	☐	☐	☐	☐
20	Construction method	☐	☐	☐	☐	☐
Q6	**How important is the following weather-related factors influencing construction productivity:**	Not important	Somewhat important	Moderately important	Very important	Extremely important
1	High temperature	☐	☐	☐	☐	☐
2	High Humidity	☐	☐	☐	☐	☐
3	Heavy Rain	☐	☐	☐	☐	☐
4	Sand Storms	☐	☐	☐	☐	☐
5	Fog	☐	☐	☐	☐	☐

Appendix B

المملكة العربية السعودية
وزارة الشؤن البلدية والقروية
وكالة تصنيف المقاولين
الرياض - فاكس 4035433

قائمة بالمقاولين المصنفين

رقم المقاول	اسم المقاول	اسم المجال	اسم المنطقة	درجة التصنيف	اسم المدينة	تاريخ التصنيف
377	شركة أبناء عبدالله عبدالمحسن الخضري	المباني	المنطقة الشرقية	الاولى	الدمام	1435/03/08
604	شركة نسما و شركاهم للمقاولات المحدودة	المباني	المنطقة الشرقية	الاولى	الخبر	1436/12/24
16338	شركة نسما التجارية المحدودة	المباني	المنطقة الشرقية	الاولى	الخبر	1437/10/08
18806	شركة الكفاح القابضة	المباني	المنطقة الشرقية	الاولى	الاحساء	1437/10/29
295	شركة رضايات المحدودة	المباني	المنطقة الشرقية	الاولى	الخبر	1436/06/10
834	شركة اليمامة للأعمال التجارية والمقاولات	المباني	المنطقة الشرقية	الاولى	الدمام	1436/09/11
4996	شركة الشرقية للتجارة والتعهدات	المباني	المنطقة الشرقية	الاولى	الخبر	1438/05/09
10100	الشركة العربية الحديثة للانشاءات المحدودة	المباني	المنطقة الشرقية	الاولى	الخبر	1438/05/09
1348	شركة ابتك للمقاولات المحدودة	المباني	المنطقة الشرقية	الاولى	الدمام	1435/03/15
4907	شركة راكان للتجارة والمقاولات	المباني	المنطقة الشرقية	الاولى	الخبر	1437/06/12
1824	شركة الخنيني العالمية المحدودة	المباني	المنطقة الشرقية	الاولى	الجبيل	1435/11/26
10331	شركة شيد المحدودة	المباني	المنطقة الشرقية	الاولى	الدمام	1436/08/08
1562	شركة ناصر سعيد الهاجرى وشريكه للمقاولات	المباني	المنطقة الشرقية	الاولى	الثقبه	1436/08/10
15351	شركة العسيس للمقاولات	المباني	المنطقة الشرقية	الاولى	الدمام	1434/10/18
4686	شركة التطوير والاستثمار العقاري المحدودة	المباني	المنطقة الشرقية	الاولى	الدمام	1435/07/05
2039	شركة سعد للتجارة والمقاولات والخدمات المالية	المباني	المنطقة الشرقية	الاولى	الخبر	1435/09/19
15473	شركة اعمار المشاريع للمقاولات العامة	المباني	المنطقة الشرقية	الاولى	الخبر	1435/01/07
4255	شركة أزميل للمقاولات	المباني	المنطقة الشرقية	الاولى	الجبيل	1435/02/21

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4752	مؤسسة عثمان صالح الغامدي للمقاولات	المباني	المنطقة الشرقية	الثانيـة	الدمام	1435/02/01
4478	شركة المطوع للتجارة والخدمات العامة	المباني	المنطقة الشرقية	الثانيـة	الدمام	1437/12/17
16563	مؤسسة فوزي صالح النجراني للمقاولات	المباني	المنطقة الشرقية	الثانيـة	راس تنورة	1437/11/29
447	شركة علي حسين اليامي وشريكه للتجارة و المقاولات	المباني	المنطقة الشرقية	الثانيـة	الخبـر	1435/02/26
19025	شركة سالم بالحمر للمقاولات العامة المحدودة	المباني	المنطقة الشرقية	الثانيـة	الدمام	1438/06/23
17571	شركة محمد عبدالله العثمان للتجارة والمقاولات	المباني	المنطقة الشرقية	الثانيـة	الخبـر	1436/04/29
4952	مؤسسة عابد علي الحبشي للمقاولات	المباني	المنطقة الشرقية	الثانيـة	الدمام	1436/06/04
17025	شركة المركب الخليجي للتجارة والمقاولات	المباني	المنطقة الشرقية	الثانيـة	الخبـر	1438/06/28
3118	شركة الخدمات الفنية للأدوات العملية	المباني	المنطقة الشرقية	الثانيـة	الخبـر	1438/06/21
239	شركة الخليج العربي للانشاءات المحدودة	المباني	المنطقة الشرقية	الثانيـة	الدمام	1438/05/26
15627	شركة مسماك للإنشاء والتطوير	المباني	المنطقة الشرقية	الثانيـة	الخبـر	1435/11/23
4756	مؤسسة عبدالله المسحل للمقاولات	المباني	المنطقة الشرقية	الثانيـة	الجبيل	1436/06/26
16973	شركة حيدر صالح ال حيدر و شريكه للمقاولات العامة والصيانة والتشغيل	المباني	المنطقة الشرقية	الثانيـة	الجبيل	1436/07/18
1909	شركة الجفر للتجارة والمقاولات لاصحابها وليد فهد الذرمان و شركاه	المباني	المنطقة الشرقية	الثانيـة	الخبـر	1437/01/09
19050	مؤسسة فنار العربية الدولية	المباني	المنطقة الشرقية	الثانيـة	الجبيل	1438/06/28
3246	مؤسسة إبراهيم السماعيل للمقاولات العامة	المباني	المنطقة الشرقية	الثانيـة	الخبـر	1435/02/27
4520	شركة النبأ العالمية للمشاريع التجارية لأصحابها /مطلق محمد بن نبأ القحطاني وأخوانه	المباني	المنطقة الشرقية	الثانيـة	الجبيل	1437/05/28
1507	شركة الحقيل للمقاولات المحدودة	المباني	المنطقة الشرقية	الثانيـة	الدمام	1436/06/10
16699	شركة بيت المودة للمقاولات العامة	المباني	المنطقة الشرقية	الثانيـة	الدمام	1434/09/22
3948	شركة المنار العربية للتجارة والمقاولات المحدودة	المباني	المنطقة الشرقية	الثانيـة	الدمام	1437/06/12
15588	مؤسسة الاعمال الوطنية للمقاولات	المباني	المنطقة الشرقية	الثانيـة	حفر الباطن	1434/11/20
964	شركة ماضي بن محمد الهاجري وشركاه	المباني	المنطقة الشرقية	الثانيـة	الثقبه	1434/09/02
16589	شركة القلاع العربية للمقاولات العامة	المباني	المنطقة الشرقية	الثانيـة	الخبـر	1438/05/19
1946	شركة المشارق للتجارة والمقاولات لاصحابها سعد محمد الزهراني وشريكه	المباني	المنطقة الشرقية	الثانيـة	الدمام	1435/03/04
2214	شركة سراكو	المباني	المنطقة الشرقية	الثانيـة	الدمام	1435/03/04

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2756	مؤسسة نحت البناء للمقاولات	المباني	المنطقة الشرقية	الثالثة	الدمام	1438/05/19
939	مؤسسة حمود محمد الجلهمي للمقاولات	المباني	المنطقة الشرقية	الثالثة	الدمام	1437/11/05
10419	شركة البرج للمقاولات وإدارة المشاريع	المباني	المنطقة الشرقية	الثالثة	الخبر	1438/05/23
10377	شركة سوماك للمقاولات	المباني	المنطقة الشرقية	الثالثة	الدمام	1436/06/17
3994	مؤسسة عبدالمنعم صالح العمر للمقاولات	المباني	المنطقة الشرقية	الثالثة	الدمام	1438/03/14
10357	شركة النبل للمقاولات	المباني	المنطقة الشرقية	الثالثة	الخبر	1435/03/05
15060	مؤسسة نصرالله عثمان للمقاولات	المباني	المنطقة الشرقية	الثالثة	الدمام	1436/05/25
992	مؤسسة سالم صالح ال الحارث للتجارة والمقاولات	المباني	المنطقة الشرقية	الثالثة	الخبر	1435/11/19
15753	مؤسسة أحمد محمد عبدالله فلقي للمقاولات	المباني	المنطقة الشرقية	الثالثة	الدمام	1434/12/02
4944	شركة عبدالهادي عبدالله القحطاني وأولاده	المباني	المنطقة الشرقية	الثالثة	الدمام	1433/06/25
4841	شركة نبراس السعودية	المباني	المنطقة الشرقية	الثالثة	الدمام	1435/04/11
17271	شركة سعد الدين مرسي ابوبكر و أولاده للتجارة والمقاولات والتموين	المباني	المنطقة الشرقية	الثالثة	الخفجي	1435/09/04
16420	مؤسسة شعلة البناء للمقاولات العامة	المباني	المنطقة الشرقية	الثالثة	حفر الباطن	1437/06/12
18153	شركة فينيسيا وشركاهم للمقاولات	المباني	المنطقة الشرقية	الثالثة	الدمام	1436/11/22
4538	مجموعة سقيا الخليج للمقاولات العامة	المباني	المنطقة الشرقية	الثالثة	الدمام	1435/04/18
516	شركة عبدالله محمد اليوسف للمقاولات	المباني	المنطقة الشرقية	الثالثة	الخبر	1437/07/11
15670	شركة عبد المحسن عبد الله بوخميس وشركاه	المباني	المنطقة الشرقية	الثالثة	المبرز	1436/06/19
18390	مجموعة تكنولوجيا الخدمات للمقاولات العامة	المباني	المنطقة الشرقية	الثالثة	الخبر	1437/05/27
1472	شركة علي حاسن الغامدي وشركاه	المباني	المنطقة الشرقية	الثالثة	رحيمة	1436/05/06
16136	مؤسسة اعمار الشرق للمقاولات	المباني	المنطقة الشرقية	الثالثة	الدمام	1436/06/10
17923	شركة تالا الانشاءات للتجارة والمقاولات	المباني	المنطقة الشرقية	الثالثة	الدمام	1436/06/26
1845	شركة عبدالرحمن العبدالقادر للتجارة والمقاولات	المباني	المنطقة الشرقية	الثالثة	الاحساء	1438/04/26
776	مؤسسة ناصر منيع الخليوي للمقاولات	المباني	المنطقة الشرقية	الثالثة	الدمام	1436/06/10
3115	مؤسسة الأنوار الشرقية للمقاولات	المباني	المنطقة الشرقية	الثالثة	الجبيل	1438/05/16
4064	شركة فيصل للأعمال الكهربائية والميكانيكية	المباني	المنطقة الشرقية	الثالثة	الخبر	1434/11/23
16084	مؤسسة سليمان الخليوي للمقاولات العامة	المباني	المنطقة الشرقية	الثالثة	حفر الباطن	1436/11/09
199	مؤسسة علي الحصان للمقاولات	المباني	المنطقة الشرقية	الثالثة	الدمام	1434/08/08
16705	شركة ابريز الشرق للمقاولات والصيانة	المباني	المنطقة الشرقية	الثالثة	الدمام	1438/03/14
4526	شركة علي وعبدالعزيز أبناء محمد عبدالمحسن بوخمسين للتجارة	المباني	المنطقة الشرقية	الثالثة	الاحساء	1438/03/19
18545	مؤسسة عبدالله حمد راشد آل غانم للمقاولات	المباني	المنطقة الشرقية	الثالثة	بقيق	1437/06/20
18908	شركة كرم الوطن المحدودة	المباني	المنطقة الشرقية	الثالثة	حفر الباطن	1438/02/21
18913	مؤسسة طالب حميد الشمري للمقاولات العامة	المباني	المنطقة الشرقية	الثالثة	الجبيل	1438/02/21
4691	شركة التعمير والانشاء المحدودة	المباني	المنطقة الشرقية	الثالثة	الدمام	1438/05/19
16399	شركه الفلك للمعدات والتجهيزات الألكترونيه	المباني	المنطقة الشرقية	الثالثة	الخبر	1438/03/07
2262	مؤسسة سبأ للمقاولات	المباني	المنطقة الشرقية	الثالثة	الدمام	1437/03/19
15197	مؤسسة عبدالله سعيد الغامدي للمقاولات	المباني	المنطقة الشرقية	الثالثة	الجبيل	1437/10/29
17385	مؤسسة أحمد العيد التجارية	المباني	المنطقة الشرقية	الثالثة	الثقبه	1435/06/03

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661	شركة المقاولات الوطنيه المحدوده	المباني	المنطقة الشرقية	الثالثـة	الخبـر	1435/04/18
4991	مؤسسة قزح للمقاولات	المباني	المنطقة الشرقية	الثالثـة	الهفوف	1437/05/16

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2000	مؤسسة محمد سلمان العرب للمقاولات	المباني	المنطقة الشرقية	الرابعة	الخفجي	1435/01/10
16843	مؤسسة علي خليفة العنزي للمقاولات العامة	المباني	المنطقة الشرقية	الرابعة	الخفجي	1438/05/23
4189	شركة الجبل الثالث للمقاولات المحدودة	المباني	المنطقة الشرقية	الرابعة	الخبر	1434/11/04
15580	مؤسسة طارق عبداللطيف آل الشيخ مبارك للمقاولات	المباني	المنطقة الشرقية	الرابعة	الهفوف	1435/03/04
16498	مؤسسة الياسر للمقاولات العامة	المباني	المنطقة الشرقية	الرابعة	الجبيل	1437/05/28
4598	مؤسسة عبدالعزيز فهد عبدالله الهريش للمقاولات	المباني	المنطقة الشرقية	الرابعة	الدمام	1436/07/18
16310	شركة نباتات للمقاولات	المباني	المنطقة الشرقية	الرابعة	الدمام	1437/02/18
17520	مؤسسة عبدالرحمن عبدالعزيز العليان للمقاولات العامة	المباني	المنطقة الشرقية	الرابعة	الخفجي	1435/08/24
15712	مؤسسة راشد للمقاولات	المباني	المنطقة الشرقية	الرابعة	بقيق	1435/08/03
17859	مؤسسة محمد فالح الهاجري للمقاولات	المباني	المنطقة الشرقية	الرابعة	الدمام	1436/04/26
2060	شركة الرفيعة للمقاولات	المباني	المنطقة الشرقية	الرابعة	الدمام	1434/05/15
3757	الشركة الاهلية للمقاولات	المباني	المنطقة الشرقية	الرابعة	الدمام	1435/02/13
10344	شركة عبدالله العزاز وشريكه المحدودة	المباني	المنطقة الشرقية	الرابعة	الخبر	1437/06/18
4587	شركة طارق محمد العريقي واخوانه للتجارة والمقاولات	المباني	المنطقة الشرقية	الرابعة	الظهران	1437/03/04
3763	شركة محمد راشد الخثلان للمقاولات	المباني	المنطقة الشرقية	الرابعة	الدمام	1435/06/03
16720	شركة الأتحاد الذكي للتجارة والمقاولات	المباني	المنطقة الشرقية	الرابعة	راس تنورة	1438/02/10
4735	مؤسسة عماد الجزيره للمقاولات	المباني	المنطقة الشرقية	الرابعة	الدمام	1438/02/10
15484	شركة نبيل عبدالله ابو نهيه وشريكه	المباني	المنطقة الشرقية	الرابعة	الخبر	1434/11/09
15085	شركة رواد الجزيرة للتجارة والمقاولات القابضة	المباني	المنطقة الشرقية	الرابعة	الهفوف	1435/07/05
4661	شركة سعد سحمي الهاجري وشريكه للمقاولات	المباني	المنطقة الشرقية	الرابعة	الثقبه	1435/04/11
4700	مؤسسة صالح حمد القحطاني للمقاولات العامة	المباني	المنطقة الشرقية	الرابعة	رحيمة	1435/02/26
17280	شركة انجاز العربيه للمقاولات	المباني	المنطقة الشرقية	الرابعة	الاحساء	1435/01/24
18080	شركة عمر أحمد المحسن وشركاه للتجارة والمقاولات المحدودة	المباني	المنطقة الشرقية	الرابعة	الدمام	1436/06/04
15719	شركة ديار الوطن للتجارة والمقاولات	المباني	المنطقة الشرقية	الرابعة	الدمام	1434/12/22
16256	مؤسسة الرفقة للمقاولات	المباني	المنطقة الشرقية	الرابعة	الدمام	1437/09/03
15652	مؤسسة سليمان عبدالله الفلاح	المباني	المنطقة الشرقية	الرابعة	حفر الباطن	1436/02/22
1378	شركة منصور وعبدالله محمد المرزوق	المباني	المنطقة الشرقية	الرابعة	الدمام	1437/12/27
15963	مؤسسة براك ناصر الدوسري للمقاولات العامة	المباني	المنطقة الشرقية	الرابعة	الاحساء	1435/11/01
17685	مؤسسة إنشاءات وجدان للمقاولات العامة	المباني	المنطقة الشرقية	الرابعة	الدمام	1435/11/14
1561	شركة عبدالله محمد العرجاني وأبناءه للتجارة والمقاولات	المباني	المنطقة الشرقية	الرابعة	الاحساء	1437/12/17
15049	مؤسسة ساس للمقاولات العامة	المباني	المنطقة الشرقية	الرابعة	الخبر	1437/12/17
18825	شركة الكحيمى للصناعات المعدنية المحدودة	المباني	المنطقة الشرقية	الرابعة	الدمام	1438/01/15
16111	مؤسسة رواسن للمقاولات	المباني	المنطقة الشرقية	الرابعة	الهفوف	1437/07/04

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225	مؤسسة الوابل للمقاولات	المباني	المنطقة الشرقية	الرابعة	الدمام	1436/06/06
329	شركة هادي صالح حيدر اليامي وشركاه (شركة الحيدر للتجارة والمقاولات)	المباني	المنطقة الشرقية	الرابعة	رحيمة	1436/07/01
3962	مؤسسة الدليمان للمقاولات	المباني	المنطقة الشرقية	الرابعة	الجبيل	1437/09/24
17250	مؤسسة أسس المشرق للبناء والتعمير	المباني	المنطقة الشرقية	الرابعة	الدمام	1435/11/26
18576	شركة نور المتقدمة للمقاولات	المباني	المنطقة الشرقية	الرابعة	الخبر	1437/07/21
17894	مؤسسة الانشاء الخليجي للمقاولات العامة	المباني	المنطقة الشرقية	الرابعة	الجبيل الصناعيه	1436/09/04
2955	شركة بن دلامة للمقاولات	المباني	المنطقة الشرقية	الرابعة	رحيمة	1435/06/03
17197	مؤسسة عبدالله عايد العنزي للمقاولات العامة	المباني	المنطقة الشرقية	الرابعة	الدمام	1434/12/02
4323	مؤسسة خالد عبدالعزيز العبدالقادر للمقاولات	المباني	المنطقة الشرقية	الرابعة	الاحساء	1437/03/10
4948	مؤسسة اتمار للمقاولات العامة	المباني	المنطقة الشرقية	الرابعة	الدمام	1436/02/24
15389	شركة القمه الفضائية المحدودة	المباني	المنطقة الشرقية	الرابعة	الدمام	1438/04/04
3770	مؤسسة نواف جليل الشمري للمقاولات	المباني	المنطقة الشرقية	الرابعة	الخفجي	1438/01/15
18014	مؤسسة ابراهيم عبدالرحمن البطي للمقاولات	المباني	المنطقة الشرقية	الرابعة	الجبيل	1436/05/20
17384	شركة صروف العالمية	المباني	المنطقة الشرقية	الرابعة	الخبر	1435/04/27
17107	شركة قاس العربيه للخدمات الصناعيه والمقاولات المحدودة	المباني	المنطقة الشرقية	الرابعة	رحيمة	1435/05/29
331	شركة النفجان والعباد للمقاولات	المباني	المنطقة الشرقية	الرابعة	الدمام	1437/02/25
4377	شركة مفرح مرزوق الحربي وشركاه المحدودة	المباني	المنطقة الشرقية	الرابعة	الدمام	1437/02/25
1115	شركة دخيل الهاجري وعبدالرحمن الهاجري (الدخيل والملفي للتجارة والمقاولات)	المباني	المنطقة الشرقية	الرابعة	الخبر	1436/04/27
18276	شركة المبنى العالمي للمقاولات	المباني	المنطقة الشرقية	الرابعة	الخبر	1436/10/26
4659	شركة روابي للمقاولات المتخصصة	المباني	المنطقة الشرقية	الرابعة	الخبر	1436/06/17
16032	شركة فيصل وبدر احمد محمد هادي المحمدى (شركة مشاريع الخليج)	المباني	المنطقة الشرقية	الرابعة	الدمام	1437/02/19
18121	مؤسسة بورصه الرياض للمقاولات	المباني	المنطقة الشرقية	الرابعة	الخبر	1436/09/18
16727	شركة رسو للمقاولات	المباني	المنطقة الشرقية	الرابعة	الخبر	1438/03/22
17628	مؤسسة عبد المحسن عبد الله ابراهيم الجريوي للمقاولات	المباني	المنطقة الشرقية	الرابعة	حفر الباطن	1435/11/01
15873	مؤسسة مارونا للمقاولات العامة	المباني	المنطقة الشرقية	الرابعة	الخبر	1435/09/02
16411	شركة راشد صالح آل عباس وشريكه	المباني	المنطقة الشرقية	الرابعة	راس تنورة	1437/08/11
18540	شركة محمد مهدي حسن الوعله وشركاءه	المباني	المنطقة الشرقية	الرابعة	الدمام	1437/04/16
18948	شركة الانحاء للتجارة والمقاولات	المباني	المنطقة الشرقية	الرابعة	الهفوف	1438/04/11
16311	مؤسسة تقنية نظم الاعمار للمقاولات	المباني	المنطقة الشرقية	الرابعة	الدمام	1436/12/22
15791	مؤسسة ابراج الدانة للمقاولات	المباني	المنطقة الشرقية	الرابعة	الخبر	1435/03/15
4269	شركة زومان محمد الهاجري وشركاه للمقاولات	المباني	المنطقة الشرقية	الرابعة	الخبر	1437/11/18
4914	مؤسسة يوسف علي العلي للمقاولات	المباني	المنطقة الشرقية	الرابعة	الاحساء	1434/09/22
16646	مؤسسة جوري الشرقية للمقاولات	المباني	المنطقة الشرقية	الرابعة	الدمام	1437/09/18
4570	شركة الشلوي العالمية للتجارة والمقاولات القابضة	المباني	المنطقة الشرقية	الرابعة	الخبر	1436/07/18

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18526	مؤسسة حسين علي العنزي للمقاولات	المباني	المنطقة الشرقية	الرابعة	الخفجي	1437/04/09
1364	مؤسسة محمد العجيمى للمقاولات	المباني	المنطقة الشرقية	الرابعة	الدمام	1438/03/07
5574	مؤسسة اتحاد داماس العالمي	المباني	المنطقة الشرقية	الرابعة	الخبر	1437/02/18
5840	فرع شركة كات انترناشنال ليمتد	المباني	المنطقة الشرقية	الرابعة	الخبر	1438/02/06
5730	شركة أنماط العمار للبناء المحدودة	المباني	المنطقة الشرقية	الرابعة	الخبر	1435/07/06
18673	شركة الشرقية الخليجية للمقاولات العامة	المباني	المنطقة الشرقية	الرابعة	الخبر	1437/08/16
4616	مصنع بوخمسين للالمنيوم	المباني	المنطقة الشرقية	الرابعة	الاحساء	1437/02/18
18967	مؤسسة نايف متعب عميره للمقاولات	المباني	المنطقة الشرقية	الرابعة	الاحساء	1438/05/09
15785	مؤسسة السمران للمقاولات	المباني	المنطقة الشرقية	الرابعة	الدمام	1436/04/23
3233	مؤسسة الانشاءات وخدمات الطرق للمقاولات العامة	المباني	المنطقة الشرقية	الرابعة	الدمام	1438/05/09
15680	مؤسسة حمود السماح الشراري للمقاولات	المباني	المنطقة الشرقية	الرابعة	الدمام	1434/08/08
4447	شركة البشير للتجارة والمقاولات	المباني	المنطقة الشرقية	الرابعة	الاحساء	1436/11/09
5596	مؤسسة المياه الخليجية للمقاولات	المباني	المنطقة الشرقية	الرابعة	الدمام	1436/11/09
1544	شركة الجلهمي للمقاولات والتجارة	المباني	المنطقة الشرقية	الرابعة	الخفجي	1438/01/04
16830	مؤسسة الخشان للمقاولات العامة	المباني	المنطقة الشرقية	الرابعة	الخفجي	1438/06/28
15327	مؤسسة محمد مجاهد ال صلاح للمقاولات	المباني	المنطقة الشرقية	الرابعة	راس تنورة	1437/11/29
17606	مؤسسة رافا الخليج للمقاولات العامة	المباني	المنطقة الشرقية	الرابعة	الخبر	1435/09/16
531	شركة جفال ونايف عبيد الشمرى للتجارة والمقاولات	المباني	المنطقة الشرقية	الرابعة	رحيمة	1434/08/23
5775	مؤسسة نهضة الفنون للمقاولات والديكور	المباني	المنطقة الشرقية	الرابعة	الخبر	1436/02/30
4843	شركة محمد البرغش المنصوري وأولادة للتجارة والمقاولات	المباني	المنطقة الشرقية	الرابعة	الخبر	1436/02/30
5573	فرع شركة بناء للتجارة والمقاولات (بيتكو)	المباني	المنطقة الشرقية	الرابعة	الدمام	1435/02/07
15783	مؤسسة فهد عبدالله المطيري للمقاولات العامة	المباني	المنطقة الشرقية	الرابعة	حفر الباطن	1435/05/25
15523	شركه عبدالله فؤاد القابضة	المباني	المنطقة الشرقية	الرابعة	الدمام	1435/10/07
4855	شركة امير احمد الشهاب وشريكه للتجارة والمقاولات	المباني	المنطقة الشرقية	الرابعة	الاحساء	1436/01/10
1621	مؤسسة ظافر للتموين والمقاولات	المباني	المنطقة الشرقية	الرابعة	الخبر	1435/10/14
15050	مؤسسة خالد حسين الكثيري للمقاولات	المباني	المنطقة الشرقية	الرابعة	الدمام	1437/04/09
15888	شركة الأمجاد الكبرى	المباني	المنطقة الشرقية	الرابعة	الهفوف	1435/12/19
303	شركة الأعمال المدنية المحدودة	المباني	المنطقة الشرقية	الرابعة	الدمام	1436/03/28
4514	شركة راجح سعد الراجح للتجارة والصناعة والمقاولات	المباني	المنطقة الشرقية	الرابعة	الدمام	1437/11/18
145	شركة عبدالله احمد الدوسري القابضة	المباني	المنطقة الشرقية	الرابعة	الخبر	1436/09/06
10388	شركة إعمار البنية التحتية للمقاولات المحدودة	المباني	المنطقة الشرقية	الرابعة	الدمام	1436/03/27
5636	مؤسسة فصول السنه	المباني	المنطقة الشرقية	الرابعة	الدمام	1438/03/28

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178	مؤسسة البتال للمقاولات	المباني	المنطقة الشرقية	الخامسة	الدمام	1435/10/18
480	شركة نجران للتجارة والمقاولات لاصحابها / سعيدعلي محمد آل سرور وشركاه	المباني	المنطقة الشرقية	الخامسة	رحيمة	1435/03/05
522	شركة الزير للتجارة والمقاولات المحدودة	المباني	المنطقة الشرقية	الخامسة	الخبر	1438/05/19
845	شركة عبدالعزيز ومحمد سالم العجيمي (شركة المناقصات الفنية)	المباني	المنطقة الشرقية	الخامسة	الدمام	1438/06/01
1021	شركة الإرتفاع للتجارة والمقاولات العامة المحدودة	المباني	المنطقة الشرقية	الخامسة	الدمام	1438/02/01
1417	مؤسسة عبدالله الجضعي للمقاولات العامة	المباني	المنطقة الشرقية	الخامسة	الدمام	1435/03/29
1968	مؤسسة محمد سعود السبيعي للمقاولات	المباني	المنطقة الشرقية	الخامسة	رحيمة	1437/08/16
2851	مؤسسة آل هرقل للمقاولات	المباني	المنطقة الشرقية	الخامسة	رحيمة	1435/02/21
3071	شركة ماني للمقاولات	المباني	المنطقة الشرقية	الخامسة	الخبر	1437/10/21
4073	شركة العوض للتجارة والمقاولات	المباني	المنطقة الشرقية	الخامسة	الهفوف	1436/10/11
4635	مؤسسة بن غره للتجارة والمقاولات	المباني	المنطقة الشرقية	الخامسة	الدمام	1438/05/19
4666	شركة الجسور العربية للتجارة والمقاولات	المباني	المنطقة الشرقية	الخامسة	سيهات	1435/10/07
4740	مؤسسة مثلث الخليج للصيانة والمقاولات	المباني	المنطقة الشرقية	الخامسة	الدمام	1434/08/29
4798	الشركة السعودية للتموين والتعهدات	المباني	المنطقة الشرقية	الخامسة	الخبر	1438/02/21
4902	شركة إبراهيم وعلي حسن الياسين للتجارة والمقاولات	المباني	المنطقة الشرقية	الخامسة	الهفوف	1435/09/17
5592	مؤسسة الساري الجديد	المباني	المنطقة الشرقية	الخامسة	الخبر	1437/06/20
5706	مؤسسة الهدف البعيد للمقاولات	المباني	المنطقة الشرقية	الخامسة	الدمام	1434/10/20
5757	مؤسسة النيل المصري للمقاولات	المباني	المنطقة الشرقية	الخامسة	الخبر	1436/02/08
5822	فرع شركة الدلتا للاساسات (عبدالسميع عبدالقادر يوسف وشمس الدين محمد يوسف)	المباني	المنطقة الشرقية	الخامسة	الخبر	1437/07/04
5849	شركة السرعة الكهربائية للمقاولات الصناعية	المباني	المنطقة الشرقية	الخامسة	الخبر	1438/05/01
10459	شركة باسل أبو الرب وشريكه	المباني	المنطقة الشرقية	الخامسة	الخبر	1435/07/09
15184	شركة محمد عبدالرحمن البريدي للمقاولات	المباني	المنطقة الشرقية	الخامسة	الدمام	1435/01/24
15330	شركة منافع الخليج للمقاولات	المباني	المنطقة الشرقية	الخامسة	الدمام	1435/12/18
15572	مؤسسة يوسف صالح يوسف للمقاولات	المباني	المنطقة الشرقية	الخامسة	الدمام	1436/03/28
15602	مؤسسة قمة البروج للمقاولات	المباني	المنطقة الشرقية	الخامسة	الهفوف	1435/01/28
15608	مؤسسة عبدالمحسن بن حبيب البلادي للمقاولات	المباني	المنطقة الشرقية	الخامسة	الاحساء	1437/06/20
15774	مجموعة محمد حسين الرويلي للتجارة	المباني	المنطقة الشرقية	الخامسة	حفر الباطن	1435/09/16
15804	مؤسسة عبدالرحمن عبداللطيف المخايطه للمقاولات	المباني	المنطقة الشرقية	الخامسة	الاحساء	1435/06/03
15867	مؤسسة تسامح الخليج للمقاولات	المباني	المنطقة الشرقية	الخامسة	الدمام	1436/05/20
15869	مؤسسة محمد خليفه العديل للمقاولات	المباني	المنطقة الشرقية	الخامسة	الهفوف	1436/08/02
15918	مؤسسة ديوان البناء للمقاولات العامة	المباني	المنطقة الشرقية	الخامسة	الخبر	1435/10/14
15984	شركة المعرفة و التخطيط للمقاولات العامة	المباني	المنطقة الشرقية	الخامسة	الدمام	1435/09/04
15996	مؤسسة معزي الشلاحي للمقاولات	المباني	المنطقة الشرقية	الخامسة	حفر الباطن	1436/11/09
16047	شركة أبناء معتوق حبيب البلادي للمقاولات	المباني	المنطقة الشرقية	الخامسة	الهفوف	1437/11/05
16254	المؤسسة العربية السعودية للمقاولات	المباني	المنطقة الشرقية	الخامسة	الخبر	1436/07/14

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16417	مؤسسة مريح القحطاني للمقاولات	المباني	المنطقة الشرقية	الخامسة	الدمام	1437/03/04
16710	مؤسسةعلي آل غيثان للمقاولات	المباني	المنطقة الشرقية	الخامسة	الدمام	1435/02/27
16798	مؤسسة السماح للمقاولات العامة	المباني	المنطقة الشرقية	الخامسة	الهفوف	1438/07/20
16811	مؤسسة توباز العالمية للمقاولات	المباني	المنطقة الشرقية	الخامسة	الجبيل	1438/04/17
17019	مؤسسة الدامغ للحلول الصناعيه	المباني	المنطقة الشرقية	الخامسة	الدمام	1435/05/02
17101	مؤسسة آل فويلح للمقاولات	المباني	المنطقة الشرقية	الخامسة	الهفوف	1434/08/29
17170	مؤسسة التميز الأول للمقاولات	المباني	المنطقة الشرقية	الخامسة	المبرز	1434/10/07
17178	مؤسسة ابو محمد للمقاولات	المباني	المنطقة الشرقية	الخامسة	الاحساء	1434/11/23
17188	مؤسسة الأعمال العربية للمقاولات	المباني	المنطقة الشرقية	الخامسة	الدمام	1434/10/20
17192	مؤسسة تقنية الامداد والطاقة للمقاولات	المباني	المنطقة الشرقية	الخامسة	الدمام	1435/01/08
17215	مؤسسة رياض المملكة للمقاولات العامة	المباني	المنطقة الشرقية	الخامسة	الثقبه	1434/11/25
17239	مجموعة سنيار الخليج للمقاولات العامة	المباني	المنطقة الشرقية	الخامسة	راس تنورة	1434/12/29
17263	مؤسسة احمد محمد منور البنيان للنقل	المباني	المنطقة الشرقية	الخامسة	حفر الباطن	1435/01/16
17269	مؤسسة عبدالغني الرميح للمقاولات	المباني	المنطقة الشرقية	الخامسة	الدمام	1435/02/01
17277	مؤسسة حسين حمد الامير للمقاولات	المباني	المنطقة الشرقية	الخامسة	الدمام	1435/02/01
17296	شركة غابات الخليج المحدودة	المباني	المنطقة الشرقية	الخامسة	حفر الباطن	1435/02/08
17303	مؤسسة سلمان احمد الحصار للمقاولات	المباني	المنطقة الشرقية	الخامسة	الهفوف	1435/01/24
17361	شركة سعود حزام القحطاني وشريكه للمقاولات العامة	المباني	المنطقة الشرقية	الخامسة	الدمام	1435/04/18
17376	مؤسسة الباكور للمقاولات العامة	المباني	المنطقة الشرقية	الخامسة	الخفجي	1435/04/11
17429	مؤسسة مسفر محمد الزومان للمقاولات	المباني	المنطقة الشرقية	الخامسة	الثقبه	1435/06/20
17432	شركة خشمان بن عبيد الدوسري وأولاده القابضة	المباني	المنطقة الشرقية	الخامسة	المبرز	1435/07/09
17440	مؤسسة نجمة الاوائل للمقاولات والنقليات وتاجير المعدات	المباني	المنطقة الشرقية	الخامسة	الاحساء	1437/11/05
17515	مؤسسة محمد احمد الهلال للمقاولات	المباني	المنطقة الشرقية	الخامسة	الاحساء	1435/09/16
17545	شركة آفاق الاتحاد	المباني	المنطقة الشرقية	الخامسة	الدمام	1435/08/11
17548	مؤسسة باسم بن عبدالله بوخمسين للمقاولات	المباني	المنطقة الشرقية	الخامسة	الاحساء	1437/09/08
17555	مؤسسة صالح بن محمد آل قريع للمقاولات العامة وتأجير المعدات	المباني	المنطقة الشرقية	الخامسة	الدمام	1435/07/26
17560	مؤسسة محمود بن عبدالله الحجازي التجارية	المباني	المنطقة الشرقية	الخامسة	الخبر	1435/09/04
17618	شركة الرواسي الشرقيه القابضه	المباني	المنطقة الشرقية	الخامسة	الاحساء	1435/10/14
17619	مؤسسة وليد محمد البنعلي للمقاولات	المباني	المنطقة الشرقية	الخامسة	الدمام	1435/09/04
17635	مؤسسة مطلق زعيتر الدوسري للمقاولات وتاجير المعدات	المباني	المنطقة الشرقية	الخامسة	الاحساء	1435/09/19
17644	مؤسسة الرؤية الكبرى للخدمات التجارية	المباني	المنطقة الشرقية	الخامسة	الخبر	1435/09/09
17655	شركة تمام للمشاريع	المباني	المنطقة الشرقية	الخامسة	الخبر	1435/09/02
17661	مؤسسة احمد خالد السعيد للمقاولات	المباني	المنطقة الشرقية	الخامسة	الهفوف	1435/09/19
17662	شركة راشد رجب الزهراني للمقاولات	المباني	المنطقة الشرقية	الخامسة	الدمام	1435/11/01
17679	مؤسسة الانجاز والدقة للمقاولات العامة	المباني	المنطقة الشرقية	الخامسة	الخبر	1435/09/17
17694	شركة مجموعة المجد الخالد	المباني	المنطقة الشرقية	الخامسة	الدمام	1435/11/01

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رقم المقاول	اسم المقاول	اسم المجال	اسم المنطقة	درجة التصنيف	اسم المدينة	تاريخ التصنيف
17729	شركة الذوق الأنيق للتجارة والمقاولات	المباني	المنطقة الشرقية	الخامسة	الدمام	1435/11/01
17765	شركة المثالية الدولية	المباني	المنطقة الشرقية	الخامسة	الدمام	1436/05/18
17776	شركة أسيل الشام للتجارة والمقاولات العامة	المباني	المنطقة الشرقية	الخامسة	الدمام	1436/01/10
17804	شركة أبعاد العمارة للمقاولات العامة	المباني	المنطقة الشرقية	الخامسة	الدمام	1436/01/27
17838	مؤسسة عثمان عبدالله القناع للمقاولات	المباني	المنطقة الشرقية	الخامسة	الهفوف	1436/01/09
17842	مؤسسة محمد عبدالله العزاز للمقاولات	المباني	المنطقة الشرقية	الخامسة	الخبر	1436/02/08
17849	شركة الأبراج للمقاولات المحدودة	المباني	المنطقة الشرقية	الخامسة	حفر الباطن	1436/03/13
17854	مؤسسة مشعل عطشان الشمري للمقاولات العامة	المباني	المنطقة الشرقية	الخامسة	راس تنورة	1436/04/13
17861	مؤسسة الوثائقيه للمقاولات العامة	المباني	المنطقة الشرقية	الخامسة	الدمام	1436/01/19
17911	مؤسسة امداد و ابداع للمقاولات العامة	المباني	المنطقة الشرقية	الخامسة	القطيف	1436/03/10
17951	مؤسسة طرق التعمير للمقاولات العامة	المباني	المنطقة الشرقية	الخامسة	قرية العليا	1436/03/10
17981	شركة عبدالله صالح الغامدي وشريكة للتجارة والمقاولات	المباني	المنطقة الشرقية	الخامسة	الجبيل	1437/09/01
18012	شركة مزايا الأعمال للمقاولات العامة	المباني	المنطقة الشرقية	الخامسة	الدمام	1436/07/18
18038	مؤسسة طاقه الافق للمقاولات	المباني	المنطقة الشرقية	الخامسة	الخفجي	1436/05/03
18061	مؤسسة الدوق للتجارة و المقاولات العامة	المباني	المنطقة الشرقية	الخامسة	الهفوف	1436/04/09
18106	شركة يوسف بن احمد كانو المحدودة	المباني	المنطقة الشرقية	الخامسة	الدمام	1437/06/12
18188	مؤسسة اجياد المملكة للمقاولات	المباني	المنطقة الشرقية	الخامسة	الدمام	1437/02/19
18195	مؤسسة روائع التشييد للمقاولات	المباني	المنطقة الشرقية	الخامسة	حفر الباطن	1436/07/28
18254	مؤسسة أتون للمقاولات	المباني	المنطقة الشرقية	الخامسة	الهفوف	1436/11/02
18264	مؤسسة ابتكار الخليج للمقاولات	المباني	المنطقة الشرقية	الخامسة	الاحساء	1436/08/28
18305	شركة إنجازكم للتجارة والمقاولات	المباني	المنطقة الشرقية	الخامسة	راس تنورة	1436/10/14
18327	مؤسسة الخليج الذهبي للمقاولات العامة	المباني	المنطقة الشرقية	الخامسة	الدمام	1436/10/26
18328	مؤسسة برنس العربية للمقاولات العامة	المباني	المنطقة الشرقية	الخامسة	راس تنورة	1436/10/25
18357	شركة حسين ال عطوه وشريكه للمقاولات	المباني	المنطقة الشرقية	الخامسة	الدمام	1436/11/29
18358	مؤسسة التجهيزات السريعة للمقاولات	المباني	المنطقة الشرقية	الخامسة	الدمام	1437/01/05
18368	مؤسسة الحرفيون للمقاولات العامة	المباني	المنطقة الشرقية	الخامسة	الدمام	1437/03/19
18383	شركة تنفيذ المقاييس للتجارة والمقاولات	المباني	المنطقة الشرقية	الخامسة	حفر الباطن	1436/12/24
18393	مؤسسة مقدرة للمقاولات العامة	المباني	المنطقة الشرقية	الخامسة	الدمام	1437/01/12
18399	مؤسسة مرسل هادي للمقاولات العامة	المباني	المنطقة الشرقية	الخامسة	الدمام	1437/01/05
18405	مؤسسة افياء للمقاولات والتزيين بالنباتات	المباني	المنطقة الشرقية	الخامسة	الاحساء	1436/11/29
18421	شركة افراح الخليج	المباني	المنطقة الشرقية	الخامسة	حفر الباطن	1437/02/25
18444	مؤسسة محمد راشد الحرشان للمقاولات	المباني	المنطقة الشرقية	الخامسة	الاحساء	1437/02/25
18463	شركة محمد سعيد الحربي وابناؤه للمقاولات والتجارة والصناعة	المباني	المنطقة الشرقية	الخامسة	الدمام	1437/02/18
18486	شركة الرؤى السعودية للمقاولات	المباني	المنطقة الشرقية	الخامسة	الدمام	1437/06/12
18497	شركة مرسى البحار للمقاولات العامة	المباني	المنطقة الشرقية	الخامسة	الدمام	1437/06/20
18500	مجموعة القصر التقني التجارية	المباني	المنطقة الشرقية	الخامسة	الخبر	1437/06/20
18523	مؤسسة عبدالرحمن بن عبدالله الفوزان للمقاولات	المباني	المنطقة الشرقية	الخامسة	الدمام	1437/03/26

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رقم المقاول	اسم المقاول	اسم المجال	اسم المنطقة	درجة التصنيف	اسم المدينة	تاريخ التصنيف
18527	شركة الخدمات الفنية والصناعية	المباني	المنطقة الشرقية	الخامسة	الدمام	1437/11/18
18550	مؤسسة دليل الاعمال العربيه للمقاولات العامة	المباني	المنطقة الشرقية	الخامسة	الجبيل	1437/04/16
18559	مؤسسة مبدعون أوائل الشرقيه للمقاولات العامة	المباني	المنطقة الشرقية	الخامسة	النعيريه	1437/06/07
18572	مؤسسة أديب الجبيل للمقاولات العامة	المباني	المنطقة الشرقية	الخامسة	الجبيل	1437/05/15
18578	شركة سواعد الشرق للاستثمارات و التطوير العقاري والمقاولات	المباني	المنطقة الشرقية	الخامسة	الدمام	1437/06/25
18592	مجموعة محمد مبارك المري للمقاولات العامة	المباني	المنطقة الشرقية	الخامسة	راس تنورة	1437/08/16
18663	مؤسسة نظم الطاقه العربي للمقاولات العامة	المباني	المنطقة الشرقية	الخامسة	الخفجي	1437/08/11
18718	المجموعة السعوديه المتكامله للمقاولات العامة	المباني	المنطقة الشرقية	الخامسة	الخفجي	1437/09/03
18720	مؤسسة أمناء الخليج للمقاولات	المباني	المنطقة الشرقية	الخامسة	الثقبه	1437/08/04
18745	شركة جبال طويق للمقاولات العامة	المباني	المنطقة الشرقية	الخامسة	الدمام	1437/09/09
18754	مؤسسة غرس التعمير للمقاولات	المباني	المنطقة الشرقية	الخامسة	الدمام	1437/09/15
18776	مؤسسة رك للمقاولات العامة	المباني	المنطقة الشرقية	الخامسة	الجبيل	1437/09/08
18777	مؤسسة حسين بن عبدالله الصفار للمقاولات	المباني	المنطقة الشرقية	الخامسة	الاحساء	1437/10/08
18817	مؤسسة خالد بن ناصر السبيعي للمقاولات العامة	المباني	المنطقة الشرقية	الخامسة	الخبر	1438/02/23
18832	مؤسسة المحترف المائي للمقاولات العامة	المباني	المنطقة الشرقية	الخامسة	الدمام	1438/01/17
18870	شركة الدليمان للمقاولات	المباني	المنطقة الشرقية	الخامسة	الجبيل	1438/03/14
18909	مؤسسة العطفين للمقاولات العامة	المباني	المنطقة الشرقية	الخامسة	الاحساء	1438/02/14
18952	مؤسسة اعمال الرفادة للأنشاءات العامة	المباني	المنطقة الشرقية	الخامسة	حفر الباطن	1438/03/22
18982	مؤسسة سفر بن صالح القحطاني للمقاولات العامة	المباني	المنطقة الشرقية	الخامسة	الخبر	1438/04/17
18983	مؤسسة عبدالله فهد السبيعي التجارية	المباني	المنطقة الشرقية	الخامسة	الخبر	1438/05/09
19031	مؤسسة مشاريع المرافق للمقاولات العامة	المباني	المنطقة الشرقية	الخامسة	الخبر	1438/06/23
19047	شركة عبدالرحمن العطيشان واولاده للتنمية	المباني	المنطقة الشرقية	الخامسة	الدمام	1438/05/29
19060	مؤسسة طموح الاعمار للمقاولات العامة والتشغيل والصيانة	المباني	المنطقة الشرقية	الخامسة	الهفوف	1438/07/13

Vitae

Name : Khaled Ali Ayyatt

Nationality : Jordanian

Date of Birth : 29/06/1985

Email : eng.ayyatt@hotmail.com

Address : KSA-Dammam

Academic Background:

1. Master in Construction Engineering and Management from KFUPM –KSA (Jan. 2014-June 2017).

2. BSc in Civil engineering From An-Najah National university-Palestine.

Practical Experience:

KSA Experience:-

1. From September 2012 till now :
   From July 2017 till now : I'm still working with **Al-Salimi commercial company** as client representative .

   I worked with **AXAL ARABIA Construction Company** as project engineer in Dammam city.

   a. From 2/10/2016 till May 2017: I'm still working in CFP (correctional facilities prison of Dammam). As sr. project engineer (site in-charge) for all structural and finishing works.

   b. Also I worked from 1/6/2015 till 1/10/2016 as precast factory in charge for the boundary wall of the villas and the boundary wall of the entire project production and installation including the panels with the National Guard Logo , also the production and installation of the villas front elevation panels and the villas Parapet for the roof and Upper roof .

c. From 1/9/2012 till 30/05/2015 I worked as project engineer in Saudi Arabia National Guard Housing (416 Villas) for all works (the site was turnkey agreement) .

UAE _ Dubai Experience:-

2. From Aug 2008 till Aug2012:
I worked in **Arabtec Construction Company** as a Civil Engineer and got a good experience in the construction field. Their contact number is: Tel. 0097143400700

I worked in the mentioned below project for 4 years as site engineer for structural and finishing activities :-

a. 138 villas project – Dubai – emirates hills.
b. 252 villas project – Dubai – Al-Barshaa South .
c. 1047 villas project –Dubai silicon .
d. 1209 villas project – Duba i – Al-Barshaa South.
e. 504 villas project –Dubai – Warqaa 4 .
f. 544 villas project – Dubai – Warqaa 4 .
g. 1515 villas project – Dubai – free zone .

Other Skills and Qualifications:

- Ability to work under pressure
- Ability to work with a team
- Ability to control and manage site conditions
- Ability to deal with subcontractors and consultant
- Ability to achieve safety conditions during the work
- Ability to report all situations for the management.
- Prepare Monthly payment certificate
- I have a valid driving license from UAE, KSA.
- Holding AutoCAD 2007 (2D, 3D) certificate.
- Holding SAP2000 certification design and analysis (version 9).
- Holding (seismic design of buildings) certification.
- Holding (primavera project planner) certification.
- Knowledge of Microsoft Windows XP (good).
- Knowledge of Microsoft Office XP (WinWord, PowerPoint, and Excel)(excellent)
- Knowledge of Internet and e-mailing (very good).