

Subcontracting Issues in Construction Companies of Gaza Strip

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Abstract- This Subcontracting is a common and well-established practice in the Palestinian construction industry. They are very important to the successful completion of most construction projects. Contractors enlist the services of subcontractors to achieve specific objectives, including obtaining cost and time reductions, securing access to specialized services, and risk sharing. A literature review highlights most issues related with subcontracting include the process of selecting subcontractors, Payment Issues, Safety Issues, Productivity Issues, Insurance Issues and Quality Issues. A questionnaire survey was administered to subcontractors, general contractors to investigate these issues and to determine the differences in perceptions between the parties. A seventy-eight questionnaire was distributed as follows: forty-six to contractors and thirty-two to subcontractors. Seventy-two questionnaires were received (90%) as follows: 44 (61.1%) from contractors, 28 (38.9%) from subcontractors. The results reveal the widespread use of subcontracting in the construction industry in Gaza Strip, primarily done to save time and money, and the results indicate that (1) the practices of selection and payments must be done prior to qualifying subcontractors (2) quality, productivity and safety issues are adequate from the view point of general contractors (3) General contractor should covers the subcontractor in insurance issues and compensate them. The study recommended several actions to improve subcontracting practices in the construction industry in Gaza Strip.

Keywords; Construction Projects, Subcontractors, Practices, Gaza Strip

I. INTRODUCTION

Subcontracting is a common practice in the construction industry. On any particular project, it allows General Contractors to utilize a minimum work force in construction projects and encourage specialization. General contractors may rely on many subcontractors to perform specific tasks on their projects such as construction works, electrical works, plumbing works , roofing, insulation, and so on [1]. Ref [2] sees the subcontractor as a specialist hired by the main contractor to perform specific tasks on a project as part of the overall contract. Ref [3] illustrated that the importance of the subcontractors is due to that approximately 80% of the dollar value of construction is implemented by subcontractors

Although general contractors are commonly known to sublet portions of their work, subcontractors also sublet apportion of their contract to other specialized companies. Thus the process of subcontracting is an efficient and economical means of accessing necessary resources [4]. Nowadays, subcontracting has become a very common practice on many construction projects due to increase complexity of these projects. However, main contractors should be aware of the risks of subcontracting such as bad

performance of the subcontractors and the shortage of experienced workers.

Construction industry plays a major role in development and achievement the goals of society. So the prime contractors rely heavily on the specialized services of subcontractors to reduce costs and increase efficiency on construction Projects .Through their specialized services; subcontractors execute specific tasks that prime contractors could not perform efficiently [5].

A series of study has been done to enhance the subcontracting practice such as: Bidding practices of subcontractors in Colorado [6]. Ref [4][7] discussed issues involved in subcontracting practices and improvement. In the paper [8] discussed improving sub-contractor selection process in construction projects. In [9], studied in their paper about safety performance of subcontractors in the Palestinian construction industry and they identified, evaluated, and ranked factors that influence safety performance of subcontractors in Palestine. The relationship between contractors and their subcontractors in the Gaza Strip [10],[11]. Subcontracting practices in the construction industry of Pakistan and factors influencing sub-contractors selection in construction projects respectively [12],[13]. The impacts of applying the multi-layer chain subcontracting system on project management performance with reference to Hong Kong construction industry.[14],[15]. In addition, an empirical analysis of the choices made by Japanese firms with respect to subcontracting status [16] The practice of multilayer subcontracting in Malaysian construction industry [17]

In the Palestinian construction industry, subcontracting practices are extensively used in all construction projects, but in recent years, the construction sector has been severely affected by the Palestinian division and the recurrent wars in the Gaza Strip, which in turn led to closures and severe restrictions on the movement of individuals and goods from and to the Gaza Strip, especially construction materials, which led to a significant reduction in trade, investment, and employment so subcontractor the issues regarding subcontracting are seldom acknowledged and addressed. A little research effort has been done to investigate the subcontracting common practices of Gaza Strip contracting companies. Therefore, it is important to explore and evaluate these practices under specific conditions. The aim of this research to investigate the local issues subcontracting practices in contracting comprise in Gaza strip, identify the major problem areas and explore the overall satisfaction with subcontractor practice in Gaza strip. In addition, improve practices of sub-contractors in construction industry in Gaza

Strip regarding issues related to selection, payment, safety, productivity, quality, and insurance.

II. RESEARCH METHODOLOGY

The research is conducted through the following stages: The researchers will review the relevant literature on the subject regarding subcontracting practices in the construction industry of Gaza strip, regarding issue related to selection, payment, safety, productivity, quality, and insurance.

It will take the form of structured questionnaire with experts in the field of subcontracting practices in the construction industry of Gaza strip. Those experts will include project's managers, contractors, and subcontractors. This pilot study will be the pre-stage to develop the final form of questionnaire. In this stage of the pilot study, there will be an amendment, modifications, omission, addition or developments of the questionnaire to be ready for the final stage of distribution.

After the development of questionnaire based on the structured interview and pilot studies, the questionnaire will be distributed among the contractors and subcontractors in this field to obtain their perspectives regarding the mentioned aspects of the subcontracting practices in the construction industry of Gaza strip. Statistical analysis and tests will be conducted by using (SPSS) program. It is expected that this study will provide some clarifications for the different aspects of the subcontracting practices in the construction industry of Gaza strip.

The main source of input data to this research is the data gathered from literature and through the questionnaire surveys that distributed to construction companies holding a valid registration from the contractors union within the Gaza Strip. The study is limited to Gaza strip contracting companies that are classified as first, second, third, fourth, and fifth categories, which have a valid registration in PCU. As such, the size of population for all categories is 303 companies. Seventy-eight copies of the questionnaire were distributed to contractors and subcontractors in Gaza Strip. Seventy two questionnaires were answered and received, which represents 90 % response rate as shown in table 1.

TABLE 1: SAMPLE SIZE AND RESPONSE RATE OF THE STUDY POPULATIONS

Total Population	Calculated Sample Size	Distributed questionnaire	Number of respondents	Response Rate
303	75	78	72	90%

In order to be able to select the appropriate method of analysis, the level of measurement must be understood. For each type of measurement, there is/are an appropriate method/s that can be applied and not others. In this research, ordinal scales were used. Ordinal scale is a ranking or a rating data that normally uses integers in ascending or descending order. The numbers assigned to the important (1, 2, 3, 4, 5) do not indicate that the interval between scales are equal, nor do they indicate absolute quantities. They are merely numerical labels. Based on likert scale we have the following in the table 2.

TABLE 2: LIKERT SCALE

Item	Strongly agreed	Agreed	Do not Know	Disagreed	Strongly disagreed
Scale	5	4	3	2	1
	80-100%	60-79%	40-59%	20-39%	0-19%

The distribution of the responses obtained in the two surveys administered to general contractors and subcontractor. Fortunately, the response rate was 61.1% for contractors and 38.9% for subcontractors as shown in Table 3. Also, the table illustrates the year of experience of respondents. 13.9% from the respondents have years of experience less than 5 years, 29.2% from the respondents have years of experience 5-10 years, 36.1% from the respondents have years of experience 11-20 years and 20.8% from the respondents have years of experience more than 20 years.

TABLE 3. CHARACTERISTICS OF RESPONDENTS

General Information	No of Respondents	Percent %
Nature of the Work		
General contractor	44	61.1
Sub-contractor	28	38.9
Years of Experience		
Less than 5 years	10	13.9
5 - less than 10 years	21	29.2
11 - less than 20 years	26	36.1
20 years and over	15	20.8
Annual average value of the projects (U.S. \$)		
Less than 250 thousand \$	5	29.2
250 - less than \$ 500 thousand	15	20.8
500 - Less than 1 million \$	18	25
1 million \$ and more	18	25
The number of employees (permanent)		
5 or less employees	14	19.4
6-10 employees	26	36.1
11-20 employees	12	16.7
More than 20 employees	20	27.8

However, the table is noticed that 29.2% of the respondents have executed projects with a value less than 250 thousand dollar, 20.8% between 250 - less than 500 thousand dollar, 25% from 500 to less than one million dollars, and 25% more than one million dollars. In addition, the table shows the number of employees (permanent) in the company. It shows that 19.4% of the responded companies have number of employees less than 5 employees, 36.1% of them have 6-10, 16.7% of them have 11-20 and 27.8% of them have more than 20 employees.

In other hand, the type of work and classification of the respondents contracting companies is presented in Fig.1&2

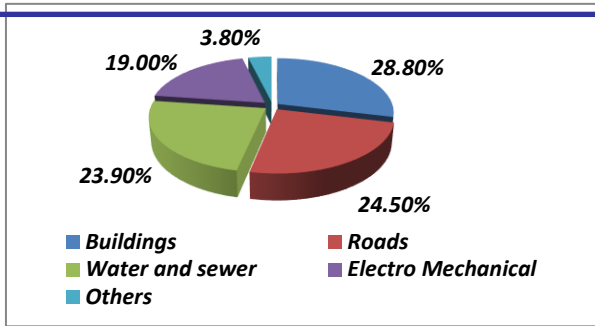


FIGURE (1), TYPE OF WORK CONTRACTING COMPANIES

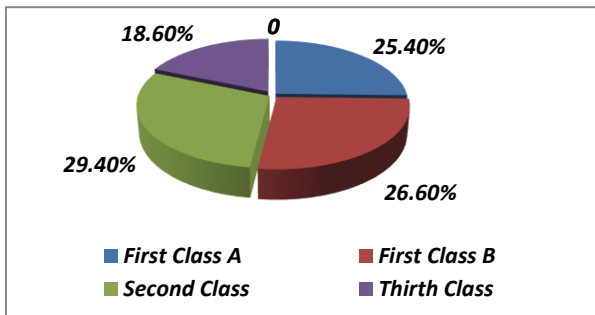


FIGURE (2), CLASSIFICATION OF THE CONTRACTING COMPANIES

III. RESULTS ANALYSIS

3.1 Subcontracting practices

3.1.1 The reasons for the use of subcontracting

Table (4) shows the opinions of the respondents about the reason of subcontracting to weight. The respondents rank "Save Time" and "Reduce Risk" are the two highest reasons for using subcontracting, which "Save Time" might occupied the first rank with percent weight (80%), and "Reduce Risk" might occupied the second rank with percent weight (74.4%).

On the other hand, it is shown that the "Lack of specialized skills in the company" and "Traditional" are the two lowest reasons for using subcontracting, which "Lack of specialized skills in the company" might occupied the penultimate rank with percent weight (69.4%) and "Traditional" might occupied the last rank with percent weight (67.8%).

TABLE 4: THE REASONS FOR THE USE OF SUBCONTRACTING

NO	Item	Mean	Std. Dev	% weight	Rank
1.	Traditional	3.3889	1.181	67.8	9
2.	Lack of specialized skills in the company	3.4722	1.0342	69.4	8
3.	Reduce cost	3.5694	1.1847	71.4	6
4.	Reduce risk	3.7222	1.1286	74.4	2
5.	Save time	4	1.0481	80	1
6.	Absorb fluctuations in prices	3.7083	0.9991	74.2	3
7.	Maintaining a good relationship	3.625	0.7950	72.5	5
8.	The ability to control working hours	3.6389	1.0112	72.8	4
9.	Get the highest quality	3.5417	1.0738	70.8	7

3.2.1 Subcontractor Selection Process

Table (5) shows that respondents rank "The ability to get the job done on time" and "Experience in the construction industry laws" are the two highest items of subcontractor selection process practice, which "The ability to get the job

done on time" might occupied the first rank with percent weight (85.6%), and "The ability to get the job done on time" might occupied the second rank with percent weight (79.2%).

On the other hand, it is shown that the "Flexibility and cooperation in the event of delay" and "Personal relationships" are the two lowest items of subcontractor selection process practice, which " Flexibility and cooperation in the event of delay" might occupied the penultimate rank with percent weight (70.8%) and "Personal relationships" might occupied the last rank with percent weight (64.4%).

TABLE 5: SUBCONTRACTOR SELECTION PROCESS

No	Item	Mean	Std. Dev	% Weight	Rank
1.	The ability to get the job done on time	4.2778	0.6329	85.6	1
2.	Flexibility in the terms and conditions of payments	3.8611	1.0251	77.2	5
3.	The terms of the tender price	3.7778	0.9960	75.6	7
4.	Resources subcontractors	3.6528	0.90631	73.1	9
5.	Financial stability (stability of Payments)	3.9028	0.9217	78.1	3
6.	Complete the work within a budget	3.8056	0.9440	76.1	6
7.	Flexibility and cooperation in the event of delay	3.5417	1.1251	70.8	12
8.	Personal relationships	3.2222	1.1161	64.4	13
9.	Past failures	3.6389	1.1171	72.8	10
10.	Compliance with quality specifications	3.9028	1.0767	78.1	4
11.	Experience in the construction industry laws	3.9583	0.9991	79.2	2
12.	Safety awareness in the workplace	3.7222	1.2012	74.4	8
13.	Cooperation between subcontractors in the project	3.5694	1.0724	71.4	11

Table.6 shows that the respondent opinions about improvement of subcontractor selection process practice, the results indicates that "Must be done prior to qualifying subcontractors" might occupied the first rank with percent weight (78.9%), and "Must submit a quote for subcontractors to contractors during the period specified key " might occupied the second rank with percent weight (77.8%).

On the other hand, it is shown that the "union contractors should reduce post the winners in the previous bidding" and "Experience in the construction industry laws" are the two lowest ways to improve the "subcontractor selection process", which "union contractors should reduce post the winners in the previous bidding" might occupied the penultimate rank with percent weight (70.6%) and "No need to improve the practice" might occupied the last rank with percent weight (51.4%).

TABLE 6: IMPROVEMENT OF SUBCONTRACTOR SELECTION PROCESS PRACTICE

No	Item	Mean	Std. Dev	% weight	Rank
1.	Union contractors Should reduce post the winners in the previous bidding	3.527	1.266	70.6	5
2.	That the owner request a list of subcontractors	3.708	0.9106	74.2	4
3.	Must submit a quote for subcontractors to contractors during the period specified key	3.888	0.8968	77.8	2
4.	Must be done prior to qualifying subcontractors	3.944	0.7670	78.9	1
5.	Must be sent subcontractors offers fair prices	3.805	0.9137	76.1	3
6.	No need to improve the practice	2.569	1.136	51.4	6

3.2.2 Payments Issues

Table.7 shows that the "Dues pay subcontractors on time between the parties" is the highest item for payments issues, which might occupied the first rank with percent weight (82.5%).It's because of the nature of the political and economic situation in Gaza strip that leads to delays in payments to main contractors.

On the other hand, it is shown that the "The sub-Contractor shall submit bank guarantees items and bookings to cover any disruption in payments" is the lowest item for payments issues, which might occupied the penultimate rank with percent weight (71.7%).

TABLE 7: PAYMENTS ISSUES

No	Item	Mean	Std. Dev	% weight	Rank
1.	Contractors pay dues on time	4.0417	1.067	80.8	2
2.	Dues pay subcontractors on time between the parties	4.125	1.02	82.5	1
3.	The sub-contractor shall submit bank guarantees -items and bookings to cover any disruption in payments	3.583	0.9604	71.7	3

Table.8 shows that the respondent opinions about improvement of payments issues practice, the results indicates that "Sub-contractor should negotiate with the general contractor on how payments before signing the contract" might occupied the first rank with percent weight (88.3%), and "owner should pay for general contractors on time" might occupied the second rank with percent weight (83.1%).

On the other hand, it is shown that the "Subcontractor should submit higher price to cover the losses from delayed payments" and "No need to improve the practice" are the two lowest ways to improve the payments issues practice, which "Subcontractor should submit higher price to cover the losses from delayed payments" might occupied the penultimate rank with percent weight (67.5%) and "No need to improve the practice" might occupied the last rank with percent weight (50.8%).

TABLE 8: IMPROVEMENT OF "PAYMENTS ISSUES" PRACTICE

No	Item	Mean	Std. Dev	% weight	Rank
1.	Sub-contractor should negotiate with the general contractor on how payments before signing the contract	4.4167	0.7071	88.3	1
2.	Sub-contractor should not work with the general contractor in late payments	3.5556	0.9625	71.1	4
3.	Sub-contractor should examine the financial statuses of general contractor before entering the tender	3.8611	0.9390	77.2	3
4.	Subcontractor should submit higher price to cover the losses from delayed payments	3.375	1.118	67.5	5
5.	Owner should pay for general contractors on time	4.1528	0.8334	83.1	2
6.	No need to improve the practice	2.5417	1.162	50.8	6

3.2.3 Safety Issues

Table.9 shows that the "Sub-contractors adhere to safety procedures in the workplace" is the highest item for safety issues with percent weight (81.7%). On the other hand, it is shown that the "General contractors consider subcontractors 'safety performance before they enter into a subcontracting agreement "is the lowest item for safety issues with percent weight (79.7%).

TABLE 9: SAFETY ISSUES

No	Item	Mean	Std. Dev	% weight	Rank
1.	General contractors consider subcontractors 'safety performance before they enter into a subcontracting agreement	3.986	1.106	79.7	2
2.	Sub-contractors adhere to safety procedures in the workplace	4.083	.8005	81.7	1

Table.10 shows that the respondent opinions about improvement of safety issues practice, the results indicates that "General Contractor should provide full time safety director" might occupied the first rank with percent weight (86.4%), and "Subcontractor should create safe work environment" might occupied the second rank with percent weight (74.4%).

On the other hand, it is shown that the "Ministry of Labor should clearly define the sub-contractor responsibility for safety " and " No need to improve the practice " are the two lowest ways to improve the Safety issues practice, which "Ministry of Labor should clearly define the sub-contractor responsibility for safety" might occupied the penultimate rank with percent weight (81.1%) and "No need to improve the practice" might occupied the last rank with percent weight (43.6%).

TABLE 10: IMPROVEMENT OF SAFETY ISSUES PRACTICE

No	Item	Mean	Std. Dev	% weight	Rank
1.	Subcontractor should create safe work environment	4.250	0.8680	85.0	2
2.	Sub-contractor should improve the performance of the safety program through the development of a plan for safety	4.222	0.7911	84.4	3
3.	General Contractor should provide full time safety director	4.319	0.8692	86.4	1
4.	Applying effective training and increasing awareness of safety precautions	4.138	0.9539	82.8	4
5.	Ministry of Labor should clearly define the sub-contractor responsibility for safety	4.055	0.8539	81.1	5
6.	No need to improve the practice	2.180	1.1174	43.6	6

3.2.4 Productivity Issues

Table11 shows that the respondent opinions about the factors that lead to low productivity of subcontractors. The findings indicated that "Lack of equipment and machines" might occupied the first rank with percent weight (86.4%), and "Lack of materials" might occupied the second rank with percent weight (74.4%). The lack of materials and equipments due to the political conditions that the Gaza Strip suffers from a siege and closure that prevents the entry of certain equipment and materials to the local market.

On the other hand, it is shown that the "Lack of control of workers" and "Supervision" are the two lowest items of Productivity issues practice, which "Lack of control of workers" might occupied the penultimate rank with percent weight (81.1%) and "Supervision" might occupied the last rank with percent weight (43.6%).

TABLE 11: PRODUCTIVITY ISSUES

No	Item	Mean	Std. Dev	% weight	Rank
1.	The relationship between workers	3.972	0.9782	79.4	5
2.	Supervision	3.638	1.2705	72.8	8
3.	Delay delivery of materials	4.055	1.0331	81.1	3
4.	Lack of equipment and machines	4.277	0.8916	85.6	1
5.	Adverse weather conditions	4.000	0.8558	80.0	4
6.	Change the specifications and drawings at work	3.750	1.1227	75.0	6
7.	Lack of control of workers	3.652	1.0636	73.1	7
8.	Lack of materials	4.125	1.1978	82.5	2

Table.12 shows that the respondent opinions about improvement of productivity issues practice, the results indicates that "Organize work sites" might occupied the first rank with percent weight (89.2%), and "Motivate workers" might occupied the second rank with percent weight (84.4%).

On the other hand, it is shown that the "Subjecting workers to vocational training" and "No need to improve the practice" are the two lowest ways to improve the "subcontractor selection process", which " Subjecting workers to vocational training " might occupied the penultimate rank with percent weight (76.4%) and "No need to improve the practice" might occupied the last rank with percent weight (41.9%).

TABLE 12: IMPROVEMENT OF PRODUCTIVITY ISSUES PRACTICE

No	Item	Mean	Std. Dev	% weight	Rank
1.	Organize work sites	4.458	0.6486	89.2	1
2.	Motivate workers	4.222	0.9527	84.4	2
3.	Try to reduce accidents in project site	4.111	0.8484	82.2	4
4.	Strengthening the capacity of compatibility between workers	3.986	1.0413	79.7	5
5.	Subjecting workers to vocational training	3.819	0.9393	76.4	6
6.	Close coordination between contractors, subcontractors	4.111	0.8316	82.2	3
7.	No need to improve the practice	2.097	1.0897	41.9	7

3.2.5 Quality Issues

Table 13 shows that the "The main contractor takes into account the standards and specifications required for quality" is the highest item for Quality issues with percent weight (80.8%). The importance of this factor is because the commitment of the contractors to the standards and specifications required for quality of the project make it easier for the subcontractor and manager to control and manage them correctly.

On the other hand, it is shown that the "Sub-contractor takes into account the price at the expense of quality" is the lowest item for safety issues with percent weight (61.9%).

TABLE 13: QUALITY ISSUES

No	Item	Mean	Std. Dev	% weight	Rank
1.	The main contractor takes into account the standards and specifications required for quality	4.041	1.0933	80.8	1
2.	Sub-contractor takes into account the price at the expense of quality	3.097	1.1525	61.9	2

Table.14 shows that the respondent opinions about improvement of quality issues practice, the results indicates that "The use of skilled labor" might occupied the first rank with percent weight (87.8%), and "Quality Workmanship" might occupied the second rank with percent weight (85.6%).

On the other hand, it is shown that the "Higher contract price" and "No need to improve the practice" are the two lowest ways to improve the Quality issues practice, which "Higher contract price" might occupied the penultimate rank with percent weight (67.2%) and "No need to improve the practice" might occupied the last rank with percent weight (47.5%).

TABLE 14: IMPROVEMENT OF "QUALITY ISSUES" PRACTICE

No	Item	Mean	Std. Dev	% weight	Rank
1.	Coordination between contractors, subcontractors	4.222	0.7911	84.4	3
2.	Quality Workmanship	4.277	0.7547	85.6	2
3.	Experience in the construction industry	4.111	0.7032	82.2	6
4.	The quality of the materials used	4.208	0.9183	84.2	5
5.	The effectiveness of team work	4.208	0.9028	84.2	4
6.	Training of supervisors	3.972	0.8876	79.4	9
7.	Training of construction workers	4.027	0.8876	80.6	8
8.	The use of skilled labor	4.388	0.8484	87.8	1
9.	More quality-control engineers	4.041	1.2153	80.8	7
10.	Higher contract price	3.361	1.2593	67.2	10
11.	No need to improve the practice	2.375	1.1437	47.5	11

3.2.6 Insurance Issues

Table.15 shows that the "General contractors shift insurance responsibility to subcontractors "is the highest item for Insurance issues with percent weight (76.7%). On the other hand, it is shown that the "General contractors shift insurance responsibility to subcontractors "is the lowest item for Insurance issues with percent weight (60.3%).

TABLE 15: INSURANCE ISSUES

No	Item	Mean	Std. Dev	% weight	Rank
1.	General contractor covers the sub-contractor in insurance	3.833	.99293	76.7	1
2.	General contractors shift insurance responsibility to subcontractors	3.014	1.0138	60.3	2

Table16 shows that the respondent opinions about improvement of insurance issues practice, the results indicates that "Responding to insurance issues" might occupied the first rank with percent weight (83.3%), and "Should provide additional insurance for subcontractors" might occupied the second rank with percent weight (77.8%).

On the other hand, it is shown that the "Avoid compensate subcontractors widely" and "No need to improve the practice" are the two lowest ways to improve the "Avoid compensate subcontractors widely" might occupied the penultimate rank with percent weight (58.3%) and "No need to improve the practice" might occupied the last rank with percent weight (42.2%).

TABLE 16: IMPROVEMENT OF "INSURANCE ISSUES" PRACTICE

No	Item	Mean	Std. Dev	% weight	Rank
1.	Responding to insurance issues	4.166	0.8558	83.3	1
2.	Should provide additional insurance for subcontractors	3.888	0.9866	77.8	2
3.	Avoid compensate subcontractors widely	2.916	1.2643	58.3	4
4.	Subcontractors should educate their staff about insurance in contract language	3.833	0.9344	76.7	3
5.	No need to improve the practice	2.111	1.0421	42.2	5

IV. CONCLUSION

The focal point of this study was to investigate and examine the subcontracting practices in constructing companies in Gaza Strip. Furthermore, to improve the existing subcontracting practices were identified six issues: Subcontractor selection process, payments issues, safety issues, productivity issues, quality issues, and insurance issues.

From the study, save time and reduce risk for the project are the important reasons for using of subcontracting between contractor and subcontractor. Moreover, Subcontractor Selection Process consider "The ability to get the job done on time", "Must be done prior to qualifying subcontractors", "Estrangement on Flexibility and cooperation in the event of delay". Therefore, the owners & Contractors should pay dues on time; Subcontractor should create safe work environment & Organize work sites. The main contractor must be taken into account the standards and specifications required for quality.

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