

ASSIGNMENT OF RESPONSIBILITY AND ROLE TO CONSTRUCTION CLIENT IN OCCUPATIONAL SAFETY AND HEALTH SYSTEM

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This study investigated the client's duty and role to prevent construction accidents by participating construction client into the occupational safety and health management system. Since the fatal accidents of the construction sites in Korea are higher than other OECD countries and approximately 500 workers annually have died on construction sites, various efforts have been performed to prevent construction accidents. Recently, in Korea, the client's participation in the safety and health management system has been focused as a fundamental method to prevent serious accidents. To examine the necessity of client's participation, the survey was performed for construction participants. And, survey results and existing studies about client's role were analyzed to assign responsibility and role to the client. Results showed that safety managers and supervisors were strongly agreed for imposing client's duty (average scores of 4.373 and 4.107 in likert 5point scale) while clients showed the lowest agreement (average score of 3.153). In addition, the detailed role was proposed in the whole project stage, that is plan, design, and construction stage. Client can be a key player in reducing the fatal construction accidents by doing the accurate roles proposed in this study.

Keywords: Participation, Fatal accident, Survey, Construction accidents.

1 INTRODUCTION

The statistics for industrial accidents in Korea shows that the accident rate and fatality rate of construction industry are higher than those of manufactural industry. For the accident rate, the construction industry showed an increasing trend recently while the overall industry is continuously decreasing (Jang *et al.* 2017). In 2016, the total number of deaths in the construction sites in Korea was 554, which accounts for 31.18% of all deaths from industrial accidents.

The role and responsibility for workers' safety and health in Korea construction industry has been focused on construction contractors who employ the workers (Won *et al.* 2015). Most of duties about the construction workers' safety and health are imposed on the contractors while, for the clients, there is no specified duty even though they contribute to the accident by ordering incorrect requirements.

In order to induce construction client's role and responsibility in construction safety and health management system, this study examined the necessity of construction client's duty and suggested the client's role for plan, design, and construction stage. The survey was performed to

investigate the method of imposing client’s duty and various literatures were reviewed to suggest the client’s role.

2 ACCIDENT STATISTICS IN KOREA CONSTRUCTION SITE

The annual variation of the fatality rate was shown in Figure 1 in order to compare the accident trend of construction and manufacture industries (MOEL 2007-2016). Fatality rate, which represents death rates per 10,000 people, showed a decreasing trend in the manufacturing industry. However, it seems that the fatality rate in construction industry is starting to increase recently. The rate for the construction industry was the highest at 2.21 in 2013, and thereafter, it drastically declined by 1.47 times from the rate in 2013, to 1.47 in 2015. However, in 2016, the fatality rate in the construction industry increased again and was 1.83 times higher than that in manufacturing industry. In addition, the number of deaths in Korea construction sites was tabulated from 2011 to 2016 in Table 1. The average number of deaths is 536.

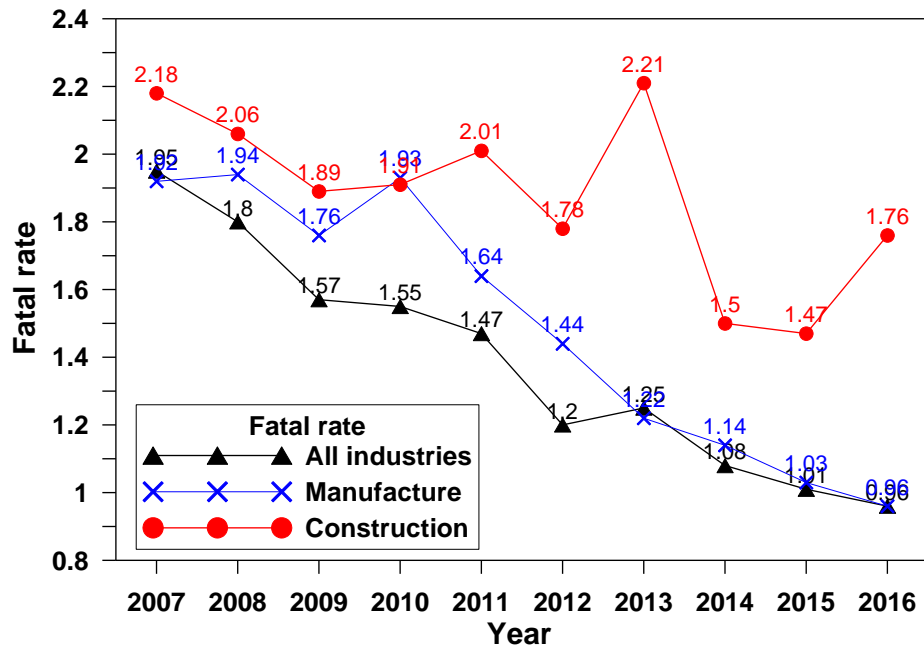


Figure 1. Annual change of industrial fatality rate in Korea.

Table 1. Number of deaths in Korean construction sites.

Year	2011	2012	2013	2014	2015	2016
Number of death	621	496	567	486	493	554

3 SURVEY RESULTS

Survey was conducted to examine the necessity for inducing the client’s role and responsibility in construction safety and health management. Various stakeholders such as clients, safety managers, construction managers, and supervisors were included in the survey. The numbers of clients, safety managers, construction managers, supervisors, other experts were 179, 119, 63, 28, 7, respectively.

Using the likert 5-point scale (1-Not at all helpful, 2-Not very helpful, 3-Natural, 4-Somewhat helpful, 5-Very Helpful), the effect of imposing the client's duty in the construction safety and health management was surveyed (Table 2). The average score of total respondents was 3.724. The clients showed the lowest agreement (average score 3.153) since they should have a mandatory duty for construction safety and health management. For the effects of prevention of construction accidents by means of imposing client's duty, safety managers and supervisors were strongly agreed. The average scores were 4.373 and 4.107, respectively.

Table 2. Average score for imposing construction clients' duty according to stakeholders.

Classification	Client	Safety manager	Construction manager	Supervisor	Total
Likert 5 point average score (standard deviation)	3.153 (1.173)	4.373 (0.985)	3.794 (1.194)	4.107 (1.166)	3.724 (1.241)

To induce the clients' duty in the law for construction safety and health management, 6 options were inquired as follows.

- Option 1: Client should appoint the safety and health specialist who carries out client's role and responsibility in the site in order to perform for client's role and responsibility.
- Option 2: Client's duty is included in the range of contractors' duty (The clients should have unique and direct role and responsibility similar to contractors.)
- Option 3: Client should employ exclusive safety and health supervisor in order to perform for client's role and responsibility.
- Option 4: Client should appoint a main contractor who will responsible for client's role and responsibility.
- Option 5: Do not impose client' duty (same to current system).
- Option 6: Others

For the 6 options, option 3 was most favorable, and then, option 1 was selected (Table 3). For only client's response, option 3 using supervisors, was dominantly. However, for the safety managers and construction managers, option 1 and option 2 was mainly preferred. Supervisors preferred option 1 and option 3.

Table 3. Selection for 6 options about method for imposing client's duty.

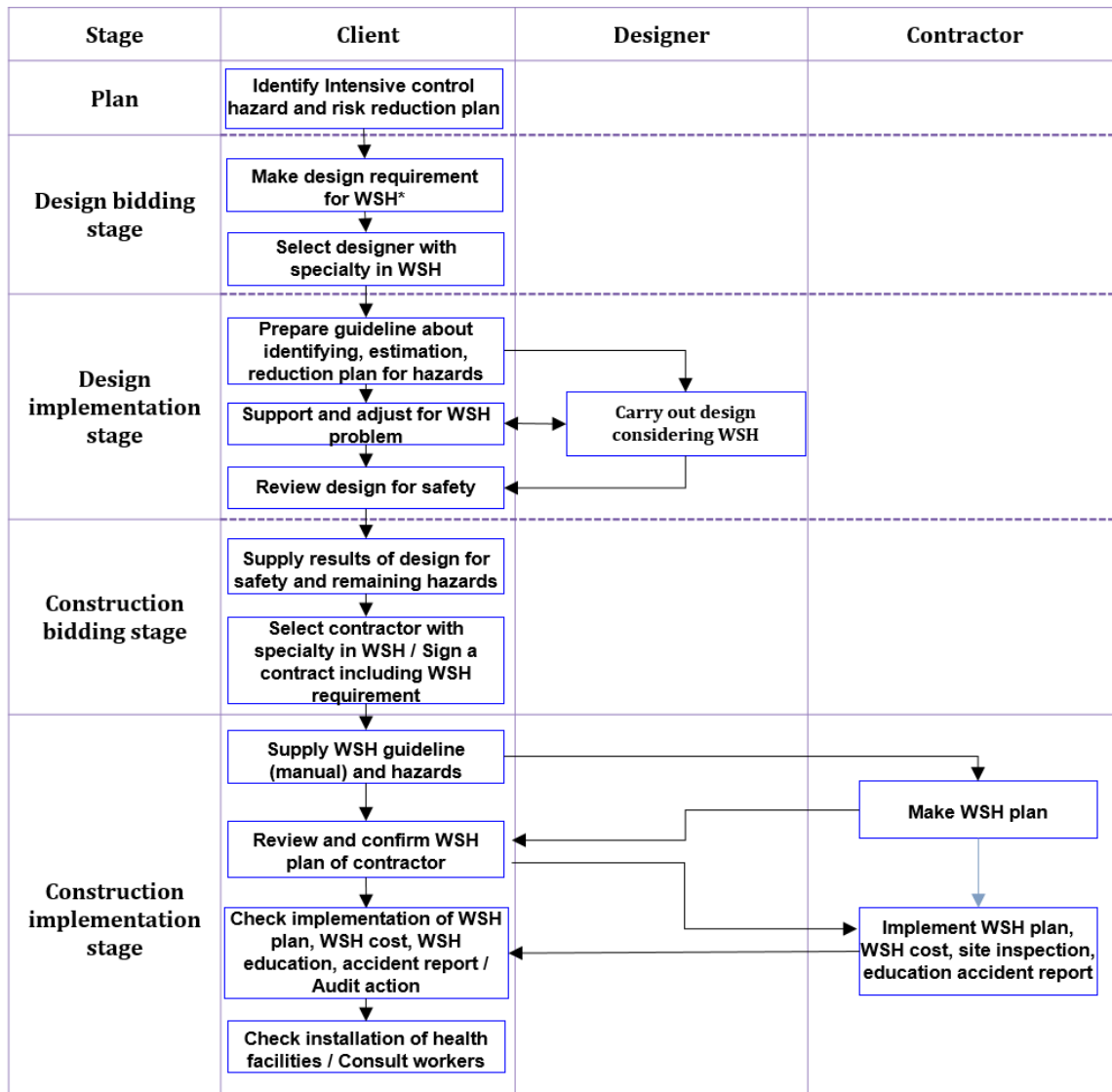
Classification	Option selection (%)					
	1	2	3	4	5	6
Client	18.7	4.3	49.7	8.0	18.7	0.5
Safety manager	34.1	32.6	20.7	6.7	4.4	1.5
Construction manager	27.4	25.8	17.7	9.7	14.5	4.8
Supervisor	37.5	15.6	31.3	6.3	9.4	0.0
Total	27.1	17.9	33.6	7.5	12.5	1.4

4 CLIENTS' ROLE IN PLAN, DESIGN AND CONSTRUCTION STAGE

Domestic construction process and guidance, foreign law and safety systems, and various researches were studied to identify the clients' role through the whole construction process (EU 1992, HSE 2015, Health and Safety Authority 2009, Huang and Hinze 2006, ILO 1992,

Smallwood 1998). Then, experts about construction safety and health discussed about the clients' role according to the construction stage. Finally, the clients' role was suggested in plan, design, construction stages as shown in Figure 2.

In the plan stage, clients should identify hazards controlled intensively and establish the approximate risk reduction plan. In the design stage, clients should control design process to carry out DFS (design for safety) by a competent designer. In the construction process, clients should select a competent contractor in the safety and health management. And, clients should check and audit the construction site whether the contractor implement the workplace safety and health plan or not.



* WSH : Workplace Safety and Health

Figure 2. Suggestion of clients' role according to construction stage.

5 CONCLUSION

The method for imposing construction client's duty in Korea construction safety and health manage system was surveyed and the client's role was suggested in the whole construction process. From the survey, it was found that safety managers and supervisors were strongly agreed to impose the client's duty legally. For the imposing method for client's duty in a law, safety managers and construction managers preferred to appoint a safety and health specialist instead of the client or to assign a client direct role and responsibility, while the client wanted to give client's role and responsibility to the supervisor. The client can be a key player and mediator in the construction safety and health management system by performing the appropriate role suggested in this study according to plan, design, and construction stage

Acknowledgments

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