

SITE MEETING AS A SUSTAINABLE CONSTRUCTION TOOL[∇]

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Abstract

Site meeting is one of the oldest - and current way of managing problems emanating from construction projects and enforcing acceptable standard. This study therefore examined the use of site meetings in addressing the level of occurrence of construction problems and challenges thereby ensuring sustainability of construction projects. Data were collected through questionnaires administered on construction professionals with relevant experience in Switzerland. Site meeting helps to enforce quality standards such as developing a project quality control plan, assess workmanship during construction, increases communication in the construction team, assess the specification used and requires a competent construction manager. In ensuring that construction projects are sustainable, adequate site meetings will ensure that protective clothing, glasses and other wears are used by workers and all stakeholders on construction site, ensure team building, ensures skilled and qualified workers are used on sites; ensure tight but realistic targets are set and ensure that there is a health and safety officer on site. In view of this, site meeting should no longer be perceived as just a routine construction exercise but a great tool for enhancing smooth and acceptable standard for construction process. Competent and experienced project managers should also be appointed by clients, owners and financiers of construction projects for proper coordination of site meetings.

Keywords: *Claims, Conflict, Dispute, Site meeting, Sustainable construction.*

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1. Introduction

The clamour for sustainable infrastructural development has grown over the decades and the construction industry has been identified as a major stakeholder. In the industry, there are several management tools that has been employed for effective and smooth running of construction projects and one of them is site meeting. This management tool has often been employed to ensure that projects are successfully delivered based on the traditional indices of time, cost and quality. All issues, including disputes, conflicts and claims, pertaining to construction projects are discussed and often finalised at site meetings. If these issues are effectively resolved, it will not only ensure that projects are delivered to cost, time and quality but will enhance the general sustainability of the project.

Before the execution of any construction project, pre-construction site meeting is held for the purpose of appraising and generally evaluating the site and the work itself. It is an important meeting because discrepancies that many arose on the start date of the construction works are identified and resolved. Most of these discrepancies which are majorly due to lack or incomplete information in construction documentation would cause delays if they are not identified early enough (Mitropoulos and Howell, 2001). Depending on some factors like size of project, type of project, type of client, etc., site meetings are usually scheduled weekly, monthly or twice in a month to monitor initial design and concept in relation to the actual occurrence on site. The aim of site meeting is to document site activities and provide technical and professional answers to prevent disputes that may eventually lead to claims (Gorse and Emmitt, 2003). In essence, building projects are managed from inception to completion using site meetings, dispute is avoided by solving problematic issues that site agents, consultants and sub-contractors comes across during construction.

The essence of site meetings is to facilitate smooth running of project from inception to completion stage. Therefore, it is important for project clients to appoint principal agents to manage their construction works to minimize disputes that may delay the completion of the project. The projects principal agents liaise and brief the project clients from time to time on progress and challenges of projects (Love, *et al.*, 2010). It is also necessary for the client to be intimated on the speed of construction and problems encountered by the supervising consultants. If the client has made unrealistic targets concerning any performance indices, the essence of site meetings is to evaluate, scrutinize and arrive at an alternative solution.

Site meeting serves as a central forum for the construction team to table, discuss and hopefully resolve problems encountered at any stage of construction. It plays an important role in the development and maintenance of relationships that mostly influence the construction works (Gorse and Emmitt, 2003). This study therefore examines the role and usefulness of site meeting in achieving sustainable construction through productivity and quality standard improvement

2. Literature Review

The construction industry constitutes of various indispensable professionals. According to Elforgani and Rahmat (2010), architects, mechanical and electrical engineers

influenced 'green' construction designs due to the materials and energy efficiency choice these professionals had amongst others. In doing this, other professionals on the projects must be carried along so as to guide against conflicts due to lack of information. Berardi (2015) and Conte and Monno (2012) analyzed that limited consideration of the aspect concerning socio, and economic facet of sustainability has been focused on at the building scale, but various limiting tools of the current sustainability assessment exist. One of these tools is site meeting that are conducted regularly to guide the affairs of construction projects and enforce necessary standards.

Sustainability as a concept has increased popularity across various disciplines and sectors including the construction industry due to the Brundtland Commission Report that took place in 1987 (Ugwu *et al.* 2006). Berardi (2015); du Plessis and Cole (2011) and the Environmental Protection Agency (2008) substantiated that the popularity of sustainability is channeling the construction industry, and the governance of the Built Environment is well on its road to a rapid transformation.

A contract for a construction project is signed by concerned parties after a tendering process for the purpose of selecting contractor that had satisfies all the requirements made by the consultant and client. A contract signed by selected contractor and client/client's representative stipulates import items regarding the contract such as contract cost, contract duration, specification of work, laws and regulations binding the contract, etc. Site meetings discuss all project payments that need to be paid and payments that are under process. It helps to track all payments that are due and over due to the contract participants. In terms of cost due, a contract stipulates the number of days the project client must have paid the contractor. (Denim, 2007).

Construction site meetings are generally to discuss specific tasks and ideas that are mostly listed on the agenda and they are usually held at a scheduled time during the construction stage, using minutes, or other types of logs and letters that the companies can receive explanations whenever needed (Mincks & Johnston, 2011). It was further stated that not all site meetings can be made formal, but all written specification and details must be kept with the principal agent. Levy (2009) noted that construction clients and companies employ construction professionals to shoulder the responsibilities of construction process and activities from start to finish so as to achieve projects delivered to time, cost, quality and other performance measures. Mincks & Johnston (2011) concluded that site meetings minutes are the only effective way to record the details and contents of meetings and to hold all present individuals or companies accountable for their statement. It should be a clear depiction of what actually transpires during the meeting date. For a better start of any construction project, the principal agent normally arranges a pre-construction site meeting between the contracting parties, that is, client, clients' representatives, contractors and other necessary stakeholders.

There are instances where cost in a contract may vary or a certain work was unforeseen during design stages. The contingency amounts cover those items. A contractor may cost all extra works from construction works and submit to the principal agent for approval. There is normally a list of variations (Sergeant and Wieliczko, 2014) that has occurred in construction site and is listed under the progress site meetings. It helps the principal agent to see if the amount for unforeseen work has been overrun or not. The

management of cost in a project is imperative to the completion of works and also to exactly know if the project is really going to be finished on the same tender price or not (Potts, 2008).

3. Research methodology

This study adopted a quantitative research method, it follows a deductive style in relating the theory, collection of data, analysis and reporting. The study area is Mbabane, Swaziland which is the capital and largest city in the country.

Using convenient sampling, a survey of clients, building contractors and construction professionals that are registered and certified to practice in the area was carried out. 50 questionnaires were administered on clients, projects managers, quantity surveyors, Architects, Engineers and B1 building contractors through hand delivery and via email. Most of the contracting and consulting firms in the country have their offices situated in the Mbabane central business district. A list of contractors obtained from the Construction Industry Council (CIC) revealed that offices of about 60% of B1 contractors are in the area. The choice of B1 contractors is also on the premise that they are well established firms with offices that could be easily located. They have the required experience of the industry and are therefore conversant with disputes, conflicts, claims and other challenges of the industry. They are also selected due to the size and type of construction projects they are able to coordinate and manage.

A close-ended questionnaire was adopted for the study and was designed in English language since the respondents were educated construction professionals; hence, they could read and answer the questions without difficulties. A cover letter was provided where the respondents were assured of anonymity of their responses. It also provided instructions and guidelines to the questionnaires so as to guide the respondents in filling the questionnaires. Section A was aimed at gaining demographic data such as gender, age, ethnicity, education level etc. and it was ensuring that questions that could reveal the identity of the respondents were excluded. The other sections were arranged according to various objectives of the study and a paragraph was provided to explain the purpose of each section. And lastly.

A five point Likert scale was adopted in order to assess identified factors from the reviewed literature. The adopted scales are 1=Strongly disagree/ Extremely unlikely; 2=Disagree/ Unlikely; 3=Neutral; 4=Agree/ likely; and 5=Strongly agree/ Extremely likely. The five-point scale was transformed to mean item score (MIS) and Standard Deviation (SD) for each of the identified factors using Statistical Package for Social Science 21 (SPSS). These indices were then used to rank of each item in descending order in order to cross compare their relative importance.

The data collection took an approximate period of 2 months and it took an average of 25 minutes to complete one questionnaire. Overall, a total of 38 were retrieved and were considered usable and fit for analysis.

4. Findings and discussion

4.1. Biographical data of respondents

The first section of the data collection instrument on background information of respondents revealed that 73.68% are males, while 26.32% are females. Majority are between age 26 and 40 with an average of about 9 years experience in the construction industry. The profession of respondents indicates that 36.84% are architects, 23.68% are engineers, 21.05% are quantity surveyors, 10.53% are construction managers and 7.89% are project managers. 50% are working as consultants, 23.68% are with contracting firms, 23.68% are working for government while 2.63% are in other agencies, departments and parastatals.

89.47% of disputes, conflicts and claims in construction projects occurred between the first 6 months of the project. Renovation works are more susceptible to conflicts followed by general government projects, civil works, schools, Hospitals, Housing estates, shopping complexes and stadium construction.

4.2. Prevention of claims and disputes using site meeting

Site meetings has been identified as a major tool for preventing and settling claims and disputes in the construction industry. As indicated in table 1, this is achieved through management of time using programme charts, using site inspections and testing, Cost checking during meetings, Adequate specification documentation by all consultants, communication of potential problems or claims at an early stage, use of pre-construction meetings, assessing quality measuring procedures was and early negotiation for disputed methods.

Table 1. Prevention of construction claims and disputes through site meeting

Factors	MIS	SD	Rank
Management of time using programme charts	4.42	9.238	1
Using site inspections and testing	4.39	7.974	2
Cost checking during meetings	4.29	5.508	3
Adequate specification documentation by all consultants	4.26	7.724	4
Communication of potential problems or claims at an early stage	4.21	6.292	5
Use of pre-construction meetings	4.11	7.326	6
Assessing Quality measuring procedures	4.08	7.234	7
Early negotiation for disputed methods	4.03	7.701	8
Assessing project risks fairly to all parties during meetings	3.95	6.952	9
Use of instruction books	3.89	6.557	10
Recording of payments certificates issued during meetings	3.84	5.066	11
Realistic assessment of a claim value and impact on a project budget	3.84	6.028	12
Educating those responsible for the administration of the contract about rights and obligations of all parties	3.82	5.909	13
Signing of mini-contracts for all sub-contractors	3.82	9.037	14
The project owner must be represented in meetings to avoid interference delays.	3.63	1.732	15
Using site log books	3.29	5.177	16
Setting up a dispute review board before the start of the construction	3.13	4.827	17

4.3. Site meeting as a sustainable construction tool

Site meeting as a sustainable construction management tool from disputes and conflicts resolution techniques was examined from two perspectives. First is to examine the quality standards that the tool enforces and its effect on productivity improvement.

Table 2 indicates quality standards that site meetings enforces to prevent claims and disputes, thereby enhancing project sustainability. The practice helps to develop a project quality control plan, assess workmanship during construction, increase communication in the construction team, assess specification used projects, require a competent construction manager, encourage team work, testing and inspection of specification, enforce testing some materials samples at laboratories to check compliance standards and assess the constructability of the design. Others are enforcement of building regulations in the construction, early warning of troubles ahead, specify quality control testing contracts, ensure conformance to original design and planning requires workman and public liability policies and reduce reworks during construction.

Table 2. Quality Standards that site meetings enforce

Quality Standards	MIS	SD	Rank
Develop a project quality control plan	4.55	8.386	1
Assess workmanship during construction	4.32	7.572	2
Assess the specification used	4.26	8.083	3
Increases communication in the construction team	4.26	9.504	4
Requires a competent construction manager	4.24	8.737	5
Encourages team work	4.18	8.021	6
Testing and inspection of specification	4.16	7.974	7
Enforces testing some materials samples at laboratories to check compliance standards	4.13	9.327	8
Assess the constructability of the design	4.00	8.386	9
Enforcement of building regulations in the construction	3.89	6.877	10
Early warning of troubles ahead	3.84	7.829	11
Specify quality control testing contracts	3.79	8.386	12
Requires workman and public liability policies	3.74	5.983	13
Ensures conformance to original design and planning	3.74	7.848	14
Reduces reworks during construction	3.63	3.416	15
Following prescribed procedures	3.61	7.182	16
Making sure that materials are stored separately	3.53	5.802	17
Ensuring building permits are obtained in the areas of local authority	3.32	5.771	18
To ensure third party inspections are conducted	3.11	5.000	19
Housekeeping during construction	3.05	6.752	20

Site meetings improves productivity and sustainability of construction projects through various means. As indicated in table 3, these include ensuring the use of protective clothing by workers, encourages team building was ranked second, ensure skilled and qualified workers are used on sites, tight but realistic targets are set and ensures there is a health and safety officer on site. It also Increases value reporting on the project, ensures

schedule overruns are avoided, ensures the use of proper tools and equipment on sites, ensures there is a first aid kit on site and promotes usage of group timing or bench marking.

Table 3. Site meetings as productivity improvement tool

Productivity factors	MIS	SD	Rank
Ensures the use of personal protective clothing by workers	4.18	9.037	1
Encourages team building	4.16	7.024	2
Ensures skilled and qualified workers are used on sites	4.11	8.226	3
Tight but realistic targets are set	4.03	7.234	4
ensures there is a health and safety officer on site	3.92	6.656	5
Increase value reporting on the project	3.92	7.500	6
ensures schedule overruns are avoided	3.89	7.550	7
Ensures the use of proper tools and equipment on sites	3.89	9.147	8
Ensures there is a first aid kit on site	3.74	9.290	9
Introducing of group timing or bench marking	3.42	7.141	10

4.4. Discussion of findings

During site meetings, issues relating to construction project in consideration are tabled, evaluated, investigated and enforced where necessary. Such issues are related to cost, time, quality, function, adherence to standard, scope, human resources, risk management strategies, health and safety issues, etc. Love, *et al.*, (2010) noted that site meeting is a management tool that prevents claims and disputes that may or arise in the course of construction. It also aid proper management of time and serve as important tool for project performance and productivity (Denim, 2007). In support of Wolf (2011); and Othman and Mydin (2014), the study concluded that there is a need for good communication among project team and other stakeholders as well as improvement of procedure and issues discussed during site meetings.

5. Conclusion and recommendation

Sustainable infrastructural development are projects that are financially viable, socially beneficial and environmentally friendly. However, conflicts and disputes emanating before, during and after construction projects has contributed to the inability of the industry to deliver sustainable projects. Site meetings have been a major tool for enhancing project success and if properly and effectively adopted, it can be deployed as a sustainable construction management tool. Conflicts and disputes are resolved and prevented through site meetings through management of time using programme chart, cost checking during meetings and communication of potential problems or claims at an early stage. Sustainable projects are achieved in that during site meetings, workmanship, materials, standard and quality of work are inspected and addressed during construction. More so, site meeting ensures adherence to safety and acceptable measures by workers and all stakeholders, ensures skilled and qualified workers are used on sites and increases value reporting on the project.

From the foregoing, site meeting ensures value for money through monitoring and enforcement of acceptable standard. This will aid achievement of objectives of any construction projects and will enhance that they are economically, socially and ecologically delivered to the satisfaction of stakeholders. It is therefore expedient for construction clients to appoint qualified and experienced construction professional as head of project team. Construction professionals engaged on projects should also ensure that acceptable standards are discussed during site meetings and enforced on site. To enhance sustainable projects, project team should also improve on the procedure and matters discussed during site meeting from cost and other technical related to include issues concerning effect of the construction activities on the environment and social well being of the people and how to improve the situation.

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