Investigation into the Level of Compliance to Construction Health and Safety Requirements within the South African Construction Industry

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Abstract

This paper investigates the level of contractors’ compliance to construction Health and Safety legislation requirements within the South African construction industry. The paper critically examines whether the contractors comply with construction Health and Safety Legislation requirements in South Africa and also whether location of site, building type, project value and attitudinal disposition of the site manager/agent has any influence on the level of compliance to Health and Safety legislation on construction sites. The rational for the investigation stems from arguments by building associations that there are shortcomings in the adherence by construction companies registered by the building associations to the requirements of the Health and Safety legislation in South Africa. The paper reveals the key areas in the construction Health and Safety legislation requirements in which contractors’ have complied and discusses the probable reasons for compliance/non-compliance by contractors to Health and Safety legislation requirements on construction sites. It proposes measures that should be used by building associations to engender total compliance to Health and Safety legislation requirements by their contracting members on construction sites in South Africa.

Keywords: Compliance, Contractors, Health and Safety, Legislation Requirements and Master Builder South Africa (MBSA)

I. Introduction

Ally and Esau (2010) stated that compliance is considered to be the practice of abiding with applicable rules and standards. In practice, it describes a situation where the critical mass of the members of a community adheres to those rules and standards. Compliance according to Ally and Esau (2010) therefore signifies acceptance of the constitutional paradigm to the extent that it is embodied in the legislation.

Construction has a poor safety record in South Africa and as a result of this, the Health and Safety in the South African construction industry has been the focus of attention of many industry stakeholders and role players (Smallwood, et al 2009). However, even though many industry associations, contracting organizations, professional bodies and the government have made significant efforts to improve Health and Safety through the enactment, enforcement and compliance with legislation such as the Occupational Health and Safety Act (OHSA) 1993, within the construction industry, the overall construction Health and Safety record is not improving significantly. Instead according to Smallwood et al (2009), the construction industry continues to contribute a disproportionate number of fatalities and injuries to National accident statistics as shown in Figure 1.
Compared to other industries, construction has the third highest death rate (Goldenhar, 2002) and there is documented evidence that construction work is one of the most dangerous occupations to engage in (United States Bureau of Labour Statistics (BLS), 2002). According to Smallwood and Haupt (2008), one of the possible ways by which the number of injuries and fatalities on the construction sites in South Africa can be reduced is through better control and compliance to the Health and Safety Legislation. Smallwood et al (2009) however reported a high level of non-compliance by construction contractors to the requirements of OHSA, 1993 and the Construction Regulations (CR) 2003 in South Africa.

In investigating the level of contractors’ compliance to construction health and safety requirements in South Africa, the paper will first of all review the health and safety legislation available in the South African construction industry. Secondly, the paper will identify the health and safety requirements embodied within the health and safety legislation and standard methods used in measuring compliance. Thirdly, the paper will present the results of physical inspection carried out on selected construction sites by Master Builder South Africa (MBSA) auditors, using a 19-point evaluation tool in assessing the level of compliance by construction companies to health and safety requirements. Fourthly, the paper will present results of the analysis of data collected, detailing the critical areas in which there are adherence/compliance to health and safety requirements and the effect of site location, building type, project value and attitudinal disposition/commitment of the site manager/agent on the level of compliance to Health and Safety requirements. Finally the paper discusses the probable reasons for compliance/non-compliance by contractors to health and safety legislation on construction sites and proposes measures that could be used by stakeholders which includes the government and building associations to engender total compliance to health and safety requirements by contractors on construction sites in South Africa.
II. Review of Health and Safety (H&S) legislation in the South African construction industry

The primary Acts that are applicable to construction with regard to H&S in SA are Occupational Health and Safety (OHSA) Act No.85 of 1993 and the Complementary Compensation for Occupational Injuries and Diseases Act No.130 of 1993 (COID Act) which replaced the previous machinery and occupational safety Act No.40 of 1989, the Machinery and Occupational Safety Amendment Act No.97 of 1991 and the Construction Regulation (CR) of 2003 under section 43 of the OH&S 1993 Act. However, this study will focus more on OHSA 1993 and CR 2003 because a significant number of the H&S requirements assessed on site during inspection are obtained from these Acts.

The Occupational Health and Safety Act (OHSA) 1993

The OHSA 1993 was produced to provide for the health and safety of people or persons at work, in connection with the use of plants and machinery, the protection of people other than persons at work against the hazards to health and safety of or in connection with the activities of persons at work, to establish an advisory council for Occupational Health and Safety and to provide for matters connected therewith. OHSA contains many rules and regulations that protect all workers in different industries however this paper focuses on the construction industry. OHSA states rules and regulation for both employers and employees to comply with before, during and on leaving the industry. Weil (2001) stated that OHSA must be seen as part of the bigger project of building a society based on the democratic values of human dignity, equality and freedom.

The OHSA 1993 Act is applicable to every work type in South Africa as opposed to the construction regulation, 2003. It specifies the general duties of the employer of which is the contractor in this case to their employees.

The Construction Regulation (CR) 2003

Smallwood & Haupt (2005) stated that the CR 2003 was introduced in the construction industry due to continuing poor construction H&S records. Geminiani & Smallwood (2008) further elaborate that the CR was produced with the intention to have a set of legislations specifically directed at and applicable to the construction industry. The CR 2003 acknowledges every individual including clients, designers and quantity surveyors of their responsibilities with regard to OHS in the construction Industry. Clients are required to – inter alia- provide the principal contractor with the Health and Safety specification and ensure that the principal contractor have made adequate allowance for Health and Safety. Designers are required to –inter alia – provide the client with all relevant information about the design, which will affect the pricing of the works, inform the contractor of any known or anticipated dangers or hazards, provide the contractor with a geo-science technical report, and the methods and sequence of construction, and modify design where dangerous procedures would be necessary, or substitute hazardous materials (ibid cited in Smallwood & Haupt, 2007).

According to Smallwood et al (2009), the manifestations of the impact of CR 2003 are wide spread and it can be inferred that CR had a positive impact on reducing the construction health and safety accidents in the industry. In particular, it has increased
H&S awareness and increased consideration by project managers and general managers and general contractors. However findings by Smallwood & Haupt (2006) indicate that there has not been an increase in consideration for H&S by designers and Quantity Surveyors and only a marginal increase by subcontractors. Agumba & Haupt (2009) opined that Occupational Health and Safety should not be driven by a legal framework however should be seen as a value.

The intention of the CR is good despite various problems that have been pointed out. However, according to Smallwood et al (2009), legislation is just a handy guide in prescribing minimum rules and regulations, but management skill are required to bring a healthy and safe workplace to realization. Occupational health and safety is not only a programme that calls for integration at various phases and stages of a project but it also is a process, which requires continual improvements.

The CR 2003 stipulates the principal contractor's duties as applicable to the contractors that are appointed as principal contractors for the main construction works and whereby they have sub-contractors doing some of the other construction works/trades for them under the same construction site.

- Emphasis on the identification of construction hazards and the assessment of risks to eliminate, avoid or at the very least reduce perceived risks.

### III. Data and Methods

The appointed Master Builder South Africa (MBSA) auditor audited fifty-five sites over a period of four months in 2010. The sites were predominantly located in the Cape Town Metropolitan area. However, there were some sites that were situated in the Boland area, which includes Strand, Somerset West, Paarl and Stellenbosch. The types of site audited ranged from high value homes, mass medium housing, shopping centres and hotels to Institutional and civil engineering projects. Members of the MBSA Western Cape, South Africa were managing all these sites.

Compliance to OHSA 1993 and CR 2003 on the construction sites audited was measured by the use of the Master Builders South Africa (MBSA) Audit System, which is compiled using the requirements stated in both Acts. It should be noted that while the MBSA aims to establish what are the shortcomings in the H&S programmes of its members, compliance assessment carried out by Department of Labour (DOL) is statutorily required for enforcement of H&S legislation on construction sites.

The construction companies are said to be compliant with both the OHSA 1993 and CR 2003 when all the requirements starting from the documentations signage on site, H&S plan, Personal Protective Equipments (PPE), etc as stated in law are in place. If a company is found not to have some of the requirements in place, they are registered as being non-complaint.
Statistics and Measurement

In analyzing the site inspection data provided by the MBSA, the paper seeks to understand the nature of compliance to H & S requirements within the South African construction industry by:

i. finding out the H & S requirements that is the most/least complied with;
ii. finding out if there is any relationship between the level of compliance to H & S requirements achieved on site and the location of the site, the building type, the value of the project and the attitude of the site manager. This is shown schematically in Fig. 2.

![Fig. 2 Schematic Model of Propositions to be tested](image)

The principal method used in analyzing the data provided by the MBSA is the chi-square ($\chi^2$) because it is a test of association between two sets of data that is nominal or ordinal (Naoum, 2007).

The location of the site was measured by identifying the site as either a rural, semi-rural or urban area. The building/facility type was identified using the classification and designation of occupancies available in the National Building Regulations. The project values were also grouped into classes based on the value of work categories found in the MBSA work classification as less than R5m, R5m to < R20m, R20m to < R50m, R50m to < R120m, R120m to < R200m, R200m to < R500m and above R500m. To measure the site manager’s attitude, his level of commitment towards and job involvement in the implementation of Health and Safety requirements was observed during the survey. He was then scored as being either committed, low or no commitment.

The MBSA audit system which, looks at 19 different elements of H&S requirements as listed in Table 1 was used in measuring the level of compliance to health and safety requirements on site. This audit tool is used to score the level of compliance on site to the requirements audited using percentages.

### IV. Results and Discussion

Table 1 presents the average scores achieved in percentages by all the sites audited in the Western Cape by the MBSA audit team in 2010, for each of the listed Health & Safety requirements.
Table 1 MBSA H&S Requirements and Points Achievable

<table>
<thead>
<tr>
<th>S/No</th>
<th>Health and Safety Requirements</th>
<th>Points Achievable</th>
<th>% of Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Material Hoist</td>
<td>44</td>
<td>100%</td>
</tr>
<tr>
<td>2</td>
<td>Cranes</td>
<td>166</td>
<td>99.9%</td>
</tr>
<tr>
<td>3</td>
<td>Emergency/Fire Prevention and Protection</td>
<td>92</td>
<td>97.0%</td>
</tr>
<tr>
<td>4</td>
<td>Transport &amp; Material Handling</td>
<td>48</td>
<td>96.2%</td>
</tr>
<tr>
<td>5</td>
<td>Tools</td>
<td>50</td>
<td>95.7%</td>
</tr>
<tr>
<td>6</td>
<td>Education, Training &amp; Promotion</td>
<td>52</td>
<td>95.0%</td>
</tr>
<tr>
<td>7</td>
<td>Administrative and Legal</td>
<td>316</td>
<td>93.6%</td>
</tr>
<tr>
<td>8</td>
<td>Public Safety &amp; Emergency Preparedness</td>
<td>54</td>
<td>93.2%</td>
</tr>
<tr>
<td>9</td>
<td>Plant &amp; Storage Yards/Site Workshops Specifics</td>
<td>88</td>
<td>93.0%</td>
</tr>
<tr>
<td>10</td>
<td>Workplace, Environment, Health &amp; Hygiene</td>
<td>52</td>
<td>92.4%</td>
</tr>
<tr>
<td>11</td>
<td>Demolition</td>
<td>44</td>
<td>92.3%</td>
</tr>
<tr>
<td>12</td>
<td>Electrical Safeguarding</td>
<td>64</td>
<td>91.4%</td>
</tr>
<tr>
<td>13</td>
<td>Housekeeping</td>
<td>98</td>
<td>91.2%</td>
</tr>
<tr>
<td>14</td>
<td>Fall Protection</td>
<td>44</td>
<td>91.2%</td>
</tr>
<tr>
<td>15</td>
<td>Site Plant &amp; Machinery</td>
<td>98</td>
<td>91.1%</td>
</tr>
<tr>
<td>16</td>
<td>Ladders</td>
<td>32</td>
<td>90.9%</td>
</tr>
<tr>
<td>17</td>
<td>Scaffolding, Formwork and Support</td>
<td>366</td>
<td>87.6%</td>
</tr>
<tr>
<td>18</td>
<td>Personal Protective Equipment and Clothing</td>
<td>102</td>
<td>87.1%</td>
</tr>
<tr>
<td>19</td>
<td>Excavation</td>
<td>30</td>
<td>74.5%</td>
</tr>
<tr>
<td></td>
<td>Totals</td>
<td>1840</td>
<td>92.3%</td>
</tr>
</tbody>
</table>

Source: MBSA Western Cape Audit System (2010)

Table 1 reveals that when scores for all the sites audited are averaged and distributed by compliance to the 19 Health & Safety requirements, 95% and above level of compliance was obtained in the following areas - material hoist, cranes, emergency/fire prevention and protection, transport and material handling, tools and education, training and promotion, listed in order of magnitude. The least compliance to Health & Safety requirements is seen in the area of excavation.

This data clearly suggests that accidents on site will not be attributable to the use of plant and other equipment but will be most attributable to the negligence of the contractor during excavation work, not providing personal protective equipment and clothing and inadequate scaffolding, formwork and support. The record of the auditor with respect to excavations noted that “the competence of the appointees is questionable, the law requires that the person appointed have knowledge of the soil conditions and in many cases, this very important knowledge is lacking” (Bester, 2010). The auditor observed that the area of lifting equipment is one area of construction that is fairly well managed probably due to the high cost of replacing equipment, the high risk of accidents and the subsequent damage to equipment.

**Distribution of Contractors’ Site/Facility audited by Level of Compliance**

Table 2 presents the distribution of the contractors’ site/facility audited by the level of compliance.

<table>
<thead>
<tr>
<th>Final Compliance Score as Percentage of total points</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Above 95%</td>
<td>14</td>
<td>25.5</td>
</tr>
<tr>
<td>90% - 95%</td>
<td>19</td>
<td>34.5</td>
</tr>
<tr>
<td>85% - 90%</td>
<td>13</td>
<td>23.6</td>
</tr>
<tr>
<td>80% - 85%</td>
<td>4</td>
<td>7.3</td>
</tr>
<tr>
<td>Below 80%</td>
<td>5</td>
<td>9.1</td>
</tr>
</tbody>
</table>
Table 2 reveals that only 25.5% of the sites audited were able to attain a final H & S compliance score of above 95%. In an ideal situation, 100% compliance to requirements is what the law requires. Giving an allowance of ± 5%, implies that only 25.5% made the mark while an allowance of ± 10% will mean that 60% of the audited sites could be said to have complied with the H & S requirements.

**Test of the Relationship between the Level of Compliance to H & S Requirements achieved on Site and other Study Variables**

The $\chi^2$ test result for the relationship between the level of compliance to H & S requirements achieved on site and the location of the site, the building type, the value of the project and the attitude of the site manager is presented in Table 3.

**Table 3. $\chi^2$ test result for the Relationship between Level of Compliance to H & S Requirements and other Study Variables**

<table>
<thead>
<tr>
<th>Variable</th>
<th>Value</th>
<th>df</th>
<th>Asymp. Significance (2-sided)</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Location</td>
<td>12.551</td>
<td>8</td>
<td>0.128</td>
<td>Not Significant</td>
</tr>
<tr>
<td>Building Type</td>
<td>51.073</td>
<td>32</td>
<td>0.018</td>
<td>Significant</td>
</tr>
<tr>
<td>Value of the Project</td>
<td>31.244</td>
<td>24</td>
<td>0.147</td>
<td>Not Significant</td>
</tr>
<tr>
<td>Attitude of the Site Manager</td>
<td>31.755</td>
<td>8</td>
<td>0.000</td>
<td>Significant</td>
</tr>
</tbody>
</table>

$df = \text{degree of freedom}$

Table 3 shows that the building type and the attitude of the site manager have a significant relationship with the level of compliance to statutory Health & Safety requirements on the construction sites audited. While, the location of the site and the value of the projects were not significant statistically with compliance levels.

From these results therefore, one can conclude that there is a significant relationship in the level of compliance to Health & Safety requirements between sites audited based on the type of building/project being constructed and the attitude of the site manager/agent. The paper shall discuss further, the implications of these findings to compliance with Health & Safety requirements and accidents on site.

**Location.** It was presupposed by the author that the farther a site is from the enforcement agencies and municipalities, the likely the site would be found to be non-compliant with requirements. However, the results of the $\chi^2$ tests suggest the contrary. This might be due to the fact that there were only five sites audited in the areas classified as rural and semi-rural and 45 sites were audited in urban areas. The results in this case can be held as inconclusive until sufficient data is obtained.

**Building/Site Type.** The analyzed data obtained from the MBSA Health and Safety audit indicates that there is a relationship between the building type and level of compliance to Health and Safety Requirements. High compliance to Health and Safety requirements was found in high value homes, manufacturing facilities and plant/storage yards. The data analyzed suggests that the higher the attention to details is required as is the case with high value homes and the more the knowledge of clients such as those found in the manufacturing industry is attuned to the requirements of health and safety, the higher would be the compliance by the contractors engaged to the legislative requirements.
Project Value. There was no significant relationship between the value of work done and the level of compliance to Health and Safety requirements. This might be due partly to the fact that the value of 21 out of the 55 sites/facilities audited could not be ascertained. It is probable that if sufficient information is obtained, it might reveal relationships between project values and level of compliance to Health and Safety legislative requirements.

Site Manager’s Attitude. According to Smallwood et al (2009), minimum rules and regulations can be prescribed but, if management skills are not geared towards the realization of health and safety on site, then, there will be no compliance to regulatory requirements. The results of the MBSA audited scores analyzed is consistent with this assertion because the statistical test reveals that the attitude of the site manager in terms of his level of commitment which is based on his involvement in the implementation of Health and Safety requirements, does have a statistically significant effect on the level of compliance of the site he manages to Health and Safety requirements.

Furthermore, the data reveals that of the 28 managers that showed commitment to Health and Safety requirements, only three had sites that recorded less than 90% level of compliance. Whilst the 24 site managers with perceived low commitment recorded above 90% level of compliance in eight sites and less than 90% level of compliance in 16 sites. The implication of this finding is that the attitude of the site manager in terms of level of commitment towards the realization of Health and Safety requirements on site is crucial to levels of compliance achieved on sites.

V. Conclusions

It can be concluded therefore that the probable reasons for compliance/non-compliance by contractors to Health and Safety legislative requirements on construction sites in South Africa can be attributed to the building/site type and the attitude of the site manager. The data obtained from the audit carried out by the MBSA in the Western Cape Province of South Africa suggests a significant relationship between the building/site type and the attitude of the site manager, to the level of compliance to Health and Safety legislative requirements on site.

Thus, the data analyzed suggests that compliance to Health and Safety legislative requirements is a combination of the building site type and the attitude of the site manager. The study indicates that sites of projects developed for manufacturers who are quite knowledgeable about Health and Safety legislative requirements and sites in which there would be use of heavy machinery would have high levels of compliance to Health and Safety requirements and also that sites manned by uncommitted managers/agents would record low levels of compliance.

Not all the hypotheses tested were however supported. Contrary to expectations, the location of the site and the value of the project had no significant effect on the level of compliance to Health and Safety requirements. Admittedly, these results are tentative and discussions made are speculative because data analyzed were insufficient to arrive at conclusive decisions about the effect of some of the variables such as location and value of the projects, which were tested. However, if the results are valid, they suggest
an association between the level of compliance to Health and Safety legislative requirements on sites and the building/site type, and site managers’ attitude, which provides an intriguing avenue for future research.

Finally the results of the data investigated also indicates that to improve the level of compliance to Health and Safety legislative requirements on construction sites, thereby reducing fatalities and injuries attributable to the construction industry, site managers’ attitudes must be evaluated and only site managers with the requisite skills, capacities and flair should be recruited for the job.

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References


