

THE LONG OVERDUE OVERHAUL OF SOUTH AFRICAN CONSTRUCTION HEALTH AND SAFETY (H&S)

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Introduction

Notable events in the South African construction industry over decades indicate a need to overhaul South African construction health and safety (H&S), and for that matter, quality management, which requires a range of interventions.

‘Chapter 1 The need for construction health and safety’ in the title *Applied Construction Health and Safety* (Haupt & Smallwood, 2023) clearly presents the case for addressing construction H&S, H&S compliance and the prevention of fatalities, injuries, and disease, which although critical, are merely two of 18 reasons.

This article will be on record for years, as is the article ‘NMMU releases report on Prevention of the Collapse of Reinforced Concrete (RC) Structures’ published online on 21 February by SA Builder (2016). The latter mentioned article enabled access to the *Draft Feedback Report on an Exploratory Study ‘Preventing the Collapse of Reinforced Concrete (RC) Structures, Support Work and Formwork During Construction’* (Smallwood, 2016a). It is notable that the report, which was posted on the KZN Master Builders Association (MBA) H&S Forum page on 1 February 2016, recorded 675 views as of 7 May 2024, and a related keynote address delivered to the 9th Construction Industry Development Board (cidb) Postgraduate Conference, 1 - 3 February 2016, posted on 14 March 2016, recorded 536 views as of 7 May 2024. As of 17 May the Forum has 2 641 members.

Furthermore, this article constitutes the first phase of the development of a major ‘document’, and is intended to conscientise, and mobilise stakeholders.

‘Safetyitis’

The use of safety as an alleged all-encompassing term must cease! With respect to South Africa, the Occupational Health and Safety Act (OHSA) replaced the Machinery and Occupational Safety Act (MOSA) in 1993. Then, the health issues are greater than the safety issues, and worse, are latent as opposed to patent. There are two aspects in terms of health, occupational and primary health, which in cases, are inter-related (Smallwood, 2022). Furthermore, the No. 1 H&S issue in construction, globally, is mental health, which is a health and well-being issue (Smallwood, 2023).

‘Cost, quality, and time’

The reference to the passé paradigm of cost, quality, and time as the set of criteria by which projects’ success are measured must cease! Doing so marginalises H&S and confirms ignorance with respect to the synergistic role H&S plays in overall project performance, including client satisfaction. Such reference also marginalises developing an H&S culture and reflects a lack of respect for people.

‘H&S costs money!’

A further term that must cease to be used! The cost of accidents (COA) is a prompt in terms of the ‘economics of H&S’, ideal as all stakeholders can relate thereto, and it can be expressed as a percentage of the cost or value of a project, or the value of completed construction on a macro scale. In South Africa this was estimated to be between 4.3% and 5.4% of the value of completed construction, whereas

the cost of implementing H&S (prevention) is estimated to be between 0.5% and 3% of project costs (Smallwood, 2004).

H&S is a value not a priority

Often H&S is referred to as a priority. Given that priorities may change daily, H&S should be a value i.e., H&S must always be the first consideration and all activities must be 'structured around it'. Consequently, construction stakeholders must be able to deal with conflicting 'priorities'.

Respect for people and 'People are our most important resource'

Respect for people is the catalyst for the value 'people are our most important resource'. However, inadequate welfare facilities on site, among others, are not a manifestation of respect for people. It must be remembered that supervisors and workers that are exposed to hazards and risk are people that have a body, mind, and a soul. They invariably have a partner, a family and are derived from a community. This value is the foundation and catalyst for H&S culture, performance on projects, and the sustainability of an organisation.

Then, there is the issue of working hours per day, and working days per week. Fatigue is a major issue, which militates against construction H&S, including mental health and well-being, productivity, quality, and time performance. The question arises as to which project stakeholder(s) determine a project's duration, and on what basis?

'Failure of management' versus 'accident'

There is no such thing as an 'accident' (myth). Traditional definitions include, among others: 'An unplanned event'. Are 'accidents' unplanned? Absolutely not! Any review will indicate that they are meticulously planned by default i.e., through actions and or omissions. Consequently, given that the five functions of management work are planning, organising, leading, controlling, and coordinating, then unplanned events such as 'accidents' = 'failure of management' (reality). Effectively, this approach constitutes a philosophy, and 'a state of mind'. It should be noted that Schwartz (1995) refers to this 'reality' in *The Magic of Thinking Big*. However, the term management must not be construed to apply solely to contractors, as there is a management echelon in all built environment stakeholder organisations, including client, construction H&S agent (CHSA), construction project manager (CPM), designer, and quantity surveyor.

Elimination / Mitigation of 'excusitis'

Schwartz (1995) maintains unsuccessful people suffer from a mind deadening thought disease called 'excusitis', and that every failure has the disease in its advanced form. However, the more successful the individual, the less inclined he / she is to make excuses.

Statistics

The Federated Employers Mutual Assurance Company (RF) (Pty) Ltd (FEM) provides continually updated injury statistics relative to approximately 50% of the South African construction workforce, which they insure, which includes motor vehicle accidents (MVAs) during employment.

The Compensation Fund was flagged on p. 38 of the cidb's H&S status report (cidb, 2009) in terms of the most recent injury statistics available being for the year 1999. Perhaps the responsible Minister can advise with respect to the status quo in 2024? Suffice to say, if the Department of Employment and Labour (DEL) cannot resolve this immediately, then they must hand the data over to an entity that can deliver. The DEL should consider FEM.

It should be noted that the fatality rate (FR) / 100 000 workers in South African construction for 2022 is 17.5, and the accident rate (AR), 2.11 / 100 workers (FEM, 2024). The FR in Australian construction for 2021 is 2.1 (Safe Work Australia, 2023), and UK construction for 2022/23 is 2.1 (HSE, 2024).

A further disease is ‘numberitis’ relative to injury statistics i.e., employment levels change, and therefore rates are the only option to monitor the level of injuries and trends.

Leading (performance) versus trailing (outcome) indicators

Although injury statistics are referred to as ‘trailing’ or ‘outcome’ indicators, they are of value in that they enable benchmarking and constitute motivators for action and interventions. They include, among other, the AR, FR, and disabling injury incidence rate (DIIR). However, ‘leading’ or ‘performance’ indicators’ constitute predictors of performance, and include, among others: percentage of supervisors that have received H&S training, percentage of workers that have received hazard identification and risk assessment (HIRA) training, and percentage of designers that have received design HIRA training.

The role of clients in construction H&S

Clients initiate projects, provide the finance, or secure the finance therefore, and influence construction H&S directly and indirectly. Indirectly through, among others, nature of the project, number of storeys, project location, project duration, selection and appointment of consultants, and ensuring adequate principal contractor financial provision for construction H&S. Directly, through, among others, choice or influence of structural frame, and choice of materials. Although ‘better practice’ construction H&S clients influence construction H&S, and have done so prior to the 2003 Construction Regulations, many clients are not knowledgeable or very knowledgeable with respect to construction H&S and quality management, and to exacerbate the situation, neither many non-CPM principal agents (PAs).

The role of project financiers

The Environmental, Health, and Safety (EHS) Guidelines of the International Finance Corporation (IFC) (2007), which is part of the World Bank Group, constitute an example of the extent to which project funders endeavour to influence construction H&S.

Project financiers must ‘protect their interests’, which are all encompassing, not just H&S, and quality, and time being an obvious issue. Therefore, they should conduct rigorous project risk assessments, and include construction H&S and quality management criteria when pre-qualifying requests for project funding.

Construction H&S agents (CHSAs)

CHSAs are invariably appointed after Stage 1 ‘Project initiation and briefing’, and even worse, at stage 4 ‘tender documentation and procurement’. Then CHSAs are often not appointed by the client, but by PAs or another member of the design team. The Construction Regulations are very clear with respect to a direct appointment.

The Construction Regulations

The 2017 Construction Regulations Guidelines cannot be deemed guidelines! The DEL and the built environment in general must read the title *Applied Construction Health and Safety* (Haupt & Smallwood, 2023). This title constitutes guidelines, and the designer-related chapters are likely to be illuminating to both the DEL and designers. These include ‘Chapter 4: Designing for construction H&S’, ‘Chapter 6: Designer H&S specification’, ‘Chapter 7: Design hazard identification and risk assessment’, and ‘Chapter 8: Designer report’.

The industry confusion with respect to what an H&S specification should include must be addressed, including the difference between a ‘designer’ H&S specification, and a ‘contractor’ H&S specification. Then, the now ‘infamous’ H&S file, which is not an H&S file, but a collection of contractor collated project H&S documentation, must be addressed. The abovementioned title and the Health & Safety Executive (HSE) (2015), United Kingdom (UK), are very clear with respect to this matter. The H&S specification and H&S file issues were flagged on p. 39 of the cidb’s H&S status report (cidb, 2009).

Hopefully, the people involved with the revision of the Construction Regulations understand and appreciate, among others, the structure of the industry, ‘project managing construction H&S’, and ‘designing for construction H&S’.

Furthermore, they must not exclude mentioning and tasking CPMs as in the case of the 2003 and 2014 versions, which leads to the question: ‘Who should be responsible for integrating construction H&S into projects?’ Given that CPMs manage design delivery, the procurement process, and oversee the construction process, they are ideally suited to integrate construction H&S into projects, and to accept ‘single point’ responsibility for the integration thereof.

Barriers to entry

Are there barriers to entry, and if so, what do they entail? What generic, H&S, and quality skills training did most supervisors, skilled, semi-skilled, and general construction workers receive? What qualifications does a contractor’s staff need to possess, what resources does a contractor need to possess, and what H&S and quality management interventions do they need to undertake, to register with the cidb? This applies to contractors applying for membership of employer associations.

Then, the reality is that contractors do not have to register with the cidb or become a member of an employer association to undertake private sector work. However, should contractors become a member of an MBA or the South African Forum of Civil Engineering Contractors (SAFCEC), they will receive H&S-related communications and their projects are likely to be visited by H&S advisors who are indirectly funded by FEM, regardless of the degree of contractors’ commitment to H&S. Furthermore, the MBSA, MBAs, and SAFCEC organise H&S competitions and manage an H&S star grading programme. Do the cidb, Department of Public Works and Infrastructure (DPWI), and National Home Builders Registration Council (NHBRC) undertake similar interventions?

Inclusion of construction H&S in registration and membership processes

Criteria such as H&S management systems, and quality management systems must be included in the cidb and NHBRC contractor registration processes, and employer associations’ e.g., MBAs and SAFCEC, membership application processes.

The ‘Scope of Work for Categories of Registration’

The six statutory built environment councils must review their respective ‘Scope of Work for Categories of Registration’ to ensure that they reflect ‘better practice’ H&S, and quality management, and reality.

Currently, the focus of registration is on projects. However, the construction of projects is undertaken from the business of construction, and not *vice versa*, the reality being that a construction business, including the owner, may not be knowledgeable with respect to construction, and / or H&S and quality management. Furthermore, the business of construction influences H&S and quality management on projects. This analogy applies to many clients.

Procurement

Clients must pre-qualify, prior to appointment, CPMs, CHSAs, designers, and quantity surveyors (Qs) in terms of ‘designing for construction H&S’ competencies, systems, and processes, and quality management competencies, systems, and processes.

Clients must pre-qualify contractors in terms of H&S management systems, workers' compensation insurance claims (loss) ratios, other H&S performance measures, and quality management systems relative to both private and public sector projects.

The assessment of private and public sector bids or tenders must include H&S and quality management criteria.

A 'letter of good standing' is a given in terms of H&S management, and hardly constitutes a 'filter'.

Financial provision for construction H&S

Although a procurement issue, it requires special 'treatment'. The author has been lobbying the Joint Building Contracts Committee (JBCC) with respect to recognising the need for the inclusion of a detailed H&S Preliminaries section in Bills of Quantities since 2013. This need has been confirmed courtesy of extensive research conducted by the author and several co-researchers / authors, and published globally, among others, by Emuze & Smallwood (2014).

Construction H&S documentation

One of the conclusions arising from the study *H&S documentation in construction* is current H&S documentation "is inappropriate in that it can be complex, generic, lengthy, onerous, repetitive (duplicative), and vague; it engenders dubious practices; it generally 'does not add the potential value'; it shifts the focus from the physical process, and it could be improved." (Smallwood & Bester, 2020).

Construction H&S became a 'paper exercise' upon the gazetting of the Construction Regulations in 2003. At the very best, it can be argued to constitute unintended consequences. Although H&S documentation is necessary, it must never compete with, or overshadow the 'physical process and activities'. Constant HIRA relative to excavations is more important than 'ticking' 'Excavation inspected prior to commencement of work' in an excavation register!

Multi-stakeholder project H&S plans

The need for such plans has been recommended, including to the cidb (Smallwood & Haupt, 2010). Such plans should clearly indicate the construction H&S interventions per stakeholder for each of the six stages of projects. However, such plans should be complemented by similar plans for the environment, risk, and quality.

Construction H&S is a construction management line function

Construction H&S should and must be a construction management line function, as cost, environment, productivity, quality, and time. The Construction Regulations' requirement to appoint a construction H&S officer (CHSO) resulted in the perception that construction H&S is the function of the CHSO. Although CHSOs are and can fulfil a staff function, they are invariably not included in the site management of a project. Furthermore, the construction manager is responsible for the physical construction process.

Then, the gazetted requirement that CHSOs register, resulted in a plethora of applications to register. As the applications intensified, the author commented to the then Registrar, and CHS Executive, The South African Council for the Project and Construction Management Professions (SACPCMP), that the South African Institute of Occupational Safety and Health (Saioosh) did not even have that many members, the point being that many applicants perceived the requirement to register as a 'job opportunity', with its inherent dangers.

Inspections and review

The OH&S Inspectorate, DEL, must review client and designer contributions to construction H&S. In the case of clients, the baseline risk assessment, and H&S specification (designer and contractor versions), including the processes adopted. In the case of designers, the designer report including interrogation of raw and residual risk, and the design HIRA process. The HSE's initiatives in the UK in this respect should be noted (Charnock, 2004).

However, it is necessary to remind the reader that 'construction H&S cannot be inspected into the built environment' and that H&S compliance is the third stage in a five-stage journey (Figure 1 below). Imagine only complying with the requirement to inspect excavations daily, prior to the commencement of each shift - even hourly is insufficient as excavations are a dynamic process.

Section 32 Inquiry Reports and Professional Association / Statutory Council 'investigations'

These must be expedited expeditiously bearing in mind the families of deceased workers and others, the need for closure, and to communicate 'lessons learnt'. However, prevention through continuous improvement and 'better practice' H&S is preferable to 'testing projects on people'.

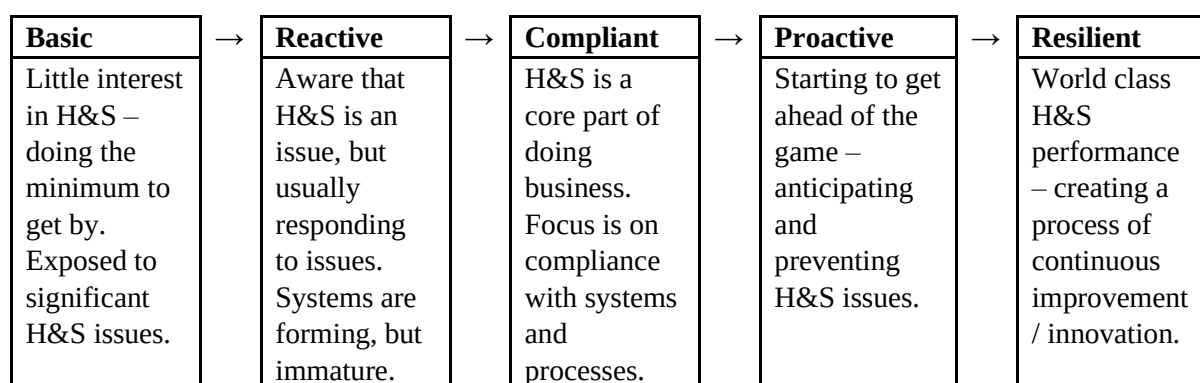
Then, how many construction-related Section 32 reports have been published other than the *Section 32 Investigation Report into the Injaka Bridge Collapse of 6 July 1998* (Department of Labour, 2002)?

The H&S journey model

Figure 1 presents Anglo American plc's H&S journey model (Foster & Hoult, 2013). It is notable that compliance, which includes compliance with legislation and regulations, does not constitute the 'end' of the journey, but a stage in the journey. Thereafter, the 'proactive' stage precedes the 'resilient' stage, manifested in world class H&S performance – creating a process of continuous improvement / innovation.

However, the challenge in South African construction is realising 'compliance'! During visits to 1 415 construction sites by Department of Labour (DoL) inspectors, 52.5% of contractors were determined to be H&S non-compliant (cidb, 2009). Can the now DEL advise with respect to the level of compliance in 2023? Then, there are the other stakeholders – to what extent do they comply?

Figure 1: Anglo American plc's H&S journey model



Continuous improvement

The author was honoured and privileged to conduct a study 'Improving H&S performance in WBHO' and to present to two WBHO Annual Conferences in 2016. The top management, and Group H&S Manager of WBHO championed the study. Question 2 required respondents to indicate the importance

of 122 (note the No.) aspects / interventions / issues / stakeholders in terms of improving WBHO's H&S performance. Furthermore, factor analysis conducted relative to question 2's data, resulted in the development of nine pattern matrices, and the conclusion that the requisite 'cocktail' of aspects / interventions / issues / stakeholders must be in place, and each to an optimum extent. This relates to stage 4 'Proactive' and stage 5 'Resilient' in Figure 1 above.

Surface competencies, core competencies, and emotional quotient

Competency and more specifically, 'competent' person is frequently referred to, and certainly within legislation, regulations, and standards. Competent generally refers to knowledge, training, and experience, and where applicable, qualifications specific to the work or task. Is this sufficient? No!

Singh (2004) suggests that competencies are divided into two categories; the surface, which are required to be at least effective, and core, which distinguishes superior performance from average performance. The core competencies are: self-concept (values, aptitude, attitude, and self-image); traits (self-confidence, team player, and handle ambiguity), and motives (focus on client success, and preserves organisation / personal integrity). Although the surface competences are important, it is core competencies that are invariably critical in a dynamic environment such as construction e.g., values, aptitude, ability to handle ambiguity, and preservation of integrity.

Smallwood, Emuze, and Bloomberg (2014) investigated the role of emotional quotient (EQ) in terms of managing construction H&S. All 15 EQ attributes / states are more than important in terms of managing construction H&S and contribute to optimising H&S performance on construction projects to more of a major than a minor extent.

Skills training

Given that construction H&S and quality are inter-related, workers must be empowered to 'do work right, first time, every time', while working in a healthy and safe manner and environment. Training in the South African construction industry must be reviewed, as the 'abolition' of the apprenticeship scheme, changed industry structure, and lack of 'barriers to entry' have collectively marginalised training, H&S, productivity, and quality.

Adopting a developmental approach to support small contractors

This recommendation is recorded on p. ii of the cidb's H&S status report (cidb, 2009). 'Breaking news' is the initiation of a mentoring programme by FEM, which will be facilitated by the MBAs. This structured programme is likely to contribute to an improvement in small contractors' H&S performance.

Tertiary built environment education

The findings and recommendations relative to the *Final Report on the Construction H&S Framework for Tertiary Built Environment Education* prepared for the Council for the Built Environment by the author, 7 July 2016, must be implemented (Smallwood, 2016b). The report includes, among others, a table, which indicates the degree of support for the inclusion of 25 aspects in 13 disciplines' tertiary-built environment programmes. Either a construction H&S subject, or a component of a subject.

Statutory council and professional association accreditation panels must focus on and interrogate (note the word) the extent to which construction H&S and quality management are embedded (not addressed) in such programmes.

Funding of construction H&S training, tertiary education, and research

The industry must fund H&S-related training, tertiary education, postgraduate studies, and research - 'What are the Rand sub-totals relative to the aforementioned?' 'Other than the National Research Foundation, and universities to a degree, which other entities fund H&S-related tertiary education,

postgraduate studies, and research?’ It should be noted that FEM funds H&S-related training via the MBAs and SAFCEC.

Digitalisation of construction

This has the potential to contribute to improving, among others, construction H&S and quality performance on projects as determined by the author and other researchers. However, it is not the panacea for the H&S challenges, and will require commitment, funding, and training.

Establishment of an 'H&S Agency'

This recommendation is recorded on p. ii of the cidb’s H&S status report (cidb, 2009). Such an agency, as the HSE in the UK, should be an H&S focus point for construction H&S promotion, awareness, information, advice, and related research.

Genuine concern for and commitment to construction H&S by the media as opposed to sensationalism

The study ‘The role of the media in construction H&S’ (Smallwood & Venter, 2001) interrogated a range of related issues. The point is, the media must address construction H&S on a consistent basis, not only when an ‘accident’ occurs, as the former reflects commitment to construction H&S, as opposed to the latter. However, it should be noted that several contemporary H&S and construction magazines have addressed construction H&S over decades. Media editors must conduct a self-audit!

Conclusions

Construction H&S is a multi-stakeholder issue, which requires an integrated effort managed by a single-point responsible ‘conductor’ who must be well versed in terms of, among others, construction H&S and quality management.

There is an unhealthy ‘H&S culture’ in South African construction in the form of: ‘safetyitis’; a focus on cost, quality, and time; the beliefs that ‘H&S costs money’, and H&S is a ‘priority’ as opposed to a value; a lack of respect for people’; people are not the most important resource, ‘excusitis’; the use of the word ‘accident’ as opposed to ‘failure of management’, and a pre-occupation with trailing as opposed to leading H&S indicators.

A pre-requisite for the realisation of optimum status for, and focus on H&S are respect for people, people-related values, H&S culture, surface and core competencies, EQ in general, which in turn requires comprehensive construction skills training, and tertiary built environment education, which includes construction H&S and quality management.

The general construction environment, structure of the industry, no barriers to entry, pseudo registration of contractors, non-inclusion of construction H&S and quality management as criteria for registration or membership, and appointment to undertake projects, individually and collectively militate against construction H&S and quality.

Recommendations

A paradigm shift is necessary in terms of how construction H&S is viewed, promoted, and approached. Legislation constitutes a template, however it represents minimum requirements not ‘better practice’ construction H&S. Therefore, continuous improvement is the ideal. ‘People are our most important resource’ and ‘H&S is a profit centre’ represent rallying points to mobilise the built environment.

The Construction Regulations must be re-visited, proper guidelines published, and a ‘conductor’ must be identified to ensure that H&S is integrated into construction projects using, among others, multi-

stakeholder project H&S plans. In terms of the building sector of the construction industry, this should be a CPM. The challenge will arise when projects do not entail the appointment of a CPM, but a traditional PA, and then, in a similar vein, with respect to civil engineering projects.

The ‘Scope of Work for Categories of Registration’ relative to the six statutory built environment councils must be re-visited to ensure that they reflect ‘better practice’ H&S, and quality management, and reality.

‘Barriers to entry must exist’, and construction H&S and quality must be included as criteria in registration and membership processes, and during the assessment of tenders or bids in both the private and public sectors. Contract documentation must include detailed references to construction H&S, and facilitate financial provision, therefore.

Generic mandatory skills training must be reinstated, and tertiary built environment education is a must for registered persons, and practitioners involved in the construction industry. Such education must address construction H&S and quality management.

The OH&S Inspectorate, DEL, must review client and designer contributions to construction H&S, and intensify inspections of H&S practices on construction sites, followed by appropriate reports. Furthermore, Section 32 Inquiry Reports and Professional Association / Statutory Council ‘investigations’ must be expedited expeditiously, and in the case of the latter, followed by accessible reports.

An H&S Agency must be established, and the industry must fund tertiary construction H&S education, and research.



Photo: ‘Better Practice’ Construction H&S, Greenacres Shopping Centre, Port Elizabeth (Smallwood, May 2016)

Acknowledgements / Thanks

In the personal capacity as a 4th year construction management trainee, M&R (EP) (Pty) Ltd., working on the Holiday Inn project, Summerstrand, Port Elizabeth, 1983, to Roy Larkin and Andre Lombard, representing BIFSA’s newly established ‘Safety and Loss Control’ division. This constituted an important milestone in the author’s construction H&S journey. Thereafter, in the capacity as the

Assistant Contract Manager, and H&S Coordinator, Mount Road Police Station project phase 2, Port Elizabeth, to the M&R (EP) (Pty) Ltd. team, and Roy Larkin and Andre Lombard, for the gargantuan effort resulting in the achievement of the second ever BIFSA 5-Star H&S grading in 1986.

Those stakeholders who have contributed, as opposed to, marginalised construction H&S. These were acknowledged on p. ii of the cidb's H&S status report (cidb, 2009), and in 'Chapter 23: Multi-Stakeholder Construction Health and Safety' in *Applied Construction Health and Safety* (Haupt & Smallwood, 2023).

The associations, councils, entities, and organisations who facilitated research conducted by the author and co-researchers, in particular, Dr Claire Deacon, Prof Fidelis Emuze, and Prof Theo Haupt, at various stages since the early 1990's: Building Industries Federation South Africa (BIFSA); CBE; cidb; DPW; FEM; GVK-Siya Zama; MBAs (EC, KZN, and WC); Master Builders South Africa (MBSA), NMC, SACPCMP; SAFCEC; Saioh, and WBHO.

The 10 000's (note) of respondents to surveys, and interviewees who participated in construction H&S and quality management studies undertaken by the author and co-researchers since the early 1990's – you know who you are.

The editors of several magazines who have requested construction H&S articles, and the conference, forum, seminar, webinar, and workshop organisers who requested the author and co-researchers to present since the early 1990's.

References

Charnock, D. 2004. *Designer Initiative 2004 Report*. Manchester: Health and Safety Executive (Construction Division).

Construction Industry Development Board (cidb). 2009. *Construction Health & Safety in South Africa Status & Recommendations*. Pretoria: cidb.

Department of Labour. 2002. *Section 32 Investigation Report into the Injaka Bridge Collapse of 6 July 1998*. Pretoria.

Emuze, F.A. and Smallwood, J.J. 2014. Financial Provision for Construction Health and Safety (H&S). In: *Proceedings of the Construction Research Congress*, Atlanta, Georgia, 19-21 May 2014, 1881-1890.

Federated Employers Mutual Assurance Company (RF) (Pty) Ltd (FEM). 2024. Statistics by Subclasses. Johannesburg: FEM. [online] Available at: <https://roe.fem.co.za/Stats#/Subclasses-Stats> [Accessed 20 May 2024]

Foster, P. and Hoult, S. 2013. The Safety Journey: Using a Safety Maturity Model for Safety Planning and Assurance in the UK Coal Mining Industry. *minerals*, 2013(3), 59-72.

Haupt, T.C. and Smallwood, J. 2023. *Applied Construction Health and Safety*. Cape Town: Juta and Company (Pty) Ltd.

Health and Safety Executive (HSE). 2015. *Managing health and safety in construction. Construction (Design and Management) Regulations 2015. Guidance on Regulations*. London: The Stationery Office.

Health and Safety Executive (HSE). 2024. *Work-related fatal injuries in Great Britain, 2023*. Bootle, Merseyside: HSE.

International Finance Corporation (IFC). 2007. *Environmental, Health, and Safety (EHS) General Guidelines*. Washington, D.C.: IFC.

SA Builder. 2016. *NMMU releases report on Prevention of the Collapse of Reinforced Concrete (RC) Structures*. Johannesburg: SA Builder [online] Available at:

<https://www.sabuilder.co.za/2016/02/21/nmmu-releases-report-on-prevention-of-the-collapse-of-reinforced-concrete-rc-structures/> [Accessed 17 May 2024].

Safe Work Australia (SWA). 2023. *Work-related injury fatalities*. Canberra: SWA.

Schwartz, D.J. 1995. *The Magic of Thinking Big*. London: Pocket Books.

Singh, S. 2004. *The Handbook of Competency Mapping*. New Delhi: Response Books.

Smallwood JJ. 2004. Optimum cost: The role of health and safety (H&S). In: Verster JJP, ed. *Proceedings International Cost Engineering Council 4th World Congress*, Cape Town, April 2004. International Cost Engineering Council, 2004: CD-Rom Smallwood-J- Optimum Cost-Health & Safety.pdf

Smallwood, J.J. 2016a. *Draft Feedback Report on an Exploratory Study 'Preventing the Collapse of Reinforced Concrete (RC) Structures, Support Work and Formwork During Construction'*. Port Elizabeth: Nelson Mandela Metropolitan University.

Smallwood, J.J. 2016b. *Final Report on the Construction Health and Safety (H&S) Framework for Tertiary Built Environment Education*. Port Elizabeth: Prof John Smallwood.

Smallwood, J.J. 2022. The 'Health' in Health and Safety in South African Construction. *Shape Shifter*, April / May 2022, 12-15.

Smallwood, J.J. 2023. Mental Health in Construction. *Master Builders KwaZulu-Natal News & Info: Occupational Health & Safety*. Monday 03 July 2023. <https://www.masterbuilders.co.za/news/645017/Mental-Health-in-Construction-.htm>

Smallwood, J.J. and Bester, D. 2020. Proliferation of Health and Safety Documentation in Construction? In: *Proceedings The 8th International Conference on Construction Engineering and Project Management*, Hong Kong SAR, 7 - 8 December 2020, 243-248.

Smallwood, J., Emuze, F. and Bloomberg, C. 2014. Exploring the Importance of Emotional Quotient in Construction: Perspectives from Health and Safety Professionals in South Africa. *Journal of Construction Project Management and Innovation*, 4(1), 721-733.

Smallwood, J.J. and Haupt, T.C. 2010. *Guidelines for Integrated Multi-Stakeholder Construction Health and Safety Plans*. Port Elizabeth: Construction Research Education and Training Enterprises (CREATE).

Smallwood, J.J. and Venter, D. 2001. The role of the media in South African Construction Health and Safety (H&S). *The Australian Journal of Construction Economics and Building*, 1(1), 43-52.

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