

# INAUGURAL PROJECT AND CONSTRUCTION MANAGEMENT PROFESSIONS CONFERENCE

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**COMPETENCIES REQUIRED TO MANAGE  
CONSTRUCTION HEALTH AND SAFETY (H&S)  
AND INTEGRATION OF H&S INTO CONSTRUCTION**

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# Introduction (1)

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- **Competent is when a person is qualified to perform to a requisite standard of the processes of a job**
- **Competence means the condition or state of being competent – skill and standard of performance reached**
- **Competency in turn, refers to the behaviour by which it is achieved**
- **Competence describes what people can do whereas competency focuses on how they do it**

## Introduction (2)

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- **Competencies are components of a job which are reflected in behaviours that are observable in a workplace, the common elements being (Sanghi, 2004):**
  - Knowledge
  - Skills
  - Abilities
  - Aptitudes
  - Personal suitability behaviour
  - Impact on performance at work
- **Two categories of competencies (Sanghi, 2004):**
  - **Surface or threshold:** these are required to be minimally effective, namely knowledge and skills
  - **Core or differentiating:** these distinguish superior from average performers, namely abilities, aptitudes, personal suitability behaviour, and impact on performance at work

## **Introduction (3)**

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**The Construction Regulations: “Competent person means any person having the knowledge, training, experience and qualifications specific to the work or task being performed: Provided that where appropriate qualifications and training are registered in terms of the provisions of the South African Qualifications Authority Act, 1995 Act No. 58 of 1995, these qualifications and training shall be deemed to be the required qualifications and training.” (Republic of South Africa, 2003)**

# Research Study 1 – Methodology (1)

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- Paper addresses the surface H&S competencies Site Managers, Site H&S Officers, and Client Appointed H&S Agents (CAH&SAs) require to manage construction H&S
- The reason for the inclusion of these occupations being:
  - Site Managers are responsible for the management of construction projects – the physical construction process and activities, which includes H&S
  - The occupations of H&S Officer, and CAH&SA resulted from the promulgation of the Construction Regulations
- The study investigated the importance of seventy-nine knowledge areas, and fifty skills relative to these occupations
- Eight composite knowledge areas and seven composite skills

## Research Study 1 – Methodology (2)

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- **Given the objectives of the study it was necessary to select a sample stratum consisting of contractors, which could be presumed to be committed to and which address H&S, and ergonomics related issues, and therefore best able to comment relative to knowledge and skills required to manage or advise regarding H&S**
- **Consisted of 26 general contractors (GCs), who had achieved first, second, or third positions in the Building Industries Federation South Africa (BIFSA) / Master Builders South Africa (MBSA) national H&S competition and, or BIFSA / MBSA 4 or 5-Star H&S gradings on one or more of their projects during the period 1995 to 2003 inclusive**

## Research Study 1 – Methodology (3)

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- The questionnaire was based upon knowledge areas and skills included in a Practice of Construction Management study conducted by Smallwood (2006), which in turn were supplemented by further knowledge areas and skills deduced from the requirements of the Construction Regulations
- 9 responded = response rate of 34.6%  
(Smallwood and Haupt, 2008)

# Research Study 1– Findings (1)

Knowledge area	Occupation							
	Site Manager (PC)		Site H&S Officer (PC)		Client Appointed H&S Agent		Mean	
	MS	Rank	MS	Rank	MS	Rank	MS	Rank
<b>Project administration:</b>								
Codes of practice / Standards	4.57	26=	4.57	12=	4.71	6=	4.62	10=
Contract administration	4.14	61=	3.71	47=	4.67	10	4.17	37
Contract documentation	4.29	53=	4.43	16=	4.29	19=	4.34	27
Professional practice	4.86	6=	4.29	21=	4.71	6=	4.62	10=
<b>Composite</b>	<b>4.47</b>	<b>5</b>	<b>4.25</b>	<b>2</b>	<b>4.60</b>	<b>2</b>	<b>4.44</b>	<b>2</b>
<b>Financial management:</b>								
Accountancy	3.57	77=	2.50	74=	3.00	72=	3.02	75
Cash flow forecasting	3.43	79	2.43	77=	3.00	72=	2.95	76=
Cost control	4.43	43=	3.14	67=	3.33	64=	3.63	65
Cost engineering	4.29	53=	3.00	69=	3.17	69=	3.49	68
Estimating	4.00	68=	2.17	79	2.67	77	2.95	76=
Financial management	4.29	53=	3.00	69=	3.00	72=	3.43	69=
Final accounts	4.14	61=	2.50	74=	2.83	75	3.16	73
<b>Composite</b>	<b>4.02</b>	<b>8</b>	<b>2.68</b>	<b>8</b>	<b>3.00</b>	<b>8</b>	<b>3.23</b>	<b>8</b>

Table 1A: Degree of importance of knowledge areas relative to the management of H&S.

# Research Study 1 – Findings (2)

Knowledge area	Occupation							
	Site Manager (PC)		Site H&S Officer (PC)		Client Appointed H&S Agent		Mean	
	MS	Rank	MS	Rank	MS	Rank	MS	Rank
<b>Design:</b>								
Design (Architectural)	4.57	26=	3.43	59=	4.29	19=	4.10	41
Design (Cantilever platforms)	4.71	17=	4.43	16=	4.14	28=	4.43	16=
Design (Engineering)	4.43	43=	3.50	58	3.86	40=	3.93	56
Design (Process)	4.29	53=	4.00	36=	3.86	40=	4.05	44=
Design (Influence of design on H&S)	4.43	43=	4.29	21=	4.57	11=	4.43	16=
Design (Influence of design on overall performance)	4.29	53=	4.17	31	4.43	17=	4.30	28
Design (Scaffolding)	4.86	6=	4.86	4=	4.57	11=	4.76	5=
Design (Support work)	4.86	6=	4.86	4=	4.57	11=	4.76	5=
Design (Temporary works)	4.86	6=	4.71	8=	4.29	19=	4.62	10=
Structural design	4.71	17=	4.29	21=	4.29	19=	4.43	16=
Drawing (Engineering / Geometric)	4.29	53=	3.29	62=	3.86	40=	3.81	60
<b>Composite</b>	<b>4.57</b>	<b>4</b>	<b>4.17</b>	<b>3</b>	<b>4.25</b>	<b>3</b>	<b>4.33</b>	<b>3</b>

Table 1B: Degree of importance of knowledge areas relative to the management of H&S.

# Research Study 1 – Findings (3)

Knowledge area	Occupation							
	Site Manager (PC)		Site H&S Officer (PC)		Client Appointed H&S Agent		Mean	
	MS	Rank	MS	Rank	MS	Rank	MS	Rank
<b>Law:</b>								
Commercial Law	4.57	26=	3.86	42=	4.00	35=	4.14	38=
Company Law	4.57	26=	3.57	55=	4.00	35=	4.05	44=
Labour Law	4.71	17=	4.14	32=	4.29	19=	4.38	23=
<b>Composite</b>	<b>4.62</b>	<b>2</b>	<b>3.86</b>	<b>5</b>	<b>4.10</b>	<b>4</b>	<b>4.19</b>	<b>4</b>
<b>Construction technology / Technology:</b>								
Information technology	4.14	61=	4.00	36=	3.86	40=	4.00	50=
Surveying (land)	4.14	61=	2.50	74=	2.20	79	2.95	76=
Materials	4.57	26=	3.57	55=	3.71	50=	3.95	54=
Mathematics	4.14	61=	3.29	62=	3.83	49	3.75	64
Measuring (quantities)	3.71	73=	2.71	72	3.17	69=	3.20	72
Methods (construction) - Building	4.86	6=	4.29	21=	4.14	28=	4.43	16=
Methods (construction) - Civil	4.86	6=	4.29	21=	4.14	28=	4.43	16=
Methods (construction) - Marine	4.67	25	3.83	46	3.67	53=	4.06	42=
Physics	4.20	60	3.60	53=	3.60	55	3.80	61
Specifications	4.71	17=	4.50	15	4.50	16	4.57	13=
<b>Composite</b>	<b>4.40</b>	<b>7</b>	<b>3.66</b>	<b>7</b>	<b>3.68</b>	<b>6</b>	<b>3.91</b>	<b>7</b>

Table 1C: Degree of importance of knowledge areas relative to the management of H&S.

# Research Study 1 – Findings (4)

Knowledge area	Occupation							
	Site Manager (PC)		Site H&S Officer (PC)		Client Appointed H&S Agent		Mean	
	MS	Rank	MS	Rank	MS	Rank	MS	Rank
<b>OH&amp;S:</b>								
Environmental issues	4.43	43=	4.71	8=	4.86	2=	4.67	8=
Ergonomics (construction)	4.57	26=	4.57	12=	4.57	11=	4.57	13=
First aid	4.43	43=	4.86	4=	4.71	6=	4.67	8=
Occupational health	4.86	6=	5.00	1=	5.00	1	4.95	1
Occupational hygiene	4.86	6=	5.00	1=	4.86	2=	4.91	2=
Occupational medicine	4.14	61=	4.29	21=	4.17	24=	4.20	34
Occupational safety	4.86	6=	5.00	1=	4.86	2=	4.91	2=
<b>Composite</b>	<b>4.59</b>	<b>3</b>	<b>4.78</b>	<b>1</b>	<b>4.72</b>	<b>1</b>	<b>4.70</b>	<b>1</b>
<b>Planning:</b>								
Planning (Operational)	4.71	17=	3.86	42=	3.50	57=	4.02	47=
Planning (Programming)	4.71	17=	3.29	62=	3.50	57=	3.83	59
Planning (Strategic)	4.57	77=	3.43	59=	3.33	64=	3.78	62
Procedures	4.57	26=	4.33	61	4.17	24=	4.36	26
<b>Composite</b>	<b>4.64</b>	<b>1</b>	<b>3.73</b>	<b>6</b>	<b>3.63</b>	<b>7</b>	<b>4.00</b>	<b>6</b>

Table 1D: Degree of importance of knowledge areas relative to the management of H&S.

# Research Study 1 – Findings (6)

Knowledge area	Occupation							
	Site Manager (PC)		Site H&S Officer (PC)		Client Appointed H&S Agent		Mean	
	MS	Rank	MS	Rank	MS	Rank	MS	Rank
<b>Management / Management of parameters:</b>								
Public relations	4.29	53=	3.57	55=	4.14	28=	4.00	50=
Purchasing	4.00	68=	2.43	77=	2.33	78	2.92	79
Quality management	4.57	26=	4.29	21=	4.00	35=	4.29	29=
Re-engineering	4.43	43=	3.14	67=	3.29	67=	3.62	66
Remuneration	3.71	73=	2.67	73	2.75	76	3.04	74
Research	3.57	77=	3.29	62=	3.43	63	3.43	69=
Risk management	5.00	1=	4.86	4=	4.71	6=	4.86	4
Service management	4.43	43=	4.00	36=	4.14	28=	4.19	35=
Sociology	3.86	72	3.71	47=	3.71	50=	3.76	63
Statistics	4.00	68=	4.00	36=	4.17	24=	4.06	42=
Subcontractor management	5.00	1=	4.29	21=	3.86	40=	4.38	23=
Total Quality Management	5.00	1=	4.57	12=	4.57	11=	4.71	7
Training	4.71	17=	4.71	8=	3.71	50=	4.38	23=
Value management	4.57	26=	4.29	21=	4.43	17=	4.43	16=
Worker participation	5.00	1=	4.71	8=	3.50	57=	4.40	22
Work study	4.00	68=	4.00	36=	3.86	40=	3.95	54=
<b>Composite</b>	<b>4.43</b>	<b>6</b>	<b>3.87</b>	<b>4</b>	<b>3.79</b>	<b>5</b>	<b>4.03</b>	<b>5</b>

Table 1E: Degree of importance of knowledge areas relative to the management of H&S.

# Research Study 1 – Findings (7)

Composite knowledge area	Occupation							
	Site Manager (PC)		Site H&S Officer (PC)		Client Appointed H&S Agent		Mean	
	MS	Rank	MS	Rank	MS	Rank	MS	Rank
<b>Project administration</b>	<b>4.47</b>	<b>5</b>	<b>4.25</b>	<b>2</b>	<b>4.60</b>	<b>2</b>	<b>4.44</b>	<b>2</b>
Financial management	4.02	8	2.68	8	3.00	8	3.23	8
<b>Design</b>	<b>4.57</b>	<b>4</b>	<b>4.17</b>	<b>3</b>	<b>4.25</b>	<b>3</b>	<b>4.33</b>	<b>3</b>
Law	4.62	2	3.86	5	4.10	4	4.10	4
Construction technology / Technology	4.40	7	3.66	7	3.68	6	3.91	7
<b>OH&amp;S</b>	<b>4.59</b>	<b>3</b>	<b>4.78</b>	<b>1</b>	<b>4.72</b>	<b>1</b>	<b>4.70</b>	<b>1</b>
Planning	4.64	1	3.73	6	3.63	7	4.00	6
Management / Management of parameters	4.43	6	3.87	4	3.79	5	4.03	5
Occupation	4.47	1	3.88	3	3.97	2	4.09	

Table 2: Importance of composite knowledge areas relative to the management of H&S.

# Research Study 1 – Findings (8)

Skill	Occupation							
	Site Manager (PC)		Site H&S Officer (PC)		Client Appointed H&S Agent		Mean	
	MS	Rank	MS	Rank	MS	Rank	MS	Rank
<b>Interpersonal / Developmental:</b>								
Communicating (Graphic)	4.00	40=	4.57	7=	4.29	8	4.29	15
Communicating (Oral)	4.43	23=	4.57	7=	4.43	6	4.48	4
Communicating (Written)	4.57	13=	4.57	7=	4.57	3=	4.57	2
Conceptual	4.14	32=	4.43	16=	4.20	9	4.26	17
Conflict resolution	4.57	13=	4.14	24=	4.33	7	4.35	13
Creative	4.00	40=	3.71	40=	3.00	45=	3.57	44
Initiating	4.80	6	4.17	23	3.40	36	4.12	25=
Interpersonal	4.57	13=	4.14	24=	4.00	15=	4.24	19=
Intuitive	4.33	29	3.67	42	3.60	30=	3.87	37
Social	4.00	40=	3.83	39	4.00	15=	3.94	36
Team building	4.86	1=	4.43	16=	4.00	15=	4.43	6=
Training	4.57	13=	4.57	7=	3.67	26=	4.27	16
<b>Composite</b>	<b>4.40</b>	<b>4</b>	<b>4.23</b>	<b>4</b>	<b>3.96</b>	<b>1</b>	<b>4.20</b>	<b>4</b>

Table 3A: Degree of importance of skills relative to the management of H&S.

# Research Study 1 – Findings (9)

Skill	Occupation							
	Site Manager (PC)		Site H&S Officer (PC)		Client Appointed H&S Agent		Mean	
	MS	Rank	MS	Rank	MS	Rank	MS	Rank
<b>General management:</b>								
Administrative	4.14	32=	4.71	2=	4.71	1=	4.52	3
Controlling	4.43	23=	4.14	24=	4.17	10=	4.25	18
Coordinating	4.71	7=	4.29	18=	4.17	10=	4.39	9
Organising	4.57	13=	4.29	18=	3.14	42=	4.00	30=
Supervisory	4.71	7=	4.14	24=	3.50	34=	4.12	25=
Systems development	4.43	23=	4.29	18=	4.00	15=	4.24	19=
<b>Composite</b>	<b>4.50</b>	<b>3</b>	<b>4.31</b>	<b>2</b>	<b>3.95</b>	<b>2</b>	<b>4.25</b>	<b>2</b>
<b>Financial:</b>								
Costing	4.14	32=	3.43	44=	3.33	37=	3.63	43
Estimating	4.14	32=	3.00	48	3.33	37=	3.49	46
Financial	4.29	30=	3.14	46=	3.17	41	3.53	45
Composite	4.19	6	3.19	7	3.28	6	3.55	7
<b>Leadership:</b>								
Decision making	4.71	7=	4.14	24=	3.83	24=	4.23	22
Leadership	4.86	1=	4.29	18=	4.00	15=	4.38	10=
Motivating	4.57	13=	4.71	40=	4.00	15=	4.43	6=
<b>Composite</b>	<b>4.71</b>	<b>1</b>	<b>4.38</b>	<b>1</b>	<b>3.94</b>	<b>3</b>	<b>4.35</b>	<b>1</b>

Table 3B: Degree of importance of skills relative to the management of H&S.

# Research Study 1 – Findings (10)

Skill	Occupation							
	Site Manager (PC)		Site H&S Officer (PC)		Client Appointed H&S Agent		Mean	
	MS	Rank	MS	Rank	MS	Rank	MS	Rank
<b>General management:</b>								
Administrative	4.14	32=	4.71	2=	4.71	1=	4.52	3
Controlling	4.43	23=	4.14	24=	4.17	10=	4.25	18
Coordinating	4.71	7=	4.29	18=	4.17	10=	4.39	9
Organising	4.57	13=	4.29	18=	3.14	42=	4.00	30=
Supervisory	4.71	7=	4.14	24=	3.50	34=	4.12	25=
Systems development	4.43	23=	4.29	18=	4.00	15=	4.24	19=
<b>Composite</b>	<b>4.50</b>	<b>3</b>	<b>4.31</b>	<b>2</b>	<b>3.95</b>	<b>2</b>	<b>4.25</b>	<b>2</b>
<b>Financial:</b>								
Costing	4.14	32=	3.43	44=	3.33	37=	3.63	43
Estimating	4.14	32=	3.00	48	3.33	37=	3.49	46
Financial	4.29	30=	3.14	46=	3.17	41	3.53	45
Composite	4.19	6	3.19	7	3.28	6	3.55	7
<b>Leadership:</b>								
Decision making	4.71	7=	4.14	24=	3.83	24=	4.23	22
Leadership	4.86	1=	4.29	18=	4.00	15=	4.38	10=
Motivating	4.57	13=	4.71	40=	4.00	15=	4.43	6=
<b>Composite</b>	<b>4.71</b>	<b>1</b>	<b>4.38</b>	<b>1</b>	<b>3.94</b>	<b>3</b>	<b>4.35</b>	<b>1</b>

Table 3C: Degree of importance of skills relative to the management of H&S.

# Research Study 1 – Findings (11)

Skill	Occupation							
	Site Manager (PC)		Site H&S Officer (PC)		Client Appointed H&S Agent		Mean	
	MS	Rank	MS	Rank	MS	Rank	MS	Rank
<b>Negotiating:</b>								
Negotiating with clients	4.43	23=	4.29	18=	3.57	32=	4.10	27
Negotiating with material manufacturers	4.00	40=	3.86	34=	2.57	49=	3.48	47=
Negotiating with material suppliers	4.00	40=	3.86	34=	2.57	49=	3.48	47=
Negotiating with plant hire organisations	4.14	32=	4.14	24=	2.86	47	3.71	39=
Negotiating with subcontractors	4.71	7=	4.57	7=	3.14	42=	4.14	23
Negotiating with unions	4.57	13=	4.57	7=	3.14	42=	4.09	28
Negotiating with workers	4.86	1=	4.57	7=	3.29	39=	4.24	19=
<b>Composite</b>	<b>4.39</b>	<b>5</b>	<b>4.27</b>	<b>3</b>	<b>3.02</b>	<b>7</b>	<b>3.89</b>	<b>6</b>
<b>Planning:</b>								
Planning (Forecasting e.g. labour, weather)	4.57	13=	3.57	43	3.00	45=	3.71	39=
Planning (Programming)	4.86	1=	3.43	44=	3.60	30=	3.96	33=
Planning (Preparing generic method statements)	4.57	13=	4.71	2=	4.14	14	4.47	5
Planning (Preparing H&S method statements )	4.86	1=	4.86	1	4.57	3=	4.76	1
Planning (Preparing Site Layouts)	4.43	23=	3.86	34=	3.57	32=	3.95	35
Procedures development	4.43	23=	4.71	2=	4.00	15=	4.38	10=
<b>Composite</b>	<b>4.62</b>	<b>2</b>	<b>4.19</b>	<b>5</b>	<b>3.81</b>	<b>5</b>	<b>4.21</b>	<b>3</b>

Table 3D: Degree of importance of skills relative to the management of H&S.

# Research Study 1 – Findings (12)

Skill	Occupation							
	Site Manager (PC)		Site H&S Officer (PC)		Client Appointed H&S Agent		Mean	
	MS	Rank	MS	Rank	MS	Rank	MS	Rank
<b>Technical:</b>								
Auditing	3.57	49	4.71	2=	4.71	1=	4.33	14
Computer	3.29	50	4.00	31=	4.17	10=	3.82	38
Design (support / formwork)	4.57	13=	4.57	7=	4.00	15=	4.38	10=
Measuring productivity	4.29	30=	3.14	46=	3.67	26=	3.70	41
Measuring quantities	4.14	32=	2.71	50	3.50	34=	3.45	49
Numerical (maths)	4.00	40=	3.71	40=	3.29	39=	3.67	42
Plan reading	4.71	7=	3.86	34=	3.67	26=	4.08	29
Report writing	4.14	32=	4.57	7=	4.57	3=	4.43	6=
Research	3.71	48	4.00	31=	4.17	10=	3.96	33=
Statistical	4.14	32=	4.14	24=	3.67	26=	3.98	32
Surveying (land)	3.86	47	2.86	49	2.67	48	3.13	50
Technical	4.71	7=	3.86	34=	3.83	24=	4.13	24
Work study	4.00	40=	4.00	31=	4.00	15=	4.00	30=
<b>Composite</b>	<b>4.09</b>	<b>7</b>	<b>3.86</b>	<b>6</b>	<b>3.84</b>	<b>4</b>	<b>3.93</b>	<b>5</b>

Table 3E: Degree of importance of skills relative to the management of H&S.

# Research Study 1 – Findings (13)

Composite skill	Occupation							
	Site Manager (PC)		Site H&S Officer (PC)		Client Appointed H&S Agent		Mean	
	MS	Rank	MS	Rank	MS	Rank	MS	Rank
Interpersonal / Developmental	4.40	4	4.23	4	3.96	1	4.20	4
<b>General management</b>	<b>4.50</b>	<b>3</b>	<b>4.31</b>	<b>2</b>	<b>3.95</b>	<b>2</b>	<b>4.25</b>	<b>2</b>
Financial	4.19	6	3.19	7	3.28	6	3.55	7
<b>Leadership</b>	<b>4.71</b>	<b>1</b>	<b>4.38</b>	<b>1</b>	<b>3.94</b>	<b>3</b>	<b>4.35</b>	<b>1</b>
Negotiating	4.39	5	4.27	3	3.02	7	3.89	6
<b>Planning</b>	<b>4.62</b>	<b>2</b>	<b>4.19</b>	<b>5</b>	<b>3.81</b>	<b>5</b>	<b>4.21</b>	<b>3</b>
Technical	4.09	7	3.86	6	3.84	4	3.93	5
Mean	4.41	1	4.06	2	3.69	3	4.06	

Table 4: Importance of composite skills relative to the management of H&S.



# Research Study 1 – Findings (14)

Statement	Response (%)					MS
	Strongly disagree	Disagree	Neutral	Agree	Strongly agree	
H&S should be an integral part of all activities	0.0	0.0	0.0	0.0	100.0	5.00
H&S should be an integral part of construction	0.0	0.0	0.0	0.0	100.0	5.00
H&S should be an integral part of construction management	0.0	0.0	0.0	0.0	100.0	5.00
Site management should take ownership of H&S	0.0	0.0	0.0	0.0	100.0	5.00
H&S should be a line function	0.0	0.0	14.3	0.0	85.7	4.71
H&S can be 'consulted into the construction process'	0.0	0.0	0.0	28.6	57.1	4.67
In order to manage H&S requires knowledge of construction	0.0	0.0	0.0	57.1	42.9	4.43
In order to manage H&S requires knowledge of the construction process	0.0	0.0	0.0	0.0	28.6	4.29
H&S is merely sound construction management	0.0	16.7	0.0	33.3	50.0	4.17
In order to manage H&S requires knowledge of design	0.0	0.0	14.3	71.4	14.3	4.00
In order to manage H&S requires knowledge of the design process	0.0	0.0	28.6	57.1	14.3	3.86
In order to manage H&S requires knowledge of procurement	0.0	0.0	28.6	57.1	14.3	3.86

Table 5: Extent of concurrence with statements.

# Research Study 1 - Conclusions (1)

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- In general the **composite knowledge areas of OH&S, project administration, design, are more important than the other areas. However, knowledge relative to the other areas, namely financial management, law, construction technology / technology, planning, and management / management of parameters, is also important**
- In general the **composite skills of leadership, general management, planning, and interpersonal / developmental are more important than the other skills. However, the other skills, namely financial, negotiating, and technical are also important**

## Research Study 1 - Conclusions (2)

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- **The importance of the composite knowledge areas, the incumbent knowledge areas, the composite skills, and incumbent skills, has implications in terms of the acquisition of underpinning knowledge in built environment technology, design, construction management, and OH&S**
- **The acquisition of the underpinning knowledge in turn has implications in terms of suitable tertiary education programmes:**
  - **Construction Management programmes, which address the streams of economics, management, and science and technology, appear to be the most suitable programmes, particularly those which include a comprehensive subject or component in the form of OH&S, and the subjects project management and theory of structures**

# Research Study 1 - Conclusions (3)

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- The subject project management being important due to the knowledge required relative to the management of design and / or design delivery, and the subject theory of structures being important due to the knowledge required relative to the design of temporary works

## Research Study 2 - Methodology

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- Consisted of 26 'better practice' H&S general contractors – place in top three of various categories of BIFSA / MBSA national H&S competition, and / or 4 or 5-Star H&S gradings on one or more of their projects
- 10 responded = 38.5% response rate

(Smallwood, 2009)

# Research – Findings (2)

Aspect / Issue	Unsure	Very poor.....Very good					Mean Score	Rank
		1	2	3	4	5		
Coordination of projects at site (construction team) level	0.0	0.0	0.0	20.0	80.0	0.0	3.80	1
Construction H&S competencies of Client Appointed H&S Agents	10.0	0.0	0.0	30.0	50.0	10.0	3.78	2
Integration of H&S into the construction process by H&S Officers	0.0	0.0	0.0	30.0	70.0	0.0	3.70	3
Coordination of projects at project (client and design team included) level	10.0	0.0	0.0	40.0	40.0	10.0	3.67	4
Construction hazard identification and risk assessments	0.0	0.0	0.0	40.0	60.0	0.0	3.60	5
Project management competencies of Client Appointed H&S Agents	10.0	0.0	10.0	40.0	30.0	10.0	3.44	6
The contribution of the Construction Regulations to the integration of H&S into projects at site (construction team) level	10.0	0.0	0.0	60.0	30.0	0.0	3.33	7
Integration of H&S into site management	0.0	0.0	22.2	22.2	55.6	0.0	3.33	8
Status afforded to H&S at site (construction team) level	0.0	0.0	0.0	70.0	30.0	0.0	3.30	9
Integration of H&S into construction activities	0.0	0.0	20.0	30.0	50.0	0.0	3.30	10
Pre-qualification of contractors on H&S competencies	10.0	0.0	10.0	50.0	30.0	0.0	3.22	11
Integration of design and construction	10.0	10.0	0.0	40.0	40.0	0.0	3.22	12
Construction H&S competencies of Project managers	0.0	0.0	20.0	40.0	40.0	0.0	3.20	13
Design competencies of Client Appointed H&S Agents	20.0	0.0	20.0	30.0	30.0	0.0	3.13	14
Construction management competencies of Client Appointed H&S Agents	10.0	0.0	10.0	60.0	20.0	0.0	3.11	15

Table 6A: Rating of the South African construction industry in terms of various aspects / issues.

# Research Study 2 – Findings (3)

Aspect / Issue	Unsure	Very poor.....Very good					Mean Score	Rank
		1	2	3	4	5		
Integration of H&S into the construction process	0.0	0.0	30.0	30.0	40.0	0.0	3.10	16
<b>Construction H&amp;S competencies of general contractors</b>	<b>0.0</b>	<b>10.0</b>	<b>20.0</b>	<b>20.0</b>	<b>50.0</b>	<b>0.0</b>	<b>3.10</b>	<b>17</b>
<b>H&amp;S competencies of site management</b>	<b>0.0</b>	<b>0.0</b>	<b>22.2</b>	<b>55.6</b>	<b>22.2</b>	<b>0.0</b>	<b>3.00</b>	<b>18</b>
Site management commitment to H&S	0.0	0.0	20.0	70.0	10.0	0.0	2.90	19
Status afforded to H&S at project (client and design team included) level	0.0	10.0	30.0	30.0	20.0	10.0	2.90	20
The contribution of the Construction Regulations to the integration of H&S into projects at project (client and design team included) level	10.0	0.0	30.0	40.0	20.0	0.0	2.89	21
Pre-qualification of project managers on H&S competencies	20.0	0.0	30.0	30.0	20.0	0.0	2.88	22
<b>Construction management competencies of H&amp;S Officers</b>	<b>0.0</b>	<b>10.0</b>	<b>20.0</b>	<b>50.0</b>	<b>20.0</b>	<b>0.0</b>	<b>2.80</b>	<b>23</b>
Construction H&S competencies of engineers	10.0	10.0	20.0	40.0	20.0	0.0	2.78	24
Design hazard identification and risk assessments	20.0	10.0	20.0	30.0	20.0	0.0	2.75	25
Pre-qualification of designers on H&S competencies	30.0	10.0	10.0	40.0	10.0	0.0	2.71	26
Integration of design and construction in terms of H&S	0.0	10.0	30.0	40.0	20.0	0.0	2.70	27
Construction H&S competencies of architects	10.0	10.0	30.0	50.0	0.0	0.0	2.44	28
Construction H&S competencies of subcontractors	0.0	10.0	60.0	20.0	10.0	0.0	2.30	29
Construction H&S competencies of quantity surveyors	0.0	30.0	40.0	20.0	10.0	0.0	2.10	30

Table 6B: Rating of the South African construction industry in terms of various aspects / issues.

# Research Study 2 – Findings (4)

Statement	Unsure	Strongly disagree.....Strongly agree					Mean Score
		1	2	3	4	5	
H&S is an integral function of site management	0.0	0.0	0.0	11.1	33.3	55.6	4.44
H&S is an integral aspect of the construction process	0.0	0.0	0.0	11.1	44.4	44.4	4.33
The Construction Regulations should require a project close out / final report that includes H&S	0.0	0.0	0.0	20.0	30.0	50.0	4.30
An overall H&S Coordinator should integrate and coordinate design and construction in terms of H&S at project (client and design team included) level	0.0	0.0	10.0	0.0	50.0	40.0	4.20
H&S is as important as cost, quality, and time at site (construction team) level	0.0	0.0	10.0	10.0	50.0	30.0	4.00
H&S is as important as cost, quality, and time at project (client and design team included) level	0.0	0.0	20.0	10.0	30.0	40.0	3.90
<b>Client Appointed H&amp;S Agents lack built environment competencies</b>	<b>0.0</b>	<b>0.0</b>	<b>10.0</b>	<b>10.0</b>	<b>70.0</b>	<b>10.0</b>	<b>3.80</b>
<b>Site management lacks H&amp;S competencies</b>	<b>0.0</b>	<b>0.0</b>	<b>10.0</b>	<b>20.0</b>	<b>50.0</b>	<b>20.0</b>	<b>3.80</b>
<b>H&amp;S Officers have the organisational authority to integrate H&amp;S into the construction process</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>50.0</b>	<b>20.0</b>	<b>30.0</b>	<b>3.80</b>
Generally projects are coordinated by a project manager	10.0	0.0	20.0	10.0	30.0	30.0	3.78
<b>Client Appointed H&amp;S Agents lack construction management competencies</b>	<b>0.0</b>	<b>0.0</b>	<b>10.0</b>	<b>10.0</b>	<b>80.0</b>	<b>0.0</b>	<b>3.70</b>

Table 7A: Degree of concurrence with various statements pertaining to various aspects / issues.

## Research Study 2 – Findings (5)

Statement	Unsure	Strongly disagree.....Strongly agree					Mean Score
		1	2	3	4	5	
Project managers integrate design and construction in terms of H&S	30.0	0.0	10.0	30.0	20.0	10.0	3.43
<b>H&amp;S Officers lack construction management competencies</b>	<b>0.0</b>	<b>10.0</b>	<b>10.0</b>	<b>30.0</b>	<b>40.0</b>	<b>10.0</b>	<b>3.30</b>
Project managers integrate design and construction	20.0	0.0	30.0	20.0	10.0	20.0	3.25
The Construction Regulations do not highlight the H&S requirements for projects in terms of the project phases	10.0	10.0	10.0	20.0	50.0	0.0	3.22
The Construction Regulations promote fragmented contributions to H&S at project (client and design team included) level	0.0	10.0	20.0	30.0	30.0	10.0	3.10
The Construction Regulations promote fragmented contributions to H&S at site (construction team) level	0.0	10.0	10.0	40.0	40.0	0.0	3.10
Project managers possess the requisite construction H&S competencies to manage projects in terms of H&S	10.0	0.0	30.0	40.0	10.0	10.0	3.00
Engineers possess the requisite construction H&S competencies to manage projects in terms of H&S	0.0	0.0	40.0	40.0	10.0	10.0	2.90
Site management is committed to H&S	0.0	10.0	20.0	50.0	20.0	0.0	2.80
Architects possess the requisite construction H&S competencies to manage projects in terms of H&S	0.0	10.0	50.0	30.0	0.0	10.0	2.50
Quantity surveyors possess the requisite construction H&S competencies to manage projects in terms of H&S	0.0	10.0	80.0	10.0	0.0	0.0	2.00

Table 7B: Degree of concurrence with various statements pertaining to various aspects / issues.

## Research Study 2 - Conclusions (1)

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- Coordination is deemed to occur, but it can be enhanced
- H&S is deemed to be integrated into site management, construction activities and into the construction process
- H&S is not afforded optimum status - therefore not an integral aspect of construction
- Perceived competencies:
  - **Generic - Client Appointed H&S Agents in all likelihood not appropriately educated and trained**
  - **Construction H&S – Built environment practitioners in all likelihood not subjected to appropriate tertiary education**

## Research Study 2 - Conclusions (2)

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- **Designers are not contributing sufficiently to construction H&S**
- **Need for a project H&S coordinator to be responsible for the coordination and integration of H&S at project level and during the construction process**

## References (1)

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- Republic of South Africa. 2003. *Government Gazette No. 25207 Construction Regulations 2003*. Pretoria.
- Sanghi, S. 2004. *The handbook of competency mapping*. New Delhi: Response Books.
- Smallwood, J.J. 2006. The practice of construction management. *Acta Structilia*, 13(2), pp. 62-89.
- Smallwood, J.J. 2009. The coordination of health and safety (H&S) and the integration of H&S into projects and the construction process. In: *Proceedings of the CIB W99 Conference 'Working Together: Planning, Designing and Building a Healthy and Safe Construction Industry'*, Melbourne, Australia, 21-23 October, pp. 12-21, Client-led OHS.Pdf ISBN 978-1-921426-47-6

## References (2)

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- **Smallwood, J.J. and Haupt, T.C. 2008. Competencies Required to Manage Construction Health and Safety. In: *Proceedings Rinker International Conference 'Evolution of and Directions in Construction Safety and Health'*, University of Florida, Gainesville, Florida, USA, 9-11 March, pp. 227-240.**

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