Supervision Engineer versus Building Surveyor – the way forward

Dr Jian Liu ¹, Dr George Zillante ², Dr. Jia-yuan Wang ³ and Dr Jian Zuo ⁴

1. Associate Professor, College of Civil Engineering, Shenzhen University, Shenzhen, China, Email: liujian@szu.edu.cn
2. Associate Professor, School of Natural and Built Environments, University of South Australia, North Terrace, Adelaide, South Australia 5000, Australia, Tel: +61 8 8302 2379 FAX: +61 8 8302 2252, Email: George.Zillante@unisa.edu.au
3. Professor, College of Civil Engineering, Shenzhen University, Shenzhen, China, Email: wangjy@szu.edu.cn
4. Lecturer, School of Natural and Built Environments, University of South Australia, North Terrace, Adelaide, South Australia 5000, Australia, Tel: +61 8 8302 1914 FAX: +61 8 8302 2252, Email: Jian.Zuo@unisa.edu.au

ABSTRACT

Building Surveyors in Australia play an important role in the construction industry by ensuring that both the design and the construction of projects conform to the building regulations.

In China, these functions are provided by different organizations ranging from government authorities through to private firms. As an independent third party, a Supervision Engineer is responsible for supervising the project design and construction from the design phase to completion. The scope of supervision involves quality, cost, schedule, safety and environmental management.

Recently, a mutual recognition agreement was signed between the Hong Kong Institute of Surveyors (HKIS) and the China Association of Engineering Consultants (CAEC). Members of the HKIS are qualified to act as the Supervision Engineer in the construction industry in mainland China. The HKIS, being originally based on the British Building Control Surveying system is similar to that used in Australia and should, in time provide some insights for the Chinese system. It appears that there are opportunities for consultants from foreign countries to provide building surveying services in the Chinese construction industry.

The paper compares the Supervision Engineer in China and the Building Surveyor in Australia, from the professional development perspective. Items compared include: structure of the professional body; educational standards required to practice at the professional level; accreditation / registration of individual practitioners and the relationship with the Government.

The paper concludes that there are many similarities between Chinese Supervision Engineers and Australian Building Surveyors and that opportunities exist for these two professional groups to work interchangeably in each other’s domain. Some factors will need further consideration for this to occur.

Keywords: Supervision Engineer, Building Surveyor, construction industry, Australia, China.
INTRODUCTION

The building and construction industry is a major driver of activity in the Australian economy. According to Australian Bureau of Statistics (ABS) data, the construction industry contributed 6.2% of Australia’s gross domestic product in 2004-05 (ABS 2007). In dollar terms, total building and construction industry activity in Australia was valued at $95.8 billion dollars for the year 2005–06. In an industry subject to cyclical swings, this represented an increase of 13% over the previous year.

The past three decades have witnessed the rapid development of China’s economy. Since the ‘open door policy’ was implemented in 1978, ushering in a period of economic reform, China has achieved remarkable success in economic development. To accommodate the rapid expansion in demand for building and infrastructure, China’s construction industry has achieved extraordinary growth and has formed the backbone in China’s economy (Liu, Fellows & Fang 2003; Low & Jiang 2003).

The Chinese construction industry is one of the largest and fastest expanding construction markets in the world. China’s construction market is forecast to grow at a rate of 15% to 30% over the next five years and by 2010 the market is expected to be worth $US 1.7 trillion (TACO 2002).

Both Building Surveyors in Australia and Supervision Engineers in China play key roles in the construction industry. The paper compares these two professions from the professional development perspective.

SUPERVISION ENGINEER IN CHINA

Brief introduction of the profession

The position of a Supervision Engineer has been a legal requirement for all types of government-financed construction projects in China since the implementation of the Provisional Construction Supervision Ordinance in 1988. The project supervision system was initially implemented in China’s hydropower construction field and has been gradually extended to the whole construction industry (Wang et al., 2007). Normally the Supervision Engineers are employed by construction supervision units.

The introduction of project supervision is a significant step towards independent professional construction management services. The functions of the Supervision Engineer cover the design stage (including investigation phase), tendering stage and the construction phase through to the defects liability period (Bajaj and Zhang, 2003). As an independent third party, a construction supervision unit is responsible for supervising the works of a construction project (for example, quality and schedule) during the construction period from the inception phase through to completion. By monitoring various aspects of construction works, a construction supervision unit is meant to bridge the gap between the functions provided by design institutes and contractors.

Presently the Supervision Engineers’ functions are limited to the construction stage where their role is to ensure compliance with construction quality, cost, schedule, safety and environmental management (Wang 2007). It is not unusual for Supervision Engineers to not be involved in the design phase.

Currently there is an imbalance between the responsibility of the Supervision Engineer and his/her rights and benefits (Wang 2007). Similarly, the services provided by the Supervision Engineer sometimes overlap with those provided by the project management consultants which can result in confusion amongst the remainder of the project team.

Structure of the professional body
The China Association of Engineering Consultants (CAEC) is the professional body for Supervision Engineers in China.

The organizational structure of CAEC is:

- "The General Assembly is the highest authority body of the CAEC, and is convened every 4 years;
- The Board of Administration of the CAEC is an executive organ of the General Assembly, is responsible to the General Assembly and is convened once a year;
- The Standing Board of Administration of the CAEC exercises the rights of the Board of Administration while it is not in session and reports to the Board. It is convened half yearly. In special circumstances it can be convened by means of telecommunication.
- The Secretariat is a standing executive organ, responsible to the Standing Board of Administration of the CAEC." (CAEC 2008)

The subordinate departments of the Secretariat include:

- Administration department;
- Finance department;
- Communication department;
- Training department;
- Information department;
- Professional development department, and
- International department.

The CAEC has three categories of membership:

- Association membership: can include the branch of the CAEC in each province, autonomous regions and municipalities. Each branch consists of construction engineering supervision enterprises;
- Corporate membership: comprises those enterprises registered in the People’s Republic of China (PRC) whose main business is construction engineering supervision, and
- Personal membership: comprises individuals who: 1) are qualified and registered as construction engineering Supervision Engineers, or 2) the academics in universities or academic institutions who are teaching or conducting research relative to construction supervision.

**Educational standards required to practice at the professional level**

Educational requirements for Supervision Engineers include:

- A three-year undergraduate degree or higher degree in construction management and/or construction economics before sitting for the National Registered Supervision Engineer Exam, and The registered Supervision Engineer must complete the relevant CPD courses:
  - Compulsory: recently promulgated law, regulation, standards and policies relevant to Supervision Engineers; the advanced theory and methods of construction supervision and project management, and a case study or construction supervision and ethics, and
  - Elective: local codes relevant to Supervision Engineers; advanced construction technology, materials and methods; a case study in a particular field, and other relevant subjects.

**Accreditation / registration of individual practitioners**

To register as a Supervision Engineer, the individual must:

- Have gained the qualification by means of passing the National Registered Supervision Engineer Exam;
• Be currently employed by a relevant employer e.g. surveying, design, construction, and supervision, and
• Satisfy the continuous professional education requirements (MoC 2006a)

The provisional Construction Commission is responsible for the assessment of the applications for registration. Ultimately the Ministry of Construction is responsible for the final approval of the application.

Once approved the registration is valid for three years after which it will need to be re-lodged for renewal
The application will not be approved if the applicant:
• Has had a criminal conviction in the last two years;
• Does not meet the CPD requirements;
• Has been registered as a practitioner by more than one employer. Is more than 65 years of age.

Relationship with the Government

As stated on the CAEC’s official website, one of the key objectives of the CAEC is to execute related government policies, both general and specific, in accordance with the national constitution, laws, regulations and national policies. The Ministry of Construction of the PRC is in charge of its operation, while the Ministry of Civil Affairs is in charge of its registration.

The CAEC provides services:
• "to initiate investigation and research on construction engineering supervision, to provide related government institutions with findings and facts; and assist the Ministry of Construction in the formulation of engineering supervision laws and regulations and professional development programs, and
• to accomplish the related construction engineering supervision work entrusted to them by the Ministry of Construction." (CAEC 2008)

Therefore, the CAEC is a bridge linking the relevant authorities and practitioners. In addition, the government has a strong influence on the functioning of the CAEC.

Competencies

Liu et al. (2004) list the competencies of a Supervision Engineer in China as:
• General knowledge and regulation of construction supervision;
• Investment management;
• Time control;
• Cost control;
• Quality control;
• Information management, and
• Contract administration.

In addition, safety supervision was added to the scope of the work of the Supervision Engineer by the Ministry of Construction in 2006. Accordingly, the Supervision Engineer is also required to have safety management knowledge (MoC 2006b).

BUILDING SURVEYOR IN AUSTRALIA

Brief introduction of the profession

In Australia, the role of the Building Surveyor is to check the construction documentation independently to ensure that the documentation meets the requirements of the Building Code
of Australia (BCA) and the relevant governing legislation (AIBS 2005, as cited in Society of
Fire Safety Engineers Australia 2006). Australia, comprised of 6 States and 2 Territories is
divided into Local Government areas with more than 700 local governments across Australia
in 2006 (Capetanakis 2004). Building laws can be developed at all three levels of
government, however there is a national document that relates to the design and construction
of buildings; the Building Code of Australia (BCA), produced and maintained by the Australian
Building Codes Board (ABCB 2004).

The roles and responsibilities of Building Surveyors include (Victorian Auditor-General's
Office of Australia, 2000; Reddaway, 2001):

- Construction of new buildings:
  - Checking the documentation’s compliance with the Building Act, Building
    Regulations, Codes and Standards;
  - Issuing a building permit before construction can commence;
  - Inspecting the construction works and give it a stamp of approval;
  - Providing regulatory advice to the project team on construction issues;
  - Advising on legislative issues, and
  - Issuing an occupancy permit before the building can be occupied, and
- Existing buildings:
  - Inspecting the existing condition of the building and its compliance with safety
    standards.

An example of a service provided by the Building Surveyor is where he/she requires proof
that the builder has the appropriate level of insurance required to practice as a registered
building practitioner. (Georgiou et al, 2000). The Certificate of Likely Compliance issued by
the Building Surveyor is the prerequisite for the Permit Authority to issue a Building Permit to
the builder (Tasmania Building Act 2000).

Originally the functions of the Building Surveyor were all provided by local government. Since
the privatisation of building surveying, more and more Building Surveyors have moved into
the private sector. The privatisation of building permits and approvals have improved the
speed of the system leading to cost and time savings (Georgiou et al, 2000).

Structure of the professional body

The structure of the Australian Institute of Building Surveyors (AIBS), the professional body
for Building Surveyors in Australia is shown in table 1.

<table>
<thead>
<tr>
<th>ATTRIBUTES</th>
<th>AIBS</th>
</tr>
</thead>
<tbody>
<tr>
<td>General Structure</td>
<td>Hierarchical and incorporated</td>
</tr>
<tr>
<td>Structure components</td>
<td>Members of 2,500</td>
</tr>
<tr>
<td></td>
<td>Board of 7 members</td>
</tr>
<tr>
<td></td>
<td>CEO</td>
</tr>
<tr>
<td></td>
<td>State Chapters</td>
</tr>
<tr>
<td>Membership</td>
<td>2,500</td>
</tr>
<tr>
<td>Degree qualified</td>
<td>Less than 500 (few of remainder studying for a degree) (25%)</td>
</tr>
<tr>
<td>CEO qualifications</td>
<td>Not necessary to be a Building Surveyor</td>
</tr>
<tr>
<td>Approval of major changes</td>
<td>Membership approval at Annual General Meeting (AGM)</td>
</tr>
<tr>
<td>Different Knowledge areas</td>
<td>No</td>
</tr>
<tr>
<td>Special Interest Groups</td>
<td>No</td>
</tr>
<tr>
<td>Voting Rights</td>
<td>Only corporate members:</td>
</tr>
<tr>
<td></td>
<td>- includes paraprofessionals</td>
</tr>
<tr>
<td></td>
<td>- equates to approx 90% of the membership (given that</td>
</tr>
</tbody>
</table>
Table 1: Structure of the AIBS

Educational standards required to practice at the professional level

The AIBS benchmarks that have been adopted and are being used to accredit university programs require the completion of a four year full time, or part time equivalent degree at the end of which the graduate needs to be competent in each of the following:

- Construction principles and practices;
- Law, statutes, codes and standards;
- Performance-based building regulatory systems and risk assessment and risk management principles;
- Building related science;
- Structural engineering principles;
- Building services and fire safety engineering principles;
- Professional ethics, management and communication practices;
- Problem solving skills, and
- Building management, development concepts and construction economics (AIBS & ABCB 2002).

Subsequent to the AIBS adopting the above benchmarks; the national education committee has recommended that two new benchmarks be added to the list; so that in addition to the abovementioned, upon completion of the degree the graduate should be able to:

- Conduct research into the various areas related to the construction industry, and
- Demonstrate appropriate experience in the industry (NEC 2006-2007).

Each of the benchmarks has a specific set of measurable criteria that are used by members of the accreditation panels when accrediting university programs.

Accreditation / registration of individual practitioners

The concept of accreditation is not always understood as it can be applied in various ways and to varying degrees. In an academic sense, accreditation can be for both a program of study or for the institution that delivers the program (Harvey 2004).

From a building surveying perspective, the two professional bodies that are most relevant in Australia are the Royal Institution of Chartered Surveyors and the Australian Institute of Building Surveyors. The RICS has had a direct involvement in accreditation since the proliferation of surveying courses in the UK during the 1960s and 1970s when courses were monitored and accredited by the RICS’s surveying courses board (Plimmer 2003).

The AIBS on the other hand, did not become involved with accreditation until 1993 when it accredited its first university degree program at the University of South Australia1. It has not had a properly documented program accreditation system and has relied on a somewhat ad-hoc education committee system to accredit programs throughout the country. It has never formally defined accreditation in terms of programs but rather has relied on one or two champions to further its cause2. Initially the independent accreditation body established by the AIBS, the Building Surveyors and Allied Professions (BSAP) Accreditation Board carried out the accreditation function of the Institute, but this was never properly formalised and

---

1 Author’s personal experience as leader of that initial program in 1993
2 Author’s personal experience as member of the AIBS National Education Committee 1993-2007
eventually folded. Since 2000 the AIBS has been carrying out program accreditation jointly with the Australian Institute of Building (AIB) and the Australian Institute of Quantity Surveyors (AIQS) and has, to some degree relied on these two bodies in terms of procedures when carrying out accreditation. Furthermore, it has only carried out accreditation of building surveying focused programs.

The AIBS assess their relevant programs of study against a set of designated criteria in the form of benchmarks e.g. knowledge base, building surveying ability and professional attributes. The AIBS benchmarks appear to cover the broad professional knowledge required to function as a professional in the relevant field. The criteria relate to four year full time equivalent accredited university Bachelor degrees.

**Competencies**

The AIBS has a set of competencies for University Programs however, it refers to them as benchmarks. Unlike the RICS who relate their competencies to levels, the AIBS benchmarks use word descriptors such as: in depth knowledge, proficiency, understanding and so on to signify the level of knowledge expected by the benchmark (AIBS 2006). These benchmarks are extremely detailed and there are a total of 16 major headings as outlined in Table 2 below.

<table>
<thead>
<tr>
<th>BENCHMARKS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
</tr>
<tr>
<td>2</td>
</tr>
<tr>
<td>3</td>
</tr>
<tr>
<td>4</td>
</tr>
<tr>
<td>5</td>
</tr>
<tr>
<td>6</td>
</tr>
<tr>
<td>7</td>
</tr>
<tr>
<td>8</td>
</tr>
<tr>
<td>9</td>
</tr>
<tr>
<td>10</td>
</tr>
<tr>
<td>11</td>
</tr>
<tr>
<td>12</td>
</tr>
<tr>
<td>13</td>
</tr>
<tr>
<td>14</td>
</tr>
<tr>
<td>15</td>
</tr>
<tr>
<td>16</td>
</tr>
<tr>
<td><strong>From 2007/2008</strong></td>
</tr>
<tr>
<td>17</td>
</tr>
<tr>
<td>18</td>
</tr>
</tbody>
</table>

*Table 2: AIBS Building Surveyor Benchmarks, Source: AIBS 2006*

**Relationship with the Government**

The relationship with governments by the AIBS is a vexed issue. The AIBS has general statements about this function as part of the rules of operation, that is, in the Articles of Association for the AIBS. The AIBS makes claims about how it is consulted and the roles that it plays however the AIBS actually has no formally designated role (in statute) in any government organization and generally relies on invitation, either directly or indirectly before it takes part (Zillante 2007).

The AIBS makes submissions to the various governments on issues that affect building surveying albeit those submissions do not, because of the AIBS’s uni-disciplinary nature, span the breadth of issues covered by other professional bodies, e.g. Engineers Australia. Similarly, the AIBS does not have an equivalent to Engineer Australia’s strategic group within its structure to coordinate any submissions made and they often tend to be state based, ad-hoc and made more as a reactive response rather than as proactive initiatives (Zillante 2007).
This places the AIBS in a vulnerable position when compared with Engineers Australia and makes it easier for the government to impose a degree of ‘control’ over the organization by interfering in what most professional bodies would term, their professional domain area (Zillante 2007). This is consistent with the literature dealing with government interference in professional activities and indicates that the government may not regard the AIBS as a strong professional body (Graham 2007; Clementi 2004; Evetts 2003).

In summary, a comparison between the AIBS and the CAEC can be seen in Table 3.

CONCLUSIONS

The services provided by the Supervision Engineer in China are very similar with those provided by Building Surveyors in Australia (Zuo and Zillante 2007). A comparison between these two professional bodies from a professional development perspective found that the:

- AIBS has more structured educational standards in order to practice at the professional level;
- AIBS accredits university programs;
- CAEC has a universally (throughout China) accepted procedure to accredit and register individuals;
- CAEC has a more formal relationship with the government; and
- AIBS has a broader set of individual’s competencies required to practice as a Building Surveyor.

Currently (2008) Australia is experiencing (and has been for some 7 years) a severe shortage of building surveying graduates and it is ironic that there are now only two building surveying programs in Australian Universities (Zillante 2007; AIBS 2002; AIBS 2003; AIBS 2004a; AIBS 2004b). Universities throughout Australia have closed down building surveying programs. One main reason is the lack of interest from students. This reason is somewhat surprising given the demand for Building Surveyors across Australia and the good rates of pay. This may indicate a lack of marketing that has left students without enough information about building surveying as a career thereby not enabling them to make informed choices (Hornlund, Mehrtens & Pullen 2006).

To date, the AIBS has not had the opportunity to accredit programs outside of Australia. It has only recently developed its benchmark system and is concentrating on Australia before it moves offshore.

Therefore, opportunities exist for the AIBS and the CAEC to recognize each other’s members and academic programs. The mutual recognition agreement signed between the HKIS and the CAEC provides an opportunity for this collaboration.

Whilst it is recognized that Hong Kong is once again part of China it must be remembered that it has developed under a different system (British) during the last century and, in 2004 the HKIS actually reached a formal reciprocal membership agreement with the AIBS (Capetanakis 2008). In recent years, with the reunification with China, the HKIS and the CAEC have reached an agreement to recognize each other’s professional standing. Given that the AIBS and the HKIS agreement is still in place it stands to reason that the AIBS is in a good position to achieve a similar agreement with the CAEC thereby forming a triumvirate consisting of the CAEC, the HKIS and the AIBS.

It is recommended that a case study be conducted in the future to provide more detailed comparative (empirical) data for the professions of Supervision Engineer and Building Surveyor.
<table>
<thead>
<tr>
<th>RESEARCH ISSUES</th>
<th>Building Surveyor (AIBS)</th>
<th>Supervision Engineer (CAEC)</th>
</tr>
</thead>
</table>
| Structure      | ▪ Hierarchical and incorporated  
▪ State chapters | ▪ Hierarchical  
▪ Branch in each of the provinces, autonomous regions and municipalities |
| Education      | ▪ Professional Building Surveyor  
  o < 25% of members  
  o 4 year degree  
▪ Assistant Building Surveyor  
  o 17% of members  
  o TAFE Advanced Diploma  
▪ Building Surveying Technician  
  o 4% of members  
  o TAFE Diploma  
▪ Non practicing (Student etc.)  
  o 8%  
▪ Other  
  o 46% of members not accredited by the AIBS scheme | ▪ Three-year undergraduate degree or higher degree in construction management and/or construction economics  
▪ Sit the National Registered Supervision Engineer Exam  
▪ Complete CPD courses:  
  o Compulsory: recent promulgated law, regulations, standards and policies relevant to Supervision Engineers; advanced theory and methods of construction supervision and project management, a case study or construction supervision and ethics.  
  o Elective: local codes relevant to Supervision Engineers; advanced construction technology, materials and methods; a case study in a particular field, and other relevant subjects. |
| Accreditation of the education program | ▪ Inexperienced (1993 start)  
▪ Joint documentation (2007)  
  o with AIB & AIQS  
▪ Ad-hoc documentation  
  o In house  
▪ Program based  
▪ Relies on individuals  
▪ Graduates assured of membership at relevant career grade  
▪ Uni-disciplinary  
  o Specialist designation category not used  
▪ Benchmarks / Competencies  
  o Building Surveyors Benchmarks  
  o ABS Competencies  
  o BST Competencies | China has no university accreditation for this profession. |
### RESEARCH ISSUES

#### Accreditation or Registration of Individuals

<table>
<thead>
<tr>
<th>Building Surveyor (AIBS)</th>
<th>Supervision Engineer (CAEC)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accreditation</td>
<td>Pass the National Registered Supervision Engineer Exam;</td>
</tr>
<tr>
<td></td>
<td>Is currently employed by a relevant employer (e.g. surveying,</td>
</tr>
<tr>
<td></td>
<td>design, construction, supervision);</td>
</tr>
<tr>
<td></td>
<td>Satisfy the continuous professional education requirements</td>
</tr>
<tr>
<td>AIBS Board</td>
<td>Not able to be registered if:</td>
</tr>
<tr>
<td>o Internal</td>
<td>• Has been criminally convicted in last two years</td>
</tr>
<tr>
<td>o Not Independent</td>
<td>• Does not meet the CPD requirements</td>
</tr>
<tr>
<td>o NAP</td>
<td>• Registered to practice by more than one employer. Is more</td>
</tr>
<tr>
<td></td>
<td>than 65 years of age</td>
</tr>
<tr>
<td>Not accepted by all states</td>
<td></td>
</tr>
<tr>
<td>Distinction in some states between government Building Surveyor &amp; private practitioner Building Surveyor</td>
<td></td>
</tr>
<tr>
<td>No chartered route</td>
<td></td>
</tr>
</tbody>
</table>

#### Role of Government

<table>
<thead>
<tr>
<th>Building Surveyor (AIBS)</th>
<th>Supervision Engineer (CAEC)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Generally have an informal relationship</td>
<td>Generally have a formal relationship</td>
</tr>
<tr>
<td>AIBS has a non strategic reactive relationship in its relationship with Government</td>
<td>Execution of related government policies in accordance with</td>
</tr>
<tr>
<td>o Ad hoc submissions to government</td>
<td>national constitution, laws, regulations and national policies</td>
</tr>
<tr>
<td>Accreditation</td>
<td>Conduct research and provide suggestions to the government</td>
</tr>
<tr>
<td>o Not universally accepted</td>
<td></td>
</tr>
</tbody>
</table>

#### Competencies

<table>
<thead>
<tr>
<th>Building Surveyor (AIBS)</th>
<th>Supervision Engineer (CAEC)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Legal aspects</td>
<td>General knowledge and regulation of construction supervision</td>
</tr>
<tr>
<td>Structural engineering principles</td>
<td>Investment management</td>
</tr>
<tr>
<td>Building related Science</td>
<td>Time control</td>
</tr>
<tr>
<td>Risk management</td>
<td>Cost control</td>
</tr>
<tr>
<td>Professional ethics</td>
<td>Quality control</td>
</tr>
<tr>
<td>Management practices and communication practices</td>
<td>Information management</td>
</tr>
<tr>
<td>Problem solving skills</td>
<td>Contract administration</td>
</tr>
<tr>
<td>Building services</td>
<td></td>
</tr>
<tr>
<td>Fire safety engineering principles</td>
<td></td>
</tr>
<tr>
<td>Building management</td>
<td></td>
</tr>
<tr>
<td>Development concepts</td>
<td></td>
</tr>
<tr>
<td>Construction economics</td>
<td></td>
</tr>
<tr>
<td>Ability to conduct independent research</td>
<td></td>
</tr>
<tr>
<td>Experiential learning</td>
<td></td>
</tr>
</tbody>
</table>

Table 3: Comparison between the AIBS and CAEC.
REFERENCES


AIBS 2004a, *Shortage of Building Surveyors: Submission to NSW Department of Infrastructure, Planning and Natural Resources’ Discussion paper: Accreditation of council certifiers*, AIBS, Australia.

AIBS 2004b, *Low Number of building Control Officers*, AIBS Tasmania Education Committee, Hobart, Australia.


Capetanakis G., 2008, personal communication with the author. Mr. Capetanakis was the President of the AIBS at the time of the agreement with the HKIS.


Hornlund, S, Mehrtens, V & Pullen, S 2006, 'Factors Influencing the Choice of Students to Study Construction Management at University', paper presented at the BEAR Conference-Construction Sustainability & Innovation, Hong Kong Polytechnic University, Hong Kong.

Liu, A, Fellows, R & Fang, Z 2003, 'The power paradigm of project leadership.' *Construction Management & Economics*, vol. 21, no. 8, pp. 819-829.


