



CERTIFICATION OF PRACTICING CIVIL ENGINEERS IN SAUDI ARABIA: AN OPINION SURVEY

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ABSTRACT

As the demographic composition of the engineering body in Saudi Arabia comprises a multinational work force who have different academic backgrounds and professional preparedness and who can practice their professions without a license or certificate, it focuses a need for adopting a policy on certification of professional engineers working in Saudi Arabia. With the realism that the issue of certification has national interest and impact, a broad-based survey was conducted as part of a funded project to gauge the opinion of the Civil Engineers working in Saudi Arabia with regard to issues related to certification.

The survey results emphatically show that there is almost an unanimous support for certification among all Civil Engineers, Saudis and non-Saudis, who felt that the certification is very important for the profession. The majority of the respondents has indicated that a bachelor's degree in Civil Engineering would be acceptable as the minimum academic qualification and that the minimum practical experience required after graduation should not be less than two years. The majority also do not support a mandatory examination for certification for all engineers. With regard to who should administer certification, the majority consensus points to the Engineering Committee in Saudi Arabia as the recommended administrative body for certification.

Keywords: Professional engineers, Civil Engineers, survey, questionnaire, academic qualification, professional experience, and certification.

1. INTRODUCTION

In order to ensure that a practicing engineer has the necessary academic preparation and technical competence to function as a qualified professional engineer who can offer engineering services, some form of certification is necessary. Although there is a debate on the need of certification (Learning Tree International, 1996), most support certification with the tacit recognition that it ensures at least some degree of competency of the professional engineers. Certification serves as a screening process to protect the minimum qualification requirements of an engineer and to maintain a minimum level of technical competence within the profession. Most developed countries have embraced the principle of certification in various forms to regulate the engineering profession (Smith, 1999; Schwartz, 1998; The Institution of Civil Engineers, 1979; Canadian Council of Professional Engineers, 1986).

Currently, the demographic composition of the engineering body in Saudi Arabia reveals a multinational work force drawn from different countries having different educational standards and curricula. The technical competence of the engineers also vary widely. Even among Saudi engineers, the engineering education may not always reflect a desired standard, as many have received their engineering degrees from various institutions abroad. The need for certification of engineers practicing in Saudi Arabia emerges from this apparent diversity in educational background and professional preparedness. In the absence of a certification policy, the minimum qualifications required of a practicing engineer for his professional activities remain obscure.

As a strong case exists in support of certification of engineers in Saudi Arabia and the issue has a strong national interest and impact, a broad-based survey was conducted to find out the level of support for certification among Civil Engineers practicing in Saudi Arabia and to collect some basic information with regard to the minimum requirements of a professional engineer. The survey was targeted for Civil Engineers in Saudi Arabia, as this was part of a University-funded project which was designed to study the issues and challenges involved in adopting a policy on certification of Civil Engineers in Saudi Arabia. The academic interest in certification stems from two factors: firstly and importantly, the degree programs followed by the local universities through curricula should not be deficient to meet the educational requirements of certification, and secondly, the University has an obligatory role to address topical issues which are of public and national interest.

The primary objective of this paper is to present the findings of this survey and in light of this focus the need of adopting a policy on certification of practicing engineers in Saudi Arabia.

2. ENGINEERING PROFESSION IN SAUDI ARABIA

In the earlier days of rapid development, the engineering work force in Saudi Arabia composed exclusively of foreign nationals who came to work from different parts of the world, bringing with them different engineering practices, know-hows and professional experience. Their academic preparation also varied due to the differences that exist in curricula of different institutions. Many of these professionals also initially had little prior knowledge about the geomorphic conditions and the constructional environment of the country. Lack of applicable codes and standards in Saudi Arabia also increased the difficulty for the engineering profession that remained as highly deregulated. A civil engineer's qualification was never scrutinized to see that he is indeed qualified to discharge his duties and responsibilities.

Today, the local engineering community comprises a large number of Saudi nationals who are graduates from local and foreign universities. Still, a substantial number of engineers are from foreign countries, practicing their professions at different positions from junior to senior levels. Both Saudis and non-Saudi professionals have different academic background, technical competence and professional preparedness. Many local companies hire professionals who claim to be engineers within their own rights, without attempting to objectively assess their qualifications. Whether or not an engineer is fully qualified to perform his duties in his capacity is not being assessed independently and objectively.

Currently, the engineering profession is regulated by the Engineering Committee in Saudi Arabia under the provision that all engineering companies must have their licenses approved by the Committee. But the Committee does not have a mandate to adopt a policy on certification and consequently does not enforce that all practicing engineers must possess minimum qualifications to render their professional services.

3. A SURVEY

On recognition of the fact that a policy on certification of engineers in Saudi Arabia is needed and it is in the best interest of the country, an effort is made to gauge the opinion of the engineering community with regard to certification through a broad-based survey. A bilingual survey questionnaire, in Arabic and English, was designed to gather information on several key questions namely, need of certification, minimum requirements and who should administer certification process. The English version of the questionnaire is shown in Appendix I. The questionnaire was directed to Civil Engineers working in Saudi Arabia and it consists of three parts, of which the first two are designed with fact-finding questions. In the first part (Part A), the personal data about the respondents are gathered through eight questions. In the second part (Part B), there are nine questions related to certification. In this section, a respondent answers if he is certified, if practicing Civil Engineers are to be certified, his opinion on the minimum qualifications, both academic and practical experience, and who

should handle certification. Where an answer would imply a degree of agreement or disagreement, the response boxes were designed accordingly to record the level of agreement. In the question no.19 on the agency who should handle certification, the Engineering Committee and the Chamber of Commerce were added in view of their closer ties to the profession.

The questionnaire ends with Part C where a responder is given the opportunity to provide additional comments about the certification of Civil Engineers, if he desires so.

Close to 1000 questionnaires were distributed to individuals, companies and government organizations throughout the country with a cover letter urging them to respond. Additionally, the offices of the Engineering Committee and the Chamber of Commerce in Dammam, Riyadh and Jeddah were visited to seek their support in distributing the questionnaires to all companies in the Kingdom. Companies and organizations were asked to photocopy the questionnaire and distribute them to all employees employed as Civil Engineers.

Over four hundred questionnaires were received duly filled-in from all regions of Saudi Arabia, representing a good response based on which some meaningful conclusions can be drawn.

4. DATA ANALYSIS

A statistical analysis of responses received for each question is given here.

Part A: Personal Data

1. Who is your employer?

- | | | | |
|----------------|---------|---------------------|-----|
| (a) Government | 46%; | (b) Semi-government | 6% |
| (c) Private | 31% and | (d) Yourself | 16% |

Over 50% of the respondents are from the government and semi-governmental agencies. The participation of Civil Engineers employed in the private sector was somewhat less enthusiastic, perhaps due to the fact that more foreigners are working in the private sector and they may not have too much interest in the issue.

2. What is the nature of the work of your employer?

- | | | | | | |
|---------------|--------|----------------|------|------------------|-----|
| (a) Education | 4%; | (b) Consulting | 48%; | (c) Construction | 33% |
| (d) Research | 3% and | (e) Others | 13% | | |

About 13% of the surveyed persons are working in the field designated as 'Others', which include supervision, project management, design, utility, maintenance and planning.

3. What is your occupation?

- (a) Practicing Civil Engineer 56% ; (b) Administrator 22%
(c) Academician 4% and (d) Others 18%

Over half of the respondents are practicing Civil Engineers. This adds significance to the findings of this survey.

4. What is your nationality?

- (a) Saudi 62% and (b) non-Saudi 38%

Although the survey indicates an approximate 2:1 ratio for Saudi to non-Saudi Civil Engineers, this ratio may not accurately reflect the actual composition of the Civil Engineering body in Saudi Arabia. This is because the governmental and semi-governmental organizations were asked to encourage their civil engineers to respond and a vast majority of these engineers are Saudi nationals. Lack of responses from many private organizations who employ more foreigners has influenced this finding. Non-Saudi engineers are mostly Egyptians, Jordanians, Palestinians, Pakistanis, Indians, Filipinos, Sudanese and Syrians, representing a true multi-national character of the civil engineering work force.

5. How many years of experience do you have, after graduation?

- (a) Less than 2 yrs. 5% ; (b) from 2–5 yrs. 7% ; (c) 5–10 yrs. 13%
(d) 10–20 yrs. 36% and (e) over 20 yrs. 38%

It is interesting to know that about 74% of the respondents have over 10 years of work experience. This strengthens the findings of this survey, as most engineers are well-experienced to express a firm opinion on issues related to certification.

6. If you are Civil Engineer, what is your highest degree?

- (a) Diploma 4% ; (b) Bachelor degree 51% ; (c) Master degree 13%
(d) Doctorate degree 6% and (e) Others 26%

About 26% of the respondents do not have a Civil Engineering degree and over 70% have degrees in Civil Engineering. Over half of the respondents have a bachelor's degree.

Part B: Certification in Civil Engineering

1. Are you a certified Civil Engineer?

(a) Yes 31% ; (b) No 69%

Response to this question is influenced by a misunderstanding of certification as evidenced from the reply to the next question (If you are a certified Civil Engineer, who certified you?). Answers mentioned various agencies and institutions which are not officially entrusted with certification. In view of this apparent misconception of certification, the actual percentage of non-certified Civil Engineers is expected to far exceed 69%.

2. In your own opinion, certification of Civil Engineers is:

(a) very important 64% ; (b) important 32% and (c) not important 4%

It is highly encouraging to note that only 4% of the surveyed sample indicated that certification is not important. Thus, almost all practicing Civil Engineers in Saudi Arabia consider certification is important for the profession and this overwhelming supportive response signals a clear preference to certification.

The responses to the next 3 items which are cast in the form of statements and which are highly relevant to certification are listed in Table 1.

A histogram plot of the responses to the statements in Table 1 is shown in Figure 1 for a better visualization. With regard to the first statement in Table 1, a whopping 91% of the respondents support certification, over 50% strongly. This observation is consistent with the response to the question no.2 above for which 96% of the respondents' answer has been important and very important.

Table 1. Responses to some statements

Statements	Strongly agree	Agree	Disagree	Strongly Disagree
All practicing Civil Engineers in Saudi Arabia should be certified	54%	37%	8%	1%
Graduates from Saudi University should be exempted from certification	5%	15%	40%	40%
All Civil Engineers must pass a mandatory EXAM for certification	36%	43%	15%	6%

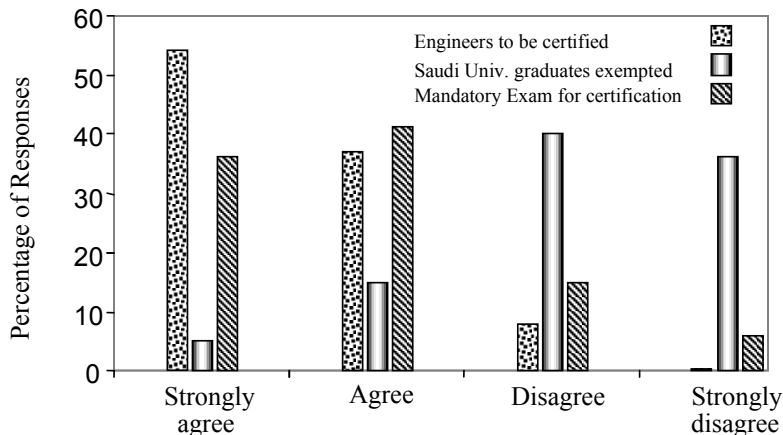


Figure 1. Responses to three items in Table 1

It is interesting to note that close to 80% of respondents have indicated that the graduates from Saudi Universities should not be exempted from the requirement of certification, considering the fact that about 62% of the respondents in this survey are Saudis. This implies that a broad-based consensus among the Civil Engineers practicing in Saudi Arabia exists for enforcement of certification for all civil engineers, regardless of their educational background and nationality. A majority of the responders (about 79%) are also in favour of a mandatory examination to determine eligibility for certification. This is also a surprising revelation and it signifies the importance of having a common testing standard for all applying for certification.

3. What is the minimum degree needed for a Civil Engineer to be certified?

- (a) none 0% ; (b) Diploma 11% ; (c) Bachelor degree 86%
- (d) Master degree 4% and (e) Doctorate degree 0%

The vast majority endorses the commonly held notion that a bachelor degree in Civil Engineering would be adequate minimum academic qualification required for certification.

4. Minimum number of years of experience required for a Civil Engineer to be certified is:

- (a) none 7% ; (b) one year 5% ; (c) 2 yrs. 21% ; (d) 3 yrs. 23%
- (e) four years 17% and (f) five years or more 27%

The histogram presentation of the responses is shown in Figure 2 for clarity. It is evident that there is no clear consensus with regard to the minimum practical

experience requirement for certification, as the respondents are more or less uniformly divided in favour of 2, 3, 4 and 5 or more years of experience after graduation. However, it seems that at least 2 years of practical experience after graduation would be acceptable to the engineering body, as the cumulative percentage of the responses endorsing 2 years and more is in the vicinity of 88%. Only a small portion of the respondents has indicated that experience is not essential for certification.

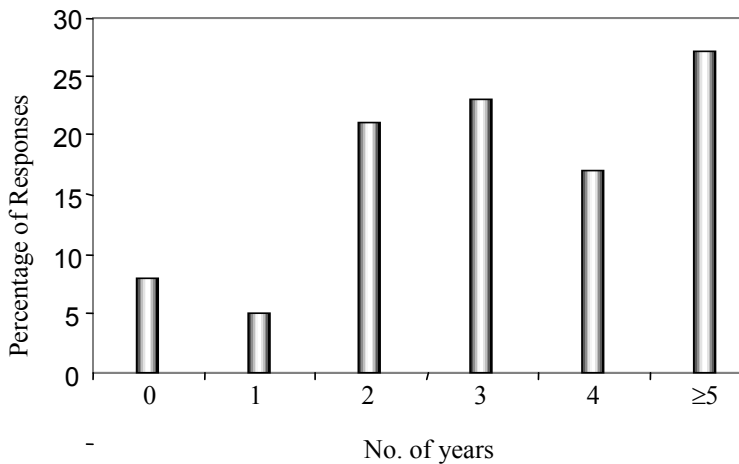


Figure 2. Minimum numbers of years of experience required after graduation

5. Who should handle the certifying process for Civil Engineers in Saudi Arabia?

- (a) Universities 16% ; (b) Independent agency 30%
- (c) Engineering Committee 50% ; (d) Chamber of Commerce 3%
- and (e) Others 1%

Almost half of the responders suggest that the Engineering Committee should handle all issues related to certification. The next highest percentage supports an independent agency to handle the certification process.

Part C : Additional Comments

Many responders utilized this optional part by providing additional input. The comments touched various topics from short courses needed to prepare for the certification examination to exemption of examination for Civil Engineers with long track record. Some of the comments which have multiple responders are listed below.

- Certification should be adopted immediately without delay.

- Individual certificates issued to engineers should be renewed after a specified period.
- Short courses should be offered to help engineers prepare for the certification examination.
- Certification should specify the specialty within the Civil Engineering (e.g. Structures, Transportation, Geotechnical, etc.).
- Highly experienced Civil Engineers should be exempted from examination, if any.
- Other engineering professionals should also be certified.
- There should be some mandatory courses a Civil Engineer must pass before certification.
- Certified engineers should be entitled to a better salary and recognition than non-certified engineers.

5. THE NEXT STEP

Encouraged by the findings of this survey which show an unequivocal strong support for certification, the authors proposed to the Department of Civil Engineering at King Fahd University of Petroleum & Minerals (KFUPM) to hold a one-day symposium on *Certification of Practicing Engineers: Issues and Challenges* so as to provide an open-forum for the engineering professionals to voice their opinions and concerns, and to discuss issues related to certification. The papers presented at this symposium held on April 30, 2002 are available in the proceedings (Symposium Proceedings, 2002).

The open-forum discussion at the symposium floored several propositions and suggestions. It has been suggested that a national committee be formed to draw up the frame of certification policy and procedures for implementation in Saudi Arabia. An idea is also floated to include all GC countries to develop a common, unified approach for certification which will be recognized by all GC countries.

It is encouraging to note that a process has begun its course in the right direction with the full support of the local engineering community. It is expected that the growing interest for certification, and the momentum triggered by the symposium held at KFUPM and the follow-up activities will eventually lead to the implementation of certification requirements for engineers practicing in Saudi Arabia.

6. SUMMARY AND CONCLUSIONS

A survey among Civil Engineers practicing in Saudi Arabia was undertaken to gauge the opinion on the idea of instituting a policy on certification of Civil Engineers, by seeking answers to various questions pertinent to issues related to certification. Based on the results of this broad-based survey, the following conclusions are drawn:

1. The personal data of the respondents reveals a Civil Engineering work force that comprises multinationals, the majority of whom has a degree in Civil Engineering. The ratio of Saudi to non-Saudi Civil Engineers who participated in the survey is about 2:1.
2. Almost all respondents, regardless of their nationality, have expressed their unequivocal support for certification, fully recognizing its need and importance.
3. With regard to the minimum academic qualification requirement for certification of Civil Engineers, there is a clear consensus that a bachelor's degree in Civil Engineering would be sufficient.
4. Unlike the degree requirement, there is no clear majority consensus with respect to the minimum requirement of practical experience following graduation. However, most respondents have indicated that the required minimum experience should be at least two years.
5. The majority of the respondents supports the idea of a mandatory examination for the purpose of certification.
6. The Engineering Committee has been chosen by the most as the preferred organization to administer certification.

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APPENDIX I: SURVEY QUESTIONNAIRE

Thank you very much for spending your precious time filling-in this questionnaire.
Please tick [✓] the box to the right of your choice. Fill-in the *specify* cell, if applicable.

A. PERSONAL DATA**1. Who is your employer?**

Government Semi-government Private Yourself

2. What is the nature of the work of your employer?

Education Consulting Constructing Research
Others _____

3. What is your occupation?

Practicing Civil Engineer Administrator Academician
Others _____

4. What is your nationality?

Saudi Non Saudi *Specify* _____

5. Where is the location of your work?

Specify the city name _____

6. How many years of experience do you have, after graduation?

<2 Years 2-5 Years 5-10 Years 10-20 Years >20 Years

7. If you are a Civil Engineer, what is your highest degree?

Diploma B.S. M.S. Ph.D.
Others, *specify* _____

8. If you are NOT a Civil Engineer, what is your academic qualification?

Highest degree _____ Specialty _____

B. CERTIFICATION IN CIVIL ENGINEERING

If you are NOT a Civil Engineer, please go to item # 13.

11. Are you a certified Civil Engineer?

Yes No

12. If you are a certified Civil Engineer, who certified you?

Name of certifying agency: _____

Country: _____

13. In your own opinion, certification of Civil Engineers is:

Very important Important Not important

14. All practicing Civil Engineers in Saudi Arabia should be certified:

Strongly agree Agree Disagree Strongly disagree

15. Graduates from Saudi Universities should be exempted from certification:

Strongly agree Agree Disagree Strongly disagree

16. All Civil Engineers must pass a mandatory EXAM for certification:

Strongly agree Agree Disagree Strongly disagree

17. What is the minimum degree needed for a Civil Engineer to be certified?

None Diploma B.S. M.S. Ph.D.

18. Minimum number of years of experience required for a Civil Engineer to be certified is:

0 1 2 3 4 > 5

19. Who should handle the certifying process for Civil Engineers in Saudi Arabia?

Universities Independent agency Engineering Committee

Chamber of Commerce Other, *specify* _____

C. ADDITIONAL COMMENTS

Please provide any additional comments about certification of Civil Engineers.

Thank you for your comments.