



Asia-Pacific
Economic Cooperation

APEC Women Builders Creating Inclusive Future

The Principles on
Women Builders Creating Inclusive Future



Policy Partnership on Women and the Economy
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Acknowledgements

This Principle is part of the APEC “Women Builders Creating Inclusive Future” project, proposed by Chinese Taipei and co-sponsored by Australia; Canada; Chile; Japan; Korea; Malaysia; Mexico; New Zealand; Peru; the Philippines and Viet Nam.

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The report was conducted by Dr. Fan Su-Ling, the Director of Research Development Center of Construction Law and the Associate Professor of Department of Civil Engineering, Tamkang University. Thanks to her team.

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Introduction

1. Background

From 2016 to 2018, APEC leaders have been emphasizing the importance of empowering women economically and bridging the gender gap to increase opportunities for women to realize their full potential. By acknowledging how greater economic participation by women spurs economic growth, APEC leaders have been encouraging economies to promote women's career development, strengthen access to STEM education, and address barriers to economic participation.

In recent years, APEC has been dedicated to diminishing inequality by increasing the participation of women in non-traditional sectors, such as the building sector. According to the ILO Global Wage Report 2018/2019, women continue to be paid approximately 20% less than men.¹ Meanwhile, the World Economic Forum found that women in architecture and engineering earn 27% less than men.² Therefore, this project encourages APEC economies to implement measures on developing women's talent in the building sector to reduce wage gaps, foster vocational and skills education for women, and increase the number of women in leadership positions.

The gender pay gap represents a social injustice. As a result, all economies should try to accelerate progress towards gender equality. For example, the gender pay gap in architecture and engineering is more than 25%.³ In addition, The National Council of Architectural Registration Boards reports that women accounted for only 36% of newly licensed architects in 2016. And, in 2017, World Architecture 100 indicated that only two firms have management teams consisting of more than 50% women, 16 with no women at all in

¹ ILO. Global wage report 2018/19: what lies behind gender pay gaps. Geneva: International Labour Organization, 2018

² The Industry Gender Gap: Women and Work in the Fourth Industrial Revolution, World Economic Forum, 2016

³ Ibid.

senior positions, and only 10% with women occupying the highest-ranking positions.

This project utilizes the methods of a questionnaire and a focus group to understand the current causes and conditions of the architecture and engineering industry (hereinafter referred as “building sector”) in APEC economies, including issues on gender pay gap and segregation within recruitment and promotion processes.

Formulated from this project, the Principles on Women Builders Creating Inclusive Future seek to address these regional issues, while creating sustained benefits for all APEC economies promoting women’s participation in higher-wage and high growth sectors. For the purposes of this guide, the term, “builders,” shall refer to architects or engineers in the building sector. Since this project focuses on cultivating the skills and capacity of women in the building sector, we also coordinate with the HRDWG (Human Resource Development Working Group) to empower women in the APEC region.

2. About This Guide

Findings from the literature review, pilot survey, and focus group discussions conducted by this project all show how gender stereotypes (in which women are the main child caregivers), lack of transparency in pay, physical strength levels, adaptation to harsh outdoor working conditions, and gender-based violence are the major causes for the gender pay gap in the building sector. Therefore, four inclusive future principles for women builders, namely encouraging women’s participation, establishing gender friendly workplaces, creating healthy and safe workplaces, and ensuring fair career development opportunities, are formulated for policy makers as guidelines to promote an inclusive future.

APEC economies and building sector stakeholders will be invited to adopt the principles and actions listed in The Principles. We anticipate the following actions to be suggested:

Raising awareness: To acknowledge the importance of engaging women in higher-wage and high growth sectors, especially in male-dominated ones, such as the building sector.

Increasing representation: To ensure women's participation in the building sector across all levels and areas, and to support women builders with diverse backgrounds.

Overcoming barriers: To embed gender perspectives in the building ecosystem, and promote laws, policies, programs and partnerships that create an enabling environment for women builders.

3. Target Audience

The target audience for these principles is policy makers, including governments, private enterprises and educational organizations in the building sector.

4. Objectives

This project aims to empower women and increase their participation in the building sector of APEC economies, with the following four objectives to be achieved:

- To raise awareness on the gender bias and stereotypes in the building sector.
- To identify the issues and causes of gender pay gaps in the building sector.
- To propose strategies that diminish gender pay gap in the building sector.
- To establish an enabling environment for women in the building sector.

Principles

To achieve the objectives of the principles, four Women Builders Creating Inclusive Future Principles based on the findings of the entire project are proposed below. Each consists of five sections: statement of issue, objectives, methods, actions, and examples.

1. Encouraging Women's Participation in the Building Sector

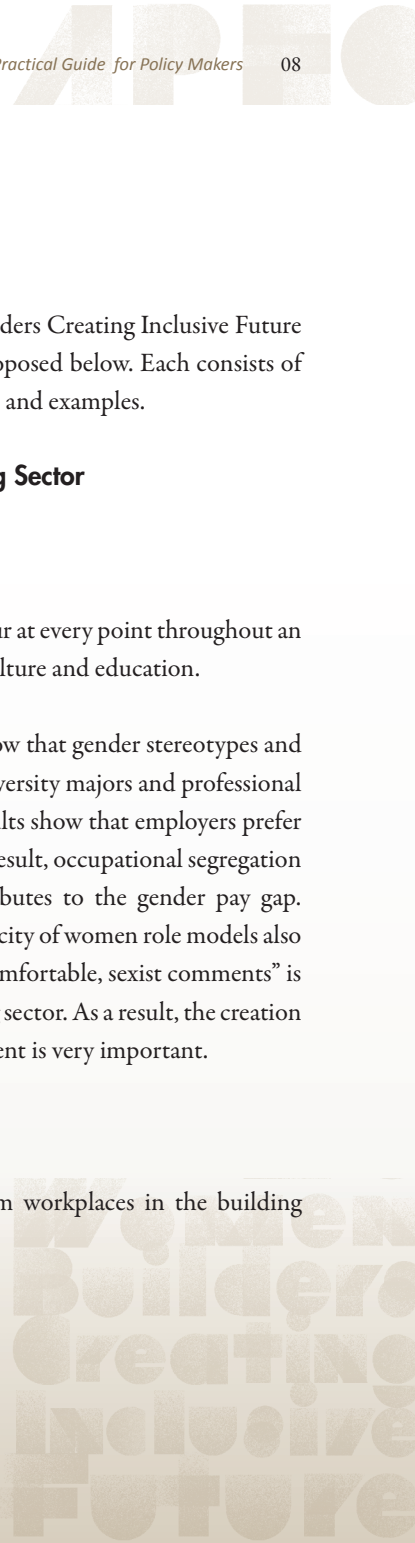
Statement of Issue

In the building sector, gender bias and stereotypes might occur at every point throughout an employment cycle. These inherent biases are the results of culture and education.

Along with past research, the results of the questionnaire show that gender stereotypes and social values have a strong impact on decisions regarding university majors and professional careers. Moreover, from the focus group discussions, the results show that employers prefer male engineers when considering on-site job positions. As a result, occupational segregation by gender substantially depresses female wages and contributes to the gender pay gap. Furthermore, in the male-dominated building sector, the scarcity of women role models also worsen gender segregation. Finally, findings show that “uncomfortable, sexist comments” is one of the most common personal experiences in the building sector. As a result, the creation of a workplace free of gender stereotypes and sexual harassment is very important.

Aim

Eliminating gender stereotypes and sexual harassment from workplaces in the building sector



This means

- ✓ Policy makers are aware of the gender bias and stereotypes in the building sector.
- ✓ Policy makers recognize and act to eliminate gender bias and stereotypes in the building sector.

Actions

- ✓ Inclusion of gender awareness courses in schools and on-the-job training programs, and introduction of legislation tackling gender-based violence and discrimination, eliminating gender stereotypes, enshrining equal rights in the workplace through fair access to skills training, promotions, and equal pay for equal work
- ✓ Requirement for gender awareness courses to be incorporated in the retraining of professional engineers, site managers, safety and health management personnel, and quality control engineers
- ✓ Notifications alongside products and mass media (including but not limited to radio and television) if gender bias or gender stereotypes are found.
- ✓ Courses on gender equality and events with female builder role models are to be included in primary and secondary education
- ✓ Amendments of Occupational Safety and Health Education and Training Rules and related education and training regulations to make gender awareness courses a requirement
- ✓ Review of the Radio and Television Act to raise overall gender awareness

Examples

Japan

To inspire female junior high and high school students to choose STEM careers, the government is implementing the “Riko-challe” project, which introduces and provides information on events by universities and companies active in STEM fields.

The government also appointed women who are active in science and technology fields as female role models (STEM Girls Ambassadors). They provide lectures at symposiums to inspire female junior high and high school students interested in choosing STEM fields for their careers.

Chinese Taipei

Each year, the Ministry of Labor along with local labor authorities hosts seminars on “Employment Equality and Sexual Harassment Prevention”. Businesses are invited to participate to strengthen the advocacy and education of gender equality in employment.

Chinese Taipei has imposed the following measures:

- 1 Incorporating gender equality concepts and examples of successful female engineers into technical seminars or trainings conducted in accordance with “Provisions for the Renewal of Professional Engineer License”;
- 2 Holding gender-related seminars or lectures, and inviting professional engineer associations to participate. For example, Chinese Taipei held a “Architecture and Feminism” lecture, which invited the participation of civil and structural engineering associations.

2. Reducing Work-family Conflicts

Statement of Issue

Work-family conflicts are common among workers throughout all economies. These conflicts reinforce gender inequality and pay gap because women are more likely expected to leave jobs or cut back work due to family obligations, resulting in an overall negative impact on the chances for women to obtain interviews, offers, and promotions.

Literature shows that women are more than twice as likely to perform housework on an average day as men. Furthermore, from focus group discussions, it is shown that following characteristics of the building sector make work-family conflicts worse for women engineers.

- 1 Jobs are mostly conducted via task groups requiring teamwork, designation of responsibilities, and a lot of overtime to fulfill client requirements
- 2 Positions often require individuals to be on-site for continuous supervision, making the implementation of flexible work hours difficult
- 3 Difficulty for firms, mostly small and medium-sized businesses, in the building sector to provide childcare or eldercare as a measure for employee work-life balance
- 4 Frequent work-related social events are often held after work hours. Working from home during pandemic might exacerbate work-life conflict

Aim

Eliminating sources of work-family conflict in workplace arrangements and job assignments

This means

- ✓ Policy makers understand and value the importance of work-family balance
- ✓ Policy makers recognize and act to reduce the impacts of work-family conflicts

Actions

- ✓ Provide flexible work arrangements options, such as flextime, work from home, compressed work weeks, and part-time work schedules
- ✓ Establish an efficient substitute system that equips employees with the tools to work remotely and flexibly
- ✓ Offer temporary childcare and eldercare, such as those provided by government-certified agencies
- ✓ Arrange work-related social events within office hours otherwise considerations should be given to those who are child- or elder-care providers
- ✓ Amend labor standards acts and all related regulations to allow for flexible work arrangements
- ✓ Establish regulations for family and childcare services agencies to ensure temporary child and elder care services are provided
- ✓ Promote the importance of sharing family duties and responsibilities, particularly to encourage men's participation in the care and education of children

- ✓ Parents take turns shifting between family and work duties while both working from home during an outbreak, such as the COVID-19 pandemic

Examples

Australia

In 2018, Australia introduced significant child care reforms to support families in bearing the costs of child care. For example, the Child Care Package included the Child Care Subsidy, which provided \$8.3 billion a year to help cover the costs of child care and encourage workforce participation.

Along with the Child Care Subsidy, Australia also introduced the Early Childhood Education and Care (ECEC) Relief Package at the height of the COVID-19 pandemic to help ensure the viability and continuity of child care for families.

Japan

To promote telework, a flexible work style that effectively utilizes information and communications technology (ICT), nationally, the government has been taking the following measures:

- 1 Granting subsidies for the costs associated with introducing telework
- 2 Informing the public of telework guidelines
- 3 Enhancing the counseling system

Chinese Taipei

Chinese Taipei organized the “Work-Life Balance Award” ceremony to promote the philosophy and benefits of work-life balance by commending model businesses. Conducted in accordance with related domestic labor laws and regulations, the policies or strategies are not specifically formulated for engineering services or relevant professional consulting industries.

3. Creating Healthy and Safe Workplaces

Statement of Issue

Especially for supervising engineers working at construction sites, the building sector offers some of the most dangerous occupations. In addition to the high risk of work-related injuries, women are also more likely to face gender-based violence, and might even be excluded from consideration for some job positions due to the following reasons:

- 1 Construction sites are often in remote or sparsely populated locations
- 2 There are inevitably dark or isolated areas, such as tunnels or basements, at construction sites
- 3 Women engineers are often the only female in their teams
- 4 Poorly equipped working sites, such as those without elevators, lead to additional physical constraints for certain jobs
- 5 Even for female engineers stationed at a firm’s head office, they are still often required to travel to a construction site. As they are often the only female in these trips, the risk of gender-based violence increases

Aim

Eliminating physical restrictions, risk of work injuries and gender-based violence at workplaces in the building sector

This means

- ✓ Policy makers are aware of the risks of work injuries and gender-based violence in the building sector
- ✓ Policy makers are aware of the impact of physical restrictions and safety of a facility on gender equality

Actions

- ✓ Application of information technology and cameras around the site, as needed and with the understanding and agreement of employees, to ensure safe environments
- ✓ Application of prefabrication and automation to reduce physical restrictions of on-site work
- ✓ Accounting for the physical needs of different genders in the site workplaces, such as toilet access and breastfeeding rooms, and enhancing the adequacy of facilities such as elevators and lights to ensure a safe environment and reduce physical restrictions at sites
- ✓ Inclusion of education on sexual health, sexualization, risk, and safety in curriculum so that students understand legal norms to protect their rights at workplaces
- ✓ Amendments of Occupational Safety and Health acts or related regulations that take into account concerns related to high-risk work environments, such as eliminating dark corners and preventing sexual assault

Examples

New Zealand

As one of seven key areas in the health and physical education section of the New Zealand Curriculum, sexuality education must be included in the teaching programmes of both primary and secondary schools. Objectives for the area are outlined in the curriculum.

Considered a lifelong process, sexuality education provides students with the knowledge, understanding, and skills to develop positive attitudes towards sexuality, take care of their sexual health, and enhance their interpersonal relationships. It includes the concept of “hauora”, a process of health promotion and a socio-ecological perspective. Students consider how the physical, social, mental, emotional, and spiritual dimensions of sexuality influence their well-being. Through this socio-ecological perspective, students critically examine the social, economic, political, and cultural influences that shape the ways people learn about and express their sexuality. Sources of influence may include gender roles, body image, discrimination, equity, mass media, social media, culturally-based values and beliefs, and the law. Sexuality education is enhanced when supportive school policies and practices are developed, links with relevant community agencies are made, and students are guided in identifying and accessing support. Exploration of personal and societal attitudes as well as values about sexuality are important.

Students require a range of developmentally appropriate learning opportunities in sexuality education. These include opportunities to develop:

- 1 Knowledge, understanding, and skills relating to sexual health and development: physical, emotional, mental, social and spiritual

- 2 Knowledge, understanding, and skills enhancing their sexual and reproductive health, such as knowledge about the process of conception and contraception, as well as the capacity to make decisions that maintain and enhance their sexual health and experiences
- 3 Understanding and skills to enhance relationships, such as in relation to friendships, intimate relationships, love, families, and parenting
- 4 Critical thinking, reflection, and social-action skills related to issues of equity, gender, body image, sexualization, risk, and safety
- 5 Personal and interpersonal skills and attitudes, including:
 - A. Personal rights and responsibilities, including consent
 - B. Skills needed to examine people's attitudes, values, beliefs, rights, and responsibilities
 - C. Respect for themselves and other people
 - D. Care and concern for themselves and other people
 - E. Ethical values
 - F. Effective communication, problem-solving, and decision-making skills

4. Ensuring Fair Career Development Opportunities

Statement of Issue

Transparency is essential to the elimination of gender pay gaps. Maintaining transparent employment and pay practices is likely to prevent gender pay gaps from occurring, helping attract and retain a diverse and committed workforce.

The results of the survey found that "mentorship" was the most important factor influencing career development. Furthermore, "social support from supervisors and colleagues" was stated as the most important factor influencing an employee's decision to stay within an organization.

Results from the focus group discussions and questionnaires suggest that gender quotas for managerial-level positions may not be as effective in encouraging female talent to stay. However, the focus group discussions also suggest that companies increasingly seeking female members to serve on their boards of directors is an influence when making relevant ratings.

Aim

Building transparent systems for employment, wages, and support to ensure fair career development opportunities for women engineers

This means

- ✓ Gender pay gap information is audited and published annually to ensure fair career development opportunities

Actions

- ✓ Require organizations in the building sectors with 250 or more employees to publish and report the following figures (see Table 1) regarding gender pay gap annually
- ✓ Organize training activities that gather outstanding women for knowledge transfer and networking in the building sector

- ✓ Develop a promotion and salary system that takes into account the differences of positions, such as technical and research and development fields, so that employees can be promoted according to their respective professions
- ✓ Monitor the status and progress of women's participation in managerial decision-making and gender pay differences via statistical analyses conducted by architecture and engineering occupational associations
- ✓ Develop a checklist to promote equal pay for equal work via the government and provide employers with the opportunity to review their organizations' incentives and pay systems for gender equality
- ✓ Establish an act governing the administration of professional engineering consulting and architecture firms and amend related regulations to expose gender pay gaps
- ✓ Promote the successful cases of companies or organizations that value gender diversity

Examples

Canada

In December 2018, the Government passed the Pay Equity Act along with amendments to related legislation. The Act, along with the Pay Equity Regulations, will come into force on August 31, 2021 and will establish a proactive pay equity regime for approximately 1.2 million workers, and require federally regulated public- and private sector employers, including the Prime Minister and Ministers' offices, with 10 or more employees to examine their compensation practices and ensure that they are providing equal pay for work of equal value. Proactive pay equity also applies to employers and employees in parliamentary workplaces through amendments to the Parliamentary Employment and Staff Relations Act.

New Zealand

The Diversity Agenda is a joint initiative from Engineering New Zealand, the New Zealand Institute of Architects and Association of Consulting Engineers (ACE) New Zealand, established to make engineering and architecture better professions for all. Members who want to make the ultimate commitment can then sign the Diversity Agenda Accord, with the personal responsibility from CEs and business owners to be held publicly accountable for achieving truly diverse industries.

Launched in early 2018 with an initial goal to see 20% more women engineers and architects, the campaign has since expanded beyond gender to encapsulate the full range of diversity and inclusion. The Accord sets out a range of commitments for organisations in the engineering and architecture professions to increase the diversity of the workforces and leadership in these sectors. The commitments include actions such as measuring progress on diversity, closing gender pay gaps, and eliminating barriers to diversity and inclusion. The 45 signatories to the Accord are required to report each year on how they are meeting the commitments in the Accord.

Firms across both engineering and architecture, and those that work within these industries, are encouraged to sign up as members to show they're serious about diversity and inclusion, and benefit from access to resources, events, tools and tips.

(www.diversityagenda.org)

Table 1 Gender Pay Gap Statement

Last Year	Total		Junior level		Middle level		Top level	
	Number	Pay	Number	Pay	Number	Pay	Number	Pay
Male								
Female								
This Year	Total		Junior level		Middle level		Top level	
	Number	Pay	Number	Pay	Number	Pay	Number	Pay
Male								
Female								
Next Year	Total		Junior level		Middle level		Top level	
	Number	Pay	Number	Pay	Number	Pay	Number	Pay
Male								
Female								

Appendix 1 APEC Women Builders Creating Inclusive Future Survey

Cover Letter

Dear Ms./Mr.:

We would like to invite you to participate in this APEC funded project by completing this short online survey (website). If you consent to participate, your responses will be kept confidential. The information provided will be used solely for the purpose of this project, and only aggregated results will be reported in APEC meetings and publications.

Background

From 2016 to 2018, APEC Economic Leaders discussed how to bridge the gender pay gap and thereby increase opportunities for women and girls. However, the latest ILO Global Wage report found that women still earn 20% less than men. Therefore, APEC is dedicated to diminishing this inequality by increasing the participation of women in non-traditional sectors, such as the architecture/engineering industry.

The “APEC Women Builders Creating Inclusive Future” project seeks to encourage APEC economies to develop Women talent in the architecture/engineering industry, reduce the wage gaps, foster vocational and skills education for women, and increase the number of women in leadership positions.

There are four objectives for the projects:

1. To identify the obstacles impeding women from entering the architecture/engineering industry and serving in decision-making positions.
2. To raise awareness on creating enabling environments in both the public and private sectors across the APEC region.

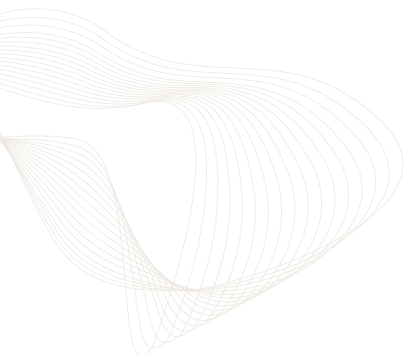
3. To show best practices, organize workshops and seminars, and provide policy recommendations that showcase women's participation in non-traditional areas to shrink the gender pay gap.
4. To empower Women talent in connecting with people and building inclusive growth within the APEC region.

A survey, workshop, and seminar will help identify obstacles as well as come up with solutions on how to empower women in the architecture/engineering industry. Moreover, the ultimate goal is to create principles that promote inclusive growth throughout the entire APEC region.

Objectives of the Survey

As part of the project, this survey aims to identify obstacles for the purpose of formulating measures for empowering women in the architecture/engineering industry. There are five objectives:

1. To identify the causes behind the gender pay gap and underrepresentation of women at senior level positions in the architecture/engineering industry.
2. To identify biases toward women as they move up in their careers in the architecture/engineering industry.
3. To identify the potential benefits for integrating gender perspectives and encouraging women to work in the architecture/engineering industry.
4. To evaluate education policies for cultivating Women talent.
5. To determine strategies for creating an enabling environment in the architecture/engineering industry that attracts, retains, and accelerates the integration of women.



This Survey Consists of Six Sections —————

- A. Background of Respondents
- B. Causes of Gender Pay Gaps and Women Underrepresentation at Senior Levels
- C. Biases Faced by Women
- D. Benefits of a Gendered Workplace
- E. Strategies and Policies
- F. Personal Experiences

All Information Will Be Kept in the Strictest Confidence —————

Your responses will be kept anonymous and never linked to you personally. Your participation is entirely voluntary. If there are items you do not feel comfortable answering, please skip them. You have the right to withdraw from the survey at any time prior to completion simply by closing the survey. To validate your responses, however, you will need to click the "Submit" button at the end of the survey.

If you have any questions regarding this project, please feel free to contact Nina Huang at yijen@ey.gov.tw or Helen Lee at helen.lee@wrp.org.tw. We greatly value your cooperation. Thank you for your time and consideration.

Ms. Hsiu-Chen Wu, Project Overseer

Director General, Department of Gender Equality

Dr. Su-Ling Fan, Project Researcher

Director, Research Development of

Construction Law Center, Tamkang University

Email: fansuling@gms.tku.edu.tw



SECTION A:**Background of Respondents**

Please answer the following questions —————

1. Your Gender

- ☐ Men ☐ Women ☐ Other

2. Your Age

- ☐ Below 25 ☐ 25-29
☐ 30-34 ☐ 35-39
☐ 40-44 ☐ 45-49
☐ 50-54 ☐ 55-59
☐ 60-64 ☐ 65+

3. Are you registered disabled?

- ☐ Yes ☐ No
☐ Other _____

4. Highest Level of Education

- ☐ High School and Below
☐ Bachelor Degree
☐ Master Degree
☐ PhD Degree

5. Specialization of Education

- ☐ Architecture
☐ Civil & Structure Engineering
☐ Mechanical & Electrical Engineering
☐ Other _____

6. Profession

- ☐ Architecture or Landscape
 Architecture
☐ Engineering
☐ Other _____

7. Position in the Organization

- ☐ Top Level Manager/President/
 Vice President
☐ Senior Level Manager/Dean
☐ Middle Level Manager / Professor/
 Researcher/Chair of Department
☐ Junior Level Manager/
 Senior Lecturer/Associate Professor/
 Associate Researcher
☐ Entry Level/Assistant Lecturer/
 Lecture /Assistant Professor/
 Assistant Researcher

8. Professional Working Experience

- ☐ < 5 years ☐ 5-9 years
☐ 10-14 years ☐ 15-19 years
☐ 20-24 years ☐ 25-29 years
☐ 30 years or more

9. Birthplace / APEC Economy :

10. Location of Organization (City):

11. Organization

- ☐ Architecture Firm
☐ Engineering Consultant
☐ Professional Engineer office
☐ Contractor
☐ Developer
☐ University
☐ Research Organization
☐ Government Agency
☐ Other _____

**12. Number of Staff/faculty
in Your Organization**

- ☐ Below 20 ☐ 20-100 ☐ 101-250
☐ 251-500 ☐ >501

**13. Number of Women Staff/faculty
in Your Organization**

- ☐ Below 20 ☐ 20-100 ☐ 101-250
☐ 251-500 ☐ >501

14. Your Annual Total Pay in 2019

USD _____

15. Your Annual Bonus Pay Out in 2019

USD _____

16. Marital Status

- ☐ Unmarried
☐ Married
☐ Divorced

17. Children

- ☐ No Children
☐ Living with One Dependent Child
☐ Living with Two Dependent Children
☐ Living with three or more Dependent Children
☐ Living with Independent Children
☐ Not Living with Children

18. First-Generation

(Multiple selections accepted)

- ☐ At least one of your parents possesses a college or higher degree
☐ At least one of your parents or close relatives is in the architecture/engineering industry
☐ None of the above

**19. Providing elder care for Parents
or Parents in Law**

- ☐ Yes ☐ No

SECTION B:

CAUSES OF GENDER PAY GAP AND WOMEN UNDERREPRESENTATION AT SENIOR LEVELS

For the following items, please place a check mark (✓) in the corresponding box that best reflects your opinion.

1. In the architecture/engineering industry, women are paid less than men.

- ☐ Strongly Disagree (Skip Question #3)
- ☐ Disagree (Skip Question #3)
- ☐ Neither Agree nor Disagree (Skip Question #3)
- ☐ Agree
- ☐ Strongly Agree

2. In the architecture/engineering industry, women are paid less than men with the same professional experience and education (adjusted gender pay gap).

- ☐ Strongly Disagree
- ☐ Disagree
- ☐ Neither Agree nor Disagree
- ☐ Agree
- ☐ Strongly Agree

3. What do you believe causes the gender pay gap in the architecture/engineering industry?

1...Strongly Disagree 2...Disagree 3...Neither Agree nor Disagree 4...Agree 5...Strongly Agree

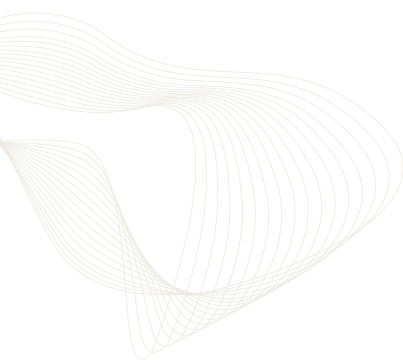
Causes	1	2	3	4	5
(1) Women have lower levels of education than men.					
(2) Women have less qualification than men.					
(3) Women have less work experience than men.					

Causes	1	2	3	4	5
(4) Women are less likely to hold higher-level, high-paying jobs compared to men ("Glass Ceiling").					
(5) A Women applicant's chances of getting an interview and an offer is lower than a Men's.					
(6) Women are especially concentrated in administrative support (including clerical) positions ("Sticky Floor").					
(7) Women have shorter and more sporadic careers than men.					
(8) Women have less opportunities to receive on-the-job training than men.					
(9) Women have lower incentives to invest in market-oriented formal education and on-the-job training than men.					
(10) Women are more than twice as likely to perform housework on an average day as men.					
(11) Women are the majority of child care providers.					
(12) Women are the majority of elder care providers.					
(13) Women tend to refuse promotions due to family roles more than men.					

Causes	1	2	3	4	5
(14) Employers do not value degrees or abilities equally between men and women.					
(15) Women may not negotiate for higher wages as aggressively as men, or they may be more likely to trade higher wages for other amenities, such as flexible work hours.					
(16) Women show less commitment to work than men.					
(17) Male executives support and promote other men who look like themselves, and they use each other's success to their own advantage.					
(18) Women executives support and promote other men who look like themselves, and they use each other's success to their own advantage.					
(19) Women tend to work part-time due to family roles more than men.					
(20) Women's preference for non-competitive environments limit their drive to contest in an electoral race or a competitive corporate advancement process.					

Causes	1	2	3	4	5
(21) The small number of women leaders may cause these beliefs to be biased and result in inefficient statistical discrimination that undervalues the performance of women.					
(22) The expectations placed on women to be homemakers and men to be breadwinners.					

4. Other causes for the gender pay gap in the architecture/engineering industry



SECTION C:**BIASES FACED BY WOMEN****1. Please indicate the extent to which you agree with each of the following statements.**

1...Strongly Disagree 2...Disagree 3...Neither Agree nor Disagree 4...Agree 5...Strongly Agree

Statement	1	2	3	4	5
(1) People automatically assume that a woman is in a secretarial or custodial position, even if she might be in a higher level role.					
(2) Taking family leave would be harmful to a women's career.					
(3) It is generally believed that children will influence a woman's job performance.					
(4) Women compete with each other for career-enhancing opportunities.					
(5) People see a woman more as a team player than a leader.					
(6) Asking for a flexible work arrangement would hurt a woman's career more than a man's.					
(7) There is a narrower range of acceptable behaviors for women at work than men.					
(8) When women give an outstanding performance, people seem surprised.					

Statement	1	2	3	4	5
(9) People think a woman is loud when she is using a normal tone of voice.					
(10) Women have to alter their appearances and demeanors to fit in work more than men.					
(11) Negative impressions are formed of women when they behave assertively.					
(12) Women easily cause a confrontation when they express themselves in a Men-dominated workplace.					
(13) Similar to men in senior roles, women more often do behind-the-scenes work or administrative work.					
(14) People react negatively when women express anger, even when it's justified.					
(15) People focus on women's technical skills, not their managerial skills.					
(16) Women have to deal with negative gender stereotypes while at work.					
(17) People expect women to be passive and quiet.					
(18) Even though women have the same credentials as their peers, other people assume women are less qualified than men.					

Statement	1	2	3	4	5
(19) Women have to prove themselves repeatedly to get the same level of recognition as men.					
(20) It upsets people when women promote themselves.					
(21) People tend to attribute a woman's success to their luck, not their performance at work.					
(22) People with caregiving responsibilities are considered not as committed to their careers.					
(23) Women are held to higher standards at work.					
(24) Ideas offered by women are less respected.					
(25) Women are expected to be more compliant than men.					
(26) Women colleagues support each other.					
(27) At work, a mother has to fight very hard to prove she can be a good mother as well as a good architect/engineer.					

2. Other biases toward women as they advance in their careers in the architecture/engineering industry.

SECTION D:**BENEFITS OF A GENDERED
WORKPLACE**

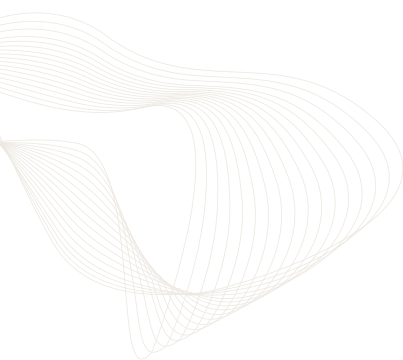
1. Please indicate the extent to which you agree with each of the following research findings.

1...Strongly Disagree 2...Disagree 3...Neither Agree nor Disagree 4...Agree 5...Strongly Agree

Benefits	1	2	3	4	5
(1) Gender equality recognized and awarded by public bodies improves the organization's image.					
(2) Public recognition of gender equality positively influences managers' efficiency.					
(3) The more gender-equal a workplace, the more profit generated from marketing and sales.					
(4) Public recognition of gender equality in the workplace creates competitive advantages.					
(5) Moving from a single-gender to multi-gender workplace can increase productivity.					
(6) More Womens members on the board of directors increases a company's profit.					

Benefits	1	2	3	4	5
(7) There are financial benefits that come with gender balance.					

2. Other benefits for integrating gender perspectives and encouraging the advancement of women in the architecture/engineering industry.



SECTION E:**STRATEGIES AND POLICIES****1. Please rate each of the following policies or strategies for cultivating Women talent through the education system.**

1...Very Ineffective 2...Ineffective 3...Undecided 4...Effective 5...Very Effective

Factors	1	2	3	4	5
(1) Ensuring there are enough Women teachers in architecture/engineering-related subjects and higher levels of education.					
(2) Design gender-responsive teacher training					
(3) Policies or strategies that provide gender equipment and other resources to simulate interest on architecture, engineering and similar or related courses among girls					
(4) Actions or strategies to eliminate gender stereotypes in teaching/learning materials					
(5) Provide gender-responsive career counselling for high school students.					
(6) Promote Women role models for girls					
(7) Strategies and/or policies for gender equality at work					

Factors	1	2	3	4	5
(8) Provide scholarships or funds for Women participation and research					
(9) Education system or mechanisms to help non-architecture/engineering related graduates obtain architect or professional engineer licenses.					

2. Other policies or strategies for cultivating Women talent through the education system.

Please rate each of the following policies or strategies for attracting and retaining women talent as well as promoting them to decision-making positions in the architecture/engineering industry.

1...Very Ineffective 2...Ineffective 3...Undecided 4...Effective 5...Very Effective

Policies and Strategies	1	2	3	4	5
(1) Gender pay gap reporting regulations					
(2) Family-leave policy supporting equality for men and women (the more parental leave that fathers take, the more mothers are able to stay at work)					

Policies and Strategies	1	2	3	4	5
(3) Flexible working hours					
(4) Allowing employees to work remotely					
(5) Provide extra assistance or support for caregivers					
(6) Introduce/adopt gender-balanced performance evaluations and recruitment committees					
(7) Promote a gender quota at the managerial level					
(8) Gender quotas for employment					
(9) Gender-equality training to eliminate gender stereotypes (biases)					
(10) Gender-balanced teams					
(11) Fair and transparent performance evaluations					
(12) Cultivation of an open and inclusive culture (e.g. Work-family Balance Award)					
(13) Mentorship program					

3. Other policies or strategies for advancing women in the architecture/engineering industry

SECTION F:**PERSONAL EXPERIENCES****1. When was your last promotion?**

- ☐ Within 1 year ☐ 1-3 years ago
☐ 4-5 years ago ☐ 6-10 years ago
☐ More than 10 years ago ☐ Never

2. When can you expect your next promotion?

- ☐ Within 1 year ☐ 1-3 years ago
☐ 4-5 years ago ☐ 6-10 years ago
☐ More than 10 years

3. How long do you plan to stay in the architecture/engineering industry?

- ☐ Within 1 year ☐ 1-3 years ago
☐ 4-5 years ago ☐ 6-10 years ago
☐ More than 10 years

4. Have you ever worked overseas?

- ☐ Yes ☐ Never

5. Please indicate the extent to which you agree with each of the following statements.

1...Strongly Disagree 2...Disagree 3...Neither Agree nor Disagree 4...Agree 5...Strongly Agree

Statement	1	2	3	4	5
(1) I am satisfied with my current salary.					
(2) I see a clear path to promotion at work.					
(3) I see myself leaving this job/ workplace in the next couple of years.					
(4) I believe that if I work hard, I will succeed at my current workplace.					
(5) I am very inspired to do more than required at work.					

Statement	1	2	3	4	5
(6) I nearly always look forward to going to work.					
(7) I feel that socially engaging with my colleagues could cause a negative impression of my competence.					
(8) I do not discuss personal things with my colleagues to avoid having my family life used against me.					
(9) I am frequently able to do overnight business travel.					
(10) I am willing to travel abroad frequently.					
(11) I am willing to be promoted to more challenging positions.					
(12) I feel excluded at work.					

6. Please rate each of the following factors influencing your decision to stay at your organization?

1...Not Important at All 2...Not Important 3...Undecided 4...Important 5...Very Important

Factors	1	2	3	4	5
(13) Advancement opportunity					
(14) Empowering work culture					
(15) Possibility to work abroad					
(16) Personal relationships with coworkers					

Factors	1	2	3	4	5
(17) Benefits package					
(18) Social support from supervisors and coworkers.					
(19) High salary and raises					
(20) Family-career balance					

7. Please rate each of the following benefits influencing your decision to stay at your organization?

1...Not Important at All 2...Not Important 3...Undecided 4...Important 5...Very Important

Benefits	1	2	3	4	5
(1) Remote work					
(2) Flexible work hours					
(3) Training, development					
(4) Mentorship					
(5) Diversity in the workplace					
(6) Salary or Income					
(7) Healthcare					
(8) Vacation/leave					
(9) Childcare					
(10) Meal plan/snacks					

8. Please rate each of the following factors when considering a new employer.

1...Not Important at All 2...Not Important 3...Undecided 4...Important 5...Very Important

Factors	1	2	3	4	5
(1) Company purpose aligns with my values					
(2) Flexible work hours					
(3) Allowing employees to work remotely					
(4) Variety of work challenges					
(5) Manager who helps resolve workplace challenges					
(6) Training and development opportunities					
(7) Frequent performance feedback					
(8) Access to peer groups					
(9) Mentorship program					
(10) Salary or Income					
(11) Diversity in the workplace					
(12) Inspiring and safe workplace environment					
(13) Childcare					
(14) Perks (e.g. meal plans or employee discounts)					
(15) Family leave with pay					
(16) Breastfeeding room and related facilities					

Factors	1	2	3	4	5
(17) Less after-work business events					
(18) Less overnight business travel					
(19) Less business travel abroad					
(20) Family-oriented after-work business events (e.g., events welcoming children and spouses)					

9. Please rate each of the following factors that influenced your decision to study in architecture/engineering industry related majors.

1---Not Important at All 2---Not Important 3---Undecided 4---Important 5---Very Important

Factors	1	2	3	4	5
(1) Family					
(2) School-teacher					
(3) Personal Skills or interests					
(4) Society Values					
(5) Career Advancement					
(6) Salary or Income					
(7) Friends or Peers					
(8) Trends					
(9) License					

10. Please rate each of the following personal factors that influence your career progress (please skip if not applicable to you).

1...Not Important at All 2...Not Important 3...Undecided 4...Important 5...Very Important

Factors	1	2	3	4	5
(1) Housework					
(2) Children					
(3) Elder care or sick family member					
(4) Relationship (spouse or girl/boyfriend)					
(5) Personal characteristics					
(6) Values of parents or siblings					
(7) Values of parents-in-law					
(8) Society values					

11. Please rate the frequency of each of the following disputes with your spouse (please skip if not applicable to you)

1...Never 2...Rarely 3...Sometimes 4...Very Often 5...Always

Factors	1	2	3	4	5
(1) Economic issues					
(2) Housework-balance issues					
(3) Children issues					
(4) Issues with Spouse's work					

12. Have you experienced any of the following at work
(please skip if not applicable to you)?

1...Never 2...Rarely 3...Sometimes 4...Very Often 5...Always

Statement	1	2	3	4	5
(1) Uncomfortable sexist comments					
(2) Uncomfortable sexual stories or jokes					
(3) Sexual or inappropriate images					
(4) Unwanted romantic or sexual attention					
(5) Unwanted physical contact					
(6) Lost career opportunities (i.e. promotion/raise, career-enhancing assignments) due to rebuffing sexual advances					
(7) Problems with breastfeeding during work					
(8) Social support from supervisor					
(9) Social support from coworkers					

13. Other comments:

Appendix 2 APEC Women Builders Creating Inclusive Future Survey Results

Basic Data

The reliability tests were carried out on twenty-two dependent variables and twenty-seven dependent variables based on Cronbach's alpha test. Cronbach's alpha is a measurement of internal coefficient, which is to measure the internal consistency among the variables (Vogt 2007).

The results show the inter-correlation scores were of 0.831 and 0.956 respectively for the first two sets of variables. The scores were above the acceptable threshold value of 0.7. This can be concluded that the variables are acceptable in terms of internal consistency.

Table 1 Inter-correlation scores

Reliability Statistics	
Cronbach's Alpha	N of Items
0.831	22
Cronbach's Alpha	N of Items
0.956	27

Sampling Adequacy

Furthermore, KMO & Bartlett's Test is conducted to measure the sampling adequacy. The result as shown in Table 1, KMO & Bartlett's Test is 0.834. It is above the acceptable

threshold value of 0.7, suggesting that the variables are acceptable in terms of the sample adequacy.

Table 2 KMO & Bartlett's Test Result

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		0.834
Bartlett's Test of Sphericity	Approx. Chi-Square	3383.592
	df	435
	Sig.	0

Section A: Background of respondents

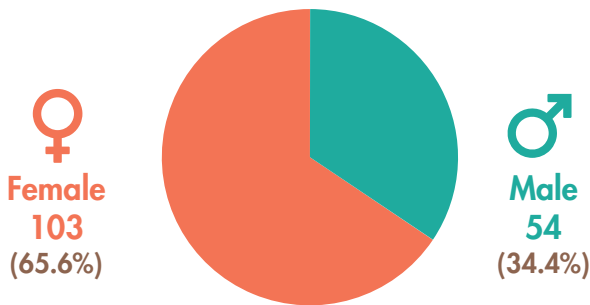


Figure 1 Gender of Respondents

Figure 1 shows the gender of respondents. Among the 157 respondents, 65.6% are Women, and 34.4% are Men.

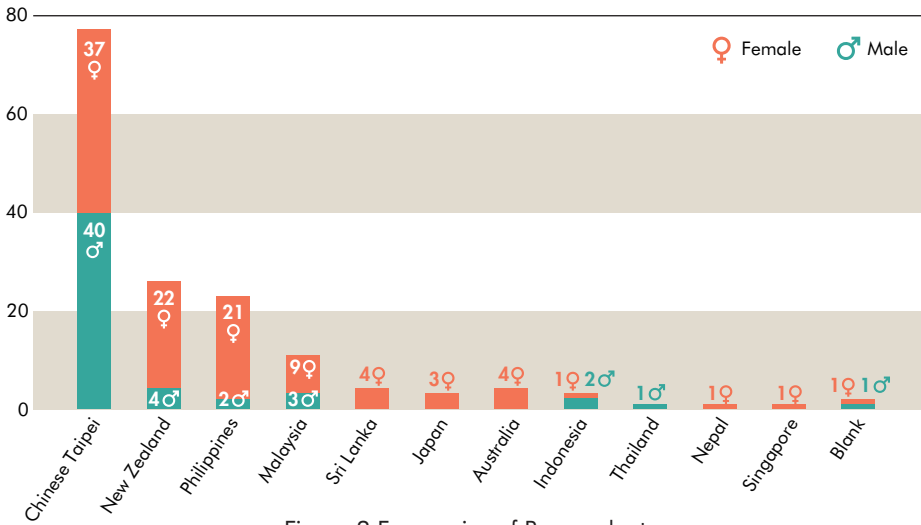


Figure 2 Economies of Respondents

Figure 2 shows the valid survey of different economies. Among the 157 respondents, 37 Women and 40 Men are from Chinese Taipei, 22 Women and 4 Men are from New Zealand, 21 Women and 2 Men are from Philippines, 9 Women and 3 Men are from Malaysia, 4 Women are from Sri Lanka, 3 Women are from Japan, 4 Women are from Australia, 1 Women and 2 Men are from Indonesia, 1 Men is from Thailand, 1 Women is from Nepal, 1 Women is from Singapore, 1 Women and 1 Men left blank.

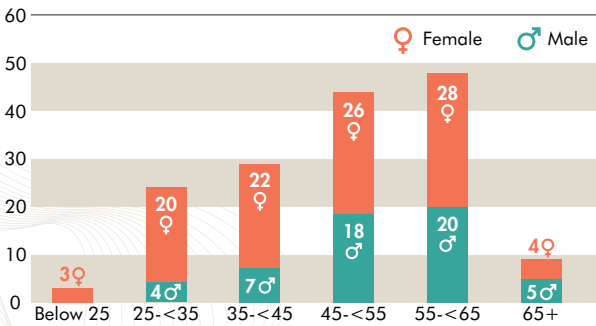


Figure 3 Age of Respondents

Figure 3 shows the age of respondents. Among the 157 respondents, 3 are below 25, 24 are between 25 and 35, 29 are between 35 and 45, 44 are between 45 and 55, 48 are between 55 and 65, 9 are more than 65 years old.

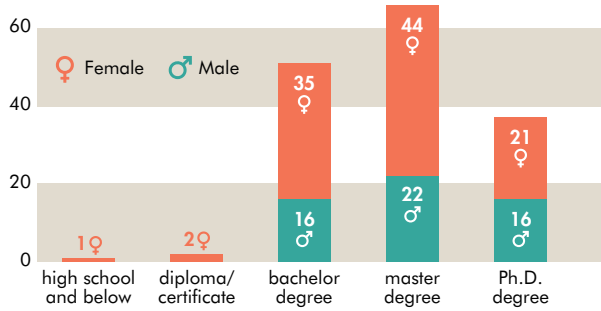


Figure 4 Highest Level of Education of Respondents

Figure 4 shows the highest level of education. Among the 157 respondents, 1 belongs to high school and below, 2 belong to diploma/ certificate, 51 belong to bachelor degree, 66 belong to master degree, 37 belong to Ph.D. degree.

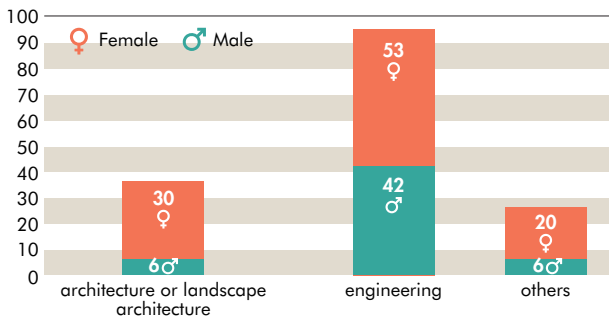


Figure 5 Profession of Respondents

Figure 5 shows the profession of respondents. Among the 157 respondents, 36 are architecture or landscape architecture, 95 are engineering, and 26 are others.

Section B: Causes of gender pay gap

and Women underrepresentation at senior levels.

In Table 3, it shows the results of principal component analysis of causes of gender pay gap. It is sorted in descending order by the answers of women and in which those below 0.7 are left blank.

The first 3 causes women agree with are (2) Women have lower qualifications than men, (12) Women are the majority of elder care providers and (14) Employers do not value degrees or abilities equally between men and women, while those identified by men are (11) Women are the majority of child care providers, (12) Women are the majority of elder care providers and (5) A Women applicant's chances of getting an interview and an offer is lower than that of a Men applicant.

Table 3 Causes of Gender Pay Gap

Statement	All	Women	Men
(2) Women have lower qualifications than men.	0.878	0.859	0.715
(12) Women are the majority of elder care providers.	0.844	0.854	0.849
(14) Employers do not value degrees or abilities equally between men and women.	0.776	0.843	0.843
(8) Women have fewer opportunities to receive on-the-job training than men	0.832	0.82	
(10) Women are more than twice as likely to perform housework on an average day as men.	0.839	0.811	
(1) Women have lower levels of education than men.	0.802	0.806	0.718
(6) Women are especially concentrated in administrative support (including clerical) positions ("Sticky Floor").	0.729	0.778	

Statement	All	Women	Men
(21) The small number of women leaders may cause these beliefs to be biased and result in inefficient statistical discrimination that undervalues the performance of women.	0.832	0.751	
(16) Women show less commitment to work than men.	0.731	0.749	
(3) Women have less work experience than men.	0.738	0.742	0.821
(22) The expectations placed on women to be homemakers and men to be breadwinners.	-0.704	0.72	
(4) Women are less likely to hold higher-level, high-paying jobs compared to men ("Glass Ceiling").	0.702	0.719	0.711
(15) Women may not negotiate for higher wages as aggressively as men, or they may be more likely to trade higher wages for other amenities, such as flexible work hours.		0.715	0.741
(11) Women are the majority of child care providers.	0.734	0.707	0.905
(5) A Women applicant's chances of getting an interview and an offer is lower than that of a Men applicant.			0.827
(13) Women tend to refuse promotions due to family roles more than men.			0.774
(20) Women's preference for non-competitive environments limits their drive to contest in an electoral race or a competitive corporate advancement process.			0.741
(17) Male executives support and promote other men who look like themselves, and they use each other's success to their advantage.			0.733

Statement	All	Women	Men
(9) Women have lower incentives to invest in market-oriented formal education and on-the-job training than men.			0.704
(7) Women have shorter and more sporadic careers than men.			
(18) Women executives support and promote other men who look like themselves, and they use each other's success to their advantage.			
(19) Women tend to work part-time due to their family roles more than men.			

Section C: Biases Faced by women

In Table 4, it shows the results of principal component analysis of biases faced by women, in which those below 0.7 are left blank.

The first three biases women agree on are (26) Women colleagues don't support each other, (4) Women compete with each other for career-enhancing opportunities, and (3) It is generally believed that children will influence a woman's job performance, while the top three agreed by man are (24) Ideas offered by women are less respected, (21) People tend to attribute a woman's success to their luck, not their performance at work, and (4) Women compete with each other for career-enhancing opportunities.

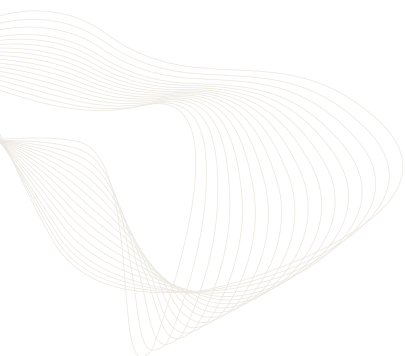


Table 4 Biases Faced by Women

Statement	All	Women	Men
(26) Women colleagues support each other.	0.869	-0.869	0.707
(21) People tend to attribute a woman's success to their luck, not their performance at work.	0.817	0.768	0.792
(4) Women compete with each other for career-enhancing opportunities.	0.791	0.808	0.785
(18) Even though women have the same credentials as their peers, other people assume women are less qualified than men.	0.777		0.767
(24) Ideas offered by women are less respected.	0.77	0.764	0.834
(20) It upsets people when women promote themselves.	0.762	0.739	0.73
(2) Taking family leave would be disadvantageous to a woman's career.	0.758	0.776	
(14) People react negatively when women express anger, even when it's justified.	0.729		
(3) It is generally believed that children will influence a woman's job performance.	0.724	0.782	
(6) Asking for a flexible work arrangement would hurt a woman's career more than a man's.	0.702		0.74
(1) People automatically assume that a woman is in a secretarial or custodial position, even if she might be in a higher-level role.		0.731	
(5) People see a woman more as a team player than a leader.			
(7) There is a narrower range of acceptable behaviors for women at work than men.			
(8) When women give an outstanding performance, people seem surprised.			

Statement	All	Women	Men
(9) People think a woman is loud when she is using a normal tone of voice.			
(10) Women have to alter their appearances and demeanors to fit in work more than men.			
(11) Negative impressions are formed of women when they behave assertively.			0.702
(12) Women easily cause a confrontation when they express themselves in a Men-dominated workplace.			
(13) Similar to men in senior roles, women more often do behind-the-scenes work or administrative work.			
(15) People focus on women's technical skills, not their managerial skills.			
(16) Women have to deal with negative gender stereotypes while at work.			
(17) People expect women to be passive and quiet.			
(19) Women have to prove themselves repeatedly to get the same level of recognition as men.			
(22) People with caregiving responsibilities are considered not as committed to their careers.			
(23) Women are held to higher standards at work.		0.771	
(25) Women are expected to be more compliant than men.			
(27) At work, a mother has to fight very hard to prove she can be a good mother as well as a good architect/engineer.			

Section D: Benefits of a gendered workplace

In Table 5, it shows the results of principal component analysis of benefits of a gendered workplace, in which those below 0.7 are left blank.

The first three benefits women agree with are (3) The more gender-equal a workplace, the more profit generated from marketing and sales, (1) Gender equality recognized and awarded by public bodies improves the organization's image, and (5) Moving from a single-gender to a multi-gender workplace can increase productivity, while those identified by men are (3) The more gender-equal a workplace, the more profit generated from marketing and sales, (4) Public recognition of gender equality in the workplace creates competitive advantages and (5) Moving from a single-gender to a multi-gender workplace can increase productivity.

Table 5 Benefits of a Gendered Workplace

Statement	All	Women	Men
(3) The more gender-equal a workplace, the more profit generated from marketing and sales.	0.874	0.861	0.781
(4) Public recognition of gender equality in the workplace creates competitive advantages.	0.822	0.795	0.731
(5) Moving from a single-gender to a multi-gender workplace can increase productivity.	0.816	0.81	0.638
(7) There are financial benefits that come with gender balance.	0.804	0.791	0.637
(1) Gender equality recognized and awarded by public bodies improves the organization's image.	0.802	0.819	0.618
(2) Public recognition of gender equality positively influences managers' efficiency.	0.769	0.748	0.638
(6) More Women members in the board of directors increase a company's profit.	0.722		0.601

Section E: Strategies and policies

In Table 6, it shows the results of principal component analysis of strategies and policies, in which those below 0.7 are left blank.

The first three strategies and policies women believe the most effective are (5) Provide gender-responsive career counselling for high school students, (8) Provide scholarships or funds for women participation and research, and (9) Education system or mechanisms to help non-architecture/ engineering related graduates obtain architect or professional engineer licenses, while men believe the followings are most effective: (7) Strategies and/ or policies for gender equality at work, (5) Provide gender-responsive career counselling for high school students, and (1) Ensuring there are enough women teachers in architecture/ engineering-related subjects and higher levels of education.

Table 6 Strategies and Policies.

Statement	All	Women	Men
(7) Strategies and/or policies for gender equality at work	0.839		0.931
(4) Actions or strategies to eliminate gender stereotypes in teaching/learning materials	0.793		0.805
(2) Design gender-responsive teacher training	0.77		0.788
(6) Promote Women role models for girls	0.759		0.836
(1) Ensuring there are enough Women teachers in architecture/ engineering-related subjects and higher levels of education.	0.749		0.841
(5) Provide gender-responsive career counselling for high school students.	0.742	0.863	0.875
(3) Policies or strategies that provide gender equipment and other resources to simulate interest in architecture, engineering and similar or related courses among girls	0.734	0.716	0.825

Statement		All	Women	Men
(8)	Provide scholarships or funds for Women participation and research		0.85	0.789
(9)	Education system or mechanisms to help non-architecture/ engineering related graduates obtain architect or professional engineer licenses.		0.843	0.77

In Table 7, it shows the results of principal component analysis of attracting and retaining women talent as well as promoting them to decision-making positions, in which those below 0.7 are left blank.

The first three factors women agree with are (8) Gender quotas for employment, (7) Promote a gender quota at the managerial level, and (12) Cultivation of an open and inclusive culture (e.g. Work-family Balance Award), while men agree with (12) Cultivation of an open and inclusive culture (e.g. Work-family Balance Award), (7) Promote a gender quota at the managerial level, and (5) Provide extra assistance or support for caregivers.

————Table 7 Attracting and Retaining Women Talent as well as
Promoting Them to Decision-making Positions————

Statement		All	Women	Men
(8)	Gender quotas for employment	0.93	0.938	0.861
(7)	Promote a gender quota at the managerial level	0.895	0.912	0.876
(12)	Cultivation of an open and inclusive culture (e.g. Work-family Balance Award)	0.866	0.866	0.893
(13)	Mentorship program	0.825	0.796	
(3)	Flexible working hours	0.819	0.806	0.784

Statement	All	Women	Men
(11) Fair and transparent performance evaluations	0.816	0.793	0.768
(4) Allowing employees to work remotely	0.795	0.825	0.719
(5) Provide extra assistance or support for caregivers	0.776	0.724	0.869
(1) Gender pay gap reporting regulations			
(2) Family-leave policy supporting equality for men and women (the more parental leave that fathers take, the more mothers can stay at work)			0.83
(6) Introduce/adopt gender-balanced performance evaluations and recruitment committees			0.775
(9) Gender-equality training to eliminate gender stereotypes (biases)			
(10) Gender-balanced teams			0.745

Section F: Personal experiences

In Table 8, it shows the results of principal component analysis of personal experiences, in which those below 0.7 are left blank.

The first three personal experiences women agree with are (11) I am willing to be promoted to more challenging positions, (9) I am frequently able to do overnight business travel and (1) I am satisfied with my current salary, while those for men are (1) I am satisfied with my current salary, (11) I am willing to be promoted to more challenging positions and (2) I see a clear path to promotion at work.

Table 8 Personal Experiences.

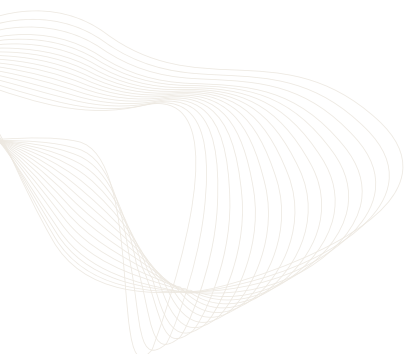
Statement	All	Women	Men
(11) I am willing to be promoted to more challenging positions.	0.81	0.886	0.825
(4) I believe that if I work hard, I will succeed in my current workplace.	0.809	0.721	
(8) I do not discuss personal things with my colleagues to avoid having my family life used against me.	0.804		
(10) I am willing to travel abroad frequently.	0.802	0.701	0.786
(3) I see myself leaving this job/ workplace in the next couple of years.	0.746	0.777	-0.736
(2) I see a clear path to promotion at work.	0.717		0.808
(1) I am satisfied with my current salary.		0.839	0.853
(5) I am very inspired to do more than required at work.			0.719
(6) I nearly always look forward to going to work.		0.781	
(7) I feel that socially engaging with my colleagues could cause a negative impression of my competence.		0.806	0.779
(9) I am frequently able to do overnight business travel.		0.847	
(12) I feel excluded at work.			0.776

In Table 9, it shows the results of principal component analysis of influencing your decision to stay at your organization, in which those below 0.7 are left blank.

The first three factors women believe the most important are (4) Personal relationships with coworkers, (8) Family-career balance, and (6) Social support from supervisors and coworkers, while men believe (8) Family-career balance, (5) Benefits package, and (6) Social support from supervisors and coworkers are most important.

————Table 9 Influencing Your Decision to Stay at Your Organization.————

Statement	All	Women	Men
(8) Family-career balance	0.812	0.809	0.876
(6) Social support from supervisors and coworkers.	0.807	0.73	0.747
(7) High salary and raises	0.762		0.726
(5) Benefits package	0.724		0.826
(1) Advancement opportunity into a new role		0.715	
(2) Empowering work culture		0.725	
(3) Possibility to work abroad			
(4) Personal relationships with coworkers		0.817	



In Table 10, it shows the results of principal component analysis of benefits influencing your decision to stay at your organization, in which those below 0.7 are left blank.

The first three benefits women believe the most important are (2) Flexible work hours, (8) Vacation/leave and (7) Healthcare, while those for men are (1) Remote work, (7) Healthcare and (8) Vacation/leave.

————Table 10 Benefits Influencing Your Decision to Stay
at Your Organization.————

Statement	All	Women	Men
(1) Remote work	0.843		0.914
(3) Training, development	0.827	0.741	0.803
(2) Flexible work hours	0.826	0.808	0.731
(4) Mentorship	0.814	0.718	0.734
(7) Healthcare	0.788	0.751	0.905
(5) Diversity in the workplace	0.735		0.771
(8) Vacation/leave	0.726	0.758	0.806
(6) Salary or Income	0.716		0.725
(9) Childcare			
(10) Meal plan/snacks			0.738

In Table 11, it shows the results of principal component analysis of factors when considering a new employer, in which those below 0.7 are left blank.

The first three factors women believe the most important are (19) Less business travel abroad, (18) Less overnight business travel, and (7) Frequent performance feedback, while men identified (12) Inspiring and safe workplace environment, (14) Perks (e.g. meal plans or employee discounts), and (3) Allowing employees to work remotely as most important.

Table 11 Factors When Considering A New Employer.

Statement	All	Women	Men
(18) Less overnight business travel	0.865	0.891	0.797
(19) Less business travel abroad	0.863	0.895	0.838
(7) Frequent performance feedback	0.827	0.849	0.829
(14) Perks (e.g. meal plans or employee discounts)	0.814		0.854
(2) Flexible work hours	0.811		0.812
(1) Company purpose aligns with my values	0.81	0.803	0.872
(3) Allowing employees to work remotely	0.809		0.842
(17) Less after-work business events	0.78	0.833	
(15) Family leave with pay	0.764		0.808
(10) Salary or Income	0.751	0.756	0.723
(13) Childcare	0.751		0.785
(12) Inspiring and safe workplace environment	0.741		0.887
(4) Variety of work challenges		0.763	0.735
(5) A manager who helps resolve workplace challenges			

Statement	All	Women	Men
(6) Training and development opportunities			
(8) Access to peer groups			
(9) Mentorship program		0.812	
(11) Diversity in the workplace			
(16) Breastfeeding room and related facilities			0.824
(20) Family-oriented after-work business events (e.g.. events welcoming children and spouses)			

In Table 12, it shows the results of principal component analysis of factors that influenced your decision to study, in which those below 0.7 are left blank.

The first three factors women believe the most important are (1) Family, (2) School-teacher, and (5) Friends or Peers, while those for men are (5) Career Advancement, (6) Salary or Income, and (2) School-teacher.

————Table 12 Factors That Influenced Your Decision to Study.————

Statement	All	Women	Men
(5) Career Advancement	0.834	0.785	0.887
(2) School-teacher	0.799	0.789	0.789
(6) Salary or Income	0.791	0.701	0.86
(1) Family	0.778	0.816	0.751
(7) Friends or Peers	0.757	0.75	
(3) Personal Skills or interests	0.712	0.732	

Statement	All	Women	Men
(4) Society Values			
(8) Trends			0.746
(9) License			

In Table 13, it shows the results of principal component analysis of factors that influence your career progress, in which those below 0.7 are left blank.

The first three factors women believe the most important are (1) Housework, (3) Elder care or sick family member, and (2) Children, while those for men are (8) Society values, (3) Elder care or sick family member, and (2) Children.

————Table 13 Factors That Influence Your Career Progress.————

Statement	All	Women	Men
(1) Housework	0.813	0.827	0.756
(3) Elder care or sick family member	0.809	0.791	0.837
(2) Children	0.788	0.786	0.814
(6) Values of parents or siblings	0.751	0.763	0.76
(8) Society values	0.748	0.712	0.867
(4) Relationship (spouse or girl/boyfriend)			
(5) Personal characteristics			0.8
(7) Values of parents-in-law			0.731

In Table 14, it shows the results of principal component analysis of disputes with your spouse, in which those below 0.7 are left blank.

The first three disputes that occur to women believe the most often are (2) Housework-balance issues, (4) Issues with Spouse's work, and (1) Economic issues, while those for men are (3) Children issues, (1) Economic issues, and (4) Issues with Spouse's work.

————Table 14 Disputes with Your Spouse.————

Statement	All	Women	Men
(2) Housework-balance issues	0.844	0.84	0.862
(4) Issues with Spouse's work	0.84	0.831	0.877
(1) Economic issues	0.792	0.706	0.894
(3) Children issues	0.787		0.907

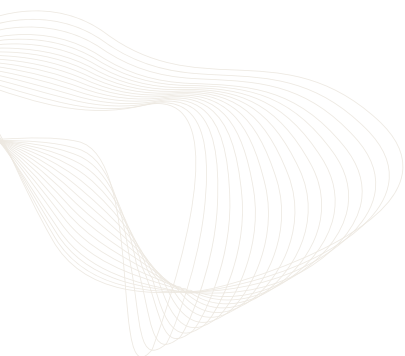
In Table 15, it shows the results of principal component analysis of personal experiences, in which those below 0.7 are left blank.

The first three situations women experienced most often are (9) Social support from coworkers, (8) Social support from a supervisor, and (4) Unwanted romantic or sexual attention, while those for men are (9) Social support from coworkers, (8) Social support from a supervisor, and (5) Unwanted physical contact.

————Table 15 Personal Experiences.————

Statement	All	Women	Men
(9) Social support from coworkers	0.964	0.965	0.952

Statement		All	Women	Men
(8)	Social support from a supervisor	0.943	0.949	0.917
(5)	Unwanted physical contact	0.857	0.833	0.896
(4)	Unwanted romantic or sexual attention	0.84	0.85	0.819
(3)	Sexual or inappropriate images	0.834	0.81	0.85
(1)	Uncomfortable sexist comments	0.822	0.84	0.821
(2)	Uncomfortable sexual stories or jokes	0.813	0.789	0.894
(6)	Lost career opportunities (i.e. promotion/raise, career-enhancing assignments)due to rebuffing sexual advances			0.802
(7)	Problems with breastfeeding during work			0.726



Reference

- Aboagye-Nimo, E., et al. (2019). "Complexity of women's modern-day challenges in construction." Engineering, Construction and Architectural Management 26(11): 2550-2565.
- Ackrill, R., et al. (2017). "'Black Boxes' and 'fracture points': the regulation of gender equality in the UK and French construction industries." The International Journal of Human Resource Management 28(21): 3027-3046.
- Agapiou, A. (2002). "Perceptions of gender roles and attitudes toward work among male and female operatives in the Scottish construction industry." Construction Management and Economics 20(8): 697-705.
- Arditi, D., et al. (2013). "Managerial competencies of female and male managers in the Swedish construction industry." Construction Management and Economics 31(9): 979-990.
- Arslan, G. and S. Kivrak (2004). "The lower employment of women in Turkish construction sector." Building and Environment 39(11): 1379-1387.
- Barreto, U., et al. (2017). "Barriers to the Professional Development of Qualified Women in the Peruvian Construction Industry." Journal of Professional Issues in Engineering Education and Practice 143(4).
- Bennett, J. F., et al. (1999). "Women in construction: a comparative investigation into the expectations and experiences of female and male construction undergraduates and employees." Women in Management Review 14(7): 273-292.
- Bigelow, B. F., et al. (2015). "Identifying the Most Effective Factors in Attracting Female Undergraduate Students to Construction Management." International Journal of Construction Education and Research 11(3): 179-195.
- Bigelow, B. F., et al. (2017). "Attracting Students to Construction Education Programs: An Exploration of Perceptions by Gender." International Journal of Construction Education and Research 14(3): 179-197.
- Bigelow, B. F., et al. (2017). "Attracting and Retaining Tradespeople, an Evaluation of Influencers on Construction Workers in Two Different Trades in Texas." International Journal of Construction Education and Research 15(3): 163-178.
- Bilbo, D., et al. (2014). "Effects of Family-Related Factors on Female Project Managers' Salaries in the Construction Industry in the United States." International Journal of Construction Education and Research 10(4): 255-267.
- Bowen, P., et al. (2014). "Occupational stress and job demand, control and support factors among construction project consultants." International Journal of Project Management 32(7): 1273-1284.
- Bridges, D., et al. (2020). "Negotiating gender in the male-dominated skilled trades: a systematic literature review." Construction Management and Economics 38(10): 894-916.
- Bryce, T., et al. (2019). "Barriers to career advancement for female engineers in Australia's civil construction industry and recommended solutions." Australian Journal of Civil Engineering 17(1): 1-10.

- Caven, V. (2006). "Career building: women and non-standard employment in architecture." Construction Management and Economics 24(5): 457-464.
- Caven, V. and E. N. Astor (2013). "The potential for gender equality in architecture: an Anglo-Spanish comparison." Construction Management and Economics 31(8): 874-882.
- Caven, V., et al. (2013). "Performance, gender and sexualised work." *Equality, Diversity and Inclusion: An International Journal* 32(5): 475-490.
- Caven, V., et al. (2016). "A cross-national study of gender diversity initiatives in architecture." *Cross Cultural & Strategic Management* 23(3): 431-449.
- Chandra, V. and M. Loosemore (2004). "Women's self-perception: an inter-sector comparison of construction, legal and nursing professionals." Construction Management and Economics 22(9): 947-956.
- Choudhury, T. (2013). "Experiences of women as workers: a study of construction workers in Bangladesh." Construction Management and Economics 31(8): 883-898.
- Clarke, L., et al. (2016). "The European Construction Social Partners: Gender Equality in Theory and Practice." European Journal of Industrial Relations 11(2): 151-177.
- Dainty, A. R. J., et al. (2000). "A grounded theory of women's career under-achievement in large UK construction companies." Construction Management and Economics 18(2): 239-250.
- Dainty, A. R. J. and D. J. Edwards (2003). "The UK building education recruitment crisis: a call for action." Construction Management and Economics 21(7): 767-775.
- Darko, A., et al. (2020). "Artificial intelligence in the AEC industry: Scientometric analysis and visualization of research activities." Automation in Construction 112.
- English, J. and P. Bowen (2012). "Overcoming Potential Risks to Females Employed in the South African Construction Industry." International Journal of Construction Management 12(1): 37-49.
- English, J. and P. Hay (2015). "Black South African women in construction: cues for success." Journal of Engineering, Design and Technology 13(1): 144-164.
- Enshassi, A., et al. (2008). "The perception of women engineers in the construction industry in Palestine." European Journal of Engineering Education 33(1): 13-20.
- Fielden, S. L., et al. (2001). "Women, equality and construction." Journal of Management Development 20(4): 293-305.
- Fielden, S. L., et al. (2000). "Women in construction: the untapped resource." Construction Management and Economics 18(1): 113-121.
- Fowler, B. and F. Wilson (2016). "Women Architects and Their Discontents." Sociology 38(1): 101-119.
- Francis, V. (2017). "What influences professional women's career advancement in construction?" Construction Management and Economics 35(5): 254-275.

- French, E. and G. Strachan (2015). "Women at work! Evaluating equal employment policies and outcomes in construction." Equality, Diversity and Inclusion: An International Journal 34(3): 227-243.
- Galea, N., et al. (2015). "Designing robust and revisable policies for gender equality: lessons from the Australian construction industry." Construction Management and Economics 33(5-6): 375-389.
- Gayani Fernando, N., et al. (2014). "The career advancement of the professional women in the UK construction industry." Journal of Engineering, Design and Technology 12(1): 53-70.
- George, M. and M. Loosemore (2018). "Site operatives' attitudes towards traditional masculinity ideology in the Australian construction industry." Construction Management and Economics 37(8): 419-432.
- Grimson, J. and W. Grimson (2019). Eliminating Gender Inequality in Engineering, Industry, and Academia. The Engineering-Business Nexus: 315-339.
- Haupt, T. and F. Fester (2012). "Women-owned construction enterprises: a South African assessment." Journal of Engineering, Design and Technology 10(1): 52-71.
- Henderson, L. S. and R. W. Stackman (2010). "An Exploratory Study of Gender in Project Management: Interrelationships with Role, Location, Technology, and Project Cost." Project Management Journal 41(5): 37-55.
- Hickey, P.J. and Q. Cui (2020). "Gender Diversity in US Construction Industry Leaders." Journal of Management in Engineering 36(5).
- Hossain, J. B. and K. Kusakabe (2005). "Sex segregation in construction organizations in Bangladesh and Thailand." Construction Management and Economics 23(6): 609-619.
- Hosseini, M. R., et al. (2018). "Critical evaluation of off-site construction research: A Scientometric analysis." Automation in Construction 87: 235-247.
- Hsiao, H., et al. (2012). "Impact of harness fit on suspension tolerance." Hum Factors 54(3): 346-357.
- OBJECTIVE: This study investigated the effect of body size and shape and harness fit on suspension tolerance time. BACKGROUND: Fall victims may develop suspension trauma, a potentially fatal reduction of return blood flow from legs to the heart and brain, after a successfully arrested fall if they are not rescued quickly or the harness does not fit them well. METHOD: For this study, 20 men and 17 women with construction experience were suspended from the dorsal D-ring of a full-body fall-arrest harness. Their suspension tolerance time, physical characteristics, and harness fit levels were assessed. RESULTS: Body characteristics (i.e., weight, stature, upper- and lower-torso depths) were associated with decreased suspension tolerance time ($r = -.36$ - $-.45$, $p < .05$). In addition, harness fit affected suspension tolerance time; workers with a torso angle of suspension greater than 35 degrees, a thigh strap angle greater than 50 degrees, or a poorly fitting harness size had shorter suspension tolerance time (mean differences = 14, 11, and 9.8 min, respectively, $p < .05$). CONCLUSION: Body size and harness fit were predictors of suspension tolerance time. Selecting well-fit harnesses and establishing a 9-min rescue plan are suggested to ensure that no more than 5% of workers would experience suspension trauma. APPLICATIONS: The study provides a basis for harness designers, standards writers, and manufacturers to improve harness configurations and testing requirements for better worker protection against suspension trauma.
- Ibáñez, M. (2017). "Women in the construction trades: Career types and associated barriers." Women's Studies International Forum 60: 39-48.

Infante-Perea, M., et al. (2016). "Perceived Career Barriers for Future Female and Male Spanish Building Engineers: Case of Occupations Related to Work on Site." Journal of Professional Issues in Engineering Education and Practice 142(4).

Infante-Perea, M., et al. (2019). "Relationship between Gender Segregation and Students' Occupational Preferences in Building Engineering." Journal of Professional Issues in Engineering Education and Practice 145(4).

Kaewsri, N. and T. Tongthong (2014). "Favorable Female Attributes in Relation to Career Challenges of Women Engineers in the Thai Construction Industry." International Journal of Construction Education and Research 10(3): 222-236.

Keen, J. and A. Salvatorelli (2016). "Discrepancies between Female Student Perception and Reality of the Engineering Industry." Journal of Architectural Engineering 22(3).

Lingard, H. and V. Francis (2004). "The work-life experiences of office and site-based employees in the Australian construction industry." Construction Management and Economics 22(9): 991-1002.

Lingard, H. and V. Francis (2005). "The decline of the 'traditional' family: work-life benefits as a means of promoting a diverse workforce in the construction industry of Australia." Construction Management and Economics 23(10): 1045-1057.

Lingard, H. and V. Francis (2007). "Does work-family conflict mediate the relationship between job schedule demands and burnout in male construction professionals and managers?" Construction Management and Economics 23(7): 733-745.

Lingard, H. and J. Lin (2004). "Career, family and work environment determinants of organizational commitment among women in the Australian construction industry." Construction Management and Economics 22(4): 409-420.

Loosemore, M. and N. Galea (2008). "Genderlect and conflict in the Australian construction industry." Construction Management and Economics 26(2): 125-135.

Lu, S. L. and M. Sexton (2010). "Career journeys and turning points of senior female managers in small construction firms." Construction Management and Economics 28(2): 125-139.

Malone, E. K. and R. R. A. Issa (2013). "Work-Life Balance and Organizational Commitment of Women in the U.S. Construction Industry." Journal of Professional Issues in Engineering Education and Practice 139(2): 87-98.

Malone, E. K. and R. R. A. Issa (2014). "Predictive Models for Work-Life Balance and Organizational Commitment of Women in the U.S. Construction Industry." Journal of Construction Engineering and Management 140(3).

Manesh, S. N., et al. (2020). "Spatial Analysis of the Gender Wage Gap in Architecture, Civil Engineering, and Construction Occupations in the United States." Journal of Management in Engineering 36(4).

Mariam, A. T., et al. (2020). "A scientometric review and meta-analysis of the health and safety of women in construction: structure and research trends." Journal of Engineering, Design and Technology 19(2): 446-466.

Moore, J. D. and G. W. Gloeckner (2007). "A Theory of Women's Career Choice in Construction Management:

- Recommendations for Academia." International Journal of Construction Education and Research 3(2): 123-139.
- Naoum, S. G., et al. (2020). "Gender in the Construction Industry: Literature Review and Comparative Survey of Men's and Women's Perceptions in UK Construction Consultancies." Journal of Management in Engineering 36(2).
- Norberg, C. and M. Johansson (2020). "'Women and 'Ideal' Women': The Representation of Women in the Construction Industry." Gender Issues 38(1): 1-24.
- O'Neil, D. A., et al. (2005). "Women's career development phases." Career Development International 10(3): 168-189.
- Perrenoud, A. J., et al. (2020). "Advancing Women in Construction: Gender Differences in Attraction and Retention Factors with Managers in the Electrical Construction Industry." Journal of Management in Engineering 36(5).
- Sewalk, S. and K. Nietfeld (2013). "Barriers Preventing Women from Enrolling in Construction Management Programs." International Journal of Construction Education and Research 9(4): 239-255.
- Sommerville, J., et al. (1993). "Women in the UK construction industry." Construction Management and Economics 11(4): 285-291.
- Styhre, A. (2011). "The overworked site manager: gendered ideologies in the construction industry." Construction Management and Economics 29(9): 943-955.
- Whitlock, M. (2010). "Women's experiences of non-traditional employment: is gender equality in this area a possibility?" Construction Management and Economics 20(5): 449-456.
- Wright, T. (2013). "Uncovering sexuality and gender: an intersectional examination of women's experience in UK construction." Construction Management and Economics 31(8): 832-844.



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For
Asia-Pacific Economic Cooperation Secretariat
35 Heng Mui Keng Terrace
Singapore 119616
Tel: (65) 68919 600
Fax: (65) 68919 690
Email: info@apcc.org
Website: www.apcc.org

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