



**2016 Survey Report** by  
the Structural Engineering  
Engagement and Equity  
Committee of the Structural  
Engineers Association of  
Northern California



The information contained in this report was gathered from a SEAONC-sponsored survey administered online by the SE3 group in early 2016. While the information presented in this document is believed to be an accurate, unbiased representation of the data received in the survey, the matters discussed are sometimes subject to differences in opinion or approach. As such, neither SEAONC nor its Board, committees, writers, editors, firms, or individuals who have contributed to this report make any warranty, expressed or implied, or assume any legal liability or responsibility for the use or reference to findings, conclusions, or recommendations expressed herein.

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# CHAPTER 1

## EXECUTIVE SUMMARY

The Structural Engineering Engagement and Equity (SE3) Committee of the Structural Engineers Association of Northern California (SEAONC) has the mission to study engagement and equity in structural engineering in order to provide meaningful input on improving both of these metrics within the profession. The group was established in 2015 as an ad hoc group of SEAONC members. SEAONC provided funding to support efforts to develop and disseminate a poll to a wide range of recipients. In early 2016, the group administered a nationwide survey of employee engagement and gender equity in the structural engineering (SE) profession, for which over 2,100 completed responses were received. SEAONC granted the SE3 group full committee status in late summer 2016.

Study findings indicate that the respondents are generally satisfied with their careers. While overall career satisfaction was reported to be high, there were a variety of areas where improvement appeared to be needed, including in the areas of career development, pay and benefits, and work-life balance. Additionally, though respondents

## CHAPTER ONE: EXECUTIVE SUMMARY

generally reported being satisfied with their careers, a majority indicated that they had considered leaving the profession at some point. Seven percent of the respondents were people who had already left the structural engineering profession, and they cited many of the same reasons for leaving as those who had considered leaving (poor work-life balance, high stress, low pay), with the addition of poor management/leadership.

Some survey responses varied significantly by gender. Notable differences included how men and women define career success, why they leave the profession, and perceptions of their work environment. A significant pay gap between women and men was shown to exist at almost every level of employment, and those who take on more caregiving responsibility (regardless of gender) were generally less satisfied with the advancement of their career, even if they were satisfied with their career overall. Survey results indicated that women are largely the primary caregivers, though the difference in percentage of caregiving responsibilities for women and men was significantly smaller in younger respondents.

Based on the myriad of results from the study, a handful of key findings are highlighted throughout this report, from which a list of best practices has been derived. Key findings include:

### OVERALL CAREER SATISFACTION

- »» While most respondents reported being satisfied with their career choice, more than half have considered leaving at some point.
- »» Men and women both reported that their top reasons for considering leaving the profession were to seek better work-life balance, less stress, and higher pay, but women rated better work-life balance most highly, while men rated higher pay as their top reason.
- »» For those who had left the profession, the same reasons were cited as for those who had considered leaving, with the addition of poor management/leadership.

### CAREER DEVELOPMENT

- »» Managers and staff have notably different perceptions of the work environment and expectations for advancement.
- »» Respondents with identified mentors reported being more satisfied

with their career advancement/trajectory and overall career choice than those without a mentor.

### **PAY AND BENEFITS**

- »» Respondents overall indicated that pay/compensation was the top reason that they had considered leaving the structural engineering profession and one of the leading reasons why they had left the profession.
- »» Employees who work more hours are more likely to consider leaving the profession.
- »» A significant pay gap was reported between genders.

### **WORK-LIFE BALANCE**

- »» Respondents with children advance at a slower rate than those without children, regardless of gender.
- »» Despite the difficulties reported, respondents with children reported higher overall satisfaction with their career than those without children.

A symposium is being held on January 26, 2017 to facilitate a discussion of the findings and suggested best practices. Committee work will continue after that time to further the group's mission.

# CHAPTER 2

## INTRODUCTION

### 2.1. PURPOSE OF THE STUDY

The Structural Engineering Engagement and Equity (SE3) group was formed by a handful of practicing structural engineers in San Francisco, California in 2015. After seeing the results and conclusions of similar studies, such as those conducted by the American Society of Civil Engineers' (ASCE) Structural Engineering Institute (SEI) in 2013 and the American Institute of Architects' (AIA) Equity by Design committee (EQxD, then called The Missing 32% Project) in 2014, the SE3 group wanted to study how engaged structural engineers around the country are in their profession and how this engagement manifests across genders. The group created a survey that was administered to practicing and former structural engineering professionals (both licensed and unlicensed) nationwide. The survey questions aimed to investigate overall career satisfaction across a range of metrics, including career development, trajectory, and advancement; compensation, benefits, and flexibility; work environment and work-life balance;



and the effects of caring for children or other dependents.

The overarching purpose of the study is to correlate career satisfaction and gender with the aforementioned metrics and to formulate a list of best practices that can be disseminated throughout the profession to aid in boosting engagement and equity. For the purpose of this study, “engagement” is defined to be the degree to which engineers are satisfied with their profession, both on a daily basis and throughout their career, and the corollary desire to continue working as a structural engineer. “Equity” is defined as the degree to which the benefits of working in the structural engineering profession, such as pay, recognition, and promotions, among many others, are fairly distributed among all engineers. This study focuses specifically on gender equity, and the term “equity” is presumed to relate primarily to gender. As this was the first study that the SE3 group has administered, a secondary goal was to gather a list of lessons learned as well as targeted ideas for further study.

### 2.2. METHODOLOGY

The SE3 group applied for and received funding from the Structural Engineers Association of Northern California (SEAONC) in May 2015. The initial group of fewer than ten people grew to approximately two dozen practicing structural engineers following a call for contributors made to the SEAONC general membership in September 2015. SEAONC provided funding for meals at evening meetings, but participants were not compensated for time or effort spent on the project. The 2015-16 SE3 team consisted of men and women, individuals with and without partners or children, and persons with varying levels of professional experience, ranging from

recent graduates to principals. Most of the team consisted of engineers employed at consulting engineering firms of various sizes in the San Francisco Bay Area, though some members held academic and research positions. Volunteers participated in various ways, from casual contributor to core researcher to committee chair. SEAONC granted full committee status to SE3 in late summer 2016.

The initial focus of the project was to formulate and administer a nationwide survey of structural engineers to gather data on the state of engagement and equity in the profession. The survey focused on three key questions:

1. **Are people within the structural engineering profession generally engaged?**
2. **Of the people who have left the structural engineering profession, what characteristics do they have in common?**
3. **Do structural engineers’ experiences vary by gender?**

The first step to answering these key questions involved a literature review, discussed in the Literature Review section of this report. The team researched case studies, reports, and articles regarding engagement and equity in the workforce at large as well as other professions in the science, technology, engineering, and math (STEM) fields. The team then composed multiple hypotheses addressing each key question and crafted a list of targeted, unbiased questions to investigate each hypothesis. The survey was tailored to various groups via focused paths of questions based on an individual’s employment status and position within their firm, and whether he or she had

## CHAPTER TWO: INTRODUCTION

dependents. The survey was vetted and beta-tested by approximately 40 engineers to verify that each individual respondent was shown all relevant questions and no extraneous ones. (For example, respondents who indicated that they did not have dependents would not be asked how children have affected their career.)

The survey was distributed throughout the United States and administered online from February through May of 2016 via the Survey Gizmo platform. Survey publicity and outreach was conducted as a broad distribution effort at the national level and a focused distribution effort within California. The primary means of distribution nationally was through the member organizations of the National Council of Structural Engineers Associations (NCSEA). The focused distribution within California was conducted via a grassroots effort, where the SE3 team compiled a comprehensive list of firms with membership in the Structural Engineers Association of California (SEAOC) and contacted all firms with more than four members. Individual participants received a link to the survey and additional information through these targeted firms and organizations. Finally, some individuals were notified of the survey via word of mouth.

Once the survey was closed, the group commissioned a professional data analyst to process the data. After reviewing the data to remove incomplete answers and other obvious errors, the analyst ran a set of regression analyses aimed at uncovering the relationships between variables that were hypothesized to be correlated. Once the first round of analysis was complete, the SE3 team reviewed the findings and proposed an additional set of follow-up questions. This process was then repeated for two additional rounds

until a large amount of evidence had been accumulated. Finally, the analyst provided a detailed write-up of the results and their statistical significance for use in this report.

This report was written by members of the SE3 committee, and a draft was presented at the 2016 SEAOC convention. This document is available online to the general public. The findings are also being presented at a symposium in San Francisco on January 26, 2017.

### 2.3. LITERATURE REVIEW

A literature review was performed as a means to understand the current state of workplace culture at large as well as findings from other groups in the architecture, engineering, and construction (AEC) industry regarding issues pertaining to engagement and equity.

#### 2.3.1. 2013 SEI SURVEY & REPORT

In 2013, the Young Professionals Committee of the Structural Engineering Institute (SEI), a specialty institute of the American Society of Civil Engineers (ASCE), issued a report that included data from a study of structural engineering students and professionals conducted the previous year (Leong et al., 2013). The SEI study had two parts: (1) a demographic study of students, academics, practitioners, and licensees in the structural engineering profession, and (2) an online survey of currently and formerly practicing structural engineers, which received responses from 741 people and focused on the professional experiences and choices of women and underrepresented minorities. Select results from both parts of the study, along with commentary on the findings, were presented in two articles in *Structure Magazine* (Liel, 2014; Pekelnicky and Twitchell, 2015).

The SEI survey found that 80% of respondents still working in the structural engineering profession were satisfied with their career while only 5% were dissatisfied, though more than 40% of structural engineers had thought about leaving the profession, including over 60% of underrepresented minorities. Results indicated that people left the structural engineering profession due to the following factors: loss of interest, discrimination, repetitive tasks, lack of recognition, and salary (hours worked versus pay). It was also found that most people left within the first five years of entering the profession. In addition, the study found that there was a statistically significant difference in the amount of money earned between men and women respondents, even when corrected for years of experience and role.

Respondents also reported being frustrated with the low fees garnered by the structural engineering profession and were concerned that many engineers are not trained in business, communications, or management, which can be especially critical as an engineer moves into leadership. It was also suggested that having a mentor could help keep someone in the profession and assist in curbing perceived discrimination.

### 2.3.2. 2014 AIA EQUITY BY DESIGN SURVEY AND REPORT

In 2014, Equity by Design (EQxD), a committee of the San Francisco chapter of the American Institute of Architects (AIA), issued a survey and subsequent report focused on documenting gender-based data in the architecture profession nationwide (AIA San Francisco, 2015). Originally entitled “The Missing 32% Project,” the committee aimed to investigate and clarify reasons why the percentage of women at the highest level of

the profession drops so drastically from the percentage of women found among architecture students. The report identified five “pinch points” along the architecture career path where both men and women leave the profession and where women fall behind: hiring, “paying dues,” licensure, caregiving, and “the glass ceiling.”

Women were found to be generally less satisfied with their current jobs than men and also earned less money, averaging around \$15,000 less per year. This pay discrepancy began to widen at around 10 to 12 years of experience; the report postulates that this was due to women being more likely than men to take time off or redirect energy toward children and caregiving. People who left the profession, however, tended to do so in the first five years, during the “dues-paying” period of low salary, long hours, and uninspiring tasks.

In contrast, men and women both derived satisfaction from working on exciting, important projects; working with the “A-team” of creative, talented coworkers; and having access to good work-life balance and flexibility. Additional factors that correlated strongly with job satisfaction included being a partner or principal, working for a firm with a clear and effective promotion process, and feeling that day-to-day tasks align with overall career goals. As architecture is a tangential profession to structural engineering and many parallels can be drawn between the two, the results of this survey and report strongly resonated with the structural engineering community. A subsequent study by the EQxD committee was conducted in 2016, findings for which are being published concurrently with this report.

## CHAPTER TWO: INTRODUCTION

### 2.3.3. OTHER LITERATURE

Various topics regarding the modern workplace have been present in nationwide (and international) dialogue in recent years. Issues such as effective management techniques and employee engagement have been the subject of research and discussion for decades. More recently, topics such as diversity, gender, and work-life balance have become popular as corporate culture has shifted over the last half century. Studies, articles, and discussions on caregiving, parental leave, the gender ambition gap, the gender pay gap, and the overall cultural perceptions of working men, women, and parents have been widely published. A summary of relevant information reviewed in preparation for the SE3 study, used to gain a greater global understanding of the state of the modern workplace, is presented herein.

How to define and attain successful management is a widely discussed topic. Recent studies show that good management of day-to-day tasks is strongly correlated with employee engagement and retention rates (Lipman, 2016; AIA, 2014). In one study, most respondents noted that they wish they had received more management training before assuming their current roles and agreed that companies need to develop better ways to evaluate managerial ability (Grovo, 2016).

Another metric that is often found to correlate with higher engagement and retention is mentorship. One recent study found that mentorship often facilitates a sense of connectedness to the organization, increases satisfaction, reduces turnover, and bolsters confidence and self-esteem of employees (Amelink, 2008).

Work-life balance and work flexibility are trending topics, because while there is typically no longer one member of a family

who provides the sole care for dependents, workplaces have not changed to accommodate this reality (Slaughter, 2015). Multiple studies have found that a large percentage of households with children have all parents working full-time (Pew Research Center, 2015; The Council of Economic Advisors, 2014). Additionally, even when flexible work policies are available to accommodate working parents, few people take advantage of them due to corporate culture and social stigma (Wells and Lublin, 2015).

One recent study found that increased flexibility benefits can be a solution that not only alleviates employee stress about balancing family with work but can also improve employee happiness, health, loyalty, and productivity (The Council of Economic Advisors, 2014). Another study found that these benefits could be achieved via a systematic management approach that does not burden non-caregivers with additional workload (Fondas, 2014).

Several articles explore the roles of parents at home and implications to career success based on female-led versus male-led parenting and the trends, benefits, and drawbacks of 50/50 parenting (Moravcsik, 2015). Paternity leave (fathers taking leave for a new child) is a subject of much discussion and is generally recognized to be underutilized even when offered (Weber, 2013). While paternity leave policies have become more generous in recent years, it is still largely not well supported by corporate culture in the United States. Fathers not taking paternity leave, and therefore not engaging as actively in parenting initially, is shown to negatively affect mothers' re-entrance into the workforce after childbearing. Anne-Marie Slaughter questioned in a TED talk whether women really can "have it all" and noted that boys and men need to be resocialized to

define caregiving as a respected option for men (2013). Japan recently instated a law that provides paid parental leave if both parents utilize the benefit (*The Economist*, 2016a). This encourages men to take paternity leave and also helps “level the playing field” by creating the same career gap for both parents. Some European countries also have incentives for fathers to take leave (Cabrita and Wohlgemuth, 2015).

Research suggests that having a diverse work force is beneficial to businesses, as it fosters greater creativity through new ideas and different perspectives, ultimately increasing a business’s bottom line (Abreu, 2014; Noland and Moran, 2016). This extends not only to ethnic and gender diversity but also diversity of origin, perspectives, and other metrics.

Though diversity is often sought, attaining it can be a challenge for employers. The use of diversity targets in the United States is much more controversial than in Europe, where they are relatively common (Feintzeig, 2015). Thornton Tomasetti, an international structural engineering consulting firm, organized and published a discussion among female leaders in the AEC industry; they pointed out that retention of women requires specific effort and suggested quotas, mentorship, and endorsement as ways to advance women in male-dominated organizations (thorntontomasetti.com, 2015).

A recent *Wall Street Journal* article considered the obstacles facing women in their career trajectories, including the idea that women and men start their careers equally ambitious, but as women move into higher positions, they become far less likely to want top positions at their companies (Waller and Lublin, 2015). One recent study points to female engineers being undervalued both in their educational environment as well as in internships as one possible reason why women are more likely than their male counterparts to express doubt

in their abilities (Silbey, 2016). The technology industry is struggling with the same retention issues, perhaps even more drastically. In that sector, 56% of women have left their profession over time, with cumulative quit rates for women more than double the rates for men (Zokowski, 2014).

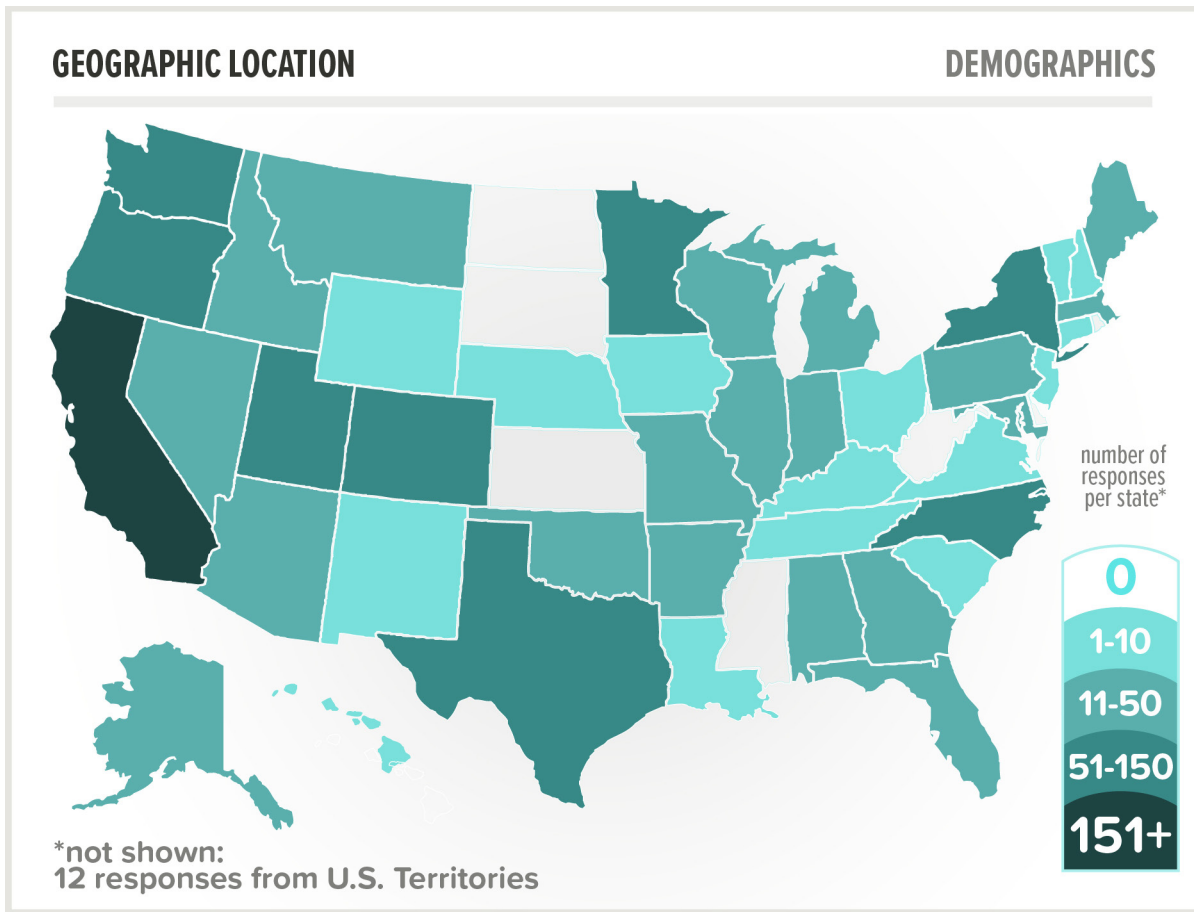
The *Harvard Business Review* recently presented the results of a survey of over 25,000 Harvard Business School (HBS) graduates—all high-achieving, motivated individuals (Ely et al., 2014). When asked to rank the importance of their career versus the career of their partner, recent female HBS graduates consistently ranked their career as equal to their partner’s, while more than half of the men interviewed put their career ahead of their partner’s. This survey’s results suggest that there is still a cultural mindset that values women’s careers less than men’s.

## 2.4. DEMOGRAPHICS

In total, the survey received 2,161 completed responses from currently and formerly practicing structural engineers, of which approximately half were located in California. The next highest state participation was Colorado, which accounted for 6% of respondents.

Of the 2,161 completed responses received, 2,015 (93%) were practicing structural engineers, while 146 (7%) were formerly practicing structural engineers who had left the profession or retired. Of the 2,015 currently practicing structural engineers, 381 (19%) were principals/owners, 337 (17%) were associates/shareholders, 504 (25%) were senior engineers/project managers, 487 (24%) were project engineers, and 306 (15%) were staff/entry level. Of the 2,161 total respondents, 1,112 (51%) had children or dependents. Nearly 50% of respondents were under the age of 35.



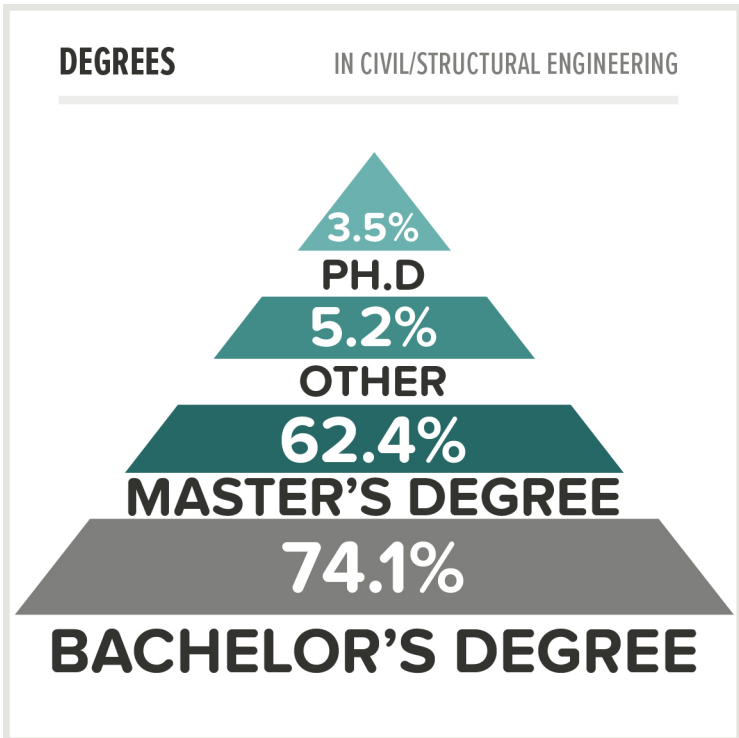
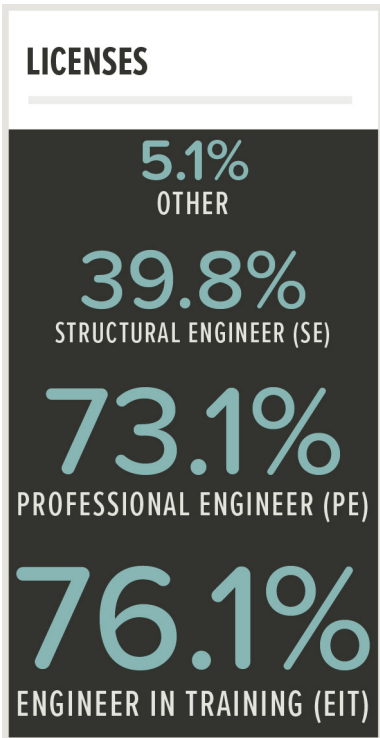
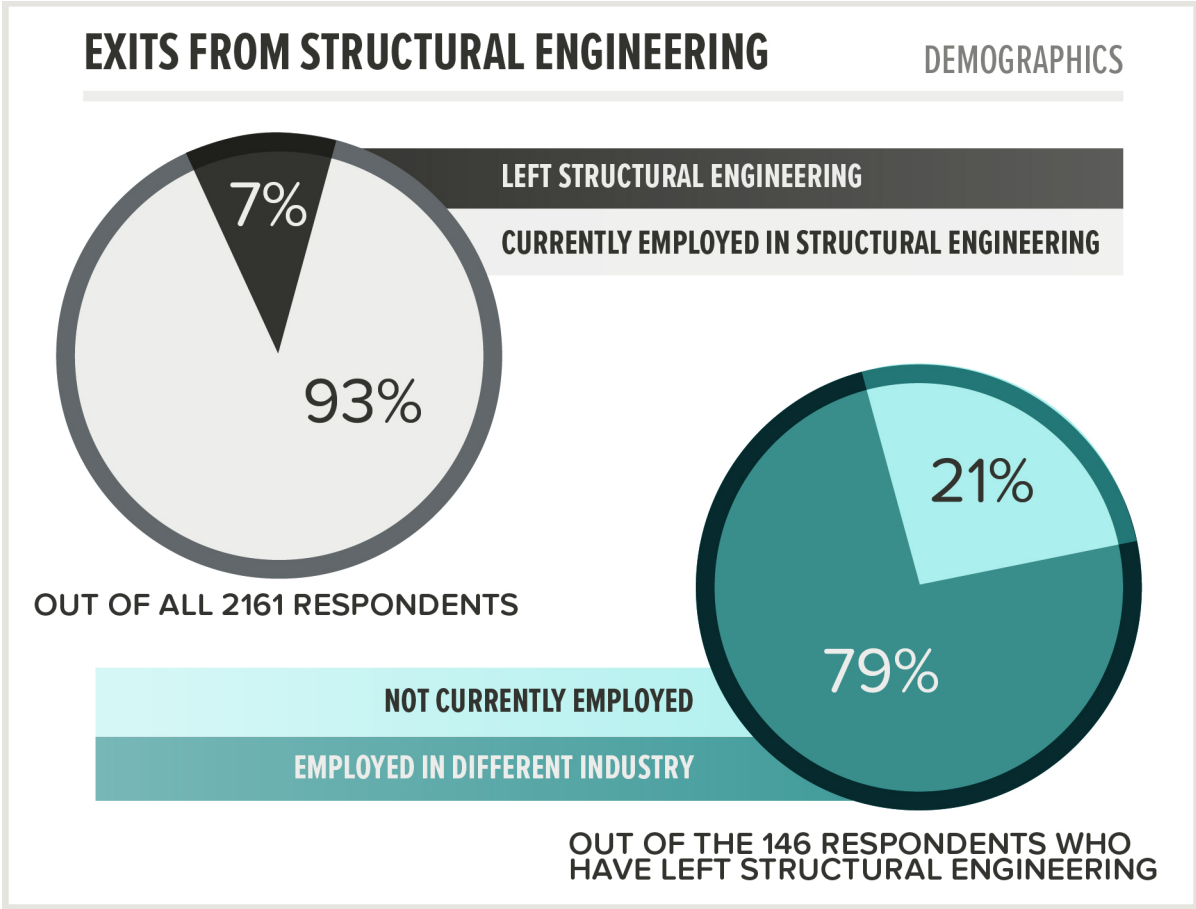


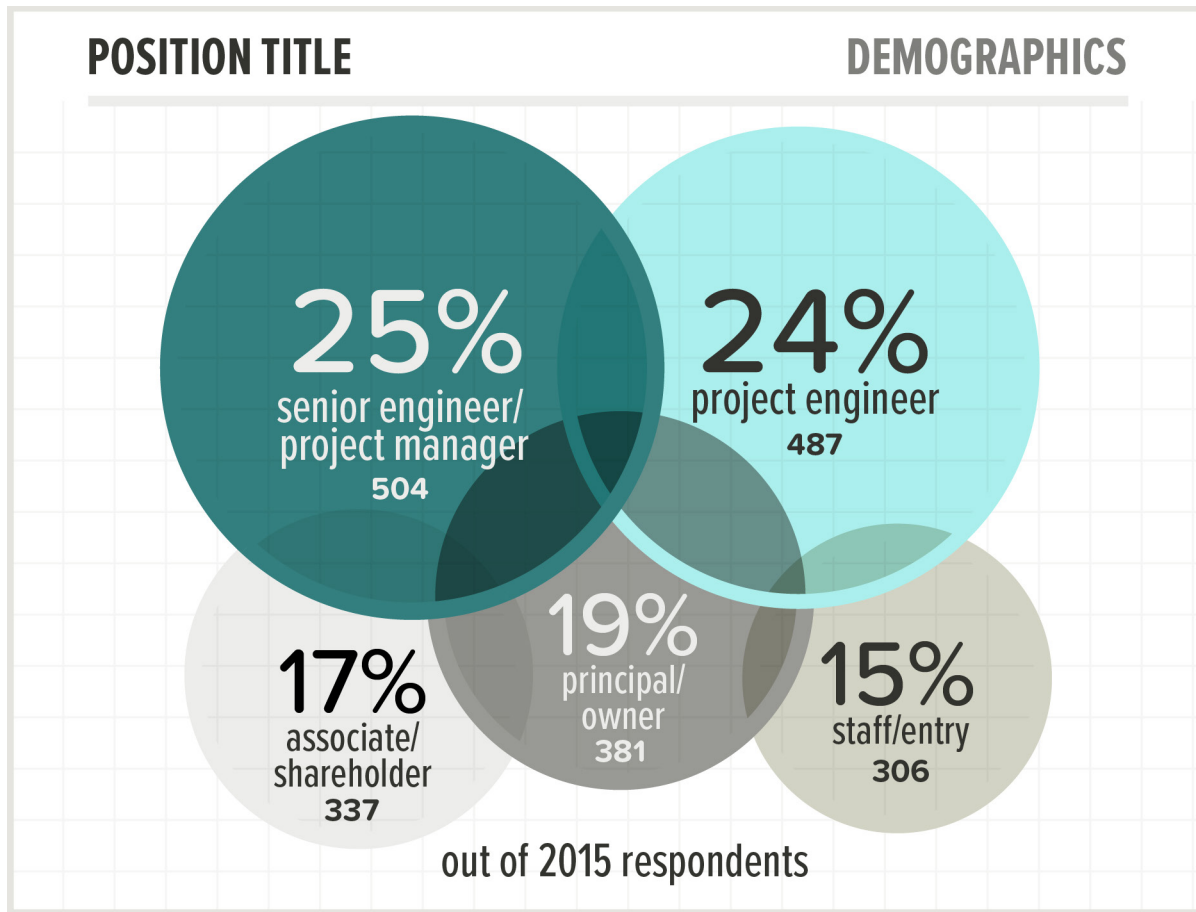
Of the 2,015 respondents who indicated the degrees they had received, approximately 65% indicated having a master’s or PhD. When broken down by age, younger engineers were more likely to have higher degrees: respondents under age 50 were 58% more likely to have a master’s degree than respondents over 50, and respondents under age 30 were 36% more likely to have a master’s degree than respondents over 30. This is consistent with the recent trend for practicing structural engineers to receive higher degrees before entering the profession.

Additionally, of the 2,015 respondents who indicated their licensure status, 76% had EIT

licenses, 73% had PE licenses, and 40% had SE licenses. Women were as likely as men to have EIT certification, but less likely than men to have a PE or SE license: 76% of men had EIT licenses, compared to 77% of women; 76% of men had PE licenses, compared to 65% of women; and 44% of men had SE licenses, compared to 29% of women.

Of the 2,161 total respondents, 1,524 (71%) were men and 636 (29%) were women; one respondent indicated “other” and specified “transgender.” For comparison, the US Bureau of Labor Statistics (BLS) reports that the 2015 annual average of Current Population Surveys for people over the age of 16 indicated that approximately 360,000



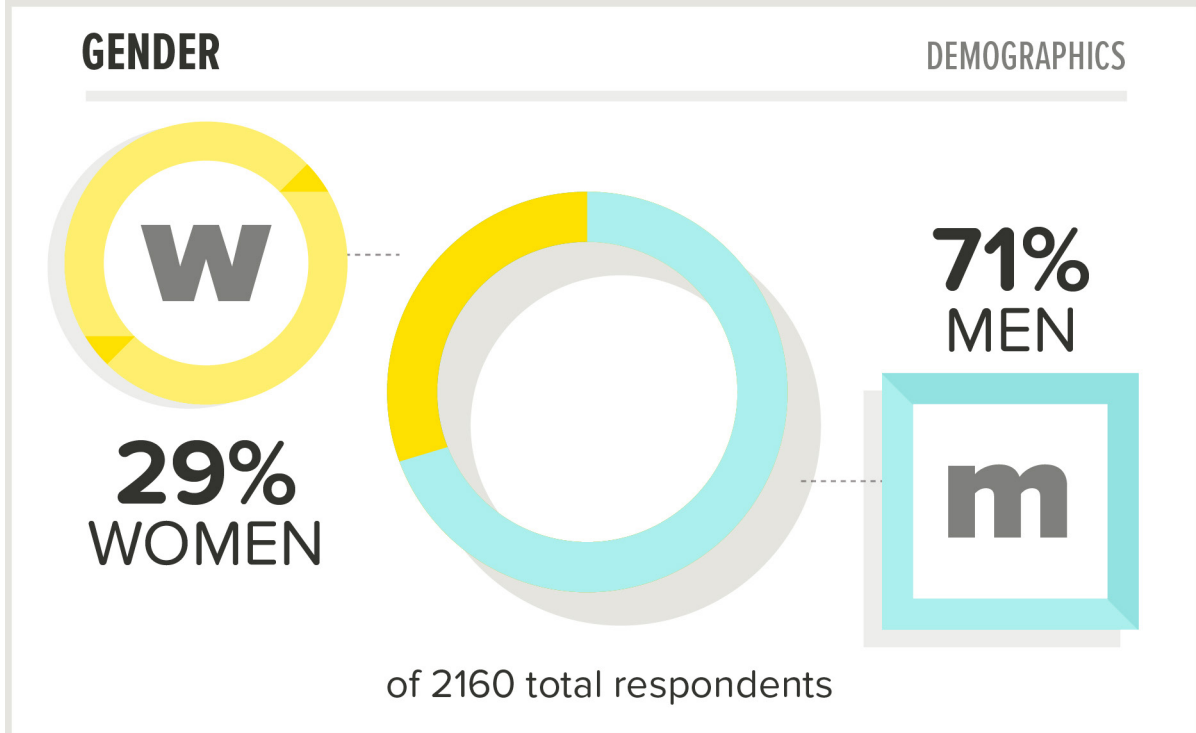
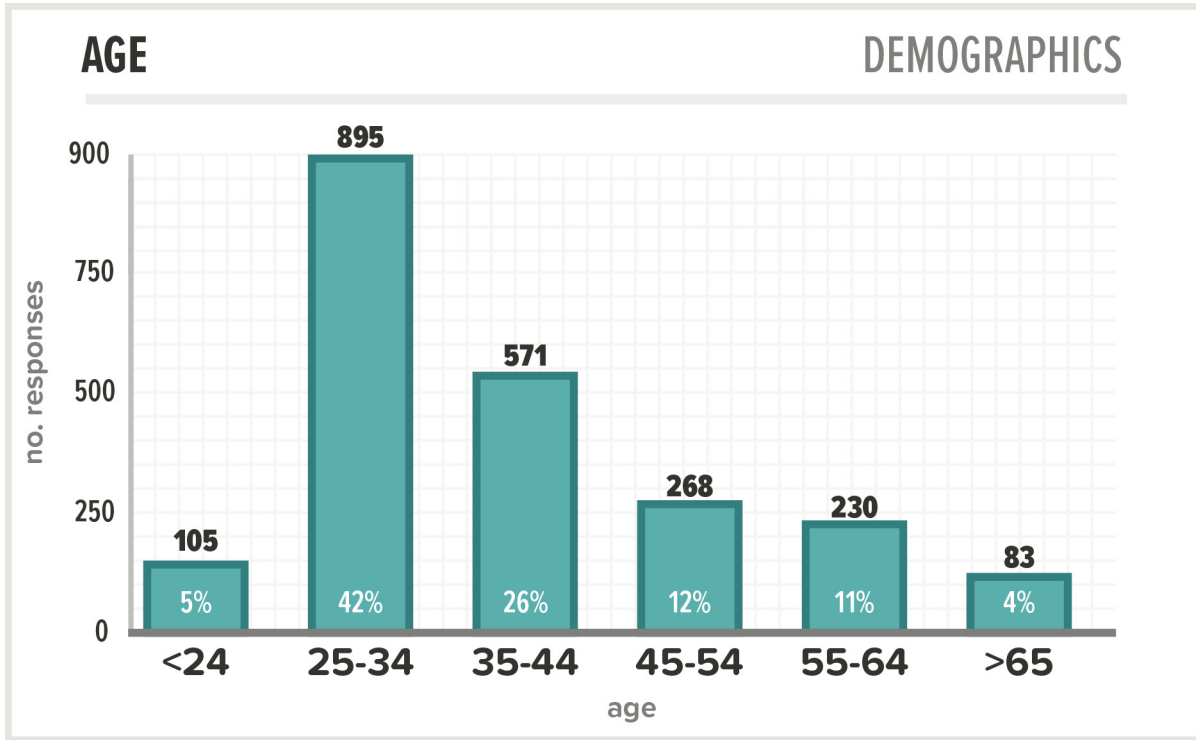


people in the United States were employed as “civil engineers” and that of those, only 12.6% were women (BLS, 2016a). (The BLS does not report data on structural engineers specifically.) As a broader measure, the BLS reported in 2011 that those employed as “architects and engineers” were 13.6% women, those employed as “lawyers” were 31.9% women, and those employed as “physicians and surgeons” were 33.8% women (BLS, 2012). The only professions on the BLS list that had a smaller percentage of women than “architect and engineers” were firefighters and pilots. (Note also that studies have shown that women are more likely to respond to surveys; hence, the demographics of all gender-based surveys may

not necessarily represent the population being surveyed accurately (Underwood et al., 2000).)

Of the 146 respondents who were no longer practicing structural engineering, 72 (49%) were women and 74 (51%) were men; 115 respondents (79%) were employed in a different industry, and 31 (21%) were not employed. Of the 115 individuals who worked in a different industry, 72 (63%) were still working in a field related to design or construction. Additionally, of the 31 respondents who were not working, 22 (71%) were men and 9 (29%) were women; 15 of these 22 men were retired, and 5 of the 9 women left to care for children or dependents.





# CHAPTER 3

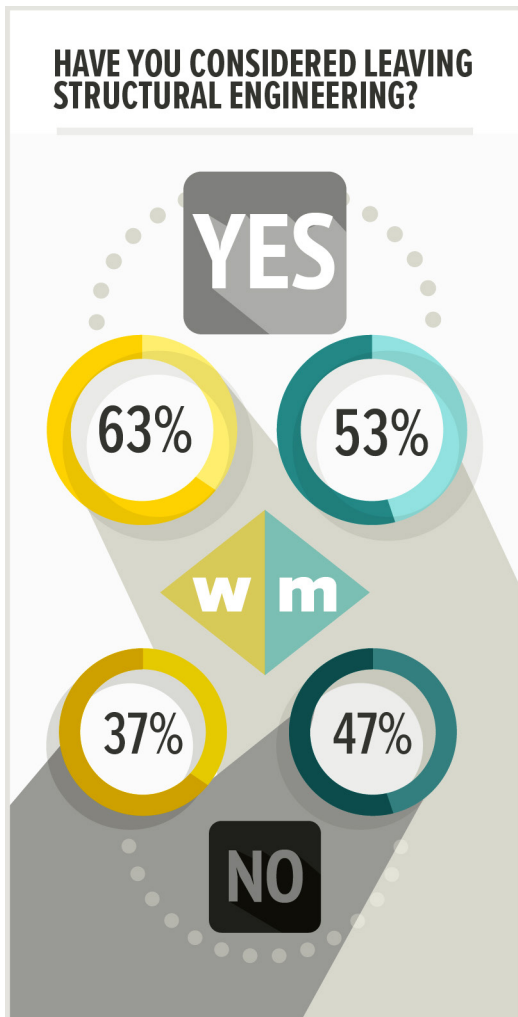
## FINDINGS

### 3.1. OVERALL CAREER SATISFACTION

Overwhelmingly, in response to the question “How satisfied are you with your choice of career in structural engineering?” respondents answered positively, with 81% reporting “satisfied” or “very satisfied” and 8% reporting “dissatisfied” or “very dissatisfied.” Despite this, 56% of respondents reported having considered leaving the profession. While most respondents reported being satisfied in their career choice, more than half have considered leaving at some point in their career. This apparent disconnect is better explained with further study of the survey results.

The survey responses suggest that overall career satisfaction stems from a variety of sources, including pay/compensation, work-life balance, career advancement, and work environment. Of these factors, men and women cite distinctly different sources for their satisfaction (or lack thereof), as do respondents of varying ages and positions. Three factors that correlated strongly among those

While most respondents reported being satisfied in their career choice, **more than half** have considered leaving at some point in their career.



### RANKED REASONS FOR CONSIDERING LEAVING STRUCTURAL ENGINEERING

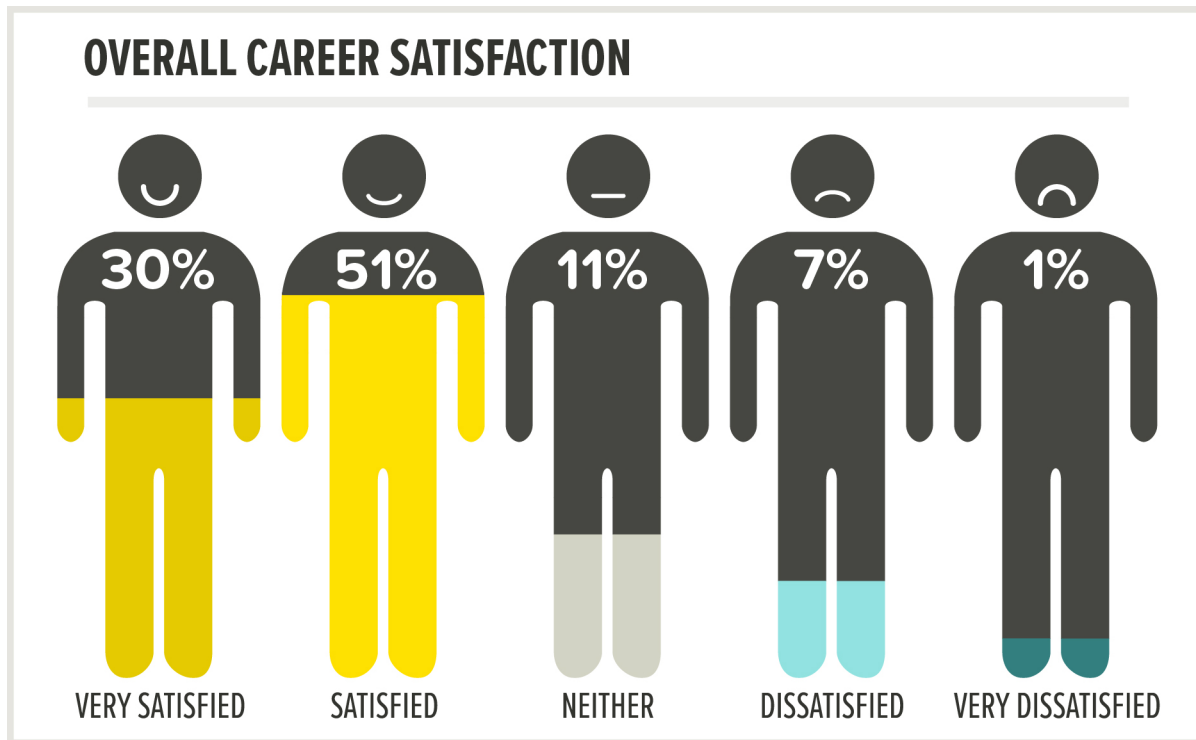


1	work-life balance	2
2	less stress	3
3	higher pay	1
4	more fulfillment	4
5	time with family	6
6	loss of interest	5

who reported the highest satisfaction are the following:

1. More senior positions within their companies
2. Daily tasks that align with their career objectives
3. Having children

The first correlation is somewhat expected, as those with higher positions likely are better paid, have more control over their schedules, and garner a sense of pride for their accomplishments. The second correlation is an important nuance of satisfaction that could be easily overlooked, as this may not often be discussed between management and staff. The third correlation may be surprising to some; however, in general, employees with children cited being more satisfied with their career than



*Men and women both reported that their top reasons for considering leaving the profession were seeking better work-life balance, less stress, and higher pay, but women rated better work-life balance highest among these factors, while men rated higher pay as their top reason.*

those without children. This is true across genders: women with children were found to be as satisfied as were men with children.

Men and women both reported that their top reasons for considering leaving the profession were seeking better work-life balance, less stress, and higher pay, but women rated better work-life balance highest among these factors, while men rated higher pay as their top reason. These findings imply that while all three factors should be addressed to improve overall

engagement within the profession, higher pay may most significantly affect retention and satisfaction of men, while broader cultural shifts in the profession may be required to significantly affect the retention and satisfaction of women.

For respondents who had left the profession (not including those who had retired), the findings were similar, but with the addition of one notable reason: poor management/leadership. On a scale of 1 to 100 (where a higher number indicates a greater contributing

## ***This suggests that overall, poor management/leadership is a core cause for people leaving the structural engineering profession.***

factor to having left the profession), women rated poor work-life balance highest (63/100), while men rated poor financial compensation highest (61/100), which correlates with the reasons given by respondents who had only *considered* leaving. Poor management/leadership ranked as the number two reason for men (53/100) and the number three reason for women (58/100). This suggests that overall, poor management/leadership is a core cause for people leaving the structural engineering profession.

Recent outside research reinforces the importance of manager/staff relationships. One study found that the top two employee complaints about leadership are not recognizing employee achievement and not giving clear directions. These studies show that good management of day-to-day tasks is highly related to employee engagement and retention rates, and perhaps more important than more visionary goals of leadership (Lipman, 2016; AIA, 2014).

### **3.2. CAREER DEVELOPMENT**

Career development—including daily activities and job responsibilities, professional development opportunities, and career advancement—is one aspect of the structural engineering profession for which respondents indicated the highest rate of dissatisfaction, though it was not as high as pay/compensation or work-life balance. Thirteen percent of respondents indicated being “dissatisfied” or “very dissatisfied” with their career development. And while most respondents were relatively satisfied with their career development, a number of important findings were revealed regarding

this topic, including differences in perceptions between managers and staff, the positive effects of mentorship, and variations based on gender.

#### **3.2.1. MANAGEMENT VS. STAFF PERCEPTIONS**

Managers and staff have notably different perceptions of the work environment and expectations for advancement. When it comes to setting expectations for advancement, the data suggest a significant disconnect between how principals/owners and staff engineers feel. Compared to staff/entry level engineers, principals/owners are 32% more likely to “agree” or “strongly agree” that expectations for advancement are effectively communicated in their firms. Compared to all other position levels (staff/entry, project engineer, senior engineer/project manager, and associate/shareholder), principals/owners are 43% more likely to agree with this. Similarly, when evaluating opportunities for advancement, principals/owners are 24% more likely than all other staff to believe that equal opportunities for advancement exist in their firms.

Principals/owners are also less likely than all other staff to believe that formal business management training is important. This is in stark contrast to a recent study that found that 98% of managers in the United States feel that more management training is needed in their own firms. In the study, 87% percent of those surveyed wish they had received more management training before assuming their current roles, and those same managers agreed that companies need to develop better ways to evaluate managerial ability

### *Managers and staff have notably different perceptions of the work environment and expectations for advancement.*

(Grovo, 2016). The belief found in the SE3 study that formal management training is unnecessary underscores the common perception that engineering managers can learn these skills on the job, when perhaps they are no different from managers in other industries, who generally value formal training.

Additionally, aligning employees' daily tasks with their career objectives was found to be one of the factors most highly correlated to satisfaction, indicating that employees would be better served if this were a prioritized goal for management. Individuals who experienced this alignment were significantly less likely to consider leaving or to have left the structural engineering profession. This was noted to be the same for both men and women.

#### **3.2.2. MENTORSHIP**

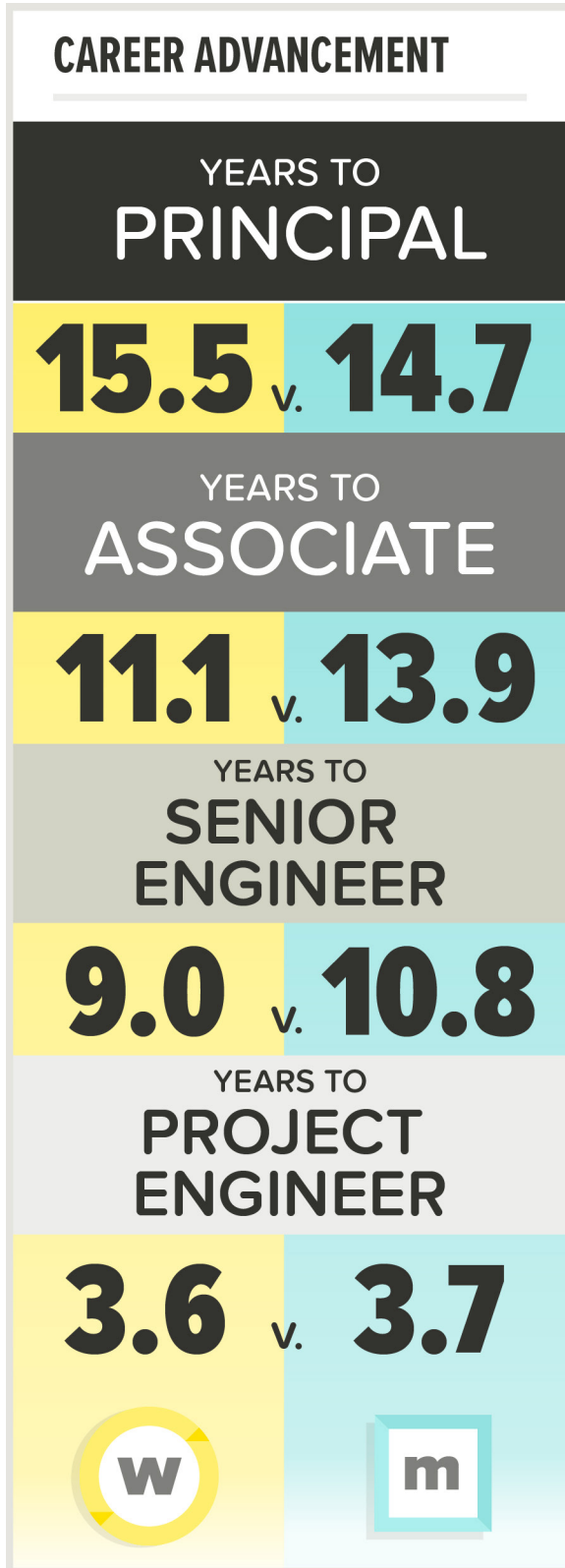
Respondents with identified mentors reported being more satisfied with their career advancement/trajectory and overall career choice than those without a mentor. Of the 1,943 engineers who responded to questions regarding mentorship, over half (55%) indicated that they had at least one mentor who strongly influenced their career path. Of these respondents with a mentor, 83% reported being either "satisfied" or "very satisfied" with their career advancement/trajectory, while of the respondents who reported that they did not have a mentor, only 67% reported being either "satisfied" or "very satisfied." Similarly, 86% of engineers with mentors indicated being "satisfied" or "very satisfied" with their overall career choice, while 74% of those without mentors reported the same. Men and women reported having mentors at roughly equal rates.

People who did not indicate having mentors were 22% more likely to consider leaving the profession. This is consistent with widespread research that documents the benefits of mentorship. One recent study by the Society of Women Engineers (SWE) highlights the benefits to both employers and employees. Mentorship often facilitates a sense of connectedness to the organization, increases satisfaction, and reduces turnover. Employees, on the other hand, benefit from increased confidence and self-esteem, and exposure to networking opportunities within the organization (Amelink, 2008).

Respondents who reported difficulty discussing career advancement with their superiors also indicated lower levels of satisfaction with career development. Because mentors are often managers or other workplace superiors, this skill may be better developed in employees who have mentors, though this hypothesis was not investigated. Women were 26% more likely than men to report difficulty discussing career advancement with their superiors. This may be one reason that women generally reported lower satisfaction with career development, as discussed in the following section.

#### **3.2.3. GENDER DIFFERENCES**

Women were 23% more likely to be dissatisfied with their career advancement than men. This effect increased over time; for each year of experience, women were significantly less likely to report being satisfied with their career progress. Additionally, men were 20% more likely than women to agree that opportunities for advancement are equal across genders.



*Respondents with identified mentors reported being more satisfied with their career advancement/trajectory and overall career choice than those without a mentor.*

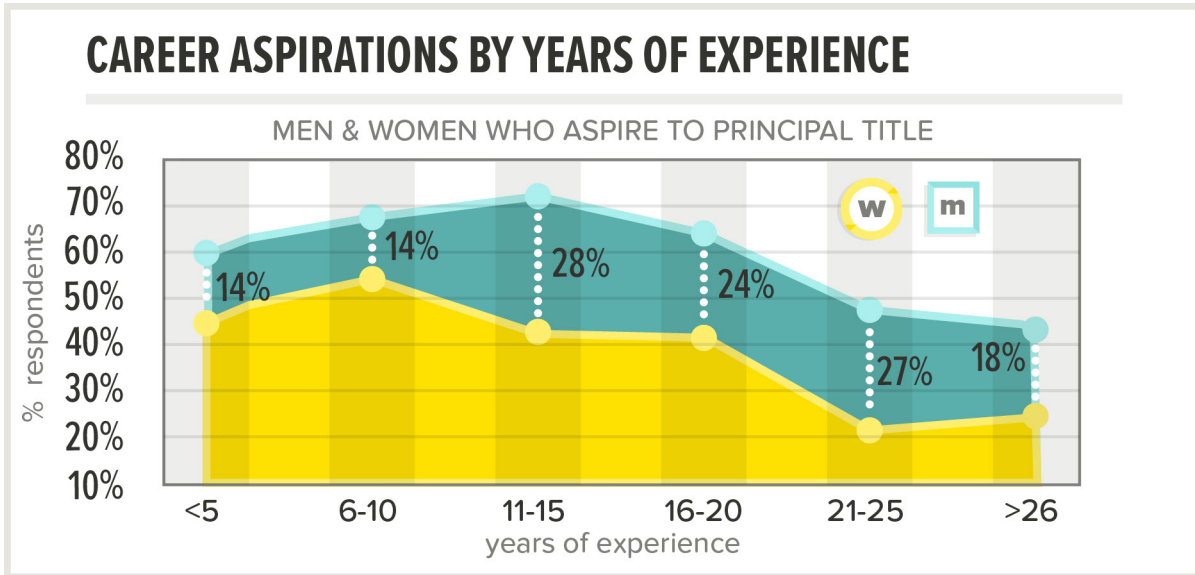
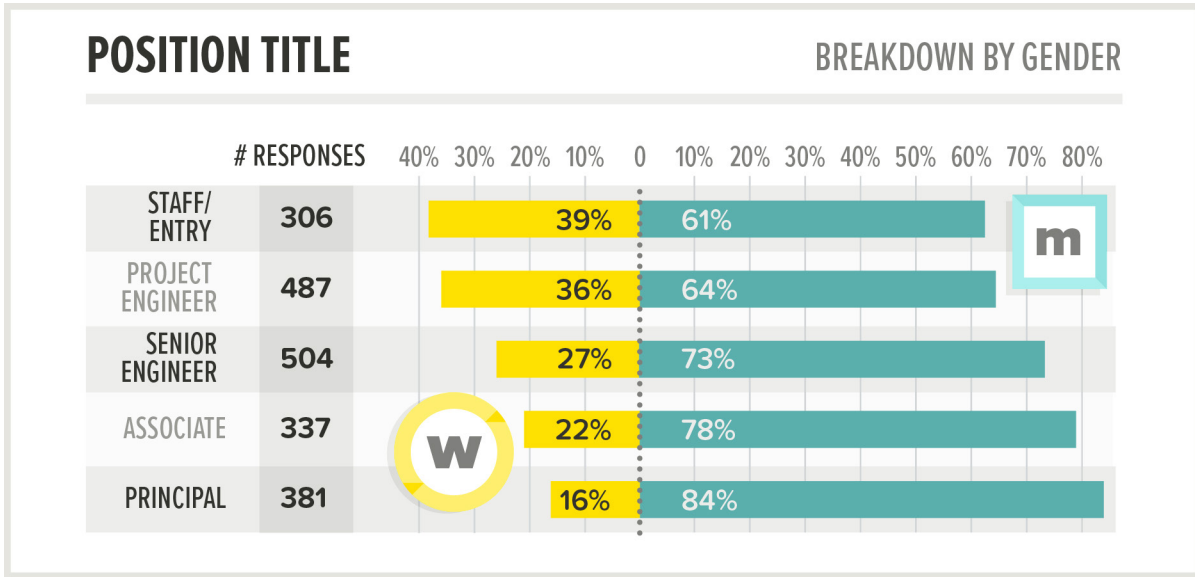
However, the data showed that women advance at a faster rate than men for all positions except principal/owner. The average number of years that it took for female respondents to reach the senior engineer/project manager position was 9.0 years, while male respondents reached this position on average in 10.8 years. Similarly, female respondents reached the associate/shareholder level in 11.1 years, while males reached this level in 13.9 years on average. At the principal/owner level, however, it took female respondents 15.5 years on average to attain this title, while male respondents reached this level after only 14.7 years.

Despite the apparent faster rate of advancement of the women surveyed, the number of women decreases significantly at each successive position, with the highest ratio of women to men occurring at the staff/entry level (39% women) and the lowest ratio at the principal/owner level (16% women).

Men and women also aspire to differing levels of leadership. When asked to identify the most senior position they hoped to hold in their careers, 46% of women responded principal/owner, compared to 62% of men. In general, women were more likely than men to aspire to lower-level positions (senior project engineer, senior project manager, and other titled positions other than principal).

Interestingly, female engineers who have a mentor are 41% more likely to aspire to principal/owner than female engineers who do not have a mentor, and male engineers





who have a mentor are 35% more likely to aspire to principal/owner than male engineers who do not have a mentor.

One recent study points to female engineers being undervalued both in their educational environment as well as in internships as a reason why women are more likely than their male counterparts to express doubt in their abilities (Silbey, 2016). In this long-term study of male and female engineering students and young professionals, female engineers were more likely than their similarly qualified male peers to be given administrative tasks that



***Respondents overall indicated that pay/compensation was the top reason that they had considered leaving the structural engineering profession and one of the leading reasons why they had left the profession.***

did not challenge them during in-school team activities as well as corporate internships. This suggests a cultural bias regarding the skills and talents of women that may be one factor affecting their confidence and aspirations in engineering.

### **3.3. PAY AND BENEFITS**

Respondents overall indicated that pay/compensation was the top reason that they had considered leaving the structural engineering profession and one of the leading reasons why they had left the profession. When asked to rate their satisfaction with pay/compensation, 20% of respondents reported being dissatisfied or very dissatisfied. The average income of all respondents currently practicing structural engineering is \$106,800 per year (in California, the average is \$117,600). Pay data were received from 1,955 respondents.

As a snapshot of income during the careers of respondents, the average income of a structural engineer with five years of experience is \$78,900 per year (in California, the average is \$89,000). The average income of a structural engineer with 15 years of experience is \$110,600 per year (in California, the average is \$118,700). For the purposes of this survey, “income” is defined as gross annual income, including bonuses. Note that these data include part-time employees who work fewer than 40 hours per week, which accounted for 110 respondents (6%).

Because nearly half of the respondents were from California, comparisons between

these respondents and respondents from the rest of the country were reviewed. Considering only full-time employees residing in metropolitan cities, respondents in California reported income 21% higher than that of those living outside California. However, when income is normalized to cost of living data (as reported by the Council for Community and Economic Research, <http://coli.org>), respondents in California actually make 7% less than those outside California.

For comparison, nationwide data collected by the US Bureau of Labor Statistics (BLS) in 2015 show that the mean annual wage for a civil engineer in the “architecture, engineering, and related services” category was \$88,820 (in California, the mean annual wage was \$100,980) (BLS, 2016b). The BLS calculates “annual wages” by multiplying the hourly mean wage by a “year-round, full-time” figure of 2,080 hours; for those occupations where there is not an hourly wage published, the annual wage is directly calculated from the reported survey data.

In comparison with the average income of all practicing survey respondents to the “mean annual wages” reported by the BLS, SE3 survey respondents reported approximately 20% higher income than the BLS data, some of which is likely due to the inclusion of bonuses in the SE3 survey responses. Additionally, SE3 data may be more highly weighted by California responses than BLS data.

## CHAPTER THREE: FINDINGS

The 2013 SEI survey, noted in the Literature Review section, reported the average salary of respondents to be \$85,500 per year, based on 728 responses from throughout the United States. This measure also excluded bonuses, and is therefore noted to be a similar finding to BLS data, especially considering inflation.

A salary survey administered by the American Society of Mechanical Engineers (ASME) and ASCE in 2012-2013 found that the median income of 807 structural engineers nationwide was \$80,500, and that the mean income for this group was \$91,345. In this survey, income comprised the respondent's current annual base salary from the primary employer, plus additional cash income from the individual's primary job, including fees, bonuses, and commissions, but excluding overtime pay and income from secondary or part-time employment (Engineering Income and Salary Survey Publishing Group, 2013).

Comparing the average income of all practicing SE3 survey respondents to the wages from the 2013 ASME/ASCE salary survey, the SE3 survey respondents reported income approximately 33% higher than the median and 17% higher than the mean. Again, part of this difference may be due to the fact that nearly half of the SE3 respondents were from California, while the ASME/ASCE study had a relatively even distribution nationwide.

In comparison with other professions that require higher education or specialized and/or technical knowledge, and that assume a significant degree of liability, 2015 BLS data indicate that the mean annual wage for “lawyers” is \$136,260 nationally and \$163,020 in California. For “physicians and surgeons, all other,” the mean annual wage is \$197,700 nationally and \$203,920 in California. The mean annual

wage for “architects, except landscape and naval” is \$82,850 nationally and \$97,880 in California (BLS, 2016c).

### 3.3.1. HOURS WORKED AND OVERTIME

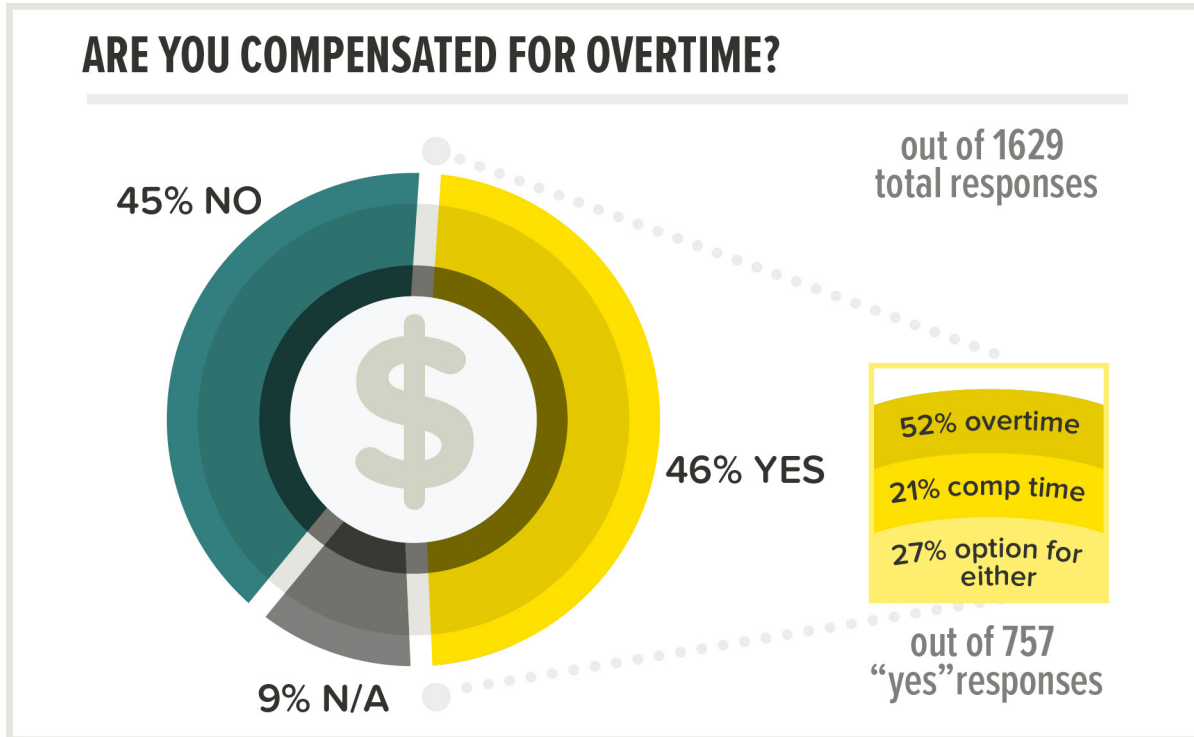
Employees who work more hours are more likely to consider leaving the profession. For each additional hour worked per week over 40, the odds of an employee considering leaving the profession were found to be 4% higher. This points to the tendency of people to “burn out” when their workload is consistently over 40 hours per week.

Additionally, satisfaction with pay and benefits was found to decrease as the number of hours worked each week increased. One solution to address this issue is to offer overtime pay or other compensation for additional hours worked beyond a 40-hour week, as being compensated for overtime is correlated with significantly higher satisfaction with pay/compensation. Of the 1,629 respondents who responded to this question, 46% indicated that they receive pay or other compensation for overtime hours worked. This group was 20% more likely to report being “satisfied” or “very satisfied” with their pay/compensation than those who are not compensated for overtime.

Interestingly, those who reported being compensated for overtime also reported working an average of two fewer hours per week than those who are not paid for overtime. Reasons for this were beyond the scope of the survey.

### 3.3.2. GENDER PAY GAP

A significant pay gap was reported between genders. Out of 1,401 men and 553 women who provided pay data, women reported making \$27,500 per year less than men, on average. When controlling for years of



### *Employees who work more hours are more likely to consider leaving the profession.*

experience and full-time employment, men still reported making significantly more money than women. For full-time employees, men with 14-17 years of experience made \$7,900 per year more than women, and men with 18-20 years of experience made \$41,200 per year more than women. When broken down by position, a similar trend persisted, though the gender pay gap widened significantly starting at the senior engineer/project manager level. A \$9,000 pay gap was present for senior engineers/project managers, a \$12,000 pay gap was present for associates/shareholders, and a \$52,000 pay gap was present for principals/owners. In analyses performed based on a variety of factors (location, position, full-time employment, firm size, with/without children), the gender pay

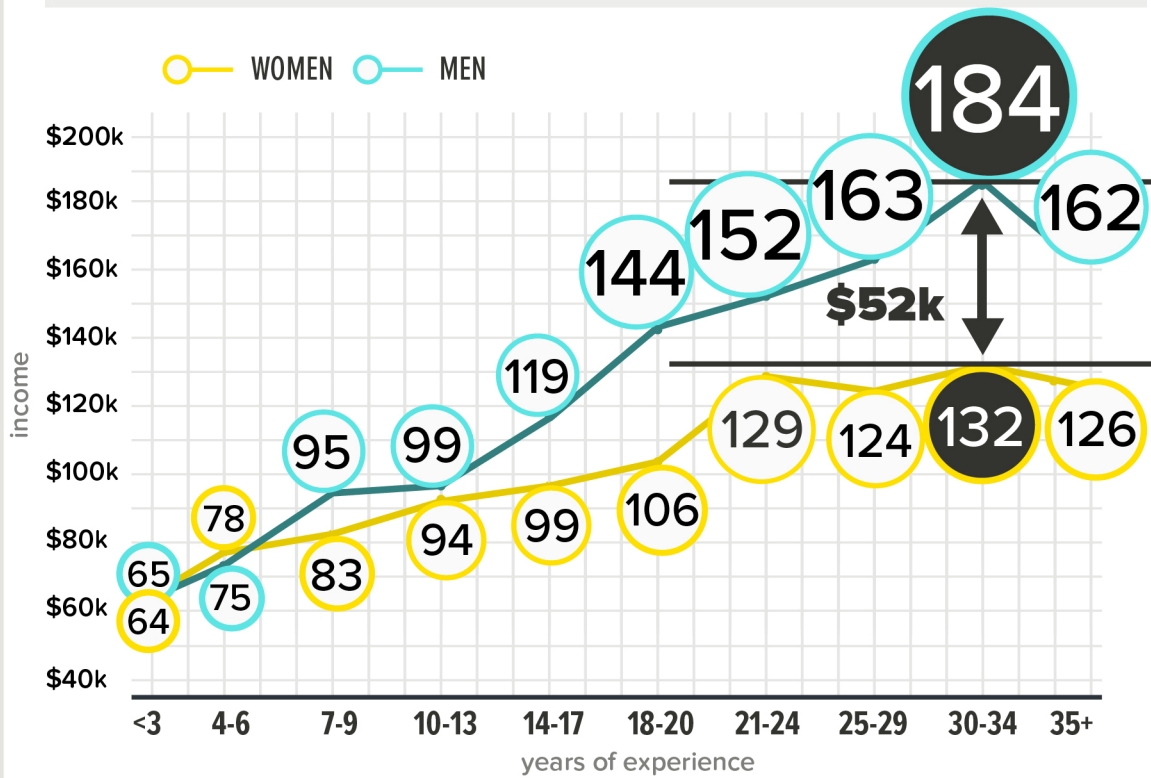
gap was consistently found to persist.

Additionally, because nearly half of respondents were from California, the gender pay gap within this state was also reviewed. The pay gap was found to be less pronounced in California as compared to the overall data set, but it was still present.

The 2013 ASME/ASCE salary survey reported similar findings among the wide variety of engineers surveyed (which included 48 disciplines, of which structural was one). Considering responses from 9,227 males and 977 females, they found that the median income for female respondents was 79.6% of that reported by male respondents. When full-time employees were compared by number of years of experience, the gap

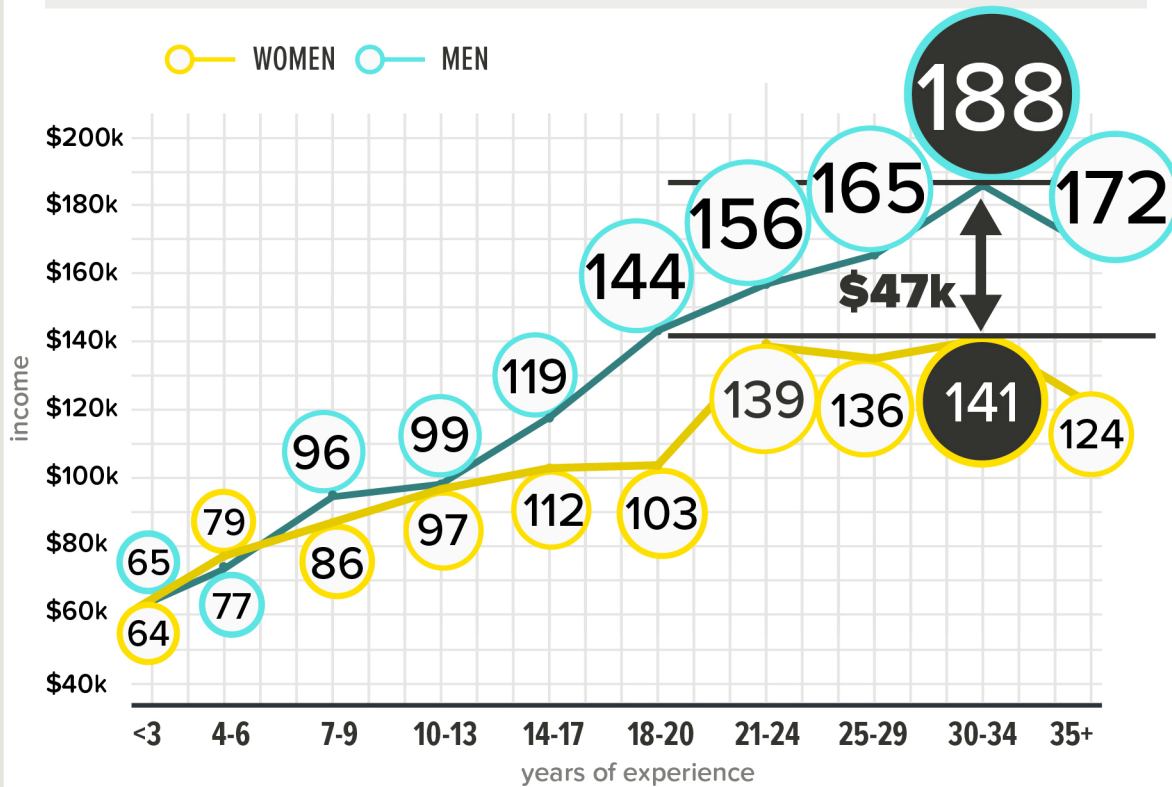
## INCOME VS. YEARS OF EXPERIENCE: ALL RESPONDENTS

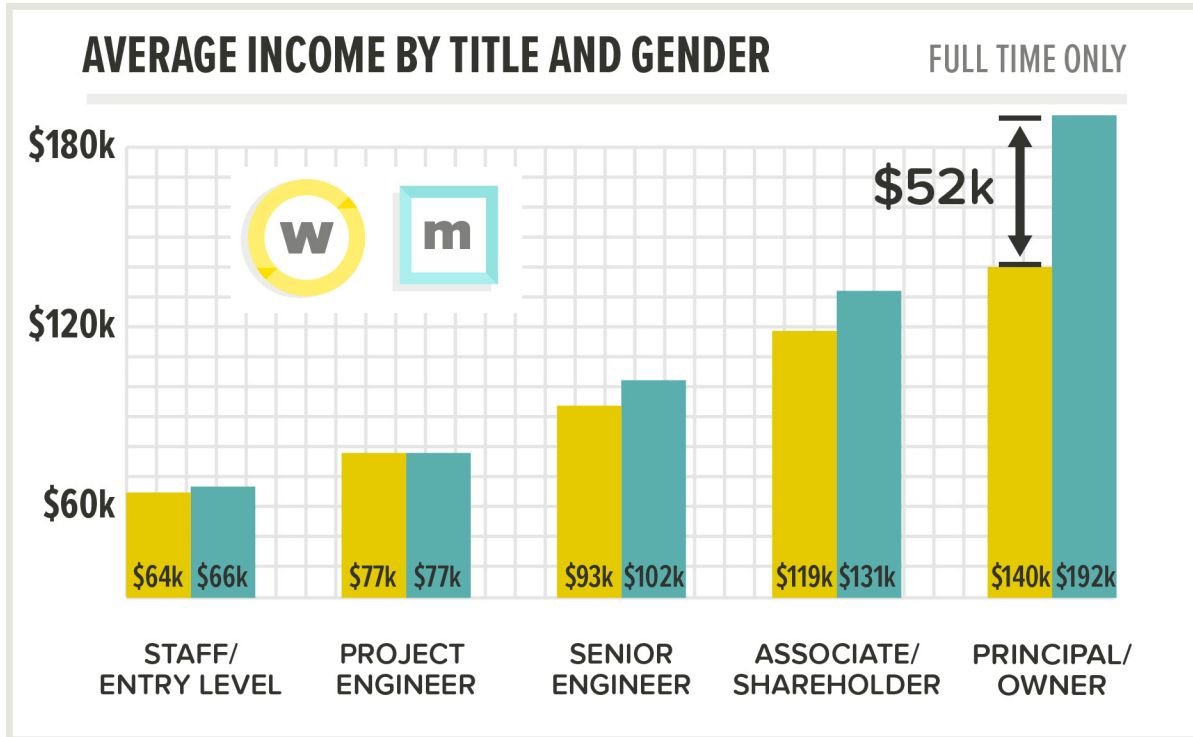
## BREAKDOWN BY GENDER



## INCOME VS. YEARS OF EXPERIENCE: FULL TIME ONLY

## BREAKDOWN BY GENDER





closed significantly, though it was still present. Notably, the pay gap found in the SE3 survey was much larger than that found in the ASME/ASCE survey.

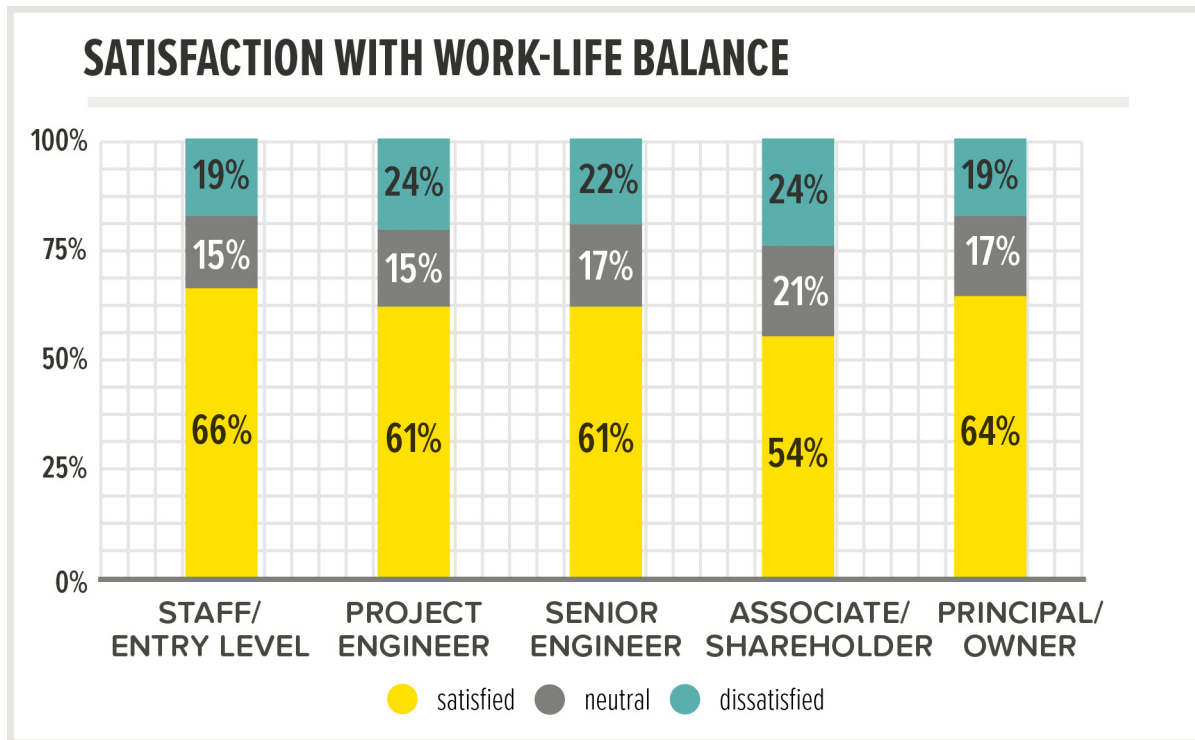
The 2013 SEI survey found that the average annual salary for women was 78% of that reported by men. Similar to the SE3 data, the pay gap widened as the number of years of experience increased.

The SE3 study also found that pay satisfaction is perceived differently by men and women. Ranking factors that are considered to define “success,” women rated pay/compensation at 66 on a scale of 1 to 100 (where 100 indicates the highest importance), while men rated it at 70. Though these values are similar, when asked what factors contributed most to considering leaving the structural engineering profession, women ranked pay/compensation third, while men ranked it

the top reason. And of those who had left the profession who were asked to rank factors that contributed to them leaving, women rated pay/compensation sixth, while men ranked it first.

### 3.4. WORK-LIFE BALANCE

“Work-life balance” is a popular phrase in modern discussions of employment and engagement. Research, articles, and ongoing studies attempt to address common concerns arising from an imbalance between the time spent at work and the time spent outside of work attending to other “life” interests or tasks, such as exercise, hobbies, errands, and care of children or dependents. Twenty-two percent of respondents reported being either dissatisfied or very dissatisfied with their work-life balance, and that this was one of the top reasons for their considering leaving the profession. Poor work-life balance is also



one of the leading reasons that respondents reported having left the profession.

When broken down by position, dissatisfaction with work-life balance was more highly concentrated in respondents at middle levels of employment—specifically, associates/shareholders. For example, while only 19% of staff/entry level engineers and principals/owners reported being dissatisfied or very dissatisfied, 24% of project engineers and associates/shareholders reported the same. Similarly, while 61-66% of respondents at all other levels reported being “satisfied” or “very satisfied,” only 54% of associates/shareholders reported the same.

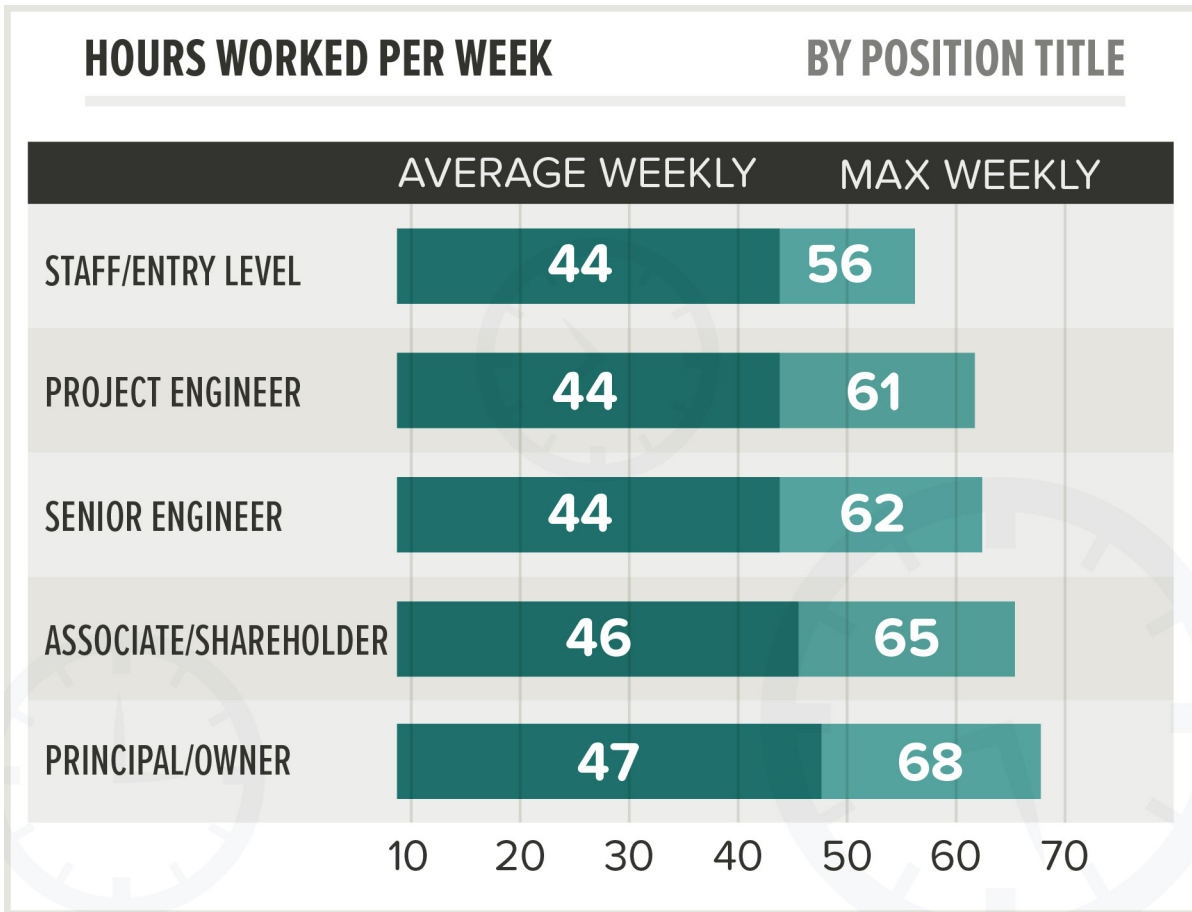
Staff/entry level engineers, on average, reported working fewer hours than respondents at all other levels, which supports the idea that they generally have more time for other activities, possibly leading to higher

satisfaction with work-life balance. Principals, on the other end of the spectrum, likely have more control over their schedules and therefore may orchestrate a better balance between work and tasks outside of work.

### 3.4.1. HOURS WORKED AND OVERTIME PAY

Respondents who reported working more hours per week were correspondingly less satisfied with work-life balance, with the exception of principals/owners. Generally, the higher position that respondents reported holding, the more hours they reported working each week. While staff/entry level engineers, project engineers, and senior engineers/project managers reported working 44 hours per week on average, associates/shareholders and principals/owners reported working 46 and 47 hours per week,





respectively. Additionally, the maximum hours worked per week increased at each position to a maximum average of 68 hours per week for principals/owners. Interestingly, respondents who reported being compensated for overtime were more satisfied with work-life balance than those who were not compensated for overtime. This suggests that even though work-life balance may be sacrificed when more hours are required, employees feel that this sacrifice is more worthwhile when they are directly compensated for it.

### 3.4.2. FLEXIBILITY BENEFITS

In the past several decades, more women

have been entering the workforce globally. In 1950, women comprised approximately 30% of the US workforce; today they comprise nearly half (The Council of Economic Advisors, 2014). This means that tasks associated with raising children are now more difficult than they used to be, as parents struggle to balance work with child-care. (Elder care is similarly difficult; nearly two-thirds of people providing unpaid elder care have jobs, and about half of caregivers work full time.) One recent study reported that in 46% of two-parent households in the United States, both parents work full-time schedules (Pew Research Center, 2015). Another found that in 60% of households

## CHAPTER THREE: FINDINGS

with children, all parents work full-time (this includes both one- and two-parent households) (The Council of Economic Advisors, 2014). This evolution of family life requires a new corporate culture that accommodates the needs of working parents.

Although having children or dependents is common (51% of respondents have children or dependents), survey findings indicate a stigma associated with employees who care for children. Even though many firms now offer “flexibility benefits” such as flexible work schedules, maternity/paternity leave, reduced hours, and the ability to work from home, many individuals are hesitant to take advantage of these benefits. For example, only 19% of respondents had taken time off from their structural engineering careers, with maternity/paternity/parental leave identified as the primary reason.

Some respondents are indifferent to coworkers using flexibility benefits, but others expressed criticism of their peers who choose to use them, indicating a perceived reduction of productivity, decreased motivation, decreased accountability to clients, and significant inconvenience to other staff, the last of which is the most commonly cited complaint regarding those who either work remotely or have reduced schedules. Twenty-two percent of the respondents who do not have children or dependents indicated that they were sometimes left to “pick up the slack” for their coworkers with children or dependents. Thirty percent of the respondents indicated that they feel that they work harder than their peers with children, and 30% of the respondents also indicated that their managers expect them to work more hours because they do not have children.

Of the benefit options surveyed, respondents indicated that a flexible daily work schedule is the benefit most commonly offered by

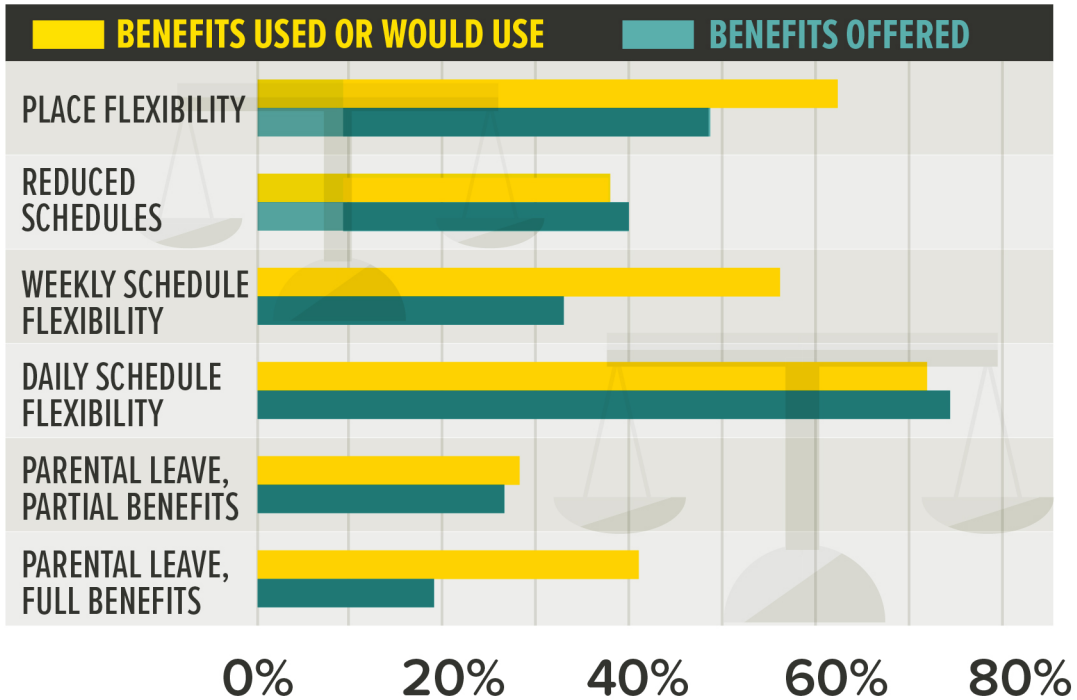
employers and the most commonly used. Over 70% of respondents indicated that their company offers flexible daily work schedules, and nearly the same number of respondents reported that they use or would use this benefit if it were offered.

The biggest discrepancies in benefits that were offered versus those that were used or desired were weekly schedule flexibility and parental leave with full benefits. Only about one-third of respondents’ employers offer weekly schedule flexibility, which is the ability to alter one’s weekly work schedule, for example, by working four ten-hour days instead of five eight-hour days. In comparison, more than half of respondents said they do use or would use this benefit if it were offered. Nineteen percent of respondents reported that their companies offer parental leave with full benefits (paid maternity or paternity leave after having a child), while 41% of respondents indicated that they would use this benefit if it were offered.

Findings from this survey align with other recent discourse that suggests that modern corporate culture in the United States generally does not embrace the needs of caregivers by allowing them to tend to both family and work obligations (Slaughter, 2015). While many companies offer flexibility benefits, they are often negotiated on a person-by-person basis and not well supported by management or other staff. Studies show, however, that increased flexibility benefits can be a solution that not only alleviates employee stress about balancing family with work but can also improve employee happiness, health, loyalty, and productivity (The Council of Economic Advisors, 2014). Another recent study found that these benefits could be achieved via a systematic management approach that neither forces working parents to try to figure out their situation alone nor burdens non-caregivers with additional workload (Fondas, 2014).



## FLEXIBILITY BENEFITS OFFERED BY EMPLOYERS VS. USED

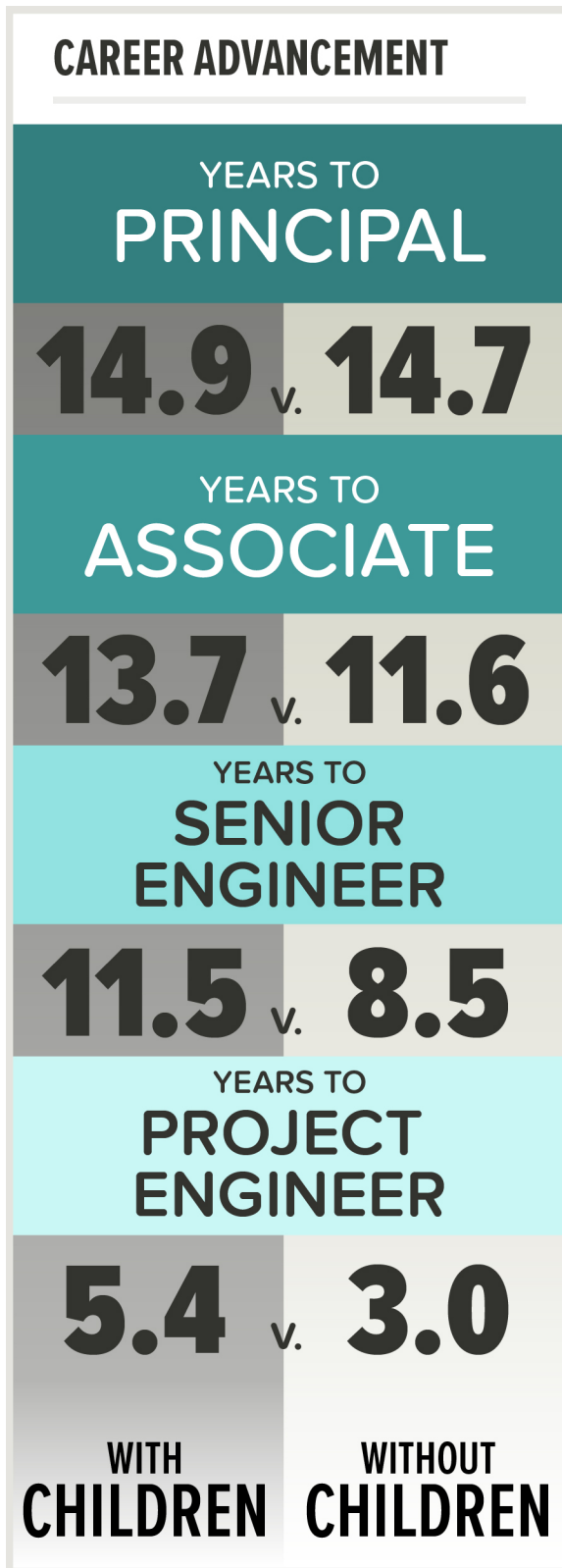


### 3.4.3. ADVANCEMENT AND PAY OF RESPONDENTS WITH CHILDREN

Respondents with children advance at a slower rate than those without children, regardless of gender. On average, it took respondents without children 8.5 years to reach the senior engineer/project manager level, 11.6 years to reach the associate/shareholder level, and 14.7 years to reach principal/owner, while it took respondents with children 11.5 years, 13.7 years, and 14.9 years, respectively, to reach those positions.

Broken down by gender, this trend persists. Excluding respondents who started their own business, mothers took 9.6 years to reach

the senior engineer/project manager level, compared to 8.3 years for women without children. Fathers took 12.0 years to reach this position, while men without children took 8.6 years. Similarly, mothers took 11.3 years to reach associate/shareholder, compared to 10.6 years for women without children, and fathers took 14.4 years to reach this position, compared to 12.4 years for men without children. At the principal/owner level, the gender trend reverses, though the parent versus non-parent trend persists. While fathers took 16.5 years to reach this position, men without children took 14.3 years; mothers took 18.2 years, while women without children took 15.9 years. Note that respondents who started their own business were excluded because their advancement may



not be commensurate with pacing in the rest of the profession. However, the same trend was found to persist even when sole business owners were included.

By comparing the age at which respondents had their first child with the time it took to reach their current position, the advancement gap can be viewed in terms of when in one's life having children is least or most detrimental to career advancement. In every age group men were found to lag further behind their childless peers than women, which may be unexpected given that mothers are commonly cited as being more heavily stigmatized and were also found to be paid less (as discussed below). Additionally, the age range where the advancement gap was found to be greatest was in those who had their first child when they were over the age of 35. This correlates with other findings from this study that indicated that those in the middle levels of management who are not yet principals are least satisfied with work-life balance. Interestingly, the group that has the smallest advancement gap compared to their childless peers is women who have their first child between the ages of 30 and 35.

At every position level, women were less likely than men to have children, which may contribute to the finding that female respondents reach each level of employment except principal/owner more quickly than male respondents (as discussed in the Career Development section of this report). At the principal/owner level, 85% of male respondents reported having children, compared to only 61% of females.

Additionally, the pay gap between genders is even more pronounced for respondents with children. For full-time employees with children, men with 14-17 years of experience made \$9,700 per year more than women, and men with 18-20 years of experience made

***Despite the difficulties reported, respondents with children reported higher overall satisfaction with their career than those without children.***

\$43,400 per year more than women. (Note, however, that the sample size for people with 18-20 years of experience who have children consisted of only 94 men and 14 women.) Similar findings are documented in multiple studies that find that women commonly experience a wage decrease after having children, while men often receive an increase, and it is sometimes referred to as the “motherhood penalty” and the “fatherhood bonus” (Budig and England, 2001; Miller, 2014; Cory and Stirling, 2016).

Despite the difficulties reported, respondents with children reported higher overall satisfaction with their career than those without children. So, even though they advance more slowly, are paid less, and are perhaps frustrated with many perceptions about their roles as caregivers, those with children are generally more satisfied with their work lives.

#### **3.4.4. CAREGIVING RESPONSIBILITIES**

When asked to estimate the percent that they contribute to caregiving responsibilities, on average women responded that they contribute 65%, while men reported that they contribute 35%. Women were also significantly more likely to feel that having children has affected their career. In fact, for both genders, as an employee’s percent of caregiving responsibilities increased, so did his or her feeling that children had affected his or her career. Because more men are taking on a larger percentage of caregiving responsibilities compared to previous generations, this issue is no longer applicable only to women.

As the percentage of caregiving increased, respondents were more likely to report a decrease in motivation and productivity. For the 192 respondents who reported having more than 50% of the caregiving responsibilities in their family, 22% reported a decrease in motivation at work after having children, and 21% reported a decrease in productivity. In comparison, of the 563 respondents who reported having less than 50% of the caregiving responsibilities, only 6% reported a decrease in motivation at work after having children, and 12% reported a decrease in productivity.

Loss of motivation and productivity was more concentrated in women, which correlates directly to the higher rate of caregiving responsibilities that women reported having. When asked about work motivation after having children, 41% of men reported an increase in motivation, compared to only 21% of women, and only 7% of men reported decreased motivation, compared to 21% of women. When asked about work productivity after having children, 19% of women reported a decrease in work productivity, compared to 13% of men.

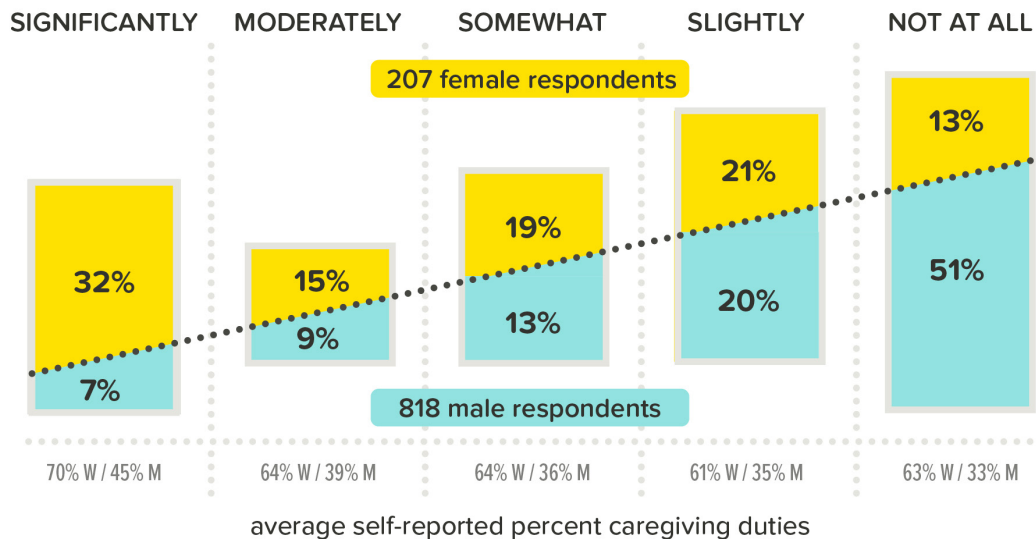
Interestingly, women who have children are 7% more likely to aspire to the level of principal/owner while men are equally likely to aspire to principal/owner whether or not they have children.

Looking at these factors together for women with children—a higher percentage of caregiving responsibilities, stigmas in the workplace against those with children or who take advantage of flexibility policies, an increasing pay gap, and correspondingly less productivity and motivation after children—it

## EVOLUTION OF DOMESTIC CAREGIVING

Age Range	Female Count	% Caregiving	Male Count	% Caregiving
20 - 29	8	54	26	35
30 - 39	117	62	268	36
40 - 49	45	63	228	34
50 - 59	32	81	173	36
> 60	4	81	109	35

## HOW HAVE CHILDREN AFFECTED YOUR CAREER? DEMOGRAPHICS



is not surprising that women are less satisfied with work-life balance, which was reported as the top reason that they have considered leaving the structural engineering profession.

It is also clear that better engagement of female engineers—as well as engineers of all genders—depends heavily on changing the perception of the value of parenting. If employees feel supported in their work and life outside work, are allowed flexible schedules as needed to care for children, and are not given lower wages or slower promotions, then perhaps they would engage better within the profession after having children and, in some cases, stay in the profession when they may have otherwise left.

# CHAPTER 4

## BEST PRACTICES

The purpose of this study was to investigate engagement and equity in the structural engineering profession; to analyze where improvements can be made by employers, managers, and staff; and to formulate a list of best practices derived from the findings that can be used to begin the discussion on these issues.

The guiding principle behind each of the recommendations below, as supported by the findings of this study, is the notion that when employees are satisfied with all aspects of their career, they are more likely to remain in the profession and to stay with their firms. Additionally, as supported by associated research, highly engaged employees are also more likely to have increased motivation and productivity, thus increasing the success of the firms for which they work.

Survey findings indicate that overall career satisfaction is high for structural engineers. However, more than half of respondents indicated that they have considered leaving the profession. Many

## CHAPTER FOUR: BEST PRACTICES

factors were cited as reasons for considering leaving or having left, of which low pay, poor work-life balance, and high stress topped the list. For those who had left the profession, poor management/leadership was also heavily cited, suggesting that this is also a core cause for people leaving the structural engineering profession.

Below is a list of the most relevant and important best practices that the SE3 committee derived from the findings of the 2016 survey and corresponding research. The committee encourages engineers at all levels to consider these recommendations and use them to begin a discussion regarding ways to improve engagement and equity in their firms. The SE3 committee believes that everyone at a company—from entry level engineers to owners—stands to benefit from the successful incorporation of these practices.

### **1. MANAGERS NEED BUSINESS AND MANAGEMENT TRAINING.**

Principals/owners are less likely than all other staff to believe that formal business management training is important. They are also more likely than all other staff to believe that expectations for advancement are clearly defined and that there are equal opportunities for advancement in their firms. Additionally, “poor management” was one of the top reasons that people who had left the profession cited as a reason for leaving. This general difference in perspective between management and staff indicates a potential need for more business management training in topics such as effective communication, workflow management, how to motivate staff, and strategies for working with different types of people.

A recent study found that 98% of managers in the US feel that more management training is needed in their own firms, and 87% percent of those surveyed wish they had received more management training before assuming their current roles (Grovo, 2016). This shows that most industries generally consider management training to be valuable, if not necessary, for their leaders. The SE3 survey results found that structural engineering is no exception to this, and that providing a path for rising leaders to achieve management skills along their path of advancement would benefit all.

### **2. ALIGN DAILY TASKS WITH EMPLOYEE CAREER GOALS.**

One factor that correlated strongly among those who reported the highest satisfaction was having daily tasks that align with their career objectives. Individuals who experienced this alignment were significantly less likely to consider leaving or to have left the structural engineering profession. This effect was the same for both men and women.

This correlation between daily tasks aligning with career objectives and satisfaction is an important nuance of engagement that could be easily overlooked, as this may not often be discussed between management and staff. As each employee is different and goals may change over time, both managers and staff are encouraged to regularly discuss career goals and evaluate how well assigned projects and tasks align with these goals. To the extent possible, a distinct effort should be made to align daily tasks with an employee’s overall career goals.

### 3. ENGINEERS NEED MENTORS.

Respondents with an identified mentor reported being more satisfied with their career advancement/trajectory and overall career choice than those without a mentor. People who did not indicate having a mentor were 22% more likely to consider leaving the profession. If female engineers have a mentor, they are 41% more likely to aspire to principal/owner; if male engineers have a mentor, they are 35% more likely to aspire to the same. These findings show that mentorship increases engagement, facilitates aspiration to higher positions, and increases overall satisfaction with an employee's career.

A recent study supports the conclusions found in the SE3 study, noting that mentorship often facilitates a sense of connectedness to the organization, increases satisfaction, and reduces turnover. Employees benefit from increased confidence, self-esteem, and exposure to networking opportunities within the organization (Amelink, 2008). Whether through a formal mentorship program or via informal mentor relationships, ensuring that each employee has a mentor to support, encourage, and assist him or her throughout his or her career is a simple yet profoundly effective way to bolster engagement.

### 4. CURB THE CULTURE OF LONG HOURS.

As the number of hours worked each week increases, satisfaction with pay/compensation and work-life balance was found to decrease. Additionally, employees who work more hours are more likely to consider leaving the profession. For each additional hour worked per week over 40, the odds of an employee considering leaving the profession were 4% higher. This points to the tendency of people to “burn out” when

their workload is consistently over 40 hours per week.

Additionally, it was found that being compensated for overtime correlates with significantly higher satisfaction with pay/compensation and work-life balance as compared to respondents who are not compensated for overtime. Those who are paid for overtime reported working an average of two fewer hours per week than those who are not paid for overtime.

These findings show that long hours are not beneficial to the long-term satisfaction of employees or employee retention. While structural engineering work is often project-driven, which may require short-term commitments of longer working hours, sustaining this practice leads to dissatisfaction and a higher likelihood of burnout. To keep employees engaged, motivated, and productive, companies must curb the culture of encouraging or requiring long hours. As it is unlikely that long hours will be altogether eliminated, one way to improve engagement during these times is to offer compensation for overtime work.

Managers are encouraged to consistently review hours worked by all staff, encourage employees to keep weekly averages near 40 hours, and consider policies that could improve engagement during times when long hours must occur, such as overtime pay or comp time. Reciprocally, employees are encouraged to request help if a task is foreseeably going to require excessive or consistent overtime and to alert management if they consistently work long hours to discuss ways this can be reduced.



### **5. PERFORM ANNUAL PAY AUDITS TO ENSURE PAY EQUITY IS ACHIEVED AND MAINTAINED.**

Pay for women continues to lag behind pay for men in a variety of professions, and structural engineering is no exception. This was true for respondents of every level, with the magnitude increasing as respondents work in the field longer and advance to higher positions. At the senior engineer/project manager and associate/shareholder levels, men were found to make \$9,000 and \$12,000 more per year than women, respectively. At the principal/owner level, men were found to make \$52,000 more per year than women. Women were found to work part-time more commonly than men; however, even when considering only full-time respondents, a significant wage gap was still found to exist between men and women. In analyses that controlled for a variety of factors (location, position, full-time employment, firm size, whether or not the employee has children), the gender pay gap was consistently found to persist. This study did not find any factors other than gender that could explain the pay gap.

To begin to fully understand and address this issue, annual company-wide pay audits should be performed to evaluate differences in pay that may be due solely to implicit biases based on gender, ethnicity, or other factors. As nationwide discussions of pay inequity have gained recent attention, some firms have already begun to address this issue. In 2015, Salesforce conducted a company-wide pay audit and spent \$3 million to close the gender pay gap in its company (Zarya, 2016; Lam, 2016; Peck, 2015). Similarly, Apple has reported that pay equity has been achieved for its employees in the US (Leswing, 2016). Many other large

firms have initiated such audits, finally beginning to take action on a discrepancy that has been known for decades.

A company need not be large or internationally known to initiate a pay equity audit. Even when factors such as location, productivity, and experience may make it difficult to readily identify pay inequity, companies are still encouraged to formulate a comprehensive approach to audit compensation for all employees and to correct any discrepancies.

### **6. CREATE A ROBUST, TRANSPARENT WORK FLEXIBILITY PROGRAM AND EMPOWER EMPLOYEES TO USE IT.**

Even though many firms now offer “flexibility benefits” such as flexible work schedules, maternity/paternity leave, reduced hours, and the ability to work from home, many individuals are hesitant to take advantage of these benefits. Only 19% of respondents had taken time off from their structural engineering careers, with parental leave identified as the primary reason. Additionally, those who do not utilize flexibility benefits are often at odds with those who do; some respondents expressed criticism of their peers who choose to use them, indicating a perceived reduction of productivity, decreased motivation, decreased accountability to clients, and inconvenience to other staff. These findings point to a cultural conflict within companies whereby employee flexibility needs are attempted to be addressed, but are not done so in a comprehensive manner such that they can be effectively used.

Recent studies have shown that increased flexibility benefits can be a solution that



not only alleviates employee stress about balancing family with work, but also improves employee happiness, health, loyalty, and productivity (The Council of Economic Advisors, 2014). Another recent study found that these benefits could be achieved via a systematic management approach that neither forces employees to try to figure out their situation alone nor burdens others with additional workload (Fondas, 2014). As dissatisfaction with work-life balance was reported by 22% of respondents and was also cited as one of the top reasons for considering leaving the profession, providing a successful flexibility benefit program could have a significant impact on increasing engagement.

The two main obstacles to successful use of flexibility benefits, as indicated by the survey data, are (1) the availability of benefits for use by employees and (2) cultural “permission” to use the benefits within a company. Management should carefully consider the flexibility benefits offered, with input from staff, to respond to the needs of all employees. Once policies are in place, a comprehensive plan to promote the use of these benefits should be enacted. This may include redistribution of workloads so as not to overburden those who are not utilizing flexibility benefits, evaluating productivity via other means besides the number of hours logged at a desk in the workplace, or direction from ownership indicating that supervisors are to fully support the use of flexibility benefits. As each company is unique, it would be wise to periodically review the use and effectiveness of flexibility benefits (via discussion, surveys, or other means) to understand what is working, what needs improvement, and how employees perceive the program.

## **7. PROVIDE COMPREHENSIVE SUPPORT TO EMPLOYEES WITH CHILDREN AND DEPENDENTS.**

People with children experience stigmas and setbacks in the workplace. They are sometimes perceived to not work as hard, to not be expected to work as hard by management, and to leave others to “pick up their slack.” Those who utilize flexibility benefits (such as flexible work schedules, maternity/paternity leave, reduced hours, and the ability to work from home) in order to balance caregiving with work are sometimes perceived in similar ways. People with children were also found to advance more slowly in their careers compared to people without children.

Study findings indicate that as an employee’s percent of caregiving responsibilities increased, so did his or her feeling that children had affected his or her career. Because more men are taking on a larger percentage of caregiving responsibilities compared to previous generations, this issue is no longer applicable only to women. This was evidenced by the finding that respondents were more likely to report a decrease in motivation and productivity at work as their reported percentage of caregiving responsibility increased, regardless of gender. But, because women still report a larger percentage of caregiving responsibilities than men (on average women reported that they contribute 65% of caregiving responsibilities; men reported 35%), self-reported loss of motivation and productivity at work after having children was more concentrated in women.

## CHAPTER FOUR: BEST PRACTICES

The gender pay gap was also found to increase for respondents who had children. This phenomenon is documented in multiple studies that have found that women commonly experience a wage decrease after having children, while men often receive an increase (Budig and England, 2001; Miller, 2014; Cory and Stirling, 2016). Overall, female respondents were less likely to have children than men. At the principal/owner level, 85% of male respondents reported having children, compared to only 61% of females. Overall, 51% of respondents reported having children (note that nearly half of respondents were under the age of 35).

These findings suggest that better engagement of parents in the structural engineering profession depends heavily on changing the perception of the value of parenting. One way this may be achieved is by enacting pay and advancement audits to ensure that employees with children are not negatively affected by using flexibility benefits when their performance is still high. Another possible way to change the perceived value of parenting is by reducing stigmas (as addressed in the previous best practice regarding flexibility benefits). Additionally, as having children correlated strongly with those who reported the highest career satisfaction, employers should capitalize on this seemingly inherent satisfaction by providing work flexibility, fair pay, and equitable advancement opportunities in order to support and retain this large portion of the workforce.

### 4.1. ONGOING STUDY AND PARTICIPATION

The analysis and findings of this study are ongoing and continue to evolve as the committee continues its work. For those who have comments on this report or are interested in joining the effort for further analysis or future studies, the committee welcomes your participation. Please contact the committee at [SE3@seaonc.org](mailto:SE3@seaonc.org).

As a next step, a symposium is being held on January 26, 2017 to facilitate a discussion of the findings and suggested best practices. Committee work will continue after that time to further the group's mission.

# CHAPTER 5

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