THE SE3 PROJECT

STRUCTURAL ENGINEERING ENGAGEMENT & EQUITY

SEAONC

STRUCTURAL ENGINEERS ASSOCIATION OF NORTHERN CALIFORNIA

2024

2020 NCSEA SE3 Survey Data from California Respondents

Demographics Topic Brief

By the Structural Engineering, Engagement, and Equity Committee of the Structural Engineers Association of Northern California (SEAONC)

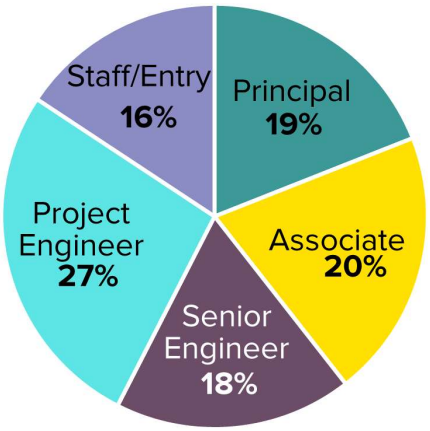
In 2020, the NCSEA SE3 Committee conducted its third national survey of structural engineers in the United States. The survey gathered more than 5,000 responses, approximately 22% of which were from respondents based in California. Following the survey, NCSEA SE3 published a series of topic briefs based on the compiled data. In 2023, SEAONC SE3 began an effort to re-process the survey data for the subset of respondents from California and to investigate whether the trends observed on a national level held for California respondents.

This Topic Brief describes the demographic characteristics of the 1,119 survey respondents from California. Though the survey did not reach all structural engineers working in California, the respondent population is sufficiently large to gain insight into overall trends. The demographic data contained in this brief are used in comparisons for the other topic briefs published as part of this effort. Information regarding age, gender identity, position level, parental or caregiver status, geographic work location, racial identity, and sexual orientation was gathered.

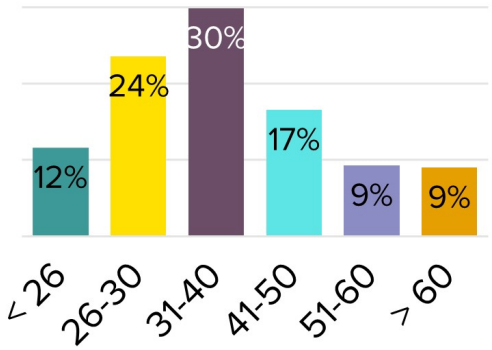
California Respondent Demographics

No significant differences between the California data and national data are seen for age, position title, position by gender, sexual orientation, firm size, and firm leadership by gender. The reader is encouraged to review the corresponding NCSEA Demographics Topic Brief to learn more about the findings from the national survey.

Position

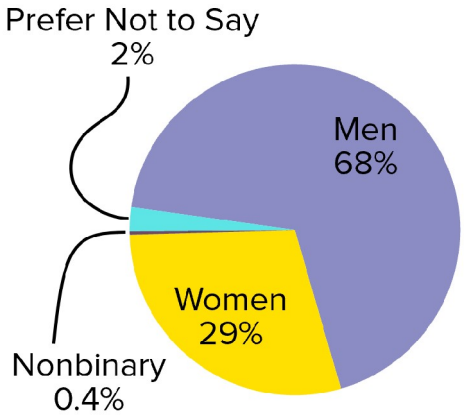


Age



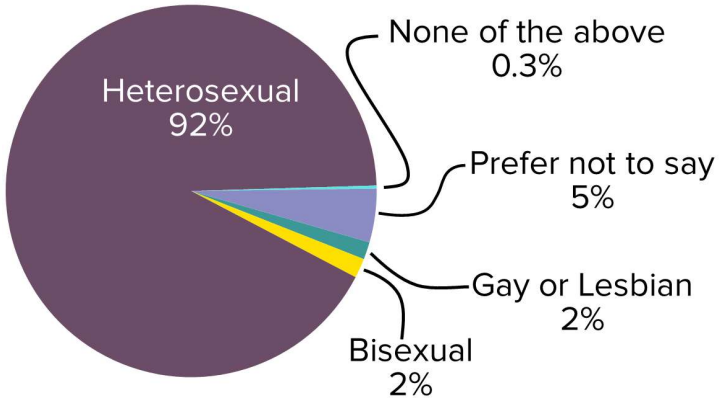
Note: SEAONC SE3 grouped the ages of respondents in different age "bins" than NCSEA SE3 to create more equal size groups for better comparison.

Gender

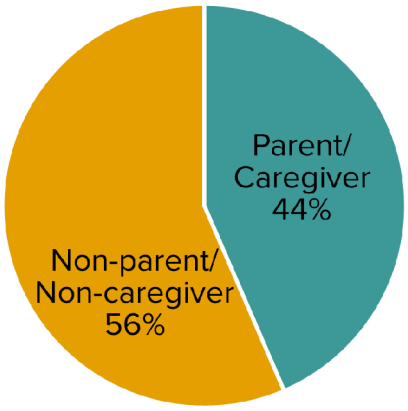


A higher share of respondents from California were women, 29% versus 24% nationally.

Sexual Orientation



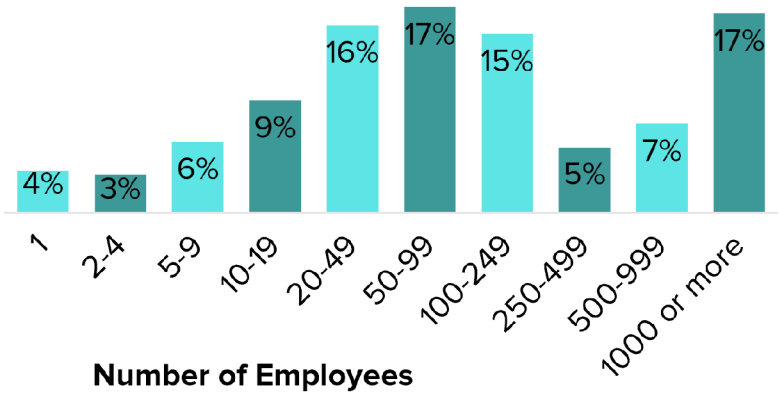
Parent/Caregiver Status



California respondents were slightly less likely to report having children or dependents than national respondents (44% in California versus 50% nationally). More trends on parenting/caregiving, including breakdowns by gender and position, can be found in the Children and Dependent Care Topic Brief.

SEAONC SE3
STRUCTURAL ENGINEERS ASSOCIATION OF NORTHERN CALIFORNIA

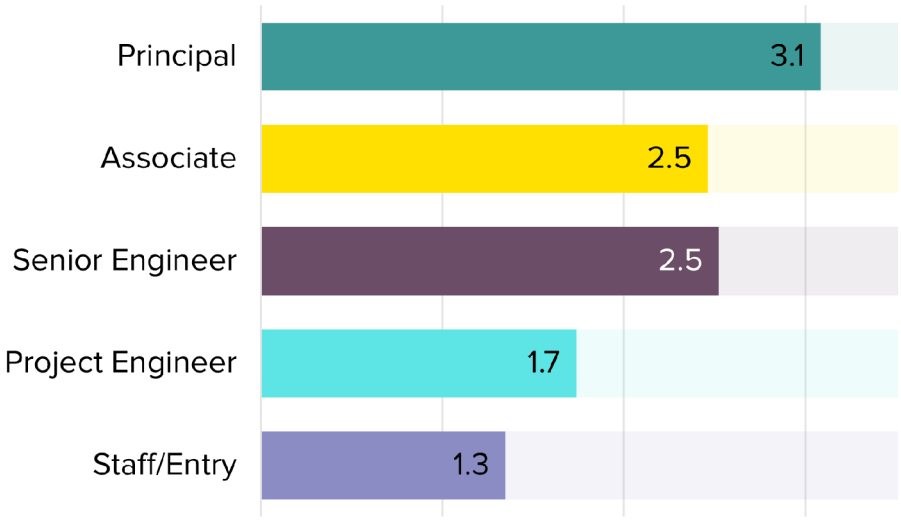
Firm Size



Respondents were asked whether they have a mentor. Approximately 68% reported having a mentor, 26% reported not having a mentor, and 7% reported being unsure if they have a mentor.

California respondents, on average, reported working 43.5 hours per week. The average is fairly consistent, plus or minus one hour per week, across race, gender, and parent/caregiver status; however, men and parents/caregivers had more variability in their responses than their counterparts. On average, Principals and Associates reported working 44.6 and 44.2 hours per week, respectively, while Staff/Entry Level engineers reported working 42.1 hours per week.

Average Number of Employers Over Career

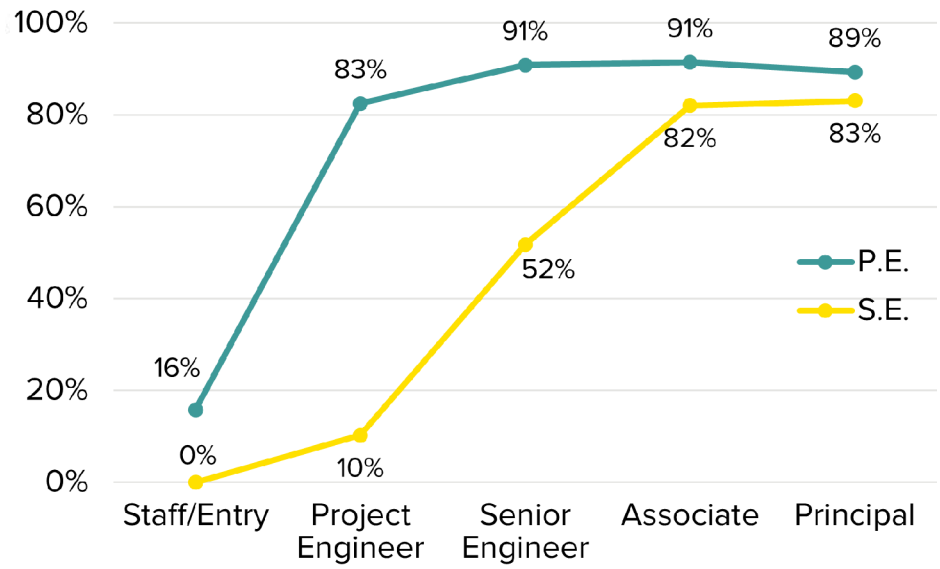


On average, California respondents reported having worked for 2.3 firms. This is positively correlated with increasing position title.

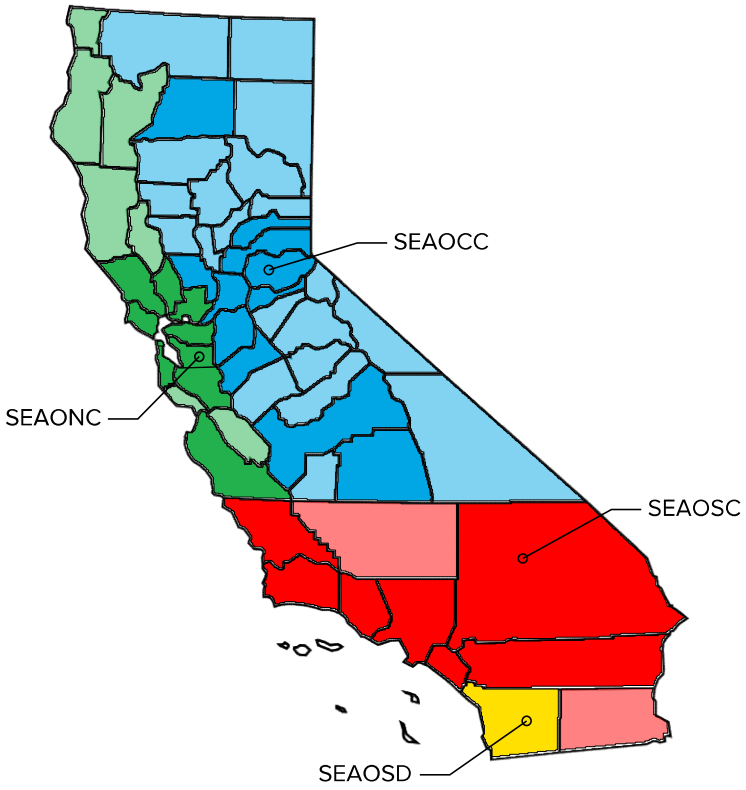
On average, 18% of respondents worked for only one firm. This number decreases with increasing position: 56% of Staff/Entry Level respondents, 29% of Project Engineers, 14% of Senior Engineers, 13% of Associates, and 5% of Principals reported working for only one firm.

Percentage of California Respondents with P.E. and/or S.E. License by Title/Position

Overall, 77% of respondents reported having a Professional Engineer (P.E.) license, while 45% reported having a Structural Engineer (S.E.) license. Unsurprisingly, licensure is positively correlated to position level. A very large jump in P.E. licensure occurs between the Staff/Entry Level and Project Engineer level, indicating that respondents are very likely to get their P.E. license during this time, while S.E. licensure appears to happen on a longer timeline.



Geographic Locations



Respondents were categorized by SEAOC member organization geographical region based on their workplace zip code. The locations of respondents' workplaces were as follows:

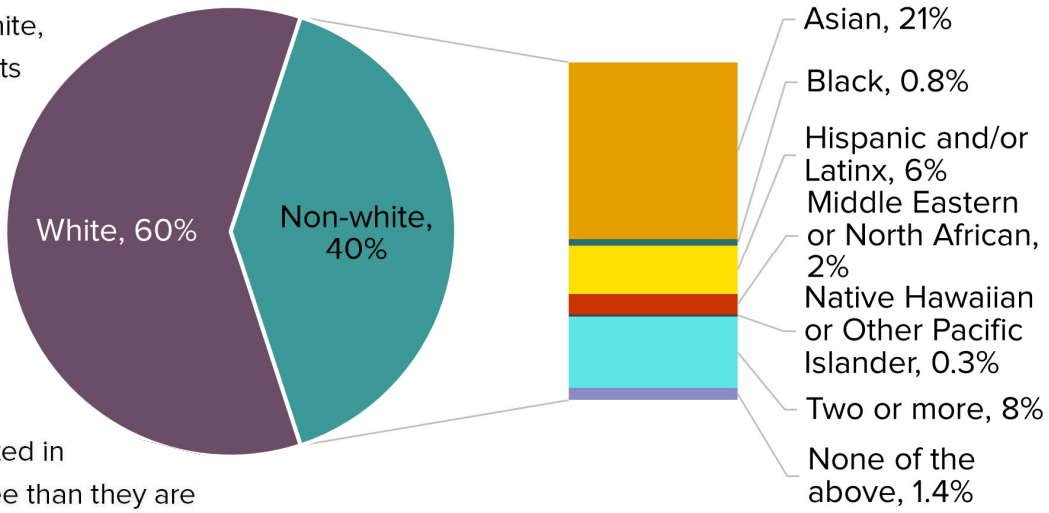
- 523 - SEAONC (Northern California)
- 359 - SEAOSC (Southern California)
- 128 - SEAOCC (Central California)
- 109 - SEAOSD (San Diego)

Note that respondents did not have to belong to these organizations to respond to the survey.

*Lighter colors signify counties with no survey responses.

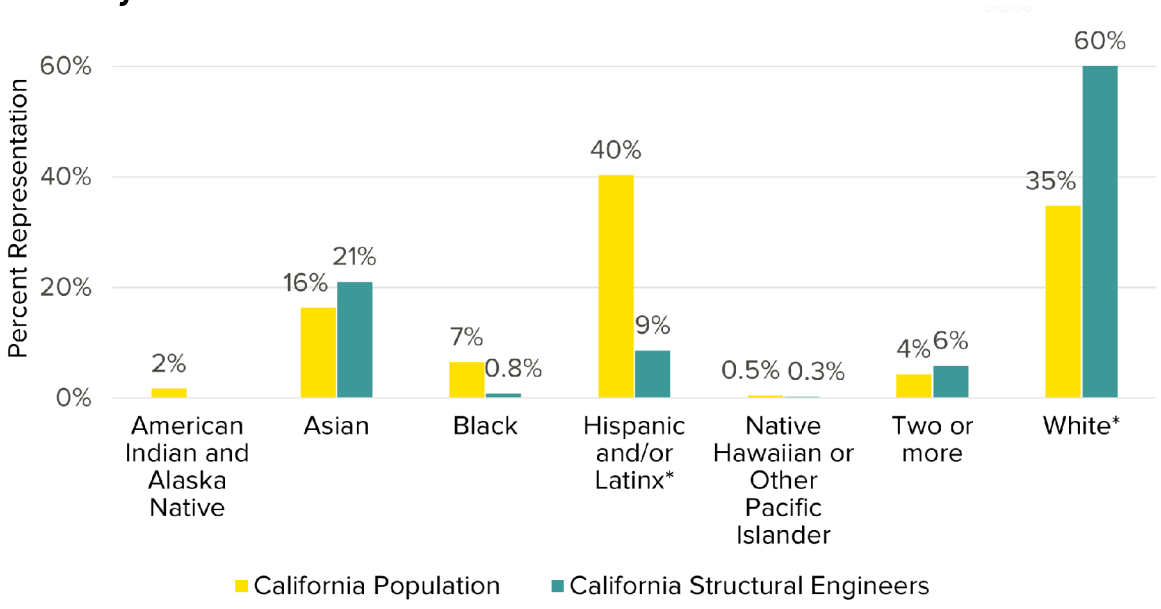
Race

Compared to the national survey where 77% of respondents identified as white, 60% of California respondents identified as white. According to the 2020 Census [2,3], approximately 59% of the national population is white (non-Hispanic), compared to 35% of the California population. Therefore, white structural engineers are overrepresented in California by a greater degree than they are nationally.



Indeed, the racial demographics of the California survey respondents do not align with the racial demographics of the state population as a whole when compared to the 2020 Census data [2,3]. Whereas 40% of the population of California is Hispanic and/or Latinx, only 9% of the survey respondents identified as such. Less than 1% of California respondents identified as Black, compared to 7% of the state population.

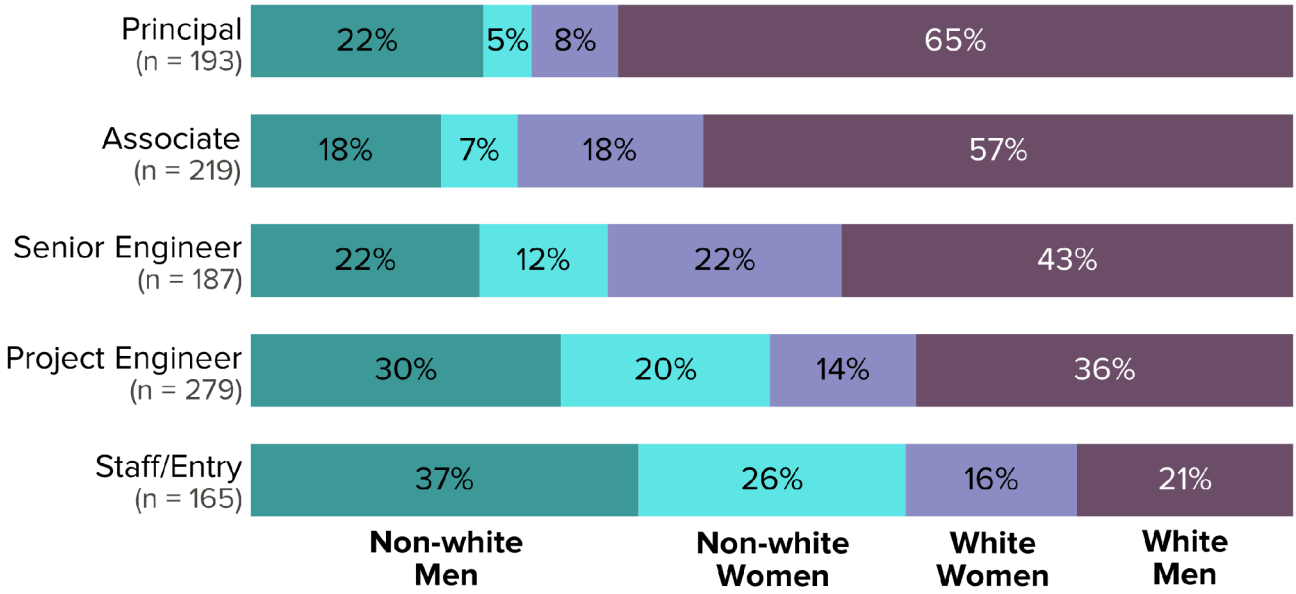
Comparison of California Population and California Structural Engineering Population by Race and Ethnicity



*California population demographics for 2020 came from census.gov. The US Census treats Hispanic ethnicity identification separate from racial identification. In order to appropriately contrast the US Census data with the survey data for this comparison only, we present "white" as the percentage of the population that is both white and does not identify as Hispanic or Latinx, while all other races who selected "Hispanic/Latinx" as an ethnicity were included in both their race and the "Hispanic/Latinx" ethnic distinction. Therefore, "Hispanic/Latinx" is the percent of the population that identified as being of Hispanic/Latinx ethnicity, regardless of race. For this reason, the total racial and ethnic breakdown does not add to 100%. For all other comparisons, respondents who selected both "white" and "Hispanic/Latinx" were considered to be "two or more races" and therefore non-white. The Census does not report Middle Eastern/North African as a separate race, and therefore those data were not included in this graph.

Position by Gender and Race

At the Staff/Entry Level position, 37% of respondents identified as white. This is reasonably representative of the population of California that identifies as white (35%). In addition, 42% of Staff/Entry Level respondents identified as women, which approaches the 50% level of California's population. As the position of respondents increases in seniority, the share of women and non-white respondents decreases. Women and non-white respondents constitute only 13% and 27% of respondents at the Principal level, respectively.



Of note: SEAONC SE3's 2021 report titled Racial Demographics of Civil Engineering Pathways in California [4] provides context on demographic trend shapes. Both women and people of color exemplify a "weak retention" trend.

The following position descriptions were provided when survey respondents were selecting their current positions. The positions have been shortened for brevity in the figures shown in this report.

Principal/Owner/Founder/ASCE Grade VII-VIII: "Owns a large share of the firm, directs firm business decisions with market sector(s), defines corporate mission, heavily involved in client and business development activities."

Associate/Shareholder/ASCE Grade VI: "Similar responsibilities as Project Manager, with enhanced autonomy and level of responsibilities in proposal writing, marketing, business development. May or may not own a share of the firm."

Senior Engineer/Project Manager/ASCE Grade V: "Assigns tasks to and reviews work of staff and project level engineers. Coordinates with clients and manages project finances. Approves overall system decisions made by team."

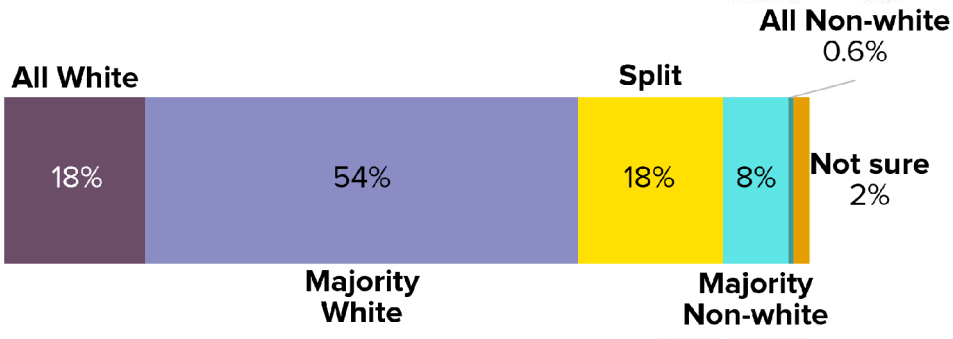
Project Engineer/ASCE Grade III-IV: "Performs complete analysis and design of building systems, prepares full project documents, manages entry level engineer, reports to a PM."

Staff/Entry Level/ASCE Grade I-II: "Performs basic to moderate design tasks, prepares portions of project documents under close supervision, reports to a PE."

Firm Leadership

Respondents were asked to classify the leadership demographics of their firm. The NCSEA SE3 2020 Demographic Topic Brief[1] notes: "It is difficult to define 'firm leadership' consistently for all respondents. The Committee decided to define 'leadership' loosely as 'the group of leaders who make decisions affecting your daily work experience, office culture, and environment.' The Committee is aware of the limitations associated with both the question text and selection options, and will be revising in future studies." Despite the inherent limitations in the wording this information still provides valuable insight. The proportion of California respondents who said their firm's leadership is all white or majority white is approximately 72%, compared to 85% of national respondents. Similarly, the share of California respondents who said their firm's leadership is all male or majority male is 78%, compared to 84% nationally.

Racial Demographics of Firm Leadership



Recall: white engineers were more overrepresented in California survey respondents than at the national level. While the percentage of firms with all white or majority white firm leaders is lower in California than nationally, the overrepresentation of white firm leaders in California (72% of firm leaders and 60% of engineers for a ratio of 1.2) is higher than nationally (1.1).

Entrepreneurship

Overall, 99 respondents in California started their own firm (9% of all respondents). All respondents who started their own firm were over the age of 30 and the proportion of respondents who reported starting their own firm increased with age. When considering only respondents in their 30s and 40s, parents/caregivers were twice as likely as their non-parent/non-caregiver counterparts to report starting their own firm. For respondents over 50, parents/caregivers and non-parents/non-caregivers reported starting their own firms at approximately equal rates. By race and gender, white men were the most likely to have started their own firm (12%), followed by non-white men (8%), white women (4%), and non-white women (3%).

Discussion Questions

1. Do any of these demographic trends or statistics surprise you? Are they what you might expect in the California structural engineering profession?
2. Most non-white racial/ethnic groups are underrepresented in structural engineering in California. What can the profession/firms/individuals do to improve this trend and attract a more diverse workforce?
3. Women, and especially non-white women, are underrepresented in structural engineering in California, especially in firm leadership. This trend has not changed significantly since SE3 began running surveys in 2016. What can the profession do to promote women into higher position levels? How much of this trend is attributed to retention? What can firm leaders do to improve retention?
4. What are some of the roadblocks to more equitable demographics in structural engineering?

References

1. NCSEA SE3 “2020 Survey Topic Brief: Demographics.” (2020). NCSEA. <https://www.se3committee.com/surveydevelopment>
2. United States Census Bureau. “Quick Facts: United States.” (2023). <https://www.census.gov/quickfacts/fact/table/US/PST045223>
3. United States Census Bureau. “Quick Facts: California.” (2023). <https://www.census.gov/quickfacts/fact/table/CA/POP010220>
4. SEAONC SE3 “Racial Demographics of Civil Engineering Pathways in California.” (2021). SEAONC. <http://www.se3project.org/seaonc-se3-publications.html>

This document was developed by members of the SEAONC SE3 Committee. It is offered for your reference and is not intended to represent the opinions of SEAONC or the SEAONC SE3 Committee. While the information presented in this document is believed to be an accurate, unbiased representation of that data gathered, neither SEAONC nor the individual members make any guarantee with regard to its accuracy, completeness, or suitability, and they assume no responsibility or legal liability for the use or reference to findings, conclusions, or recommendations expressed herein.

SEAONC
STRUCTURAL ENGINEERS ASSOCIATION OF NORTHERN CALIFORNIA

THE SE3 PROJECT
STRUCTURAL ENGINEERING ENGAGEMENT & EQUITY

Publication Team:

Primary Contributors: Kaat Ceder, Priscilla Nguyen, Hayley Proctor

Collaborators: Priya Helle, Claire Leader, Brenna Marcoux, Danny Preut, Curtis Seigfried

All rights reserved.

This document or any part thereof may not be reproduced in any form without the written permission of SEAONC or the SEAONC SE3 Committee.

The SEAONC SE3 Committee can be contacted at se3@seaonc.org

© 2024 SEAONC - Published December 2024