

Drafting and Design Technicians

Labor Market Analysis: San Diego County

July 2020

Summary



The brief provides labor market information about *Drafting and Design Technicians* to assist the San Diego and Imperial Counties Community Colleges with program development and strategic planning. According to available labor market information, *Drafting and Design Technicians* in San Diego County have a labor market demand of 311 annual job openings (while average demand for an occupation in San Diego County is 277 annual job openings), and six educational institutions in San Diego County supply 114 awards for these occupations, suggesting that there is a supply gap in the labor market. *Drafting and Design Technicians* include “Architectural and Civil Drafters,” “Drafters, All Other,” “Electrical and Electronic Drafters,” and “Mechanical Drafters.” Entry-level and median wages for all occupations are above the living wage. This brief recommends proceeding with developing a program because 1) these occupations’ entry-level and median earnings are above the living wage; 2) an associate degree is the highest education needed for the occupations; and 3) a supply gap exists for these positions.

Introduction

This report provides labor market information in San Diego County for the following occupational codes in the Standard Occupational Classification (SOC)¹ system:

- **Architectural and Civil Drafters** (SOC 17-3011): Prepare detailed drawings of architectural and structural features of buildings or drawings and topographical relief maps used in civil engineering projects, such as highways, bridges, and public works. Use knowledge of building materials, engineering practices, and mathematics to complete drawings. For this report, Architectural and Civil Drafters include:
 - **Civil Drafters** (SOC 17-3011.02): Prepare drawings and topographical and relief maps used in civil engineering projects, such as highways, bridges, pipelines, flood control projects, and water and sewerage control systems.
- **Electrical and Electronic Drafters** (SOC 17-3012): Prepare wiring diagrams, circuit board assembly diagrams, and layout drawings used for the manufacture, installation, or repair of electrical equipment.
- **Mechanical Drafters** (SOC 17-3013): Prepare detailed working diagrams of machinery and mechanical devices, including dimensions, fastening methods, and other engineering information.
- **Drafters, All Other** (SOC 17-3019): All drafters not listed separately.

For the purpose of this report, these occupations are referred to as *Drafting and Design Technicians*.

¹ The Standard Occupational Classification (SOC) system is used by federal statistical agencies to classify workers into occupational categories for the purpose of collecting, calculating or disseminating data. [bls.gov/soc](https://www.bls.gov/soc).

Projected Occupational Demand

Between 2019 and 2024, *Drafting and Design Technicians* are projected to increase by 139 net jobs or five percent (Exhibit 1a). During this period, employers in San Diego County are projected to hire 311 workers annually to fill new jobs and backfill jobs due to attrition caused by turnover and retirement, for example.

Exhibit 1a: Number of Jobs for Drafting and Design Technicians (2009-2024)²

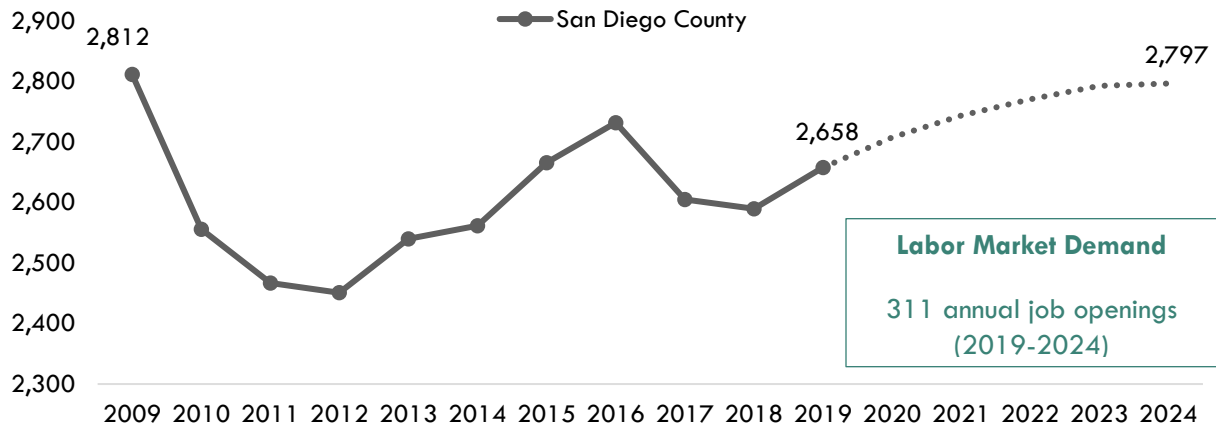


Exhibit 1b breaks down the projected number of jobs change by occupation more specifically. As Exhibit 1b shows, labor market demand for *Architectural and Civil Drafters* is projected to increase the most by 87 total jobs between 2019 and 2024.

Exhibit 1b: Number of Jobs for Drafting and Design Technicians in San Diego County (2019-2024)

Occupational Title	2019 Jobs	2024 Jobs	2019 - 2024 Net Jobs Change	2019-2024 % Net Jobs Change	Annual Job Openings (Demand)
Architectural and Civil Drafters	1,493	1,580	87	6%	176
Electrical and Electronics Drafters	469	494	25	5%	55
Mechanical Drafters	559	575	17	3%	63
Drafters, All Other	137	147	10	7%	17
Total	2,658	2,797	139	5%	311

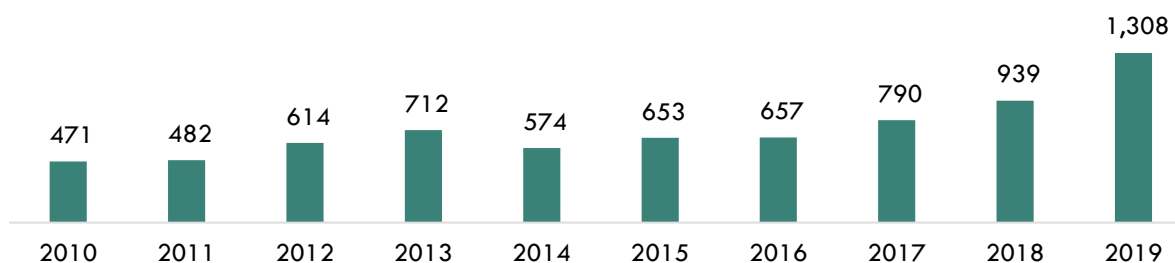
² EMSI 2020.02; QCEW, Non-QCEW, Self-Employed.

Online Job Postings

This report analyzes not only historical and projected data (traditional labor market information or LMI), but also recent data from online job postings (real-time LMI). Online job postings may provide additional insight about recent changes in the labor market demand that are not captured by historical data.

Between 2010 and 2019, there was an average of 720 online job postings per year in San Diego County for *Drafting and Design Technicians* (Exhibit 2).

Exhibit 2: Number of Online Job Postings for *Drafting and Design Technicians* in San Diego County (2010-2019)³



Earnings

The median hourly earnings of *Drafting and Design Technicians* range from \$25.39 to \$34.00 (Exhibit 3a). On average, the median hourly earnings for *Drafting and Design Technicians* is \$29.18; this is more than the living wage for a single adult in San Diego County, which is \$15.99 per hour (Exhibit 3b).⁴

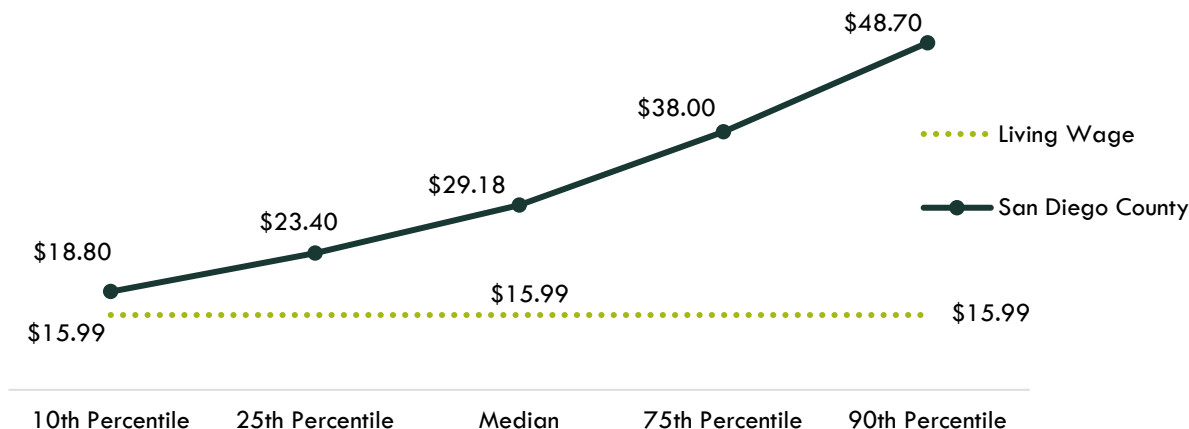
Exhibit 3a: Hourly Earnings for *Drafting and Design Technicians* in San Diego County

Occupational Title	Entry-Level Hourly Earnings (25 th Percentile)	Median Hourly Earnings	Experienced Hourly Earnings (75 th Percentile)
Architectural and Civil Drafters	\$25.37	\$29.52	\$35.32
Mechanical Drafters	\$25.02	\$34.00	\$44.28
Electrical and Electronics Drafters	\$21.93	\$27.80	\$35.31
Drafters, All Other	\$21.29	\$25.39	\$37.08

³ Burning Glass Technologies, "Labor Insight Real-Time Labor Market Information Tool." 2010-2019.

⁴ "California Family Needs Calculator (formerly the Self-Sufficiency Standard)," Insight: Center for Community Economic Development, last updated 2018. insightcced.org/2018-self-sufficiency-standard.

Exhibit 3b: Average Hourly Earnings⁵ for Drafting and Design Technicians in San Diego County⁶



Educational Supply

Educational supply for an occupation can be estimated by analyzing the number of awards in related Taxonomy of Programs (TOP) or Classification of Instructional Programs (CIP) codes.⁷ There are **six** TOP codes and **10** CIP codes related to *Drafting and Design Technicians* (Exhibit 4).

Exhibit 4: Related TOP and CIP Codes for Drafting and Design Technicians

Drafting and Design Technicians

TOP 020100: Architecture and Architectural Technology

TOP 095300: Drafting Technology

TOP 095310: Architectural Drafting

TOP 095320: Civil Drafting

TOP 095330: Electrical, Electronic, and Electro-Mechanical Drafting

TOP 095340: Mechanical Drafting

CIP 04.0401: Environmental Design/Architecture

CIP 04.0901: Architectural Technology/Technician

CIP 15.0101: Architectural Engineering Technology/Technician

CIP 15.1301: Drafting and Design Technology/Technician, General

CIP 15.1302: CAD/CADD Drafting and/or Design Technology/Technician

⁵ 10th and 25th percentiles could be considered entry-level wages, and 75th and 90th percentiles could be considered experienced wages for individuals who may have been in the occupation longer, received more training than others, etc.

⁶ EMSI 2020.02; QCEW, Non-QCEW, Self-Employed.

⁷ TOP data comes from the California Community Colleges Chancellor's Office MIS Data Mart (datamart.cccco.edu) and CIP data comes from the Integrated Postsecondary Education Data System (nces.ed.gov/ipeds/use-the-data).

Drafting and Design Technicians

CIP 15.1303: Architectural Drafting and Architectural CAD/CADD

CIP 15.1304: Civil Drafting and Civil Engineering CAD/CADD

CIP 15.1305: Electrical/Electronics Drafting and Electrical/Electronics CAD/CADD

CIP 15.1306: Mechanical Drafting and Mechanical Drafting CAD/CADD

CIP 50.0404: Industrial and Product Design

According to TOP data, six community colleges supply the region with awards for these occupations: Cuyamaca College, MiraCosta College, Palomar College, San Diego City College, San Diego Mesa College, and Southwestern College. According to CIP data, no non-community college supplies the region with awards (Exhibit 5).

Exhibit 5: Number of Awards (Certificates and Degrees) Conferred by Postsecondary Institutions (Program Year 2014-15 through PY2018-19 Average)

TOP6 or CIP	TOP6 or CIP Title	3-Yr Annual Average CC Awards (PY16-17 to PY18-19)	Other Educational Institutions 3-Yr Annual Average Awards (PY14-15 to PY16-17)	3-Yr Total Average Supply (PY14-15 to PY18-19)
020100	Architecture and Architectural Technology	43	0	43
	• MiraCosta	5	0	
	• Palomar	9	0	
	• San Diego Mesa	16	0	
	• Southwestern	13	0	
095300	Drafting Technology	42	0	42
	• MiraCosta	15	0	
	• Palomar	20	0	
	• San Diego City	2	0	
	• Southwestern	5	0	
095310	Architectural Drafting	7	0	7
	• Cuyamaca	5	0	
	• Palomar	2	0	

TOP6 or CIP	TOP6 or CIP Title	3-Yr Annual Average CC Awards (PY16-17 to PY18-19)	Other Educational Institutions 3-Yr Annual Average Awards (PY14-15 to PY16-17)	3-Yr Total Average Supply (PY14-15 to PY18-19)
095330	Electrical, Electronic, and Electro-Mechanical Drafting	6	0	6
	• Palomar	6	0	
095340	Mechanical Drafting	16	0	16
	• Cuyamaca	6	0	
	• MiraCosta	9	0	
	• San Diego City	1	0	
			Total	114

Demand vs. Supply

Comparing labor demand (annual openings) with labor supply⁸ suggests that there is a **supply gap** for these occupations in San Diego County, with **311** annual openings and **114** awards. Comparatively, there are **2,882** annual openings in California and **1,754** awards, demonstrating that there is a supply gap across the state⁹ (Exhibit 6).

Exhibit 6: Labor Demand (Annual Openings) Compared with Labor Supply (Average Annual Awards)

Community Colleges and Other Postsecondary Educational Institutions	Demand (Annual Openings)	Supply (Total Annual Average Supply)	Supply Gap or OverSupply
San Diego	311	114	197
California	2,882	1,754	1,128

Please note: This is a basic analysis of supply and demand of labor. The data does not include workers currently in the labor force who could fill these positions or workers who are not captured by publicly available data. This data should be used to discuss the potential gaps or oversupply of workers; however, it should not be the only basis for determining whether or not a program should be developed.

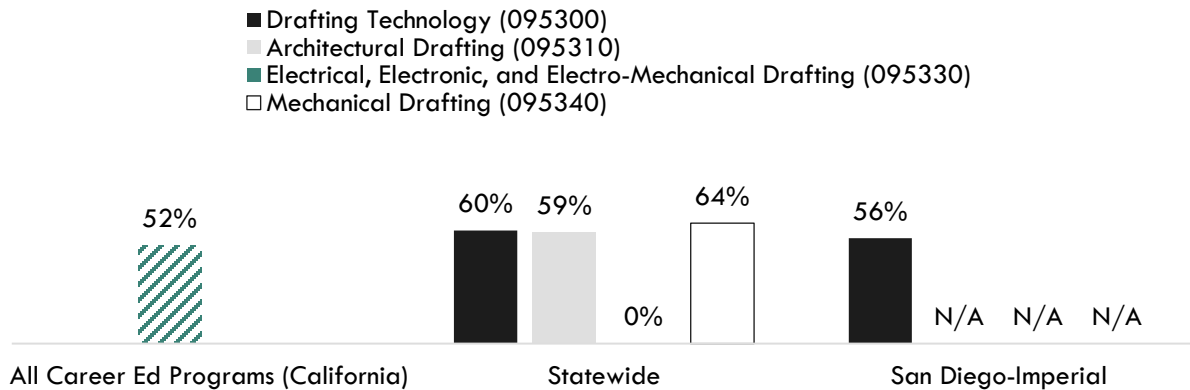
⁸ Labor supply can be found from two different sources: EMSI or the California Community Colleges Chancellor's Office MIS Data Mart. EMSI uses CIP codes while MIS uses TOP codes. Different coding systems result in differences in the supply numbers.

⁹ "Supply and Demand," Centers of Excellence Student Outcomes, coecc.net/Supply-and-Demand.aspx.

Student Outcomes and Regional Comparisons

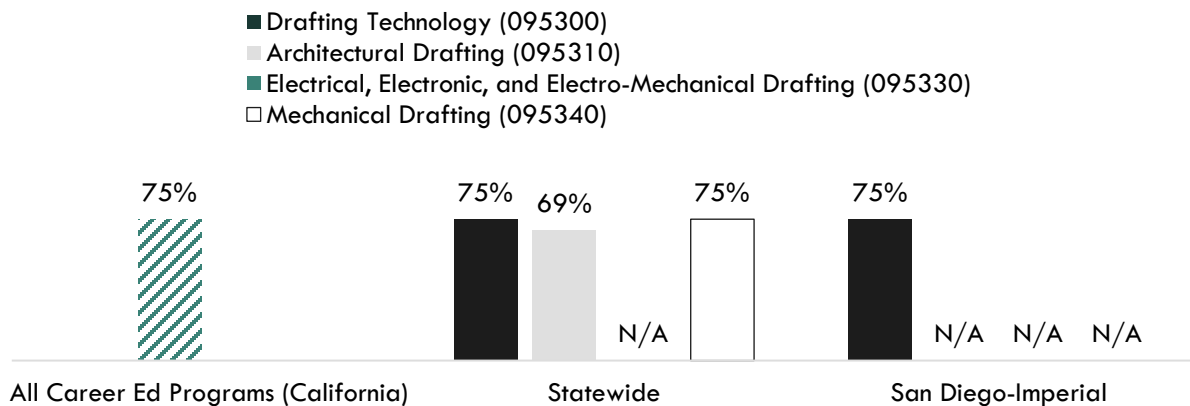
According to the California Community Colleges LaunchBoard, 56 percent of students in the San Diego-Imperial region earned a living wage after completing a program related to *Drafting and Design Technicians*, compared to 59 to 64 percent statewide and 52 percent of students in Career Education programs in general across the state (Exhibit 7a).¹⁰

Exhibit 7a: Proportion of Students Who Earned a Living Wage, PY2016-17¹¹



According to the California Community Colleges LaunchBoard, 75 percent of students in the San Diego-Imperial region obtained a job closely related to their field of study after completing a related program, compared to 69 to 75 percent statewide and 75 percent of students in Career Education programs in general across the state (Exhibit 7b).¹²

Exhibit 7b: Percentage of Students in a Job Closely Related to Field of Study, PY2015-16¹³



¹⁰ California Community Colleges Strong Workforce Program,¹¹ California Community Colleges, calpassplus.org/LaunchBoard/SWP.aspx.

¹¹ Among completers and skills builders who exited, the proportion of students who attained a living wage.

¹² California Community Colleges Strong Workforce Program,¹³ California Community Colleges, calpassplus.org/LaunchBoard/SWP.aspx.

¹³ Most recent year with available data is Program Year 2014-15. Percentage of Students in a Job Closely Related to Field of Study: Among students who responded to the CTEOS, the percentage reporting employment in the same or similar field as their program of study.

Top Employers and Work Locations

Between January 1, 2017 and December 31, 2019, the top five employers in San Diego County for these occupations were [General Atomics](#), [Qualcomm](#), [NV5](#), [Penske Automotive Group](#), and [Cubic Corporation](#) (Exhibit 8).

Exhibit 8: Top Employers in San Diego County for *Drafting and Design Technicians*¹⁴

Top Employers	
<ul style="list-style-type: none"> • General Atomics • Qualcomm • NV5 • Penske Automotive Group • Cubic Corporation 	<ul style="list-style-type: none"> • American Institute Of Architects, San Diego • Power Engineers • Apple Inc. • Power Engineers Incorporated • Stantec, Inc.

Skills, Education, and Certifications

Drafting and Design Technicians have a national educational requirement of an [associate degree](#) (Exhibit 9a).

Exhibit 9a: National Educational Attainment for *Drafting and Design Technicians* ¹⁵

Occupational Title	Typical Entry-Level Education
Architectural and Civil Drafters	Associate degree
Drafters, All Other	Associate degree
Electrical and Electronics Drafters	Associate degree
Mechanical Drafters	Associate degree

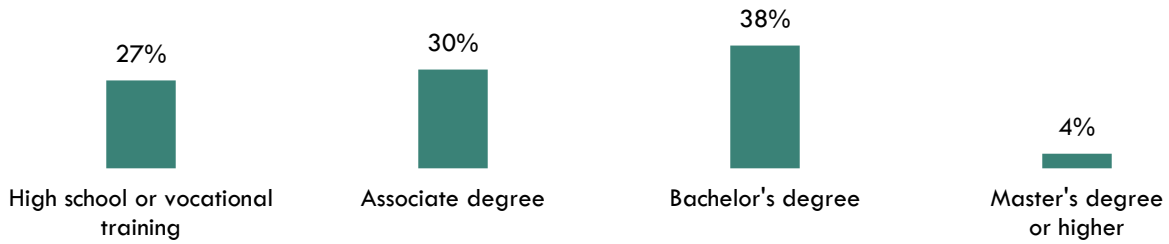
Based on online job postings between January 1, 2017 and December 31, 2019 in San Diego County, the top listed educational requirement for *Drafting and Design Technicians* is a [bachelor's degree](#) (Exhibit 9b).¹⁶

¹⁴ Burning Glass Technologies, "Labor Insight Real-Time Labor Market Information Tool." 2017-2019.

¹⁵ EMSI 2020.02; QCEW, Non-QCEW, Self-Employed.

¹⁶ Burning Glass Technologies, "Labor Insight Real-Time Labor Market Information Tool." 2017-2019.

Exhibit 9b: Educational Requirements for Drafting and Design Technicians in San Diego County¹⁷



*May not add to 100% due to rounding

Exhibit 10 lists the top specialized, soft, and software skills that appeared in online job postings between January 1, 2017 and December 31, 2019.

Exhibit 10: Top Skills for Drafting and Design Technicians in San Diego County¹⁸

Specialized Skills	Soft Skills	Software Skills
<ul style="list-style-type: none"> • Project Management • Calculation • Engineering Design and Installation • Engineering Design • 3D Modeling / Design 	<ul style="list-style-type: none"> • Communication Skills • Detail-Oriented • Organizational Skills • Teamwork / Collaboration • Planning 	<ul style="list-style-type: none"> • AutoCAD • Computer Aided Drafting/Design (CAD) • Microsoft Excel • Revit • SolidWorks

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¹⁷ "Educational Attainment for Workers 25 Years and Older by Detailed Occupation," Bureau of Labor Statistics, last modified September 4, 2019. bls.gov/emp/tables/educational-attainment.htm.

¹⁸ Burning Glass Technologies, "Labor Insight Real-Time Labor Market Information Tool." 2017-2019.

Important Disclaimers

All representations included in this report have been produced from primary research and/or secondary review of publicly and/or privately available data and/or research reports. This study examines the most recent data available at the time of the analysis; however, data sets are updated regularly and may not be consistent with previous reports. Efforts have been made to qualify and validate the accuracy of the data and the report findings; however, neither the Centers of Excellence for Labor Market Research (COE), COE host district, nor California Community Colleges Chancellor's Office are responsible for the applications or decisions made by individuals and/or organizations based on this study or its recommendations.

This workforce demand report uses state and federal job projection data that was developed before the economic impact of COVID-19. The COE is monitoring the situation and will provide more information as it becomes available. Please consult with local employers to understand their current employment needs.