

Labor Market Analysis: 0953.00 – Drafting Technology

SolidWorks 3D Designer & Drafter – Certificate requiring 8 to fewer than 16 semester units

CATIA 3D Drafter & Designer – Other credit award, <6 semester units

Los Angeles Center of Excellence, July 2024

Program Endorsement:	Endorsed: All Criteria Met	<input checked="" type="checkbox"/>	Endorsed: Some Criteria Met	<input type="checkbox"/>	Not Endorsed	<input type="checkbox"/>	
Program Endorsement Criteria							
Supply Gap:	Yes	<input checked="" type="checkbox"/>	No	<input type="checkbox"/>			
Living Wage: (Entry-Level, 25 th)	Yes	<input checked="" type="checkbox"/>	No	<input type="checkbox"/>			
Education:	Yes	<input checked="" type="checkbox"/>	No	<input type="checkbox"/>			
Emerging Occupation(s)							
Yes			<input type="checkbox"/>	No			<input checked="" type="checkbox"/>

SUMMARY

This report analyzes whether local labor market demand is being met by community college programs aligned with the identified middle-skill occupations¹ or whether a shortage of workers exists. Labor market demand is measured by annual job openings while education supply is measured by the number of awards (degrees and certificates) conferred on average each year.

Based on the available data, there appears to be a supply gap for the four identified middle-skill occupations in the region. Furthermore, entry-level wages exceed the self-sufficiency standard wage in both Los Angeles and Orange counties, and the Bureau of Labor Statistics (BLS) lists an associate degree as the typical entry-level education level for the occupations in this report.

Recommendation: Due to all three program endorsement criteria being met, the Los Angeles Center of Excellence for Labor Market Research (LA COE) endorses this proposed program.

Key Findings

Supply Gap

- 817 annual job openings are projected in the region through 2027. This number is greater than the three-year average of 637 awards conferred by educational institutions in the region.

¹ Middle-skill occupations typically require some postsecondary education, but less than a bachelor's degree. The COE classifies middle-skill jobs as the following:

- All occupations that require an educational requirement of some college, associate degree or apprenticeship;
- All occupations that require a bachelor's degree, but also have more than one-third of their existing labor force with an educational attainment of some college or associate degree; or
- All occupations that require a high school diploma or equivalent or no formal education, but also require short- to long-term on-the-job training where multiple community colleges have existing programs.

Living Wage

- All four occupations have entry-level wages **above** Los Angeles County's self-sufficiency standard hourly wage (\$18.10/hour).²

Educational Attainment

- An associate degree is the typical entry-level education for the drafting occupations in this report, according to the Bureau of Labor Statistics (BLS).
- 58% of workers in the field have completed some college or an associate degree, according to national educational attainment data.

Community college supply

- 21 community colleges issued awards related to drafting technology in the greater LA/OC region.
- 537 awards (degrees and certificates) were conferred on average each year between 2021 and 2023.

Other postsecondary supply

- 5 educational institutions in the LA/OC region have conferred bachelor's awards in programs related to drafting technology over the past three years.
- 100 bachelor's awards and no sub-baccalaureate awards were conferred on average each year by other postsecondary institutions throughout the greater LA/OC region between 2020 and 2022.

TARGET OCCUPATIONS

LA COE prepared this report to provide regional labor market and postsecondary supply data related to four middle-skill occupations. [For full occupation descriptions, please see Appendix.](#)

- **Architectural and Civil Drafters (17-3011)**³
- **Electrical and Electronics Drafters (17-3012)**⁴
- **Mechanical Drafters (17-3013)**⁵
- **Drafters, All Other (17-3019)**⁶

OCCUPATIONAL DEMAND

Exhibit 1 shows the five-year occupational demand projections for these drafting occupations. In the greater Los Angeles/Orange County region, the number of jobs related to these occupations is projected to decrease by 1% through 2027. However, there will be more than 800 job openings per year through 2027 due to retirements and workers leaving the field. The majority of jobs in 2022 for these middle-skill drafting occupations (63%) were located in Los Angeles County.

² Self-Sufficiency Standard wage data was pulled from The Self-Sufficiency Standard Tool for California. For more information, visit: <http://selfsufficiencystandard.org/california>.

³ [Drafters \(bls.gov\)](#)

⁴ [Ibid.](#)

⁵ [Ibid.](#)

⁶ [Ibid.](#)

Exhibit 1: Current employment and occupational demand, Los Angeles and Orange counties⁷

Geography	2022 Jobs	2027 Jobs	2022-2027 Change	2022-2027 % Change	Annual Openings
Los Angeles	5,266	5,148	(117)	(2%)	502
Orange	3,155	3,200	45	1%	316
Total	8,421	8,349	(72)	(1%)	817

Detailed Occupation Data

Exhibit 2 displays the current employment and projected occupational demand for each of the target occupations in Los Angeles County. The percentage of workers aged 55+ and automation index are included in order to visualize upcoming replacement demand for these occupations.

Exhibit 2: Current employment, projected occupational demand, percentage of workers aged 55+, Los Angeles County⁸

Occupation	2022 Jobs	2027 Jobs	5-Yr % Change	Annual Openings	% Aged 55 and older*	Automation Index**	% Full Time Workers***
Architectural and Civil Drafters	2,972	3,145	6%	323	24%	88.9	Data unavail.
Electrical and Electronics Drafters	618	639	3%	61	30%	91.0	Data unavail.
Mechanical Drafters	994	903	(9%)	76	33%	84.6	Data unavail.
Drafters, All Other	681	462	(32%)	42	30%	87.0	78%
Total	5,266	5,148	(2%)	502	-		

*The average percentage of workers aged 55 and older across all occupations in the greater LA/OC region is 27%. Architectural and civil drafters have a smaller share of older workers, which typically indicates fewer replacements needs to offset the amount of impending retirements.

**The automation index captures an occupation's risk of being affected by automation with a base of 100. An automation index greater than 100 indicates a higher-than average risk of automation; less than 100 indicates a lower-than-average risk.

*** Across all jobs in California, 81% of workers are employed full-time.

WAGES

The labor market endorsement in this report considers the entry-level hourly wages for these drafting occupations in Los Angeles County as they relate to the county's self-sufficiency standard wage. Orange County wages are included below in order to provide a complete analysis of the greater Los Angeles/Orange County region.

⁷ Five-year change represents new job additions to the workforce. Annual openings include new jobs and replacement jobs that result from retirements and separations.

⁸ Ibid.

Los Angeles County

All four occupations have entry-level wages above the self-sufficiency standard wage for one adult (\$18.10 in Los Angeles County). Typical entry-level hourly wages are in a range between \$24.59 and \$28.37 (Exhibit 3). Experienced workers can expect to earn wages between \$38.41 and \$44.20, which are higher than the self-sufficiency standard.

Exhibit 3: Earnings for occupations in Los Angeles County

Occupation	Entry-Level Hourly Earnings (25 th Percentile)	Median Hourly Earnings	Experienced Hourly Earnings (75 th Percentile)	Median Annual Earnings*
Architectural and Civil Drafters	\$25.97	\$30.40	\$37.34	\$63,200
Electrical and Electronics Drafters	\$27.58	\$31.95	\$38.75	\$66,500
Mechanical Drafters	\$28.37	\$35.54	\$44.20	\$73,900
Drafters, All Other	\$24.59	\$29.54	\$38.41	\$61,400

*Rounded to the nearest \$100

Orange County

All four occupations have entry-level wages above the self-sufficiency standard wage for one adult (\$20.63 in Orange County). Typical entry-level hourly wages are in a range between \$25.74 and \$29.86 (Exhibit 4). Experienced workers can expect to earn wages between \$38.84 and \$45.97, which are higher than the self-sufficiency standard.

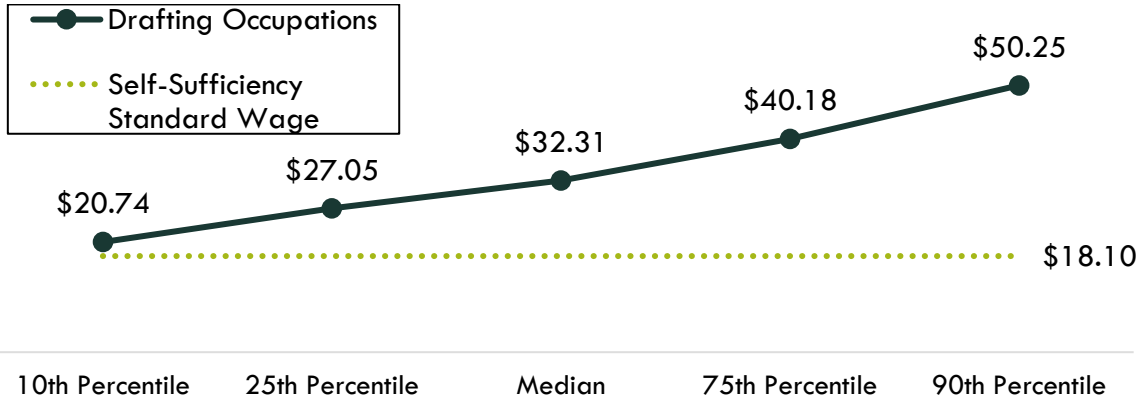
Exhibit 4: Earnings for occupations in Orange County

Occupation	Entry-Level Hourly Earnings (25 th Percentile)	Median Hourly Earnings	Experienced Hourly Earnings (75 th Percentile)	Median Annual Earnings*
Architectural and Civil Drafters	\$27.07	\$31.64	\$38.84	\$65,800
Electrical and Electronics Drafters	\$28.55	\$32.88	\$39.74	\$68,400
Mechanical Drafters	\$29.86	\$37.11	\$45.97	\$77,200
Drafters, All Other	\$25.74	\$30.49	\$39.47	\$63,400

*Rounded to the nearest \$100

Across the greater Los Angeles and Orange County region, the average entry-level hourly earnings for the occupations in this report are \$27.05; this is above the living wage for one single adult in Los Angeles County (\$18.10). Exhibit 5 shows the average hourly wage for the occupations in this report, for entry-level to experienced workers.

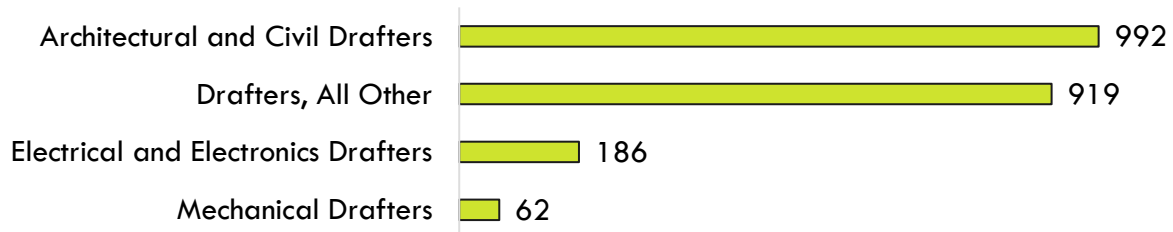
Exhibit 5: Average hourly earnings for drafting occupations, Los Angeles and Orange counties



JOB POSTINGS

There were 2,159 online job postings for drafting occupations listed in the past 12 months in Los Angeles and Orange counties. Exhibit 6 displays the number of job postings by occupation. The majority of job postings (46%) were for architectural and civil drafters, followed by drafters, all other (43%), electrical and electronics drafters (9%), mechanical drafters (2%).

Exhibit 6: Job postings by occupation (last 12 months), Los Angeles and Orange counties



Job postings were analyzed for the most common job titles, skills, and employers associated with the target occupations in this report (Exhibit 7).

Exhibit 7: Most commonly requested job titles, skills and employers in job postings, Los Angeles and Orange counties

Top Job Titles	Top Software Skills	Top Employers
<ul style="list-style-type: none"> Architectural designers Drafters CAD designers Electrical designers CAD drafters Civil design engineers 	<ul style="list-style-type: none"> AutoCAD Autodesk Revit SketchUp (3D Modeling Software) AutoCAD Civil 3D SolidWorks (CAD) 	<ul style="list-style-type: none"> Actalent* GPAC* Stantec Randstad* AECOM HNTB

*Staffing company

In the greater Los Angeles/Orange County region, 57% of the drafting-related job postings listed a minimum educational requirement. The number and percentage of job postings by educational level appear in exhibit 8.

Exhibit 8: Education levels requested in job postings for drafting occupations, Los Angeles and Orange counties

Education Level	Job Postings	% of Job Postings
Bachelor's degree	655	53%
Associate degree	390	32%
High school diploma or vocational training	181	15%

EDUCATIONAL ATTAINMENT

The Bureau of Labor Statistics (BLS) lists an associate degree as the typical entry-level education for all four drafting occupations in this report (Exhibit 9). Furthermore, the national-level data indicates 58% of workers in the field have completed some college or an associate degree as their highest level of educational attainment. The Bureau of Labor Statistics (BLS) lists the following typical entry-level education levels for the occupations in this report:

Exhibit 9: Entry-level education preferred by employers nationally, Bureau of Labor Statistics

Occupation	Education Level
Architectural and Civil Drafters	Associate degree
Electrical and Electronics Drafters	Associate degree
Mechanical Drafters	Associate degree
Drafters, All Other	Associate degree

EDUCATIONAL SUPPLY

Community College Supply

Exhibit 10 shows the annual and three-year average number of awards conferred by community colleges in programs that have historically trained for the occupations of interest. The colleges with the most completions in the region are Mt. San Antonio, Cerritos, and Orange Coast.

Exhibit 10: Regional community college awards (certificates and degrees), 2021-2023

TOP Code	Program	College	2020-21 Awards	2021-22 Awards	2022-23 Awards	3-Year Average
0201.00	Architecture and Architectural Technology	Cerritos	28	15	48	30
		Citrus	6	7	5	6
		East LA	16	23	66	35

TOP Code	Program	College	2020-21 Awards	2021-22 Awards	2022-23 Awards	3-Year Average
		El Camino	5	15	13	11
		Glendale	3	17	19	13
		LA Harbor	4	13	7	8
		LA Pierce	16	11	8	12
		LA Trade-Tech	7	13	12	11
		LA Valley	4	3	2	3
		Long Beach	11	9	9	10
		Mt San Antonio	61	95	76	77
		Pasadena	12	12	9	11
		Rio Hondo	3	8	9	7
		Santa Monica	-	-	4	1
		LA Subtotal	176	241	287	235
		Fullerton	4	-	7	4
		Orange Coast	38	75	57	57
		Saddleback	3	4	4	4
		OC Subtotal	45	79	68	64
		Supply Subtotal/Average	221	320	355	299
0953.00	Drafting Technology	Cerritos	9	40	30	26
		Citrus	12	15	5	11
		East LA	20	12	13	15
		El Camino	7	10	8	8
		LA Mission	-	-	2	1
		LA Pierce	8	1	5	5
		LA Valley	-	-	1	0
		Mt San Antonio	32	24	25	27
		Pasadena	6	8	9	8
		Rio Hondo	8	15	11	11
		LA Subtotal	102	125	109	112
		Fullerton	10	5	8	8
		Golden West	4	3	4	4
		Irvine	6	7	7	7
		Saddleback	1	1	3	2
		Santa Ana	30	16	46	31
		OC Subtotal	51	32	68	50
		Supply Subtotal/Average	153	157	177	162

TOP Code	Program	College	2020-21 Awards	2021-22 Awards	2022-23 Awards	3-Year Average
0953.10	Architectural Drafting	Citrus	1	2	-	1
		Long Beach	5	3	2	3
		Pasadena	-	-	2	1
		Rio Hondo	6	39	28	24
		LA Subtotal	12	44	32	29
		Fullerton	1	8	17	9
		Santa Ana	2	-	-	1
		OC Subtotal	3	8	17	9
Supply Subtotal/Average			15	52	49	39
0953.20	Civil Drafting	Rio Hondo	3	4	1	3
		LA Subtotal	3	4	1	3
		Irvine	1	3	3	2
		Santa Ana	-	3	11	5
		OC Subtotal	1	6	14	7
Supply Subtotal/Average			4	10	15	10
0953.40	Mechanical Drafting	Glendale	13	10	-	8
		LA Valley	5	-	1	2
		Long Beach	7	4	4	5
		Pasadena	-	-	1	0
		Rio Hondo	-	-	3	1
		LA Subtotal	25	14	9	16
		Irvine	3	10	2	5
		Santa Ana	-	8	13	7
		OC Subtotal	3	18	15	12
Supply Subtotal/Average			28	32	24	28
Supply Total/Average			421	571	620	537

Other Postsecondary Supply

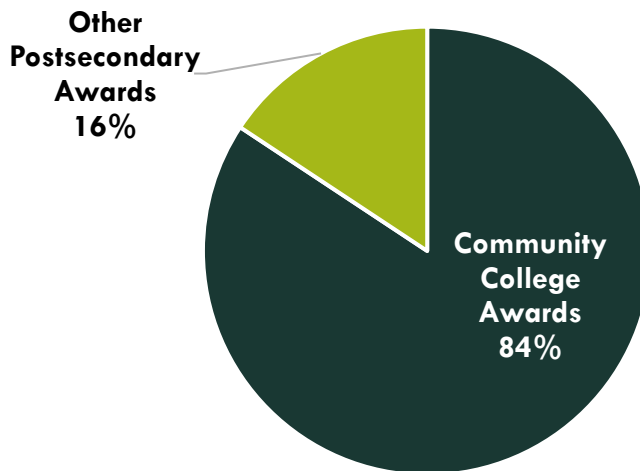
For a comprehensive regional supply analysis, it is important to consider the supply from other institutions in the region that provide training programs for drafting technology occupations. Exhibit 11 shows the number of awards conferred by these institutions in relevant programs. Due to different data collection periods, the most recent data is from 2020 to 2022. Between 2020 and 2022, other postsecondary college institutions in the region conferred an average of 100 bachelor's awards and no sub-baccalaureate awards. Sub-baccalaureate awards include associate degrees, postsecondary awards, and other academic awards that typically take fewer than four years to complete.

Exhibit 11: Other regional postsecondary awards, 2020-2022

CIP Code	Program	Postsecondary Institution	2019-20 Awards	2020-21 Awards	2021-22 Awards	3-Year Average
04.0401	Environmental Design/Architecture	Otis College of Art and Design	10	11	11	11
15.1301	Drafting and Design Technology/Technician, General	Woodbury University	-	-	3	1
50.0404	Industrial and Product Design	CSU-Long Beach	34	34	34	34
		Fashion Institute of Design & Merch.	31	18	22	24
		Otis College of Art and Design	15	43	35	31
Supply Total/Average			90	106	105	100

Exhibit 12 shows the proportion of community college awards conferred in the greater Los Angeles/Orange County region compared to the number of other postsecondary awards for the programs in this report. The majority of awards conferred in these programs are awarded by community colleges in the greater Los Angeles/Orange County region.

Exhibit 12: Percentage of community college awards compared to other postsecondary institution awards in the Los Angeles/Orange County region



APPENDIX: OCCUPATION DESCRIPTIONS

LA COE prepared this report to provide regional labor market supply and demand data related to these target occupations:

- **Architectural and Civil Drafters (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.⁹
- **Electrical and Electronics Drafters (17-3012)** Prepare wiring diagrams, circuit board assembly diagrams, and layout drawings used for the manufacture, installation, or repair of electrical equipment.¹⁰
- **Mechanical Drafters (17-3013)** Prepare detailed working diagrams of machinery and mechanical devices, including dimensions, fastening methods, and other engineering information.¹¹
- **Drafters, All Other (17-3019)** All drafters not listed separately.¹²

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DATA SOURCES

- O*NET Online
- Lightcast (formerly Emsi)
- Bureau of Labor Statistics (BLS)
- California Employment Development Department, Labor Market Information Division, OES
- California Community Colleges Chancellor's Office Management Information Systems (MIS)
- Self-Sufficiency Standard at the Center for Women's Welfare, University of Washington
- Chancellor's Office Curriculum Inventory (COCI 2.0)

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⁹ [Drafters \(bls.gov\)](#)

¹⁰ [Drafters \(bls.gov\)](#)

¹¹ [Drafters \(bls.gov\)](#)

¹² [Drafters \(bls.gov\)](#)