

**Program Endorsement Brief: 2102.10/Public Works**  
**Construction Management Associate of Science Degree**  
**Construction Management Certificate of Achievement**  
**Construction Inspection Associate of Science Degree**  
**Construction Inspection Certificate of Achievement**  
 Orange County Center of Excellence, August 2021

**Summary Analysis**

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

The Orange County Center of Excellence for Labor Market Research (COE) prepared this report to provide Los Angeles/Orange County regional labor market supply and demand data related to five middle-skill occupations: *construction managers (11-9021)*; *cost estimators (13-1051)*; *civil engineering technologists and technicians (17-3022)*; *first-line supervisors of construction trades and extraction workers (47-1011)*; and *construction and building inspectors (47-4011)*. Middle-skill occupations typically require some postsecondary education, but less than a bachelor's degree.<sup>1</sup> Although two of the occupations (construction managers and cost estimators) in this report typically require a bachelor's degree, they are considered middle-skill because approximately one-third of workers in the field have completed some college or an associate degree. This report is intended to help determine whether there is demand in the local labor market that is not being met by the supply from community college programs that align with the relevant occupations.

Based on the available data there appears to be a supply gap for these public works occupations in the region. Though the majority of annual openings for these occupations typically require a high school diploma or equivalent, roughly one-third of current workers in the field have completed some college or an associate degree as their highest level of education. Furthermore, the majority of annual openings for the occupations in this report have typical entry-level wages that exceed the living wage in both Los Angeles and Orange counties. **Therefore, due to all the criteria being met, the COE endorses this proposed program.** Detailed reasons include:

<sup>1</sup> 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.

### Demand:

- **Supply Gap Criteria** – Over the next five years, there is projected to be **4,892 jobs available annually** in the region due to retirements and workers leaving the field, **which is more than the 1,563 awards conferred annually** by educational institutions in the region.
- **Living Wage Criteria** – All the annual job openings for these public works occupations have **entry-level wages above the county's living wage** (\$17.36/hour).<sup>2</sup>
- **Educational Criteria** – Within the LA/OC region, **51% of the annual job openings** for occupations related to program **typically require a high school diploma**.
  - However, the national-level educational attainment data indicates **between 29.2% and 50.7% of workers in the field have completed some college or an associate degree** as their highest level of education.

### Supply:

- There are **23 community colleges** in the LA/OC region that issue awards related to these public works occupations, conferring an average of **1,136 awards annually** between 2017 and 2020.
- Between 2016 and 2019, there was an average of **427 awards conferred annually** in related training programs by non-community college institutions, all of which were generated by **7 individual four-year colleges, adult schools, and trade schools throughout** the region.

### Occupational Demand

Exhibit 1 shows the five-year occupational demand projections for these public works occupations. In Los Angeles/Orange County, the number of jobs related to these occupations is projected to decrease by 1% through 2024. However, there will be nearly 4,900 job openings per year through 2024 due to retirements and workers leaving the field.

*This report includes employment projection data by Emsi which uses EDD information. Emsi's projections are modeled on recorded (historical) employment figures and incorporate several underlying assumptions, including the assumption that the economy, during the projection period, will be at approximately full employment. To the extent that a recession or labor shock, such as the economic effects of COVID-19, can cause long-term structural change, it may impact the projections. At this time, it is not possible to quantify the impact of COVID-19 on projections of industry and occupational employment. Therefore, the projections included in this report do not take the impacts of COVID-19 into account.*

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<sup>2</sup> Living wage data was pulled from California Family Needs Calculator on 07/28/2021. For more information, visit the California Family Needs Calculator website: <https://insightcced.org/2018-family-needs-calculator/>.

**Exhibit 1: Occupational demand in Los Angeles and Orange Counties<sup>3</sup>**

Geography	2019 Jobs	2024 Jobs	2019-2024 Change	2019-2024 % Change	Annual Openings
Los Angeles	38,208	37,972	(236)	(1%)	3,298
Orange	18,641	18,359	(283)	(2%)	1,594
<b>Total</b>	<b>56,849</b>	<b>56,331</b>	<b>(518)</b>	<b>(1%)</b>	<b>4,892</b>

### **Wages**

The labor market endorsement in this report considers the entry-level hourly wages for these public works occupations in Orange County as they relate to the county's living wage. Los Angeles County wages are included below in order to provide a complete analysis of the LA/OC region. Detailed wage information, by county, is included in Appendix A.

**Orange County**—All of the annual openings for these public works occupations have entry-level wages above the living wage for one adult (\$17.36 in Orange County). Typical entry-level hourly wages are in a range between \$26.78 and \$32.59. Experienced workers can expect to earn wages between \$42.52 and \$76.41, which are higher than the living wage estimate. Orange County's average wages are above the average statewide wage of \$42.78 for these occupations.

**Los Angeles County**—All of the annual openings for these public works occupations have entry-level wages above the living wage for one adult (\$15.04 in Los Angeles County). Typical entry-level hourly wages are in a range between \$21.07 and \$32.88. Experienced workers can expect to earn wages between \$42.96 and \$65.69, which are higher than the living wage estimate. Los Angeles County's average wages are below the average statewide wage of \$42.78 for these occupations.

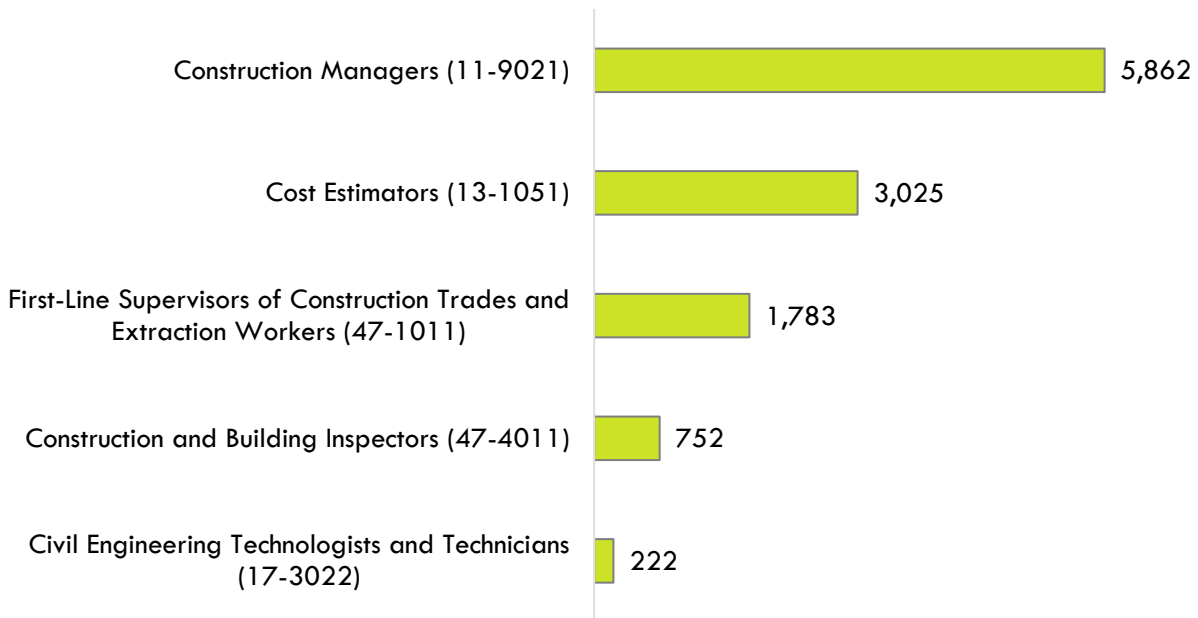
### **Job Postings**

There were 11,644 online job postings related to these public works occupations listed in the past 12 months. Exhibit 2 shows the number of job postings by occupation. The highest number of job postings was for construction managers (50%), followed by cost estimators (26%). The most frequently posted job titles were construction project manager, construction superintendent, estimator, and inspector. The top skills requested by employers were project management, scheduling, budgeting, construction management, and estimating. The top three employers, by number of job postings, in the region were: Northrop Grumman, Grestar, and Lacarguy.

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<sup>3</sup> Five-year change represents new job additions to the workforce. Annual openings include new jobs and replacement jobs that result from retirements and separations.

## Exhibit 2: Job Postings by Occupation (n=11,644)



*It is important to note that the job postings data included in this section reflects online job postings listed in the past 12 months and does not yet demonstrate the impact of COVID-19. While employers have generally posted fewer online job postings since the beginning of the pandemic, the long-term effects are currently unknown.*

### Educational Attainment

The Bureau of Labor Statistics (BLS) lists the following typical entry-level education for these middle-skill public works occupations:

- **Bachelor's degree:** construction managers; cost estimators
- **Associate degree:** civil engineering technologists and technicians
- **High school diploma or equivalent:** first-line supervisors of construction trades and extraction workers; construction and building inspectors

In the LA/OC region, the majority of annual job openings (51%) typically require a high school diploma or equivalent. However, the national-level educational attainment data indicates between 29.2% and 50.7% of workers in the field have completed some college or an associate degree as their highest level of education. Of the 52% of job postings listing a minimum education requirement in Los Angeles/Orange County, 65% (3,937) requested a bachelor's degree, 31% (1,856) requested a high school diploma or vocational training, and 4% (257) requested an associate degree.

### Educational Supply

**Community College Supply**—Exhibit 3 shows the three-year average number of awards conferred by community colleges in the related TOP codes: Architecture and Architectural Technology (0201.00); Engineering Technology, General (Includes Trigonometry) (0924.00); Construction Crafts Technology (0952.20); Carpentry (0952.10); Electrical (0952.20); Plumbing,

Pipefitting and Steamfitting (0952.30); Drywall and Insulation (0952.80); Civil and Construction Management Technology (0957.00); Construction Inspection (0957.20); and Public Works (2102.10). Over the past three years, community colleges throughout the region conferred an average of 1,136 awards annually. The colleges with the most completions in the region are Pasadena, LA Trade, and Orange Coast. Over the past 12 months, there were 8 other related program recommendation requests from regional community colleges.

**Exhibit 3: Regional community college awards (certificates and degrees), 2017-2020**

TOP Code	Program	College	2017-2018 Awards	2018-2019 Awards	2019-2020 Awards	3-Year Award Average
0201.00	Architecture and Architectural Technology	Cerritos	17	24	44	28
		Citrus	2	3	6	4
		Compton	0	2	0	1
		East LA	34	57	25	39
		El Camino	35	14	21	23
		Glendale	4	6	6	5
		LA Harbor	5	5	4	5
		LA Pierce	8	9	4	7
		LA Trade	8	11	8	9
		LA Valley	4	1	3	3
		Long Beach	10	14	13	12
		Mt San Antonio	82	97	51	77
		Pasadena	11	16	18	15
		Rio Hondo	19	20	3	14
		LA Subtotal	239	279	206	241
		Fullerton	8	5	12	8
		Orange Coast	82	40	59	60
		Saddleback	12	15	8	12
		OC Subtotal	102	60	79	80
		Supply Subtotal/Average			341	339
0924.00	Engineering Technology, General (requires Trigonometry)	Cerritos	23	26	15	21
		East LA	0	0	1	0
		Glendale	17	14	7	13
		Mt San Antonio	0	0	2	1
		Pasadena	173	176	216	188
		LA Subtotal	213	216	241	223
		Santa Ana	1	1	3	2
		OC Subtotal	1	1	3	2
Supply Subtotal/Average			214	217	244	225
0952.20		Compton	2	1	0	1

TOP Code	Program	College	2017-2018 Awards	2018-2019 Awards	2019-2020 Awards	3-Year Award Average
	Construction Crafts Technology	El Camino	7	11	17	12
		LA Swest	0	0	152	51
		Long Beach	0	0	60	20
		Pasadena	1	1	1	1
		LA Subtotal	10	13	230	84
		Fullerton	11	14	8	11
		Orange Coast	56	91	37	61
		Santa Ana	12	72	85	56
		OC Subtotal	79	177	130	129
Supply Subtotal/Average			89	190	360	213
0952.10	Carpentry	LA Trade	38	21	27	29
		LA Subtotal	38	21	27	29
		Fullerton	0	3	0	1
		Santiago Canyon	0	1	2	1
		OC Subtotal	0	4	2	2
Supply Subtotal/Average			38	25	29	31
0952.20	Electrical	LA Trade	163	132	149	148
		LA Subtotal	163	132	149	148
		Irvine	7	15	8	10
		North Orange Adult	22	30	2	18
		Orange Coast	6	4	0	3
		Santiago Canyon	1	51	31	28
		OC Subtotal	36	100	41	59
Supply Subtotal/Average			199	232	190	207
0952.30	Plumbing, Pipefitting and Steamfitting	LA Trade	35	10	31	25
		LA Subtotal	35	10	31	25
		Orange Coast	0	0	1	0
		OC Subtotal	0	0	1	0
Supply Subtotal/Average			35	10	32	26
0952.80	Drywall and Insulation	Santiago Canyon	0	0	1	0
		OC Subtotal	0	0	1	0
Supply Subtotal/Average			0	0	1	0
0957.00	Civil and Construction	East LA	0	0	1	0
		LA Valley	5	6	13	8

TOP Code	Program	College	2017-2018 Awards	2018-2019 Awards	2019-2020 Awards	3-Year Award Average
	Management Technology	Mt San Antonio	3	0	11	5
		LA Subtotal	8	6	25	13
		Fullerton	11	12	11	11
		OC Subtotal	11	12	11	11
Supply Subtotal/Average			19	18	36	24
0957.20	Construction Inspection	Pasadena	9	7	21	12
		LA Subtotal	9	7	21	12
		Coastline	12	15	11	13
		Fullerton	8	11	4	8
		Saddleback	3	10	15	9
		Santiago Canyon	0	0	15	5
		OC Subtotal	23	36	45	35
Supply Subtotal/Average			32	43	66	47
2102.10	Public Works	Citrus	9	27	22	19
		LA Trade	2	0	0	1
		LA Subtotal	11	27	22	20
		Santiago Canyon	18	19	26	21
		OC Subtotal	18	19	26	21
Supply Subtotal/Average			29	46	48	41
Supply Total/Average			996	1,120	1,291	1,136

**Non-Community College Supply**—For a comprehensive regional supply analysis, it is also important to consider the supply from other institutions in the region that provide training programs for these public works occupations. Exhibit 4 shows the annual and three-year average number of awards conferred by these institutions in the related Classification of Instructional Programs (CIP) Codes: Engineering Technology, General (15.0000); Electrician (46.0302); and Construction Management (52.2001). Due to different data collection periods, the most recent three-year period of available data is from 2016 to 2019. Between 2016 and 2019, four-year colleges in the region conferred an average of 427 awards annually in related training programs.

**Exhibit 3: Regional non-community college awards, 2016-2019**

CIP Code	Program	College	2016-2017 Awards	2017-2018 Awards	2018-2019 Awards	3-Year Award Average
15.0000	Engineering Technology, General	California State Polytechnic University-Pomona	11	1	4	5

CIP Code	Program	College	2016-2017 Awards	2017-2018 Awards	2018-2019 Awards	3-Year Award Average
Subtotal/Average			11	1	4	5
46.0302	Electrician	Baldwin Park Adult & Community Education	76	62	93	77
		InterCoast Colleges-West Covina	47	54	63	55
		InterCoast Colleges-Santa Ana	31	25	49	35
		Southern California Institute of Technology	243	231	242	239
Subtotal/Average			397	372	447	405
52.2001	Construction Management	Learnet Academy Inc	0	1	0	0
		University of Southern California	5	28	16	16
Subtotal/Average			5	29	16	17
Supply Total/Average			413	402	467	427

#### Appendix A: Occupational demand and wage data by county

##### Exhibit 4. Orange County

Occupation (SOC)	2019 Jobs	2024 Jobs	5-Yr Change	5-Yr % Change	Annual Openings	Entry-Level Hourly Earnings (25 <sup>th</sup> Percentile)	Median Hourly Earnings	Experienced Hourly Earnings (75 <sup>th</sup> Percentile)
Construction Managers (11-9021)	6,026	6,207	181	3%	445	\$32.59	\$48.55	\$76.41
Cost Estimators (13-1051)	3,052	2,805	(247)	(8%)	241	\$26.78	\$36.06	\$53.84
Civil Engineering Technologists and Technicians (17-3022)	1,019	940	(79)	(8%)	82	\$27.40	\$34.02	\$42.52
First-Line Supervisors of Construction Trades and Extraction Workers (47-1011)	7,453	7,258	(195)	(3%)	695	\$30.31	\$39.86	\$51.88
Construction and Building Inspectors (47-4011)	1,091	1,149	57	5%	131	\$32.05	\$43.68	\$54.85
<b>Total</b>	<b>18,641</b>	<b>18,359</b>	<b>(283)</b>	<b>(2%)</b>	<b>1,594</b>			



### Exhibit 5. Los Angeles County

Occupation (SOC)	2019 Jobs	2024 Jobs	5-Yr Change	5-Yr % Change	Annual Openings	Entry- Level Hourly Earnings (25 <sup>th</sup> Percentile)	Median Hourly Earnings	Experienced Hourly Earnings (75 <sup>th</sup> Percentile)
Construction Managers (11-9021)	13,508	14,307	798	6%	1,052	\$21.07	\$37.49	\$65.69
Cost Estimators (13-1051)	5,458	4,964	(494)	(9%)	431	\$24.77	\$33.53	\$50.16
Civil Engineering Technologists and Technicians (17-3022)	1,958	1,764	(194)	(10%)	150	\$27.58	\$34.32	\$42.96
First-Line Supervisors of Construction Trades and Extraction Workers (47-1011)	14,529	14,080	(449)	(3%)	1,345	\$27.12	\$36.14	\$47.92
Construction and Building Inspectors (47-4011)	2,755	2,858	103	4%	320	\$32.88	\$44.76	\$56.14
<b>Total</b>	<b>38,208</b>	<b>37,972</b>	<b>(236)</b>	<b>(1%)</b>	<b>3,298</b>			

### Exhibit 6. Los Angeles and Orange Counties

Occupation (SOC)	2019 Jobs	2024 Jobs	5-Yr Change	5-Yr % Change	Annual Openings	Entry- Level Hourly Earnings (25 <sup>th</sup> Percentile)	Median Hourly Earnings	Experienced Hourly Earnings (75 <sup>th</sup> Percentile)
Construction Managers (11-9021)	19,534	20,514	980	5%	1,497	\$23.76	\$40.46	\$69.32
Cost Estimators (13-1051)	8,510	7,769	(741)	(9%)	672	\$25.41	\$34.47	\$51.42
Civil Engineering Technologists and Technicians (17-3022)	2,976	2,704	(272)	(9%)	232	\$27.52	\$34.21	\$42.82
First-Line Supervisors of Construction Trades and Extraction Workers (47-1011)	21,982	21,338	(644)	(3%)	2,039	\$28.17	\$37.40	\$49.36
Construction and Building Inspectors (47-4011)	3,847	4,007	160	4%	451	\$32.65	\$44.44	\$55.77
<b>Total</b>	<b>56,849</b>	<b>56,331</b>	<b>(518)</b>	<b>(1%)</b>	<b>4,892</b>			

## Appendix B: Sources

- O\*NET Online
- Labor Insight/Jobs (Burning Glass)
- Economic Modeling Specialists, International (Emsi)
- Bureau of Labor Statistics (BLS)
- Employment Development Department, Labor Market Information Division, OES
- California Community Colleges Chancellor's Office Management Information Systems (MIS)
- California Family Needs Calculator, Insight Center for Community Economic Development
- Chancellor's Office Curriculum Inventory (COCI 2.0)

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