**Architecture Design Occupations**

**Labor Market Information Report**

Prepared by the San Francisco Bay Center of Excellence

for Labor Market Research

March 2018

# Recommendation

Based on all available data, there appears to be an undersupply of Architecture Design workers compared to the demand for this cluster of occupations in the Bay region and the East Bay sub-region. The annual gap between demand and supply is about 1,960 in the region and 440 in the East Bay.

As stated in the request from Diablo Valley College (DVC) for a labor market report from the COE, “Currently we offer an AS degree in Architecture Design, but there is no option for a certificate. The AS is a high unit major and a relatively small number of students complete this degree. We would like to add a certificate of achievement that allows all students transferring to UC Berkeley with the assist. org transfer agreement to obtain a certificate through DVC, and to then maintain our AS degree as a stack-able degree that transfers to Cal Poly San Luis Obispo. Current transfer numbers indicate that we would be able to recognize approximately 30-40 students/year with this certificate.”

Two of the three occupations (SOC codes) selected in the request for a labor market report are for occupations which typically require a four-year degree. As stated above, DVC students in the current program have been focused on transfer to four year colleges to pursue Architecture Design. However, with the addition of this proposed new Certificate, even students who did not transfer to four year programs and entered the labor market seeking employment would find that for Architectural and Civil Drafters, which typically requires an Associate Degree, there is still an undersupply annually of about 385 in the region for this occupation and about 90 annually in the East Bay sub-region.

This report also provides student outcomes data on employment and earnings for Architecture and Architectural Technology programs (TOP 0201.00). It is recommended that this data be reviewed to better understand how student outcomes for DVC students compare to potentially similar programs at colleges in the state, region and sub-region as well as to outcomes across all CTE programs at DVC and in the region.

# Introduction

This report profiles Architecture Design occupations in the 12 county Bay Region and the East Bay sub-region (Alameda and Contra Costa counties) for a proposed new Certificate at Diablo Valley College.

* **Architectural and Engineering Managers (SOC 11-9041)**: Plan, direct, or coordinate activities in such fields as architecture and engineering or research and development in these fields.

*Entry-Level Educational Requirement:* *Bachelor’s Degree*

*Training Requirement:* *None*

*Percentage of Community College Award Holders or Some Postsecondary Coursework:* 11%

* **Architects, except Landscape and Naval (SOC 17-1011)**: Plan and design structures, such as private residences, office buildings, theaters, factories, and other structural property.

*Entry-Level Educational Requirement:* *Bachelor’s Degree*

*Training Requirement:* *Internship / residency*

*Percentage of Community College Award Holders or Some Postsecondary Coursework:* 7%

* **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.

*Entry-Level Educational Requirement:* *Associate Degree*

*Training Requirement:* *None*

*Percentage of Community College Award Holders or Some Postsecondary Coursework:* 61%

# Occupational Demand

**Table 1. Employment Outlook for Architecture Design Occupations in Bay Region**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Occupation | 2017 Jobs | 2022 Jobs | 5-Yr Change | 5-Yr % Change | 5-year Open-ings | Annual Open-ings | 10% Hrly Wage | Median Hrly Wage |
| Architectural & Engineering Managers | 12,614 | 13,037 | 423  | 3% | 4,817 | 963 | $52.78  | $83.05  |
| Architects, except Landscape & Naval | 6,369 | 6,822 | 453  | 7% | 2,830 | 566 | $25.75  | $39.43  |
| Architectural and Civil Drafters | 4,547 | 4,716 | 169  | 4% | 2,149 | 430 | $20.60  | $27.92  |
| **Total** | **23,529** | **24,575** | **1,046** | **4%** | **9,797** | **1,959** | **$39.25**  | **$60.59**  |

*Source: EMSI 2018.1***Bay Region** includes Alameda, Contra Costa, Marin, Monterey, Napa, San Benito, San Francisco, San Mateo, Santa Clara, Santa Cruz, Solano and Sonoma Counties

**Table 2. Employment Outlook for Architecture Design Occupations in East Bay Sub-Region**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Occupation | 2017 Jobs | 2022 Jobs | 5-Yr Change | 5-Yr % Change | 5-year Open-ings | Annual Open-ings | 10% Hrly Wage | Median Hrly Wage |
| Architectural & Engineering Managers | 2,723 | 2,843 | 121  | 4% | 1,069 | 214 | $48.77  | $81.31  |
| Architects, except Landscape & Naval | 1,425 | 1,559 | 134  | 9% | 678 | 136 | $24.81  | $40.82  |
| Architectural and Civil Drafters | 1,222 | 1,286 | 64  | 5% | 601 | 120 | $21.07  | $27.64  |
| **Total** | **5,370** | **5,688** | **318** | **6%** | **2,348** | **470** | **$36.11**  | **$58.35**  |

*Source: EMSI 2018.1***East Bay Sub-Region** includes Alameda and Contra Costa counties

### Job Postings in Bay Region and East Bay Sub-Region

**Table 3. Number of Job Postings by Occupation for latest 12 months (March 2017 – February 2018)**

|  |  |  |
| --- | --- | --- |
| Occupation | Bay Region | East Bay |
| Architectural and Engineering Managers (11-9041.00) | 7,577 | 1,059 |
| Architects, Except Landscape and Naval (17-1011.00) | 2,215 | 311 |
| Civil Drafters (17-3011.02) | 67 | 39 |
| Architectural Drafters (17-3011.01) | 29 | 18 |
| **Total** | **9,888** | **1,427** |

*Source: Burning Glass*

**Table 4. Top Job Titles for Architecture Design Occupations for latest 12 months (March 2017 – February 2018)**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Common Title | Bay | East Bay | Common Title | Bay | East Bay |
| Engineering Manager | 2,830 | 286 | Senior Project Engineer | 55 | 19 |
| Director of Engineering | 856 | 93 | Architectural Designer | 46 | 6 |
| Project Engineer | 431 | 148 | Design Architect | 44 | 3 |
| Engineering Project Manager | 362 | 29 | Head Of Engineering | 37 | 1 |
| Project Architect | 359 | 26 | Applications Engineer | 35 | 4 |
| Chief Engineer | 234 | 40 | Information Technology Architect | 31 | 6 |
| Construction Engineer | 201 | 48 | Devops Architect | 30 | 2 |
| Vice President Of Engineering | 114 | 4 | Electrical Engineer | 30 | 9 |
| Architectural Project Manager | 102 | 23 | Intermediate Architect | 30 | 4 |
| Architect | 89 | 19 | Vice President Engineering | 29 | 2 |
| Principal Engineer | 85 | 13 | Aem Architect | 28 | 15 |
| Security Engineer | 71 | 12 | Engineering Supervisor | 28 | 0 |

*Source: Burning Glass*

# Industry Concentration

**Table 5. Industries hiring Architecture Design Workers in Bay Region**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Industry – 4 Digit NAICS (No. American Industry Classification) Codes | Jobs in Industry (2017) | Jobs in Industry (2022) | % Change (2017-22) | % in Industry (2017) |
| Architectural, Engineering, and Related Services (5413) | 11,774 | 12,522 | 6% | 50.0% |
| Semiconductor and Other Electronic Component Manufacturing (3344) | 1,412 | 1,249 |  (12%) | 6.0% |
| Scientific Research and Development Services (5417) | 1,216 | 1,353 | 11% | 5.2% |
| Computer and Peripheral Equipment Manufacturing (3341) | 1,150 | 1,230 | 7% | 4.9% |
| Navigational, Measuring, Electromedical and Control Instruments Manufacturing (3345) | 923 | 876 |  (5%) | 3.9% |
| Computer Systems Design and Related Services (5415) | 746 | 863 | 16% | 3.2% |
| Management of Companies and Enterprises (5511) | 584 | 589 | 1% | 2.5% |
| Local Government, Excluding Education and Hospitals (9039) | 472 | 491 | 4% | 2.0% |
| Management, Scientific, and Technical Consulting Services (5416) | 377 | 418 | 11% | 1.6% |
| Nonresidential Building Construction (2362) | 310 | 340 | 10% | 1.3% |
| Industrial Machinery Manufacturing (3332) | 295 | 306 | 4% | 1.3% |
| Federal Government, Civilian (9011) | 272 | 269 |  (1%) | 1.2% |
| Residential Building Construction (2361) | 262 | 267 | 2% | 1.1% |
| Pharmaceutical and Medicine Manufacturing (3254) | 232 | 262 | 13% | 1.0% |

*Source: EMSI 2018.1*

**Table 6. Top Employers Posting Jobs in Bay Region and East Bay for latest 12 months (March 2017 – February 2018)**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Employer** | **Bay** | **Employer** | **Bay** | **Employer** | **East Bay** |
| Apple Inc. | 736 | Amazon.com | 46 | Tesla Motors | 59 |
| Autodesk Inc | 148 | Uber Technologies Inc | 44 | Hired | 39 |
| Google Inc. | 130 | Gensler | 42 | Veeva Systems | 23 |
| Facebook | 94 | Salesforce Incorporated | 38 | Lawrence Livermore National Lab | 22 |
| Linkedin Limited | 84 | Accenture | 35 | Ellie Mae | 18 |
| Hired | 83 | Jacobs Engineering Group Inc | 28 | Lam Research Corporation | 14 |
| Tesla Motors | 81 | Vmware | 28 | Gensler | 13 |
| Cisco Systems Inc | 77 | Nvidia Corporation | 25 | Tesla | 13 |
| Salesforce.Com | 60 | Western Digital Corporation | 25 | Kaiser Permanente | 12 |
| Intel Corporation | 59 | Gap Inc. | 24 | Intarcia Therapeutics, Inc | 11 |

*Source: Burning Glass*

# Educational Supply

There are seven community colleges issuing 44 awards annually on Architecture and Architectural Technology (TOP 0201.00) in the Bay Region and three community colleges issuing 28 awards annually in the East Bay sub-region.

**Table 7. Architecture and Architectural Technology Programs (TOP 0201.00) in the Bay Region**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| College | Sub-Region | CC Headcount | No of Transfer Students | Associate Degrees | Certificates or Other Credit Awards | Total Awards |
| Canada | Mid-Peninsula | 79 | n<10 | 0 | 0 | 0 |
| Chabot | East Bay | 166 | 22 | 7 | 1 | 8 |
| College of Marin | North Bay | 75 | n<10 | 0 | 0 | 0 |
| Diablo Valley | East Bay | 574 | 33 | 14 | 3 | 17 |
| Laney | East Bay | 179 | 13 | 2 | 1 | 3 |
| San Francisco | Mid-Peninsula | 427 | 43 | 3 | 0 | 3 |
| San Mateo | Mid-Peninsula | 174 | 18 | 4 | 0 | 4 |
| Santa Rosa | North Bay | 56 | n<10 | 2 | 0 | 2 |
| West Valley | Silicon Valley | 161 | 19 | 2 | 5 | 7 |
| **Total Bay Region** | **1,878** | **159** | **34** | **10** | **44** |
| **Total East Bay Sub-Region** | **915** | **68** | **23** | **5** | **28** |

# *Source: IPEDS, Data Mart and Launchboard*

NOTE: For Community Colleges, the annual average for Associate Degrees and Certificates is 2014-17. There appears to be no programs at Other Educational Postsecondary Institutes based on a crosswalk of TOP to CIP codes. Headcount is for 2016-17, and number of transfer students is for 2015-16.

# Gap Analysis

The labor market gap is significant in the Bay region for this cluster of occupations with total annual openings of 1,959 and annual supply of 44 awards. This represents an annual undersupply of 1,915 students. In the East Bay sub-region, there is also a gap with total annual openings of 470 and annual supply of 28 awards for an annual gap of 442.

It should be noted that two of the three occupations (SOC codes) selected in the request for a labor market report are for occupations which typically require a four-year degree. As stated above, DVC students in the current program have been focused on transfer to four year colleges to pursue Architecture Design. However, with the addition of this proposed new Certificate, even students who did not transfer to four year programs and entered the labor market seeking employment would find that for Architectural and Civil Drafters, which typically requires an Associate Degree, there is still an undersupply annually of about 385 in the region for this occupation and about 90 annually in the East Bay sub-region.

# Student Outcomes

Student Outcomes data from Launchboard is available for students who took courses on Architecture and Architectural Technology (TOP 0201.00), in the Bay region.

**Table 8. Four Employment Outcomes Metrics for Students Who Took Courses on TOP 0201.00 Architecture and Architectural Technology**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **2015-16** | **Bay Region (All CTE Programs)** | **DVC** **(All CTE Programs)** | **State (0201.00)** | **Bay Region (0201.00)** | **East Bay (0201.00)** | **DVC (0201.00)** | **Top Colleges for 0201.00 in Bay Region** |
| % Employed Four Quarters After Exit | 74% | 68% | 67% | 66% | 66% | 55% | Chabot | 92%(12 students) |
| Median Earnings Two Quarters After Exit | $10,310 | $9,735 | $7,605 | $10,410 | $9,650 | $7,530 | San Francisco | $11,820 (40 students) |
| Median % Change in Earnings | 46% | 52% | 50% | 28% | 85% | 5% | Laney | 132% (12 students) |
| % of Students Earning a Living Wage | 63% | 55% | 53% | 55% | 52% | 50% | West Valley | 67% (18 students) |

*Source: Launchboard*

# Skill & Certifications

**Table 9. Top Skills for Architecture Design Occupations in the Bay Region (March 2017 – February 2018)**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Skill** | **Postings** | **Skill** | **Postings** | **Skill** | **Postings** |
| Project Management | 2,581 | Scrum | 460 | Repair | 304 |
| Engineering Management | 1,926 | SQL | 459 | Adobe Indesign | 294 |
| Scheduling | 1,653 | Staff Management | 457 | HVAC | 291 |
| Software Development | 1,541 | Project Architecture | 417 | Mechanical Engineering | 289 |
| Budgeting | 1,505 | Software as a Service (SaaS) | 405 | Microsoft Word | 285 |
| JAVA | 1,349 | Contract Management | 382 | Business Development | 274 |
| Software Engineering | 1,331 | Adobe Photoshop | 376 | Microsoft Powerpoint | 266 |
| Python | 887 | Optimization | 374 | Building Codes | 264 |
| Product Development | 842 | Cost Estimation | 362 | Procurement | 264 |
| Product Management | 840 | Estimating | 361 | NoSQL | 262 |
| Microsoft Excel | 803 | Git | 358 | UNIX | 255 |
| AutoCAD | 768 | Machine Learning | 349 | Google SketchUp | 254 |
| Microsoft Office | 730 | Customer Contact | 346 | Autodesk | 251 |
| C++ | 717 | Web Application Development | 334 | Product Sales | 251 |
| Revit | 684 | Request for Information (RFI) | 331 | Adobe Illustrator | 244 |
| JavaScript | 644 | Software Architecture | 329 | Team Management | 238 |
| Program Management | 606 | Object-Oriented Analysis and Design (OOAD) | 328 | MySQL | 235 |
| Agile Development | 600 | Big Data | 324 | Process Improvement | 235 |
| Construction Management | 578 | Microsoft Project | 322 | Civil Engineering | 233 |
| LINUX | 525 | Inspection | 321 | Prototyping | 232 |
| Validation | 515 | Ruby | 316 | Computer Engineering | 231 |
| Electrical Engineering | 511 | Apache Hadoop | 314 | Product Design | 231 |
| Customer Service | 489 | Debugging | 311 | Oracle | 230 |
| Supervisory Skills | 485 | Plumbing | 306 | System Design | 228 |

*Source: Burning Glass*

**Table 10. Certifications for Architecture Design Occupations in the Bay Region (March 2017 – February 2018)**

Note: 90% of records have been excluded because they do not include a certification. As a result, the chart below may not be representative of the full sample.

|  |  |  |  |
| --- | --- | --- | --- |
| **Certification** | **Postings** | **Certification** | **Postings** |
| Project Management Certification (e.g. PMP) | 203 | Security Clearance | 43 |
| Architecture License | 120 | Certified Information Systems Security Professional (CISSP) | 42 |
| Leadership In Energy And Environmental Design (LEED) | 112 | Scrum | 38 |
| Professional Engineer | 109 | National Council Of Architectural Registration Boards (NCARB) | 25 |

*Source: Burning Glass*

**Table 11. Education Requirements in Bay Region**

|  |  |
| --- | --- |
| **Education (minimum advertised)** | **Latest 12 Mos. Postings** |
| High school or vocational training | 6 (0%) |
| Associate Degree | 32 (1%) |
| Bachelor’s Degree or Higher | 6,198 (99%) |

*Source: Burning Glass*

# Methodology

Occupations for this report were identified by use of skills listed in O\*Net descriptions and job descriptions in Burning Glass. Labor demand data is sourced from Economic Modeling Specialists International (EMSI) occupation data and Burning Glass job postings data. Educational supply and student outcomes data is retrieved from multiple sources, including CTE Launchboard and CCCCO Data Mart.

# Sources

O\*Net Online

Labor Insight/Jobs (Burning Glass)

Economic Modeling Specialists International (EMSI)

CTE LaunchBoard [www.calpassplus.org/Launchboard/](http://www.calpassplus.org/Launchboard/)

Statewide CTE Outcomes Survey

Employment Development Department Unemployment Insurance Dataset

Living Insight Center for Community Economic Development

Chancellor’s Office MIS system

# Contacts

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