Case Study: Assessing NLX Coverage of QCEW Construction Employers in Minnesota

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This is a follow-up to similar work. The previous analysis, related to schools in Minnesota, contains more background and definitions.

Considerations

For this analysis, the focus was on two NAICS codes chosen in consultation with QCEW staff: Construction of Buildings (236) and Specialty Trade Contractors (238).

Compared to schools, the Construction Industry has many more and smaller establishments in Minnesota. For schools, 28% in the state are part of multi-unit establishments. For all industries, 1.7% of UI accounts are multi-unit establishments. In Construction it's much lower, with Construction of Buildings at 0.1% and Specialty Trade Contractors at 0.2%. The average employment per firm is much lower, too – 5.8 for Construction of Buildings and 7.4 for Specialty Trade Contractors. Overall, there is an average of 15.7 employees per UI account. Schools are well above that, at 200 employees per school or district. The result of this distribution of employees is that a lot more construction companies to match to NLX (21 times as many), but that many of them have very few employees. For the purposes of this analysis, the scope was limited to establishments that had an average of greater than 5 employees, which still resulted in 1039 Construction of Buildings firms and 3021 Specialty Trade Contractors firms.

	QCEW Totals				Averages		
	Locations	UI Accounts	Employment	% Multi-Unit	Locations/UI	Avg Emp/UI	Avg Emp/Loc
Overall	214,711	186,028	2,925,655	1.7%	1.15	15.73	13.63
Construction of Buildings	5,364	5,340	30,948	0.1%	1.00	5.80	5.77
Specialty Trade Contractors	12,101	12,060	89,735	0.2%	1.00	7.44	7.42
Schools	2,146	815	162,749	28.0%	2.63	199.69	75.84

The names of construction firms tend to be somewhat fluid. QCEW does not always update trade and legal names, but the name they advertise under may change. There are instances of a firm name going from "X Plumbing and Heating" to "X and Sons Plumbing and Heating" or "X Y Plumbing and Heating" while remaining at the same address and having a continuous tax record. There are large companies that have several brands, as well, and it's often necessary to look at the footer of the company's website to find text to the effect of "A [Company Name] company", linking it to a useful name. This complicates matching firms, and it was necessary to use address a lot more frequently than for schools.

There are more cross-state firms that were difficult to link directly to a Minnesota establishment than for schools. It was unclear if large regional firms were hiring for a local project and were not yet liable or if they were advertising to bring Minnesotans to neighboring states for short-term projects or if they had some unrelated legal name that was difficult to link to the name they were advertising under.

Method

The basic idea is to take the pool of QCEW firms within the two industries, Construction of Buildings and Specialty Trades Contractors, and look for firms advertising in the NLX that are likely the same entity. The first step was to match on FEIN – only a small percentage of NLX firms have that included, but those that do can most reliably be assigned to a QCEW firm. The second was to identify firms that were advertising under the exact same name as either the QCEW trade or legal name. The third was to identify firms that were advertising under a name that was entirely contained in a QCEW trade or legal name. This removed some firms missed in the previous steps because of minor differences like the inclusion of LLC, Inc, or punctuation. Because some firm names are very short, there were manual exclusions to prevent false positives. After this automatic phase, specific industries were targeted for manual matching.

The QCEW firms belonging to the targeted construction industries were searched for in the list of distinct NLX firms. Firm name was the primary focus, but because many companies seemed to have very different public names from their legal names, the search also included address and sometimes a review of the firm's website to see if there were other clues. Largest firms were reviewed first and most thoroughly.

It's also necessary to look at likely construction firms in the NLX data and match against the QCEW, for several reasons. First, it catches some that could be missed due to spelling or formatting differences. Second, ultimately, any use of the NLX as an input to a metric would have to be able to identify firms by industry because maintaining matches on a national scale would be difficult. In the absence of complete industry data from NLX, having other criteria to target the same pool of employers and assessing how accurate those criteria are could be an alternative to doing this kind of analysis on a national scale. Finally, it captures out of state firms that are advertising and may be useful to prevent duplication from widely-advertised jobs.

To identify construction firms from the NLX side, two methods were used:

- Search terms in the application_company
  (*excavat, egress, window, exterior, paint, cooling, modular, solar, contractor, remodel, concrete, preserv, bath, restor, hvac, build, electri, plumb, construction, interiors, mason, framing , insulat, mechanical, fenc, garage, drywall, floor, erect, gutter, tile, crane, asphalt, basement, granite, siding*)
- Firms that posted jobs with ONET codes beginning with 47

Search terms yielded just over 500 application_companies, of which only 205 were unmatched by automatic processes. After manual review, 43 remained unmatched. Of those, 8 were ambiguous – a google search suggested they were Minnesota firms, but it was difficult to confirm because their names were general. Twenty were in the wrong industry, mostly auto repair (from search term "garage") and utilities ("electric"). The last 15 were at firms that were out of state. Some were clearly not doing work

in Minnesota, but others listed projects in Minnesota without there being a local QCEW firm that could be matched to the company.

Occupational codes were found in 1245 distinct application_companies, but only 330 remained to be matched after automatic methods. The search term application_companies were more likely to be confirmed as construction firms while occupations were found in many companies that were clearly not. After manual review, 173 companies remained unmatched from the ONET match. Most (97) were the wrong industry, often local government or property management. There were also staffing firms (15) and railroads (11), which are not covered by UI. There were 22 out-of-state firms. That leaves 25 that were ambiguous, of which 10 had names that were too vague to match or search for and 15 couldn't be found in QCEW for other reasons. They were often very small firms that may be more likely to change their names or addresses.

out of state	22
wrong industry	97
unknown	15
bad	10
staffing	15
not covered	11

A number of Employment Services firms show up in the NLX data as the application_company, even though they're ultimately going to place the workers at other companies or hold them in reserve. The number of NLX openings associated with those firms is usually far in excess of their QCEW employment, either because they're not filling an immediate opening or because of reporting differences. Those firms were not included in this analysis, and any company that relies on those services will be underrepresented in the output.

In outlier review, there were substantially more management occupations than in the projections matrix distribution, so we reviewed matched firms that had a large number of management occupations in their listings. Ultimately, there were four national firms with more management postings than they had employees in the state and those firms were excluded from the analysis. For engineers, two companies were excluded for the same reason.

Results

Larger firms were more likely to appear in the NLX, but construction firms tend to be fairly small. It was necessary to set the size classifications for aggregations based on this distribution rather than making them comparable to the schools analysis to better reflect the distribution of firm size in these industries. Overall, the match rate was low: 11.5% for Construction of Buildings and 8.7% for Specialty Trades, compared to 22.8% for Schools. When comparing like categories, however, the 50+ size had a match rate of 30.2% in schools versus 43.2% and 29.0% for Construction of Buildings and Specialty Trade respectively. For the under 50 category, schools had a 4.4% match rate versus 10.0% and 7.6% for Construction of Buildings and Specialty Trades respectively.

Regionally, coverage ranges from 6.6% to 15.2% in Construction of Buildings and 7.5% to 13.2% in Specialty Trade Contractors. Interestingly, the lowest coverage regions for firms aren't the same for the two categories, but for employment the Twin Cities has the highest percent covered in both industries, perhaps thanks to a concentration of larger firms.

2023 Q2 Comparison of QCEW Employment to Matched NLX Job Posting Data for Construction of Buildings

	Total	Matched	Pct Matched	Emp	Matched Emp	Pct Matched
Total >5	1039	120	11.5%	25107	8118	32.3%
5-15	640	45	7.0%	5386	385	7.1%
15-30	212	13	6.1%	4389	269	6.1%
30-50	92	21	22.8%	3517	771	21.9%
50+	95	41	43.2%	11815	6694	56.7%
Region						
Central	136	9	6.6%	2289	298	13.0%
NE	67	8	11.9%	1522	364	23.9%
NW	105	16	15.2%	1683	439	26.1%
SE	76	5	6.6%	1507	160	10.6%
SW	73	10	13.7%	1282	321	25.0%
Twin Cities	540	64	11.9%	15991	6346	39.7%

Specialty Trade Contractors had a lower match rate overall and is proportionate across sizes. It is slightly better distributed regionally.

2023 Q2 Comparison of QCEW Employment to Matched NLX Job Posting Data for Specialty Trade Contractors

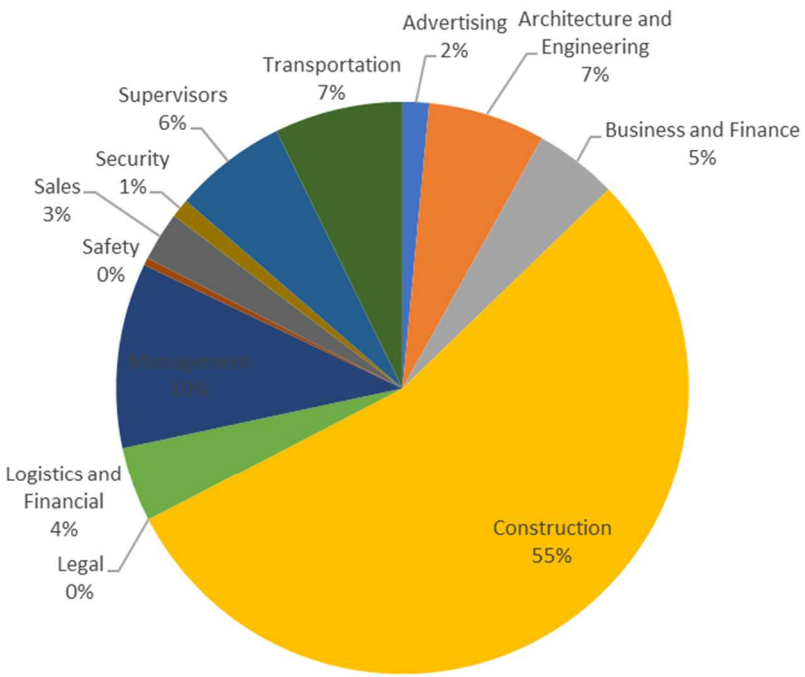
	Total	Matched	Pct Matched	Emp	Matched Emp	Pct Matched
Total >5	3021	262	8.7%	75438	17009	22.5%
5-15	1829	84	4.6%	15738	749	4.8%
15-30	614	51	8.3%	12756	1061	8.3%
30-50	268	37	13.8%	10246	1403	13.7%
50+	310	90	29.0%	36697	13795	37.6%
Region						
Central	261	30	11.5%	10018	1577	15.7%
NE	80	6	7.5%	2822	669	23.7%
NW	139	15	10.8%	4902	671	13.7%
SE	130	11	8.5%	5342	570	10.7%
SW	107	14	13.1%	3599	673	18.7%
Twin Cities	948	125	13.2%	47699	12737	26.7%

Occupation distribution

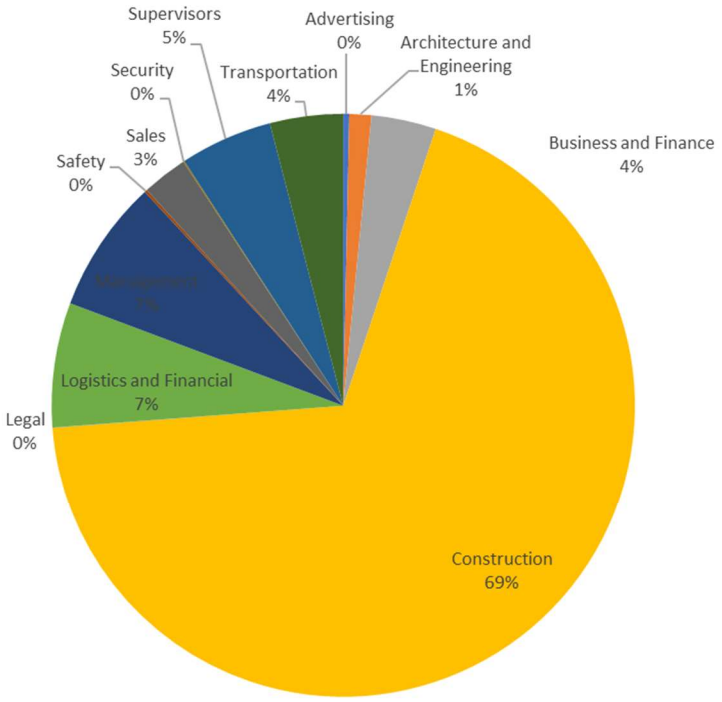
Construction is an industry with many very small firms. Businesses have short-term and temporary employees, subcontract with other firms, and can potentially go in and out of business very quickly. Many jobs may never be advertised and employment arrangements may be temporary or variable. The industry is challenging to collect data from and validate across all our programs.

Minnesota's Job Vacancy Survey uses a stratified random sample to identify firms from QCEW to survey and has staff calling non-respondents, resulting in generally strong coverage even among smaller employers. Looking at the unweighted responses for jobs by industry, the JVS occupational mix for construction overall (NAICS 23) is somewhat skewed: Managers and Architecture and Engineering occupations are over-represented while Construction Trades workers are under-represented.

JVS NAICS 23



Projections NAICS 23



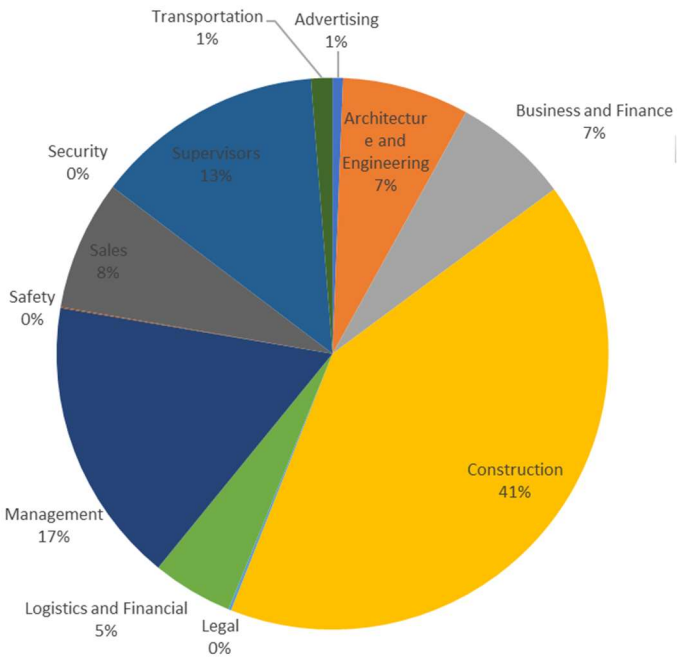
The NLX data is similar in its occupational distribution.

Construction of Buildings:

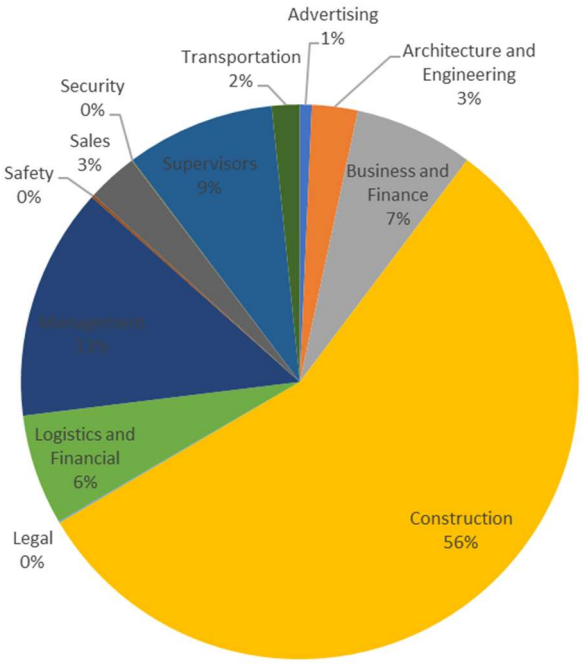
Whether you look at detailed occupations or the roll-ups presented below, the ranking of occupations by their number of jobs/openings is consistent between NLX and Projections matrix distributions for the industry. The scale, however, is different. Construction Trades Workers (combined with a few smaller occupations in the Construction category for the charts), makes up more than half of employment in the matrix distribution but only just over a quarter in NLX postings. Instead, Management, Supervisors, Sales, and Architecture and Engineering occupations all take up a larger share of the total. It may be that the recruitment methods for Construction Trades Workers rely more heavily on other methods – unions, personal connections, and calling up past workers to invite them back after seasonal layoffs. It may also

be that those jobs are easier to fill and don't get duplicated through time but the systematic differences in recruiting (word of mouth, recalling previous workers, etc) seem a more likely cause.

NLX NAICS 236



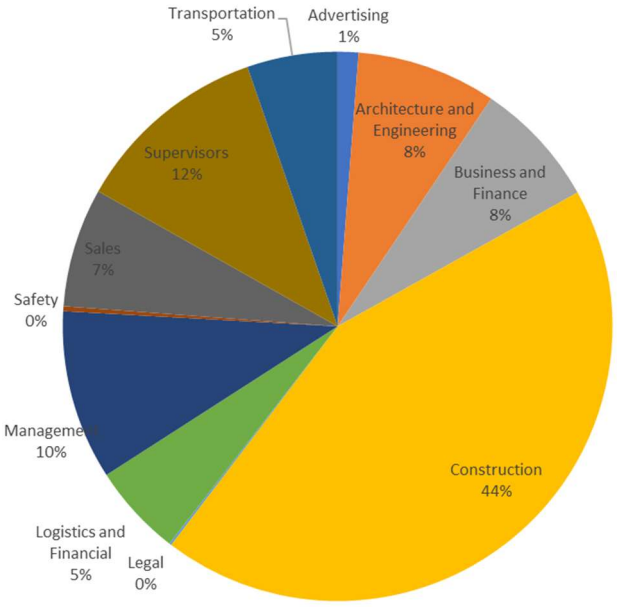
Projections NAICS 236



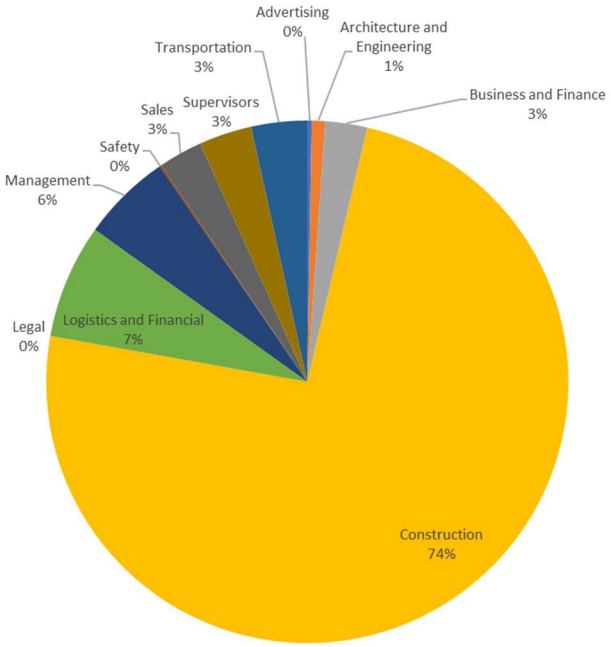
Specialty Trade:

Specialty Trade Contractors matches similarly underrepresent the Construction Trades Workers. Supervisory roles, Architecture and Engineering, Business, and Management were all more prevalent in the NLX postings than in the Projections matrix for the industry. There were two employers excluded because they had many more openings than QCEW jobs in the state, but it's probable that others could have their impact reduced as well. A next step may be to attempt to look for cross-state duplication to see which companies advertise their openings most widely and need to be weighted appropriately.

NLX NAICS 238



Projections NAICS 238

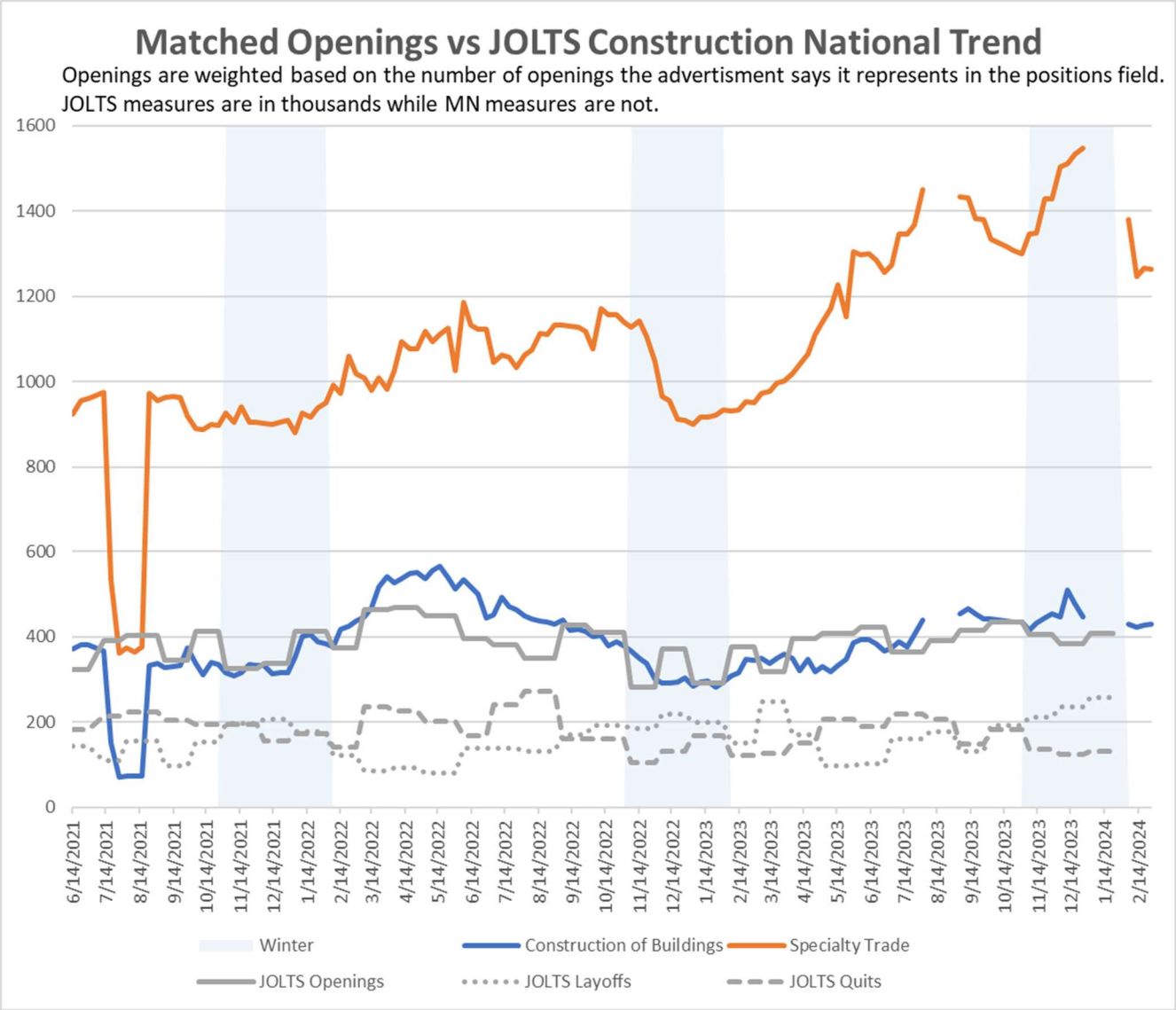


Something that complicated analysis for both these industries was that many postings represented more than one opening. The field that contains that data is not perfectly coded. Sometimes it's blank, sometimes it has a number, and a large number of records had 999. For this analysis, 999s were treated as null and recoded to 1s, as were blanks. However, there were also a lot of mostly transportation jobs with very high weights, in excess of 100. Anything with a value of >=100 was reduced to 10. The use of a single advertisement to advertise multiple openings adds uncertainty – it would be helpful to have the assumptions made (999s being null, large weights) confirmed. It also increases the likelihood that minor miscoding errors could distort the results.

While the distribution of occupations does not perfectly reflect the work available, it's consistent with response rate patterns present in other data sources.

JOLTS

JOLTS publishes a Construction series for the US as a whole that contains both these industries and a few more. Unlike schools, which tracked best with Quits and Layoffs, these two industries align better with the Openings metric. However, Construction of Buildings is a much better fit than Specialty Trade. The blue shading identifies November-January, and only in 2023-2024 is there strong growth in any series. The difference could be driven by local trends as Minnesota did have record-breaking warmth and lack of snow in those months, allowing more construction work to continue through the winter. The occupational mix of Specialty Trade Contractors, however, was not as good of a match as Construction of Buildings and had a lot of Engineers and Construction managers. It's possible that out of state employers were recruiting in Minnesota's slow season or that jobs were advertised well in advance of hiring. A closer look at large firms would be useful.



Conclusions

Construction has pretty good coverage of companies meeting the size threshold but is less reliable for occupations within the industry. There are some companies that advertise their managerial positions widely and are likely recruiting from out of state. There are some outliers in terms of the number of openings per advertisement. The occupations that are underrepresented are those that are lower paid (laborers, etc.) and that may not be advertised online. Construction of Buildings seems to be somewhat more reliable in its matches than does Specialty Trade Contractors, but both leave out a large share of very small firms. In construction industries, many owner-operators obtain their license and insurance and can run their own business with no employees or minimal office help, partnering with other companies in subcontractor arrangements. Job openings can't measure the market demand or available work for those firms or people seeking to open them. These are challenges that aren't limited to this data source in researching the industry, but using job postings alone may distort the accuracy of the availability of work.