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# Employer and Training Needs: Report 14 Construction Technologies

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## Recommended Citation

Eskey, Michael, "Employer and Training Needs: Report 14 Construction Technologies" (1980). *Publications Archives, 1963-2000*. 114.  
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Report Number Fourteen


CONSTRUCTION TECHNOLOGIES

# EMPLOYER AND TRAINING NEEDS

PREPARED FOR METROPOLITAN TECHNICAL COMMUNITY COLLEGE



Center for Applied Urban Research

university of  
nebraska   
at omaha

CONSTRUCTION TECHNOLOGIES

by

Michael T. Eskey

## CONSTRUCTION TECHNOLOGIES

### Purpose of the Study

The purpose of this study is to determine the employment and training needs of Metropolitan Omaha in the occupational area designated as construction technologies. The construction trades were divided into eight major areas including: 1) brick and block layers, 2) carpenters, 3) drywall installers/finishers, 4) cement workers, 5) electricians, 6) plumbers and pipe-fitters, 7) sheet metal workers, and 8) heavy equipment operators.

### Program

Specific programs are not available at Metro Tech in the above areas of building construction. General programs are offered in such fields as drafting technology and electronic technology; however, no specific programs are offered that would provide individuals with the skills and knowledge needed to prepare adequately for a position in the construction trades.

### Data Source and Methodology

The target population included a sampling of employers in each of the eight major areas. Union and non-union representatives were also contacted in each of the major areas.

Two survey instruments were constructed to gather data about the employment and training needs of the companies in each of the nine major areas, both union and non-union, in the Omaha area. The sampling technique utilized insured that the number of union and non-union companies adequately represented the ratio of such companies in the area. The longer and more detailed of the two questionnaires was used when the researchers perceived that the data would contribute to the purpose of the study. Both personal and telephone interviews were conducted. The findings of this portion of the study are summarized here with conclusions about employer and training needs as related to present or proposed training at Metropolitan Technical Community College.

## Findings of the Study

### Brick and Block Layers

About 90 percent of residential work in this area is performed by non-union bricklayers, and about 95 percent of commercial jobs are performed by union bricklayers. The union represents approximately 30 separate companies, and approximately 25 non-union companies are in business in the metropolitan area.

The union presently has a membership of 310 individuals. Of these, approximately 40 are currently unemployed, and another 60-90 are commuting to Kansas City and towns in Kansas and Iowa in order to remain employed. A representative of the Bricklayers Union #1 revealed that he currently has a list of non-union bricklayers who are attempting to join the union due to the major slow-down in the trade. The current rate of unemployment of current members, however, prevents the union from accepting new members.

Their current apprenticeship program has only 15 members enrolled. This is down from nearly 100 apprentices two years ago. Various reasons were cited for the cutback; however, the current economic situation was cited most often as the major reason. Another reason was the use of substitute materials for bricks and blocks; that is, metal and glass are now used more often. Also, more emphasis is being placed on remodeling than on building new structures. While this does provide some work for the contractors, it is much less than if the structure was being built from the start.

Union brick and block layers have completed either a three- or four-year apprenticeship training program approved by the Bureau of Apprenticeship and Training. Non-union contractors, who work mainly on residential jobs, generally employ brick and block layers who have not received their training from a federally approved training program.

A need presently does not seem to exist for more brick and block layers. Interviews with operating contractors and a sampling of those who have gone out of business revealed that the number of trained people greatly exceeds the number of available jobs. The presence of the union apprenticeship program also places a limitation on the number of jobs available to non-union members who have been trained in non-union apprenticeship programs. These factors suggest that the introduction of courses in this area of the construction field might not be able to

insure employment for graduates due to the present economic situation and might conflict with present apprenticeship programs operated by union contractors.

### Carpenters

This trade presented the most optimistic view about the need for skilled individuals. However, like the other construction trades, the carpenters are being affected by the current economic situation.

A representative of the Carpenters Local Union #400 revealed that approximately 1,700 journeyman carpenters are in the Omaha area. Of these, about 98 percent are presently working. With some relief in the present economy, an increase of 300 persons in the field is expected in the next two years. Union carpenters are not presently traveling to other cities to work as in the other trades.

The union presently supports an apprenticeship program with an enrollment of about 200 individuals. The apprenticeship program is four years long and requires that the individual attend 48 three-hour classes per year. With on-the-job training and classwork the program is 8,000 hours in length. The program is certified by the Bureau of Apprenticeship and Training and the Associated General Contractors of Omaha.

The union representatives and contractors employing union carpenters revealed that presently no need exists for Metro Tech to institute a program in carpentry. They contended that the need for training and supplying new carpenters was being fulfilled by the union. Further, they revealed that by limiting the number of apprentices they were able to insure quality training and to keep the trade from being flooded.

Non-union contractors revealed contrasting views about the carpentry trade. Although some of the contractors interviewed had received their training in a union apprenticeship program, most felt that the length and extensiveness of the training was not necessary for working as a journeyman. Many of the jobs performed by a carpenter are relatively similar and do not require that the individual spend four years in training or that he be skilled in every aspect of carpentry. Only years of experience can produce an "all-around" carpenter, and an individual can learn this in or out of an apprenticeship program by working in the trade, according to the non-union contractors.

Both union and non-union contractors basically agreed on the skills and knowledge required for carpenters. Framing, forming-setting, blueprint reading, mathematical aptitude, and a knowledge of building codes were cited most often. Non-union contractors were in agreement that a six-month to one-year program at a technical community college supplemented with on-the-job training would be sufficient preparation.

#### Drywall Installers/Finishers

Union drywallers have completed the union carpenter's apprenticeship program. Thus, their training and skills are the same as those listed in the carpentry section. The skill is a specialty area; however, when necessary these individuals can be used as carpenters. Like other union carpenters, the present employment level is fairly stable.

Approximately 15 union and non-union drywall contractors are in business in Omaha. Those surveyed revealed that the trade has been affected somewhat by the slump in the economy but that unemployment is minimal. This is due to the flexibility in using these individuals for other areas of carpentry.

As in the carpentry trade, the union drywall journeyman have completed a four-year apprenticeship program. The union contractors felt that a program specifically oriented toward teaching an individual drywalling skills would not be sufficient. Drywall installation techniques are minimal in the additional skills required for individuals with carpentry training. Further, the variation in different jobs does not merit separate instruction because variations can be learned on the job during the apprenticeship training.

Non-union contractors said that drywalling was a skilled trade and that a separate program of instruction, if only a basic and advanced phase, was needed. To preserve the skill and insure quality work these contractors said that individuals should be utilized specifically in this capacity as much as possible. Specific courses should be offered by Metro Tech during the construction off-season and further supplemented with experience by on-the-job training, according to the non-union contractors.

#### Cement Finishers

As in the other construction trades, the present state of the economy has caused slowdowns in work and hiring in commercial and residential

building for both union and non-union contractors. Any new jobs created in this field in the next two years will be dependent on an upsurge in the economy of the nation.

A representative of the Cement Finishers Local #538 revealed that this group presently has an active membership of 300 journeyman cement finishers who represent approximately 125 contractors in the Omaha area. The majority of the union contractors are working in commercial construction. In contrast, the majority of residential construction work is done by non-union contractors. Both union and non-union contractors revealed that the number of trained cement finishers presently exceeds the number of available jobs.

The union sponsors an apprenticeship program, but only about 20 apprentices are enrolled at this time. The normal classload is about 90. The apprenticeship program is three years in length and includes six 13-week sessions. The total program is 6,000 hours of combined classroom and on-the-job training. The union representative revealed that the present size of the apprenticeship program is dictated by specific union requirements which govern the number of cement finishers employed and the projected needs of the trade.

The non-union contractors revealed that an apprenticeship program was not needed to become a journeyman cement finisher. Experience was cited as the most important teaching tool; however, they also stated that coursework could be combined with experience, especially during the off-season. The most often mentioned skills and knowledge needed for the trade included mathematical aptitude, the ability to set forms, run a transit and level, and prepare the job site. Other skills cited were blueprint reading and a knowledge of the different types of cement mixtures required for different jobs. This would require that the individual be knowledgeable about specific building codes.

The specific courses cited most often as a necessary part of a program of studies in this trade included: applied mathematics, form setting, instrument usage, surveying, concrete mixture, and building codes, especially for the City of Omaha and the State of Nebraska.

The non-union contractors were generally optimistic about the future and felt that individuals trained in this area would be able to find employment upon completion of their coursework coupled with experience.

The cement finishers trade has unique features which would allow



diversity in programs of instruction. The major divisions are commercial and residential which require specific courses in building codes. Further, much of the commercial work is in specific areas such as highway finishing, city streets, or office buildings. Much of the work done residentially includes foundations, driveways, and sidewalks. Possibly a program of instruction might be devised to allow individuals to specialize in these areas of the trade.

### Electricians

The interviews with union and non-union representatives and contractors in the electrician trades revealed very similar results to those found in the other construction fields. Many more skilled electricians are found in the Omaha area than available jobs. The majority of commercial electrician work is done, as in other trades, by union electricians. In Omaha, the majority of contract work is performed through the National Electrical Contractors Association (NECA). This organization represents 39 of the major contractors in the Omaha area.

The Electricians Union Local #22 is the largest supplier of electricians for commercial and residential work in the Omaha area. Local #22 has a membership of approximately 550. About 350 of these are located in the Omaha area. Of these, about 25 percent are unemployed, and another 100 union electricians in Lincoln are currently unemployed. Many electricians are commuting weekly to job sites in Iowa, Missouri, and Kansas because of the shortage of work in Omaha.

Two types of apprenticeship programs are offered by the union. One is a two-year program with a major emphasis on residential wiring. The training includes one night of class per week with a total of 4,000 hours of combined classroom and on-the-job training. The second, a more extensive program, is a four-year program requiring two classroom sessions per week and 8,000 hours of combined classroom and on-the-job training. Both programs are approved by the Bureau of Apprenticeship and Training. The National Electrical Contractors Association currently utilizes facilities on college campuses in Hastings, Kearney, and Grand Island; however, their representatives do not feel the use of such facilities is warranted in Omaha due to the current oversupply. The present electrician apprenticeship class in Omaha has only seven individuals enrolled, and, as evidenced by the large number of unemployed, the number of journeyman electricians greatly exceeds the number of available jobs.

The non-union electrical contractors interviewed generally have been affected by the present economic situation. They do, however, have plans for increasing the number of electricians employed by their firms, dependent on a change in the economy. Generally, electricians from open shops have been trained in the union apprenticeship program and then have gone into business for themselves. Those who were contacted generally felt that the training they had received was adequate and that additional training for electricians was needed to certify journeymen as master electricians in order to qualify them to open their own businesses.

Representatives of the Electricians Union Local #1974 at Western Electric revealed that a need currently exists for individuals trained as industrial electricians. Currently, Western Electric employs 84 industrial electricians and has plans for expansion. The Western Electric apprenticeship program is three and a half years in length and divided into nine levels of training based on individual skill and subsequent advancement and pay increases. The total apprenticeship program includes 7,328 hours of on-the-job and classroom training and is certified by the Bureau of Apprenticeship and Training.

The union representative and training program coordinator at Western Electric indicated that employees, particularly females and minorities, are presently being sent to Milford to receive training as machine operators and tool and die makers. The apprenticeship program in these areas is similar to that of the electricians, and, upon completion of their training, these individuals generally enter the apprenticeship program at about the fifth level. It was suggested that individuals receiving similar classroom training in the electrician field, particularly courses in elementary electricity, resistors, and blueprint reading, might enter into the electrician apprenticeship program at a higher level.

Union representatives and the training coordinator at Western Electric felt that a training program by Metro Tech would benefit the individual and would save the company money and time. Further, they felt that such training would be applicable to other areas of industrial electronics. They stated that they would welcome the opportunity to coordinate with MTCC in the introduction of a course of instruction.

## Plumbers and Pipe Fitters

As in some of the other construction trades the amount of available work, and subsequently the number of journeyman plumbers needed, is down from a year ago. The present state of the economy was blamed for this slowdown both in new residential and commercial building and in home remodeling.

A union representative for the Plumbers Local Union #16 revealed that there are 345 licensed union journeymen in this area. Of these, 28 percent are currently unemployed. The prospects for additional union plumbers are very limited at this time. As in the other union trades, the union feels their first responsibility is to those union members currently not working. This was further reflected by the declining number in the apprenticeship program which currently has 15 members, down from a typical enrollment of 55. Entrance standards are becoming more stringent, and only four of the last 77 applicants met the standards for acceptance into the program. The number of apprentices allowed on a job is regulated by the number of plumbers on a job; thus, with a decline in the number of plumbers working comes a subsequent decline in the number of apprentices.

Plans are to build a new apprenticeship training site in the Omaha area. The proposed new facility will accommodate 60 students, a sufficient size to meet the ongoing need for plumbers in the Omaha area. No changes are planned in the type of training. The current apprenticeship program is four years long and includes two three-hour classes per week plus on-the-job training. The complete apprenticeship program is 8,000 hours. Major course work is in the areas of applied mathematics, welding, transit reading, blueprint reading, building codes, and the many different facets of plumbing. An individual trained in the apprenticeship program would be prepared to handle any type of plumbing job.

The union plumbers contacted were in agreement with the training information given by the union representatives. As in the other construction trades, their loyalty is to union members. Further, they claimed that such a program at Metro Tech would have difficulty meeting certification requirements from the Bureau of Apprenticeship and Training or in producing qualified, trained journeymen.

The non-union plumbers contacted presented different views concerning training needs for attainment of journeyman. They disagreed with the

structure of the union and the selection of apprentices and journeymen. On the whole, non-union shopowners were in favor of a program of studies offered by a technical community college. The specific courses they suggested were basic plumbing, welding, building codes, soldering, pipe-cutting, and blueprint reading. The need for on-the-job training was emphasized; in fact, some felt that individuals should have from six months to one year of experience before entering the classroom.

A major concern of both union and non-union shop owners was the quality of instruction. Both groups pointed to the fact that the instructor must be able to teach students as well as possess knowledge of the trade. That is, good plumbers are not necessarily good teachers. A union representative pointed out that instructors for the apprenticeship program attended courses specifically for classroom teaching at Purdue University. If Metro Tech should start a program in plumbing, an effort should be made to insure that instructors have teaching skills as well as technical knowledge.

#### Sheet Metal Workers

A representative of the National Association of Sheet Metal Workers said that 450 journeymen are in the Omaha area plus 50 individuals in the apprenticeship program. The apprenticeship program is four years in duration and is approved by the Bureau of Apprenticeship and Training. The four-year curriculum is divided into eight semesters.

Each semester consists of two three-hour classes for 12 weeks. Classes are presently conducted primarily at South High School and, when necessary, at other OPS schools and Thomas Jefferson High School in Council Bluffs. The specific need for sheet metal journeymen is limited in the total construction effort.

The consensus among union contractors and representatives was that the classes now being given to union apprentices are adequate in content and provide a uniformity in learning. Training by Metro Tech or non-union sponsors may not provide the needed skills for particular jobs unique to union construction.

The non-union employers save a different set of responses. Two training programs are presently offered by non-union groups. The first, conducted by the American Building Contractors, emphasizes safety, blueprint reading, building codes, and sheet metal skills. This program is

certified by the Bureau of Apprenticeship and Training. The second is conducted by Metropolitan Heating, Ventilation, and Air Conditioning. The program is relatively new as the first class was organized in September, 1979. Two levels of instruction are offered: 1) a basic course for students with no prior sheet metal instruction, and 2) a more advanced course of instruction for those who have either passed the basic level or who have instruction or experience in sheet metal. In addition, another advanced course of instruction is being taught in a sheet metal shop which affords advanced students an opportunity actually to work with the materials.

The MHV and AC classes are presently planning to continue. In the fall of 1980 a more advanced course will be available to students who have completed the first two levels of instruction. The non-union representatives and instructors interviewed expressed a need for this type of instruction and were enthusiastic about Metropolitan Technical Community College offering courses in this area. A variance in the levels and types of instruction is needed, and these representatives stated that coordinating meetings could bring about a compromise in instructional needs and training desired.

#### Heavy Equipment Operators

The interviews indicated little need for more skilled individuals in this trade. A representative from the International Union of Operating Engineers #571 said that there are presently 1,100 heavy equipment operators in the state of Nebraska, most of whom are located in the Omaha area. Approximately 30 percent of the union heavy equipment operators are presently unemployed.

The union does not sponsor an apprenticeship program in Nebraska. The major criterion for union membership is simply a proven experience on specific pieces of heavy equipment. Very few operators are skillful on three or more pieces of equipment. The typical heavy equipment operator works on 25 to 30 different construction sites per year, although they are employed an average of only seven months.

Very few owner/operators work in this area of the construction field as the cost of owning equipment requires an extremely high capital investment. Most owner/operators are limited in the number of pieces of equipment, and this further limits these individuals to specific types and sizes of jobs.

Currently in Omaha the supply of heavy equipment operators exceeds the demand. The primary function is site preparation and digging footings.

Very little building is presently being done in Omaha other than street and highway construction. Most excavating companies are down approximately 25 percent from last year.

The training for both union and non-union heavy equipment operators is typically through on-the-job experience. The Local #571 representative stated that the Nebraska chapter is relatively small and does not have sufficient capital or the need to justify an apprenticeship training program. Similarly, the independent contractors did not feel that specific training was needed and that most of their heavy equipment operators received their training on the job. Training schools are very difficult to start up due to the large amount of capital needed to purchase the different types of equipment, to provide sites for training, and to keep equipment up to date.

Due to the over-supply of heavy equipment operators and the shortage of construction work, the need for Metro Tech to offer training in this area is limited. The cost of training individuals would be much higher both initially and throughout the program than any of the other construction trade areas.

#### Summary and Conclusions

Unions and union contractors differed with non-union contractors about the need for Metro Tech to establish training programs in the construction technology field. Generally non-union contractors said there was a need for training programs in construction. Union representatives, on the other hand, viewed such programs as a threat to their existing training programs and to the presently overcrowded market. A major difference existed between the two groups in their views on the amounts and types of training needed to produce skilled journeymen in the construction trades.

Union contractors in every area of the construction trade were concerned with the quality and length of training available at a technical community college. Further, the present state of the economy has forced many union members out of work, and the employment of these individuals is a more important need for the unions than that of bringing newly trained individuals into the trades. Similarly, a representative of the Associated General Contractors (AGC) stated that 1,200 of their 3,700 members working as carpenters, brick-layers, cement-finishers, iron-workers, plasterers and lathers, operating engineers, and cement finishers are currently unemployed. Their stated priority is for full employment before bringing in new members.

Non-union contractors are presently slowed down by the current state of the economy but feel that training in the construction trades should be offered by Metro Tech. The majority of non-union contractors responded that the union programs were generally too long and required too much training for an individual to become a journeyman. While both union and non-union contractors indicated that experience on the job was a primary teaching tool, non-union contractors did not feel that four years of apprenticeship was necessary to become a journeyman.

The areas of carpentry, cement finishing, plumbing, electronics, and sheet metal were cited by non-union contractors as the trades in which technical community college coursework might be useful. In all these areas, they indicated, training should be supplemented with on-the-job training. The length of training required varied by trade. Six months to one year of coursework would be sufficient for the hard-line construction areas (carpentry, cement work) and longer programs of study would be necessary for the electronics, plumbing, and sheet metal courses.