

The Business Roundtable

**TRAINING PROBLEMS IN
OPEN SHOP CONSTRUCTION**

**A CONSTRUCTION INDUSTRY COST
EFFECTIVENESS PROJECT REPORT**

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**THE BUSINESS ROUNDTABLE
1615 L STREET N.W.
WASHINGTON DC 20036
(202) 872-1260**

TRAINING PROBLEMS IN OPEN SHOP CONSTRUCTION

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SUMMARY

Current construction industry training efforts are inadequate to meet the needs of the industry. Training that is being done has been largely concentrated in the union sector where training funds are supplied through charges on labor hours which in turn are passed on by contractors to the ultimate user or client. Such means of funding through uniform cents per hour charges are legally permitted if included as part of a negotiated collective bargaining agreement. Although the open shop segment does close to 60 percent of all construction, it has no comparable method available for funding of training. This report outlines some of the problems associated with craft training in the open shop sector.

- Current training levels are not adequate to meet the shortfall of close to 2 million workers in the construction industry projected by 1990. A significant increase in craft training within the open shop sector is essential.
- Less than 10 percent of all funds now going into construction craft training is directed toward open shop training. Likewise less than 10 percent of those individuals completing construction craft training are in open shop programs.
- If the open shop sector of construction remains at the present level of 60 percent without a significant increase in its training, there could be a long-term deterioration in the quality and productivity of the construction work force.
- There is a need for a recognized and accredited training curriculum that can be utilized by open shop contractors to train craftsmen for industrial work by modern skill related methods particularly in the specialty trades. Such a curriculum is not available at this time.
- There is little understanding on the part of most owners as to how craft training takes place in the construction industry or how it is funded.
- Some mechanism needs to be developed whereby funds for craft training in the open shop sector are made available through the application of broad across-the-board cents-per-hour charges ultimately paid for by owners.
- Improved coordination and cooperation between open shop contractor associations, vocational education administrators, user groups and owners is essential if significant improvement in construction craft training in the open shop sector is to be achieved.

II

OBJECTIVES

The objective of this study was to explore the extent to which training is carried out in the open shop sector of construction and specifically to determine:

- Those problems that are unique to open shop construction training.
- Whether the present level of training is adequate to meet the future needs of the industry.
- Actions needed to improve the extent and quality of craft training in the open shop sector.

III

BACKGROUND

In all industries except construction, employers generally hire and train their own employees. They are selected for their general ability to do the task at hand with the intent to provide training as needed to upgrade the quality of an essentially permanent workforce.

In construction, however, employees are hired by a number of employers on projects generally of relatively short duration. Thus training in the construction industry has largely been conducted under the auspices of contractor associations. In the union sector this has taken place through traditional apprenticeship programs administered through joint training committees made up of union and contractor representatives, with the respective building trades unions taking the primary interest.

The Department of Labor, Bureau of Apprenticeship and Training (BAT) created pursuant to the 1937 National Apprenticeship Act (commonly called the Fitzgerald Act) sets standards which apprenticeship programs should meet and operates nationwide through ten regional offices. State Apprenticeship Councils (SAC) exist in 29 states and are recognized by the Department of Labor and empowered to implement BAT standards.

Training in the open shop sector has largely developed since World War II, coinciding with the growth of open shop construction activity. In the 1950's a number of returning veterans who had learned their

construction skills while in the service, unable to obtain membership in unions representing their particular skill, turned to open shop for their livelihood. As open shop activity grew, the need for specific training was recognized and was developed by associations of open shop contractors-however at a much lower rate than the overall growth of the open shop construction.

During the late 1960's and early 1970's, there was tremendous demand for construction. Full employment, plus pressure to complete projects on schedule, resulted in spiraling wage increases and lower productivity. Both of these set the stage for a surge in growth of open shop construction' in the 1970's. The housing boom, the interstate highway system, and strong demand in industrial construction stimulated the rise and its encroachment into formerly union-only domains.

During this period, a few large industrial contractors initiated training programs of their own to take care of their own requirements.

The vast majority of training programs provided open shop contractor through their associations are patterned after traditional apprenticeship programs sanctioned by the BAT. Those developed by individual large contractors emphasized specific training to meet immediate needs and are not registered with the BAT.

The forecasted manpower demands of the 1980's make it clear that the need for construction training will continue. A major obstacle facing open shop contractors today is the development of adequate training programs to provide trained craft workers to meet these demands.

IV

FINDINGS

The study team included user representatives with experience in craft training and construction labor relations, open shop contractors interested in craft training, and contractor association representatives responsible for open shop training, planning and curricula.

The findings of the study reflect the personal background and experience of the team members. Information was gathered through interviews by team members who personally visited various association chapter locations to obtain first hand information from local training directors. Those associations known to have open shop training pro-

grams are listed in Appendix 1. The locations visited are listed in Appendix 2.

This report does not pretend to be a comprehensive review of all aspects of training within the construction industry or even within the open shop sector of the industry. Problems were perceived and are reported. They may represent only the "tips of the icebergs". However, the overall thrust of the report is valid and presents problems which need to be faced by both contractors and owners.

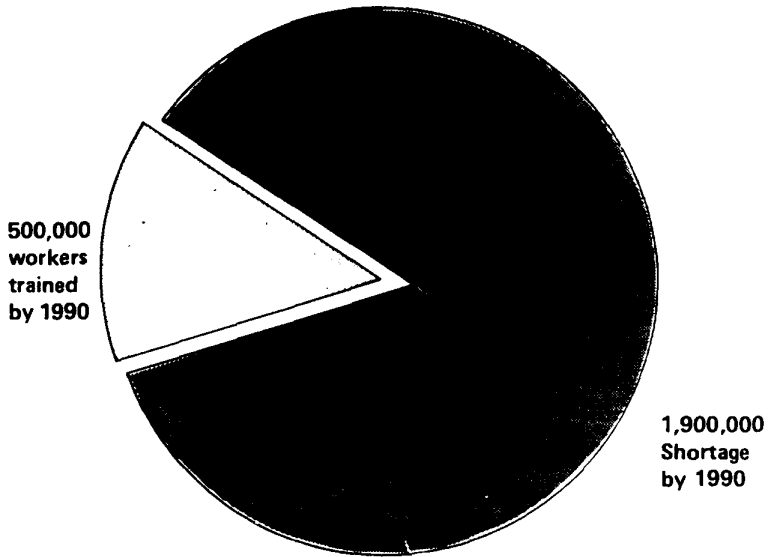
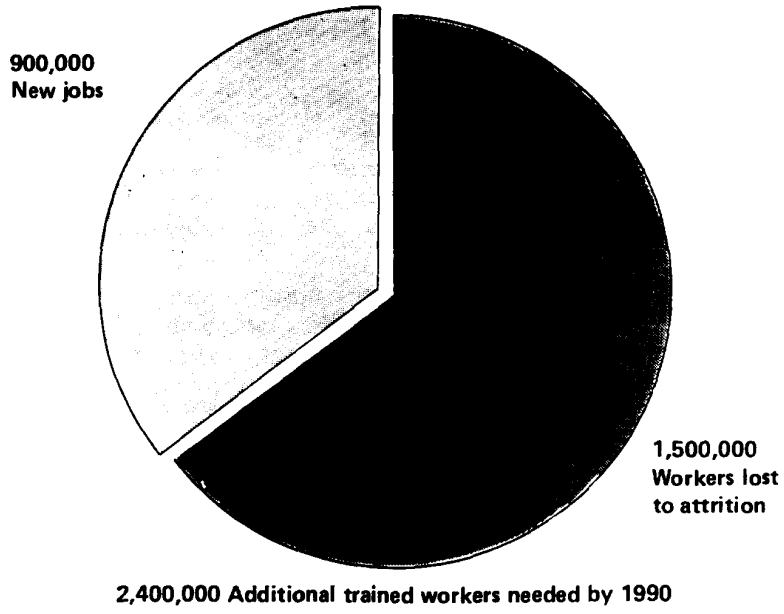
Published Data

The Department of Labor Bureau of Labor Statistics¹ in 1980 estimated that 900,000 new jobs would be created for construction craftworkers by 1990. In addition, 1.5 million vacancies will occur by workers leaving the industry because of retirement or transfer to other industries. Thus a total of 2.4 million new construction workers will be needed by 1990. Present construction craft apprentice and task training programs are graduating an average of 50,000 per year. Unless training of construction workers is significantly increased, a severe shortage could result. Figure 1 illustrates this problem.

It is important to recognize the inadequacy of statistical data and cost information associated with the training of construction workers. Fairly good records were kept by the BAT on participants in BAT/SAC approved programs through 1979, at which time reporting of this information ceased. The only information found on non collective-bargaining agreement [non-joint] programs was that reported by Bourdon and Levitt² showing the 1978 participation of apprentices in joint and non-joint approved programs in selected crafts. (Table 1.)

¹ Department of Labor, Annual Construction Industry Report, April, 1980

² Reprinted by permission of the publisher, from ***Union and Open-Shop Construction*** by Clinton C. Bourdon and Raymond E. Levitt (Lexington, Mass., Lexington Books. D.C. Heath and Company, Copyright 1980, D.C. Heath and Company).



SOURCE: ANNUAL CONSTRUCTION INDUSTRY REPORT DEPT OF LABOR 1/80

Currently training less than 50,000 workers per year

FIGURE 1

TABLE 1
APPRENTICES IN SELECTED JOINT AND NON JOINT
PROGRAMS
1978 U.S. TOTALS

	JOINT	NONJOINT	TOTAL	%NONJOINT
Bricklayers	6,768	650	7,418	9
Carpenters	31,191	3,438	34,629	10
Cement masons	2,513	88	2,601	3
Electricians	19,330	6,887	26,217	26
Floor coverers	1,230	80	1,310	6
Glaziers	903	98	1,001	10
Insulation workers	1,807	196	2,003	10
Lathers	1,210	41	1,251	3
Operating engineers	4,997	143	5,140	3
Painters	5,381	205	5,586	4
Pipefitters	8,261	403	8,664	5
Pipe and steam fitters	916	14	930	2
Plasterers	1,171	15	1,186	1
Plumbers	10,588	4,913	15,501	32
Roofers	4,184	228	4,412	5
Sheet metal	6,707	1,125	7,832	14
Sprinkler fitters	1,761	183	1,944	9
Structural steel	6,671	97	6,768	1
Drywall tapers	1,206	147	1,353	11
Linemen	1,624	114	1,738	7
TOTAL	118,419	19,065	137,484	14

From this tabulation, the percent participation in non-joint programs amounted to only 14 percent. In only two crafts, electricians with 26% in non-joint programs and plumbers with 32% in non-joint programs was this average exceeded. The total apprentices in joint and non-joint programs reported by the BAT at the beginning of 1978 totaled 158,417 and at the end of 1978 totaled 175,303. The Bourden and Levitt figure of 137,484 apparently omitted some crafts. The discrepancy does not affect the conclusions drawn as to the percent participation in non-joint programs.

According to BAT, in 1978 there were about 14,200 construction industry apprentice programs registered with the BAT/SAC. Over 10,000 of these were nonjoint programs while about 4,000 were joint programs. Less than 200 of the nonjoint programs were run by contractor associations while essentially all of the 4,000 joint programs involved contractor associations. This means the vast majority of nonjoint programs were individual contractor run programs designed to train a few individuals by a single contractor. It appears that registration of such programs with BAT/SAC by individual con-

tractors enables them to have such apprentices work on federal or state funded projects at apprentice rates and also ensures that veterans benefits are available to such individuals. The study team estimates that as many as 10-12,000 of the nonjoint apprentices shown in Table 1. might be in this category. No information is available which would indicate what portion of these nonjoint programs are sponsored by open shop contractors, but it was the consensus of those with whom this was discussed that it was less than half.

Overall analysis of these data led to the conclusion that less than 10 percent of those completing construction craft training are in open shop programs.

An Overview Of Open Shop Training

Open shop construction training takes place primarily through three major sources; the Associated General Contractors (AGC), the Associated Builders and Contractors (ABC), and the activities of a few large open shop industrial contractors located in the southeast and southwest part of the country.

The open shop training activities of the AGC are concentrated in the Carolinas where they have been in existence since the late 1940's. During the late 1960's the Carolina Construction Training Council was formed to coordinate AGC training throughout the Carolinas. In the early 1970's it was expanded to include specialty trade contractor members. During recent years this group has had some 700-800 craft participants annually. About two thirds of these were in the specialty crafts of electrician, plumber or sheet metal working. Well-equipped training facilities are maintained and some 300 contractor members participate.

During the 1970's a few other AGC Chapters developed open shop training programs, but the study team was unable to find any programs which had received BAT or SAC approval. On the other hand, most of the 11:3 AGC Chapters sponsor an estimated 1,500 jointly administered union apprenticeship programs. The current level of total spending by AGC Chapters on open shop training programs appears to be about one million dollars per year.

The first formal ABC open shop (nonjoint) apprentice training program was approved in Baltimore in 1959 by the State Apprenticeship Council. Not until 1970 did ABC obtain BAT approval of any of its construction apprenticeship programs.

The open shop training activities of ABC have expanded both geographically and numerically since 1970. By mid 1982 about half of the total 72 ABC Chapters were sponsoring some 170 separate training programs with a total enrollment of close to 5,000 participants. About

\$2 million annually is now being spent on training by ABC Chapters. A more detailed discussion of these programs is provided later in this report.

The formal training programs sponsored by both AGC and ABC generally follow the traditional BAT/SAC apprenticeship programs and are time-based rather than competency-based.

Early in 1980, AGC gained approval from BAT of its *Unilateral Trainee Program Standards* and by mid 1982, BAT regional offices had approved 12 programs started by 6 Chapters located in the southeast and southwest part of the country. About 400 participants are currently enrolled in these trainee programs. Additional programs are being developed.

The most extensive open shop craft training found by the study team was that done by five large industrial contractors working primarily in the southeast and southwestern part of the country. Essentially all of this training was task-oriented and none of the programs were registered with BAT. Collectively these programs trained more than the total of all of the above association programs. Recently, the yearly total participation in these training programs averaged 12,000. The yearly cost to the five contractors totaled \$8-9 million.

The study team found no significant effort by any of the major specialty contractor associations to support open shop training. Training is carried out through the National Association of Home Builders; however, its impact was not determined since primary effort of the CICE Project has been in the industrial, commercial and power segments of construction.

ABC Association Programs

Open shop training programs, conducted by about half of the ABC Chapters are open to all contractors - members and non-members.

Most of the programs cover four trades-carpentry, electrical, plumbing, and sheet metal. Ironworking, bricklaying, and cement finishing are taught in less than a third of the programs. Training of other skills depends upon the level and type of construction activity in the area and those found included welding, operating engineer, instrumentation, painting, insulation, HVAC, roofing, and construction mechanic. Apprentice participation is highest in electrical in almost every area of the country and accounts for over half of the total 5,000 participants in the ABC programs. Plumbing, carpentry, and sheet metal followed in that order and accounted for 20%, 15% and 10% of the total participants respectively. Most of the ABC programs are geared to commercial and light industrial work with little training for heavy industrial work.

The study indicates that where these programs have been established within the framework of a formal apprenticeship program, the number of classroom and on the job training hours is consistent with the government requirements of 144 classroom hours and 2,000 job site hours per year. Most programs take three to four years to complete, similar to their counterparts in the union sector. Those programs that differ in the required number of hours (classroom and job site) generally do not have BAT or SAC approval.

Training is conducted through utilization of the facilities of vocational schools, high schools, junior colleges, universities, as well as contractor's shops, and leased or rented facilities. Trainees generally attend classes four hours weekly on their own time without pay.

Programs as a whole have had good success in recruiting large numbers of applicants, but as is the case in union apprenticeship programs, a large percentage fail to complete the program. The record shows an annual completion rate of some 10 to 13 percent of the total enrollment in the open shop programs. This seems to indicate a dropout rate of 50 to 60% of those entering the programs.

A major problem appears to be apathy on the part of the contractors. Some contractors characterized this by saying "Training just doesn't have any sex appeal." In all too many cases, contractors feel that their need for trained manpower is met by hiring additional qualified manpower from a competitor as the need arises.

The research showed that less than one-third of the association member contractors participate in the training programs even where they are available. Six reasons for this contractor non-participation in training programs are:

1. Fear of losing a bid due to added training costs.
2. Fear of training employees and losing them to a competitor.
3. Fear of working with a non-proven program.
4. Failure to recognize a need for training, since workers can be pirated from their competitors.
5. Lack of employee acceptance of traditional training programs.
6. Lack of appreciation of the improved productivity that can be realized through training of their workers.

Owner Supported Programs

The study team found that in the industrial sector it was not uncommon for owners to support open shop training programs recommended by contractors to help alleviate manpower shortages on particular projects. Some arrangements were found where owners

would accept a flat ten cents per hour on total hours worked relying on the contractor to provide the necessary training required.

The more usual form was where mutual agreement was reached regarding the type and extent of specific training needed and where the out-of-pocket cost of the training was borne by the owner. The program listed as number 10 in Appendix 2 is of this type.

Two other programs surveyed deserve special comment. One is the program sponsored by the Texas Gulf Coast ABC Chapter located in Freeport, Texas. The cost for this program is underwritten primarily by a single industrial owner who has extensive continuing construction activity in the area. The owner has encouraged local contractors' participation in the operation of the program and, in addition to contributing financial support, he has in some cases provided instructors. This program has received BAT approval and operates according to traditional apprenticeship training standards.

The second program operates in the nearby Houston metropolitan area and is sponsored by a division of the Greater Houston ABC Chapter. Task training courses are offered on a quarterly basis. These courses provide contractors with the opportunity to enroll employees in initial craft training or to up-grade training. These courses are short, (generally 32-40 hours duration), concise, hands-on type training with classes held after hours, usually at a nearby vocational facility. Funding for this program is primarily underwritten by industrial owners in the area who voluntarily accept a charge of one half of one percent of their direct field labor cost as a line item in their contractors regular invoices. Some 24 task training courses and 9 supervisors or management courses are offered.

Training Administration

The team found all groups visited had a full time staff to administer the training program. While one group had 17 persons full time, most groups averaged three full time staff. Instructors were generally individuals who had achieved journeyman status with many having prior teaching experience. The groups recruited their instructors by advertising, word of mouth from contractor members, community colleges, industrial companies, suppliers, and from the ranks of senior citizens.

Compensation for instructors ranged from \$8.50/hour to as high as \$20.00/hour, depending on skills sought and general salary levels in the area. Partial or full compensation was provided by local Boards of Education in over 50% of the cases. The training staffs report either through an Association Education Director or directly to the

Association Chapter Executive Director, who, in turn, reports to a contractor board of directors.

Guidelines for training programs were generally established by the local association's apprenticeship committee after review of the BAT or SAC requirements and data secured from state and national contractor associations.

Most programs provide for apprentices to attend formal class training for eight to nine months per year with a particular skill generally requiring three to four years for completion. The total cost for the formal training including all books, tuition, instructors, classrooms, teaching aids, and administrative costs, ranged from \$300 to \$600 per student per year. The total cost per student per classroom hour ranged from \$2.50 to approximately \$5.00 per hour, with the average being \$3.00.

A cost analysis made of three different open shop task training programs, not a part of approved apprentice programs, indicated an average cost per participant learning hour of \$3.50. This is close to the \$3.00 per classroom hour for the formalized apprenticeship training.

Curriculum Development

One of the problems faced by contractors interested in training their workforce has been the unavailability of training materials and methods needed by small contractors who comprise the great majority of firms which perform open shop construction. Training curricula developed by the union sector in addition to being in the traditional format are also protected under copyright laws.

In recent years the AGC in cooperation with the Oklahoma State Board of Vocational and Technical Education has developed and validated competency-based instructional systems for the construction industry. These systems provide contractors and instructors with the necessary tools for implementing craft-worker training programs that meet the current demands of the industry.

Programs developed through these efforts are primarily aimed at the basic trades generally associated with the AGC and include bricklaying, commercial carpentry, cement masonry, heavy equipment operator, millwright and multi-craft construction craftsmen. These programs have been used by individual contractors, by jointly administered union apprentice programs and by AGC Chapters in implementing recently approved AGC ***Unilateral Trainee Programs*** mentioned earlier.

In 1979, the ABC initiated an ambitious program, to extend through 1986, aimed at developing training curricula in 21 separate construction trades. This program, a project of the Merit Shop Foundation, and known as the ***Wheels of Learning*** is being implemented through contracts with several midwestern universities to develop appropriate instructional modules for the different trades. These modules are then field tested by a number of contractors to ensure their applicability to current construction practice and problems.

By the end of 1982 it is expected that curricula in 10 trades will have been prepared and tested:

- First, second and third year of a planned four year curriculum for electrical and plumbing.
- First and second year of a planned four year curriculum for sheet metal and (HVAC).
- First and second year of a planned three year curriculum for ironworking, painting and masonry.
- First year of a planned four year curriculum for carpentry and pipefitting.
- First year of a planned two year curriculum for welding.

Expenditures through 1982 of \$1.5 million will represent about one-third of the expected total cost. Support for this program has come primarily from ABC members. ABC has recently made an across the board assessment to all members to provide necessary funding. Some support to the program has also been provided by special grants from a few industrial companies and foundations which fund meritorious educational activities. The study team felt this broad based program, which can provide a good source of skilled craftsmen required in the industrial sector, merits financial support from industrial and commercial construction owners.

Funding Of Open Shop Training

During the course of the study, a major problem, given the need for programs and means of training new workers for the open shop sector of construction, was how to fund such training. The need for a uniform across-the-board cost charge to underwrite training costs was often mentioned. This parallels the funding for training in the union sector where a cents-per-hour charge is in most collective bargaining agreements. The terms of these agreements, generally negotiated by contractor associations, apply to all who use union labor whether or not a member of a association. Thus in the union sector there is broad financial support for training which is directly charged to the ultimate owner as part of the cost of the facility-be it a building, industrial plant, power plant or a highway.

In order to provide some perspective, the Construction Labor Research Council (CLRC) was requested to determine the extent to which training funds exist in the union sector. CLRC monitors some 3100 collective bargaining agreements in the construction industry covering about 85% of all union construction workers. Seventy-four percent of these agreements contained provisions for apprentice training with charges ranging from two cents to a few over 50 cents-per-hour. In over forty of these agreements the charge is in excess of 25 cents-per-hour. The nationwide average for all apprentice training for all contracts monitored, weighted in proportion to union members covered, amounted to 9 cents-per-hour.

The Department of Labor reports³ the membership of building trades unions involved in construction as 2,778,000. CLRC studies⁴ indicate that the number of union members actively employed in construction is 1,605,000. Assuming each worked an average 1600 hours per year⁵ the total amount available for apprentice training in the union sector would be 230 million dollars. This includes only those funds administered at the local level.

This is in significant contrast to the total of \$11-12 million identified by the study team as spent in the open shop sector. Although hard data as to the funds for open shop training spent by homebuilders and other individual contractors was not available, the study team concluded that less than 10 percent of all funds going into construction craft training is directed toward open shop craft training. Figure 2 dramatically shows the disparity between availability of training funds.

³ **Annual Construction Industry Report** - April, 1981 U.S. Department of Labor, Office of Construction Industry Services

⁴ **Union-Nonunion Employment Trends in Construction**, Construction Labor Research Council, April, 1981

⁵ Annual Hours of Construction Workers, Contractors Mutual Association, April 24, 1975

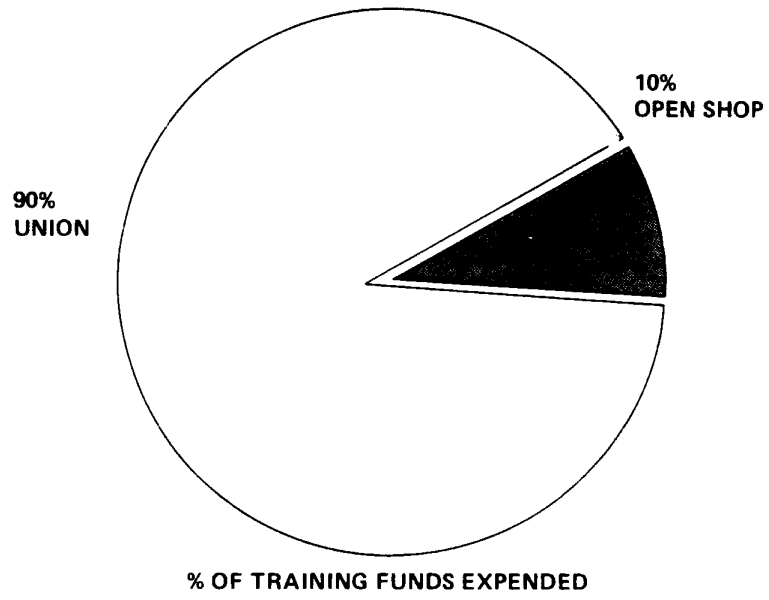
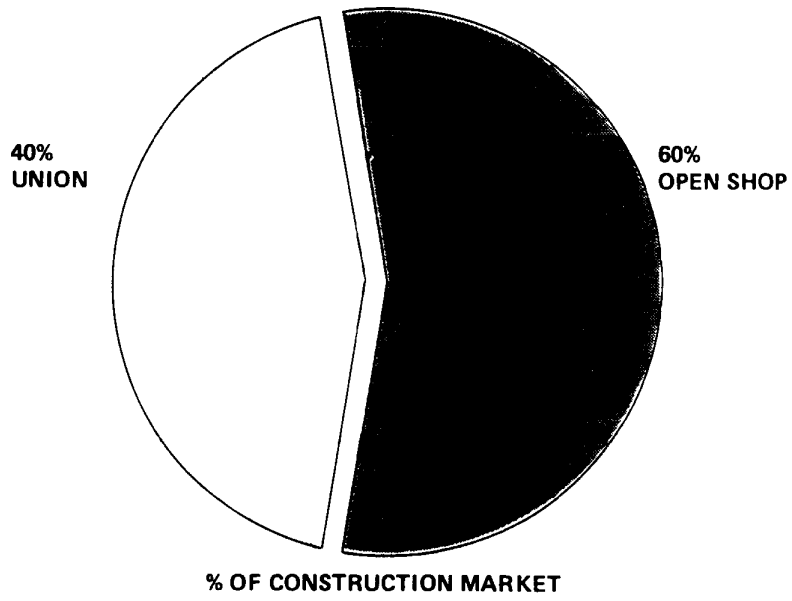


FIGURE 2

The study team explored legal means whereby broader financial support for open shop training might be obtained. In general it was determined that:

- (a) There appears to be no problem involved in an across-the-board cents-per-hour charge in support of construction training if voluntarily accepted by owners.
- (b) There are no problems if a contractor association imposes an assessment to support training on all of its members in proportion to the volume of work done by each member.
- (c) There are no problems if an individual contractor charges its clients a uniform cents-per-hour charge to support construction training either for his separate training program or as part of an association training program.

Current practice is for contractors to cover the cost of training either in their overhead or as a direct pass-through to the owner. In the case where a contractor pays for training in his overhead, it may be for a specific project, or included in a general overhead on all projects bid.

In only two cases (mentioned earlier under Owner Supported Programs) was the direct pass-through to the owner found. The contractor bills the owner either on a percentage of labor cost or on a cents-per-hour basis.

Open shop training budgets of contractor association chapters appear to vary from as low as \$10-15,000 per year for programs in a single craft to as high as \$500,000 per year found in the Carolinas. Generally the chapter programs averaged \$50-75,000 per year and totaled some \$3,000,000 per year for both ACG and ABC training activity.

V

CONCLUSIONS

- Less than 10 percent of those individuals completing construction craft training programs are being trained in open shop programs, in spite of the estimate that open shop contractors now perform 60 percent of all construction work.
- Less than 10 percent of all funds currently spent in training construction craftsmen are directed toward open shop programs.
- If the open shop sector of construction remains at the present level without a significant increase in open shop training, there could be a long-term deterioration in the quality and productivity of the construction work force.
- Only in a few areas of the country is open shop construction training conducted at a level commensurate with the growth of open shop construction activity,
- The fragmentation existing within the construction industry tends to reduce the effectiveness of most training programs within the industry.
- Many open shop contractors do not recognize the improved productivity that can be realized through the training of their workers.
- There is a need for a continuing effort toward a well-developed curriculum of construction craft training programs for use by open shop contractors, particularly in the specialty trades, and adapted to the needs of industrial construction.
- Though the open shop sector tends to use vocational education facilities more than does the union sector, their use by the open shop sector is still far less than the potential available.
- Greater emphasis should be placed on development of task-oriented curriculum.
- There is essentially no understanding on the part of owners as to how craft training takes place within the construction industry or how it is funded.

- Training in the union sector is funded through negotiated across-the-board cents-per-hour charges paid by all contractors which serve to finance joint labor-management administered union apprenticeship programs. A comparable funding method is needed for the open shop sector.
- Only a small percentage of open shop contractors in any area make any effort to involve themselves or contribute financially toward the development and training of craft manpower.

VI

RECOMMENDATIONS

The responsibility for training in open shop construction rests with contractors and their contractor associations. Since training costs are ultimately borne by owners, the recommendations of this report set forth actions recommended for individual contractors and outlines the supportive role recommended for individual owners to improve open shop craft training.

Contractors should consider:

- Establishing open shop Construction Training Councils or Centers in metropolitan areas similar to those which now exist in the Carolinas. Such Councils will be most effective if they are only concerned with training of construction skills and are supported broadly by contractor associations in the area. It is essential that such Councils use a well-developed nationally recognized and accredited curriculum.
- Developing a broad funding mechanism to support open shop craft training. It is legally possible to have individual labor arrangements which provide for payment of a cents per hour labor charge to be allocated to support a local Construction Training Council or Center providing a broad spectrum of craft training.
- Strengthening liaison relationships between open shop contractor associations and vocational education directors and educators in their areas. This could be an essential part of the development of local Construction Training Councils.

Owners should consider:

- That it is in their self-interest to ensure that sufficient funding and effective programs for training craftsmen are provided to meet future needs.
- Working through Local Users Groups, to develop programs which increase owner awareness of craft training activities within both the union- and open-shop sectors of the construction industry.
- Support of contractors in their area in the establishment of local Construction Training Councils or Centers.
- Working with contractors in developing a broad funding mechanism to support open shop craft training.

- Including in bid solicitations a requirement that contractors outline their plans for assessing adequately trained workmen and the extent of their financial support to craft training programs.
- Including a clause in their bid solicitations to the effect that each contractor shall include in his bid an amount equal to ___ cents per field man-hour worked to be used in a mutually agreed upon craft training program.
- Including in bid solicitations on cost reimbursable work a willingness to accept contractor contributions to mutually agreed upon training programs as a reimbursable cost.
- Support and financial assistance to national construction craft curriculum development programs such as ABC's ***Wheels of Learning***.

APPENDIX 1

ASSOCIATION OPEN SHOP CRAFT TRAINING PROGRAMS

ASSOCIATED BUILDERS AND CONTRACTORS

Wheels of Learning (curriculum development)
Local chapter apprenticeship training programs.

ASSOCIATED GENERAL CONTRACTORS OF AMERICA

Carolina Construction Training Program.
Craft training programs - carpentry, masonry, at local AGC chapters.
Curriculum development in the basic trades.

NATIONAL ASSOCIATION OF PLUMBING-HEATING-COOLING CONTRACTORS

Four-year plumbing curriculum being used by vocational schools, ABC chapters, and unions.

ASSOCIATED INDEPENDENT ELECTRICAL CONTRACTORS OF AMERICA

Four-Year electrician program being offered through their local chapters.

PAINTING AND DECORATING CONTRACTORS OF AMERICA

Working with ABC to develop programs in the painting trade.

NATIONAL INSULATION CONTRACTORS ASSOCIATION

Have training program curriculum, but not used by their open shop members.

NATIONAL ASSOCIATION OF HOME BUILDERS

Have craft training programs in the carpentry, electrical, plumbing, sheet metal, HVAC, and maintenance trades for the home building industry.

APPENDIX 2

LOCATIONS VISITED AND PROGRAMS SURVEYED

Sponsor	Geographical Area	Type Training
1. ABC, Texas Gulf Coast Chapter	Freeport, Texas	Apprenticeship
2. ABC, Greater Houston Chapter	Houston, Texas	Apprenticeship
3. ABC, Central Ohio Chapter	Central, Ohio	Apprenticeship
4. AGC, Carolina Construction Training Council	N & S Carolina	Apprenticeship
5. ABC, Central Alabama Chapter	Alabama	Apprenticeship
6. ABC, Rocky Mtn, Chapter	Colorado	Apprenticeship
7. Merit Shop Training Center	San Francisco Area	Task Training
8. ABC, Baltimore Chapter	Baltimore Area	Apprenticeship
9. ABC, Central Florida Chapter	Central Florida	Apprenticeship
10. Zachry/Dupont Companies	Victoria, Texas	Task Training
11. ABC Wheels of Learning Curriculum Development	Nationwide	Both

CICE REPORTS

The Findings and Recommendations of The Business Roundtable's Construction Industry Cost Effectiveness project are included in the Reports listed below. Copies may be obtained at no cost by writing to The Business Roundtable.

Project Management -- Study Area A

- A-1 Measuring Productivity in Construction
- A-2 Construction Labor Motivation
- A-3 Improving Construction Safety Performance
- A-4 First and Second Level Supervisory Training
- A-5 Management Education and Academic Relations
- A-6 Modern Management Systems
- A-7 Contractual Arrangements

Construction Technology -- Study Area B

- B-1 Integrating Construction Resources and Technology into Engineering
- B-2 Technological Progress in the Construction Industry
- B-3 Construction Technology Needs and Priorities

Labor Effectiveness -- Study Area C

- C-1 Exclusive Jurisdiction in Construction
- C-2 Scheduled Overtime Effect on Construction Projects
- C-3 Contractor Supervision in Unionized Construction
- C-4 Constraints Imposed by Collective Bargaining Agreements
- C-5 Local Labor Practices
- C-6 Absenteeism and Turnover
- C-7 The Impact of Local Union Politics

Labor Supply and Training -- Study Area D

- D-1 Subjourneymen in Union Construction
- D-2 Government Limitations on Training Innovations
- D-3 Construction Training Through Vocational Education
- D-4 Training Problems in Open Shop Construction
- D-5 Labor Supply Information

Regulations and Codes -- Study Area E

- E-1 Administration and Enforcement of Building Codes and Regulations

Summaries - More Construction For The Money

- CICE: The Next Five Years and Beyond

Supplements - The Workers' Compensation Crisis...Safety

- Excellence Will Make A Difference (A-3)