



CONSTRUCTION INDUSTRY INSTITUTE®

THE SHORTAGE OF
SKILLED CRAFT WORKERS
IN THE U.S.

Construction Industry Institute

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The Shortage of Skilled Craft Workers in the U.S.

**Prepared by
The Construction Industry Institute
Addressing the Shortage of Skilled Craft Workers in the U.S.
Project Team**

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Executive Summary

Shortages of skilled craft workers continue to plague the construction industry. Employers have attempted to identify the root causes and to develop strategies to overcome these shortages. The Construction Industry Institute (CII) and others have funded research on the problem and generated potential solutions. The industry now uses, although sporadically, a number of initiatives including craft and supervisory training, multi-skilling, and self-directed work teams as well as productivity enhancements utilizing technology, constructability, and prefabrication. Efforts to quantify or qualify the resulting benefits, however, have been unsatisfactory.

Despite this research and the efforts to stem the problem, the construction industry's skilled worker pool continues to shrink. The decreasing number of young people entering the work force and the failure to recruit from non-traditional labor pools both contribute to this troublesome trend. Over the past 30 years, real wages of construction workers have declined relative to those of other workers. Poor industry image, tough working conditions, and the industry's perceived poor safety record (despite the stellar performance in safety by CII members) also have contributed to the decline in the number of people willing to enter and remain in the industry.

In 2001, CII commissioned Project Team 182, Addressing the Shortage of Skilled Craft Workers in the U.S., to conduct a study on recruiting and retaining qualified craft workers. Based upon its examination of the industry, PT 182 concluded that:

- The journeyman-level work force is as educated as the rest of the U.S. population.
- The construction work force is failing to attract women and minorities.

- The construction work force can be characterized as two divergent work forces: one that is satisfied with the work and is willing to participate and improve skill levels; and a second that is transient, unsatisfied, and will quickly leave the industry when other opportunities arise. These two work forces have vastly different characteristics and need to be managed accordingly, thus there is a need for two different work force management strategies.
- Currently the industry is not utilizing any formal, structured work force management strategies, nor does it have a way to measure the success of its current management practices.

PT 182 found a particular interest in a recent collaboration between CII and the Center for Construction Industry Studies (CCIS). That study produced a theoretical model for a revolutionary new way to address the issue in a more comprehensive manner. Although the method, called “Tier II,” is new and future-oriented, it may have a considerable impact on the construction work force and industry.

PT 182 developed a complimentary strategy to Tier II to address the work force shortage: Tier I. It is based on the concept that productivity gains from optimal management of the work force will relieve pressure on demand and will encourage workers to remain on a project and in the industry. These productivity gains will be achieved by applying training, collaboration, and the use of technology in a systematic way to maximize the effectiveness of the front-line supervisors. Tier I proposes that the cohesive, structured implementation of industry accepted best practices will improve the management and utilization of the work force.

It is important to note that the focus for Tier I is on the management and supervision of the work force on a project. Explicitly choosing a work force management strategy in early project planning stages should allow for systems to be put into place, recruitment to be focused, and crews to be structured in a way that will result in better project performance.

Implementing a Tier I or Tier II Work Force Management Strategy will require management commitment. Part of this strategy is the utilization of the Tier I and Tier II Metrics that help to evaluate the implementation of these strategies. Implementation guidelines and a Work Force Assessment Package are currently being developed.

This research summary provides an overview of the work of PT 182 and the findings in the study that led to the development of the Tier I strategy, which shows promise not only in productivity gains, but in recruitment and retention of a skilled crafts work force. Implementing the recommendations made here should help to reduce demand and improve supply of skilled construction workers in the U.S.

Introduction

Since the 1970s, a steady decline in the availability of skilled labor in the construction industry in the United States has hampered the industry. A 2001 study conducted by the Construction Users Roundtable (CURT) found that 82 percent of owners reported shortages of skilled labor on construction and industrial maintenance projects. Of the firms reporting shortages, 73 percent indicated that the impact to their projects was moderate to significant.

In 2001, a study by CII and the Center for Construction Industry Studies (CCIS) produced a theoretical model for a revolutionary new way to address the issue in a more comprehensive manner. This model, Tier II, is based on three propositions:

1. The sporadic, uncoordinated use of best practices such as craft training, multi-skilling, and self-directed work teams, is unlikely to result in a meaningful change or to meet future demands for qualified skilled craft workers. What is needed is a systematic approach that incorporates all known best practices in a coordinated way.
2. This systematic approach would result in a higher skilled craft worker (i.e., a Tier II worker), higher productivity, and reduced costs. This higher productivity would allow contractors to pay Tier II craft workers a higher hourly wage resulting in increased retention of the work force. This combination of higher productivity and lower turnover would decrease the total number of workers that would have to be hired for each project.
3. The adoption of universally accepted metrics would drive behavioral changes in the industry by placing value on strategies to promote Tier II craft workers.

Research Objectives

PT 182 was tasked to provide research that would help the industry understand the root causes of the current skilled worker shortage, and to use that understanding to develop and implement recommended initiatives and guidelines for key stakeholders to address the problem. The specific objectives of the research effort were to:

- Quantitatively document the degree, location, and type of skilled worker shortages.
- Identify the root causes of each shortage, including historical and policy aspects.
- Document the current level of utilization of best practices as they relate to employment, work force retention, and training of skilled craft workers.
- Identify effective programs and practices to counteract the shortages.
- Identify and develop cohesive corporate strategies.
- Implement a high value-added strategy developed in the CII-CCIS study.
- Suggest institutional solutions to minimize future shortages.

Research Developments

During its literature review, PT 182 was able to quickly summarize the factors that led to the development of Tier II. First, the basic elements of an effective craft employment strategy are already known in the industry. Second, contractors rarely employ a consistent craft employment strategy in a coordinated way, minimizing the benefits of any particular element. Third, consistent industry-wide metrics to measure utilization of effective craft employment strategies do not exist. Although Tier II is a new and future-oriented strategy that should have a considerable impact on the construction work force and industry, there may be occasions where the utilization of Tier II workers is either not practical or appropriate.

PT 182 embarked on developing an alternative strategy that, while focused on front-line supervisors, could provide more immediate productivity gains through training and the use of technology. The Tier I strategy, as the team labeled it, is based on the concept that productivity gains will be achieved by applying industry accepted best practices (training, collaboration, and the use of technology) in a systematic way to maximize the effectiveness of the front-line supervisors. Although current best practices are being used in some areas on some projects, Tier I proposes that the conscientious, structured implementation of all of these best practices in a coordinated way will improve the management and utilization of the work force. It is anticipated that this will lead to improved productivity, reduced absenteeism and turnover, and eventually to overall project success.

Table 1 (next page) compares the most distinguishing characteristics of the Tier I and the Tier II Strategies and is just a summary. More information on the Tier II Strategy can be found in Borcharding et al (2001) and Castañeda-Maza (2002). The following chapters detail the reasons for developing the Tier I strategy, and provide metrics that point the way to its future use.

Table 1. Characteristics of Tier I and Tier II

Tier I	Tier II
Highly skilled front-line supervisors in all crafts	Highly skilled journey-level workers (computer skills, planning skills, management skills) in key crafts
Single-craft journey-level workers	Multi-skilled/ multi-crafted journey-level workers
No pay differential to workers for skill	Workers are paid a higher wage for their higher skill level
Traditional, top-down management structure	Pro-active, horizontal management structure
Strong communication between field supervisors and project managers	Strong communication between journey-level workers and project managers
Information Technology used extensively at field supervisor and project management level	Information Technology used extensively at all levels
Large labor pool available (possibly unskilled)	Skilled labor available
Management, Computer, Planning training available to field supervisors only	Management, Computer, Planning training available to journey-level workers
Task training available to workers	Craft training available to workers
Traditional hierarchical work environment at crew level in all crafts	High Performance Work Teams utilized at the crew level (for key crafts)

The Strategy-Driven Model for Craft Recruitment and Retention

Current practices for craft recruitment and retention could best be described as unstructured and uncoordinated. This approach has not resulted in any appreciable improvement and is not expected to do so in the future. PT 182's Strategy-Driven Model for craft recruitment and retention allows owners and contractors to predetermine a coordinated strategy utilizing industry accepted best practices based on the unique challenges of a specific project. It is designed for locations with skilled craft shortages, short-term or time-sensitive projects, sites where it is not feasible to bring in a skilled work force, or in locations where the training and experience of the work force is minimal.

Figure 1 describes the anticipated effect of utilizing a Strategy-Driven Model (i.e., Tier I or Tier II) on the overall number of craft workers needed in the industry over time. The hypothesis is that as contractors

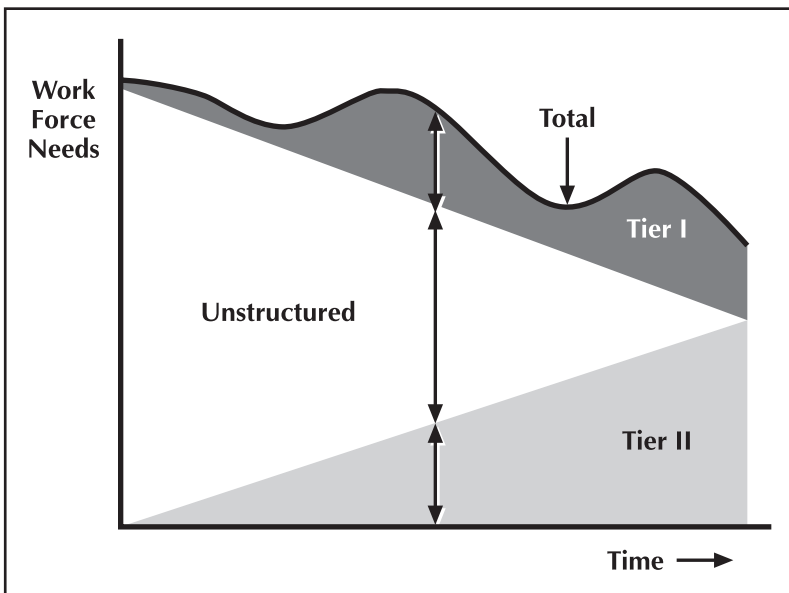


Figure 1. Work Force Needs Over Time Using Tier I and Tier II