

**INDEPENDENT STUDY IN MICHIGAN SHOWS  
CONSTRUCTION PRODUCTIVITY IMPROVEMENT OPPORTUNITIES THROUGH  
EARLY DESIGN WORK AND COORDINATION AMONG OWNERS, CONTRACTORS  
AND BUILDING TRADES**



An independent study on construction productivity in Michigan has concluded that early design work, more up front coordination and communication between contractors, building trades and project owners, pre-project planning and more “hands on” involvement in projects by architects and project owners are the necessary ingredients to increase construction productivity.

“Construction is one of the few industries in which productivity has remained relatively flat, growing at less than one percent per year, while labor productivity as a whole has grown at two to three percent per year. This study was undertaken to try and find ways to overcome obstacles to construction productivity improvement not only in Michigan, but around the country,” said Dr. Walter W. Tucker, Professor in the College of Technology at Eastern Michigan University, who conducted the study.

The top five areas offering the best opportunity to increase construction productivity, as identified by the study, are:

- **Constructability of the design documents with input of major contractors on schedule quality and realism;**
- **Coordination among major contractors;**
- **Pre-project planning;**
- **Communication and teamwork between project owners, design professionals, contractors and labor;**
- **Improvement of the construction management process. Consider**

**general contractors instead of  
construction managers.**

Dr. Tucker completed the study after analyzing responses contained in 182 questionnaires filled out by professional construction supervisors working in commercial/industrial construction in Michigan. Ninety percent of the responding supervisors had more than 10 years of experience in the industry and 60 percent had more than 20 years of experience.

“The construction industry, building tradesmen and project owners have an opportunity to achieve real productivity growth by implementing the findings of this study,” said Dr. Tucker. “Doing so would result in huge savings and contribute to Michigan’s economic growth.” He noted that construction represents about five percent of the U.S. gross domestic product and employs some seven million people. Also, construction accounted for about 5.8% of earned income in Michigan between 1991 and 2001.

The Michigan Tri-Partite Committee was formed by a group of construction project owners, contractors and the Michigan Construction and Building Trades Council. It works to collaborate and share plans, problems and successes. Its goal is to develop solutions to utilize limited resources in a cost effective manner.

*The Greater Michigan PMC and Michigan NECA have been working in cooperation with the Michigan Tripartite Committee to deal with the need to improve productivity for the construction user. The summary of the report follows.*

*Please review the total study at:  
[www.mitripartite.com](http://www.mitripartite.com)*

# **Construction Productivity Study Survey to Improve Productivity in Commercial / Industrial Construction**

## **Executive Summary**

***Productivity growth is the single most important economic indicator. It determines how fast living standards can grow. The reason why the average American today is seven times better off than his counterpart at the turn of the century is that he is seven times as productive. And faster growth not only lifts living standards, it also boosts tax revenues and makes it easier to pay for tomorrow's pensions. Sept 21, 2000. Economist.***

This seven-fold increase over the last century means that labor productivity in the economy as a whole has increased by 2-3% per year. However the United States Department of Commerce has determined that the average annual increase in construction productivity is 0.8 %. In national terms, the problem of construction productivity growth is really significant as construction represents about 5% of the U.S. gross domestic product (GDP) and employs some 7 million individuals. (U.S. Bureau of Labor Statistics). If construction related businesses including design, equipment and material manufacturing are included, construction accounts for some 13% of the U.S. GDP. Furthermore, construction employment is projected to grow 13.3% from 2000-2010 with the bulk of these jobs developing in the construction trades. Also important to the Committee is that construction accounted for about 5.8% of earned income in Michigan between 1991 to 2001. (U.S. Bureau of Economic Analysis).

### **Michigan Tri-Partite Committee**

The Michigan Tri-Partite Committee was formed by a group of Owners, Contractors and the Michigan Building Trades. It works to collaborate and share plans, problems and successes with the goal of maximizing

through consensus, usage of a finite resource base in a cost effective manner. In developing initiatives to improve the construction process and cost effectiveness, a number of Task Forces were created. Significant among them was the Productivity Task Force. It was formed to address the concern of the owner/user community that worker productivity had become a problem on the jobsite. The need to work in concert to address the problem of slow productivity growth and seek effective solutions were the charge of the Task Force. This pro-active approach was to seek a solution by undertaking some fundamental research.

The Michigan Tri-Partite Committee met to discuss ways to improve the construction process. Increased productivity was a leading concern for all Committee stakeholders: users, contractors, and construction labor unions; and led by the owners including General Motors, Pfizer, and Consumers Energy. The construction users emphasized the need to collect data directly relevant to productivity improvement. After much discussion, the Committee concluded that the front-line construction foreman/supervisor would be a reliable source of information. These informants would be asked to provide their judgment of the greatest impediments to a productive construction project.

## **Construction Productivity Study Summary**

The survey was to be completed by individuals serving in a supervisory capacity who had been initially trained through an organized contractor and/or building trades union. According to the Construction Users Roundtable, some 25% of all construction cost is from field labor, and that labor is the largest non-material cost on a project. In the opinion of the Committee those individuals supervising field labor could provide insightful opinions on productivity improvement and cost savings.

On large commercial and industrial construction sites, the role of supervisor is often transitory. Individuals may be working in the trades one day on one project, and move to a supervisory role the next day on another project. As a result, developing an effective survey sampling plan was difficult. A scientific randomized sampling plan was virtually impossible because establishing a reliable number of supervisors on a given day could not be computed. A sampling plan was developed using contractors to hand out the surveys to their supervisors on a given day.

Supervisors who wished to respond totaled 182, a number adequate to reflect the overall sample. Respondents were asked to answer the questionnaire based on all of their construction experience. Some 90% of responding supervisors had more than 10 years of experience and almost 60% had more than 20 years. Surveys were returned by late 2002.

The Greater Michigan Plumbing & Mechanical Contractors (PMC) and the Michigan Chapter, National Electrical Contractors Association (NECA) entered into an agreement with Dr. Walter Tucker of Eastern Michigan University to develop, test, and complete a survey addressing the issue

of construction productivity. All respondents would be employees of contractors affiliated with PMC, NECA, and Associated General Contractors (AGC) working in commercial/industrial construction in the State of Michigan. The study was also supported by the Michigan State Building Trades Council. The audience for the survey results was the Michigan Tri-partite Committee.

After initial meetings with industry representatives, an open-ended questionnaire was developed. Three questions were asked:

(1) How many years of experience do you have in the construction industry?,

(2) What are the greatest barriers to productivity improvement on the job site?

Please list at least three barriers in descending order of importance with most important first. and

(3) What do you feel could be done to enhance job site productivity?

Please list at least three improvements/suggestions/ideas in descending order of importance with most important first.

The test questionnaire was given to a pilot group of twelve individuals eligible for inclusion in the study sample. Dr. Tucker handled all pilot responses and strict anonymity was maintained. Feedback from the pilot study indicated that the survey instrument was clearly understood and analysis revealed that the responses were usable and reliable. Additionally, the average time to complete the survey was 20 minutes. This was critical since employers were donating this time to the study.

## **Construction Productivity Study Summary**

PMC, NECA, and AGC representatives made numerous contacts, both by telephone and in person, to encourage contractors to participate.

Dr. Tucker's oversight ensured confidentiality of responses and neutrality in analysis.

One hundred and eighty-two questionnaires were received and analyzed. Statistical analysis indicated that the data were reliable. All comments have been logged and reside in computer files. The data were presented to the Michigan Tripartite Committee Productivity Task Force. A number of subsequent meetings were held to discuss the findings. The Task Force in conjunction with Dr. Tucker concluded that the top two categories of barriers to productivity improvement were Code 5: Design/documentation and change orders/engineering and Code 6: Project management/scheduling/planning. The Task Force then reviewed the comments in these two categories and extracted those they considered to be the most representative. These include:

### **What are the Five Greatest Barriers to Productivity on the Construction Jobsite?**

- 1. Design: specifications, drawings, documents have to be improved.***
- 2. Field support for timely responses; have architect/engineer on site with field competency***
- 3. Coordinate Design/Review***
- 4. Timely RFI's/RFP's (Request For Information's/Request For Proposal's)***
- 5. Construction/Project management competency***

## **What are the Five Greatest Areas with Potential for Productivity Improvement?**

- 1. Constructability of the design documents with input of major contractors on schedule quality and realism***
- 2. Coordination among major contractors***
- 3. Pre-project planning***
- 4. Communication and teamwork between owners, design professionals, contractors and labor***
- 5. Improvement of the construction management process. Consider general contractors instead of construction managers***

The Michigan Tripartite Committee Productivity Task Force, with the concurrence of the full Committee, has agreed that these are logical topics to include in future efforts to improve productivity. An action plan has been developed and pilot projects have been initiated.

The image shows the cover of a report. At the top, it says 'Michigan Specialty Contractors Federation' in white text on a dark blue background. Below that, the title 'Survey to Improve Productivity in Commercial / Industrial Construction' is written in large, bold, blue letters. Underneath the title, it says 'Prepared for the Michigan Tri-Partite Committee' in red. The author's name, 'Walter W. Tucker, Ph.D.', and affiliation, 'Eastern Michigan University', are listed in green. At the bottom, it says 'Study available at: www.mitripartite.com' in red. There are logos for 'MICHIGAN NECA' and 'Michigan Tri-Partite Committee' at the bottom of the cover.

***Study Available at:  
[www.mitripartite.com](http://www.mitripartite.com)***