

Managing Production

Foreman's Development Series

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Objectives

- To make the IBEW more competitive in today's market by increasing the productivity of our Workers
- To study the various aspects of Productivity
 - System and Individual Task Productivity
 - Best Practices that will help improve Productivity
- To give you, the Foreman, a better awareness of these issues



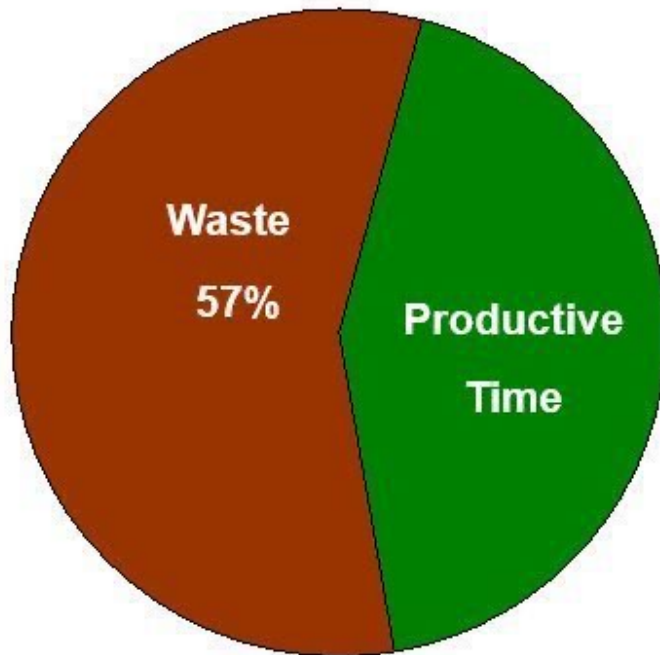
Group Activity #1

As Foremen on the job, list the ways we can make our electricians more productive and work more efficiently.

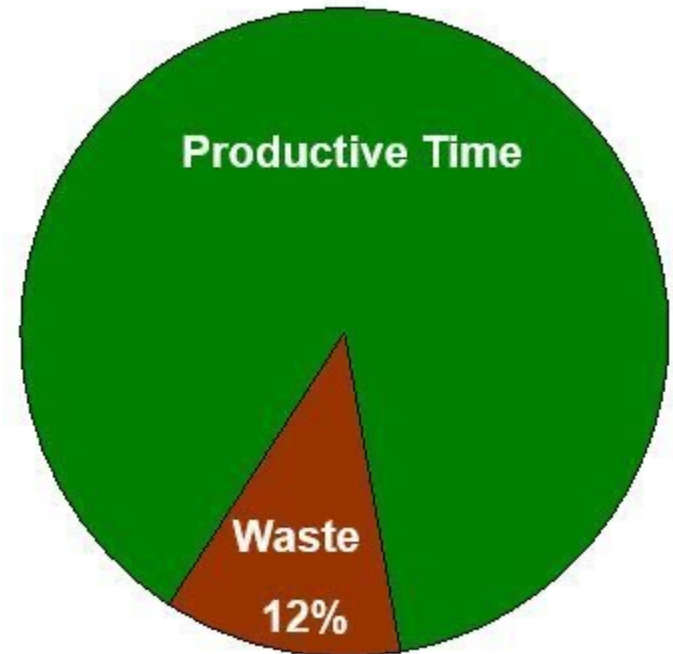


We are Inefficient!

The Construction Industry Institute (CII) published a report in 2004 comparing wasted time vs productive time in the Manufacturing and the Construction industry:



Construction



Manufacturing

A Comparison of Operational Costs of Union vs. Non-Union Electrical Contractors

- By Parviz Daneshgari PHD

Are the Non-Union Contractors going to put us out of business?

What are the most important differences between them and us? **In order of their Cost impact:**

1. Operational Model
2. Labor Management
3. Labor Costs
4. Training
5. Hiring & Loyalty
6. Composite Crew Mix and Crew Ratios



Union / Non-Union Differences

#1 Cost Impact :

- The Traditional Union Operational Model

- The Company is made up of completely separate Departments
 - Estimating, Project Management, Accounting, the Field, etc.
- This leads to a “Throw it over the Wall” mentality.



Union / Non-Union Differences



Labor Costs - #3 in cost impacts:

- Union contractors pay more in wages and fringe benefits than a open shop.
- This leads to an increase in overall project cost of 8.3% for the Union contractor.

Training - #4:

- Union electricians have better technical training as a result of their apprenticeship programs but rarely take advantage of any advanced training later in their careers.
- Many Non-Union contractors offer incentives and most require minimum annual, usually in-house, training for the duration of their electrician's employment.

Hiring & Loyalty - #5:

- Only 28.1% of the Union electricians are considered “Core” electricians
- In Non-Union shops the electricians hire on and work directly for the company.
- There are many more “Core” employees and a much lower turnover rate.

Crew Mix / Crew Ratio - #6



Composite Crew:

- A crew made up of more than just Journeymen wiremen.
- A number of Apprentices and Construction wiremen / Construction electricians, laborers or groundsmen could also be added to make up the overall crew mix.



Crew Ratio:

- Many states or municipalities now require a specific crew ratio.
- Your Union agreement will also govern how many JW a Foreman can have on their crew.

Construction Wiremen / Construction Electrician Program



- To recruit an adequate number of personnel to meet the demands of the electrical construction industry
- To establish a standard by which those recruited will be properly placed and trained

Construction Wiremen / Construction Electrician Program



- There is a great deal of resistance to CW/CE program. - **Why?**
- The CW/CE program is here to stay!
- Open Shops have a much more flexible crew mix and crew ratio!

Non-Union Productivity

So just how can a lower paid, less skilled and less productive worker compete against our Union electricians?

- Union Contractor pays: 3 men \$30.00/hr for 8 hours of work
- Non-Union Contractor pays: 5 men \$18.00/hr for 8 hours of work

- UC = 3 men x \$30 = \$90/hr x 8 hrs = **\$720 per day**
- N-U = 5 men x \$18 = \$90/hr x 8 hrs = **\$720 per day**

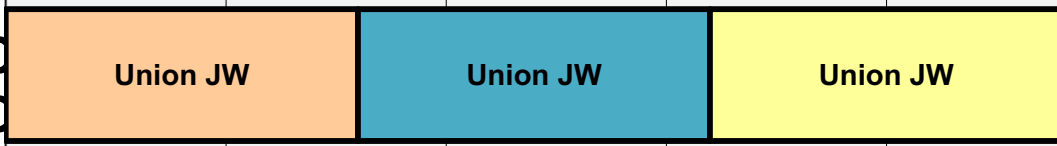
$$\text{UC} = 3 \times 8 = 24 \text{ hours/day} \times \underline{40\% \text{ productivity}} \\ = \mathbf{9.6 \text{ hrs/day of productive work}}$$

$$\text{N-U} = 5 \times 8 = 40 \text{ hours/day} \times \underline{30\% \text{ productivity}} \\ = \mathbf{12 \text{ hrs/day of productive work}}$$

- **For the same amount of money the Non-Union contractor is getting more real work done per day!!**

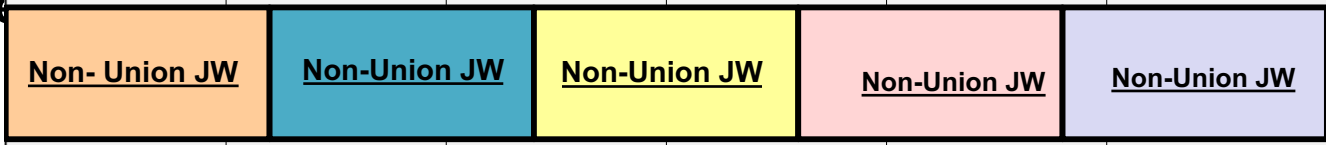


3 Union JW @ 40%
Productivity

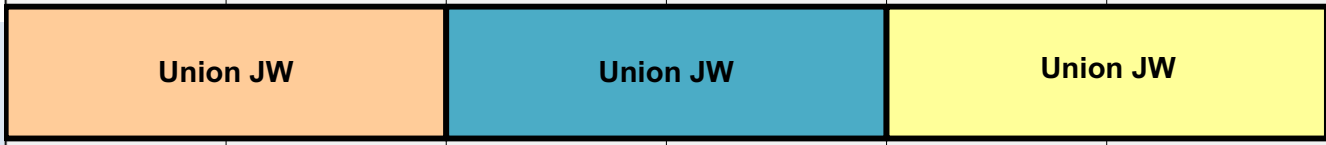


9% Job
Overhead

5 Non-Union @ 30%
Productivity

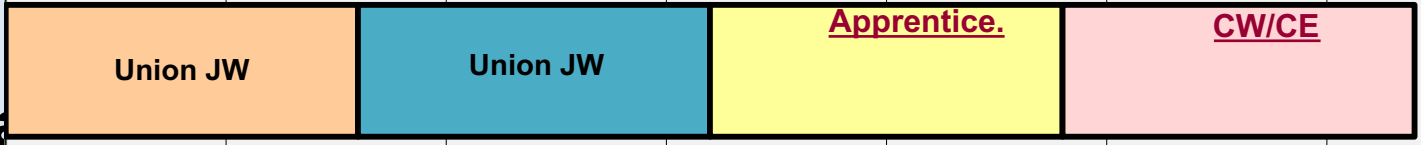


3 Union JW @ 50%
Productivity



*If we save
productivity*

2 Union JW + 2 CW
/ CE @ 40%
Productivity



At 3% sa

• 1.2% = 40% increase in profits on the Job from 3% to 4.2%!

Hours of productive work completed in 10 days

Management of Labor - #2 Cost Impact

“Contrary to common belief, the main difference between the two styles of operation is not the labor cost, but rather:

How the Labor is Managed!



480 Minutes?

As an example, if you had:

150 min. wasted minutes

= 330 min. productive / 480 = 69% efficiency

200 min. wasted minutes

= 280 min. productive / 480 = 58% efficiency

300 min. wasted minutes

= 180 min. productive / 480 = 37.5% efficiency



THE COST CONNECTED WITH WASTED TIME

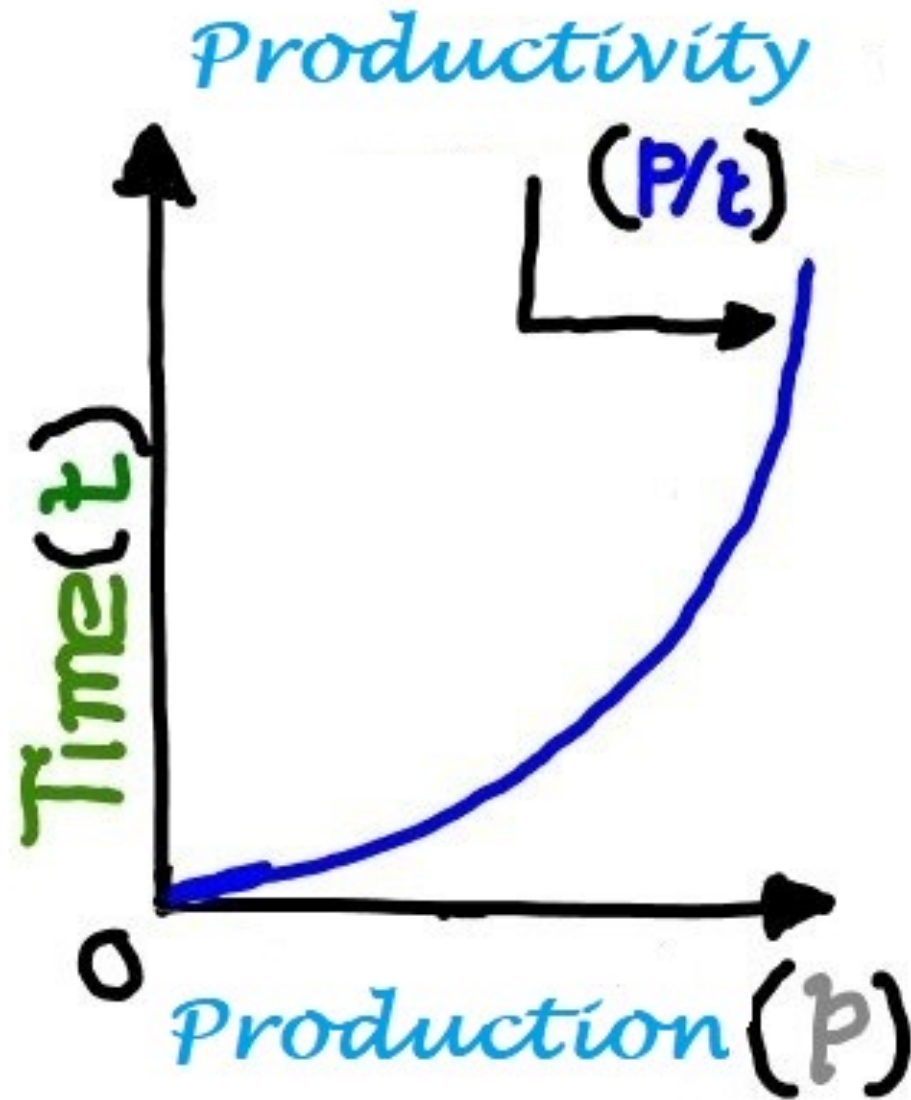
•Some of the most common Individual Issues are:

- Late starts
- Long coffee breaks
- Early lunch (leaving early)
- Long Lunch (Returning late)
- Afternoon breaks
- Conversations that are non-job related
- Early quits

On a National average, this lost or wasted time accounts for 14% of the productive day.



Production vs Productivity?



What is Productive Work?

- **Effective Work**

- Activities that are directly involved in the operation or installation of electrical work.

- **Contributory Work**

- Activities that are required for the installation but do not directly add to the amount of work actually being installed

- **Not-Useful Work**

- All other activities that contribute nothing whatsoever to the installation / production.





Individual Productivity

- The problem here is that most jobs don't suffer low productivity because the workers are “lazy” or just aren't working “hard enough”
- It is because of problems with the overall Process: System Productivity!!

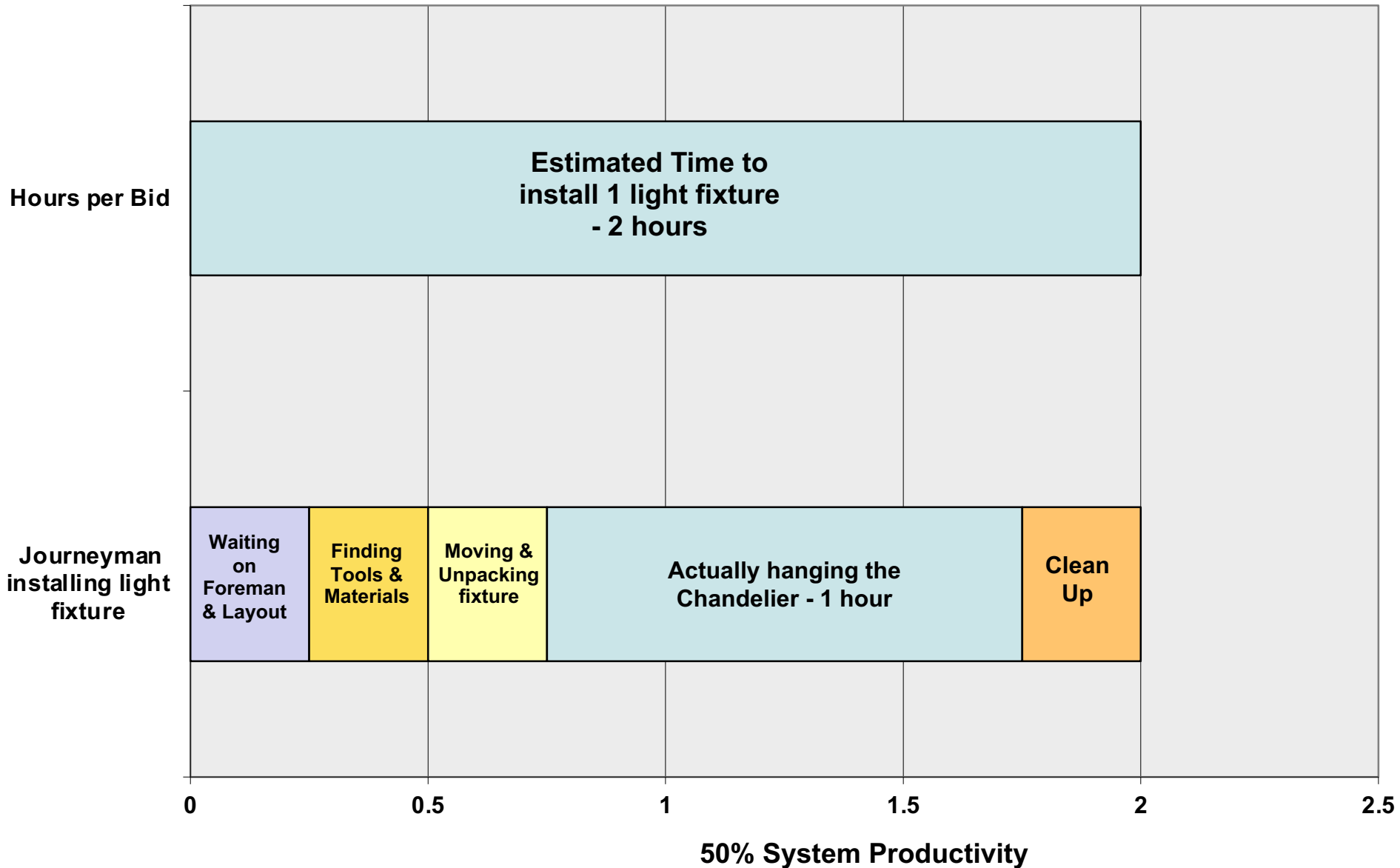


System Productivity

**“The Effectiveness or the Efficiency
- of the entire collection
of jobsite activities.”**



System Productivity



System Productivity



- We routinely plan our projects but almost never plan our Production!
- System Productivity is almost never taught to or discussed with Field Labor!

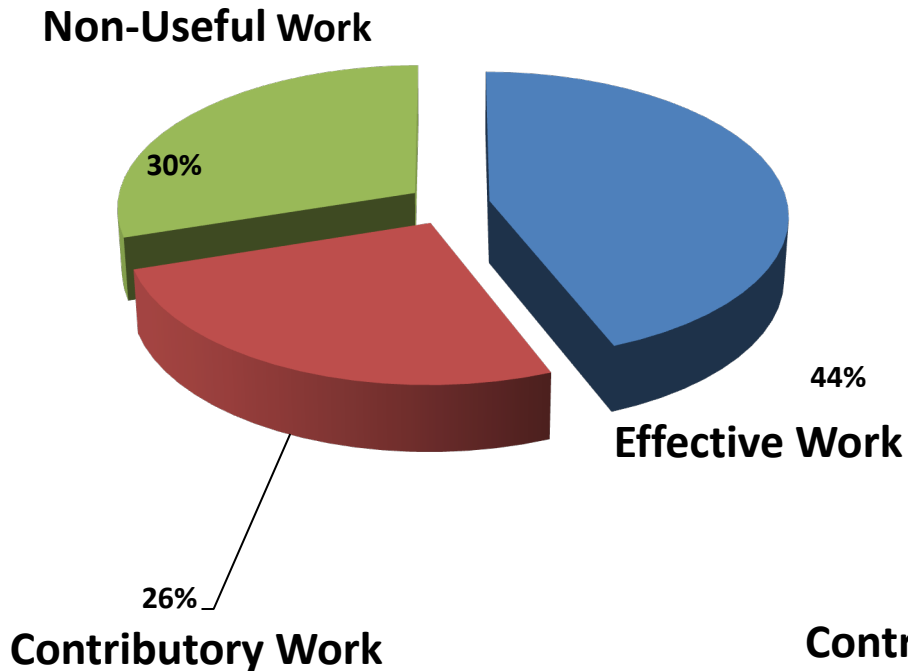
RS Means - Estimating Labor-Hours

“The labor-hours expressed in this publication are based on Average Installation time, using an efficiency level of approximately 60%–65%. The book uses this national efficiency average to establish a consistent benchmark. A typical day for a journeyman might be”:

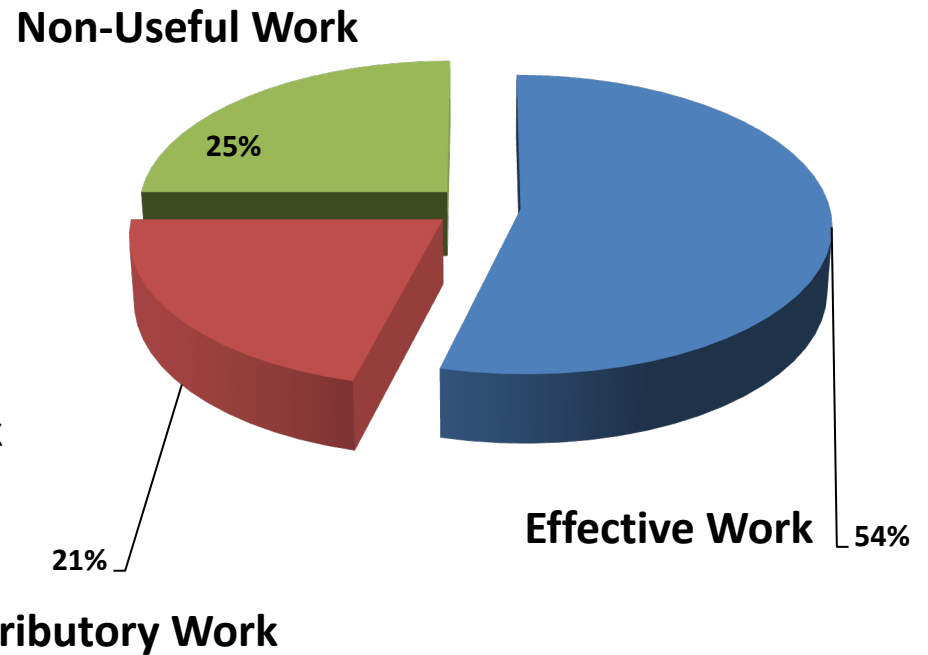
1. Study Plans	3%	14.4 min.
2. Material Procurement	3%	14.4 min.
3. Receiving and Storing	3%	14.4 min.
4. Mobilization	5%	24.0 min.
5. Site Movement	5%	24.0 min.
6. Layout and Marking	8%	38.4 min.
7. Actual Installation	64%	307.2 mi
8. Cleanup	3%	14.4 min.
9. Breaks, Nonproductive	<u>6%</u>	<u>28.8 min.</u>
	100%	480 min.

System Productivity

44 Light Fixtures



54 Light Fixtures



**From 44 light fixtures (44%) to 54 fixtures (54%) =
A 10 fixture increase / 44 = 23% increase in Productivity!**

Identify Productivity Issues

Group Activity #3:

Use Handout #2 – Non-Productive Minutes:

1) **Left Hand Boxes** - Which of these Activities are C - Contributory Work and which ones are N - Non-Useful work?

2) **Right Hand Boxes** - Which of these Activities would you consider I - Individual Productivity Issues and which ones are S - System Productivity Issues?



Productivity Issues

C/N		I/S
N	Arriving late for work	I
C	Getting out the tools for the day	S
C	Gathering up material	S
C	Foreman discussing the plans for the day	S
C	Going from the Gang box to the work area and back	S
N	Waiting for materials not ordered on time	S
N	Waiting for Foreman to lay you out on the next project	S
N	Waiting on the Foreman to answer your questions	S
N	Waiting on another trade so you can finish your work	S
N	Looking for tools being used by another crew or trade	S
N	Morning and afternoon breaks	S
N	Traveling to and from break area	S
N	Stopping early for lunch	I
N	Returning late from lunch	I
N	Talking to each other while not working	I
N	Practical jokes	I
N	Talking on a Cell phone	I
N	Cigarette smoke breaks or chewing tobacco	I
N	Going to the Bathroom	I/S
N	Going to get a drink of water	I/S
C	Unloading or moving materials	S
N	Fixing work that was installed incorrectly	S
C	Putting away your tools and material at the end of the day	S
N	Quitting early	I

Non-Useful AND System Productivity issues !!!

A Productivity Scenario – Handout #6

Another day in Paradise and Fred's crew are all busy working. You're the new GF on the Job and this is what you see as you walk by.

A) How are things going today?

B) Anything wrong with what the workers are doing in this Scenario??

C) Are they being "Productive"?

D) Is there a better way to organize this crew?



What Are We Going To Do?

Your Job has an average of 56% unproductive time!

- We have looked at some of these unproductive activities.

These are Symptoms of larger problems!

What could be some of the basic / fundamental / system-wide causes of these unproductive activities?



Factors affecting Productivity



- **TIMERS**
 - Tools & Materials
 - Information & Communication
 - Workers / Expectations
- **Supervision & Planning**
- **External Issues**
 - Jobsite & Contractors



Causes of Unproductive Time - Tools & Materials



1) What are the Problems?

2) How can we prevent them?



Information / Communication



- **Information**

- Prints, RFIs and Change Orders

- **Communication / Active Listening**

- Between you and your Crew

- Between you, the other Trades and the GC



Expectations / Monitoring Your Labor Force



- Did you set your expectations with your crew?
 - Late starts & early quits as well as Individual production.
- Why do we need to monitor their performance?
- How do we monitor their labor?

Inadequate Supervision

Symptoms may include:

- When you walk onto a job, can you tell if it is disorganized?
- Are the guys standing around?
 - Not enough drawings for everyone to use?
 - No materials or materials on site but not located near point of installation?
 - Workers don't know what their next assignment is?
- Tools in disrepair or not on the job when needed?
- Lots of unfinished Tasks?

Does all this tell you something about the Supervision?



Planning

- Our Union Electricians are highly trained but the lack of proper planning on a job can create **Chaos**.

Written planning is important.

– Job Preplanning and 2 Week Plans

- One of the biggest problems with Planning are changes to the Schedule.



External Productivity Factors

- Over-Manning
- Shift Work
- Stacking of Trades
- Owner-Furnished Equipment
- Beneficial Occupancy
- Ripple Effect





1) What is productivity?

- A. How hard a worker works
- B. How efficiently the labor and material resources were used
- C. The amount of installation completed

2) The crew reports to the 1st floor gang box area and then goes to work on the upper floors. This is an example of?

- A. System productivity
- B. Individual productivity
- C. Poor management

3) Labor-saving devices and tools will primarily improve which of the following?

- A. Overall job productivity
- B. Individual productivity
- C. Project preplanning and scheduling

4) Which of the following will improve job productivity?

- A. Shrink wrapped orders, staged and delivered to the specified location on the job site
- B. Protecting tools so you have everything you may need at any point in the job
- C. Having extra labor on-site to help

5) If I set expectations for my crew's productivity?

- A. It is an important management tool
- B. They will laugh at me
- C. I need to monitor their production

6) Where does having material available at the right time come from?

- A. Determining all materials at the beginning of the job
- B. Identifying material needed for the next two to three days
- C. Calling the vendor whenever material is needed

7) Reading or studying the blueprints is an example of:

- A. Non-Useful work
- B. Contributory work
- C. An inefficient use of time

8) When does the location of material on the job site have the most positive impact on installation time?

- A. When material is all kept together, so we can find it
- B. When material is located where it will be installed
- C. Material location is irrelevant. Everything will ultimately end up where it needs to be installed

9) The bathrooms are on the ground, three stories below. One JW is making frequent trips to the bathroom.

- A. He should be given a verbal warning for making so many trips
- B. Consider moving the bathrooms closer to the work area
- C. Put him on a different crew working on the ground level

10) The JW is talking on the cell phone.

- A. This is an Individual productivity issue
- B. This is affecting system productivity
- C. The Steward should be called over

Summary



- Individual and System Productivity
 - Activities that contribute to producing actual work.
 - Activities that provide no useful value to the project.
- We have given you a basic overview of how we can monitor and improve productivity on our jobs.
- As Foremen, not only do we have to be good at building the Building but we now have to do it in a more productive way.
- As Foremen, we **can and must** learn to manage the Productivity of our jobs.