

## Construction Waste Survey Report

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Waste in any business is like throwing profit in the trash. It seems there is even a greater predisposition for waste in the construction industry. Because of the immense amount of coordination of components and critical timing of phases, the construction industry is prone to a large amount of wasted time, motion, materials and skill.

Waste can be defined as any inefficiency that results in the use of equipment, materials, labor or capital in large quantities than those considered as necessary in the production of a building or completing a project. Another way to look at it is that which can be eliminated without reducing customer value.

Data for this report was gathered from construction companies in an online survey conducted in August/September 2010. This report includes the results of this survey and a discussion of best practices regarding construction waste.

### Construction Waste Survey

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#### *Waste and Inefficiencies*

Waste can be separated into eight general areas. We asked survey participants to choose the top areas of waste that impact their business. Waiting time, utilization of people and excessive motion were the three areas receiving the highest number of votes. Here is a breakdown of responses:

#### Basic Types of Waste

Probable Areas of Waste		
Basic Types of Waste	Number of Companies	Percentage
Waiting (for materials, people, other trades, decisions, etc.)	30	76 percent
People Utilization (not utilizing skills to fullest)	20	53 percent
Motion (excessive movement of people, tools, materials, etc.)	19	50 percent
Defects (processing to correct a defect)	18	45 percent
Overprocessing (putting in extra resources than necessary)	11	26 percent
Transport (material moved numerous times around job site)	7	18 percent
Inventory (excess supplies and work piles)	4	11 percent
Overproduction (producing extra or excess work)	3	8 percent

### ***Timeliness of Work***

Timeliness of work is an important issue when looking at construction waste. Work completed right on time has the least waste while work completed ahead of time or behind schedule raises the waste meter. Work completed ahead of or behind schedule results in waiting – either on the part of those just completing the work or those waiting to start work. When work is planned, scheduled and completed right on time, work flow is smooth and is not conducive to waste. Of the survey participants, 58 percent say they generally complete work right on time, 30 percent complete work ahead of time and roughly 13 percent complete work behind schedule.

### **Completing Work**

<b>Work Practices</b>		
<b>Timing of Jobs</b>	<b>Number of Companies</b>	<b>Percentage</b>
Right on Time	22	58 percent
Ahead of Time	12	29 percent
Behind Schedule	5	13 percent

### ***Jobsite Readiness***

One way to reduce waste caused from waiting or disorganization is to have the materials and supplies laid out ready for the job. We asked survey respondents if they follow this well tested practice. Roughly a third of participants say they have a consistent system to have jobsites ready and organized to maximize efficiency. This is one area where companies can positively affect their effectiveness on the job.

### **Prepared Jobsites**

<b>Jobsite Practices</b>		
<b>System</b>	<b>Number of Companies</b>	<b>Percentage</b>
Consistent system where jobsite is ready and organized	15	37 percent
Some jobs are laid out and ready	20	53 percent
No system in place	3	8 percent

### ***Value of Workforce***

More than half of survey respondents chose people utilization as a top area of waste in their business. This area references not utilizing people's skills to their fullest ability. When survey participants were asked what percentage of their workforce adds value to final projects, 43 percent responded between 75 and 90 percent. Another 40 percent responded greater than 90 percent. The results are as follows:

## Workforce Adding Value to Final Projects

Workforce Value		
Ranges	Number of Companies	Percentage
Greater than 90%	15	40 percent
Between 75% and 90%	16	43 percent
Between 50% and 75%	3	8 percent
Less than 50%	1	3 percent
Difficult to quantify	2	5 percent

### *Workforce Efficiency*

In contrast to studies finding average construction worker efficiency at 40 percent, respondents to this survey had a more optimistic view. When asked about the average efficiency of construction workers, 78 percent of companies estimated their workers are between 75 and 90 percent efficient. Below are the results:

## Workforce Efficiency

Workforce Efficiency		
Ranges	Number of Companies	Percentage
Greater than 90%	4	11 percent
Between 75% and 90%	30	78 percent
Between 50% and 75%	3	8 percent
Difficult to quantify	1	3 percent

### *Jobsite Practices*

The jobsite is one area that can be scrutinized to find waste. Many participating companies are well aware of this fact and plan and coordinate the activities on the jobsite. Sixty-three percent plan crew sizes to optimize productivity. Another 47 percent plan and coordinate jobs to minimize time wasted moving from one phase of a job to the next or between subcontractors completing different parts of the job.

## Jobsite Practices

Jobsite Practices		
Jobsite practices	Number of Companies	Percentage
Crew sizes are planned to optimize productivity	25	63 percent
Planned and coordinated jobs to minimize wasted time between phases and/or subs	19	47 percent
Excess equipment and materials not on the jobsite	14	37 percent
Little crew downtime and minimal disruption	11	29 percent
Jobsite organized to maximize efficiency	9	23 percent
None of the above	5	13 percent

### ***Warehouse and Yard Storage***

Fifty-four percent of companies have materials or supplies stored in their warehouse or yard with no definite plans for use. For 44 percent of companies, less than 10 percent of their storage is taken up by these materials. Another 40 percent said that number is closer to between 10 and 30 percent.

### ***Impact of Cutting Waste on Profit Improvement***

The bottom line of this report is determining the impact cutting waste will have on company profit. Forty-nine percent of respondents say that they would see profit improve by 10 to 25 percent if they could cut waste by half.

### **Profit Improvement by Cutting Waste in Half**

<b>Profit Improvement</b>		
<b>Profit Improvement Range</b>	<b>Number of Companies</b>	<b>Percentage</b>
More than 50%	4	11 percent
Between 25% and 50%	7	19 percent
Between 10% and 25%	19	49 percent
Less than 10%	4	11 percent
Difficult to quantify	4	11 percent

## **Summary**

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Most experts agree that there is a direct correlation between cutting waste and improving business profit. Studies have indicated that between 40 and 60 percent of a typical construction day is spent in non-productive time. This can include workers waiting for instructions, looking for materials or tools, re-do work, and over allocation of workers, equipment and materials. The results of this survey seem to paint a better view of the Utah construction jobsite than these studies demonstrate.

It appears that many construction companies have eliminated much of the obvious waste in their operation. However, there may still be hidden waste difficult to pinpoint. It is proven that the more a business can streamline processes, improve productivity and coordinate workflow on the job, the less waste will be found and the greater the profit. To assist construction companies on their journey to eliminate waste and create more profit, the following section contains best practices that can give companies insight on making additional improvements.

## Best Practices

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While there are several culprits of construction waste, most impact labor. One study found that the average construction worker operates at 40 percent efficiency. Roger W. Liska, chair of the construction science and management department at Clemson University, determined that many of the reasons for low productivity in construction are due to lack of effective management. Liska found that more than half of lost productivity can be traced to delays waiting for equipment and supplies, inefficient company processes, and work rules and congested work areas.

*(Constructioninformer.com)*

In his studies of construction labor, Dr. James Adrian of Bradley University discovered that in many cases more than half of a construction day is lost because of inefficiency – the epitome of waste. He found that most of the delays result from:

		<u>Equated to Minutes</u>
Waiting for resources	14%	67
Multiple material handling	6%	28
Late starts and early quits	6%	28
Waiting on instructions	6%	28
Late or inaccurate information	5%	24
Punch list work	3%	15
Accidents	3%	15
Wastage or theft	3%	15
Substance abuse	2%	10
Re-do work	2%	10

*(Jim Adrian's Construction Productivity Newsletter, Volume 18, #6)*

### ***Improving Construction Labor Productivity***

How do you remedy these problems? First, accept that you can improve labor efficiency. Study your numbers from bids, accounting of dollars, and overtime. Go to the field and determine if the job is laid out in an orderly manner. Are the materials to perform the work in an accessible location? Has the supervisor of the job been properly trained? Is the construction office supporting the field crew by following through on deliveries, getting sub-contractors to be responsive, and communicating with those on the job?

For most contractors, construction labor is a significant portion of the company's cost. If with some study, thought, and determination, you can reduce your direct labor costs by approximately 10 percent, you may well have doubled your net income.

That is a bold statement, but here is the justification. A 10 percent savings means fewer days a job is open, and most likely, overtime is significantly reduced. Not only is there a direct savings in labor costs, but also labor burden.

### ***Improving the Use of Labor***

Becoming more efficient on jobs and improving your use of labor will eliminate waste and improve profit. Here are some ideas to consider:

1. Assist your construction supervisors to become proactive, instead of reactive, on all job issues by making sure these components are in place:

- \_\_\_\_\_ The company has developed procedures for all operations of a job from required paperwork, following the plan of the job, reporting to management, daily overseeing of job labor and subcontractors, equipment usage, tools on the job, and how to finalize a job
- \_\_\_\_\_ Crew size is correct for smooth construction workflow
- \_\_\_\_\_ Supervisors are empowered to make decisions on the job to improve project time, cost, quality and safety of the project
- \_\_\_\_\_ Supervisors measure actual job progress and results, not just manpower
- \_\_\_\_\_ Supervisors understand their job is to coordinate labor, subcontractors, materials, inspections, and keep a dialogue open with management for change orders and job issues
- \_\_\_\_\_ Daily reports are completed on the job and submitted to management
- \_\_\_\_\_ Key performance measures are determined and tracked
- \_\_\_\_\_ Management reviews daily reports, and feedback is given, even if everything is okay and on budget
- \_\_\_\_\_ Supervisors are given time to coordinate, manage and oversee jobs

2. Teach supervisors how to make decisions. Decision-making is a skill that needs to be taught, encouraged and supported by management. Management has to set examples and limits so that supervisors do not become paralyzed when they need to be making effective decisions.
3. Supervisors need to have management experience, not to just complete the paperwork for the office, but to oversee all phases of the job including resolving labor issues, coordinating timely delivery, and storage of materials, communicating with the business office, and using technology to their advantage.
4. Teach your supervisors communication skills so they effectively discuss the job with employees, other contractors, and even the owners visiting the job site.

### ***Identifying Hidden Waste***

We know of contractors who months ago cut waste. They examined their businesses and dutifully eliminated overhead, perks, non-essential workers, travel and entertainment. When we talked to them again, a few months later, they had again eliminated more waste, waste that they didn't see in the first assessment. The saying, "Necessity is the mother of invention," truly applies when examining a business. Economic pressures have forced many businesses to take a hard look at their operations and down size and eliminate excess. The attached Construction Waste Checklist is a tool you can use with your

management team. Look at each item and determine if it is an issue in your company, and if it is, the frequency this occurs. Find the top three waste items and work to eliminate or decrease them. Continue assessing your company and watch your profit improve.

### **Creating Opportunity (Outside the Discussion of Waste)**

Business owners and managers are faced with the challenge of finding opportunities for their companies to succeed. At the same time, competing firms are trying to beat you on every bid or project, and with every customer.

Even in this economy, you must create opportunities for your business. Accept that in this challenging market, decisions will not wait. You may decide to stay the course and continue doing what your company does best. Or, you may decide to add areas of expertise, or move into new territories. As managers, you must make the choice you believe is best for your company and pursue it.

If you have excess capacity, use the time to hone your business practices. Find ways to make profit on the work you have and continue to pursue more opportunity.

# Construction Waste Checklist

**Instructions: Distribute this checklist to your key management team. Ask them to complete the checklist based on their view of the company. Gather the checklists and compile the results. Use this information to determine the top three areas of waste. Use your management team to develop initiatives to address these areas. Come up with action items, implement and re-evaluate after three months.**

## Construction Waste Checklist

This checklist should be completed by management to determine potential areas of waste in your company. Check the most appropriate box as it applies to your operation. Check **Waste** if this is an area of waste for your company or **Non-Issue** if this is not an area of waste or does not apply to your business. For items you mark **Waste**, rate the frequency that this particular waste occurs:

**1 (Never)      2 (Rarely)      3 (Sometimes)      4 (Frequent)      5 (Always)**

After the checklist is complete, choose the top three waste culprits that impact your company with the highest frequency. Meet with your team and focus on these items to eliminate or reduce them. Develop an action plan and implement. Re-evaluate your progress after three months.

1-Never; 2-Rarely; 3-Sometimes; 4-Frequent; 5 Always

		<b>Waste</b>	<b>Non-Issue</b>	<b>Frequency rate 1(never)—5(always)</b>
1.	Waiting for other trades to complete work before you can begin			
2.	Waiting for equipment to be delivered on-site			
3.	Waiting for materials to be delivered on-site			
4.	Waiting for skilled workers to be on-site			
5.	Waiting for clarification and/or confirmation from client or consultants			
6..	Over-allocation/unnecessary equipment on-site			
7.	Over-allocation/unnecessary materials on-site			
8.	Over-allocation/unnecessary workers on-site			
9.	Unnecessary procedures and working protocols			
10.	Material loss/stolen from site during construction periods			
11.	Material deterioration/damaged during construction periods			
12.	Mishandling or error in construction applications/installation			

13.	Time for rework/repair work or defective work			
14.	Time supervising and inspecting the construction work			
15.	Time spent instructing and communicating among different tiers and trades of workers			
16.	Transporting workers, equipment and materials			
17.	Accidents on site			
18.	Poor planning, coordination and scheduling			
19.	Equipment breaking down or not being right for the job			
20.	Poor site layout			
21.	Wrong or unclear information			
22.	Late information and decision making			
23.	Poor material handling on site			
24.	Poor quality of material			
25.	Delay of material delivery			
26.	Poorly scheduled delivery of material			
27.	Other:			

**If you want assistance working through this checklist or tackling areas of waste, Leverich Group team members are trained to perform walkthroughs or consulting in this area. Contact Joe Leverich or Steve Scoggan at (801) 364-4949 for more information.**