Lean Construction Institute

Building Knowledge in Design and Construction

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Provider Name: Lean Construction Institute
Provider Number – H561

Course Name: Improving the Way We Work: Principles of Lean Design

Course Number – 20121010PM

Course Speakers: Laura Lesniewski, Will Loftis, Bernita Beikmann, Jennifer Taylor, Luciana Burdi, Bevan Mace, John Bechtel, Steve DiBartolo, David Riz, Amanda Goolsby

Course Date: October 10, 2012

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Course Description

This session trains participants about the fundamental principles of lean design, such as co-location, team education, and an enlightened perspective about the nature of design. We will touch on lean as it relates to high-performance buildings, and incorporate case studies from participants in projects that used lean methodologies to improve the design of their facilities and change the way they deliver a project in design and construction.

Learning Objectives

At the end of the this course, participants will be able to:

1) Uncover strategies and pitfalls associated with a Lean Transformation for a public agency including demonstrating results and coordinating implementation of Lean Construction practices to support process improvement.

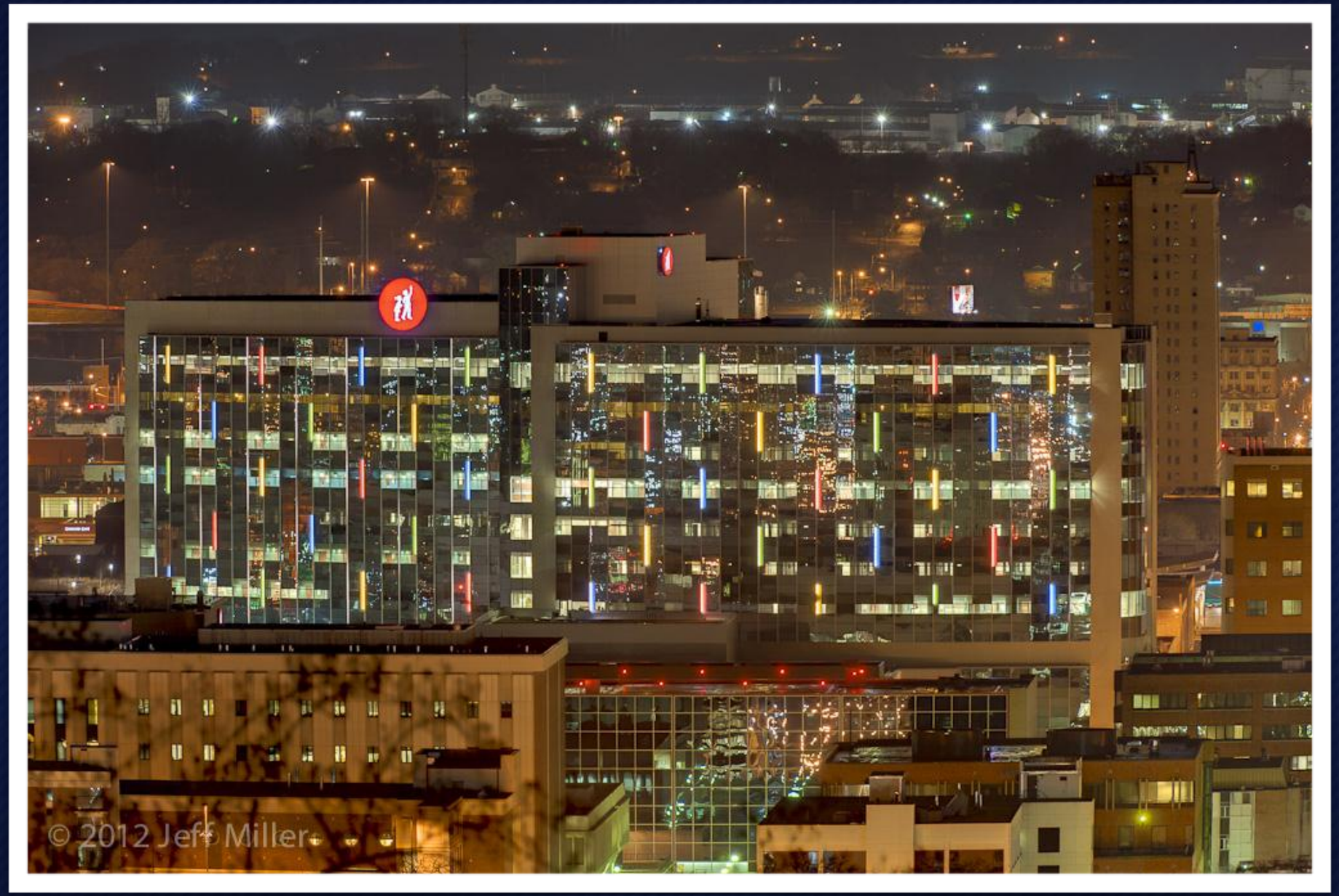
2) Understand what specific procurement changes are needed for Owners to enable lean delivery of projects and establish a governance structure to enable decision making.

3) Gain an understanding of the need for each team member to reinvent themselves on a continual basis in response to the constant project dynamics and understand how this leads to greater sustainability.

4) Identify critical concepts around team collocation and integrated team dynamics in order to be more fully prepared to optimize the results.

LEAN: AN IDEA WHOSE TIME HAS COME

October 10, 2012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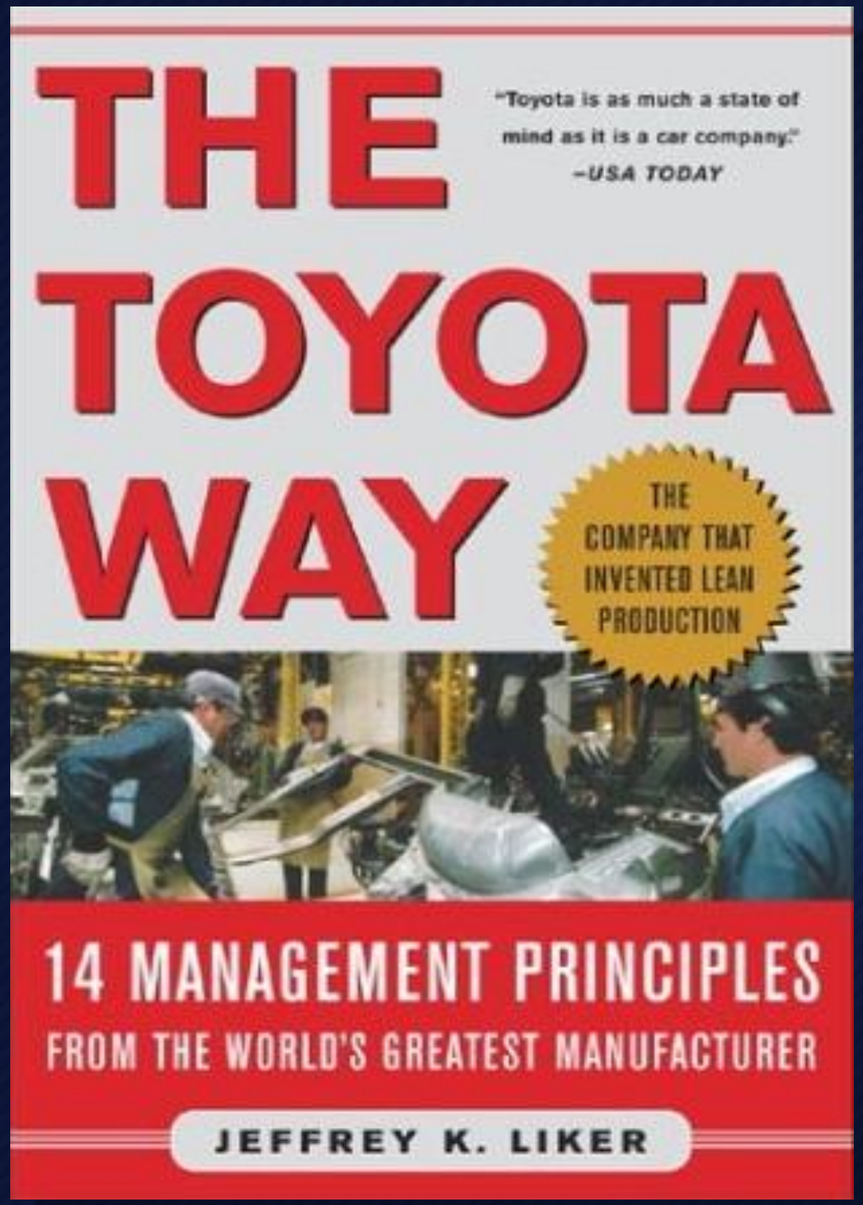
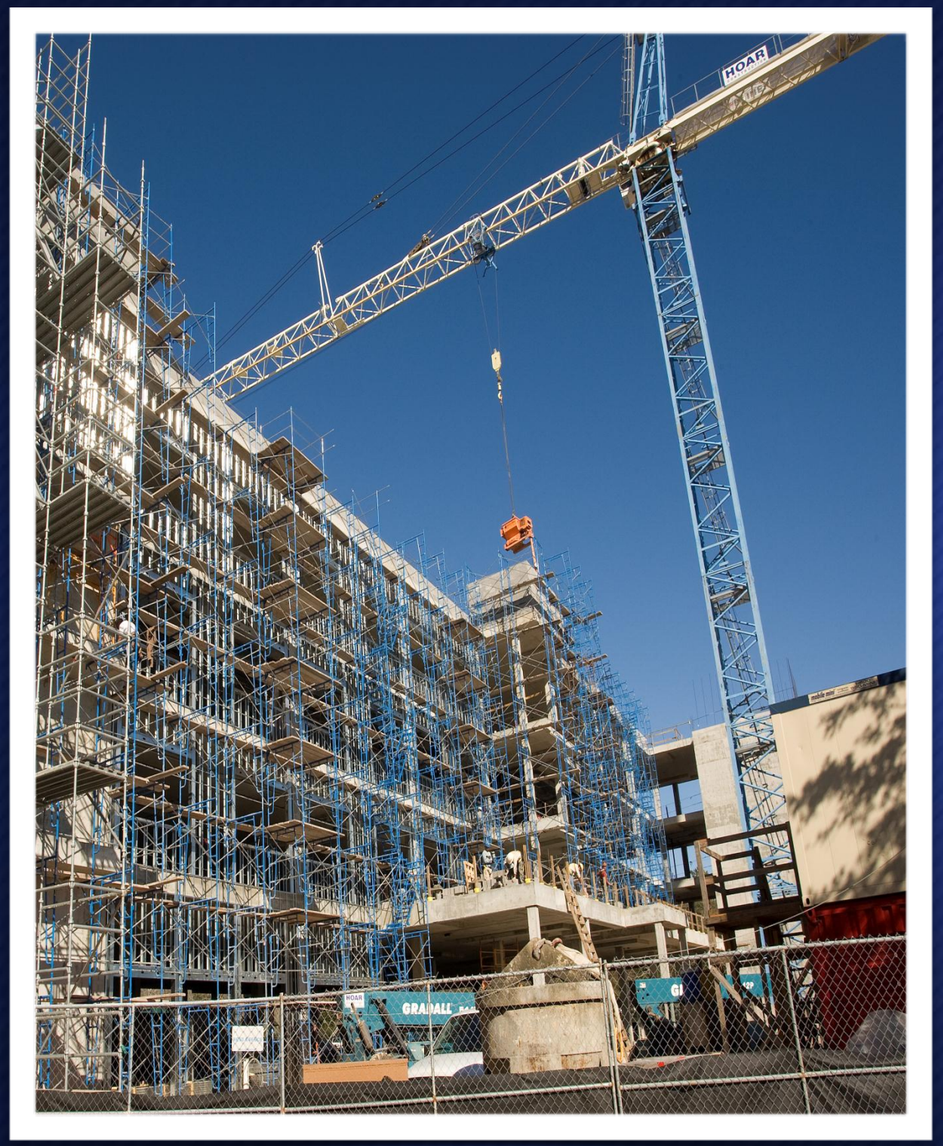


14 PRINCIPLES

1. Base management decisions on a **long term philosophy**, even at the expense of short term financial goals.
2. Create **continuous process flow** to bring problems to the surface.
3. Use **"pull" systems** to avoid overproduction.
4. **Level out workload** (heijunka).
5. Build a culture of stopping to fix problems, to get **quality right the first time.**
6. **Standardized tasks** are the foundation for continuous improvement and employee empowerment.
7. Use **visual control** so no problems are hidden.
8. Use only reliable **thoroughly tested technology** that serves your people and processes.
9. **Grow leaders** who thoroughly understand the work, live the philosophy, and teach it to others.
10. **Develop exceptional people** and teams who follow your company's philosophy
11. Respect your **extended network of partners** and suppliers by challenging them to improve.
12. **Go and see for yourself** to thoroughly understand the situation.
13. **Make decisions slowly** by consensus, thoroughly considering all options; **implement decisions rapidly.**
14. Become a learning organization through **relentless reflection** and **continuous improvement.**

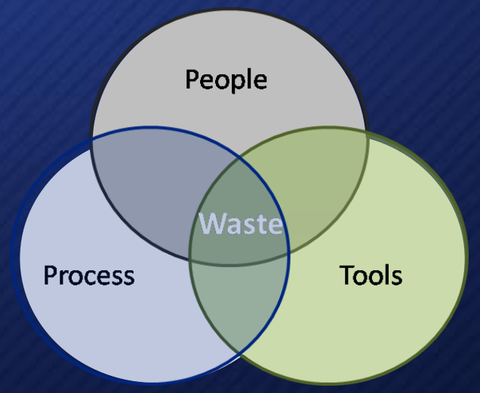

BASIC LEAN, INC.

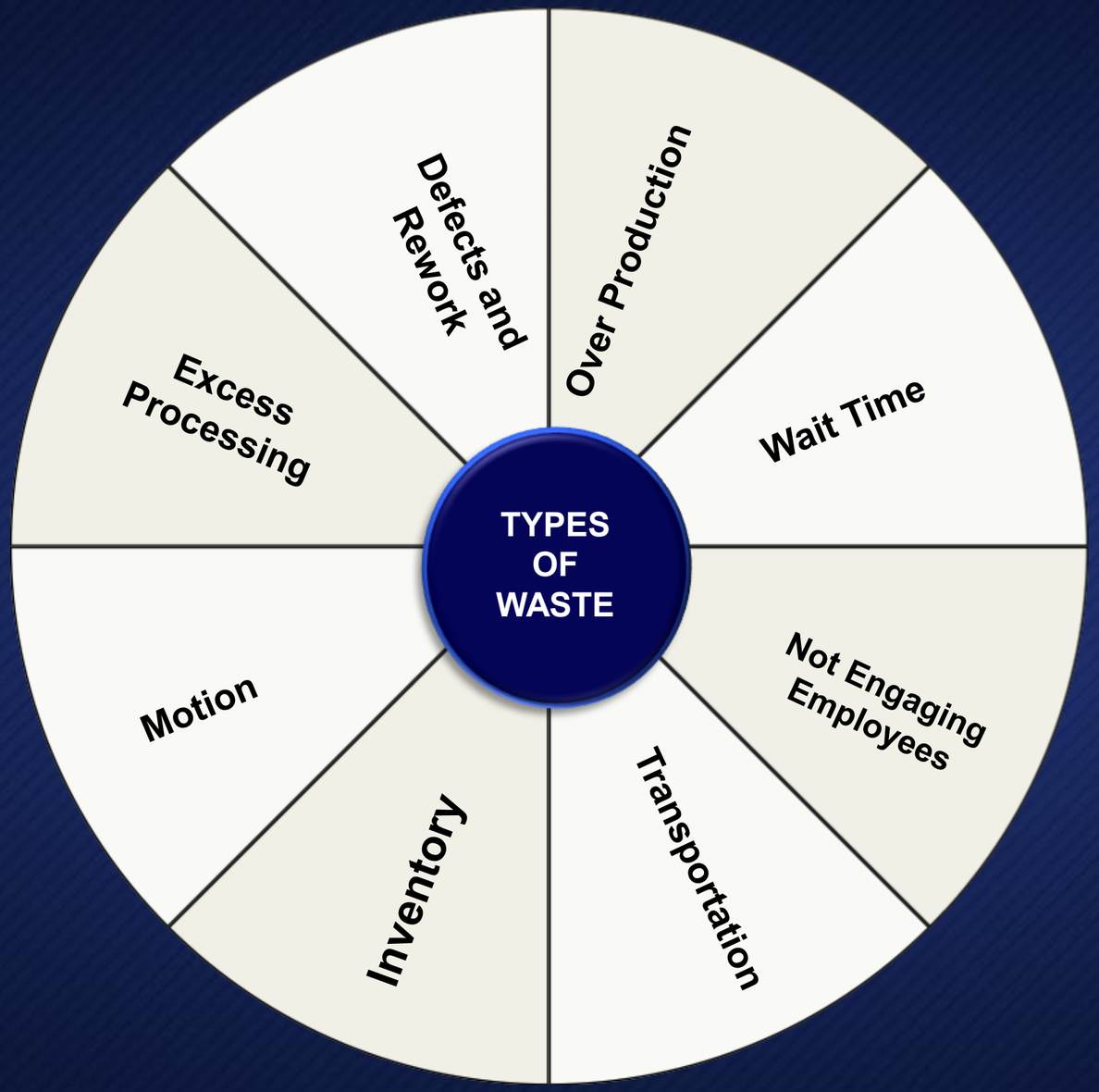

NUMMI
New United Motor Manufacturing, Inc.



WHAT IS LEAN?

- A new way of thinking
- An approach to MAXIMIZE VALUE and MINIMIZE WASTE



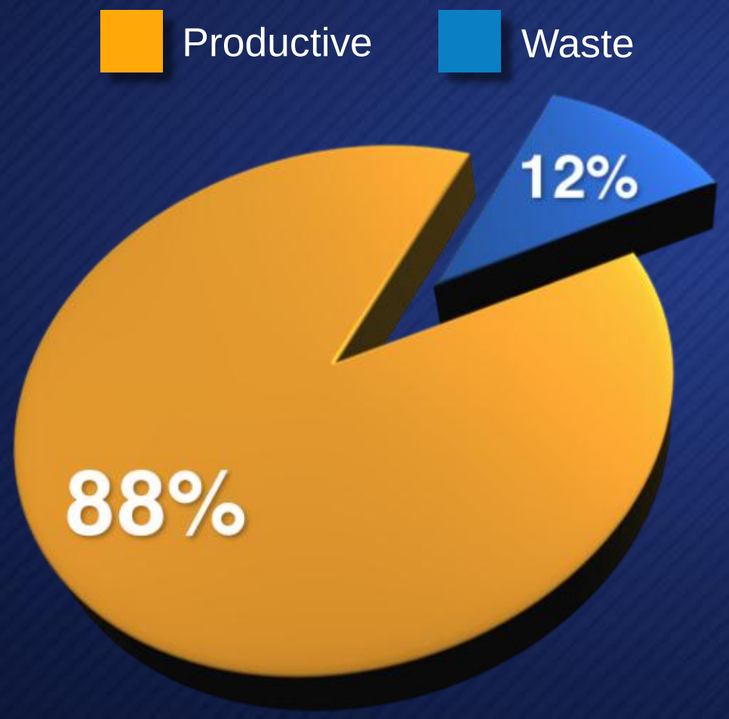

TYPES OF WASTE
Defects and Rework
Over Production
Wait Time
Not Engaging Employees
Transportation
Inventory
Motion
Excess Processing

HOW DO WE SPEND OUR TIME?

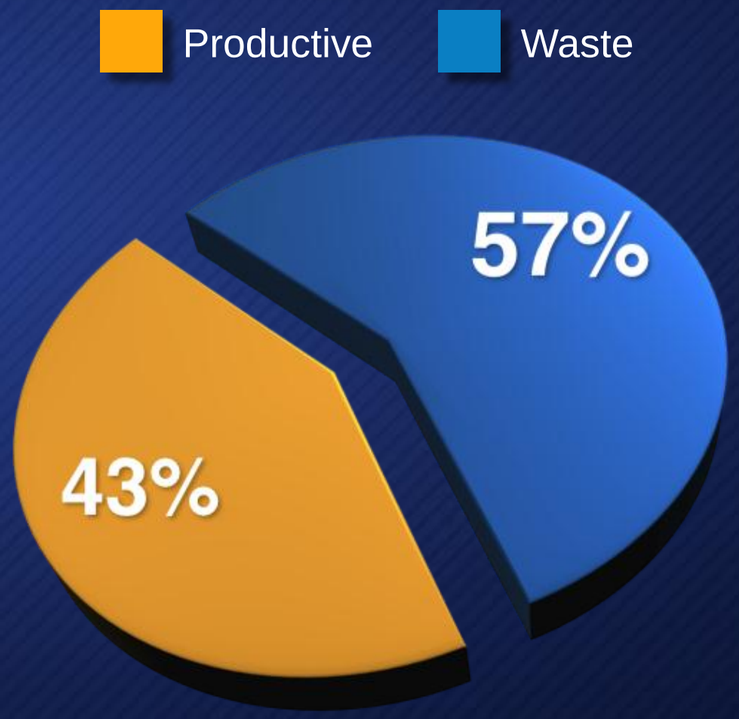
- There is great potential to improve workflow in construction
  - **<u>20% of a worker's time is spent on direct work</u>**
  - 45% on indirect work (preparation, instructions, getting material, etc.)
  - 35% redoing errors, waiting, disruptions, etc.

Productivity Gap = Opportunity

Manufacturing



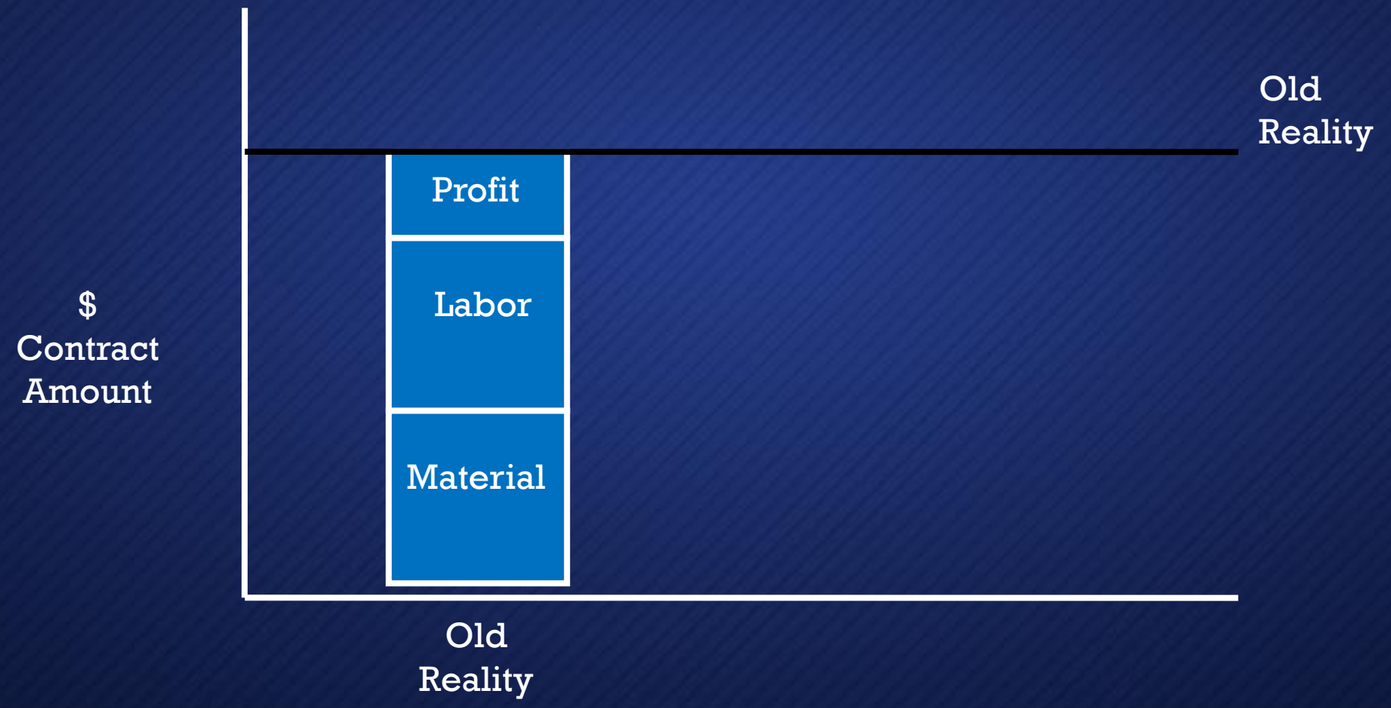
Construction



Construction Industry Institute (CII) Study (2004)

Why Lean?

The market drives price, we control cost & profit.



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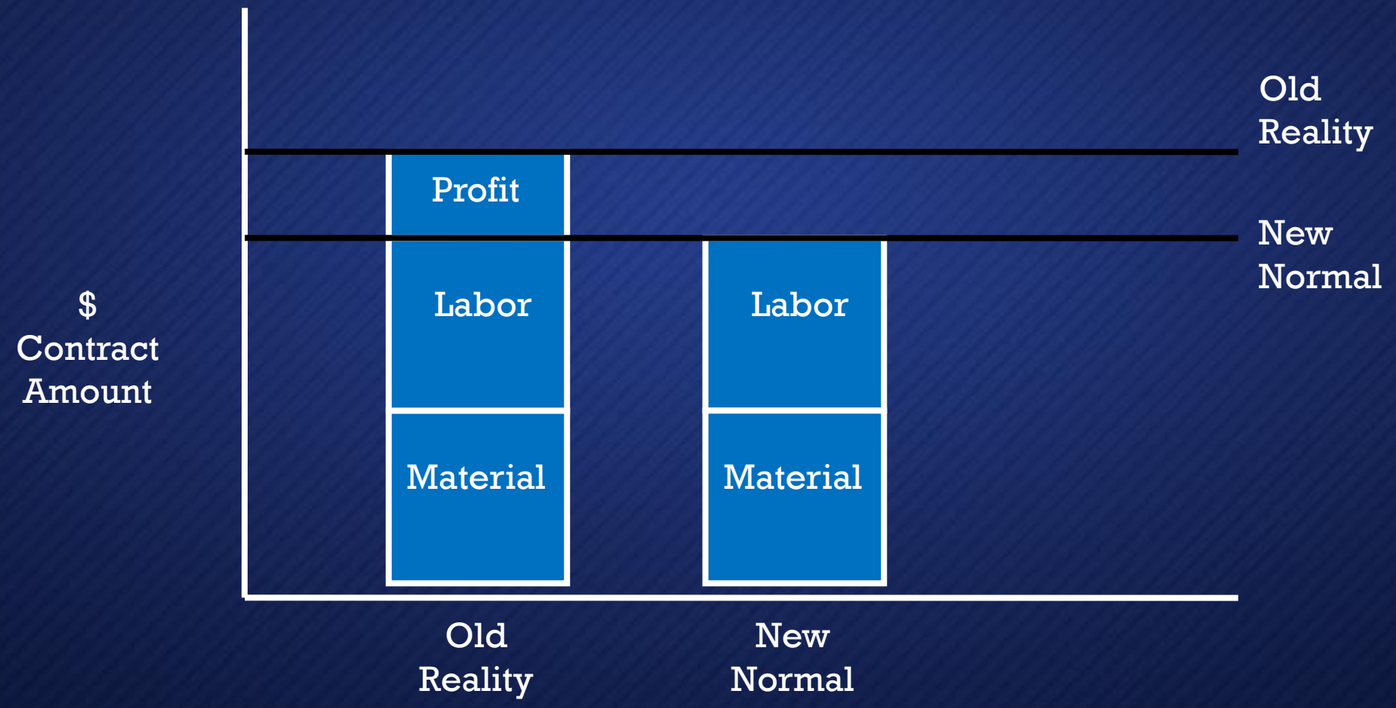

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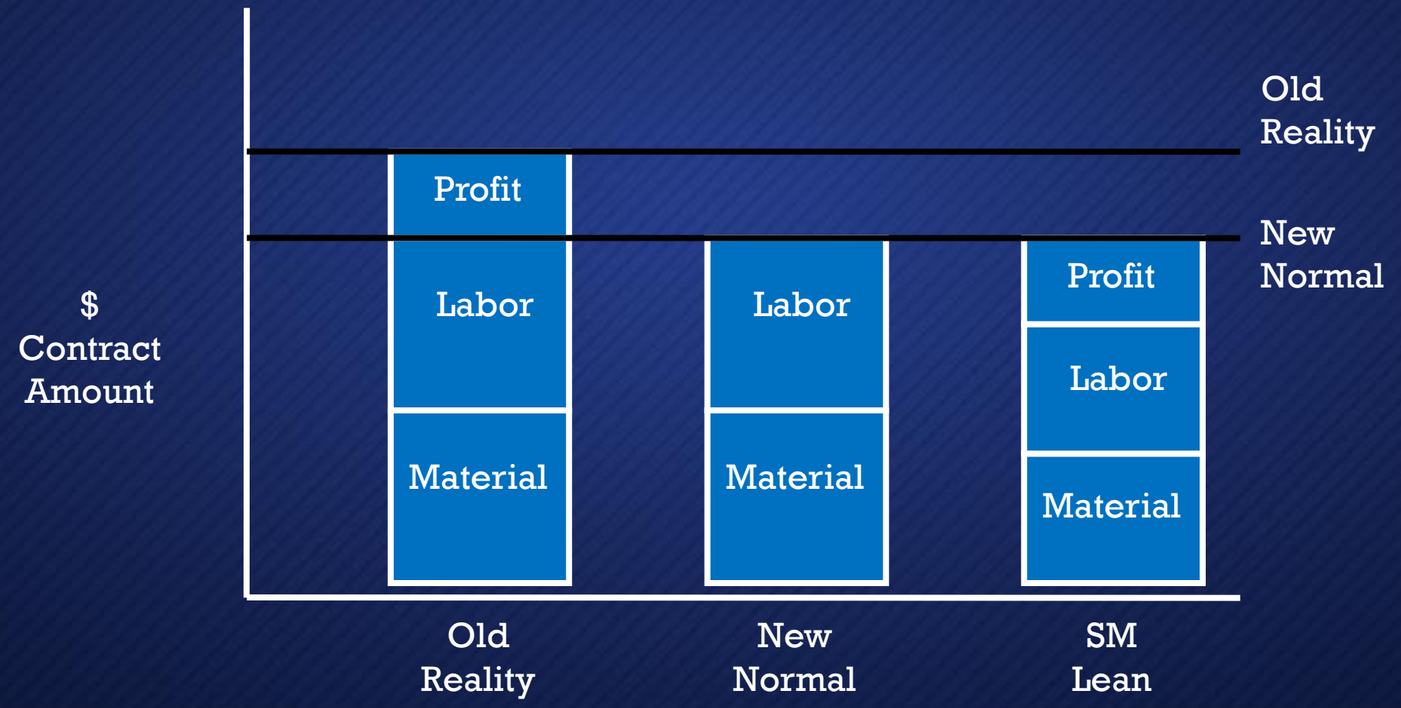


Characteristics :

1. Bloated
   (Inventories of unwanted fats)

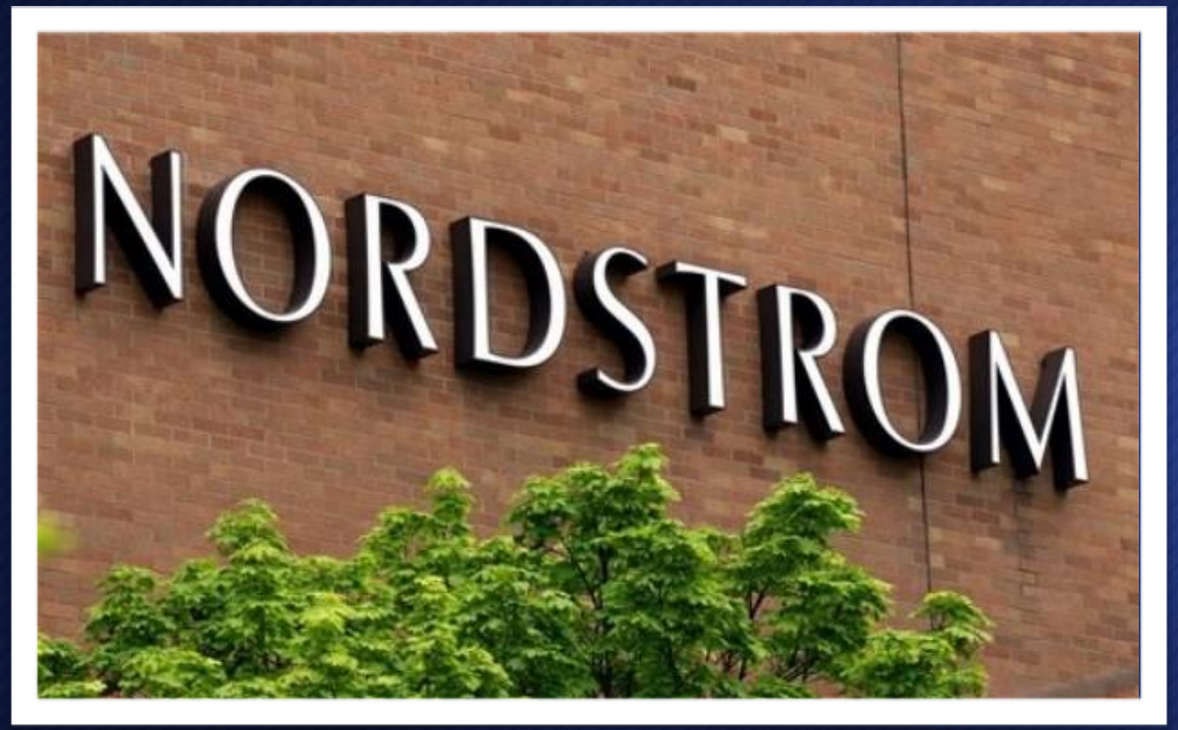
2. Over eating
   (High consumption)

3. Body of diseases
   (Rejections)

4. Heavy medical bills
   (Rework cost / High maintenance cost)

5. Walking speed
   (Low on-time delivery)

6. Tiredness
   (Low goal-orientation)

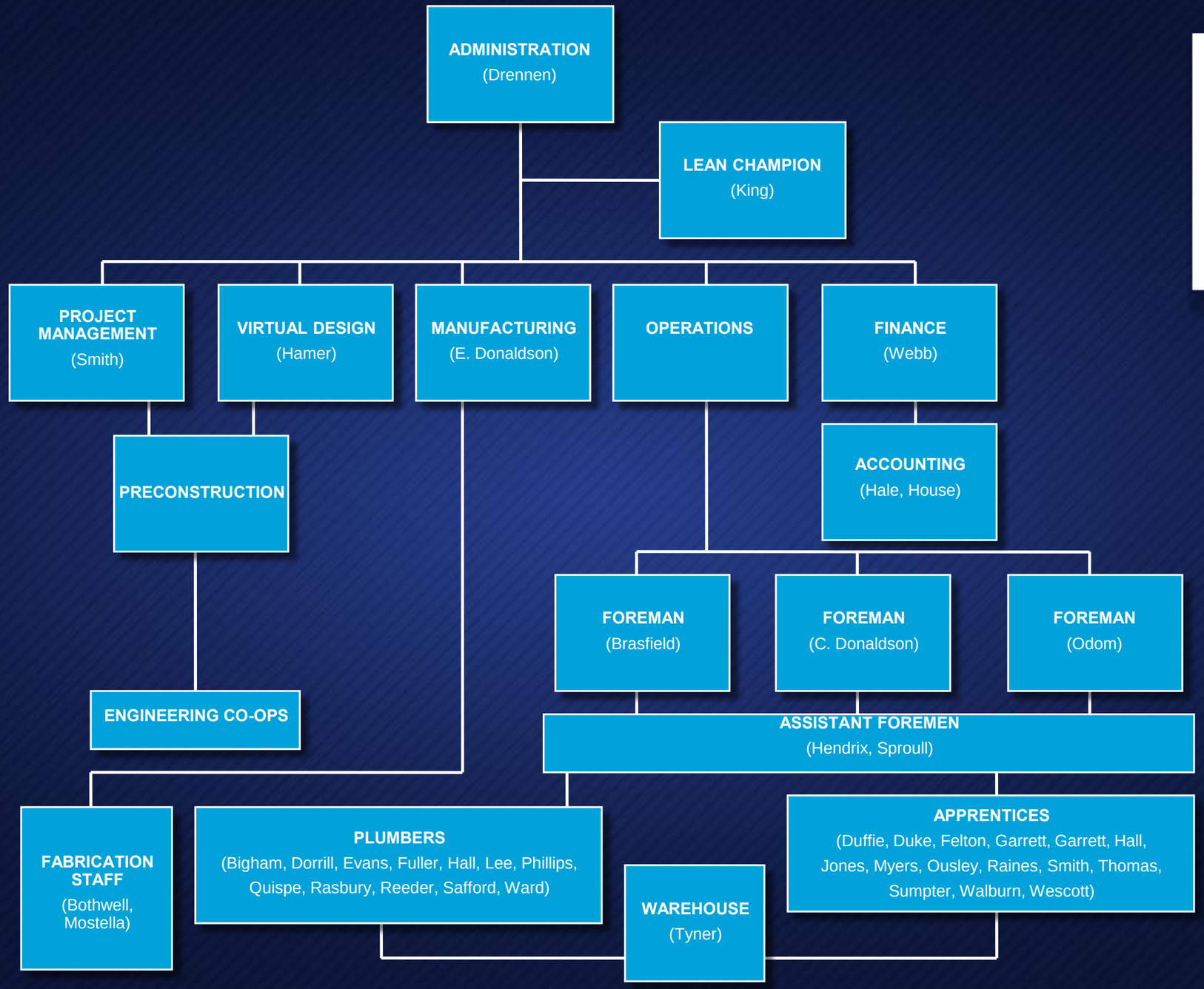

NORDSTROM


Rollback
$10
Rollback
$10
Rollback
10
$49

SUPERIOR MECHANICAL

LEAN

Leaning in the Right Direction

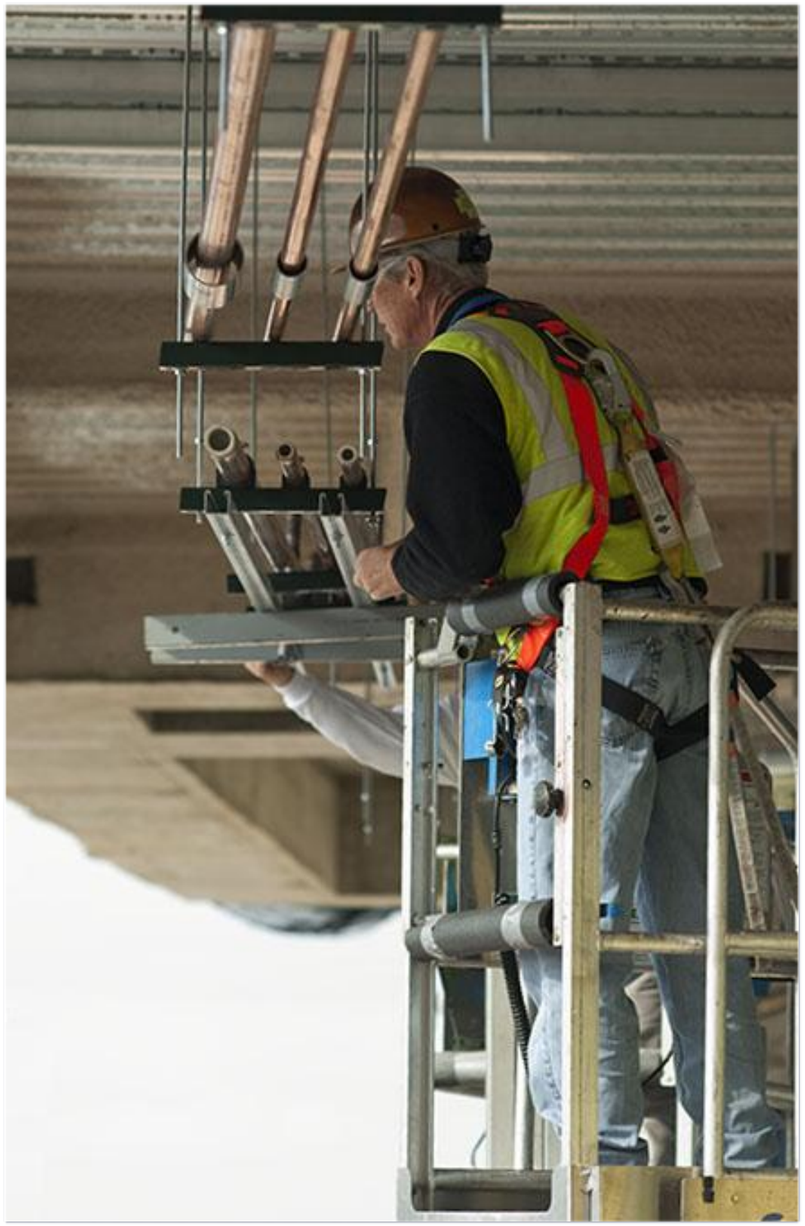


SUPERIOR MECHANICAL

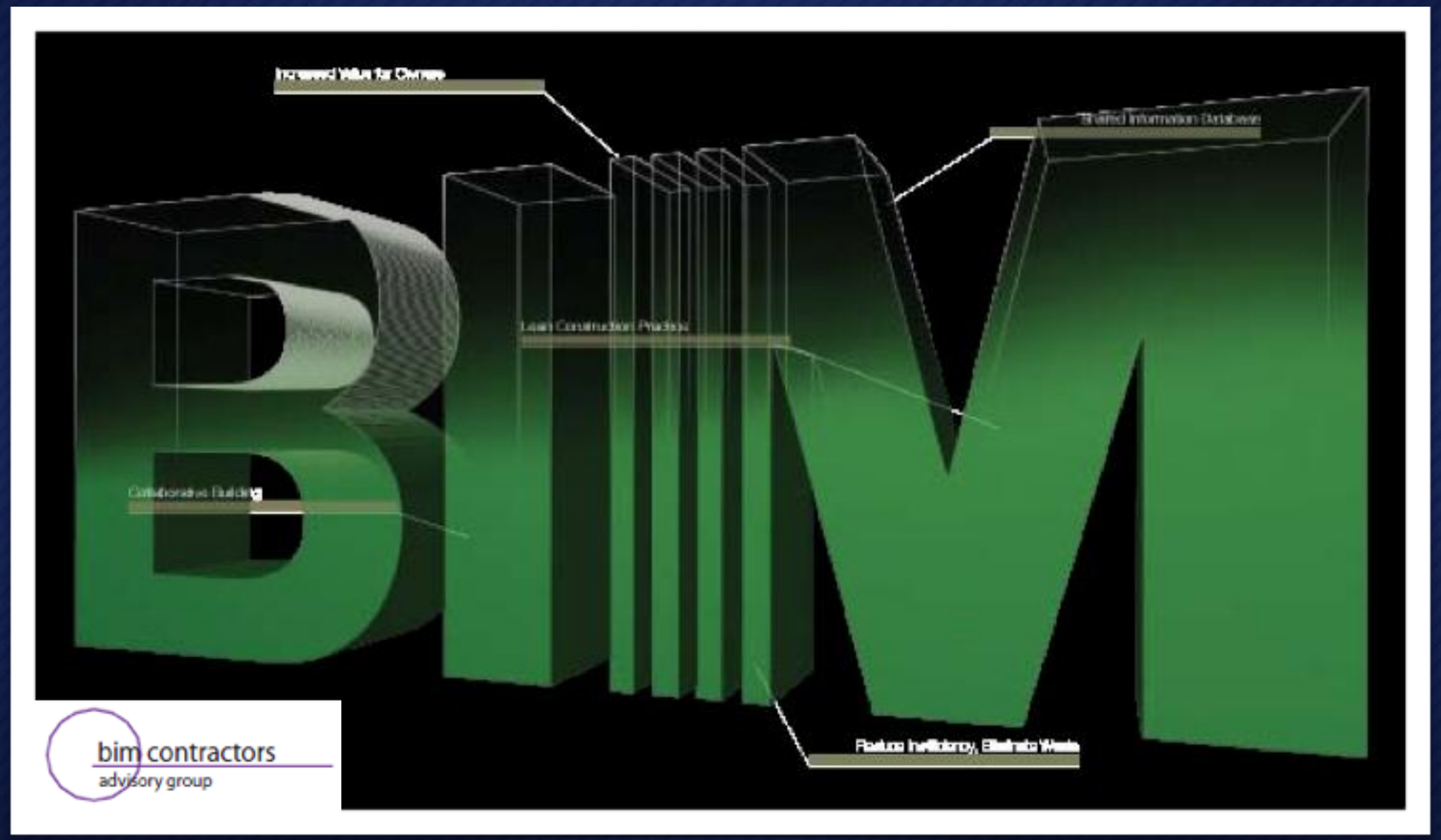
LEAN

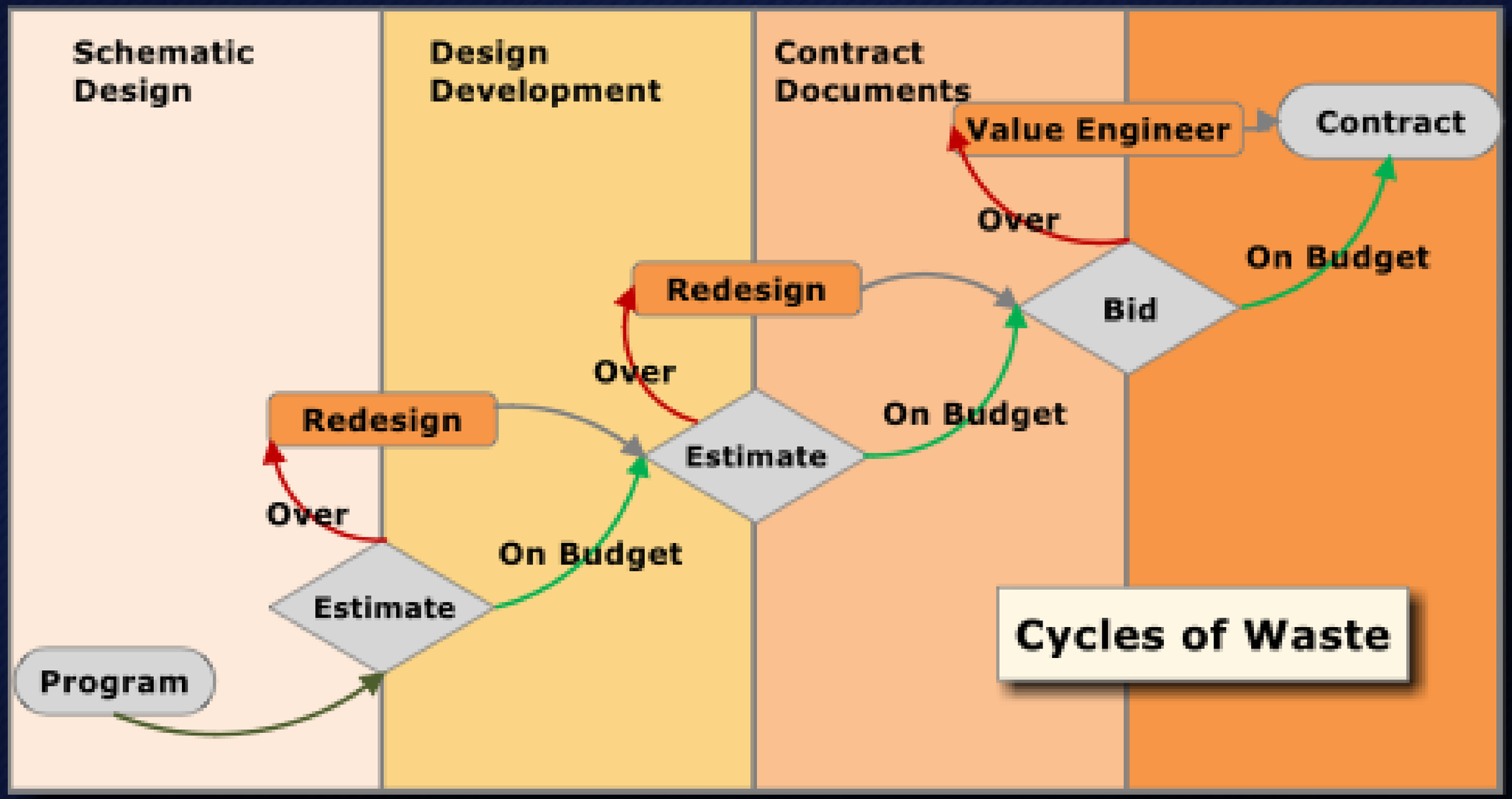
Leaning in the Right Direction

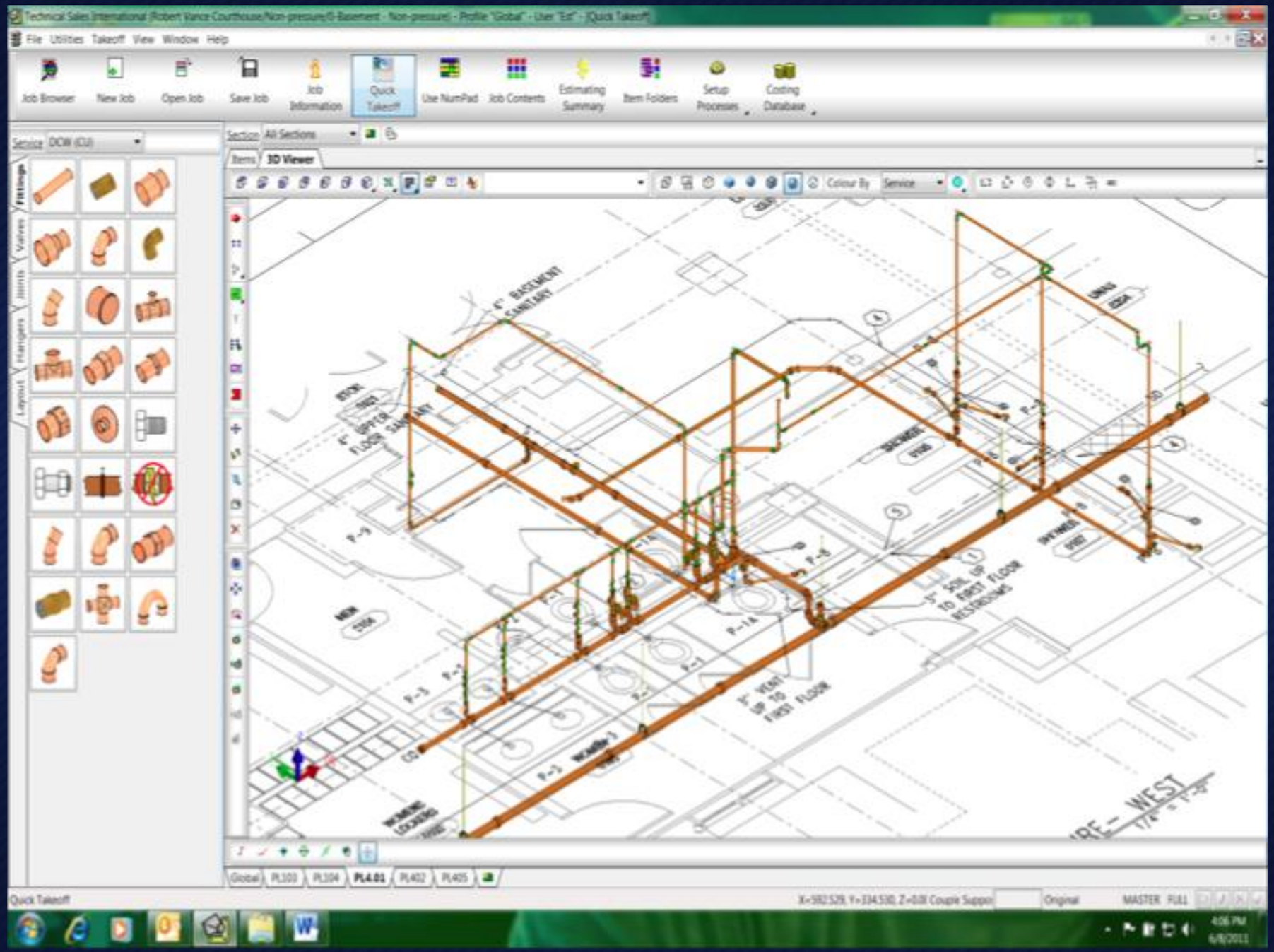

SM
SUPERIOR
MECHANICAL
ADT
LEAN
Leaning in the Right Direction
MANUFACTURING
DIVISION

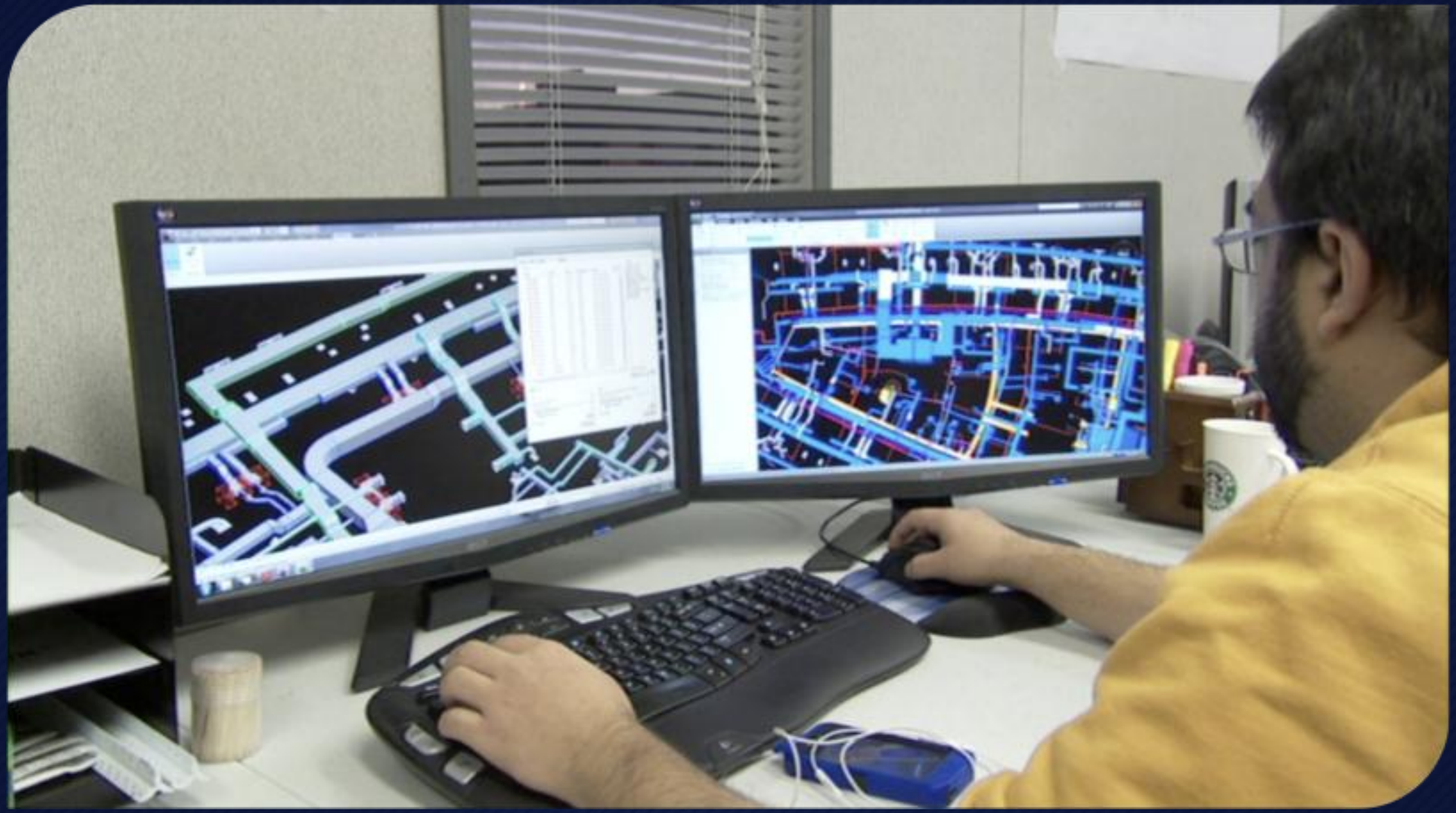


The Future of Construction is Now!




Schematic Design
Design Development
Contract Documents
Program
Estimate
Over
Redesign
On Budget
Estimate
Over
Redesign
On Budget
Bid
Over
Value Engineer
On Budget
Contract
Cycles of Waste

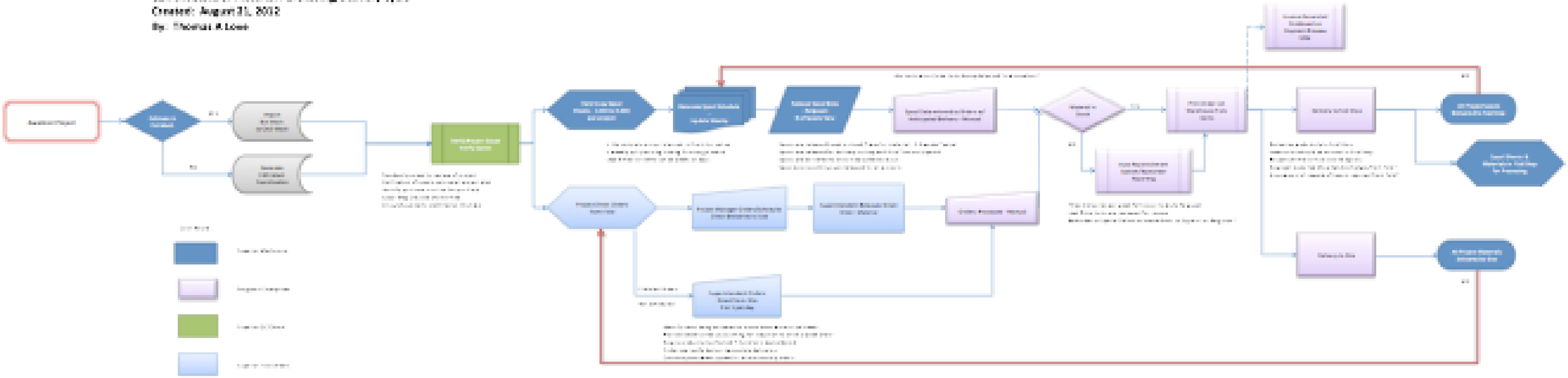

File Utilities Takeoff View Window Help
Job Browser
New Job
Open Job
Save Job
Job Information
Quick Takeoff
Use NumPad
Job Contents
Estimating Summary
Item Folders
Setup Processes
Costing Database
Service DCW (CU)
Section All Sections
Items
3D Viewer
Colour By Service
Fittings
Valves
Joints
Hangers
Layout
Quick Takeoff
Global
PL100
PL104
PL401
PL402
PL405
Original
MASTER FULL

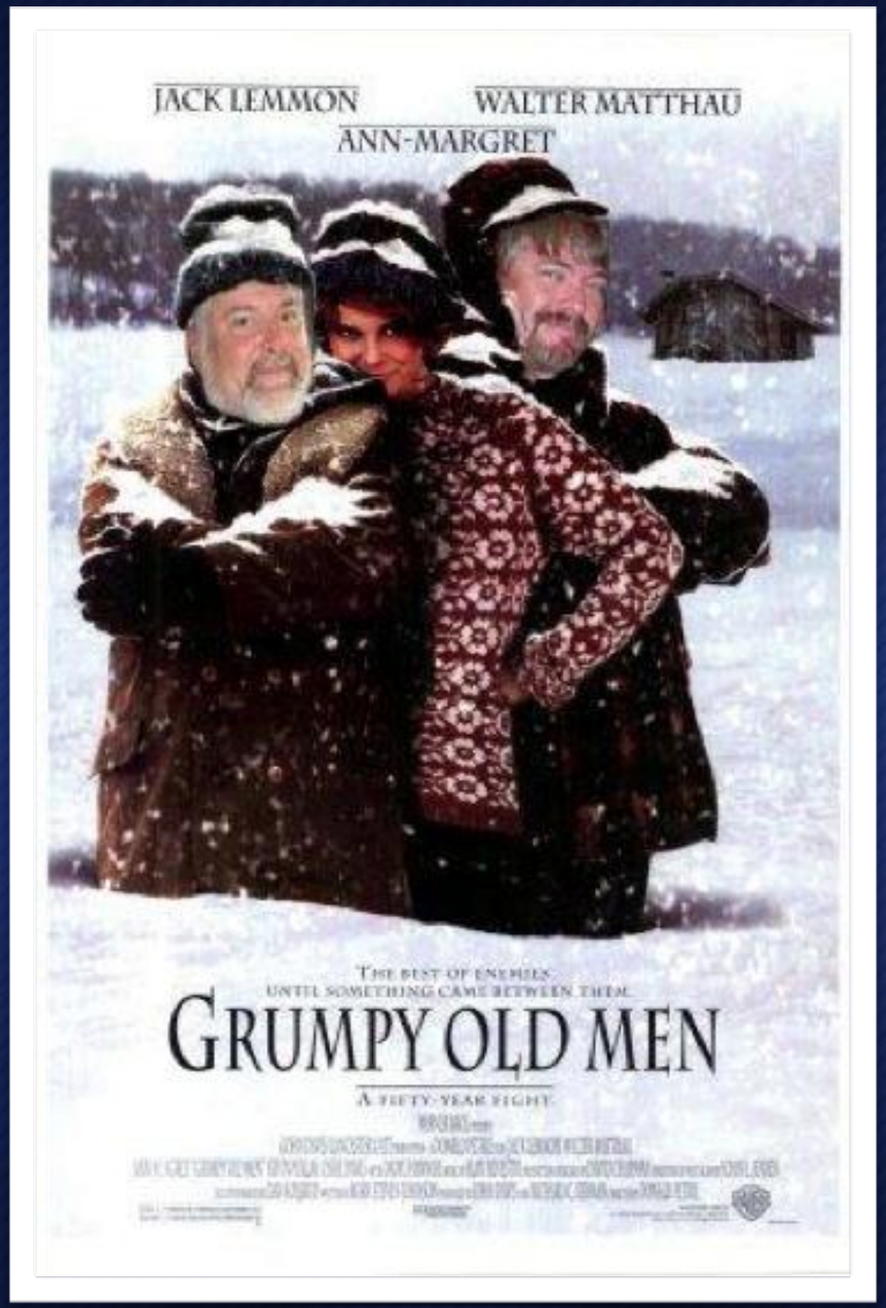


FERGUSON®

a WOLSELEY company

Value Stream Map
Superior Mechanical & Ferguson Enterprises
Current State of Material Purchasing/Delivery Cycle
Created: August 31, 2012
By: Thomas A Lowe




JACK LEMMON
WALTER MATTHAU
ANN-MARGRET
THE BEST OF ENEMIES
UNTIL SOMETHING CAME BETWEEN THEM.
GRUMPY OLD MEN
A FIFTY-YEAR FIGHT


SM
SUPERIOR
MECHANICAL
Thomas L. Parish Award
BOBBY HOLLIS
December 19, 2007


A's
18

THE FOLLOWING **PREVIEW** HAS BEEN APPROVED FOR

APPROPRIATE AUDIENCES

BY THE MOTION PICTURE ASSOCIATION OF AMERICA, INC.

www.filmratings.com

www.mpaa.org


Merry Christmas 2011
LEAN EXPRESS
SM
SUPERIOR MECHANICAL
LEAN


Ortho/Rehab
Emergency Room
SUPERIOR MECHANICAL
LEAN

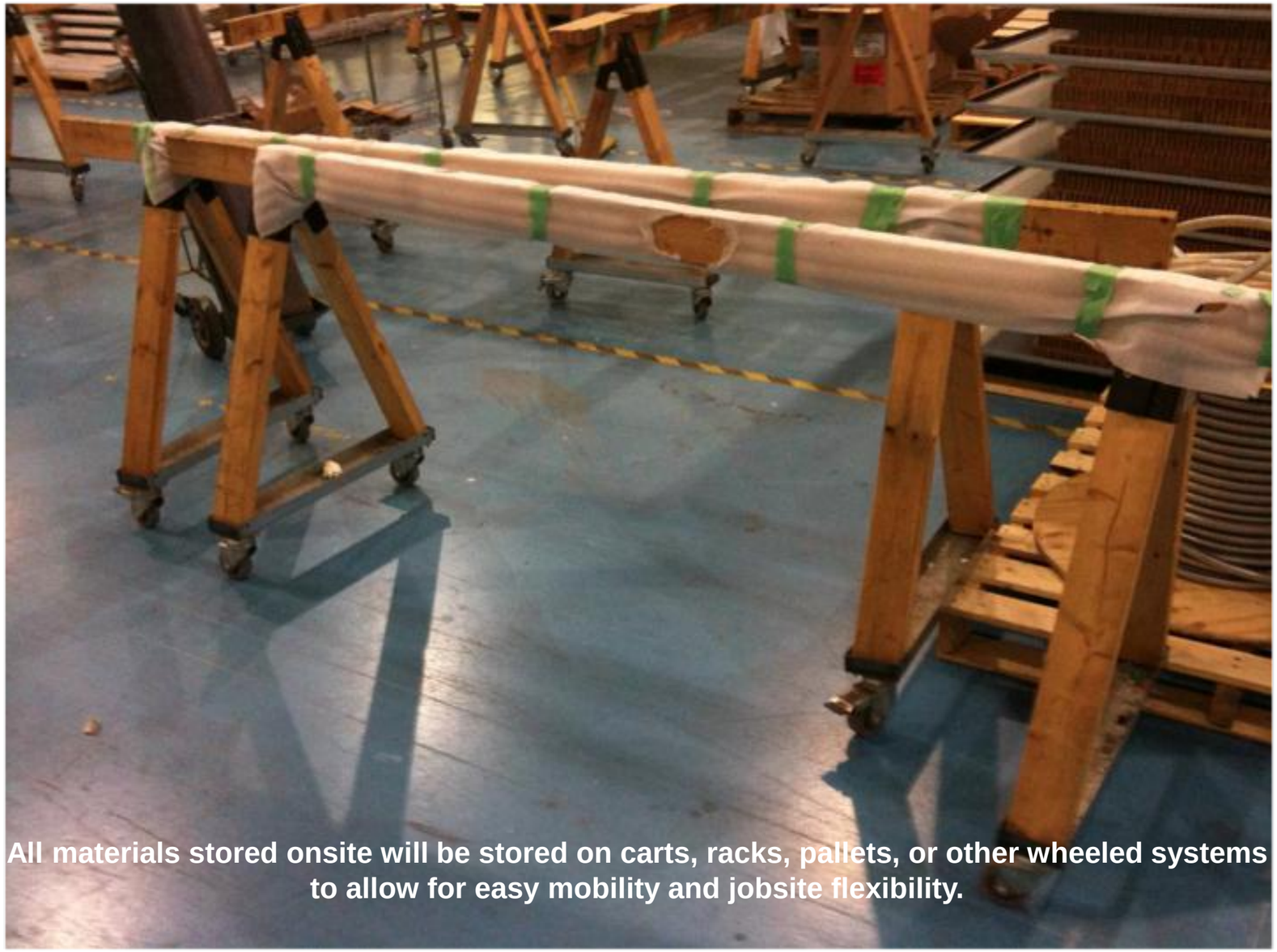
A Teachable Spirit


1 2 3 4 5 6 7 8 EXT
1 2 3 4 5 6 TC DC DO RS FL
GOAL ACTUAL TREND D-TIME
4:19 30 00 00 000 OC OF

Lean is ultimately…

“the continuous process of eliminating waste,
focusing on the entire value stream
and pursuing perfection in the execution
of a constructed project”


04.06.2010



All materials stored onsite will be stored on carts, racks, pallets, or other wheeled systems to allow for easy mobility and jobsite flexibility.


20.9%
maxo2®
OXYGEN ANALYZER
maxtec


BEGIN with the
END in mind.
SUPERIOR MECHANICAL
LEON
REGIONS FIELD
BIRMINGHAM
REGIONS

When CardioVascular Associates moves in to its new $20 million building at the Colonnade in about a year, patients should find that they spend less time waiting and more time with the doctor -- thanks to a patient flow system designers say is based loosely on manufacturing principles.

When architects with Giattina Aycock Architecture Studio sat down with the physician-owners of the cardiovascular practice, the doctors identified a shortage of exam rooms as the cause of most delays in their current facilities, said Giattina Aycock President Chris Giattina.

But a work flow study surprised the doctors by showing that exam rooms often sat empty even as patients waited, he said, so the architecture firm set about designing a new system for moving patients, as well as a new building.

In the new facility, physicians and nurses will work in pairs, with each pair using three exam rooms, Giattina said. Each team of two will be paired with another, and nurses and support staff will be trained to back up their counterparts on the team with which they're paired.

Like lean manufacturing, it's a step forward from the "push system" common in medical care and manufacturing, in which patients and parts are moved linearly from one delay to the next, he said.

SUPERIOR MECHANICAL

LEAN

Leaning in the Right Direction

Water Spider = Process Flow

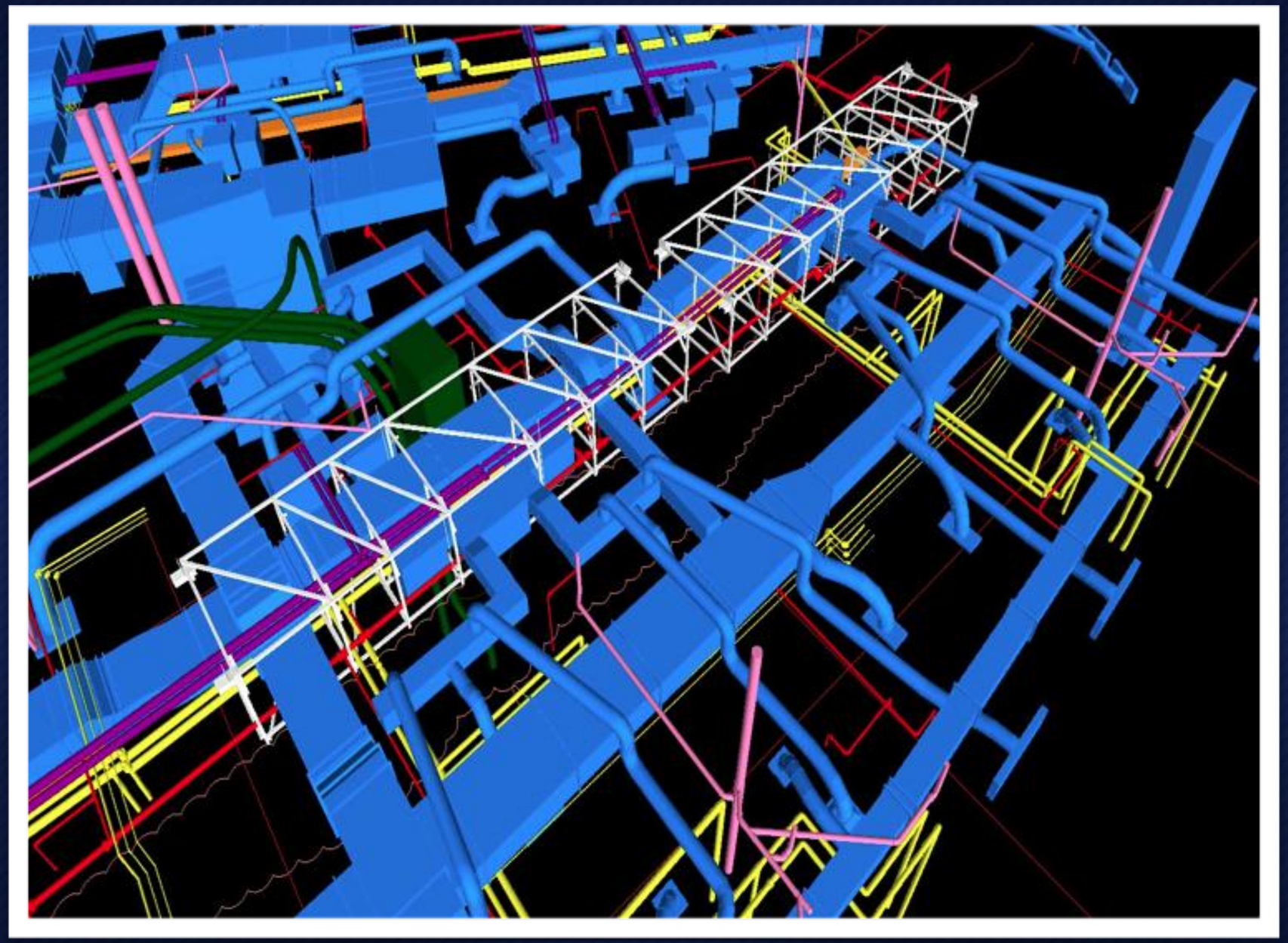

KNAACK


SUPERIOR
MECHANICAL
LEAN

Trust in the Lord with all your heart
And **LEAN** not on your own understanding (Pr 3:5)

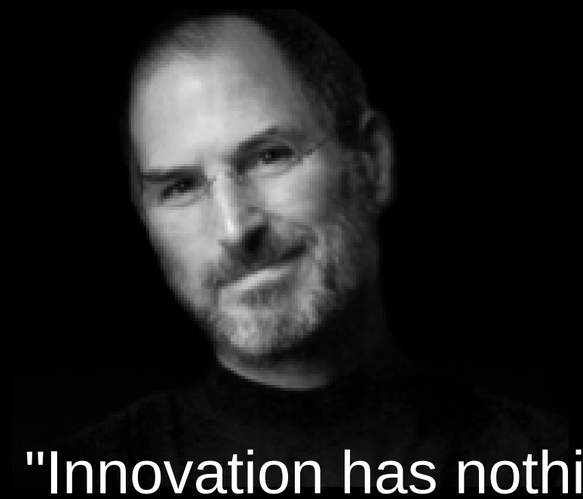
Superior Mechanical Comparative Analysis vs. Traditional Plumber		
	SUPERIOR	BLOATED
Budgeted Cost	$1,000,000	$1,000,000
LABOR as % of Total Cost	40.00%	40.00%
Average Labor Cost	$400,000	$400,000
Base Wage Per Hour	$20.00	$20.00
Manhours Received By Client	22,000	20,000
Variance	10%	
MATERIAL as % of Total Cost	31%	40%
Average Material Cost	$310,000	$400,000
STORED MATERIAL	4 Months	
Interest Savings Received By Client	$3,800	
LABOR Savings	$40,000	
MATERIAL Savings	90,000	
CAPITAL Savings	3,800	
TOTAL Savings	$133,800	
Savings as % of Total Cost	13.4%	

Navigating the R&D Tax Credit




RH
36

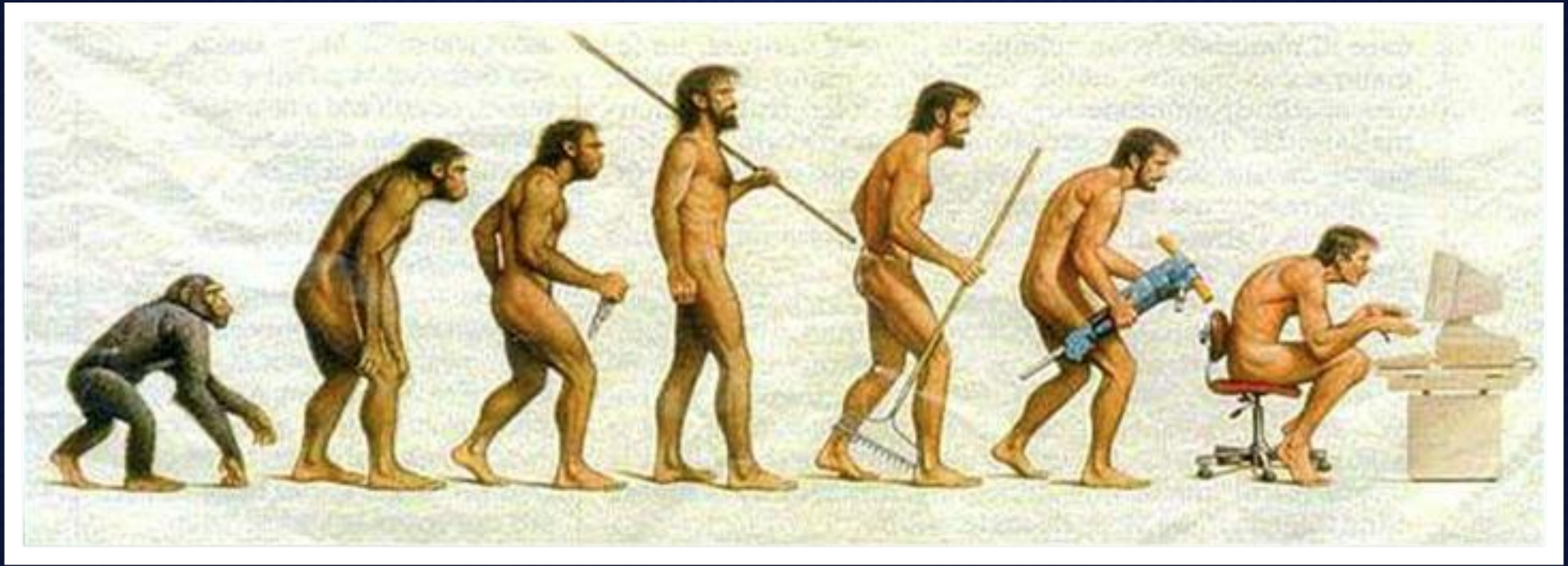

RK
35



"Innovation has nothing to do with how many R&D dollars you have. When Apple came up with the Mac, IBM was spending at least 100 times more on R&D. It's not about money. It's about the people you have, how you're led, and how much you get it.“

Steve Jobs

1955-2011




3/3
P&H
05
06
JIG TABLE 1


World › United States › GA › Richmond Co. › Augusta › West

Redefining Innovation

to make changes – innovative *adj*
in•no•va•tion \ i-nə- vā-shən\
n **1** : the introduction of something
new **2** : a new idea, method, or
device **3** : **Superior Mechanical**

Lean Manufacturing
Building Information Modeling (BIM)

SUPERIOR MECHANICAL

LEAN
Leaning in the Right Direction

SuperiorMechanical.com
Phone: 205.834.9001

This concludes The American Institute of Architects Continuing Education Systems Course

Lean Construction Institute info@leanconstruction.org