

Getting Better at Getting Better

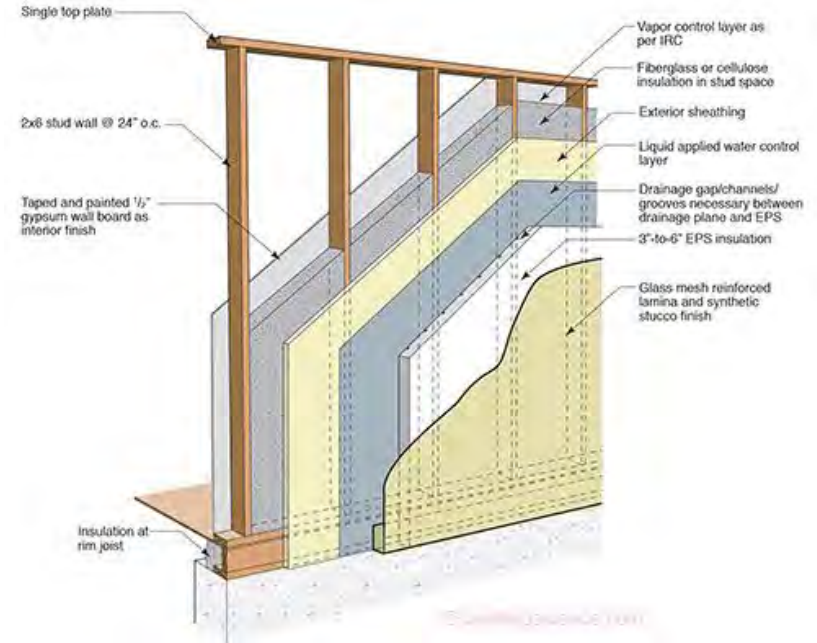
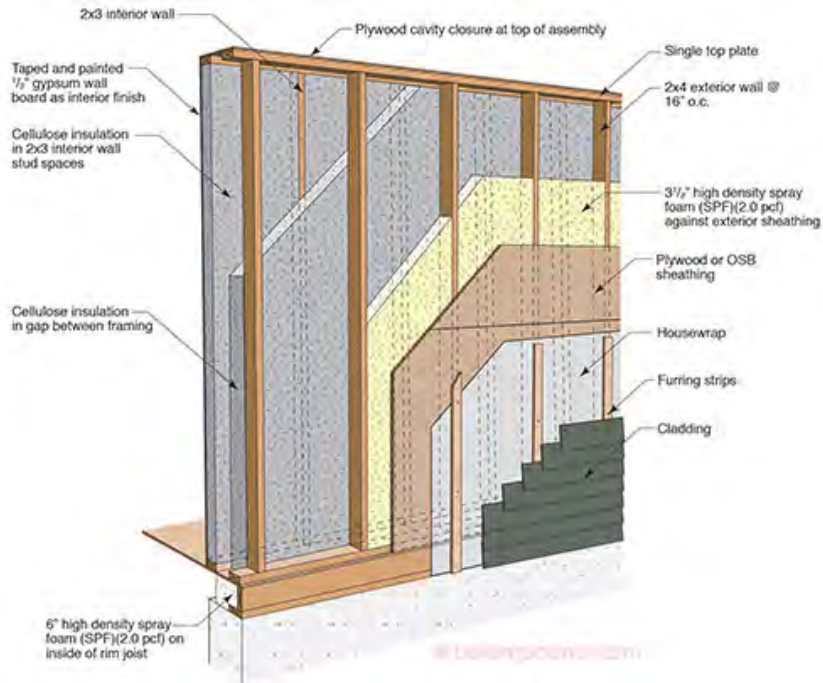
Lean Thinking for Residential Construction

Tedd Benson

Kevin Bittenbender

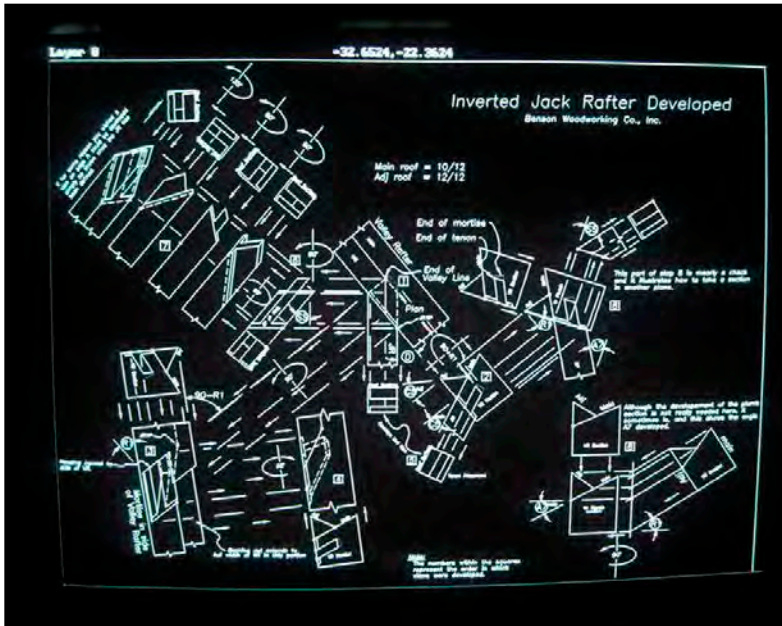
Andrew Dey

More is Better



(Except for the cost)





Mid-Course Correction 1988-90

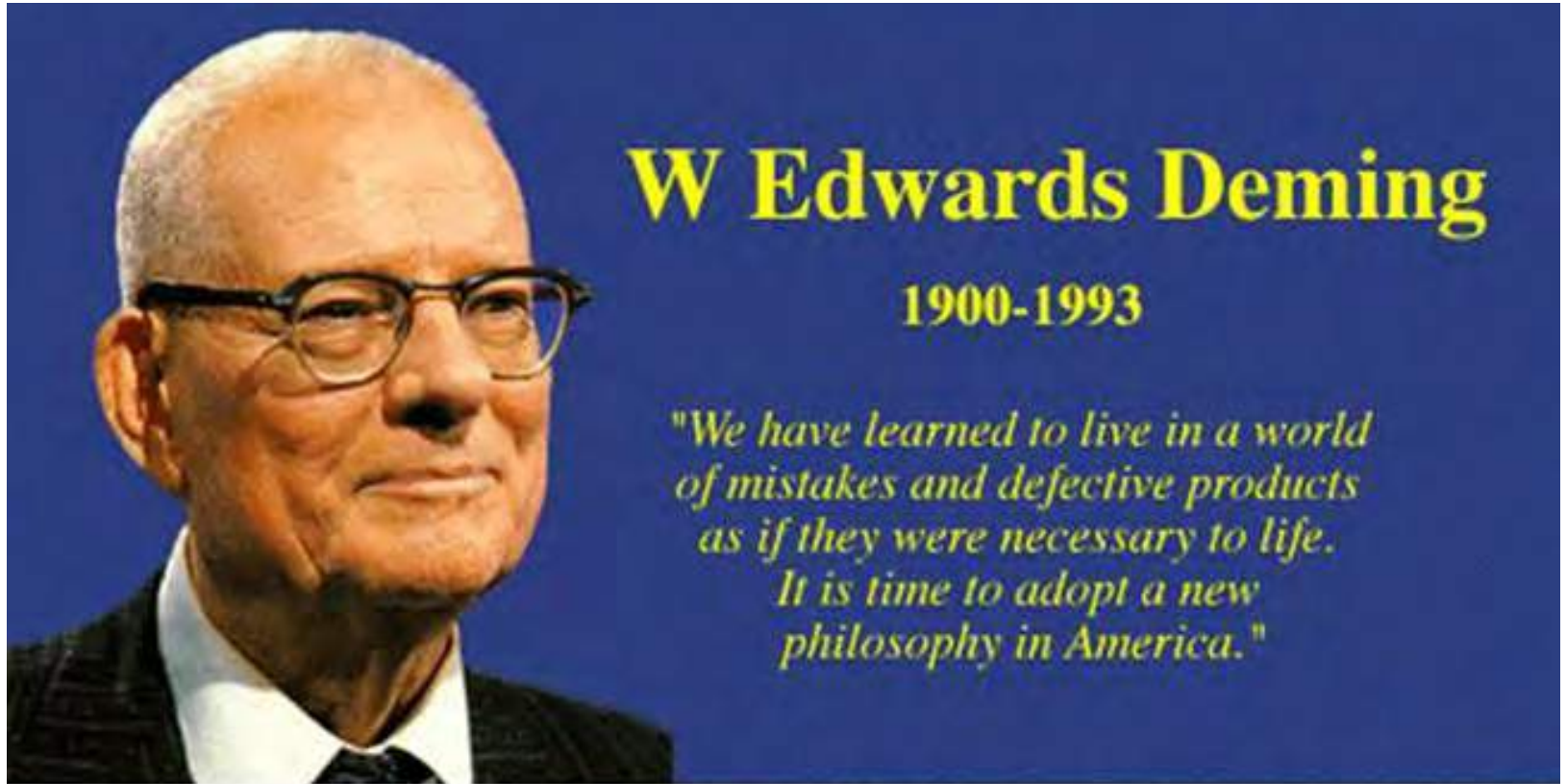
Mastering the Craft of Building

Depends on

Mastering the Craft of Business

Which is about

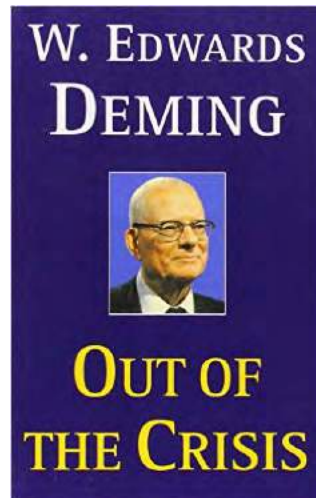
Mastering Process



The American who taught Japanese about
Quality

Deming's 14 Points

- Create constancy of purpose toward improvement of product and service, with the aim to become competitive and to stay in business, and to provide jobs.
- Adopt the new philosophy. We are in a new economic age. Western management must awaken to the challenge, must learn their responsibilities, and take on leadership for change.
- Cease dependence on inspection to achieve quality. Eliminate the need for inspection on a mass basis by building quality into the product in the first place.
- End the practice of awarding business on the basis of price tag. Instead, minimise total cost. Move towards a single supplier for any one item, on a long-term relationship of loyalty and trust.
- Improve constantly and forever the system of production and service, to improve quality and productivity, and thus constantly decrease costs.
- Institute training on the job.
- Institute leadership. The aim of supervision should be to help people and machines and gadgets to do a better job. Supervision of management is in need of an overhaul, as well as supervision of production workers.
- Drive out fear, so that everyone may work effectively for the company.



A bad system
will beat a
good person
every time.

– W. Edwards Deming

Double Quotes
doublequotes.net



It is not enough to do your best; you must know what to do, and then do your best.

(W. Edwards Deming)




Quality is pride of workmanship.
W. Edwards Deming




Innovation comes from people who take joy in their work.

W. Edwards Deming



"Your system is perfectly designed to give you the results you're getting."

- W.E. Deming



"IN GOD WE TRUST,
ALL OTHERS MUST
BRING DATA."

W. EDWARD DEMING



It is not necessary to **change**.

Survival is not **mandatory**.



W. Edwards Deming

Blower Door Testing

Summary

~~"Buildings have to breathe"~~ X



"Buildings have to dry, **people** have to breathe"



"You can't control what you can't contain"



"You can't manage what you can't measure"



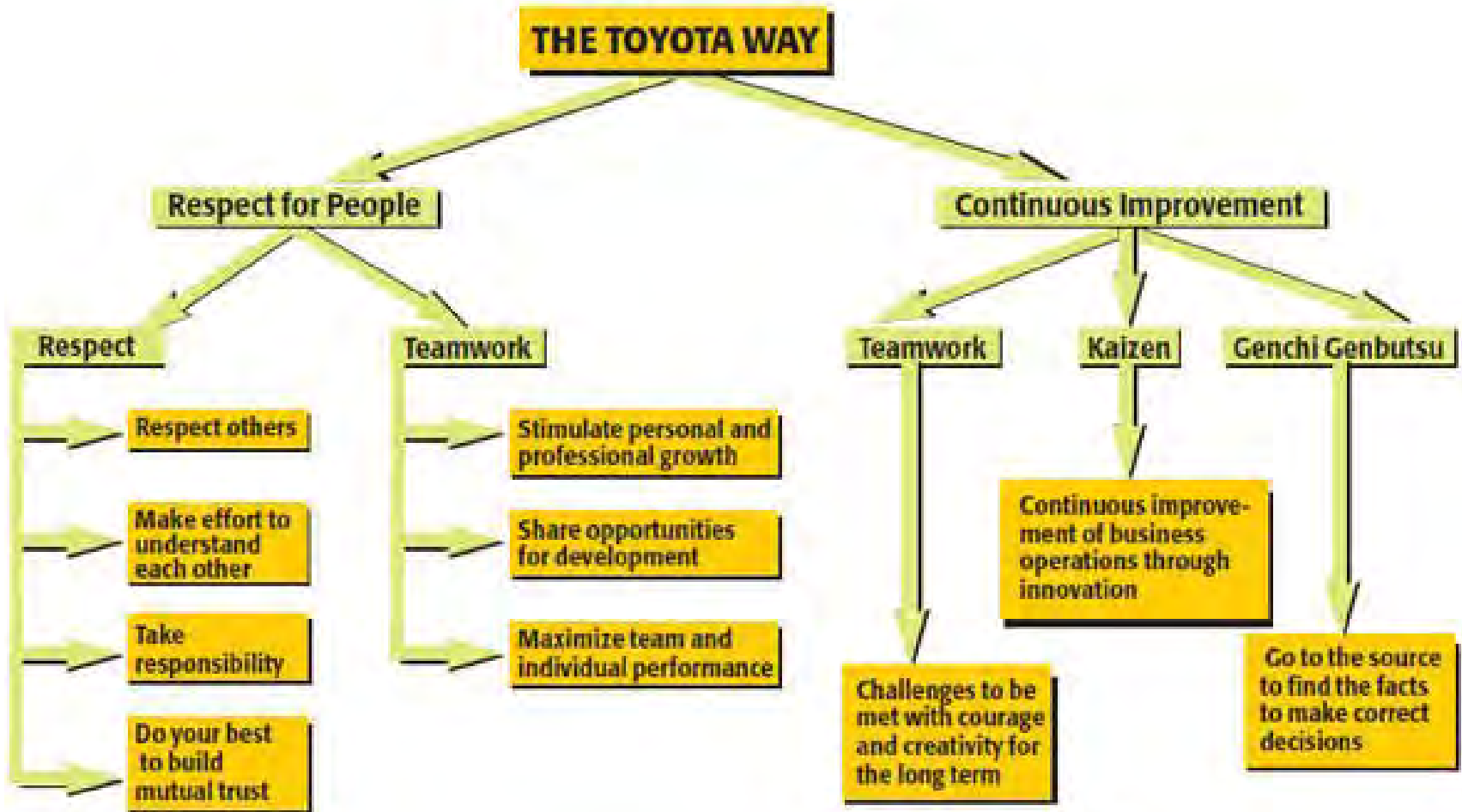
"Build Tight and Ventilate Right!"

“ YOU CAN'T MANAGE
WHAT YOU DON'T MEASURE.

- W. Edward Deming







For \$20,000



For \$20,000





MASCO

LUTRON®



PROGRESS LIGHTING

uponor



American Standard







**LEAN
THINKING**

Getting Better at Getting Better, Part II: *Lean Thinking In The Shop*

NESEA Building Energy Boston 2017

KEVIN BITTENBENDER,
Company Steward, Bensonwood Homes



LEAN FOR CUSTOM JOBS

We're not making widgets!



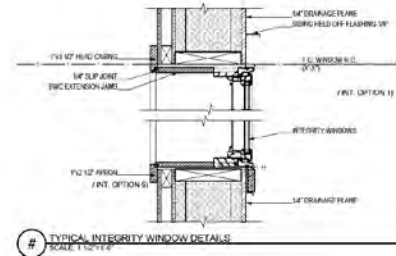
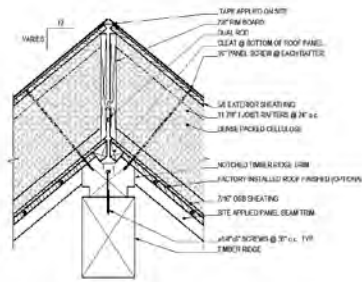
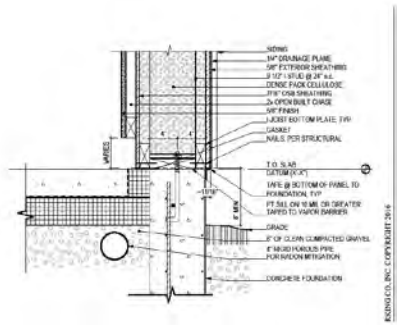
FIND WHAT REPEATS

OFFSITE CONSTRUCTION
Repeating Job Site



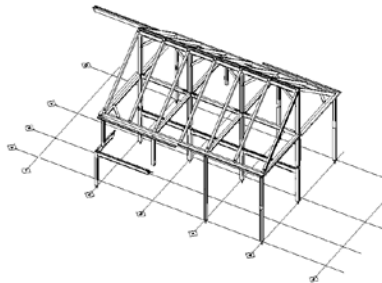
FIND WHAT REPEATS

REPEATING INTERSECTIONS

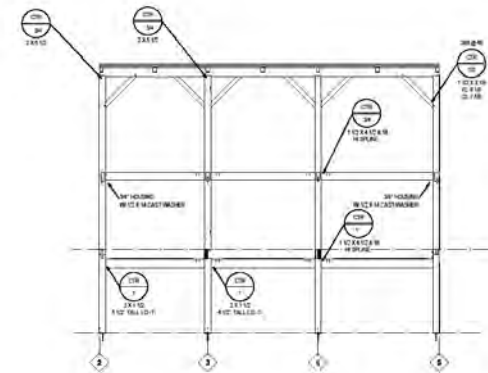


TYPICAL INTEGRITY WINDOW DETAILS
SCALE: 1/4\"/>

REPEATING JOINERY



REPEATING TERMINOLOGY



USE LEAN TOOLS

- 5S (Basic Organization)
- Visual Controls
- Reducing Batch Size
- Point of Use Storage
- Creating Flow
- Pull Systems

Elements of 5S (Organization)

Sort

Set in Order

Shine

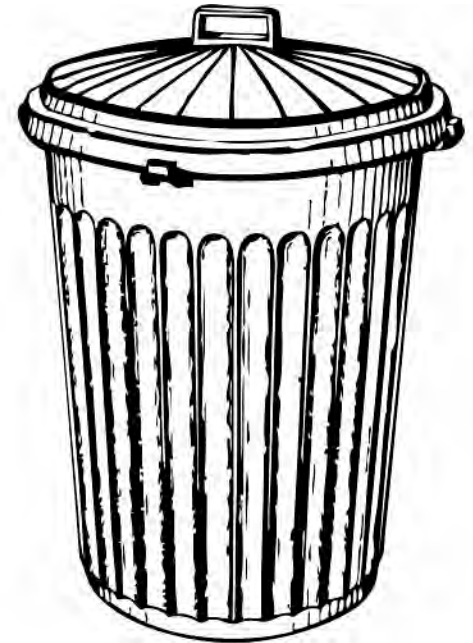
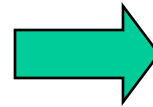
Standardize

Sustain

5S

SORT

“When in doubt, throw it out”



5S

SET IN ORDER



- A place for everything and everything in its place.

5S

SET IN ORDER

Labels



Shadow Boards



Build storage to fit

5S

SET IN ORDER

Existence is better than perfection



5S

SHINE



5S

**Looks good..... now how do we
keep it this way?**

Standardize (4ths)

&

Sustain (5ths)

5S

Example: Posted 5S standards



5S

Example:
Check
lists/SOP's
are
Standards

Procedure for Preparing splines

Things to do first

- Get list
- Check for proper species
- Look for detail type and keep this in mind when getting stock(see spline detail sheet)
- Double ck thickness with job cap.

Getting rough stock

- Ck list for thickness / making sure that we got it.
- Make roughing list- i.e. length & with
- Bring stock into shed
- Rough cut stock 3" over list On upcut saw
- When cutting stock, grade /no checks /rot /or visible loose knots
- Cut at least one extra of longest length
- After cutting mark length on end grain with marker
- Pack on cart , bring to lower shop



Milling stock

- Mill 1" to 1-1/4" over width on band saw
- Face and edge joint on jointer (making sure not to joint below thickness)
- Plane to spec. Note you should have double checked this with job captain
- With a fat ripping blade, rip splines to width on table saw
- Using chop saw or tiger stop would be best (making sure you check for square) cut to length
- Label the top non-visible edge of spline (ck speck sheet to find tnve)



Weekly 5S Sustain Practices

Area #2

- CNC Mortiser, Hollow Chisel, 2 Shapers, Chop Box, Bench Top Mortiser, Tenoner

Record dates 5s is complete (write month for Monthly check)					

5S routine

Each Month—Blow out outlets -- Inspect fire extinguishers (2) -- Pin in place? gauge in the green? Turn upside down) -- Inspect extension cords – Check & replace lightbulbs – Check & fill Oil cups on tenoner (30 wt

Weekly

- Blow off all machines
- Empty full garbage and wood cans
- Sweep
- Purge scrap wood
- Empty Shop-Vac
- Check and fill shadow board
- Make sure jigs are organized

Improvements to be made

Get clipboard on two shapers. Move Sander down the shop, 5S the jig storage area behind the mortiser, 5S the jig storage on the wall behind the shaper (after wall is insulated and sheathed), Fix leak on South wall and insulate & finish, Remove garage door supports, Add broom station by old phone jack

5 Necessary Conditions for SUSTAIN

1. Development of new awareness and skills
2. Support from management
3. Ongoing communication
4. 5S is part of daily work
5. Total Employee Involvement (TEI)

Visual Controls

- Labels
- Shadow boards
- Lines on floor
- Pictures
- Andon Lights
- Kanban



Visual Controls



Set Up Reduction

