Net Zero is Smart, Cool and our Future

It's time!

EcoSmart

LEAN PROJECT DELIVERY

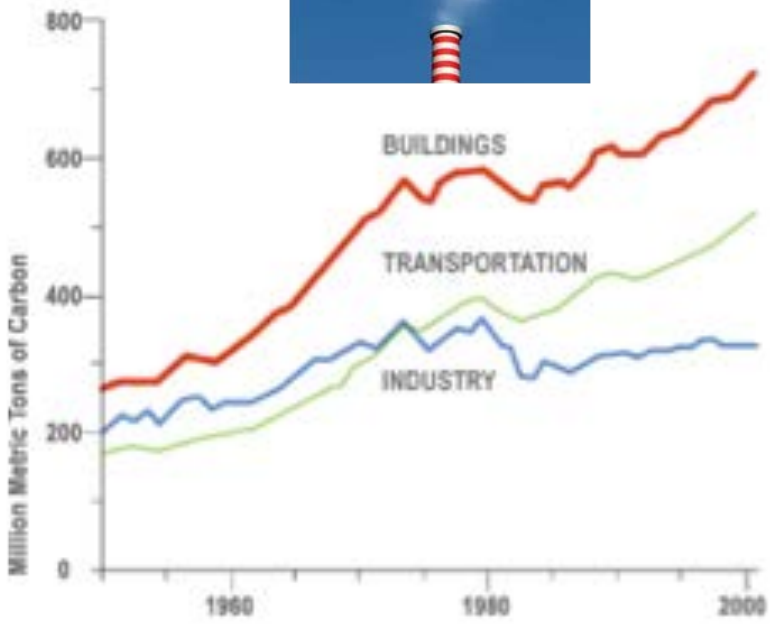
integrated DESIGNS


Hey Buddy
The planet needs
help!!!

Stop having so much FUN Windsurfing

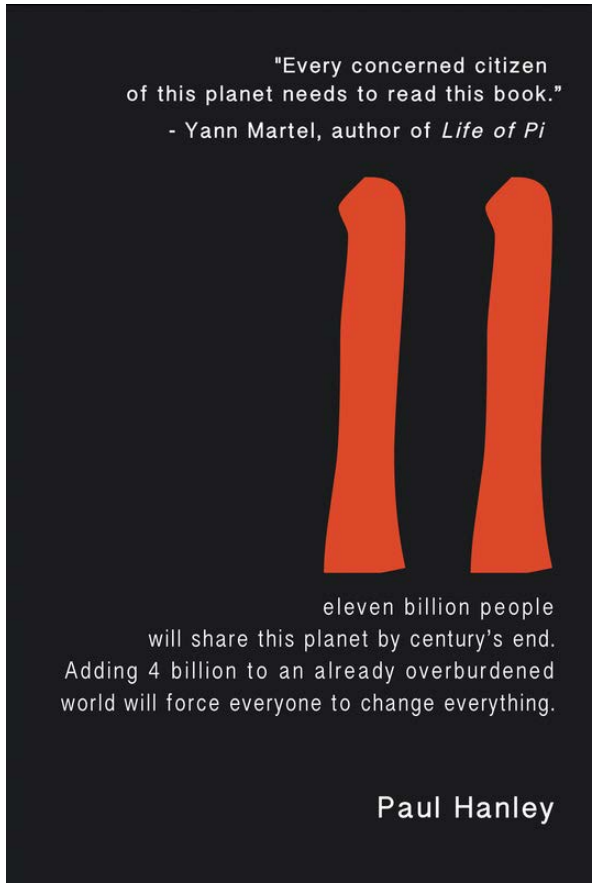
and DO SOMETHING about climate change!

- 1/3 of Canada's Energy Use
- 50% of extracted materials
- 25% of our landfill waste
- 10% of our airborne particulates
- **40% of greenhouse gases**
- Reference: A Business Case for Green Buildings in Canada



Factor 10 reductions for a FUTURE on this Planet

factor10



We need EVERYONE to GO BIG on GREEN

VP Sustainability Aspen Skiing Company

It Takes POWDER to be Successful

P People to give a SH!T &

O Open to Change that

W Want to protect the WOW on this Planet &

D Drive a new

E **Eco**nomy that

R Respects the Planet

Some really influential people THINK

What happens if we don’t figure it out soon?

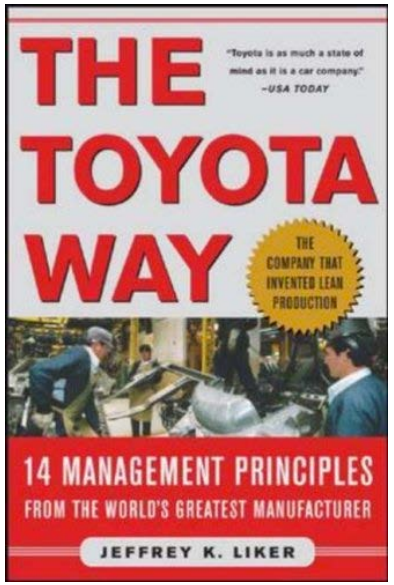
Musk, as he will gladly tell you, has a vision: Colonize Mars and make humans a multi-planet civilization. He sees it as insurance against a global catastrophe that leads to human extinction. (Quartz)

and Lean will help take them there!

To make it affordable to blast off into space, Elon Musk has adopted lean practices that enable SpaceX to build rockets at half the cost.

"The secret to the low cost is relatively simple, at least in principle: Do as much as possible in-house, in an integrated manufacturing facility, with modern components; and avoid the unwieldy supply chains, legacy designs, layers of contractors, and "cost-plus" billing that characterized SpaceX's competitors."

SpaceX like Toyota, know that Lean works



Lean enbles Toyota to be 3x more Profitable than their closet competitor

WHY NOT use these same principles to create the Cool, Smart Net 0 Home of the Future

Lean …A New Way of THINKING

Integrated Project Delivery

IPD integrated DESIGNS

Moneyball… Getting to Net 0 is the game!

EcoSmart
High Performance Green Home Building Company

integrated DESIGNS

The Building Industry needs to stop acting like the New York Yankees!

Payroll: $**126** million
Wins: 103 games

Payroll: $**40** million
Wins: 103 games

The problem with the building industry is that we act like the New York Yankees when it comes to delivering GREEN building projects. We get out our checkbooks buy sexy green technologies, field a team of disintegrated high priced performers that stumble their way to Net 0 energy performance at a significant cost premium. It doesn't have to be this way!

We need to adopt similar processes as Billy Beane did in baseball or Edward Deming, who proved that "Quality is Free" in the automobile industry.

We need to perform like the Oakland A's

By finding undervalued performance the Oakland A's have consistently outperformed the competition and have demonstrated ***there does NOT need to be tradeoffs between cost and performance.***

Lean is for Health Care!

How can we afford the PV panels?

I thought GREEN building were 10% more expensive!

WE know there will be OBJECTIONS

We have a **FIXED BUDGET!**

Triple glazed windows are way too expensive!

I just want fast and cheap!

The REALITY is
Lean to be Green ECOnomics work

Cowboy Math

If Lean saves 20% > 10% (Passive) + 10% (Net 0)

Then we should be able deliver **Net 0-0**

By adopting new thinking for the building industry we can make every building

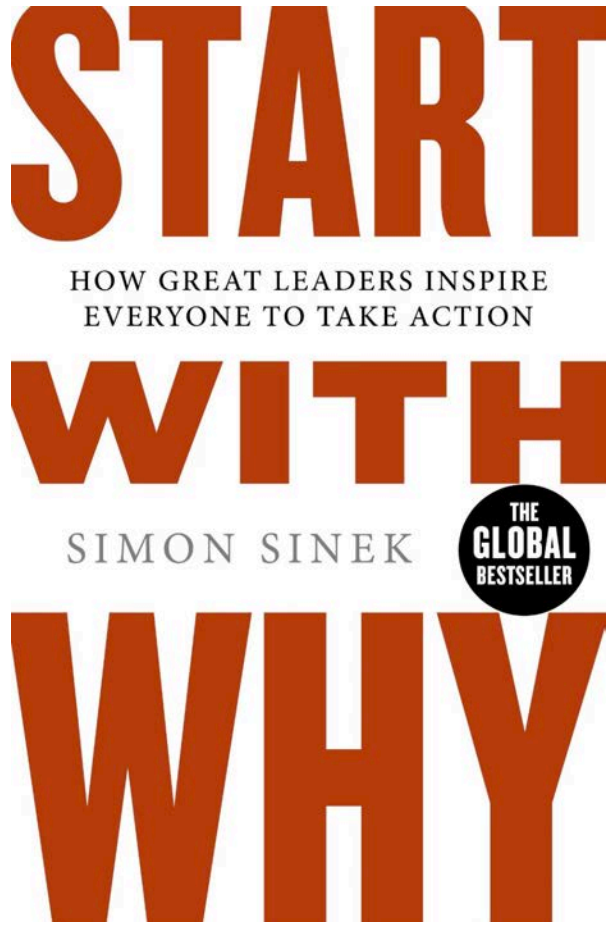
NET 0 and *eliminate*

40% of Green House Gases

This sums it up pretty good!

In his book "Quality is Free", Philip Crosby says it all.

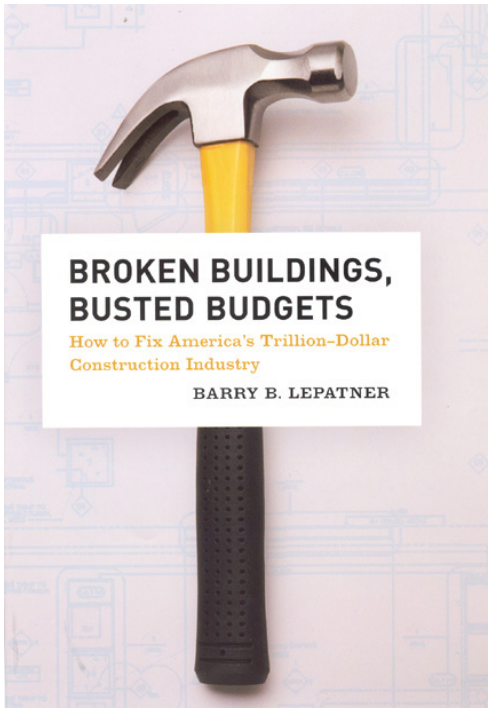
When we confront conventional wisdom that there is a tradeoff between quality and cost with optimism and an open mind we can do so much better!


START
HOW GREAT LEADERS INSPIRE
EVERYONE TO TAKE ACTION
WITH
SIMON SINEK
THE
GLOBAL
BESTSELLER
WHY

The Money Pit

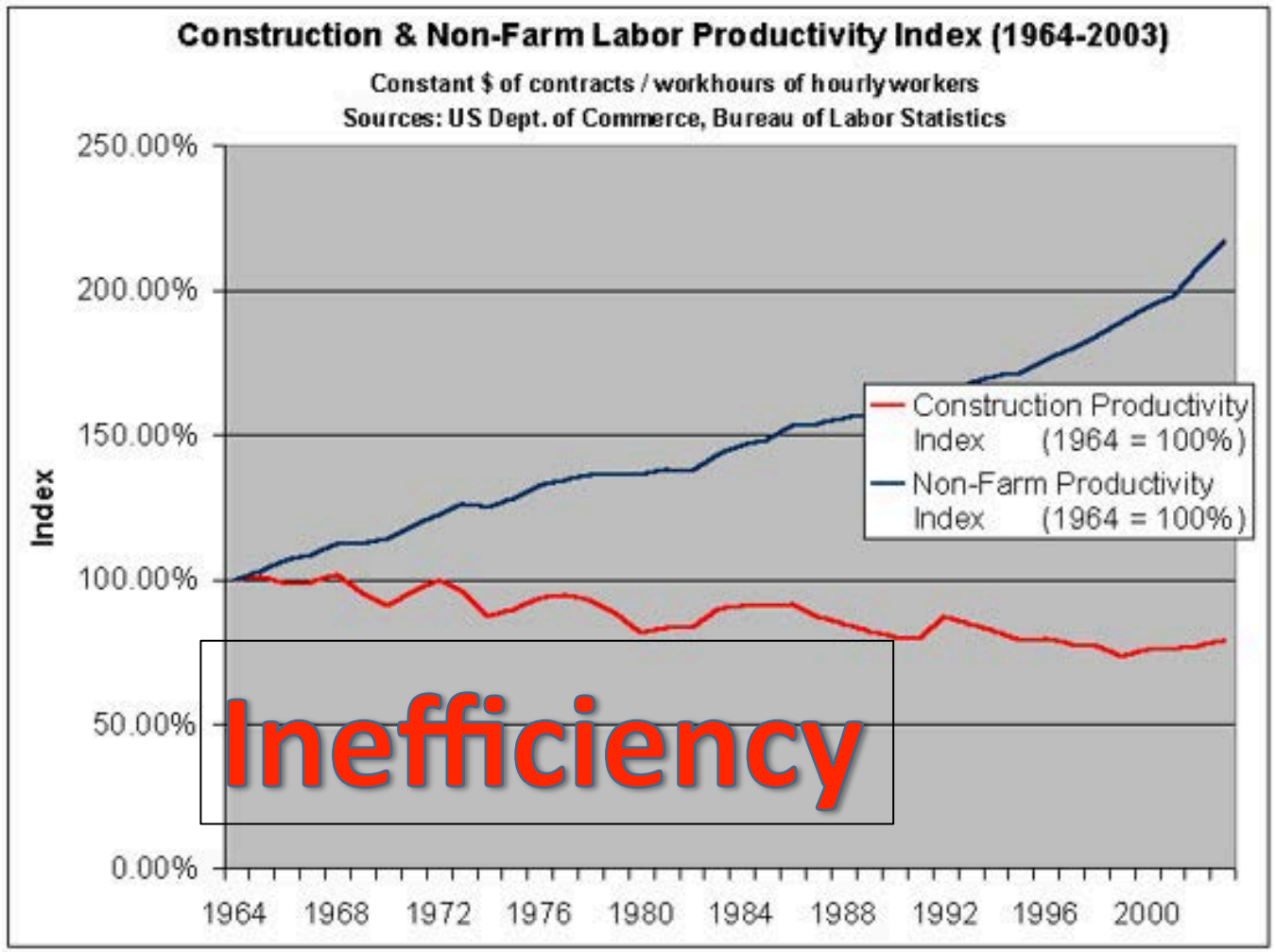
In 2007, US Construction was estimated at $1.288 TRILLION and if the building SMART ALLIANCE is right, 50% of it is waste. That means we waste $500B annually.

Shame on Us!

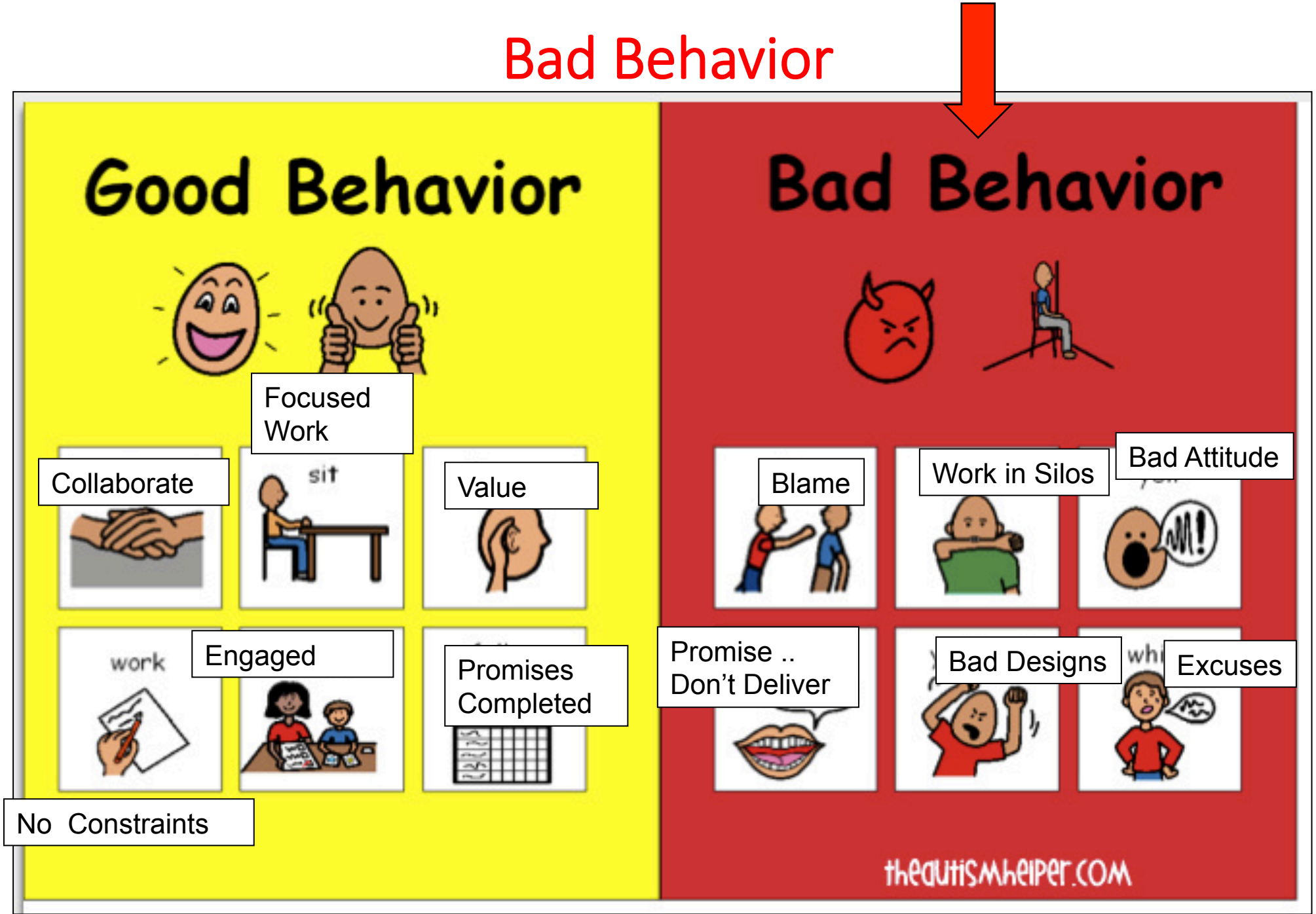


We need to fix 2 Things

Inefficiency



Bad Behavior



AHA Moment

Design-Build-LEED-Cx?

Design-Build-Cx-LEED™
A High Performance Method for Delivering Advanced Building Design Projects

By Murray Guy LEED™ , MBA, P.Eng

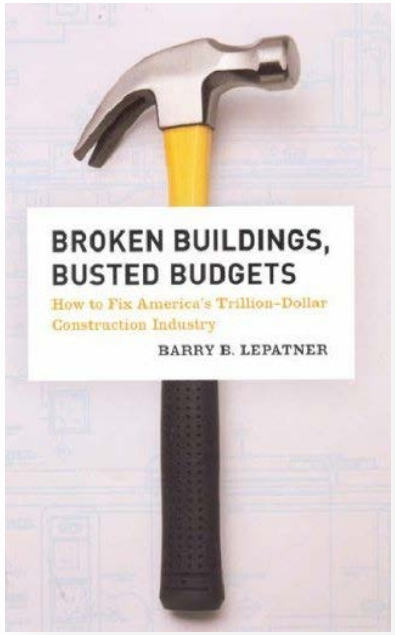
It took me two bailouts by the same general contractor to wake up to the fact that contractors are not the bad guys and that change notices, delay claims and confrontational relationships are the result of the traditional design-bid-build game that we force contractors to play. How can it make sense to spend 5% to 10% of a project budget on designing a building without input from knowledgeable contractors that have better cost control, value engineering and knowledge of building construction than most design teams?

integrated DESIGNS

THE UNIVERSITY OF WINNIPEG

Richardson College for the Environment

"Broken Budget" $10M over on $38.5M
LEED Gold 59% Less energy



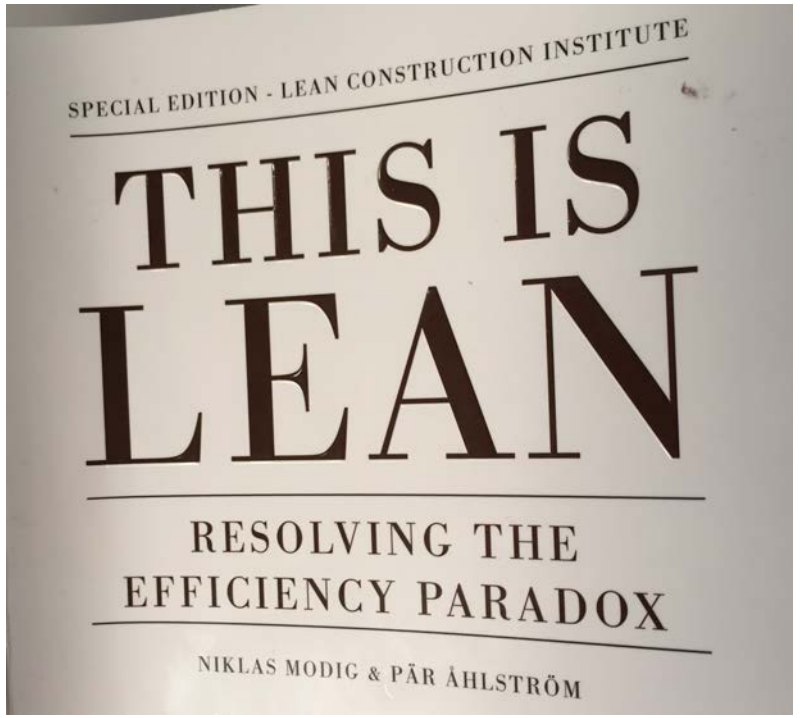
Lean to be Green Business Case Summary

- Why? The Bridge to our Future is Broken
- What do we need to Fix? Inefficiency & Bad Behavior
- How? Lean principles and practices
- Evidence? Toyoya 3x profit …. SpaceX ½ the cost
- Building Example? EcoSmart Prefab Green Net 0 Project
- Cowboy Math: Net 0 building are economically viable
- BIG IDEA…. Why Not All building Net 0 by 2020?
- Lesson Learned: SFC & U of W RCFE
- Next …. What is Lean ?


Now Murray, Lean is a new way of THINKING do you really know what to do?

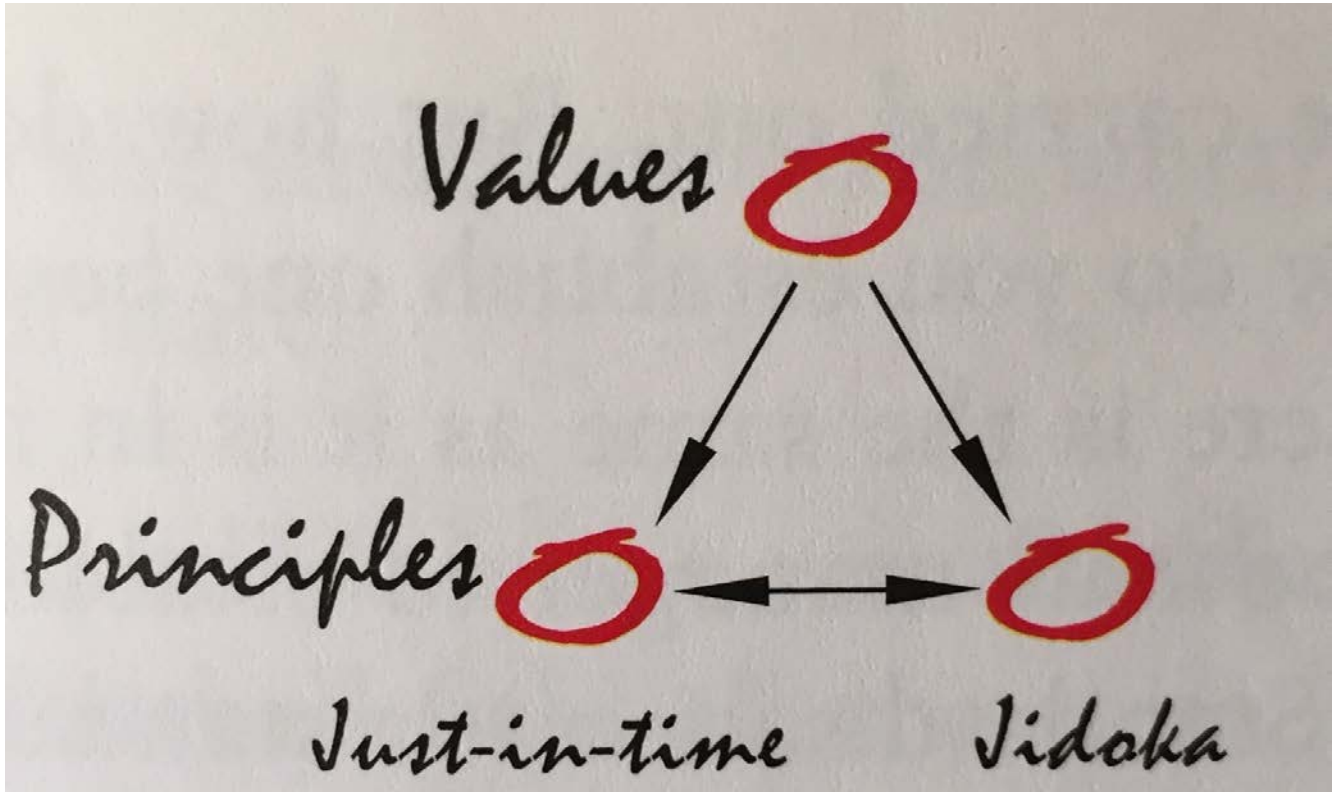
If you really want to understand LEAN, I would read this book first

Niklas Modig, Stockholm School of Economics Applying Toyota's Lean Manufacturing Philosophy to Lean Services & Management



LEAN PROJECT DELIVERY

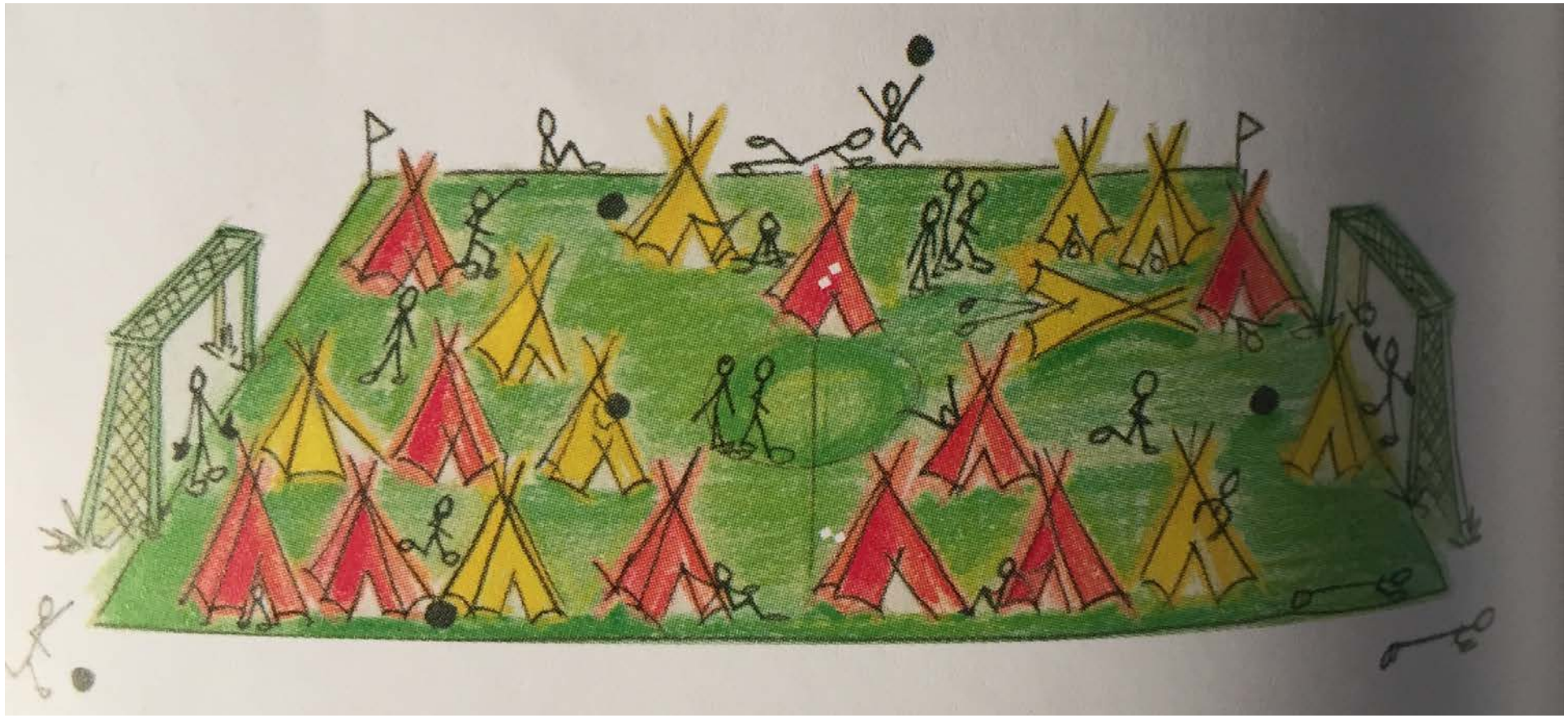
Customer First …. Value



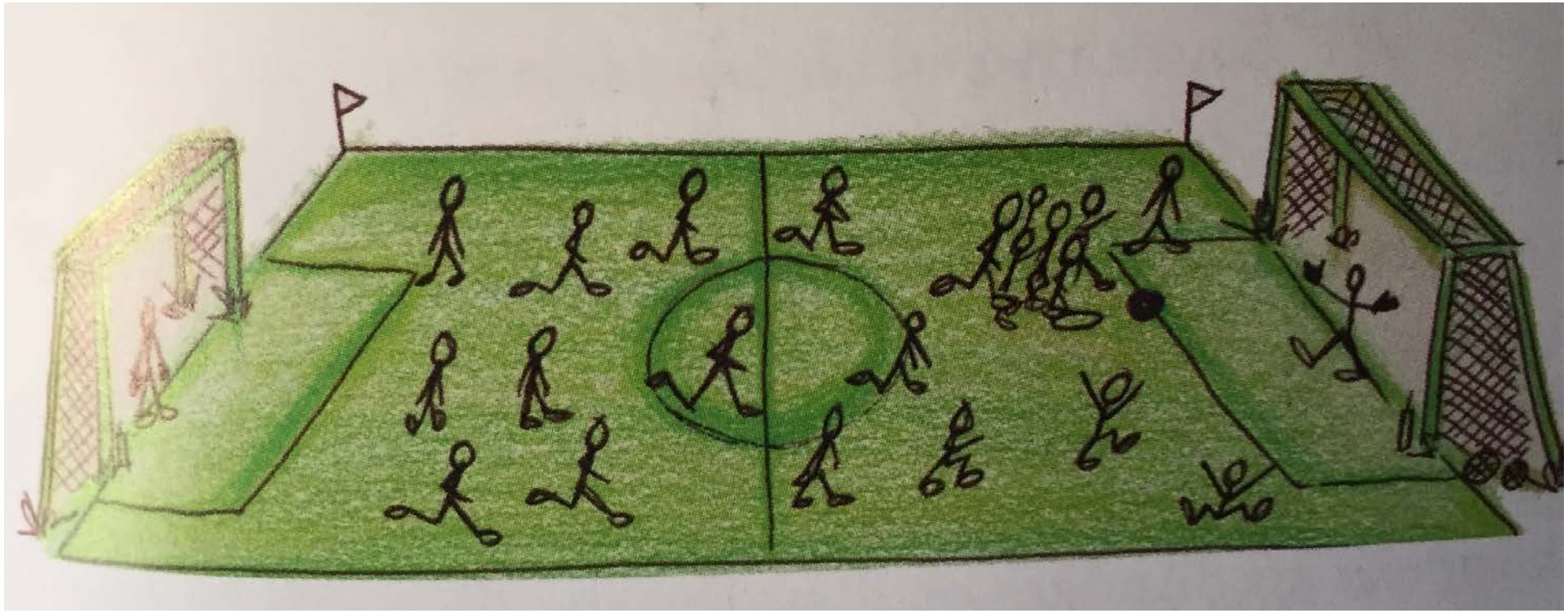
Define **VALUE** for the

Fix problems with traditional projects

No Flow



create FLOW



Think of it as a Soccer Game

Score Lots of Goals

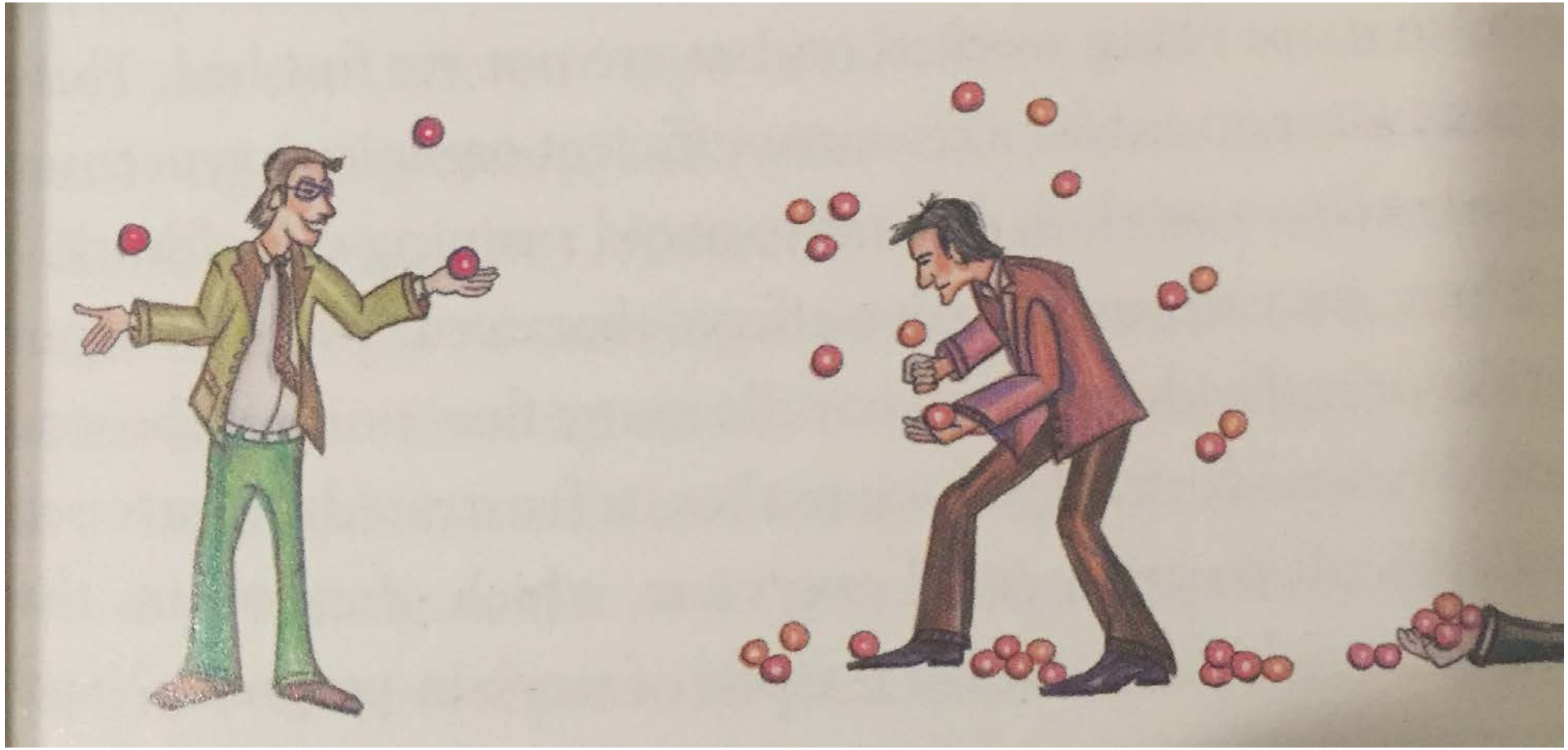
See the field, the ball & the goal

See all the players on the field

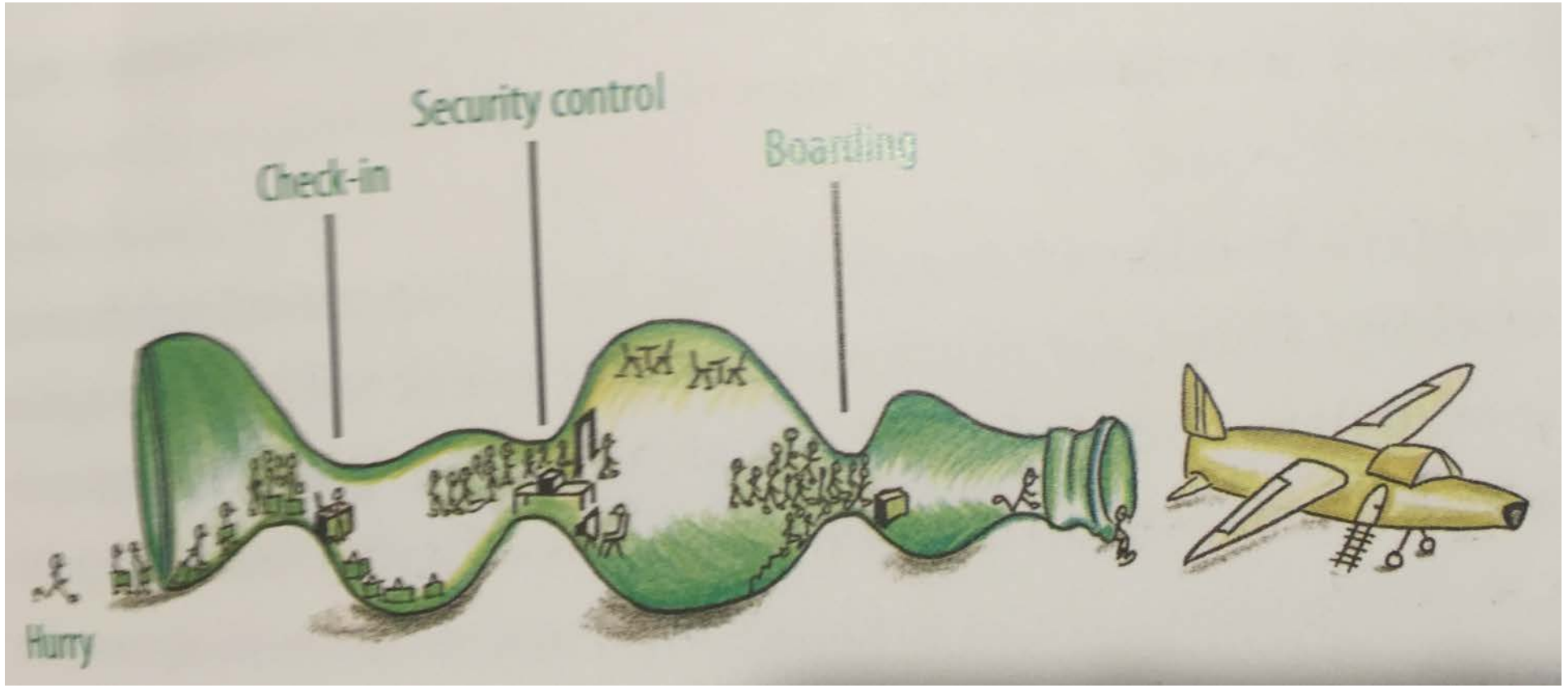
See the scoreboard

Hear the whistle

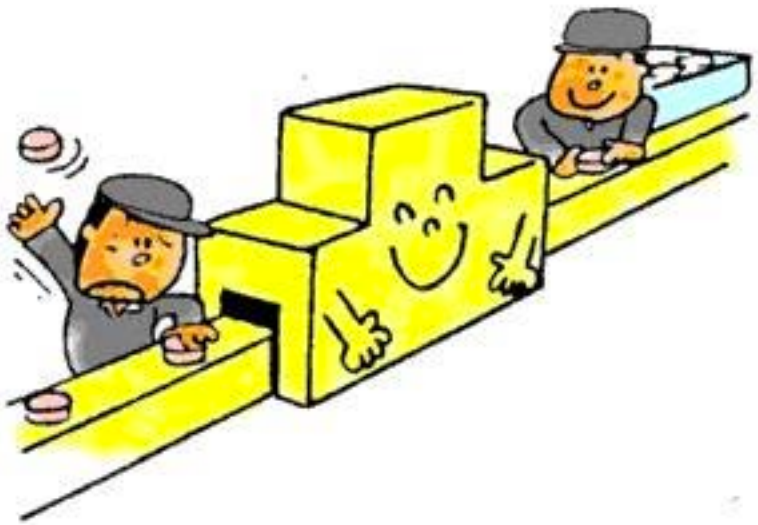
Focus on the right **Work**



Look ahead and remove Constraints



Stop to fix PROBLEMS

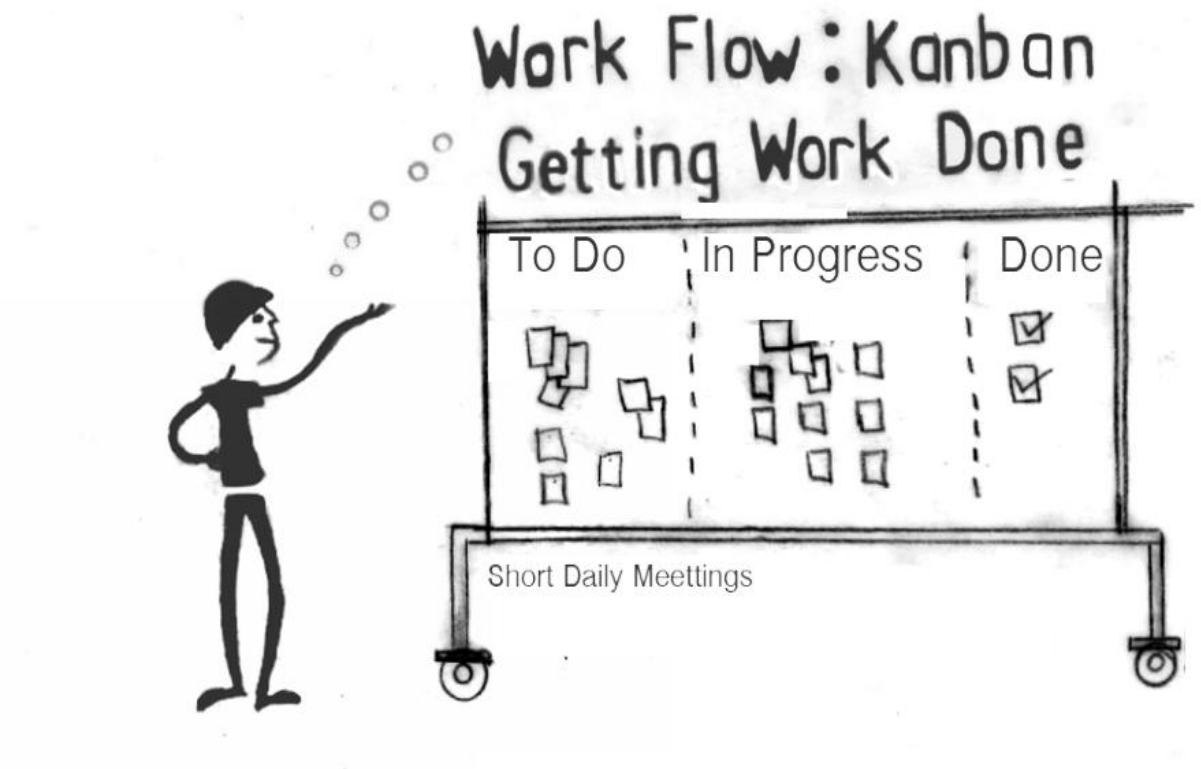


JIDOKA

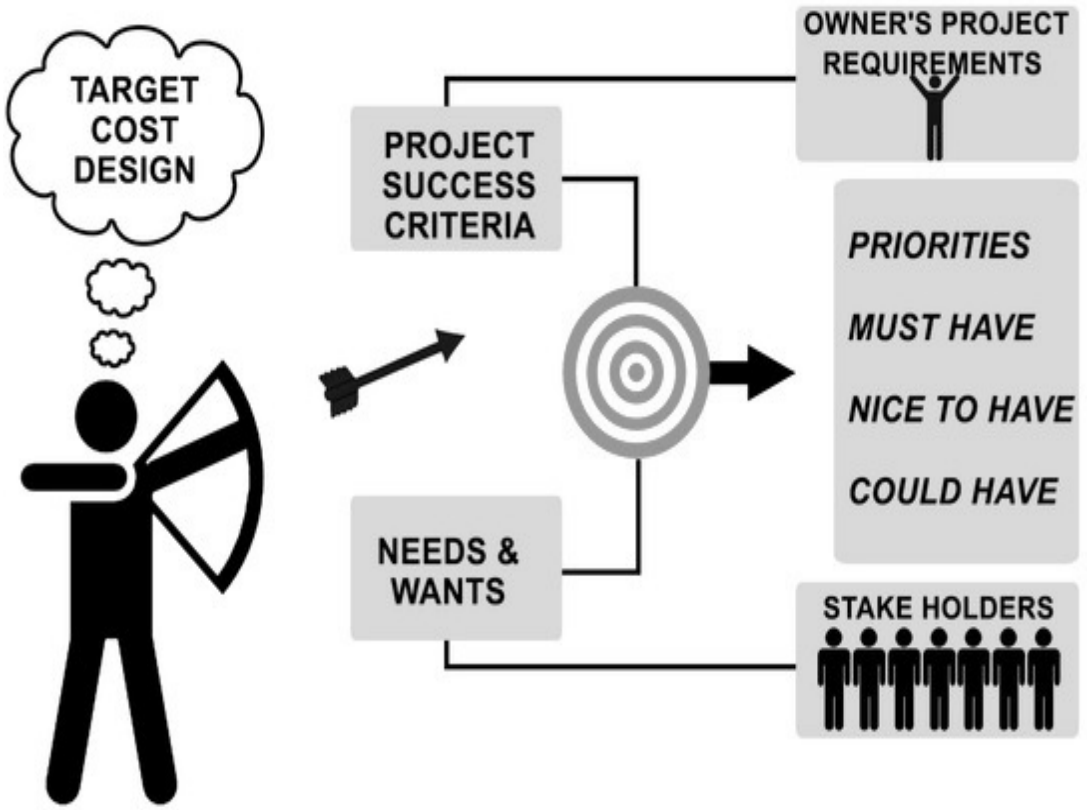
How to apply **LEAN** to PROJECTS?

Assemble a Championship TEAM?

Get Work FLOWING

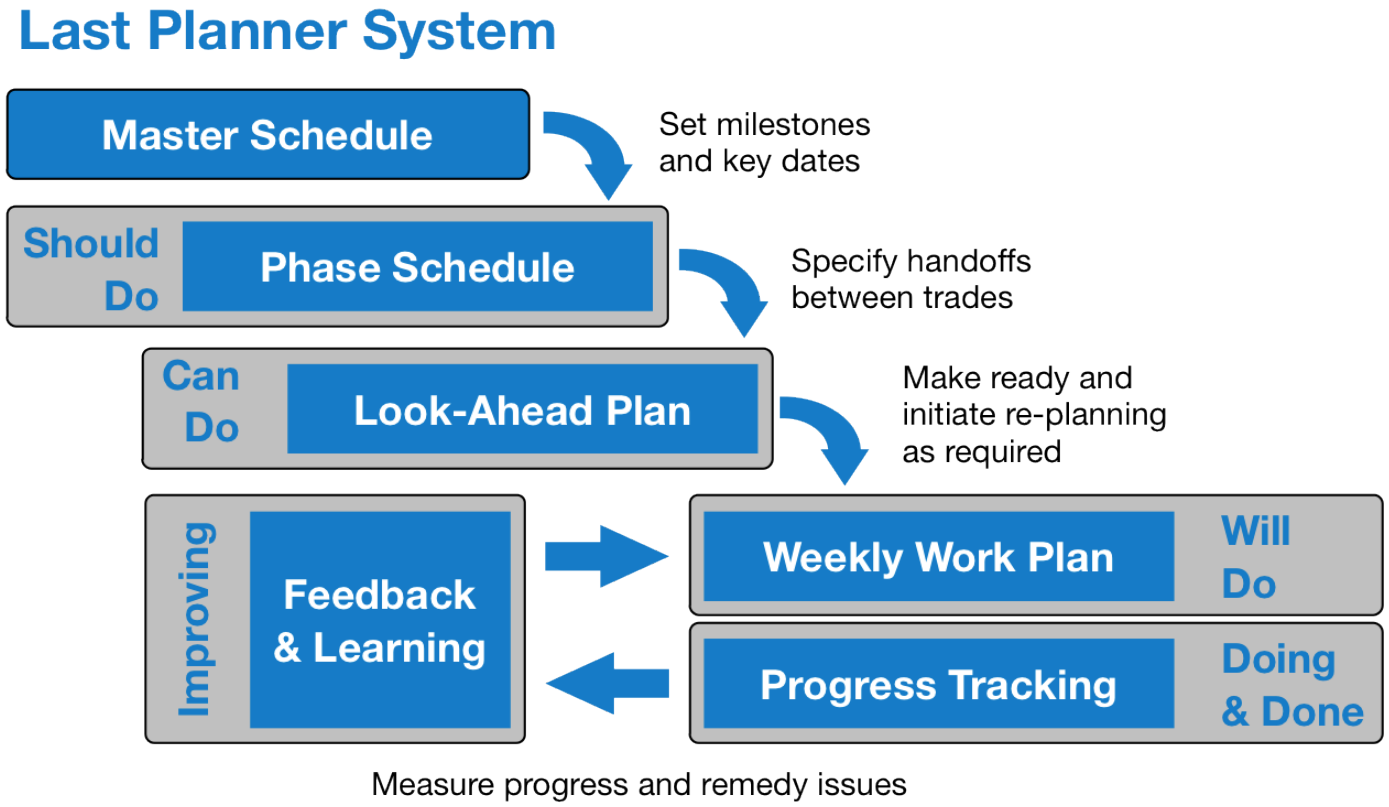


Design with DISCIPLINE



Integrate the Design

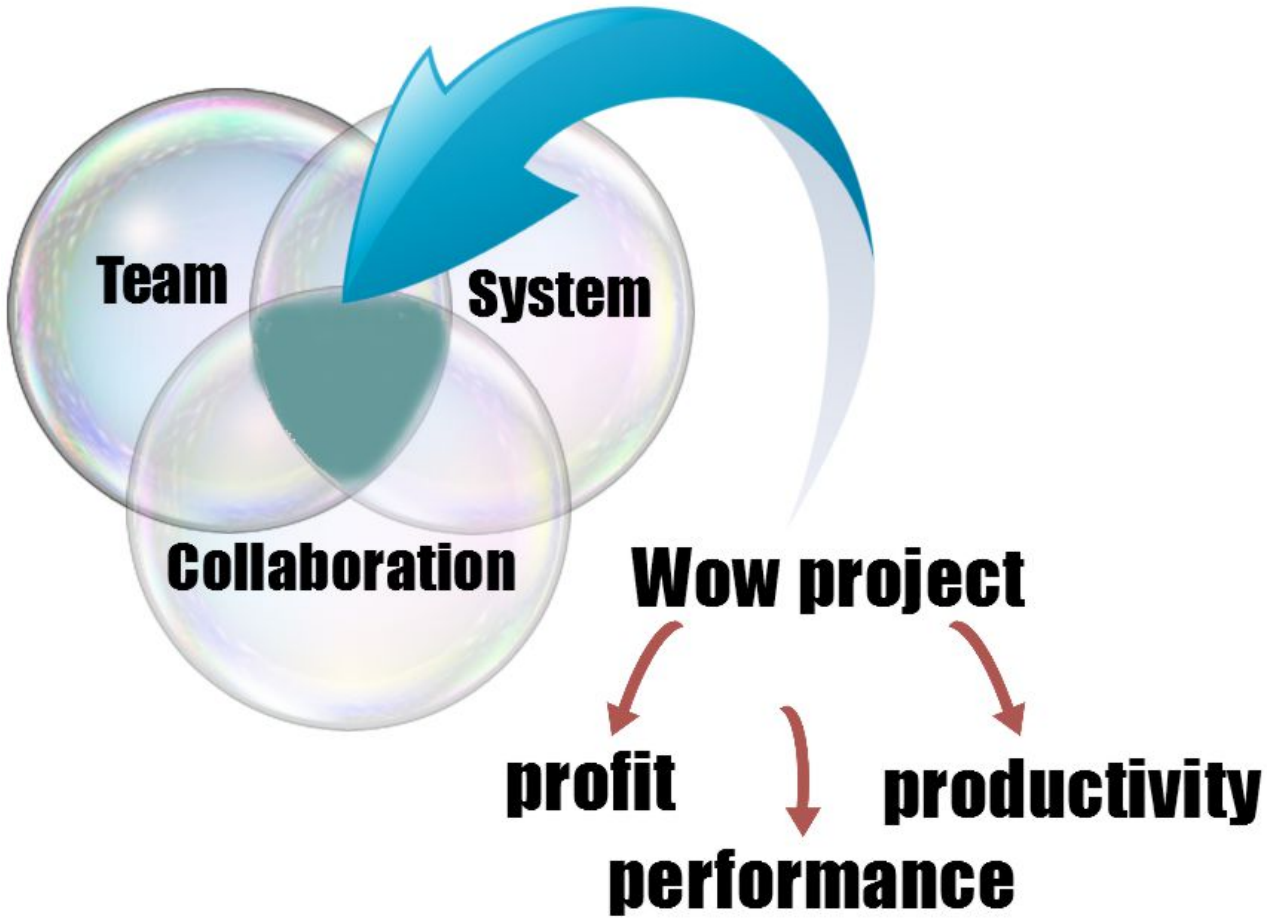
Deliver with DISCIPLINE



COLLABORATE

Simple as that!

Lean Project Delivery works



LEAN pays for GREEN

4 NET 0 projects that did it!

EcoSmart

LEAN PROJECT DELIVERY

integrated DESIGNS

For our project we wanted to demonstrate to that triple bottom line economics work for commercial real estate. We are on target to deliver the Mosaic Centre to the highest level of sustainability as defined by Living Building Challenge for approximately the same cost as a traditional build.

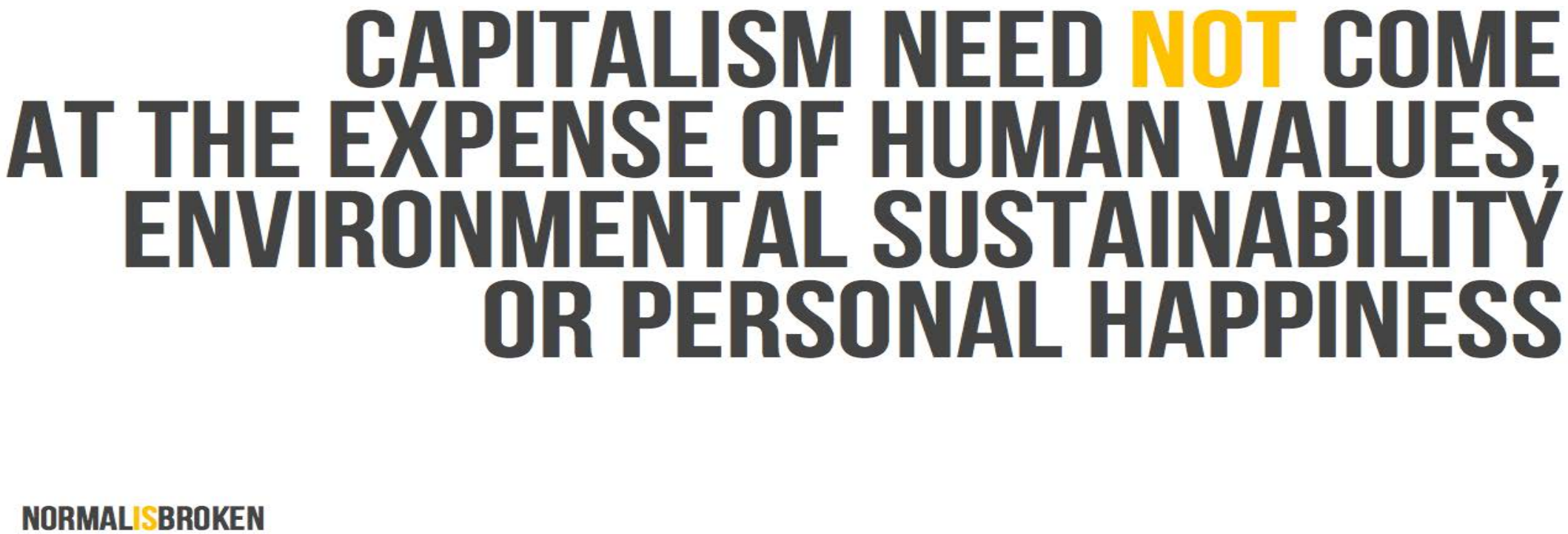
Our return on investment will be in the productivity of our people, recognition as good stewards of the planet and from the financial benefits of having higher occupancy and no energy bills.

Dennis Cuku

Mosaic Center for Community and Commerce

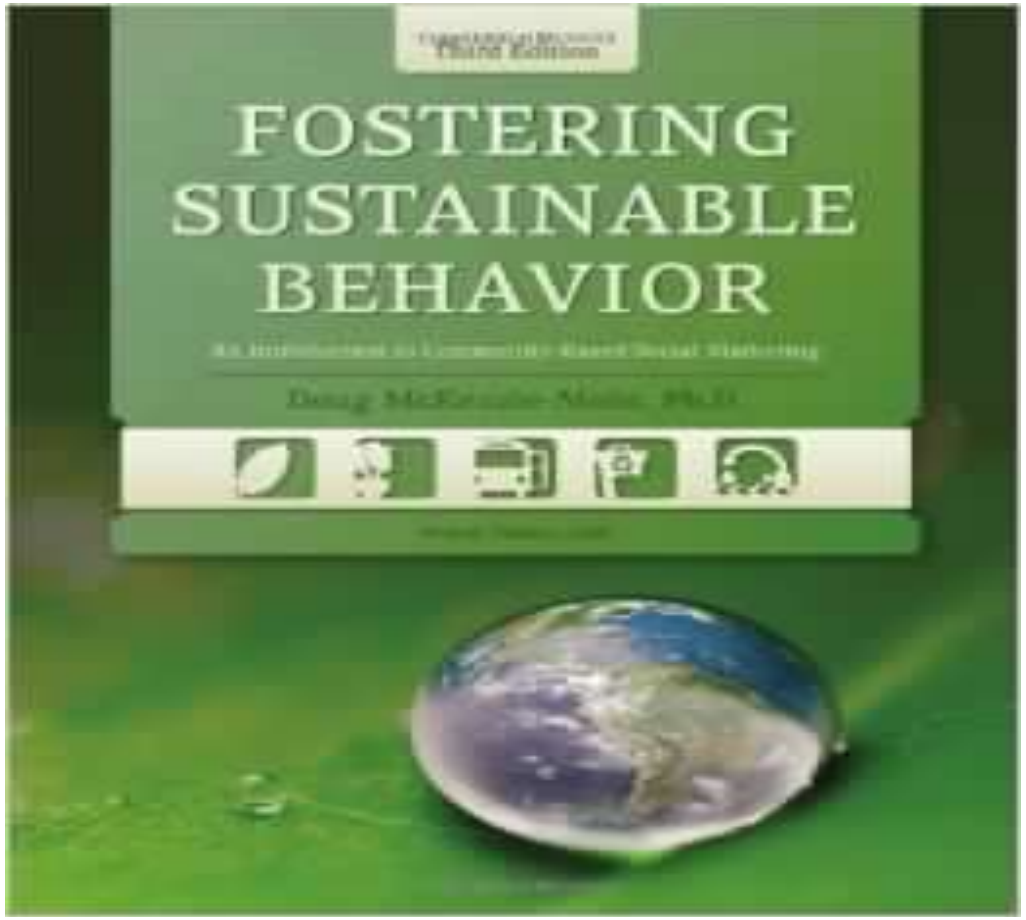
Canada's first private commercial Living Building Challenge project

Mosaic Centre



Mosaic Centre

Collaborate on Sustainable Behavior



Design for Sustainable Behavior

AMAZING reductions in Energy

INNOVATION PLACE

integrated DESIGNS

mosaic CENTRE

RATS Experiment

Responsible Adults Temperature Study

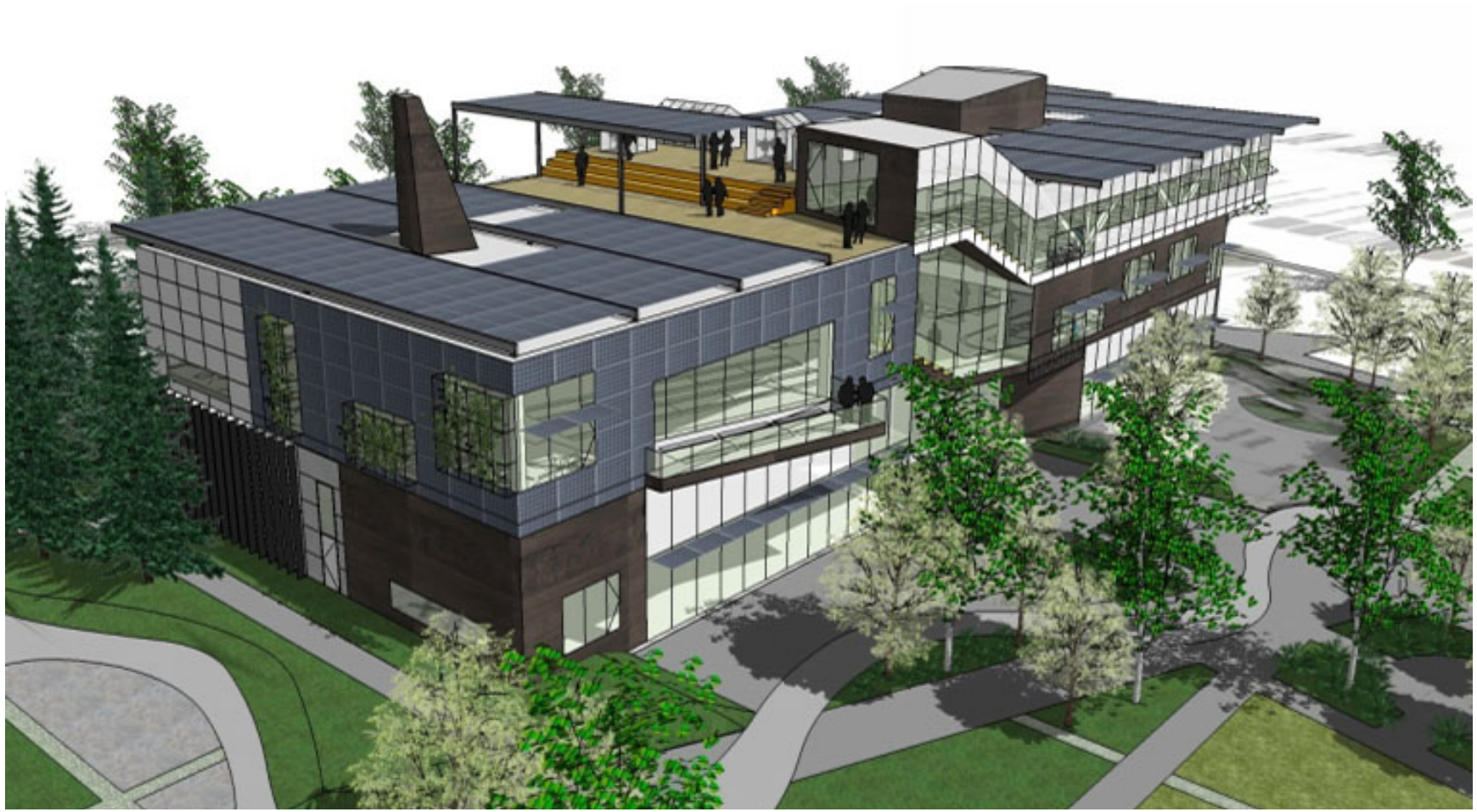
- Red Button Hot/Blue Button Cold
- Males 16 to 23 ºC
- Females 20 to 27 ºC

Retro-commissioning Pilot Project achieves 4% Saving with a 1 DGC change in cooling setpoint

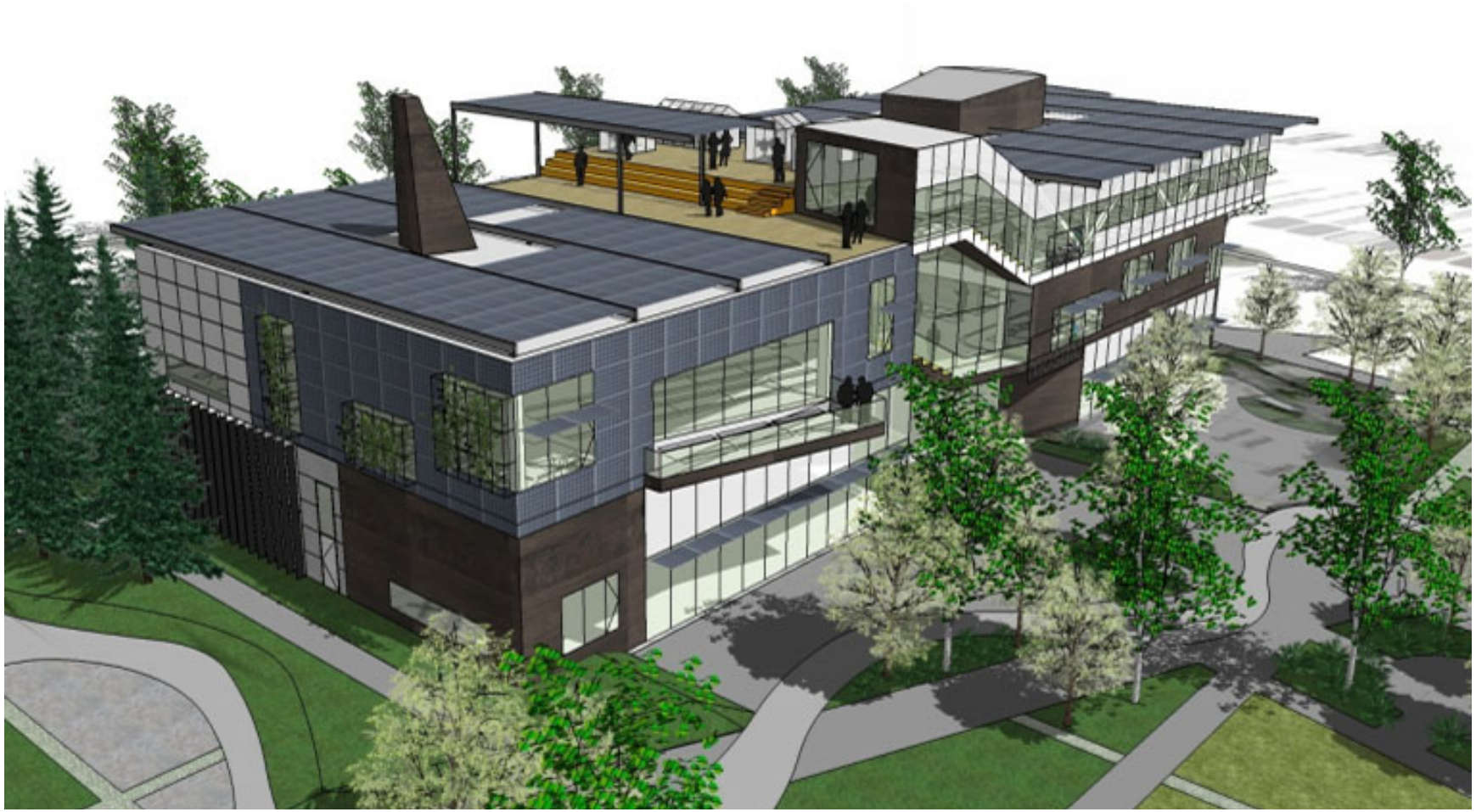
Annual Cooling Energy Savings From a 1°C Increase in Cooling Temperature Setpoint	Percent Reduction in Cooling Energy	Cooling Energy Reduction (MJ)	Equivalent # of Sask Homes Powered With that Energy	GHG Reduction (kg CO2e)	Equivalent # of Cars Off the Road	Equivalent # of Trees Planted
	4.2%	126,071	4.2	7,195	1.5	184

Cooling Savings of $1000/yr/DGC for a 140,000 sq.ft building

How Net 0-0 PV Economics



Connections to Nature & Community



Roof Top Garden

Living Building /Net 0 Office

We wanted to demonstrate that triple bottom line economics work for commercial real estate and that our project achieves Net 0 energy at very little if any additional cost. (Dennis Cuku)

LEAN

- Sparked change in the Alberta market
- Target Cost Design
- Last Planner System
- Multi-Party Agreement
- Delivered to budget/Ahead of schedule

GREEN

- Living Building Challenge Certification
- Triple Bottom Line Economics
- Net 0 Energy at Net 0 Additional Cost
- Living Wall/Roof Top Gardens
- Sustainable Education

http://leanprojectdelivery.blogspot.ca/2015/11/mosaic-center-lean-to-be-green-wow.html

Going Net 0 on there 2nd Project

and "Getting Green Done"

As leaders in the community it is our duty to protect the planet and demonstrate that triple bottom line economics work. For our second Living Building Challenge project, we have adopted Lean Project Delivery to raise the bar even higher as we want Net 0 energy, Net 0 Water, beauty, sustainable materials, less cost, less time and to be fully commissioned at substantial completion.

Penticton Jim Pattison Centre
NET 0/Living Building Challenge Project #1

Kelowna Trades Centre
NET 0/Living Building Challenge Project #2

Living Building/Net 0 Trades Center

As leaders in the community it is our duty to protect the planet and demonstrate that triple bottom line economics work. For our second Living Building Challenge project we adopted Lean Project Delivery to demonstrate that we can deliver higher performance at less cost and in less time.

Kathleen Lausman

LEAN

- On track on an aggressive schedule
- Last Planner System
- Target Cost Design
- Collaborative Team (BIG ROOM)
- Building Culture (Study Action Team, CBA)

GREEN

- Second Living Building Challenge Project
- Sustainable Construction Program
- LeanCx: Early verification of Net 0
- Net 0 Energy at Net 0 Additional Cost
- Waste heat district sewage

http://leanprojectdelivery.blogspot.ca/2015/11/okanagan-college-committed-to-triple.html

Why not go **Net 0** for your next home?

For our #PREFAB #GREEN Net 0 duplex in Saskatoon, Saskatchewan the capital cost premium to achieve #Net Zero home was $50,000. The energy saving provide a 6% Return on investment.

" The economics work and it is the right thing to do"

EcoSmart
High Performance Green Home Building Company

integrated DESIGNS

The Recipe is Really SIMPLE!

Taylor Guy

Use a more lean and more integrated building process to deliver GREEN building projects.

With our projects the energy and construction cost savings finance better quality & higher performance.

PREFABRICATION reduces time, cost and improves quality

This Hybrid Timber home was completely enclosed in 2 weeks

Productivity and Team Commitment are key for Getting Work Done

Process

In his book "Quality is Free", Philip Crosby says it all.

When we confront conventional wisdom that there is a tradeoff between quality and cost with optimism and an open mind we can do so much better!

INTEGRATION helps reduce building energy loads enabling simple more cost efficient systems!

“High Performance at Less Cost”

*We can deliver **PREFAB GREEN** homes that uses 60% less energy at no additional capital cost!*

*We can deliver **Net 0 PREFAB GREEN** home where the savings in energy more than cover the capital cost premium!*

Net O Economics

Our capital cost premium to achieve Net 0 is approximately $50,000.

$20K for high performance features + $30k for PV panel less a $6k rebate

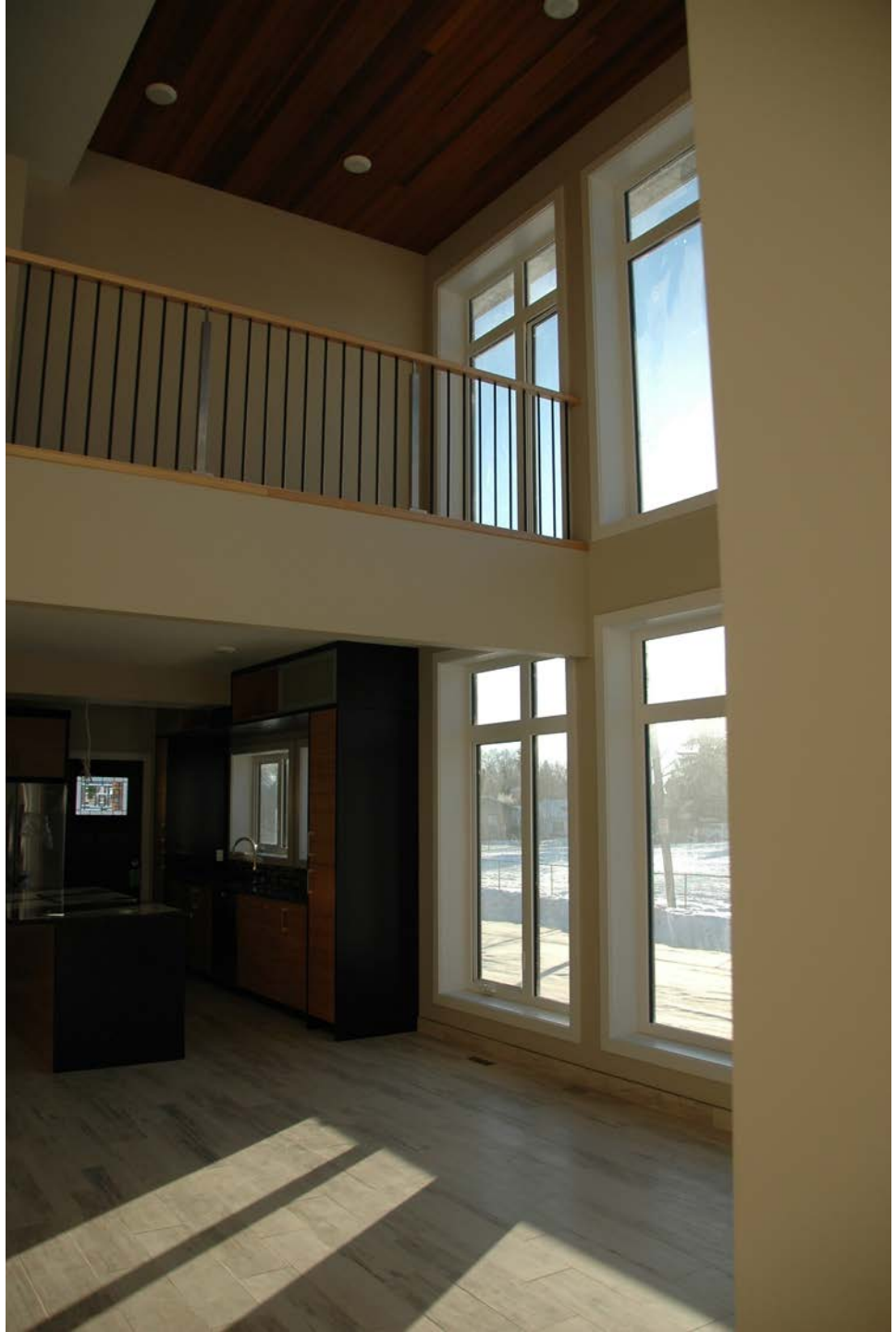
The energy saving provide a 6% on the high performance measures!

A really good return on investment

60% Solution ECOnomics

On the 1602 Edward Avenue project our capital cost premium to achieve 60% less energy is approximately $25,000 for insulation, triple glazed windows and high performance equipment.

The energy saving provide a 7% on the high performance measures!



As we tweak our RECIPE we hope to deliver Net 0 homes at Net 0 additional cost!

With superior integration
Net 0-0 is achievable!

Prefab Green Net 0 Target

We wanted to demonstrate that PREFAB Net 0 homes provide a positive return on investment and we did. The success of this project has lead to participation on three other Passive House or Net 0 targeted homes in the Saskatoon area. Taylor Guy

LEAN

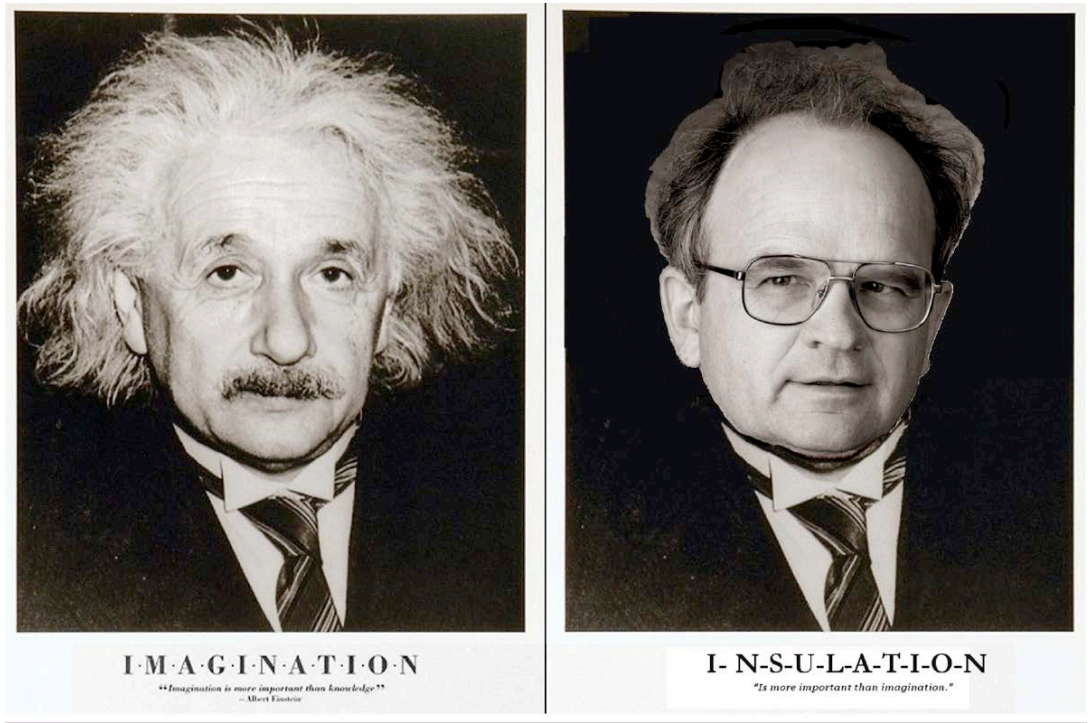
- Prefab Green Construction
- Early involvement of trade partners
- Collaborative & integrated team effort

GREEN

- Target is Net O Energy (6 kw)
- High Performance Design Recipe
- No cooling other than a Big Ass Fan
- Passive principles, 12 inch walls/triple glazed
- Technologies Nest/Erv/Heat Pump WH

http://leanprojectdelivery.blogspot.ca/2015/11/ecosmart-prefab-green-net-0-targeted.html

1. Start with a really good performance RECIPE



From a GREAT chef

Dr. Rob Dumont who developed one of the first passive houses.

Directives for High Performance Homes in a North Climate!

Share knowledge - make SMARTer decisions.

- Directives for High Performance Homes in a Northern Climate, Rob Dumont
http://www.i-designs.ca/blog/project-management/rob-dumont%E2%80%99s-recipe-for-high-performance-residential-design
- Passive House Fundamentals
http://www.passivehouse.ca/fundamentals
- Affordable Net 0 Homes
http://www.nrcan.gc.ca/energy/efficiency/housing/research/5133
- Solar Hot Water is Dead
http://www.renewableenergyworld.com/rea/news/article/2013/09/solar-hot-water-which-is-better-pv-or-thermal
- Goodbye Radiant Floor in Low Energy Homes
http://www.greenbuildingadvisor.com/blogs/dept/guest-blogs/goodbye-radiant-floor
- Hot water heaters as a Heating Source
http://www.civil.uwaterloo.ca/beg/archtech/hot_water_heater_furnace.pdf
- Get Ready for Heat Pump Hot Water Heaters
http://www.greenbuildingadvisor.com/blogs/dept/energy-solutions/get-ready-heat-pump-water-heaters
- Heat Pumps for a Northern Climate?
http://unexpectedcontr.hubpages.com/hub/air-source-heat-pumps-for-cold-weather
- HRV or ERV's
http://www.greenbuildingadvisor.com/blogs/dept/musings/hrv-or-erv
- Best SMART Home Devices of 2014
http://www.cnet.com/topics/smart-home/best-smart-home-devices/
- Be COOL with Realistic Comfort Expectations
http://www.i-designs.ca/blog/high-performance-design/be-cool-with-realistic-comfort-expectations!

Blue Herron Passive/Net 0 Target

Kent and Darcy Earle wanted to demonstrate that we can deliver economical simple beautiful unique Net 0 homes. Our team used Lean and integrated practices to deliver a double wall constructed affordable home!

LEAN

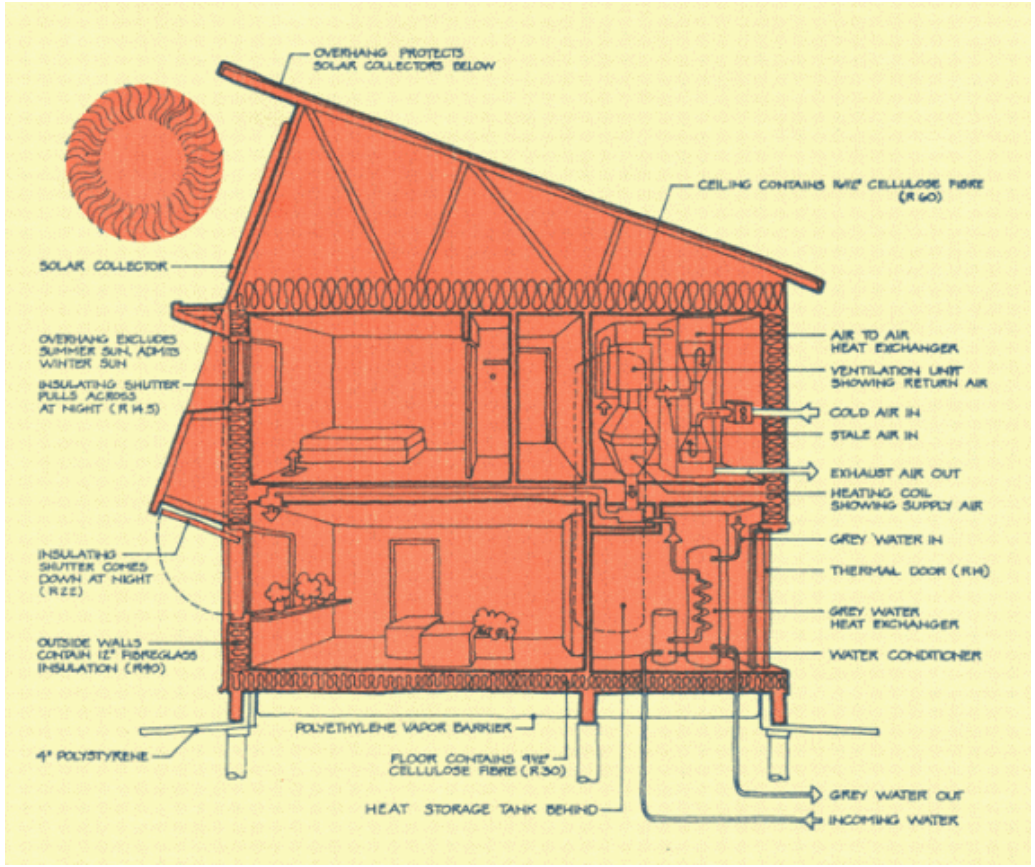
- Early engagement with the whole team
- Collaborative Target cost design process
- Pull Plan Schedule
- Double wall construction dirt to roof on and enclosed in 2 months
- Owner Involvement

GREEN

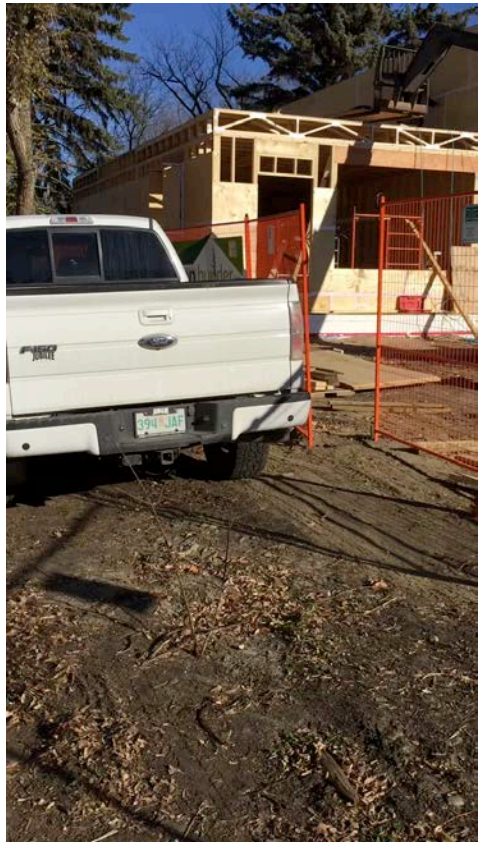
- Target is Net O Energy (6 kw)
- Double wall construction/Triple glazed
- Passive solar design (Not Certified)
- Simple finishes & systems
- Green education component

http://leanprojectdelivery.blogspot.ca/2015/11/blue-heron-haus-net-0-targeted-home.html

Anyone know of this project?



Passive House … Back in Saskatchewan



Passive Haus Certified Duplex

- Robin Adair Green Builder
- .1 acph
- 19 inch Thick Walls
- 12 inched of Insulation under Basement Slab
- No thermal breaks
- Electric heat in ERV as only heating system

- Video

EcoSmart

Building smart cool homes for the future

www.eco-smart.ca

Lean Construction Institute – Canada

Institut de Lean Construction – Canada

The Lean Construction Institute – Canada (LCI-C) was established in 2015 as a special committee of the Canadian Construction Association to help transform the building industry in Canada

Want to participate in Lean Construction?

http://www.lcicanada.ca/

Lean
Lab

Knowledge worth sharing

Join Learn Create

Normal is Broken

That is why we adopted Lean Project Delivery to deliver our project!

This is LEAN

A best seller that makes Lean SIMPLE. You should read it!

the BIG idea

LEAN enables GREEN
Why not all new projects Net 0

www.LeanLab.ca