

TECH

HOUR



# Where Have All the Ethics Gone?

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# Who Decides Performance?

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IAQ  
Rigor – Physics  
Algorithms  
Math models  
Sustainability  
Value Engineering  
Manufacturer  
Design  
BIM  
LEED / Bream  
QA  
Climate  
Codes and standards

PM cost and time?  
Brief – divided responsibilities  
Design – divided responsibilities  
Construction – divided responsibilities  
Use – divided responsibilities



\$

Commissioning  
Deskilled design workforce  
Deskilled site workforce  
Deskilled O&M workforce  
Energy Performance  
Certificates  
Low by over 3 times (CIBSE March 2016)  
Controls overcomplicated  
Few Clerks of Works (Client supervisors)

**Rely on the  
commissioning**



# Communication

Architect  
Designer/Consultant



Contractor

Design

Fuzzy  
Communication  
Gap

Build

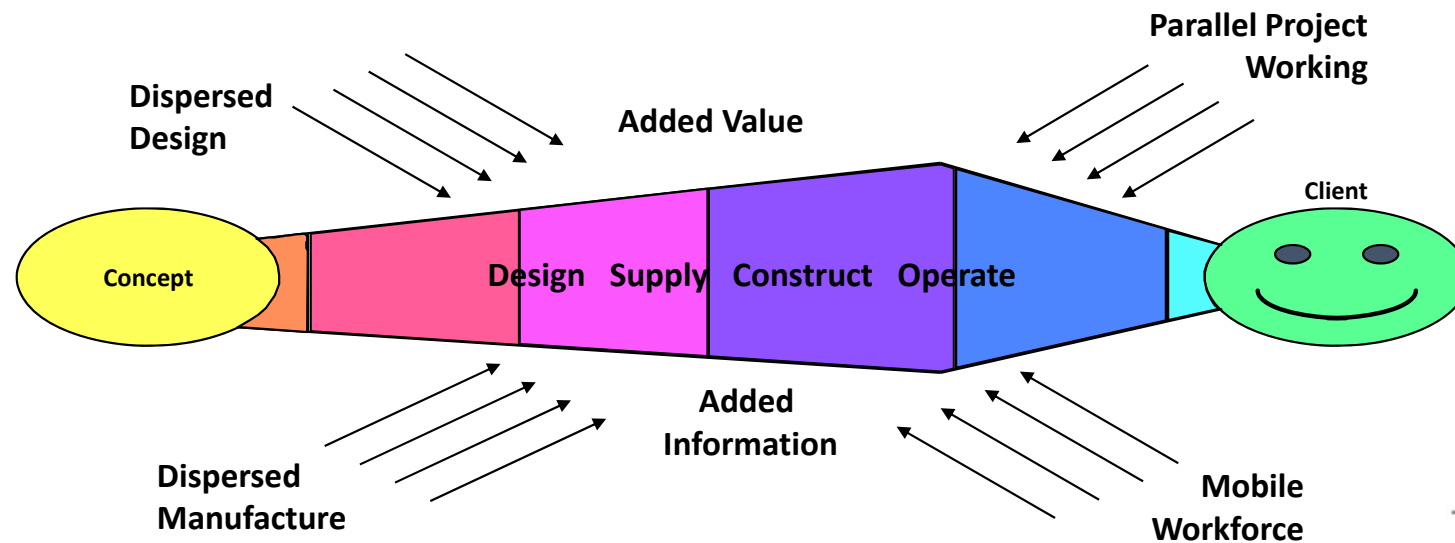


- Ethics
- Usual practice
- Incompetent engineering

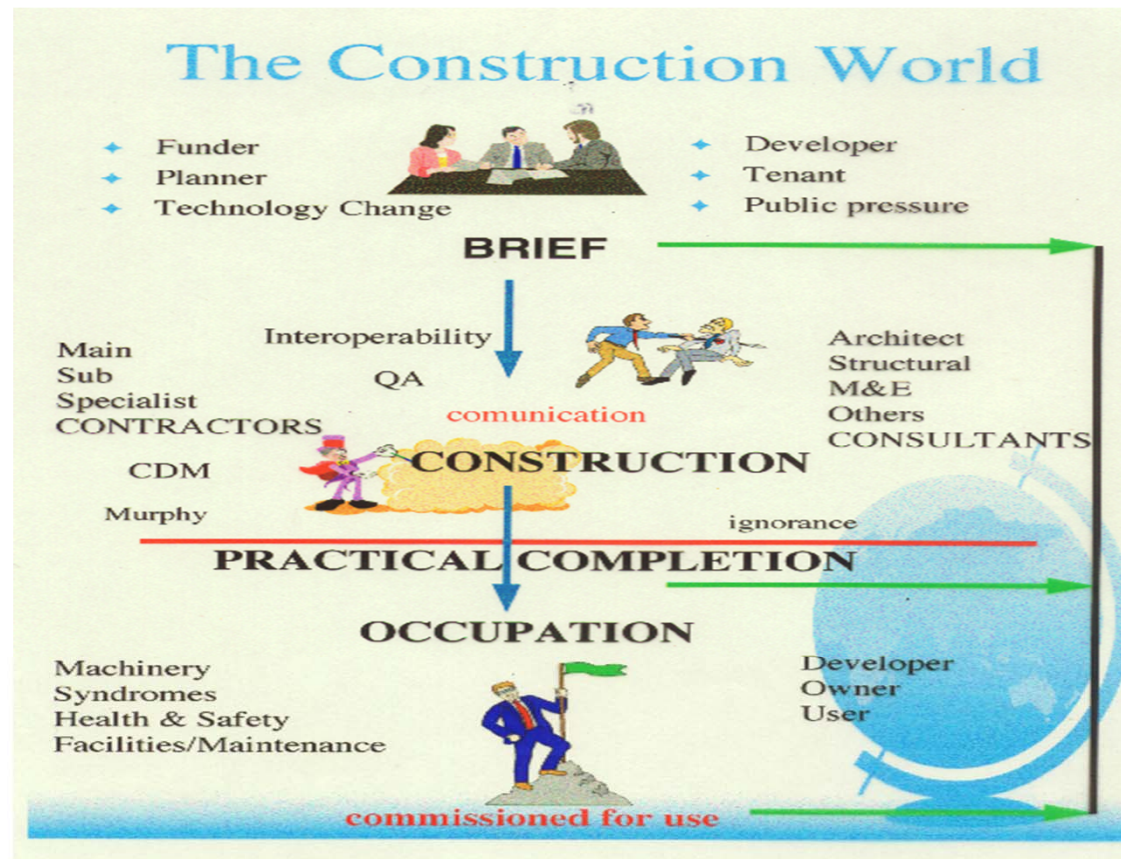
Someone  
else's fault

# What is the Construction Industry?

- It translates concepts into concrete
- It removes barriers to give truly satisfied clients



# The Construction World

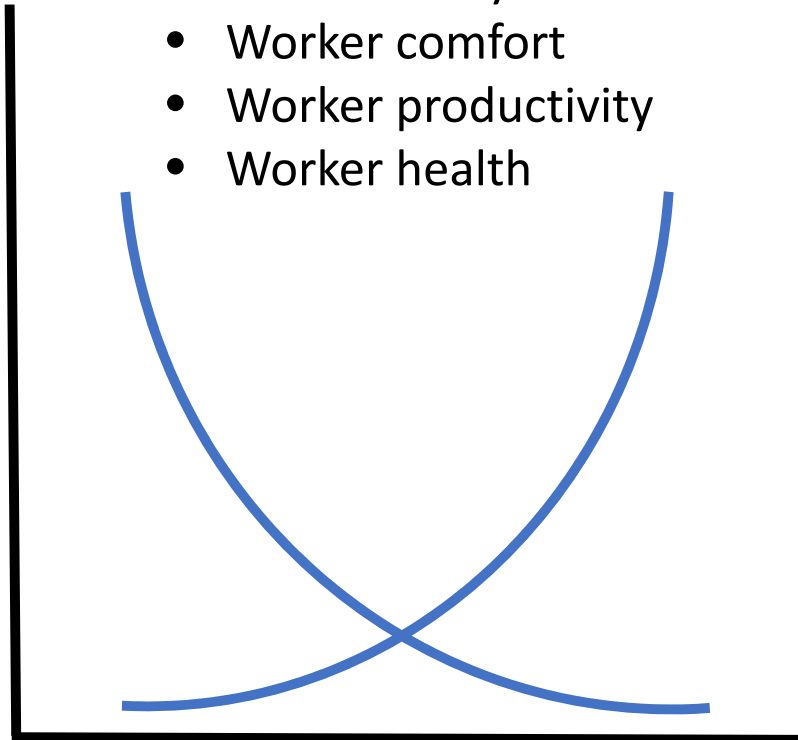


# Ideal vs. Reality

## Ideal

- Good technology
- Comfort
- Meet all standards
- Full price
- Assume full competence
- Efficiency of scheme
- Integrated
- Fully planned

- Sustainability
- Worker comfort
- Worker productivity
- Worker health



**Reality Gray Areas**

## Reality

- Expediency
- Save cost
- Monument
- My company profit
- Get it to work on site
- Change orders
- Time
- Bid too low to do job properly

# Ethics – 3 Levels

- Professional morals
- ASHRAE Society codes
- The ethical building



# ASHRAE Code – General

- Stewards of environment
  - Own actions no harm
- Commit to ASHRAE code in professional activities
- Follow codes of national and cultural boundaries at project location
- Follow professional and industry codes



# ASHRAE Code – Competence and Expertise

- Only work within competence
- Use care, competence, expertise
- Be up to date



# ASHRAE Code – Within Committee

- No conflicts of interest unless declared
- Confidentiality in work and Society
- Executive sessions are secret
- Sanctions if unfounded, frivolous or malicious



# Computer Errors

## Computer Errors

- 58 percent attributed to the user
- 25 percent the software
- 13 percent the hardware
- 4 percent “other.”
- User error is the same as application error
- Hardware and software errors are program errors.
- User inexperience is the leading cause of computer errors.

■ Source: Puri, S.P.S. (1998, October). Avoiding engineering failures caused by computer-related errors. *Journal of Computing in Civil Engineering*

# Practice Ethics

Practice ethics – never reported, no complaints – **even when found guilty**

## Faults Found in Court or Arbitration

- Time delay
- Cost over-run
- Fail to operate as designed
- Incompetent maintenance
- Giving false evidence
- Using wrong standards and technical information

## ASHRAE Code

- Areas of competence and expertise
- Using and developing up-to-date knowledge and skills
- Avoid real or perceived conflicts of interest



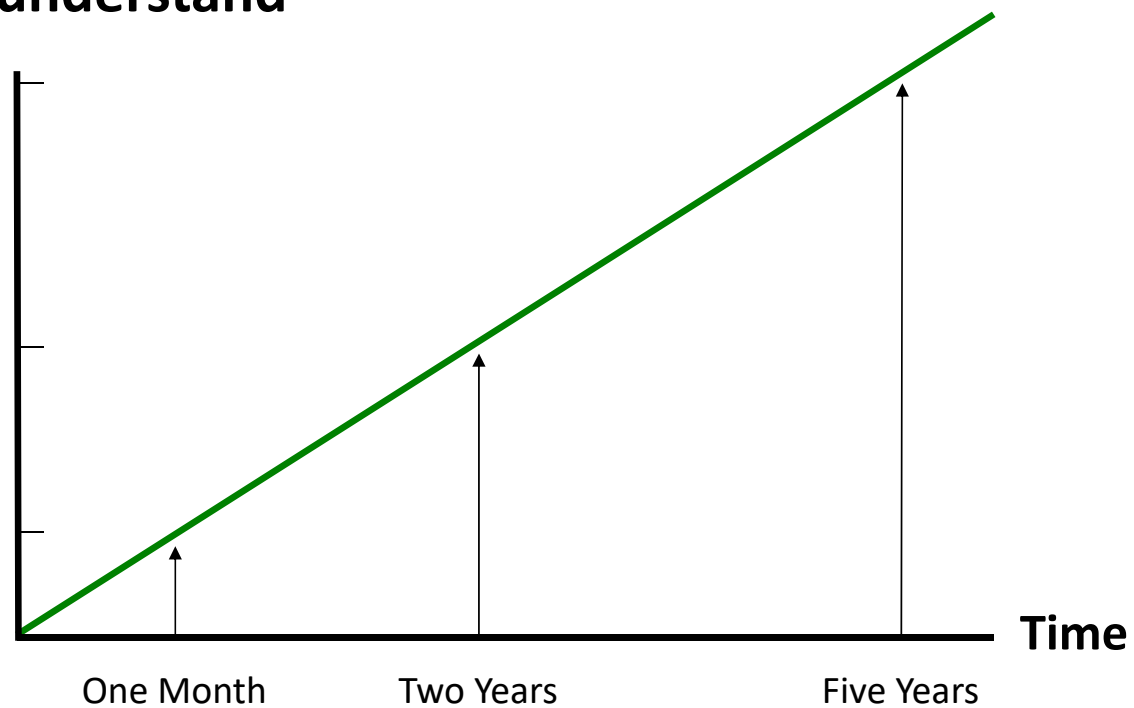
# Top Causes of Uncertainty

Top 7 Causes of Uncertainty	Ranking of Importance		
	Owner	Architect Engineer	Contractor
<b>Unforeseen Site or Construction Issues</b>	<b>1</b>	<b>3</b>	<b>1</b>
<b>Design Errors</b>	<b>3</b>	<b>6</b>	<b>5</b>
<b>Design Omissions</b>	<b>2</b>	<b>7</b>	<b>2</b>
<b>Construction Coordination Issues</b>	<b>7</b>	<b>5</b>	<b>7</b>
<b>Contractor-Caused Delays</b>	<b>4</b>	<b>4</b>	<b>6</b>
<b>Owner-Driven Changes</b>	<b>5</b>	<b>1</b>	<b>4</b>
<b>Accelerated Schedule</b>	<b>6</b>	<b>2</b>	<b>3</b>

A screen from Dodge Data & Analytics recent webinar on its new risk and uncertainty Smart Market Report. *Courtesy Dodge Data & Analytics*

# Commissioning Time

- **Non standard**
- **Difficult to understand**





# Boyce Presidential Address

## **We do not do this...are we unethical?**

- Follow the principles outlined in the new guideline, “Designing for Effective Building Operations.”
- Add computer assisted building operations enhancements into the design program.
- Transfer the design operational concepts to the operations team.
- Learn and apply well-building fundamental principles to the design.



# High vs. Low Energy

## High Energy – Accepted

35MW  
800 years rot  
Not waterproof



## Low Energy – Protests

11MW  
Farmed  
2 years rot  
Waterproof 1



