Pancho Sanza Speaks. August 2, 2017. Westford, MA
#BuildingScienceFightClub
Don Quixote: “Firmitas, Utilitas et Venustas”

Pancho Sanza: Risk, Constructability, Cost
“You have to know so much about materials and engineering.....”

“No, that’s what we have consultants for.”
Ancient Greece: The designers were the builders (designers were not the tradesmen)
Limited number of materials.
Building instructions given by word and through models
Roman Empire: The designers were the builders.
Limited number of materials.
Scaled drawings on paper. One copy. Mostly elevations.
Medieval: The designers were the builders. The trades had common assembly knowledge.
Limited number of materials.
Plan drawings, elevations, full scale templates.
Renaissance: The designers were the builders. The trades had common assembly knowledge. Limited number of materials. Perspective drawings and perspective sections, plans elevations.
**Industrial:** The designers were the builders. Common trade knowledge & details of construction. Limited number of materials. Plans, elevations, sections, isometric views. Few drawing details since the building techniques were common knowledge.
"If I have seen further, it is by standing on the shoulders of giants."

- Isaac Newton
And then……this guy.

“Architecture begins where the engineering ends.”

“Specialists are people who always repeat the same mistakes.”

…liberated from historicism…

….marked the beginning of the end of a historically imitative architecture in the USA.

Let them eat cake.

Walter Gropius, 1883 - 1969
Architectural Curricula:

1. Beauty

2. Usefulness

3. Strength

"They’re training every student to be the next Zaha Hadid."
- Ed Siegel, 2017

Not Desk Ready.
Villa Savoye by LeCorbusier, 1931, Poissy, France.

“…. A manifesto… an iconic building… a UNESCO World Heritage site…”

Letter from client to architect:

*It’s raining inside.*

Architect’s response:

*The flat roof design has been enthusiastically received by architectural critics worldwide.*

The Vitruvius test:

- Strength: no
- Usefulness: no
- Beauty: ?

Architecture for the approval of other architects.
“What’s with the flat roofs — you know it rains a lot here, right?”
“...You never quite know where they went wrong.”
- Frank Gehry
Boldness in the face of wastefulness

Studio Gang, City Hyde Park. Chicago, 2015
Just as many problems with non-starchitect designs.
What are good drawings?

How to create good drawings?

How to achieve strength?
What The Law Requires:

Documents only need to show that the code is met.
What Your Contract Requires:

“… setting forth in detail the quality levels of materials and systems and other requirements …”
### Design and Construction Deliverables

#### SCHEMATIC PHASE

- _1_. Existing Conditions
- _2_. Landscaping Concept
- _3_. Existing Irrigation

#### DESIGN DEVELOPMENT PHASE

- _1_. Planting Plan
- _2_. Irrigation Plan

#### CONSTRUCTION DOCUMENT PHASE

- _1_. Protection of existing trees and significant plantings during construction
- _2_. Soil Preparation and Planting Specifications
- _3_. Guying Diagrams
- _4_. Piping Diagrams
- _5_. Pipe Sizes
- _6_. Landscape Irrigation Details and Legends

#### LANDSCAPING

1. Structural schematic plans
2. Written description, proposed materials, foundation types, design criteria, design loads

#### STRUCTURAL

1. Foundation Plan
2. Typical Floor Framing Plan
3. Framing plans at unique features
4. Main member sizes
5. Structural Sections

#### BUILDING EXTERIOR ENVELOPE

1. All building elevations w/ dimensioned height
2. Typical Wall Sections
3. Parapet and coping details
4. Roof and drainage plan
5. Exterior Door Details
6. Typical Window Details
7. Expansion Joint Locations
8. Large Scale building cross sections

1. Roof details
2. Exterior Details
3. Flashing Details
4. Control Joint definition and details

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Foster Lyons Charles Hilton Architects.  Greenwich, CT

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What Your Schooling Taught:

- Floor plans.
- Elevations.
- Major Sections.
The only rule:

There are no rules.
What is REALLY needed: These guys need good assembly instructions.
We created this attitude.
Study Good Examples
“Foster, you know, they all suck.”
  - John Ferrarone, Plath Construction

“What we most want is an architect that will work with us and help work through problems.”
  - Marty Houston, Walsh Construction
“HOW ABOUT LABELING EVERYTHING?!!!”

“HOW ABOUT USING COLOR?!!!”

- Peter Marciano. April 24, 2017, New York, NY
Foster:
“The fox is watching the hen house.”

Henry:
“Bullshit, the fox is designing the hen house.”

Henry Gifford
Good things happen when you ignore the dogma:

**NO BULLHEADED TEES ON RETURN PIPING**

**GOOD**

**BAD**

Henry Gifford, 2010
Study Good Examples

Building Science Corp., 2010
Study Good Examples

- PLYWOOD (AIR BARRIER)
- AB TAPE
- FIRECAULKING
- JOIST BEYOND
- FIRE BARRIER SEE PLANS FOR WALL TYPES SHEATHING
Study Good Examples
Study Good Examples
How to systematically achieve this level of usefulness, completeness and quality?
“It is not necessary to change. Survival is not mandatory.”

“In God we trust, all others must bring data.”

“Defects are not free. Somebody makes them, and gets paid for making them.”

85% of the problem is the process. Fix the process.
On the drawings.

Mock – ups.

Empowered tradesmen.


No Elitism. Draw as if your project will be on Rapa Nui.

One shipment. No local stores. Local (untrained) workforce. Supervision by one Peace Corp volunteer.
#2 – What damage functions does the building need to withstand?
#3 Major assembly decisions.*

* You’ve got to know stuff.
#4 Specifications – choose your materials/assemblies.**

- You’ve got to know stuff.
- Experience helps.
#5  Figure out where the sections should be cut and what should be shown in greater detail.
#6 Draw and note the sections and details.**

- Everything is ID’d
- Overlapping drawn properly.
- Air Control Layer ID’d.
- Water Control Layer ID’d.

You’ve got to know stuff.
Experience helps.

Ankrom Moisan Architects
#7 Draw and note penetration details.
#7 Create Sequence Drawings.
#6 Draw and note the sections and details.

Intent is what you write – not what you only think: Specifications, Typical details ("Typ.", "Sim.")
#5 – Where to detail.
#5 – Where to detail.
Change!
Roof to Fascia.
How?
You Need a Detail.

#5 – Where to detail.

SECTION A-A
SCALE: 1:50
Make the effort remembering that the lawyers will clean up behind you. Come to peace with the certainty that you won’t find them all.
Create a visual check-list.
Create a visual check-list.
#7 Sequence Drawings.
What if there isn’t enough fee to draw it or hire a consultant?
Not enough fee?

Material Spec
+ Mock Up

Make sure the money is in the budget – allowances.

Photo Credit: Green Building Advisor
What if there’s REALLY no money.
No fee, no mock-ups? Copy the Navy SEALS: Empower the Trades & Communicate

Leadership is fluid. Everyone on the team can be the leader.

Real time communication.

The person who knows what to do becomes the new leader.

Follow the leader until there is a new leader.
Primary purpose: Improve quality of communication.

Unification of:
- Language/Understanding
- Specifications
- Drawings

J Building Science and Performance
ENCLOSURE THERMAL ENVELOPE CRITERIA

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<thead>
<tr>
<th>COMPONENT</th>
<th>R-VALUE</th>
<th>U-VALUE</th>
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<tbody>
<tr>
<td>FRAMED WALLS</td>
<td>R-45</td>
<td></td>
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<tr>
<td>ROOF</td>
<td>R-72</td>
<td></td>
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<tr>
<td>WINDOWS</td>
<td></td>
<td>U-0.19</td>
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<tr>
<td>BASEMENT WALLS</td>
<td>R-23</td>
<td></td>
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<tr>
<td>BASEMENT FLOOR</td>
<td>R-10</td>
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Climatic and Geographic Design Criteria
(Reference IRC Table R301.2(1))

<table>
<thead>
<tr>
<th>Ground Snow Load</th>
<th>Wind Design</th>
<th>Seismic Design Category</th>
<th>Subject to Damage From</th>
<th>Winter Design Temp (°F)</th>
<th>Ice Barrier Underlayment Required</th>
<th>Flood Hazards</th>
<th>Air Freezing Index</th>
<th>Mean Annual Temp.</th>
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</thead>
<tbody>
<tr>
<td>Speed (mph) (3 second gust)</td>
<td>Topographic effects</td>
<td>Wind Borne Debris zone</td>
<td>Weathering</td>
<td>Frost line depth</td>
<td>Termites</td>
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<tr>
<td>30 mph</td>
<td>100 mph</td>
<td>NO</td>
<td>n/a</td>
<td>B</td>
<td>Severe</td>
<td>3-6&quot;</td>
<td>Moderate to Heavy</td>
<td>40°</td>
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US EPA Climate Zone Design Criteria: 5A
A good place to add some why.
“Mobile jobsite plan desk! Love it.”
- Matt Risinger, April 19, 2017

The Paper Dogma.
1989
Same phone as the Director of the CIA!

More computing power than that on the last Space Shuttle.

Better screen display also!
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