Is the Grass Greener on the other side?
Examples of Cx south of the border

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AIA Quality Assurance

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Questions related to specific materials, methods, and services will be addressed at the conclusion of this presentation.
Presentation Description

The following presentation shall provide insight and examples of actual projects in Mexico and how the Cx Team has modified traditional Cx Process to the peculiarities of latitudes different from the USA.

Even working on projects with Transnational companies setting the guidelines, local idiosyncrasies & status quo have made it a necessity to adapt.
Learning Objectives

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

1. Strategize different approaches to the standard Cx Process and make adjustments to the Cx Team Roles & Responsibilities.
2. Identify potential cost creep due to lack of participation in the Cx Process by Cx Team members.
3. Identify serious risks to Cx Team members at job sites.
4. Identify the one of the biggest Cx tasks in Mexico that is usually not even looked at in the USA, Plumbing.
SHOW ME THE MONEY
Financing is not the same everywhere in a Global Economy

Owner/Investor does not borrow from bank

Purely privately held monies

What am I getting for my money/investment?, or
When do can you upload the C x report so I can get my plaque?

KNOW WHEN TO WALK AWAY... KNOW WHEN TO RUN
SHOW ME THE MONEY
Financing is not the same everywhere in a Global Economy

It may be worse when working with Transnationals
  - Corporate philosophy does not always trickle all the way down
SHOW ME THE MONEY
Financing is not the same everywhere in a Global Economy

• Owners/Developers (smart ones), know that there is added value in High Performance Buildings, or at least LEED Certified buildings.
• It is our job to educate the true added value and ROI when Commissioning a project.
• Make it very clear that the objective is not to certify the Project... it is to have the Building Systems operate as intended. However show some love.
I DON’T CARE ABOUT LEED CERTIFICATION
Show some passion!

- Indoor Environmental Quality
- Water efficiency
The Golden Rule
Use Appropriate Language

The real world is not like Hollywood!
Not everybody speaks English

<table>
<thead>
<tr>
<th>ITEM</th>
<th>DATE</th>
<th>DRAWING</th>
<th>DISCIPLINE</th>
<th>LOCATION</th>
<th>ISSUE</th>
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<tr>
<td>029</td>
<td>6-Dec-2012</td>
<td></td>
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<td>Verificación del cumplimiento con los requerimientos olistarios de la norma ASHRAE 90.1-2007 sección 6.4. Falta sellar adecuadamente los componentes del envolvente del inmueble.</td>
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<td>6-Dec-2012</td>
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<td>Es necesario controlar el sistema de iluminación interior por algunos medios automáticos descritos en la norma ASHRAE 90.1-2007 sección 9.4.1.1. - Sensor de presencia con un retardo máximo de 30 minutos. - Salida de alarma contra el sistema de alarma.</td>
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<td>6-Dec-2012</td>
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<td>Es necesario controlar el sistema de iluminación interior por zonas con medios automáticos descritos en la norma ASHRAE 90.1-2007 sección 9.4.1.2. - Un sistema de control que se instalará que apaga las luces en un periodo no mayor de 30 minutos después de que el último ocupante ha dejado el espacio, con las siguientes excepciones: - Salas de conferencias y/o jardines - Comedores y/o cafeterías</td>
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<td>003</td>
<td>6-Dec-2012</td>
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<td>Es necesario controlar el sistema de iluminación de exteriores para una de las dos siguientes opciones: - Combinación de sensor e interruptor de tiempo - Interruptor manual.</td>
</tr>
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</table>
Patience Grasshopper
Lack of adequate Cx service providers

Cx Provider said “Only one of all the projects I have Commissioned is working properly”

Good things take time... let the owner and the rest of Cx Team know that the Issues Log will not go away by itself

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<td>001</td>
<td>15-Mar-11</td>
<td>PLBG</td>
<td>PARKING</td>
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<td>Plumbing supports is are not adequate for storm drains (see SOR-001 item 003)</td>
<td>CxA has verified adequate supports</td>
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<td>002</td>
<td>28-Jun-11</td>
<td>HVAC</td>
<td>GENERAL</td>
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<td>Dampers for adequate balancing, are not installed in ductwork at each floor in compliance with ASHRAE 90.1-2007 requirements (see SOR-002 item 016)</td>
<td>CxA has verified installation of MVD</td>
<td>8-Aug-11</td>
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<td>003</td>
<td>20-Jul-11</td>
<td>HVAC</td>
<td>GENERAL</td>
<td></td>
<td>No balancing valves installed at each floor for compliance with ASHRAE 90.1-2007 requirements (see SOR-003 item 004 and SOR-005 item 009)</td>
<td>CxA has verified installation of MVD</td>
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<tr>
<td>004</td>
<td>20-Jul-11</td>
<td>HVAC</td>
<td>GENERAL</td>
<td></td>
<td>Chilled water supports are not per details on drawings (see SOR-003 item 005)</td>
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<td></td>
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<tr>
<td>005</td>
<td>20-Jul-11</td>
<td>HVAC</td>
<td>GENERAL</td>
<td></td>
<td>Manual Balance Valves for exhaust ductwork at the water, chiller is sending air measurements of ASHRAE 90.1-2007</td>
<td></td>
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</table>
Opportunities are out there

- Torre Reforma
  - Mexico City, MX
  - Core and Shell v2.0

- CIHAC M16
  - Mexico City, MX
  - New Construction v2009

- Torre Efizia
  - Mexico City, MX
  - Core and Shell v2.0

- Corporativo Terracota Cien
  - Mexico City, MX
  - Core and Shell v2.0

- CENTRO CENTREX LOREAL
  - Mexico City, MX
  - New Construction v2.0
Design Phase Basics

Mandatory Requirements?

- HVAC
- LIGHTING
- PLUMBING
- CONTROLS

Codes & Standards are more of a guideline!
Design Phase Basics

- Simple & Easy
- Before & After
Design Phase Basics

5% Skylights
No Lighting Controls
Construction Phase Basics

- No Real Submittal Phase
  - Create one!
- Big Chance for mistakes to happen . . . Or let creativity take hold
Commissioning Water Systems
Seldom done in the USA

Not today, maybe tomorrow
ASHRAE Standard 191P already moved in that direction
Metering
Reuse
Commissioning
USGBC / LEED already has it in the current language

Some water-saving technologies affect on-site energy performance and require commissioning; this task should be addressed by a project's measurement and verification plan. Calibration is necessary for projects using automatic sensors or flow valves. See EA Prerequisite 1, Fundamental Commissioning of Building Energy Systems, and EA Credit 5, Measurement and Verification, for more information. Space constraints or characteristics of the plumbing fixtures and fittings in existing buildings may hinder water efficiency efforts.
Commissioning Water Systems
Seldom done in the USA

Not today, maybe tomorrow
ASHRAE Standard 191P already moved in that direction
   Metering
   Reuse
   Commissioning
USGBC / LEED already has it in the current language

Additional energy use may be needed for certain on-site wastewater treatment operations or for reuse strategies. These active systems also require commissioning and should be considered in relation to the following credits:

- EA Prerequisite 1: Fundamental Commissioning of Building Energy Systems
- EA Credit 3: Enhanced Commissioning
- EA Credit 5: Measurement and Verification

All commissioning activities must address the following systems and assemblies as they relate to energy, water, indoor environmental quality and durability. (Core and shell projects: only include systems within their scope of work)

- Building Envelope
- Mechanical
- Electrical
- Renewable energy
- Plumbing
- District energy systems (DES) as directed by the LEED DES requirements.
Plumbing System Commissioning
The Basics

No pressure reducing station at the CHW fill.
Piping and accessories are usually rated to 125#
Dissimilar materials can cause galvanic corrosion.
No insulation on hot water side
Not really supported adequately
Larger buildings in Mexico City tend to be vertical (real estate is expensive)
Projects can have more than 10 underground levels
Everything is collected and then distributed from there
Water is scarce in most of Mexico
Treated water is used for: irrigation and flush fixtures (even Cooling Towers)
Plumbing System Commissioning
The Basics

Storm water buffer tanks are mandated in Mexico City
If you are storing it, why not use it

Storm Water Pumping Skid
PLUMBING SYSTEM COMMISSIONING
FOR SOME REASON I NEVER TRUST ANYBODY

BEFORE . . . 4.2 GPF

AND AFTER . . . 1.6 GPF
PLUMBING SYSTEM COMMISSIONING
FOR SOME REASON I NEVER TRUST ANYBODY
PLUMBING SYSTEM COMMISSIONING
FOR SOME REASON I NEVER TRUST ANYBODY

WATER SAVINGS...

Installed does not match submittal,
everybody throws hands up in the air

ENERGY SAVINGS

CxA changes flow to comply with OPR & Design Documents
MISSING TAB CONTRACTOR?, OR OTHERS
Some times you have to do it yourself

Verify impeller size
Verify system flow
Verify pump operating data (start-up)
Without the proper tools it can’t be done

Pumps and chillers run 24/7 for a High School? No controls (value engineering?)

Installing P/T ports for start-up, testing, and O&M
MISSING TAB CONTRACTOR?, OR OTHERS
Some times you have to do it yourself

With the absence of these devices you will never finish your job!

And contractors will just walk away and leave you alone!

Not easy to come by in Mexico
LEADERS IN FILTRATION TECHNOLOGY
Mandated by Corporate to have LEED® certified plant

No OSA
No MVD
No programmable T-Stat
No condensate drains
No start-up Report
No TAB report

CxA performs Start-Up & TAB work!

90.1 & 62.1
IS THE DEVICE OPTIONAL?
Just because it is on the drawings, does not mean they will install it

Two chiller system with no automatic isolation of each unit
Cleaning chiller barrels is impossible without the removal of one wall.

5°F from Chiller discharge to Building Supply

No automatic isolation valve on two chiller system
No maintenance clearance
Water treatment is almost non-existent in both CHW and CDW systems, with the exception of industrial facilities.

After a few months, imagine what the chiller barrel looks like.
IT ALL STARTS AT THE SKIN
Always verify, that what we get paid to do!

Have found glazing with coating on wrong surface.
Have detected wrong coating (or none)

Wrong glazing, or installed inside-out
One of these things is not like the others
Can you find it?

STICKER ON THE INSIDE

STICKER ON THE OUTSIDE
ASHRAE 90.1 & 62.1
Mandatory Requirements

Shut off dampers

½” x ½” bird screen
AUTOMOBILE MANUFACTURING
ASHRAE 90.1 & 62.1 Mandatory Requirements

Owner argues Mandatory Requirements are not necessary!
FORM FOLLOWS FUNCTION
Does it comply with ASHRAE 90.1

BEFORE . . .

AND AFTER
FORM FOLLOWS FUNCTION
Does it comply with ASHRAE 90.1-2007

MUCH CLEANER INSTALLATION
CAN AIR QUALITY BE BETTER INSIDE?

Cleaning it may work.

FROM THE OUTSIDE

TO THE INSIDE
CAN YOU PRODUCE MORE THAN YOU USE
Efficient, minimalistic approach to systems

RADIAN T HEATED SLAB

PHOTOVOLTAIC SYSTEM
IT ROOMS & NO MECHANICAL COOLING

It works!
YOU CAN DO IT IF YOU TRY
Simple systems produce a Platinum Project

Simple lighting controls, with added scheduling for ventilation system

Lighting Controls . . . simplify
TOOTHPASTE & SOAP MANUFACTURER
Need to comply with ASHRAE 90.1 and 62.1

No OSA at offices

No OSA at production plant
TOOTHPASTE & SOAP MANUFACTURER
Even if you are not after that LEED credit

Follow SMACNA Guidelines

This is a health risk
DESPERATE TIMES
Desperate measures

Ingenious day lighting
ACCEPTANCE PHASE

Fire Protection Agent Release

Room Integrity Failure

21st NCBC Conference
ACCEPTANCE PHASE

Potable/Fire Protection Tank

Low level Hg switch
ACCEPTANCE PHASE

Simulate Low Level

Potable Pumps Still Run
OCCUPANCY PHASE

Can you make the Owner listen to you
Try to make the Contractors come back
Few projects that are exceptions are extraordinarily satisfying
COMPLY WITH THE LAW

Import & Export

Work Permits

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SAFETY FIRST
Exaggerated some times, relaxed others
SAFETY FIRST
Exaggerated some times, relaxed others
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Exaggerated some times, relaxed others
SAFETY FIRST
Some of what you hear in the news is true . . . Bad News sells
WHAT I HAVE LEARNED

- Common sense is the least common of all the senses
- An optimist is a misinformed pessimist
THANK YOU

Jorge Torres Coto
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Empirical Engineering