

LCI 11th Annual Lean Construction Congress

Boulder, Colorado

Notes by Alan Mossman

Wednesday 21 Oct 2009 - morning

CPMC, Cathedral Hill Hospital

David Long, Sutter Health

- Lean contributes to the global environment
- video
- 2005 \$400m over budget
- 2009 \$13m under budget w/ 90% of the scope in 70% of the area
- 5 big ideas help make the project stable
- focus on planning (not firefighting)
- advocate for the project, the customer,
- if you become advocate we promise to provide the support and the structure (IFoA etc)
- the move from the trad hierarchical model to flatter lean model is essential
- The Toyota Way, IPD, doesn't have all the answers – Teamwork is vital
- Playing on peoples strengths helps them address their weaknesses

David , Smith Group, Architects

- Video
- The patient and family experience comes first
- No-one can do it all – it's a team effort
- How do we get the best out of everyone
- This is a large building even for SF
- Learning how to make and manage the team
- Validation is key
- Revitt from day 1
 - Used in all the renderings
- A3 reports and processes
 - Validation tool
 - Decision making tool
 - Teambuilding tool
- Lots of training on the project
 - What so what now what do it
- Many young team members had no idea how special this was
 - Its been the 45-50 year olds who have struggled
- Not everything can be quantified – working in a group helps create robust proposals
- Getting the right people in the boat

Paul Reiser, HerreroBoldt, Exec VP

- This is a big project – but now we are taking the learning from this one to smaller projects
- There is only one sort of project that it won't work on – the one where you don't want it to work
- There are no subs on this project- only trade partners
- Brought together by the IFoA
- IFoA = Integrated form of agreement
 - includes 5 big ideas, LPS
 - some margin at risk
 - savings shared by all partners
- Big Room co-location
 - Virtual and part-time in smaller projects
- Transparency runs through the project
- Validation
 - Creates shared understanding
 - Answers question can we do what you want within your budget
 - Yes, no, yes if ...
 - CHH was "yes if we can collaborate"
- TVD=Target Value Design
 - Target cost is 13% below market average
- Started \$65m above target
- Now \$13m below
- TVD imposes a discipline
- Budget influences design, rather than an outcome of design
- Budget is reviewed & updated weekly
- Now trying to drive additional value (>scope) into the project
- Every cluster has their own budget – envelope, structure, etc
- First step in TVD is optimising the fit
 - Systems – e.g. stucture
 - Parts and pieces – e.g. mark's enhanced design, hangers for services, patient lifts
 - Designing Production — Value Stream Mapping, cycle time reduction
- Next challenge is planning how the hospital will be built
- Added Value Process – formalising scope creep to create more value for the client
 - Unfunded value must never exceed project contingency
 - Added value must be continuously prioritised
- A3 reports
 - Information analysis
 - D-m process
 - Documentation of analysis and learning
 - Disciplined issue resolution
 - A standard process
 - "Making decisions slowly by consensus"
 - using Choosing by advantages
 - Helps customer make decisions
- Last Planner
 - Highly decentralised as such a large project
 - Based on cluster groups
 - Brought together in Thursday morning meeting
- Training
 - Lean leadership is vital
 - David Mann Creating a Lean Culture
 - *Servant Leadership* – who do I support?
 - Visual management
 - Daily accountability
 - Focus on process
 - Ensure running as designed
 - Improve
 - Empower and develop people

- PDCA
- Daily accountability and visual control at the workplace
- Run the business/project

- Improve it
- Assess/assign/accountability
- Gemba walk
- Teach – be the Sensei

- Be a humble learner
- Primary role
- Be advocates for all who will use the project

Key points

- Take concepts from ops to construction
- Eliminate all barriers to building trust
- Make decisions by consensus
- Drive customer value
- Organise network not hierarchy
- Focus on process
- Training builds trust
- Drive customer value

- Eliminate waste
- Servant leadership
- Set-based design to create design efficiencies
- Global envt resp
- Make decisions slowly to
- Do not get caught up in the processes
- No subcontractors
- Creating stability enables innovation

- Bottom down top up leadership
- Lean works on all projects
- Set aside personal interests
- One jerk can mess up all
- Transparency – making it visual
- Create learning environment
- Right people on the boat, how fast they get on

Questions

- Dollar value of the project
- What does it mean to have an Est Max Price
- How to set stretch metrics
- How were specific trades selected
- Front end costs
- Timing of EMP
- Life cycle cost as well as first cost

- What are skills of weekly estimate leader
- With trades involved early how do you design in safety
- How does the reward program work
- How do you create profit pool without a GMP
- How long is pre-construction process

- How have SF City and OSHPD responded
- Process for consensus
- Validation document/study
- What metrics really matter
- Did the glazing form have 3D experience
- What are the weak points of the process

CPR, California Prison Receivership

Will Lichtig

- Cruel and unusual punishment
- 3 teams collaborating
- 8 volunteers talking for 10 minutes

Cathy Blume, Southland

A3

- Tim Brown, IDEO on TED http://www.ted.com/talks/tim_brown_on_creativity_and_play.html
- Experience
- Learning – A3 process
- Experiment
-
- ask more questions
- change way we look at problems

- actively remove roadblocks to collaboration
- experimentation
- create more robust & innovative solutions
- A3 process
- Strategic goals
- Problem solving
- Collaborative process
- Roadblocks
- We don't have time
- We don't see the real problem

- Being right
- Myth of the loan genius
- Changing the questions we ask
- STOP, collaborate and listen
- Challenge everything, step outside your comfort zone,
- Look at the issue from different stakeholder perspectives
- Rapid prototyping
- PDCA
- Don't let GREAT be the enemy of the GOOD

Ron , Buler & Buler

Restructuring design to accommodate knowledge development

- Optimise system knowledge
- Knowledge maps
- Choosing by advantages → structured decision making
- Create, analyse, converge, decide
- Why knowledge maps
- Explore systems and sub-systems
- Document learning

- organise A3s – road map for –
-
- five primary systems
- Choosing by Advantages
- Structure for disciplined research
- Builds consensus
- Share knowledge

- Decisions based on importance of advantages
- Rigorous
- Industry should be restructuring the design process to target customer value through a knowledge based Design

Arun Kaiwar, Stantec Architecture

work structuring

- =Optimisation of the Project Delivery system to create predictable workflow
- what , when how and by whom
- VSM- system and components

- Info flow in deign
- Trade flow in constr
- Material flow thru supply chain
- Design standardisation to create reliable workflow

- Reduce variation
- Process standardisation
- Predictable outcomes
- Reduce loop-backs
- Purchasing leverage

- 3 strategies
 - design checklists
 - standard designs
 - standard parts
- greatest opportunity to build safety into design is at concept stage
 - construction eng in design
 - prefab
- Quality
 - FRS
- Work structuring ← teamwork ←

Ron Nussle & Mike Holston, ICR Lean Supply

Lean Supply Chain: Learning form Mfg to construction

- Started lean in 1990
- We've seen that the construction industry is learning lean but:
 - Lean achieves less than 50% of its potential unless it is fully integrated
 - It means changing people, processes, systems and tools on every project
 - CPR integrated four lean supply elements:
 - Bar codes on all jobsite materials integrated with lean
- LPS enabled JIT delivery
- Strategic sourcing
- Procure to Pay process to reduce end-to-end costs
- Plan – program- procure – Project – Pay
 - Reduce costs 10%+
 - Accidents down 20%+
 - Schedules down 10%
 - Material scrap down 50%+
 - Labour productivity up
- BIM supply chain integration and bar-coding process steps
 - Real time assembly data
- LPS enabled JIT delivery
 - Kaizen event – train and deliver in 24 hrs
- Trade partner selection
- Plexus web-based ERP system
 - Know where everything is
 - Eliminate admin processes

Stan Chiu, Architect, HTA – Chief Eng of TVD process

- If you're not in over your head how can you know how tall you are – TSEliot
- TVD method is scaleable
- Monday will be different
- This is going to change our industry
- Conditions of Satisfaction = impact 4 ...
- TVD targets
- Vision-research-prototype-refine
- Build resolution slowly
- TVD teams – physical and operational
- Test big ideas against the metrics
- It works on a smaller project \$48m Harvard

Eric Winje, DPR Construction

Schedule reduction

- The challenge 30→22.5 months
- How to use TVD to reorganise ourselves and validate D-B schedule
- Set-based process --= Vision-research-extremes- hybrid-recombined + reliable back-up
- Used pull planning, co-location, A3, LPS, Visual Mgmt

, DPR

Functional organisation planning

- Produced a functional organisation chart (FOC)
- Project specific functional org chart
 - Matrix – plan – chart
 - Matrix = what by function
 - Processes within each function
 - = Functions x processes
 - Functional Organisational Plan
- Define *tasks* and *activities* associated with each process
 - → task list
- FOC pulls together all similar major tasks into position descriptions
 - Create org chart – no names
 - Review tasks and determine FTEs
 - When do I need the FTEs
- Add names and companies – the *who*
- Benefits
 - Roles and resp defined
 - Surfaces training needs
 - Builds trust as FTEs mix and manage for the good of the whole
 - Cross functional expertise dev
 - Lessons learned shared

Richard (Dick) Bayer, ReAlignment Group

Lessons Learned

- conclusions
 - go slow to go fast
 - need opps to put learning into action
 - teach JIT
 - lean requires resources & commitment to supply them
 - mentors are an essential resource
- leaders must lead visibly the lean change
- lean is an organisational, not a project, commitment
 - why 65 days
- Learn in Action, learn at the speed at which people can learn,
 - Trained both operations and project delivery teams
- Mentor – A3, pull-planning, VSM, etc
 - How can everyone have a mentor?
- Lead – teach, listen, learn, coach, teamwork,
- What are you doing and how can I help you?

Questions to all 8

- Brief synopsis of the A3 process
- How do you choose who to involve in the A3 process
- How do you describe LPS to a 3rd party

Wednesday 21 Oct 2009 - afternoon

Lean Construction Transforming Companies

Michael Gnazzo, Joseph Gnazzo Co Inc

- Who what where when how
- Heritage construction and restoration
- Lean started in 2006
- Big bang April to June 2006
- Failure in family owned companies – Michael is 3rd generation
- Financial trouble pushed lean to the front – conversations with a friend in autobody construction
- Observe friends Kaizen event – saw light on day 3
- → u/s who customers are and what they want
- Value Stream Mapping – Crack to cash
 - Customer value 9/223 steps!
 - ID tasks that support value creation
 - Focus out to customer
- Written and visual corporate processes
 - Project traveller
 - Forms to take info from customer for consistent sharing across the project.
- 5S/6S reduced warehouse 50%
 - Fisher Price Simple
- Yard as a tool
 - Every vehicle has a home location
- Truck in loading area is signal to load it
- Fuel filler cap off is signal to refuel
- Once filled, truck is returned to its home location
- 5S on trucks
- first truck took a month to build – collaborative
- inventory from warehouse to wheels
 - → standardised trailers
 - → e/one knows where to find things
- Std re-order process
 - Visual cues to re-order
- Work stop process → data on reasons for work stoppage
 - Problems with operational definitions
 - Process currently suspended
- 2007
 - Continuous Improvement Idea forms
 - Looking at defects in a whole new way
- 2008
 - OTD% metric introduced – on-time delivery
- 2009
 - LPS
- Enterprise Excellence Leader – Garrison Macomber
- LPS
 - On all projects
 - Tracking the future
 - Puts what is in the supervisors head onto the wall and encourages collaboration
 - Makes project schedules achievable
 - Proactive waste reduction
 - Used as Prime/GC and as Sub
- Successes
 - Less chaotic work env't
 - More fun
- Learning - choose own path and stick to it
 - have fun
 - humour
 - helps
 - move out of comfort zone
- challenges
 - → teaching
 - work stoppage process
 - productivity tracking
- Monday
 - Standard work
 - Better measures of improvements
 - A3
 - ...

David MacNeel, Baker Concrete

The role of engagement and vision

- without engagement of your last planners and craft people you cannot be truly lean
- journey 2.5 years
- on 12 projects
- regional initiative
- comparison of two lines in a large steel mill – lean results significantly different
- three stone mason's story – we want inspired people *building cathedrals*
- continuum – resource limits = tell → strong team, more time = collaborate
- Learn to use your mind as a weapon
- US special forces model
 - Hi skill A teams
 - Force multipliers
 - Must be teachers
 - Means & methods
 - Winning hearts and minds
- Winning hearts and minds
 - Incident and injury free safety culture
 - SATs
 - TWI – job instruction
 - Lean simulations – airplane, dice, silent
 - LPS
- LPS conversations
 - Pre-bid
 - Pull planning
 - Weekly meetings
 - Morning huddles
- Share the vision
 - deep involvement
 - regular discussions
 - BIM
 - Physical models
- SQP meetings = weekly Kaizen meetings
 - Build relationships
 - Ask for ideas
- Document them
- Take action
- Learning
 - AAR
 - Post-mortem reviews
 - Incident reviews – weekly
 - All on sharepoint site
- Willingness to participate
 - Prisoners and tourists to start with – players come later
 - Fake it until you make it
 - Me too effect
 - Takes time and effort
- Results
 - Safer
 - Faster
- Benefits
 - Coworkers think
 - Common vision
- Respect innovation communication →
- Football metaphor
- Commitment by the top makes a difference

Key points

- Engage the frontline
- Keep it fisher price simple

- The base of the relationship determines the height of the pyramid
- Bridging the gap between lean tools and the enterprise
- The truck in the parking lot at 805 is problem
- One team at a time
- Fear leads to paralysis
- Foremen must be teachers
- Workforce want to be involved
- All foremen experts in means and methods
- Proactive waste reduction

Questions

- What are the repercussions of you being able to do your work reliably on the rest of the team
- How do you standardise the man-hour scores?
- How did you determine customer values and needs
- How did you come up with training programmes
- Was body shop guy your only consultant
- What is safety result in relation to
- What about lean drove the safety result

Richard Deluccie, Snr PM, Lean/LPS & Bruce Cousins AIA, National PM, VDC, The Weitz Company

The lean journey at The Weitz Co

- Resetting the company – 2013 plan
- Has grown out of BIM
- Started before downturn predicted
- Emphasise it is an organisational choice more than a project one
- Elements -
 - Lean
 - LPS
 - Labour cost mgmt
 - Sustainability
 - VDC
 - QC
- Founded in value as defined for the customer
- Started 2 years ago
- Path to transformation is slow
- First project – everyone new, thrown in at deep end
- Lessons learnt
 - Need structural input sooner
 - Define scope of BIM modelling and lean implementation earlier
 - Relied on outside experts for BIM & Lean
- U/s investment req'd in both people and process
- Not just one right way
- Choose where you intervene and be consistent
- Consistent top management support is vital
- Project 2
- Helped bring project within budget
- Then applied learning from project 1
- Defined major project risk for owner and Weitz – cast in place concrete
- Modelled rebar so could be fabricated
- Involved trade foreman – Davy
- Benefits
 - C.f. Project 1 & 2
 - Rfis on core wall 44 → 0
 - 22% less rebar than in budget
 - 2 wks saved on CIP work
 - \$250k steel mill savings
 - 37% steel detailing cost savings
 - higher level of collaboration LPS
 - higher trust
- earlier involvement – lean boot camps
- better team chemistry
- higher level of innovation accepted
- better risk management
- → smaller batch sizes – in shop drwgs too
- talking about lean without calling it lean
- Force multiplier dashboard
 - Smile O Meter
- Trades solving problems together and then seeking OK
- SATs
- Building from the bottom up
- Lean • green • VDC-BIM • QA/QC • Organisational Excellence
- Come further than we thought in under 2 years
- Jump in and start doing

John Scianna, Mission Bell Mfg Inc

Learning to be lean

- Focus on flow
- Making it continuous flow &
- One-piece flow
- Started 2004
- Articulated co purpose
- We exist to serve by appreciating worth
- Created ESOP – employee share ownership
- Architectural woodwork and cabinets
- Design – build – install
- One piece flow is different for every company
 - Learn to see it and when its not
- What defines one piece for us
- One-piece flow – room by room
- Estimate room x room
- Design at the last responsible moment is the last moment that it can make a difference
- Deliver to the jobsite in small trucks room x room
- Benefits
 - Hours per cabinet more than halved
 - Errors per cabinet decreasing
 - Sales revenues (were) increasing!
 - Flowing value smoothly to the job
- Flow cuts through the silos
- Lean applies anywhere work is done
- It needs to be enterprise wide
- Construction can improve its impact

Key points

- Finding one continuous flow
- Lean as investment
- Engage trades
- Best people work in construction
- Lean tools are available in any contract model
- Define one-piece flow from customer perspective
- Discover one-piece flow in your company
- Process is slow but not as long as you think
- Integration of design and constructors
- Call me anything you want but pay me on time
- Shop drgs disappearing
- Don't meet to define problems, come to resolve problems
-

Questions

- If use BIM, does e/one on the team have to u/s it
- It takes more to design up front – how much more
- Similar metrics from Project 3
- What is a lean boot camp
- Why not fully using the bar-code system
- Who paid for education
- When you chose the room as the basis for 1-piece
- Do you install each room in a day
- What is a task
- How become a learning organisation

Mike Sullivan, The Weitz Co

- History of the change

Chapter formation

Greg Howell

Vision for LCI (Centre for Innovation in Project and Production System Management dba LCI) & the chapters

- 501.3.C (charitable) organisation – not for profit; not for consultancy
- board of directors – no voting membership
- 998 individual members
- 20 academic members
- 60 corporate members (from 20 2 years ago)
- mission: *to develop and disseminate knowledge about the management of work in projects*
- connecting practioners
- how to make LCI an industry **think-tank** nationally, internationally
 - trying to get CURT, AGC, AIA, ASA, COAA, etc involved
- establish education protocols
- before chapters – meetings and forums
- meetings = training
- symposia e.g. relational contracting
- forums = special interest group e.g.
 - academic
 - design
- chapters = regional and local
 - self organising
 - job is for people who are interested in lean construction, for our own learning, c.f. evangelism
 - connecting practitioners
 - feeding the centre and the whole
- Actions
 - Reform board
 - Support chapters
 - Setting boundaries, quality control

George Zettel, Founding Coordinator, Norcal LCI Chapter

- How to get from 12→120 per meeting?
- Acknowledge people on continuum from mastery to awareness – help people make the journey
- Networking is secondary to learning
- → something they can use tomorrow; what does the community need?
- Initial mailing list 207 after 2 years, now 1200 2 years on
- Done by volunteers with sponsorship
- Norcal just agreed to a partial split so as to reduce travel time. one chapter—two branches→ bay area and valley

Questions

- Is there a chapter handbook?
- How to determine chapter geography?
- How chapter meetings organised?
- How to set up a chapter?
- Payment arrangements?
- What is required to setup and form a chapter?
- Are there fees and costs involved?
- Process to start?
- Standard for speaker recognition and appreciation?
- Academic involvement?
- Chapter discussion forum?
- What levels of membership?
- Are there limits on what a chapter can do?
- How do we find speakers?
- What is the low hanging fruit?
- Are suppliers involved?
- Who may use the LCI logo?
- How is liability dealt with?
- Is LCI a trademark?
- Do you need a business licence to operate in other states?
- What if gov't agencies want to join?

Support

- **Chapter handbook:**
 - All are unique
 - Different boards
 - Different management

Thursday 22 October 2009 – morning

Changing an industry segment: Lean Construction in Healthcare Projects

William (Bill) Seed, Universal Health Service

- For-Profit healthcare co
- Largest in US
- Just joined Fortune 500
- Objectives
 - Patient centred care
 - Employer of choice
 - Cost reduction
- Nurses are ageing
- Flexibility of care
- In trad healthcare procurement every stage costs more than the last
- Predict-plan-produce-perfect
- How
 - Work as team
 - Start with detail budget
 - Focus on customer value
 - Surface and test all presuppositions
 - Bring in the doers early
 - Eliminate waist (sic)
 - Learn from small mistakes (sic)
- Owner needs
 - Owner value decision making
 - TVD
 - Help find pitfalls
 - Change management – Last responsible moment
 - Define contingency—underspend is waste
 - Help making decisions
 - Help to understand the magnitude of the decisions required in a program

- How
 - Start with all encompassing budget
 - Est mission critical services
- Build a core team that can provide and decide
- Breakdown silos
- Admit don't know
- UHS insists on Lean
- Texoma Medical Center – HKS architects, Bernita
- Designing from the inside out
- No need for value engineering

Key points

- Design from inside out
- Underspend is waste
- Allow eqpt designers to lead
- Owner needs drop dead decision points
- Capable contractors to start
- No RFIs
- More focus on cost
- All work is bought lean
- Punch list free projects are possible
- More work for the owner
- D-m at last responsible moment
- Admit ignorance
- Trade [partners participate in results
- End-user involvement in design
- Predict, plan, produce, perfect
- Stop protecting contingencies
- Help identify ALL of the cost
- One team with a single process
- **Contractors need to help owner through the process**

Questions

- Before and after litigation
- What level of contingency do you add in the budget
- What questions do you ask to test lean engagement
- Are you using simulation for the design of hospitals
- Have you seen schedule optimisation benefits
- Do you use BIM on your projects
- What are differential cost of projects in California
- Do you have a typical multiplier for soft costs vs construction
- What will this industry look like 5-10 years out

Digby Christian, Sutter Health

- Sutter is a non-profit in Bay area of California
- Castro Valley
- 11 partners signed up to IFoA
 - so everyone working on the same terms
 - 18 mths to negotiate
 - goals explicit
 - due date
 - GMP
 - Env't
 - No change orders
- TVD
- Design for fabrication
 - Developed new software to make handoffs simple
 - Used ProjectWise from Bentley via Ghafari
- 6 Revit models as Revit not big enough for whole hospital
- Smartboards to enable looking at same part of building from different perspectives
- 400m from Hayward fault
- 100% CD is end of shop drawings
- used 3D underground as well as in structure
- modelled rebar in 3D as well
- shared system live files so reducing rework
- Plan, re-plan, re-re-plan, re-re-re-plan, ...
- Only one plan – get big wall
- Co-location
- *Find it in design not in the field*
- Money
- Model based estimating
- Cost reporting sheet – replaces 100 page report
- Going to construction
 - What goes wrong in ...
 - Trying to understand how things go wrong
 - SPS
 - Line of balance
- designed from inside out
- broke ground in July
- its really hard work
- I have more people who care about the whole project working with me
-

Key points

- Plan, re-plan, re-re-plan, re-re-re-plan, ...
- 11 Party contract
- design for fabrication
- *Find it in design not in the field*
- Function dictating form
- Get a big Wall
- owners can change the business
- Line of balance
- Shared distributed model
- Make a list of the things that usually go wrong
- One page cost report
- Model based estimating
- Constructor and partners work on the same model
- 100% CDs = end of shop drgs

Questions

- who owns and is responsible for functionality of project wise
- why did it take so long to get contract signed
- how do you integrate eqpt vendors & when
- say more about *no change orders*
- what LoB software
- How do you get accurate trade partner productivity for LoB
- Total time of design from start to groundbreaking
- What is SPS
- What sort of contract is Otis under
- How do you determine what to pay those involved in planning
- Was steel fab one of 11
- How is the owner educated in the lean process
- How the level of detail of design was managed in early phases of design
- How are you holding entities accountable
- Pros and cons of BIM
- How much of your time do you spend with the team
- How are lower tier trade partners selected
- How do you manage the TVD accounting
- What will you do differently next time
- Did you see opps to optimise the hospital processes
- How do you pay preconstruction
- Would other members of the team like to comment on what Digby has said

Comments from others on the team

- Dean Read, DPR
 - Leadership is vital – Digby has done that well
- We have to help owners learn what it takes to do this
- It is a learning experience

Thursday 22 October 2009 – afternoon

Stephanie Davi Ercolini, ACE Mentoring Programming of America Inc

- <http://www.acementor.org/>
- Mentoring high school students
- Middle school students
- Experience of the industry
- Competitive project
- Looking for Time, talents & \$

Allen Meyer, NxtNote Technology

- Collaborative sticky note creation
- Output to a variety of software

Ben Schwab,

- Links unit prices to BIM for instant estimating

Update on Phase Scheduling

Dean Reed, DPR Construction; James Choo, Strategic Project Solutions; Peter Gwynn, Lean Implementation services

- Current benchmark on phase scheduling – Glenn – March 2009
- Called Peter after last year’s presentation on operative involvement
- James was there
- Agreed to collaborate
- Noticed that everyone doing LPS in a different way – first thing on a project was to align methods
- Does the master schedule reflect the reality on the project? What confidence do you have in the schedule?
 - CPM doesn’t tell us what is going on
 - Disconnect between production and schedule
 - Need to improve but we don’t know what we need to do
 - The schedule is for the owner
 - We will have an updated in a couple of weeks
 - We were 90% reliable but we were still late delivering
- Schedules are forecasts of what should or could happen
- Further and more details → less accuracy
- 47% of what is planned is not completed
 - in design = work planned 1 week ahead
 - in construction = work planned 1 day ahead
 - change of plan
 - prior work not completed
- reducing variation → reduction in buffers
- Integrating project and production management
 - Project mgmt obj → production mgmt obj
- Planning and control: roles and responsibilities
- How far do you need to LookAhead?
 - Thinking differently
 - Planning investment
 - Reconnecting workflow planning and execution
 - Abolish central planning
 - Abolish command and control mgmt
 - Implement LPS
 - Change the planning paradigm
 - From forcing workflow according to baseline plan
 - To accepting reality of constant change
 - We will be done with the planning the same day the project is complete
 - Master Schedule purpose (ID Milestones) and driving forces
 - Phase schedule purpose = ID major handoffs; missing link between master and production schedule
 - Guidelines
 - Highest level of production-driven schedule
 - Begin process 4-6 weeks prior to starting work
 - include everyone, all stakeholders with input and responsibility for scope
 - develop plan from scratch
 - focus on work to complete
 - use critical path only when abs necessary
 - have 3D available – smartboard
 - only show # days not dates
 - record agreements made not on wall
 - not issues and agreed who will resolve when
 - be prepared for 2-4 initial sessions to arrive at initial phase plan (4 hrs then 90mins each)
 - Collaborative Planning sessions
 - Structured and systematic framework for planning
 - Everyone on same page
 - Develop better understanding of the work
 - Easier for doers to commit
 - Leverages experience and expertise of the workforce
 - More realistic
 - Benefits
 - Develops a shared vocabulary
 - Improves job satisfaction
 - Optimises production for whole project
 - Basis for production control
 - ID and manage float
 - Validate milestone plan
 - Opps often come from people not directly involved in the issue
 - Keeps team focused
 - Continually updated
 - Allows creating a recovery plan if reqd
 - Clear rep of progress
 - Effective tool for project leadership
 - Steps
 - Start with scope and bookends
 - Start with fantasy plan – optimal workflow – and adjust based on constraints
 - Plan from the future – work backwards

- Size activities so that team can ID handoffs (work releasing work);
- Include major constraints – long lead items, handover reqmts
- Apply durations and crew size with no contingency or padding – duration expected under normal conditions
- Input into appropriate tool (e.g. Primavera) to test viability
- Deliberately and publicly generate and schedule any float available.
- Planning environment
 - Focus on optimising work – who best suited to do work when based on what we know now
 - Allow team members to get smarter about the work
- No rank in the room – create culture where team members feel comfortable speaking openly and honestly
- Leadership is critical
- Establish team unity – pick a name
- Limit tech discussions by getting commitments to resolve issues offline
- Limit duration of the meeting
- Resolve conflicts by group consensus in favour of project as a whole
- LookAhead planning
 - Purpose = ID constraints & optimal task sizing & sequencing
 - Guidelines
 - Constraints ID and removed
 - Work details and opns designed
 - Repetitive processes optimised w/ FRS
- Repetitive processes optimised, captured in standard work that can be replicated as required
- Production Planning
 - Purpose
 - assign tasks for production
 - Coordination for production
 - Capture reasons for late delivery
 - Guidelines
- Learning
 - Purpose = prevent reoccurring plan failures
 - Guideline = review KPI to minimise reasons for non-delivery
 - PPC = *flywheel of LPS*
- Components for successful impl – need all: Process, tools, people

Lean Learning on the tough ones: SSM St Clare Health Centre

Tim Gunn, Alberici constructors; Kevin Kerschbaum, HGA Architects and Engineers, project Mgr, St Clares; (Don Wojtkowski, SSM Health Care)

- Replacement hospital
- \$221m total project; \$152m construction
- 174 beds, 6 floors, 80rs
- significant medical records
- some seismic reqmt
- aims – IHI 6
 - patient centred
 - efficient
 - safe
 - effective
 - timely
 - equitable – sensitive to diverse patient needs
- initial success with \$60m Cardinal Glennon
- team charged to build on that learning
- why lean construction – conventional PD not conducive to complex
- *probability of error and change is absolute so we must organise a team and use a delivery system to deal with it*
- What is IPD to us
 - IPDA
 - TVD
 - VDC
 - Prototyping
 - Financial arrangements
- Team procurement
 - 3 levels
 - lean partners –
 - specialty – involved in design
 - lump sum – based on 100% CDs
- TVD
 - Initial programme and budget set by SSM – didn't consider 6 aims or all owner goals
 - Project was initially 80kft² under prog & \$90 ft² under budget
 - SSM has now revised its front end scope and budget process
 - *Design to budget (not est design)*
 - Arch components – scope and budgets matched
 - MEPFP struggled with conceptual estimating
 - Frustrated with iterative process of design
 - Challenged with total project cost
 - Not unique to this project
- MEPFP 100% virtually designed
 - Big room
 - HGA → 3D structural and Arch model in AutoCAD ???
 - Hard to do
 - Painful process because of who owns construction docs; software integration issues;
 - *??? who will do drawings in future – and in what – how much detail of what*
- Why VDC
 - Coordination
 - Prefab
- Save duplication in drwg
- Lessons
 - Design eng need to own model and develop capability
 - MEPFP frustrated by iteration
 - Early meetings with permitting authorities
 - Decide what gets modelled early
- prototyping and mockups in design
 - everything repeated >6 times
 - 3D model → foam → full size spaces
 - → design refinements
 - benefits
- LPS
 - Tougher on a larger project
 - Swapped out some supts
- Finance
 - No GMP – cost plus fixed fee
 - no incentive programme
 - cost accounting – cost tracked against control estimate
 - cost plus created nimble team
 - *behaviour is a result of financial consequence*
- outcomes
 - on schedule despite v wet year
 - on budget
 - safety OSHA rate 0.1739
- How did you manage MakeReady
- How much did owner spend on mockups
- How did you plan design ... particularly the 300 Sis
- Did you do a pull schedule in design so that you know what to do next

Lean Learning on the Tough ones: Half a loaf is better than no bread

Jay Davidson AIA, Capital Programme Management; Jim Kordakis LEED AP, Robelin Construction

- We learn from struggles
- \$25m elementary school
- lean LEED silver 2 story tilt-up
- 2/3 normal design and construction period
- public clients are risk averse
 - don't want to be first to do something
- lease leaseback enabled use of relational contract structure
- sep contracts with designer and constructor – common exhibit
- agreed distribution of risk
- constructor asked to take risk for coordination as involved pre-design
- designer resp for negligence and doc production
- owner, weather, unforeseen circumstances
- balance of contingency became incentive – third each to design, construction, owner.
- No need to establish blame – only which contingency it comes from
- **continuity of staff** – issue 'cos of loss of relationships, knowledge, understandings
- **reverse phase scheduling** – first experience – started in design 6mths became 2 mths – completion date brought forward 5 mths – took 2 passes to get there → yes if ...
- **collaboration, LPS** better in design than construction
- bit of Command and control in construction
- struggled to eliminate waste in both design and construction, some success
- Lessons
 - Maintain continuity of culture
 - Discuss risk openly and assign reasonably and by agreement – gets everyone involved in managing risk
 - Choose team members carefully— we're managing a social process
 - Set *unreasonable* goals
 - Maintain high expectations
 - *Ah but a man's reach should exceed his grasp, or what's a heaven for?* Robert Browning

Key points

- Continuity of staff
- Its abt managing a social process
- Diff processes
- Risks set fairly at start
- Choose team to fit process and project
- Breakthrough failure
- Successful projects push you to do better
- Perseverance & persistence
- Six most frequent lies
- If you can't what you want find another way to get there
- If it not broke don't fix it is the moral enemy of Continuous Improvement

Questions

- You said trades wanted to do something different ...
- Identifying which contingency (rather than blame) creates the basis for preventing recurrence.

Plus Delta – what was good, what could be improved

plus	delta
<ul style="list-style-type: none"> • So much free sharing of success/short coming • CPR format excellent (10mins) • What will you do Monday • Food and service is good • Parking is easy • Posters • Depth and quality of information • Enterprise transformations • Hearing abt less than stellar schemes • Better view lines to screens • All the new folks • One day intro helpful • Subtle examples like the CPMC plumber Mark • Evolution of Group/Industry 	<ul style="list-style-type: none"> • Put light on the speakers • Break out sessions to discuss some detail issues • Keep doing take aways & questions • Post presentations ahead • Schedule congress dates earlier • More specific times on the daily schedule • Rotate Denver, Chicago, Atlanta • Do CII like research teams • White papers with presentations • Sessions too long – use yest lunch formula • Breakout sessions to discuss detail issues • Larger screen for presenters • Absence of handouts • More vendors • Workshop breakouts • Too many hospitals • Get leaders here • Get owners here • Petcha Kucha evening • Mic on every table • Summarise all presentations on A3 • A3 posters on projects blown up to A0 • Deep dive into aspects of projects • Chapter discussion time – e.g. Tuesday pm • Survey membership to find what is of value • More on Insurance • More training sessions •

Friday 23 October 2009 – morning

Introduction to Choosing by Advantages (CBA) Decision Making (DM) System

John Koga CVS AIA, Boldt Construction

- Recommended by UN and US Gov't depts.
- Decisions matter – why? → actions → consequences
- but what precedes decisions? We need a method – methods matter
- CBA =
 - A dm system unified by
 - Definitions
 - Principles
 - Models
 - Methods
 - A set of skills
 - A process that improves
- Learn to make sound decisions
 - Learn defs and princs
 - Learn & skilfully use models & Methods
 - Unlearn weighing
 - Pros & cons
 - Advantages and disadvantages -
 - Factors, criteria, goals, roles, categories, attributes, objectives
- Factors = a container for data – general – an element of a decision
- Criterion
- Attribute = specific
- Advantage – beneficial difference
- *Decisions must be based on the importance of advantages*
Jim Suhr
- *How*
 - Vital thinking skills

- Thinking vs generalising
- Drive to specific
- Which is more important – list of high level constructs – no shared operational definition
- Decisions anchored in relevant facts
- Based on the importance of advantages
- CBA is not cost benefit analysis!

	Alt 1	Alt 2
Factor criteria	Attribute Advantage	Attribute Advantage

Monitor	model 1	model 2
size bigger	17"	20" 3" larger
button position		
etc		

- weight the importance of the advantages
- choose one with greatest if cost is irrelevant or equal
- otherwise CBA chart – cost x cash
- can look at lifecycle cost too
- CBA process
 - 5 stages
- compatible with Liker's principle 13 – make decisions slowly
- build into A3
- www.decisioninnovations.com

What are you going to do next Monday

- list produced using NxtNote <http://www.nxtnote.com/>

Push the Limits – Experiment

- Improve facilitation of Owner Decision Making
- Determine a place to start—just do it
- Jump on the train
- Relay that Alliances are real
- Linking medical centers engaged in lean operations to their construction operations
- Conduct a retrospective on the last design cycle (last batch of work)

- Motivate owners with the Mike Gnazzo story to take ownership
- Relay story of Collaborative Atmosphere
- Set Unrealistic Goals and Solve Them
- Introduce the lean culture from the manufacturing into the installation

Apply in Your Domain

- Investigate and share resources for practicing zero punch list
- Utilize Toyota Way to facilitate starting a new profit center (pg 238)
- Improve/Quicken implementation of Last Planner
- Focus on use of specific tools for each situation: 5S, Last Planner, A3s, VSM.
- Use information for specific project/workshops already planned/underway and in need of assistance.

- Focus on job preplanning
- Begin regular Gemba walks
- Use resources from conference – A3, LastPlanner, CBA, books, etc.
- Develop baseline metrics for office/company to understand where we are and where we need to go.
- Develop a Lean Action Team for various offices

Legal et. al

- Investigate liability and licensing for stamping collaborative work
- How insurance industry can support IFOA
- Defining the insurance industry's role in participating with LCI

- Gather IPD contracts information and review/consult with internal legal.
- Develop relations with Zurich

Recruit Others

- Get involved with local chapter
- Recap and share learning within organization and clients
- Suggested that everyone either join or start a chapter and participate in the P2SL
- Tell the Lean story & bring others in
- Start a SAT to promote cultural change towards a learning organization
- Maintain, grow, and use contacts from the congress for speakers, resources, information.
- Drive adoption at the executive level
- Affect the Company Culture – Building Collaboration, Integration, and Spreading the Word.
- Report back to senior mgt and promote lean concepts and applicability to the organization
- Develop a process to enable foremen to become teachers
- Start/Facilitate LCI chapters in Denver, NC, and Dallas
- Develop AGC Alliance with Denver
- Continue supporting Sr. Management as they begin using A3 as part of Strategy Deployment
- LCI involved with local chapters (Construction Industry, Productivity and Innovation)
- Share our passion of lean

Educate Yourself

- Download congress presentations and materials, review notes, and integrate in class presentations.
- Define a strategy for sharing the presentations with the rest of the organization
- Pursue new ideas that were revealed during preparation for the conference presentation.
- Answering questions: What is Lean, Lean Construction, Lean Project Delivery, IPD, and how does BIM fit
- Plan the next step
- Focus on Self Education – A3, CBA, Toyota Way, Lots of Books!
- Read the Hothouse Effect
- Understand A3 and Use for Decision Making
- Learn more and begin to practice CBA
- Last Planner, Production Management, Pull Scheduling – refocus the effort and expand to new areas.
- Process mapping guidelines in preparation for a workshop
- Learn more about the Knowledge maps.
- Support the facilitation of a design management workshop
- Attend Pull Planning Session and learn how to do it and teach it
- Begin my deep dive in lean