

# Lean Liverpool 2014

**Andy Fielding - Costain** 











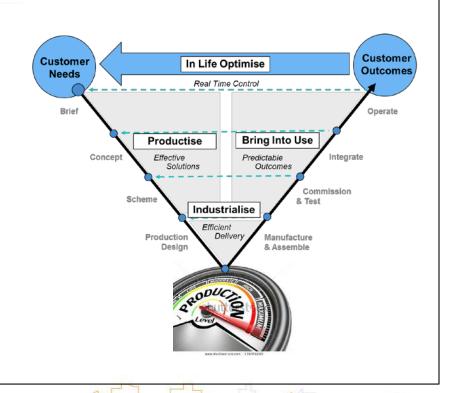




# **Lean Liverpool**

#### AN EXAMPLE OF FACTORY THINKING?

- 1. Collaborative Planning
- 2. Pre-Cast & Modular Design
- 3. Building Information Modelling

















# **Lean Liverpool – Why we did Lean!**

- Past Experience from other Costain project successes
- Large Project £200Million demands special effort
- Repetitive Nature of project 16 cells 42m x 45m x 7m, why can't it work
- Time is our most Irreplaceable Resource
- Challenge to find efficiencies

















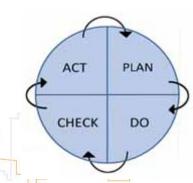


- Develop Strategy & Plan,
  - Think Big, Start small and build knowledge, skills
  - Think Factory, Off Site Manufacture & DfMA
  - Do Collaborative Planning
  - Develop Precast and Modular Knowledge
  - Challenge
  - Lean training and knowledge
  - Leadership
  - Need to think different, simultaneous not sequential



#### **FORMULA 1 PRODUCTION**













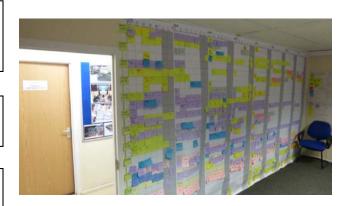




Master Planning Session Every 3 months

Weekly Planning max 1hr

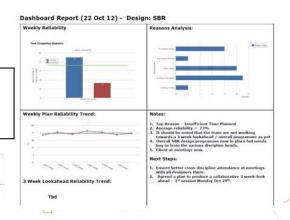
Daily Planning max 15mins



Use good visual displays of the plan and results!

Live Data

Use the data to improve









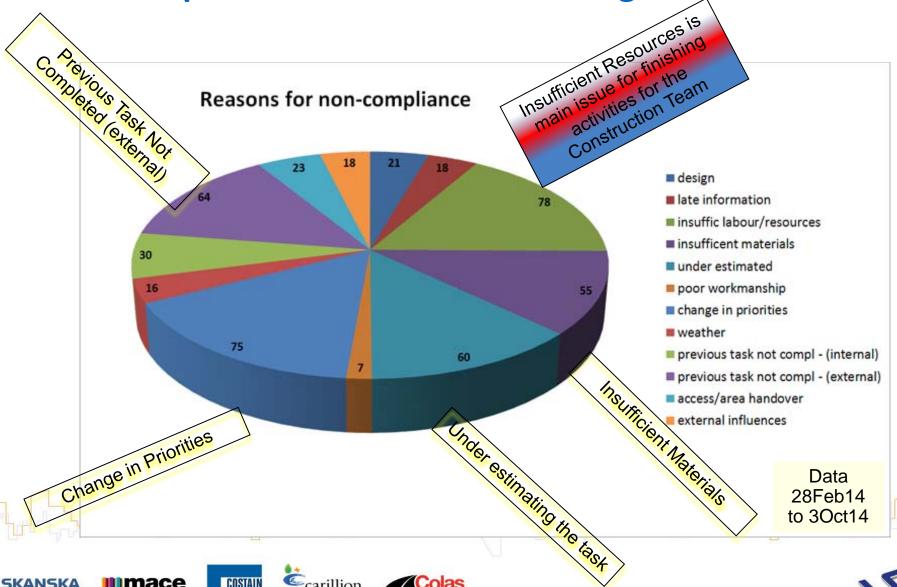


















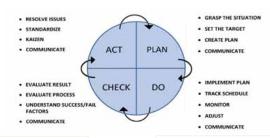








- Benefits & Lessons Learnt
  - Allows Knowledge Transfer & Learning
  - Implementation Strategy and Plan essential
  - Size & Selection of Teams to be Sensibly Selected
  - Allocation & Understanding of Daily/Weekly Tasks to be Clear
  - Requires Regular Collaborative Planning Sessions with Updated Master Planning Sessions
  - Needs Good Monitoring, Control and Influence from Leadership
  - Reduces the Risk of Things Going Wrong Or Things Being Missed
  - Builds collaboration
  - Builds Relationships
  - Creates Motivation
  - Allows Lean Team to Plan Better
  - Awareness of Critical Path and Critical Activities
  - Develop Clarity of Task to be done
  - Develops better sequence of activities
  - Helps improve safety performance









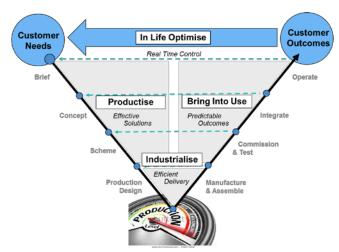




### **Lean Liverpool – Pre-Cast & Modularisation**

Pre-Cast Concrete structure cast off site to minimise the on site construction time and activities

Modularisation (Assembled Off Site) (DfMA)









Pipe Bridges

**Precast Retaining Wall** 













### **Lean Liverpool – Pre-Cast & Mod Summary**

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### **Lean Liverpool – Pre-Cast & Modularisation**

**EXAMPLES** 

North and South Stair Towers

Reduced installation time on site by 2-3 weeks each



**Decanter Walkways** 

Took 2 ½ Days to install

(typical install 2-3wks)



#### **Decanters**

Fabricated in 4 sections as large as possible for transport

















### **Lean Liverpool – Pre-Cast & Modularisation**

#### **Lessons Learnt**

- Concrete alignment
- Errors in design and build
- Concrete damage
- Coordination
- Subcontractor understanding
- Package details

#### -Benefits

- **Cost Saving Benefits**
- Reduces time on site installation
- and construction activities
- Quality improvement
- Improves Safety



















# **Lean Liverpool – BIM**

- Building Information Modelling
  - It's more than a 3D model
  - It's a central database for anything you want
  - Technology is evolving and improving the access to more information available
  - 3D Scanning is evolving to make BIM easier to use
  - SBR Fly <u>Through 2mins</u>

















### Lean Liverpool – BIM

#### Benefits & Lessons Learnt

- Visibility, by all, of what is being built
- Better Understanding of what will look like
- Clash Detection can be easily evaluated
- Subcontractors can assess their designs better but beware of access
- Customer can see what it looks like, again access to the 3D model
- Access, Lifting and Maintenance can be reviewed at many levels during design
- Depending on Data Linked to Model Can be Used as a Central Database
- Can be Time and Cost Loaded
- Construction and Build Defects can be linked to the model
- Modelling Requires 3D capable PC Software and Hardware
- 3D Design Change Control needed for engineering and CAD
- Contracts still want 2D drawings
- Quality of 2D drawing
- Design status awareness, 3D is not the end
- Is a way of creating asset intelligence for lifecycle of asset









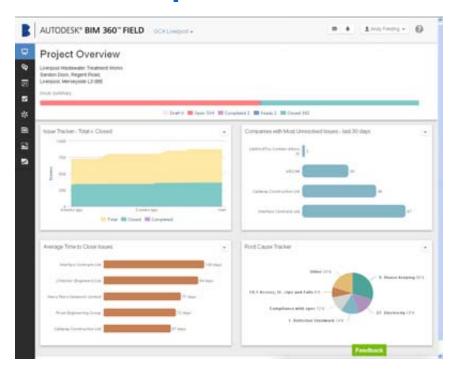


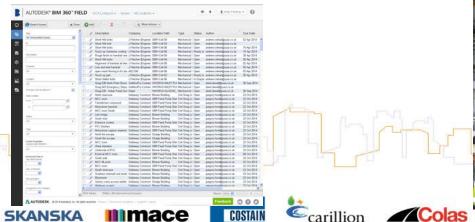






# Lean Liverpool – BIM 360 Field

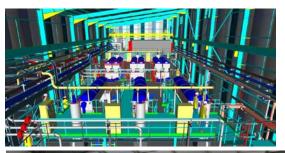




**Snagging Issues** 

Weekly Safety Inspection Issues Record

**Best Practice** 



Ipad Video 1 2mins

Ipad Video 2 2mins





### **Thanks for Listening**



