Recognising & Eliminating Waste (at the Design phase)

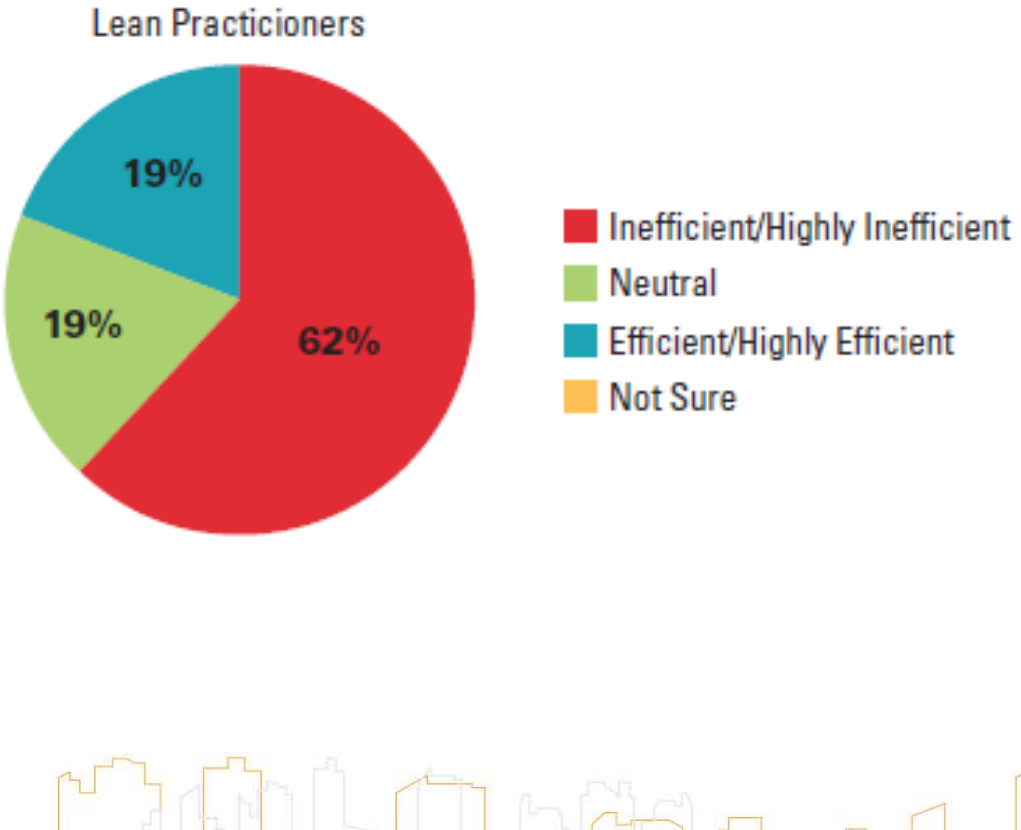
Infrastructure BIM Manager's feedback

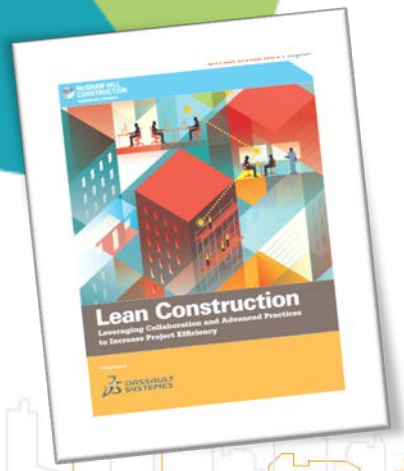
Simon Dean, 3MU LIMITED
(ARUP alumni)


GOOD LIFE

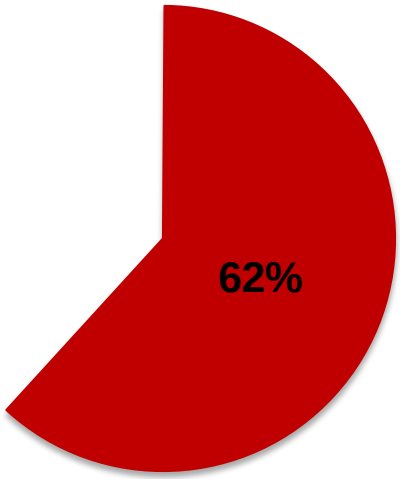
Efficiency of Construction Processes in the Industry
(By Level of Lean Engagement)

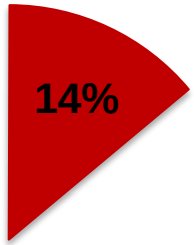
Source: McGraw Hill Construction, 2013





Today's objective: A lean health check





Design Development

Communicating Design using BIM

Group Discussion

- Feedback
- Q & A

Design Development

Communicating Design using BIM

Group Discussion

- Feedback
- Q & A

Design development - wastes:

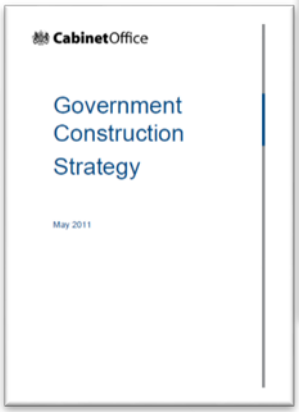
- Point to point design development
- Delivering ‘non-value-added’ change
- Not knowing the current state
- Not recognising your customers
- Not understanding customers needs.
- Not considering the whole

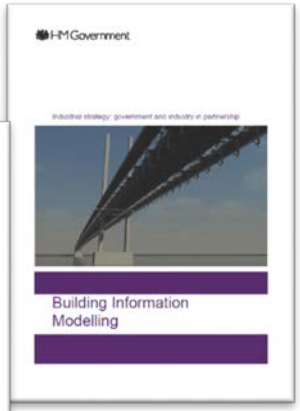
Design Development

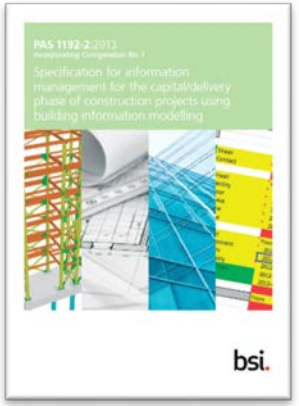
Communicating Design using BIM

Group Discussion

LEAN ACKNOWLEDGEMENT

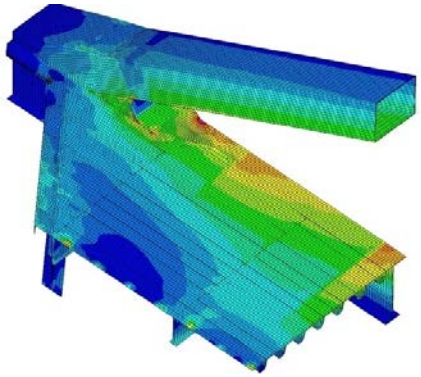


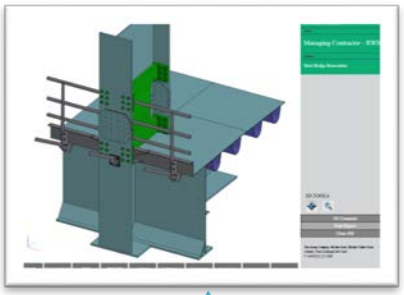


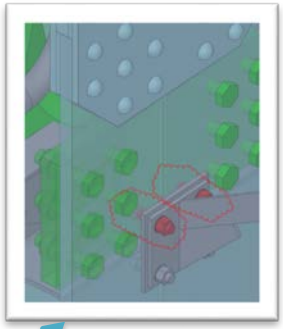


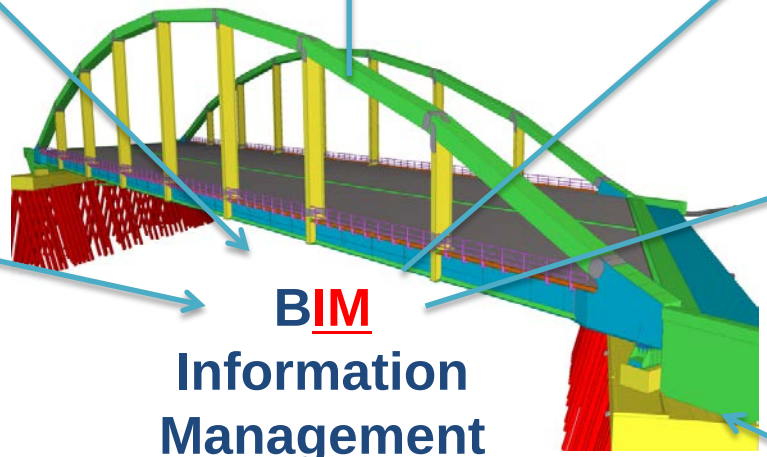
2010 2011 2011 2012 2012 2013

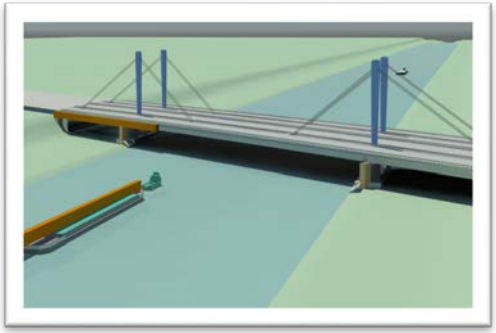
BIM RELATED DOCUMENTATION

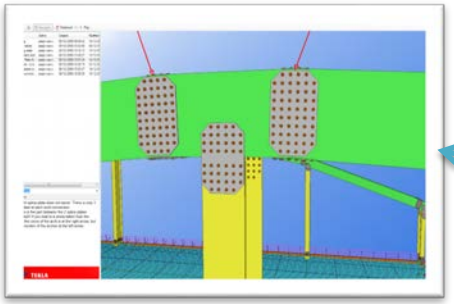




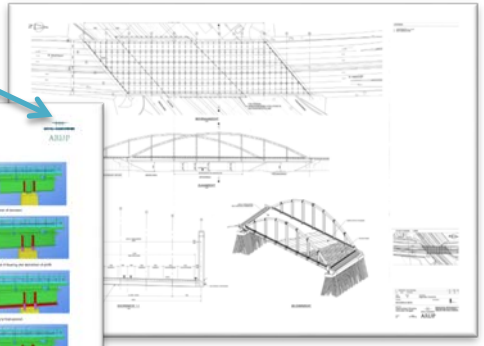


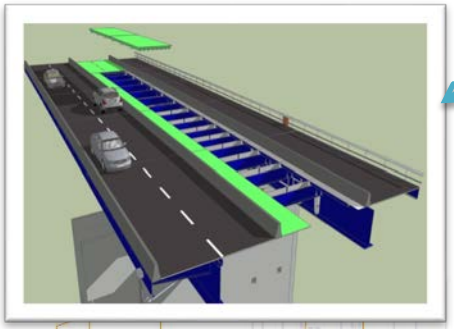


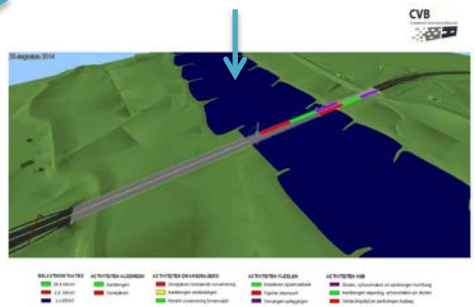


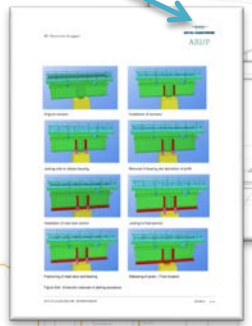


BIM
Information
Management

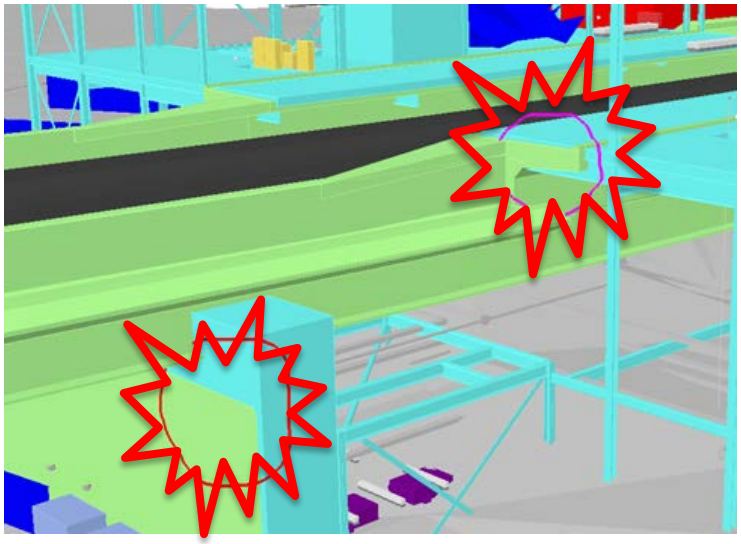


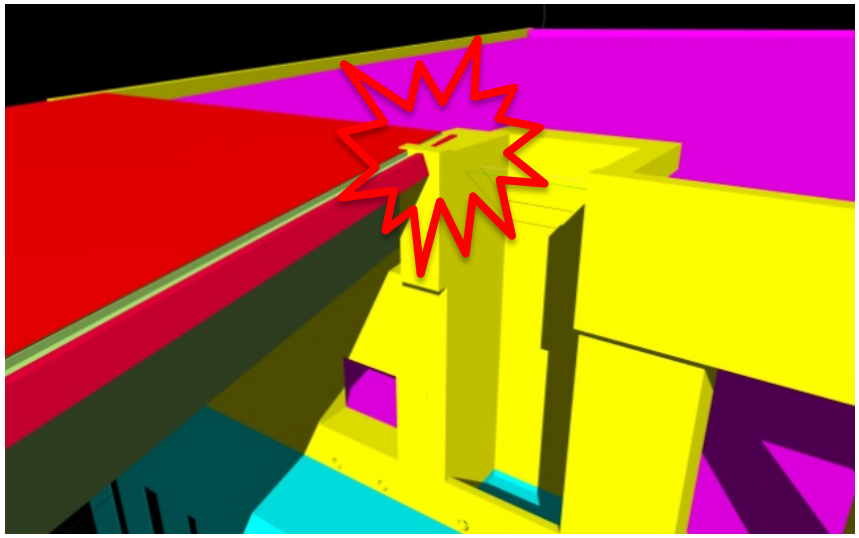




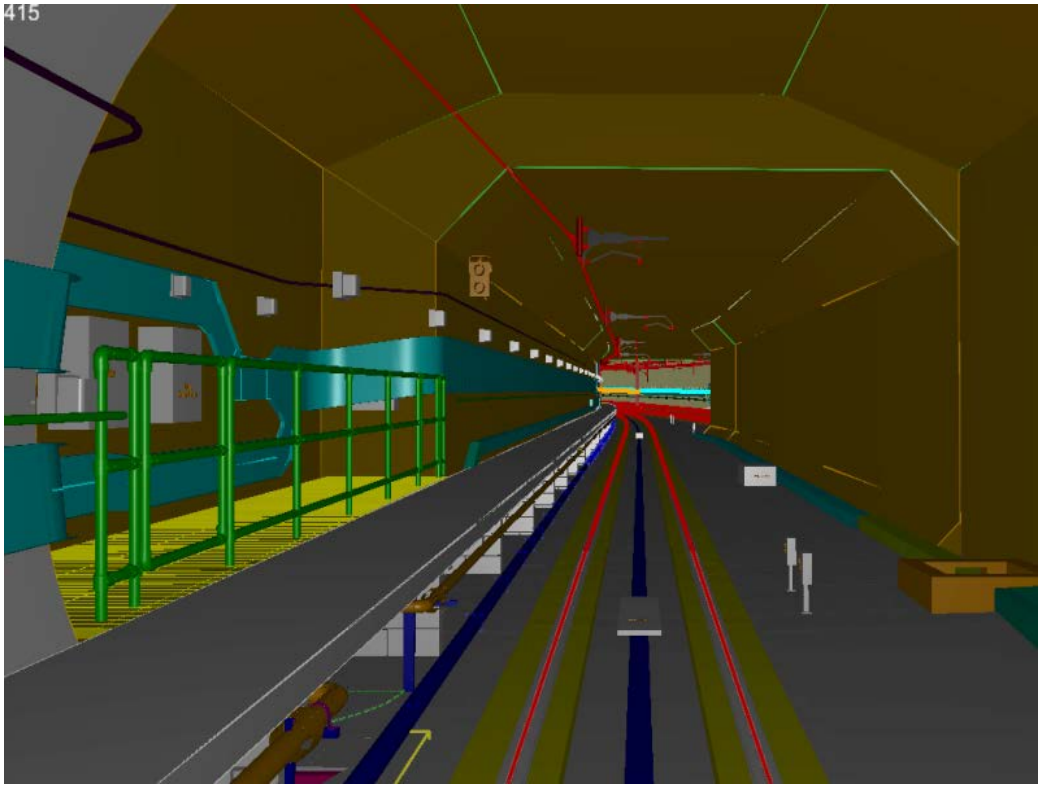


Make the process transparent





Q: What, if anything, is missing from this model?



© Arup

PAS 1192-2 Specification for Information Management

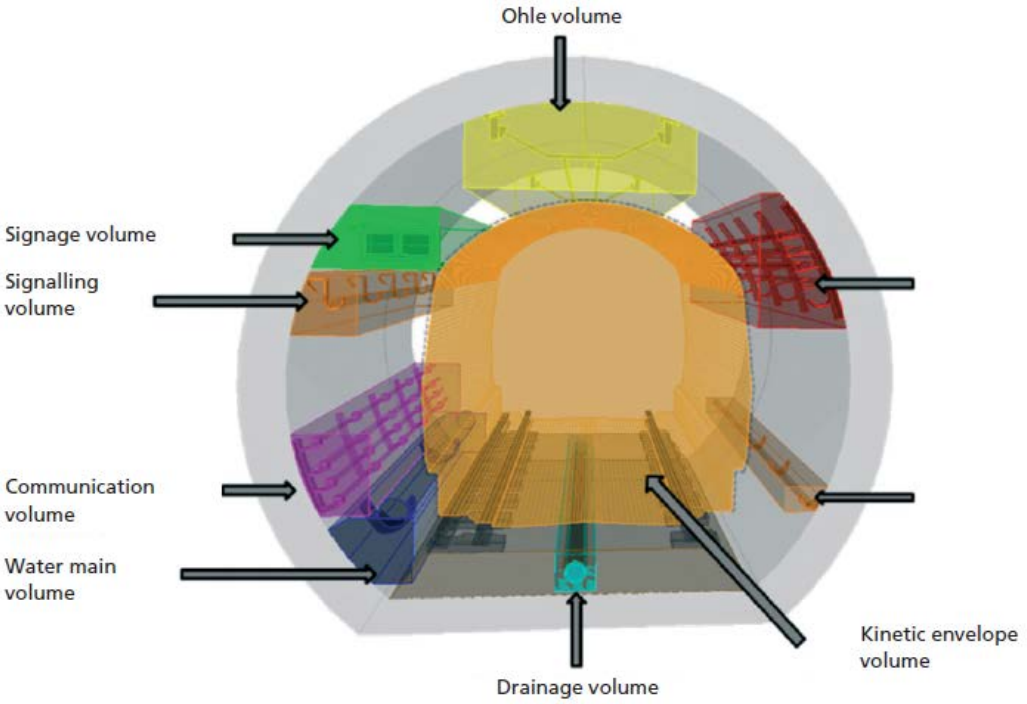
Volumes

7.6.1

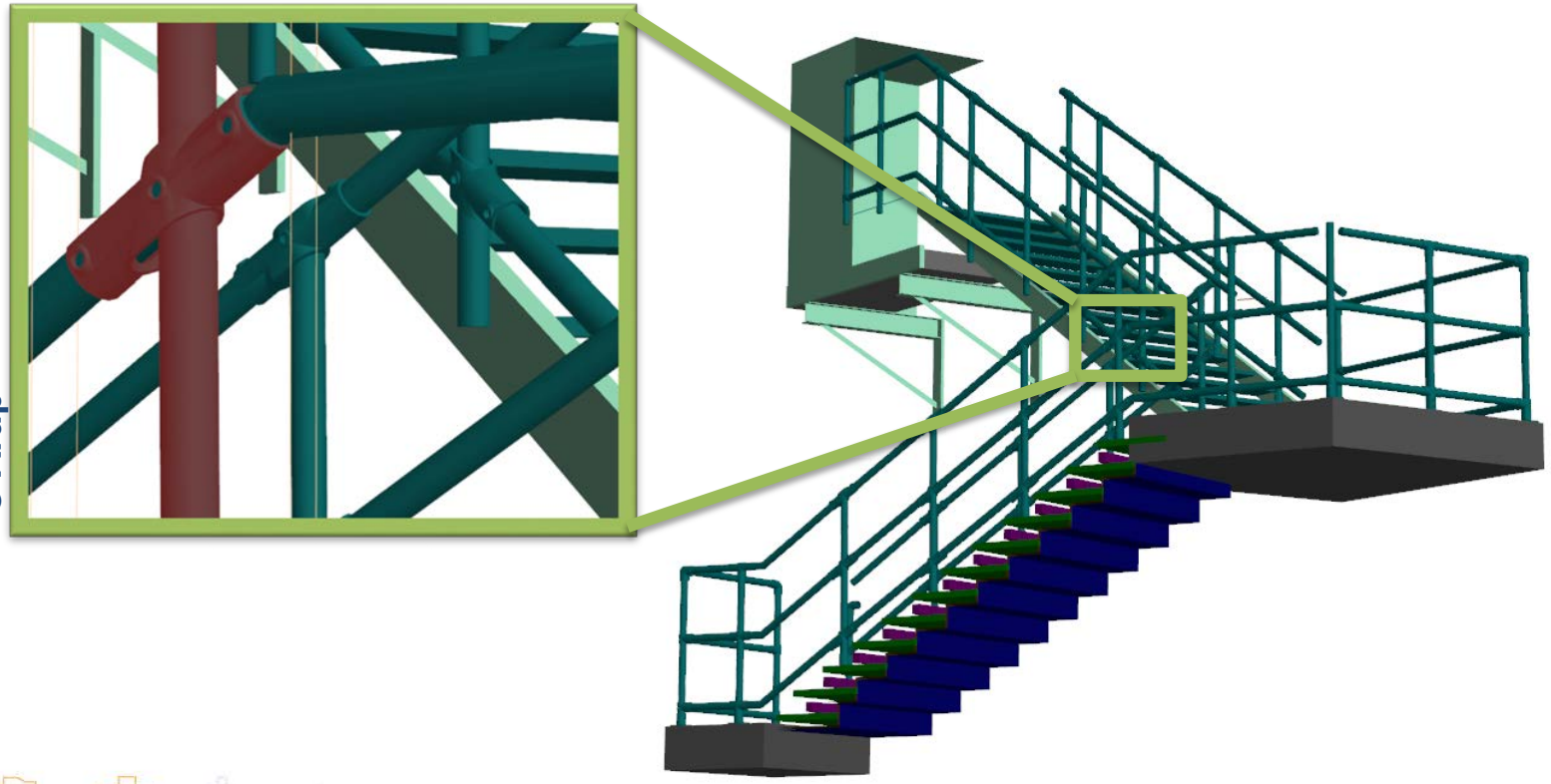
…the project shall be broken into a number of volumes

7.6.2

All members of the design team shall agree volumes as fully as possible at the start of the project and publish them as a shared document.

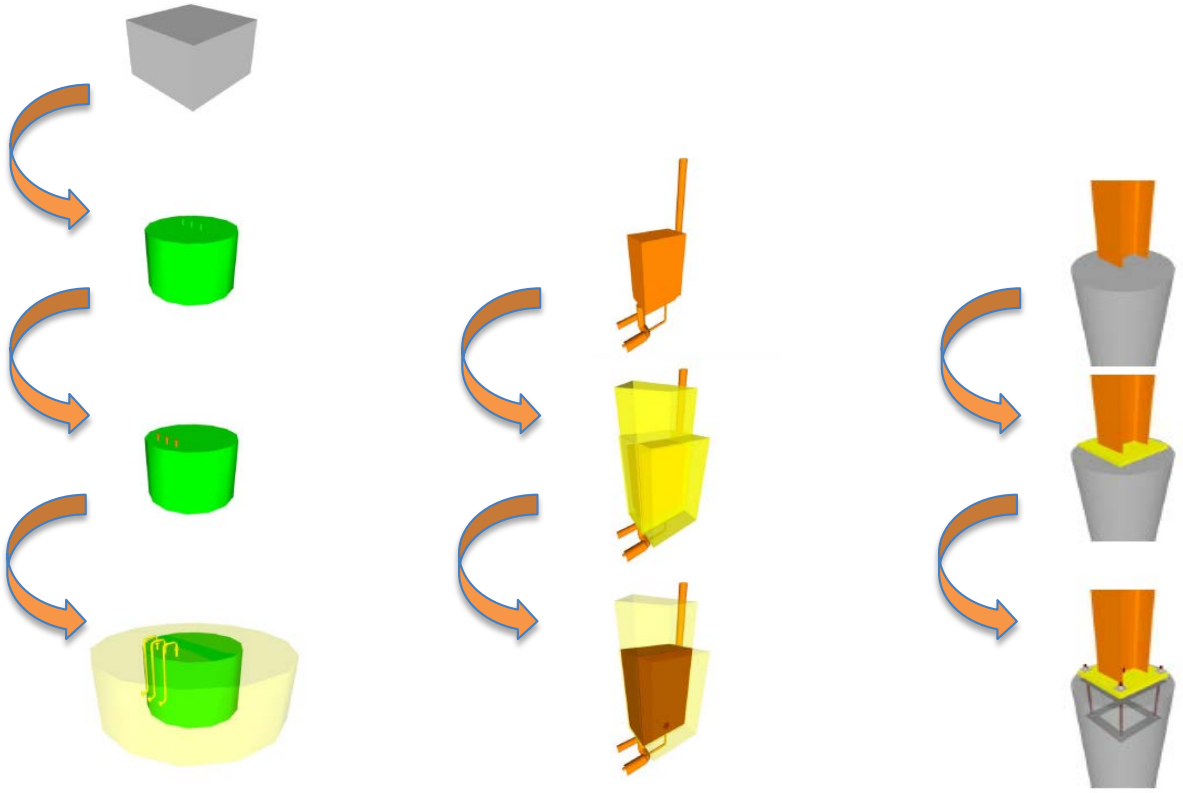


What is an appropriate level of detail?



Improve current protocols

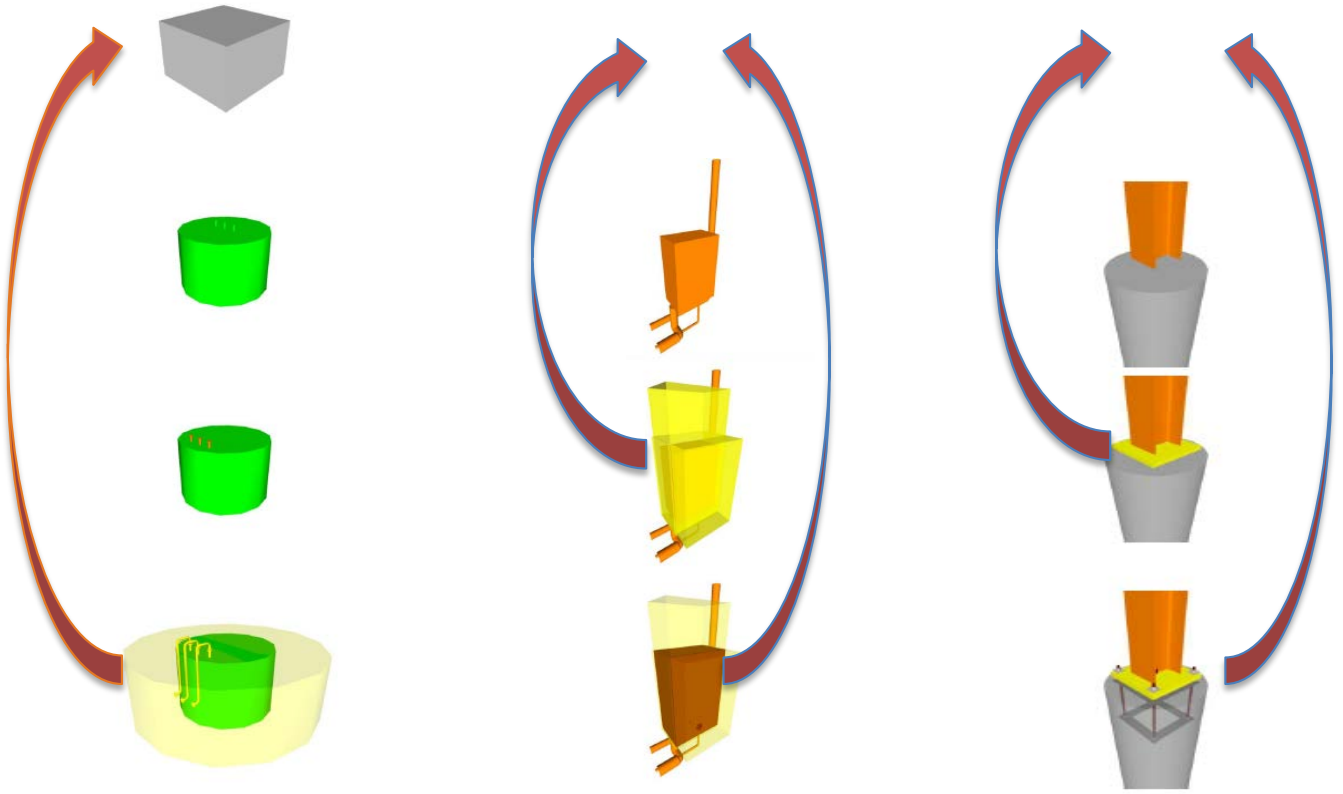
Level of Development



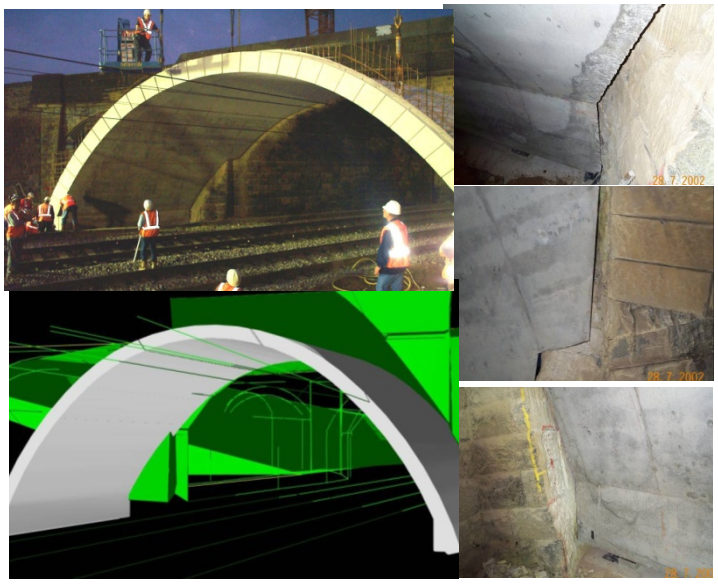
Level of Detail Specification. Version 2013:
www.bimforum.org.lod

Promote a knowledge-based approach

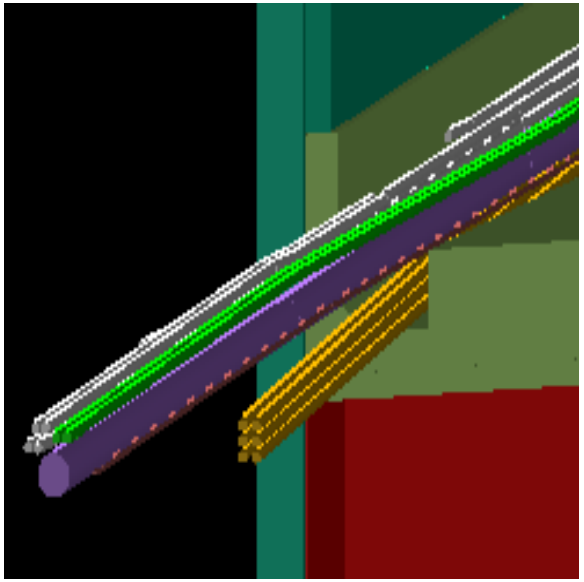
Consider key information early



Level of Detail Specification. Version 2013:
www.bimforum.org.lod



© Arup - Bingley Bypass



© Arup - Cambridge Guided Busway

© Arup - British Waterways - Liverpool Canal Link

© Arup - M1 Westlink – Roden Street Footbridge

Building Information Modelling Top Tips
(or Wastes should you choose to ignore them):

- Model current (today's) situation
- Fix the grid system early
- Agree a single coordinate system
- Model known unknowns, whole life-cycle volumes and rules
- Model to a suitable level of detail and development
- Include downstream processes early

Group Discussion

Are we lean practitioners seeing a high % of waste (and opportunities for improvement)

Or

Are we leading the Good Life, blissfully unaware others are maybe laughing at our lack of vision?

Lean Manufacture

Transportation (Conveyance)
Moving material or information from place to place.

Inventory
A build up of material or information that is not being used.

Motion
Excess motion or activity during task execution.

Waiting
Waiting for material, information, or decisions.

Over-production
Producing more or earlier than the process than the next process needs

Over-processing
Doing unnecessary processing on a task or an unnecessary task.

Defects (Correction)
Inspection to catch quality problems or fixing an error already made.

Skills Misuse
Losing time, ideas and learning opportunities
People working one or two levels below their true capacity.

Lean Construction

Transportation
Moving work-in-progress from place to place
Delivering equipment, incomplete orders
Moving to and from storage.

Inventory
Excess raw material
Poor stock management
Too much material compromising workspace

Motion
Unnecessary movement of people and/or material.
Movement of materials and drawing information.

Waiting
Workers unable to do ‘value-added’ work
Waiting time between processes
Documents awaiting updating

Over-production
Producing items earlier than needed
Producing more than is needed

Over-processing
Work done to ‘fill gaps’ rather than appear to be waiting for instructions
Taking unnecessary steps

Defects
Production of work which is not ‘right first time’
Inspections to reduce/remove defects

Skills Misuse
Losing time, ideas and learning opportunities
People working one or two levels below their true capacity.

Lean Design

Transportation (Conveyance)
Hand-offs/excessive information distribution
Information changing hands, by word.
Unnecessary hand-offs

Inventory
Batching
Problems remaining hidden or discovered after resulted in extensive rework and long lead times.

Motion
Redundant / superficial meetings - not getting the direct data needed to make real design decisions.

Waiting
Waiting for reviews, decisions, permission, information, purchase orders.

Over-production
Downstream operations working on upstream designs too early in an effort to do concurrent work.

Over-processing
Stop & go tasks, redundant tasks, reinvention.
Designing from scratch instead of morphing standard design architecture.

Defects (Correction)
Late engineering changes.
All forms of correction and rework.

Skills Misuse
Losing time, ideas and learning opportunities
People working one or two levels below their true capacity.