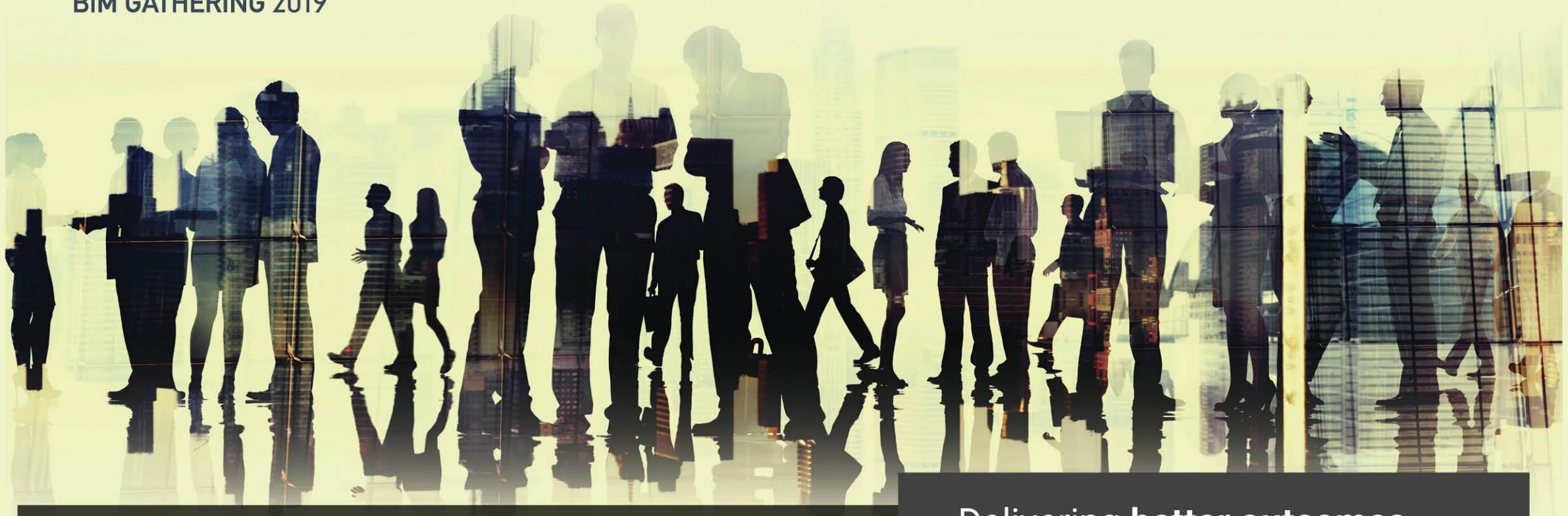


# CitA

BIM GATHERING 2019



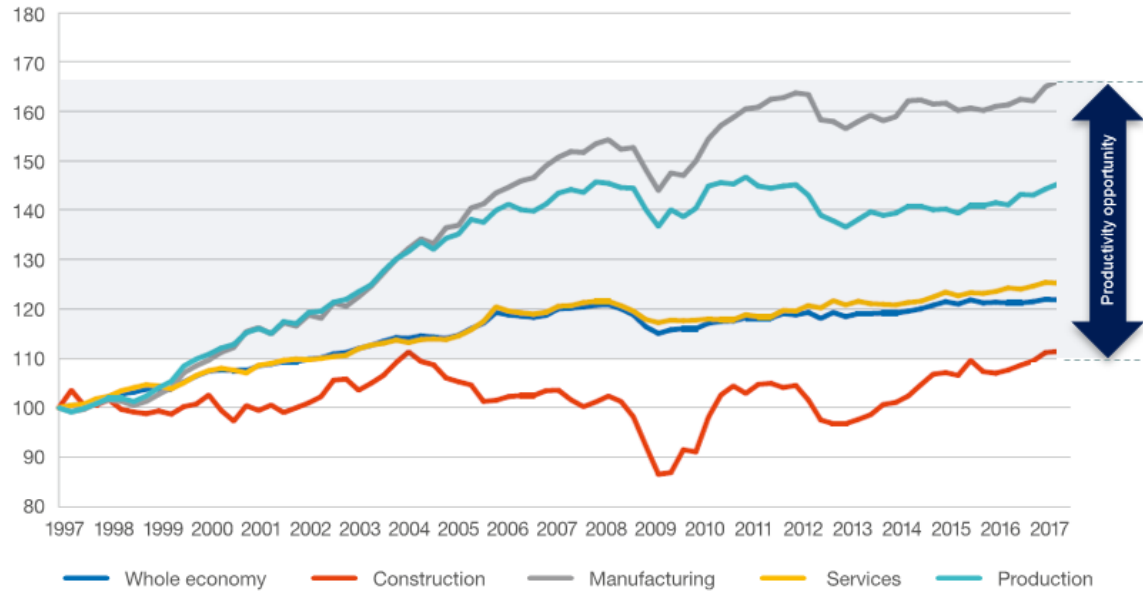
**4th CitA BIM Gathering** 26th September 2019, Galway, Ireland.

Delivering **better outcomes**  
for Irish Construction

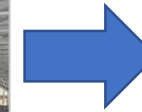
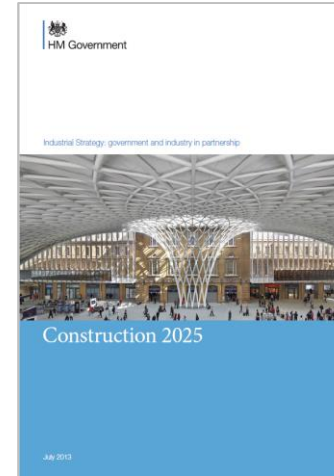
# Transforming Construction: a new catalyst for change

**Paul Oakley BA(Hons) Dip Arch RIBA**  
BRE Director BIM  
Construction Innovation Hub  
September 2019

# Drivers for change



Source: ONS / Transforming Infrastructure Performance, IPA, 2017.



**Lower costs**

**33%**

reduction in the initial cost of construction and the whole life cost of built assets

**Faster delivery**

**50%**

reduction in the overall time, from inception to completion, for newbuild and refurbished assets

**Lower emissions**

**50%**

reduction in greenhouse gas emissions in the built environment

**Improvement in exports**

**50%**

reduction in the trade gap between total exports and total imports for construction products and materials

**Productivity**  
**Fragmentation**  
**Skills crisis**  
**Quality**

**Improved social outcomes**  
**Safer and more resilient buildings**  
**Increased new skills**  
**Increased investment**

**4th CitA BIM Gathering**  
26th September 2019, Galway, Ireland.

Delivering **better outcomes**  
for Irish Construction



## Clean growth

- Energy revolution
- Transforming construction
- Transforming food production

## Healthy ageing

- Medicines manufacturing
- Data to early diagnosis and precision medicine
- Healthy ageing

## Future of mobility

- Faraday battery challenge
- Extreme robotics
- National space test facility

## Artificial intelligence and data economy

Audience of the future · Next generation services · Quantum technology





**£170m**

Government  
funding

**£250m**

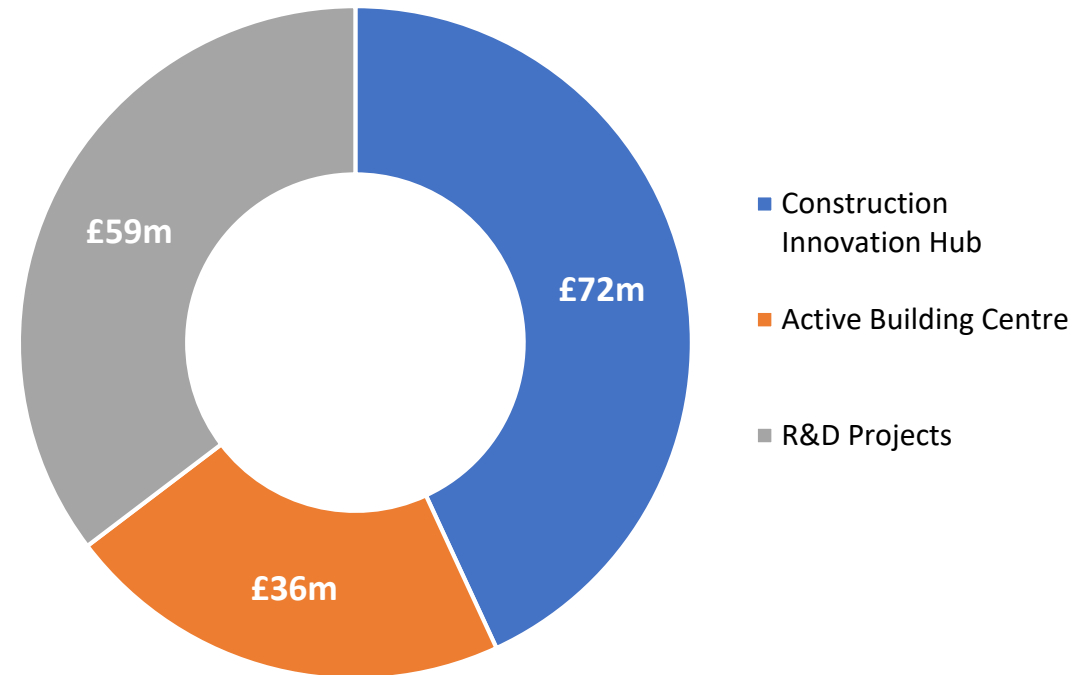
Matched industry  
funding

**4 years**

of funding

**Sustainable**

long-term model





Our mission is to be a catalyst for transforming the UK construction sector through manufacturing technologies and digital ways of working – boosting productivity, exports and asset performance to benefit society

# CitA Three core partners...

BIM GATHERING 2019



4th CitA BIM Gathering  
26th September 2019, Galway, Ireland.

Delivering **better outcomes**  
for Irish Construction



**mtc**  
Manufacturing  
Technology Centre

- Product Family Architectures
- Standardised Component Sets
- Process Engineering Solutions
- Government Department  
Discovery and Analysis
- Physical Demonstrators

**bre**

- Engagement and Skills
- Demonstration, Testing  
and Validation
- Built Environment  
Performance
- Digital Product Data and  
Building Regulations

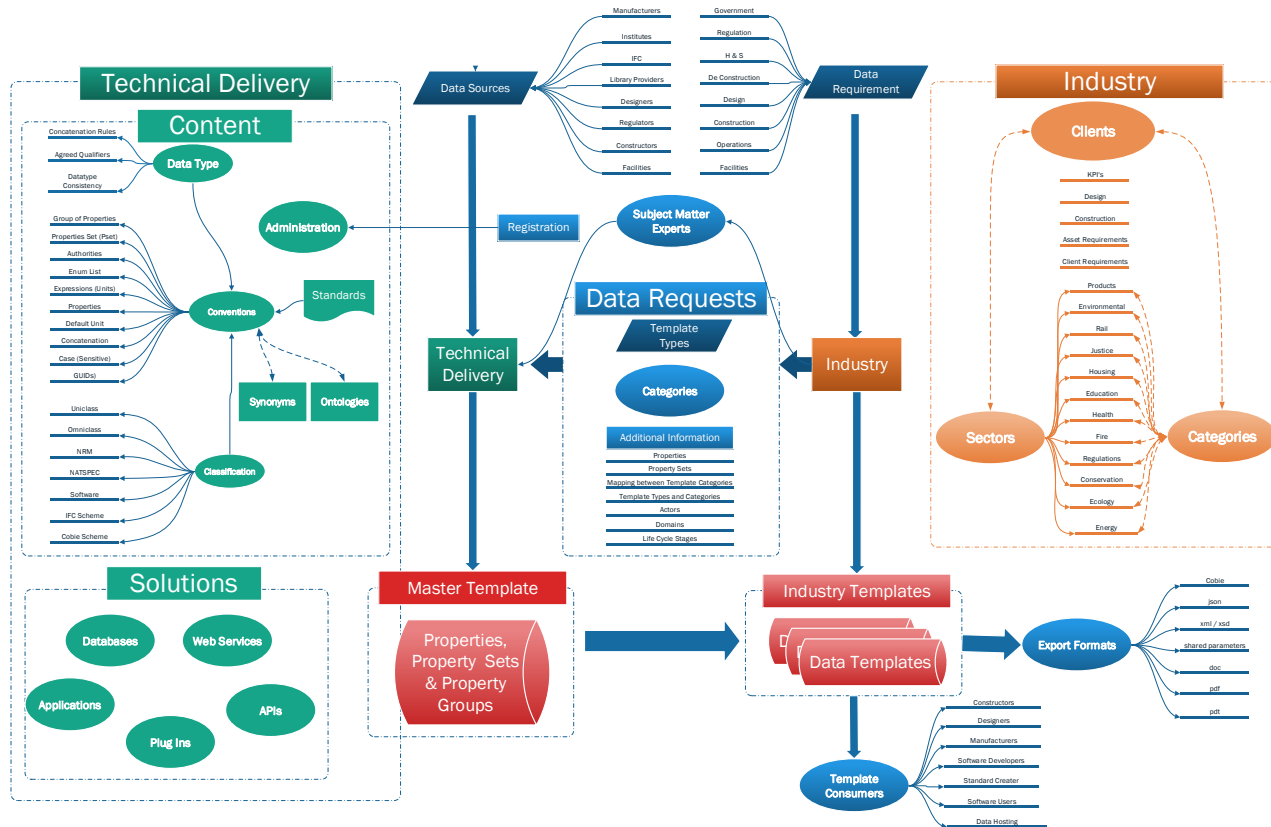
**cdbb**  
Centre for Digital Built Britain

- Digital Transformation across  
Asset Lifecycle
- Asset Management and  
Digital Twins
- Contracting and Business  
Models for the Digitally  
Enabled Built Environment
- Impact Assessment
- Driving Change and Growth





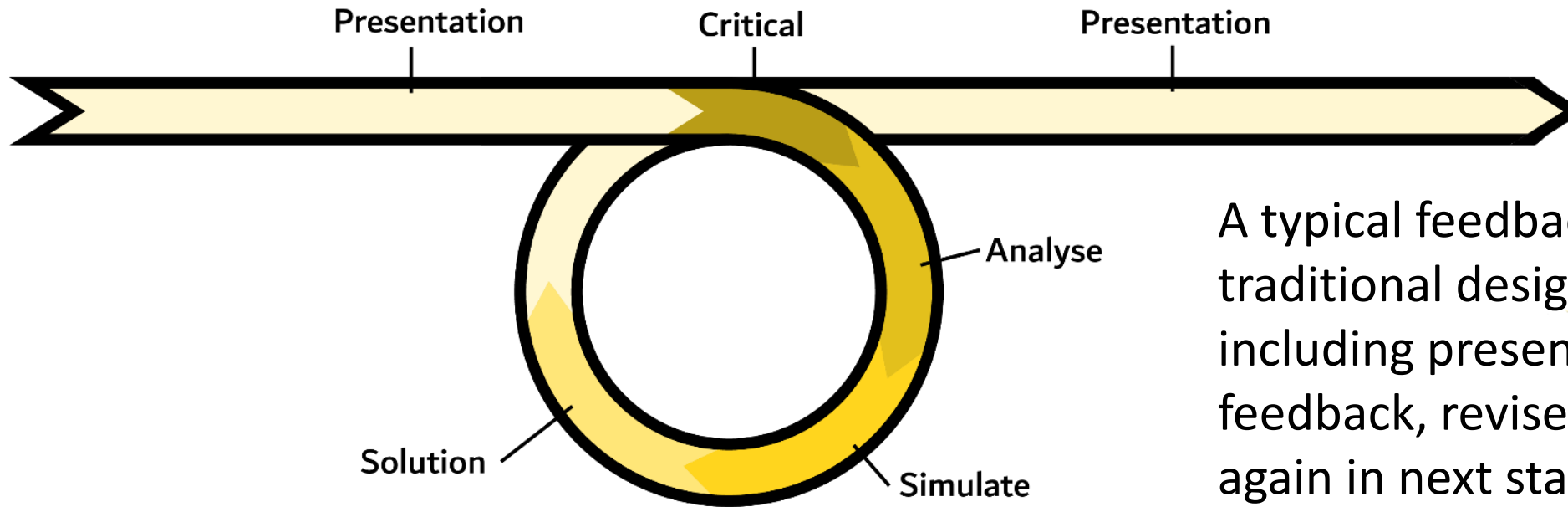
## Product Data



## Building Regulation Digitisation

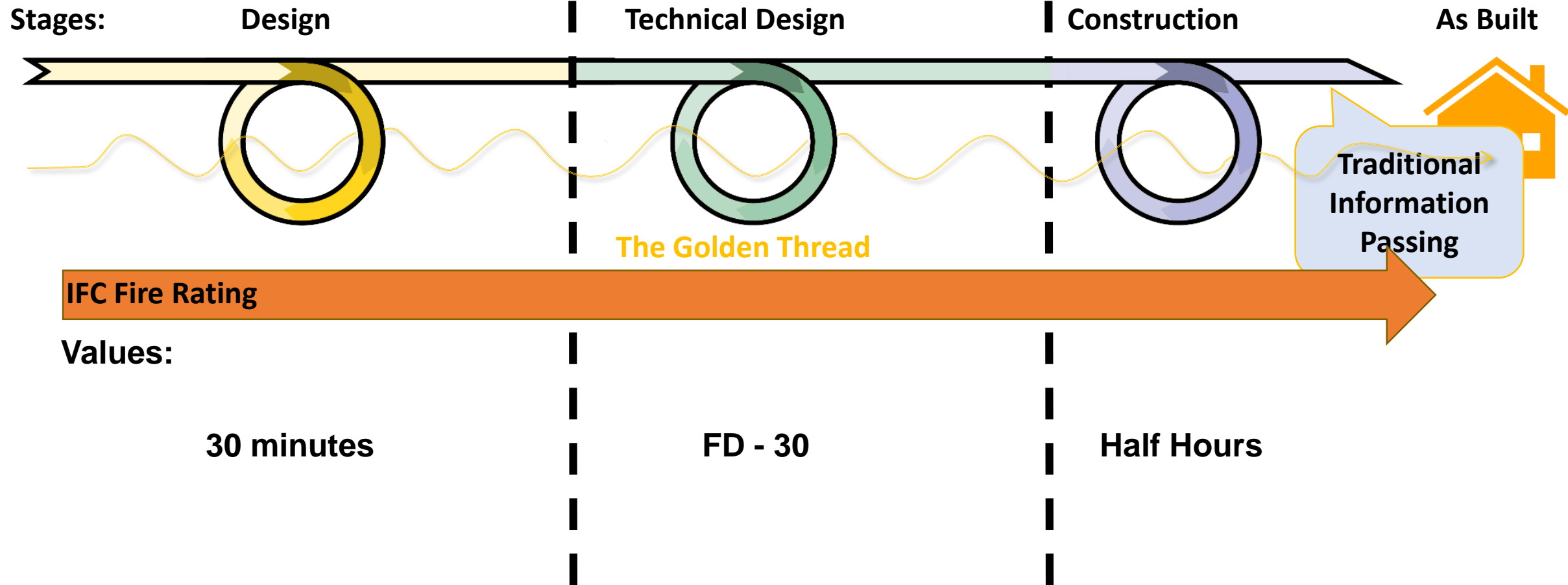


# BIM: The Golden Thread Solution...

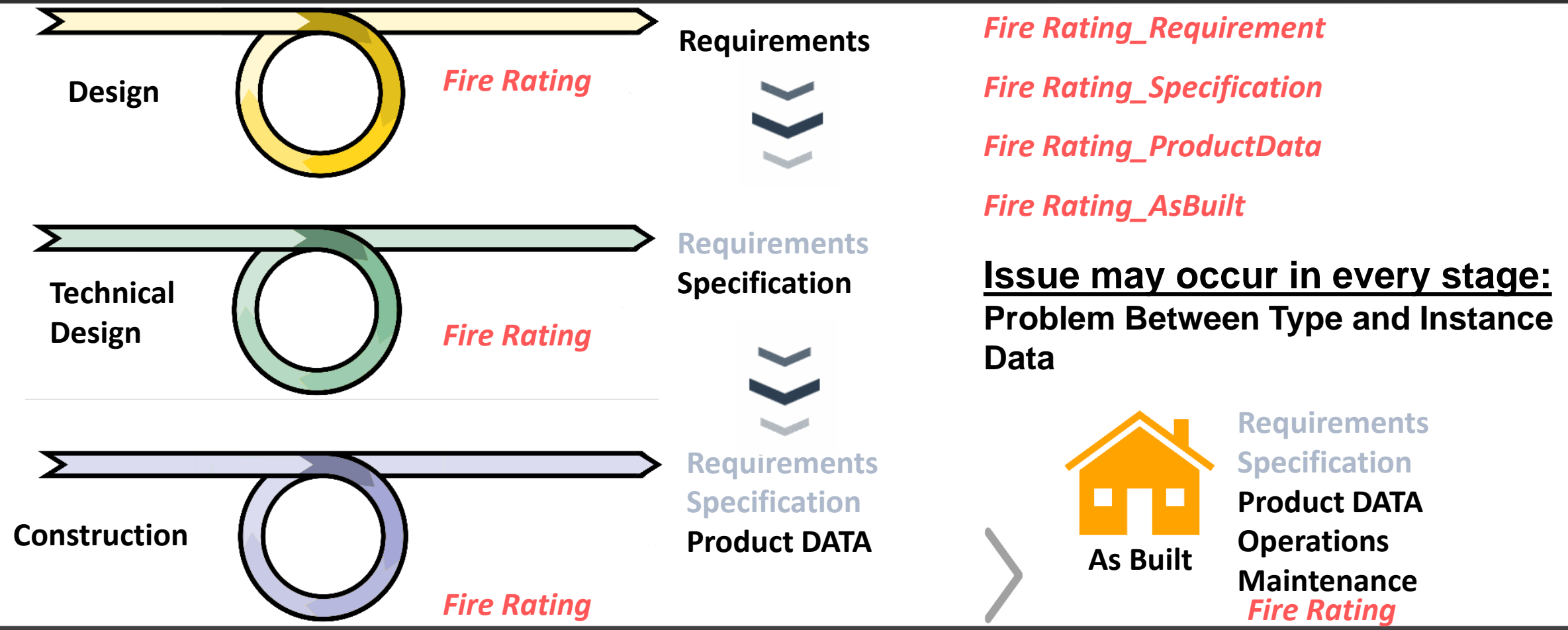


A typical feedback loop in traditional design process, including presentation, feedback, revise and present again in next stage.

# BIM: The Golden Thread Solution...



# Traditional Design Stages

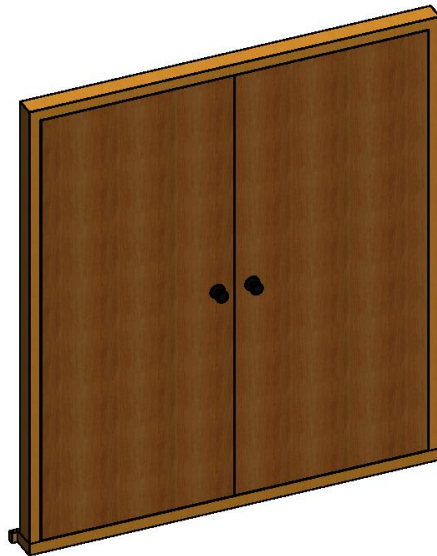






## BIM Object

### Graphics



### Non Graphics

Type Properties

Family: Doors\_ExtDbl\_Flush Load...

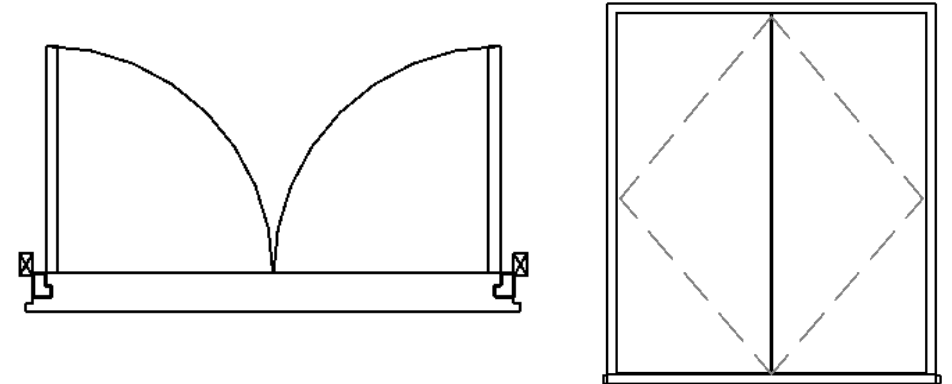
Type: 1810x2110mm Duplicate... Rename...

Type Parameters

Parameter	Value
<b>Identity Data</b>	
Type Comments	External Double
Keynote	L20
Model	
Manufacturer	
Type Image	
URL	
Description	
Assembly Code	
Fire Rating	
Cost	
Assembly Description	
Type Mark	44
OmniClass Number	
OmniClass Title	
Code Name	
<b>IFC Parameters</b>	
Operation	DoubleDoorSingleSwing

<< Preview OK Cancel Apply

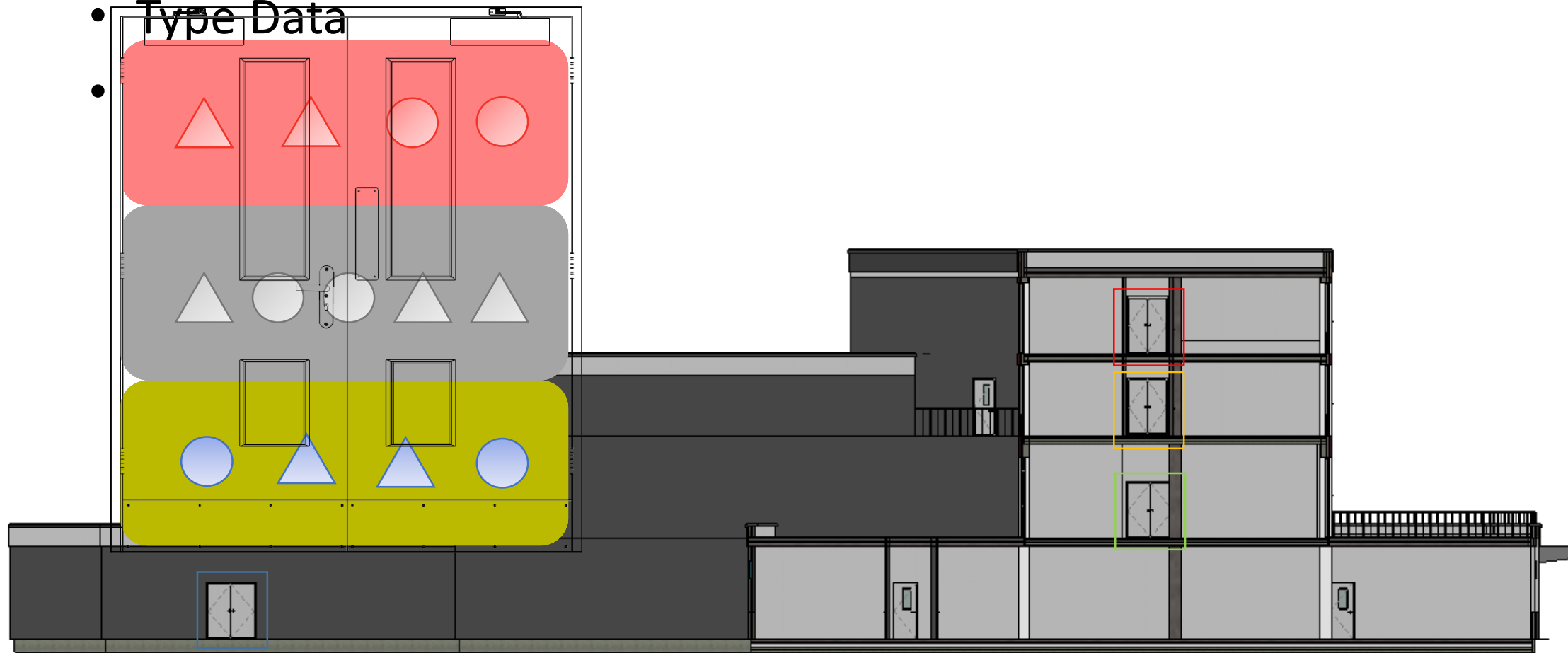
### Symbology

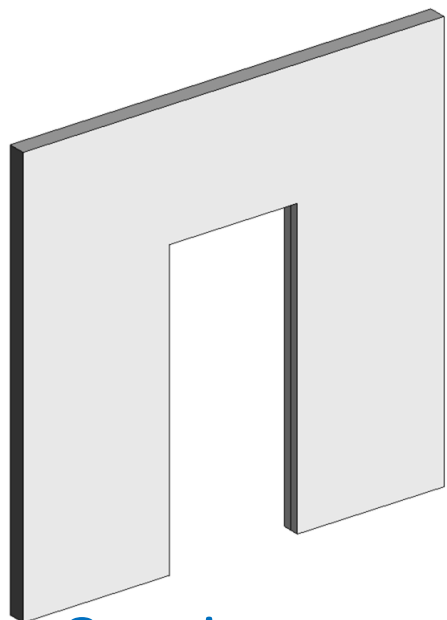




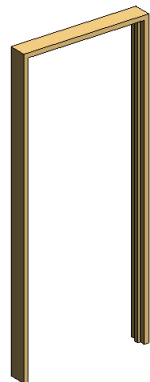
## Type to Instance

- **Type Data**

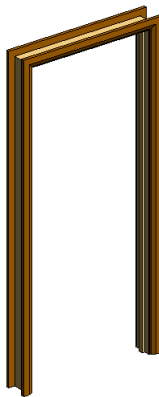




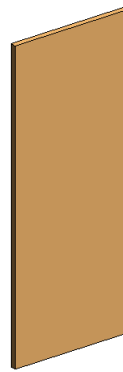
# Opening



+Frame



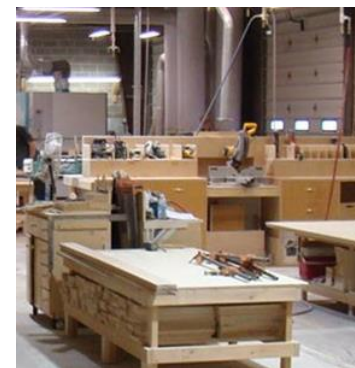
## +Architrave



+Panel

## Technical Team defines:

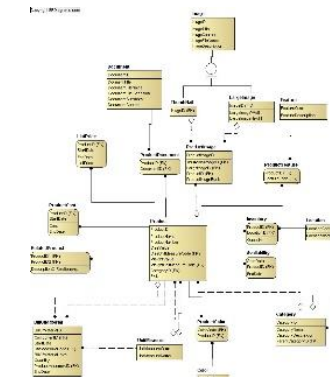
- Object hierarchy
- Classifications
- Mappings
- Data properties



## +Manufacturer



## +Installers



+Product

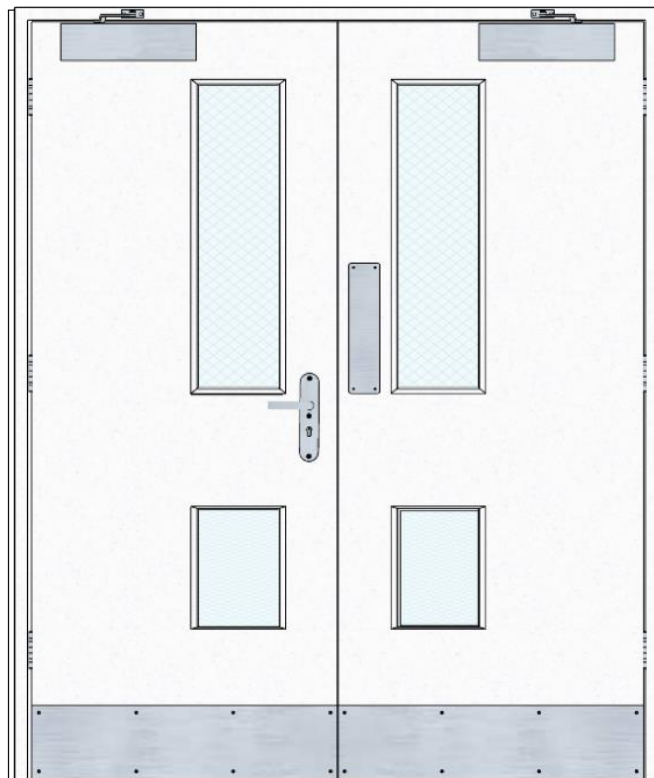


## +H & S

## +Ironmongery



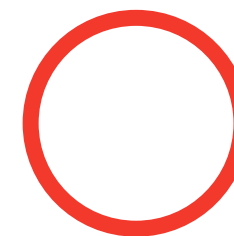
## Physical Objects



## Properties

- **FireRating**

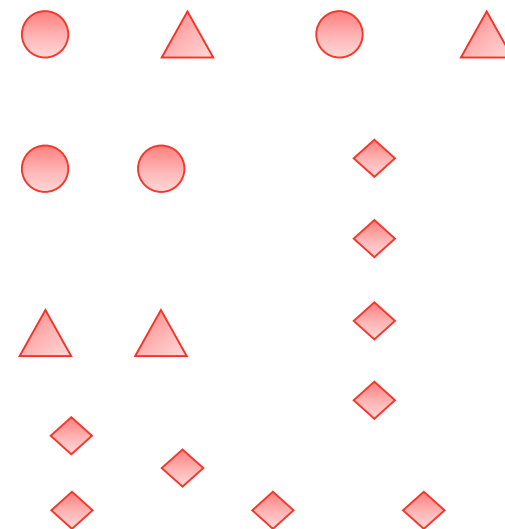
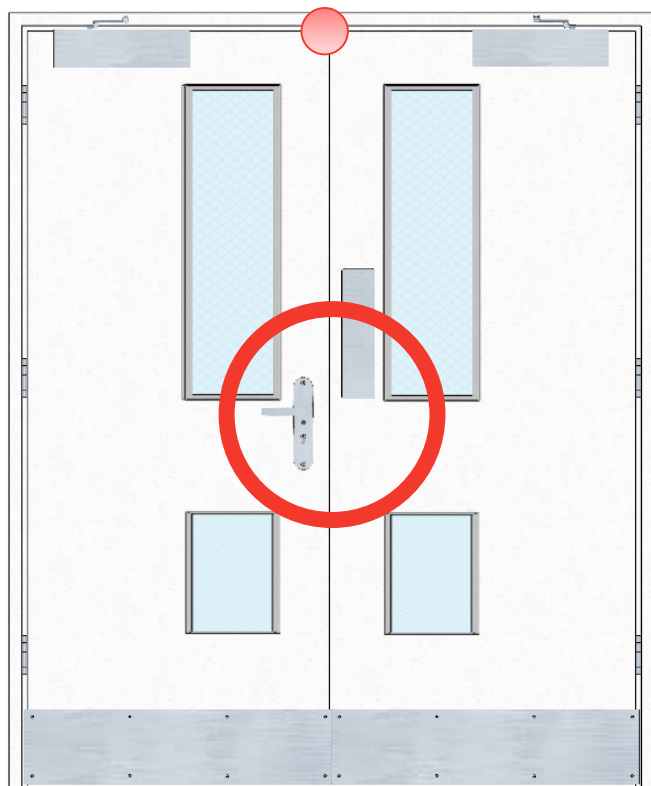
## Digital Objects







## Door Panel Assembly & Properties: FireRating





BIM Library Objects:



FireDoor\_D-1



S-1\_Door

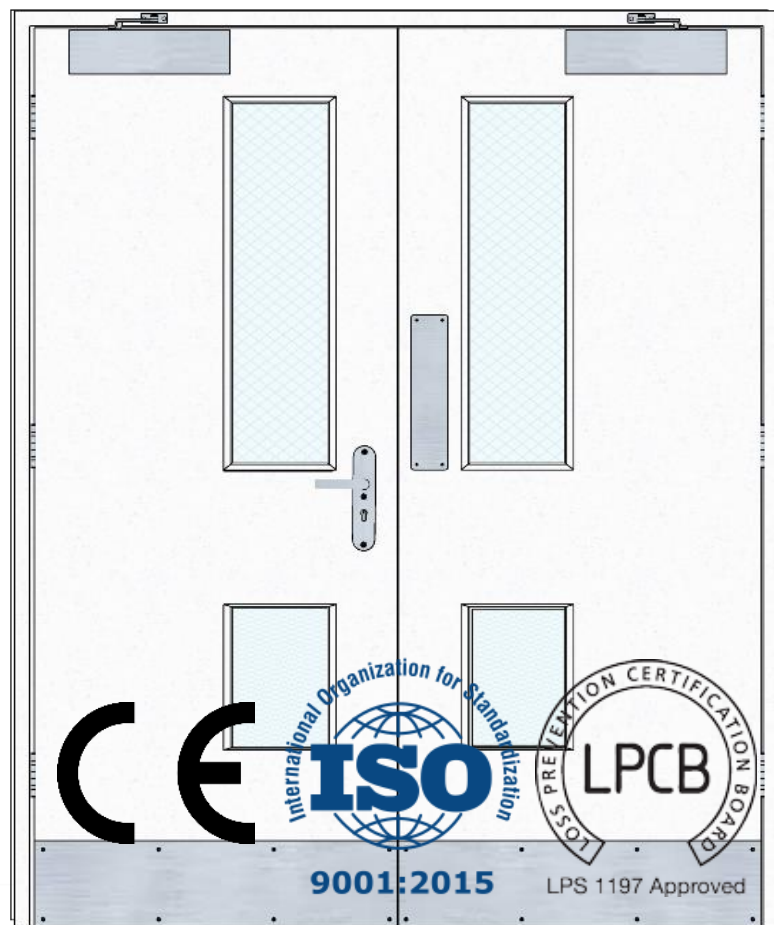


Door\_Fire



Fire-Door\_01

No	Window Type	FireRating	FireRating	firerating	Fire Rating
1	FireDoor_D-1	FD-30-S	-	-	-
2	S-1_Door	-	EI30	-	-
3	Door_Fire	-	-	0.5 hours	-
4	Fire-Door_01	-	-	-	Half Hours



## Emphasis

- Data Structure
- Data Type
- Measurement
- Uniqueness

**Data Template**

**Geometry**

Attribute A	Attribute B
Attribute C	Attribute D
Attribute E	Attribute F
Attribute G	Attribute H
Attribute I	

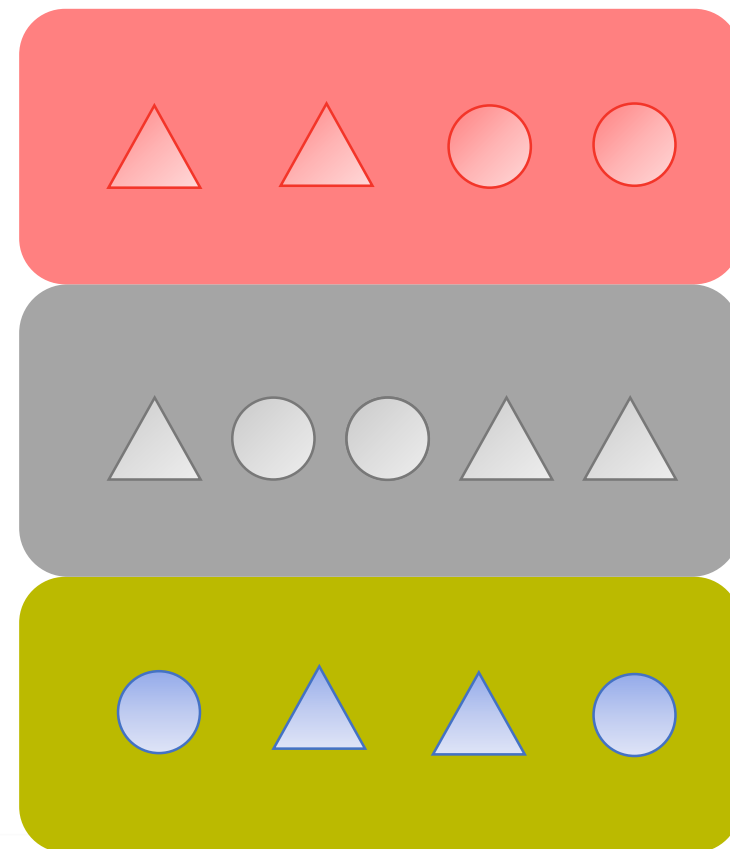
**Material**

Attribute A	Attribute B
Attribute C	Attribute D
Attribute E	Attribute F
Attribute G	Attribute H
Attribute I	

**Fire Rating**

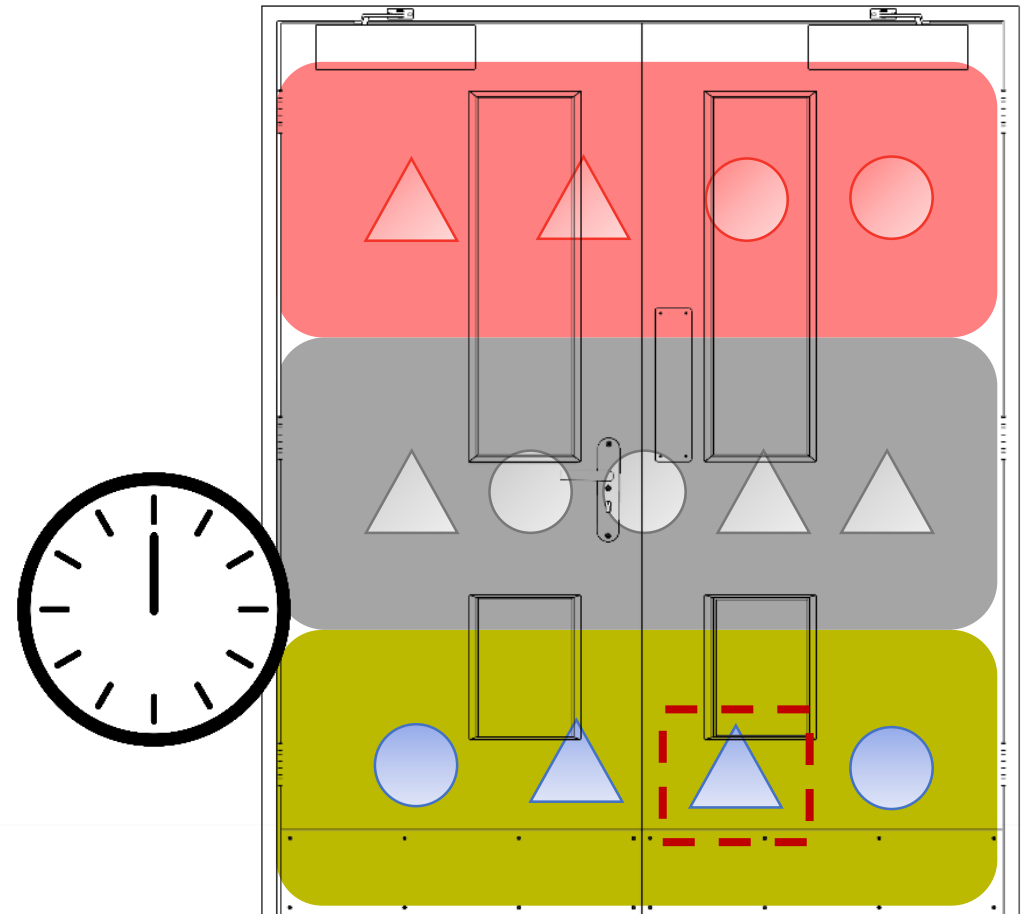
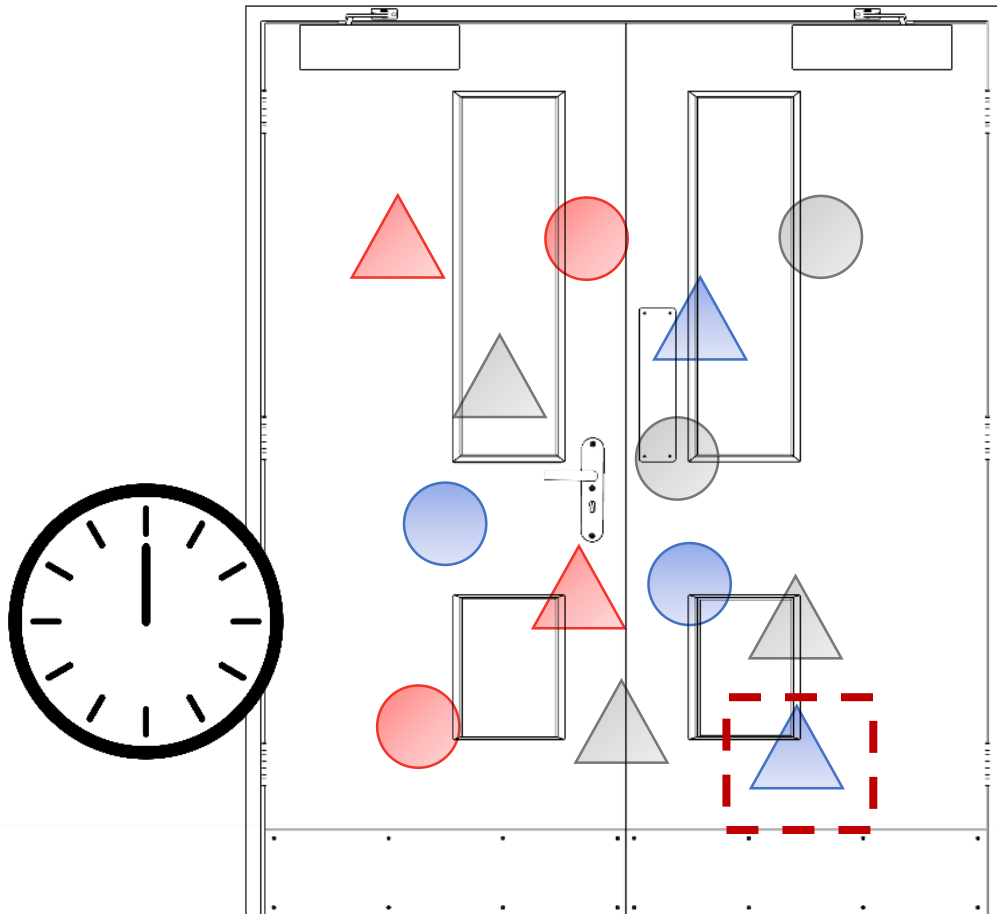
Attribute A	Attribute B
Attribute C	Attribute D
Attribute E	Attribute F
Attribute G	Attribute H
Attribute I	

**GOOD DATA QUALITY**





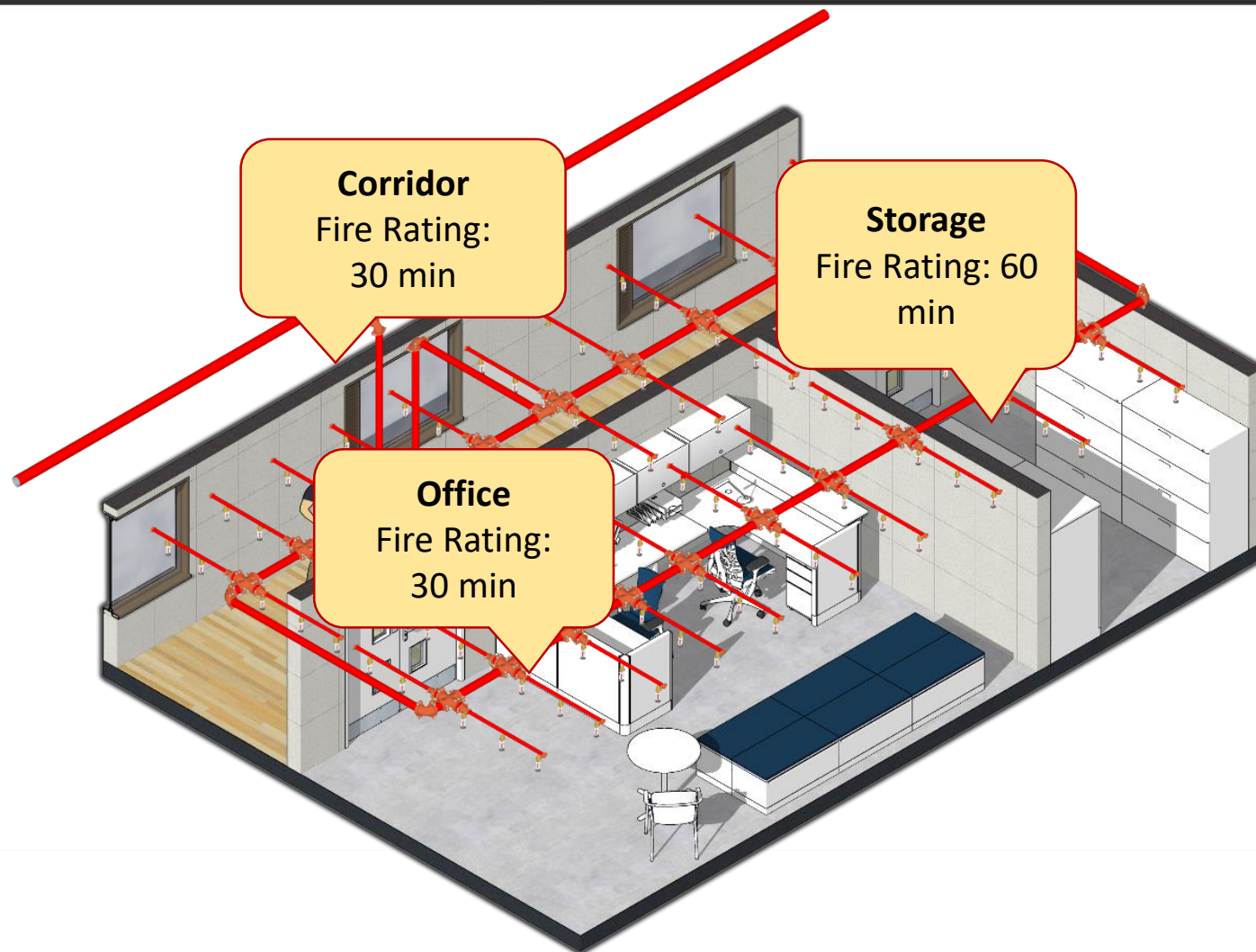
Improve performance in finding data







- Office with sprinklers



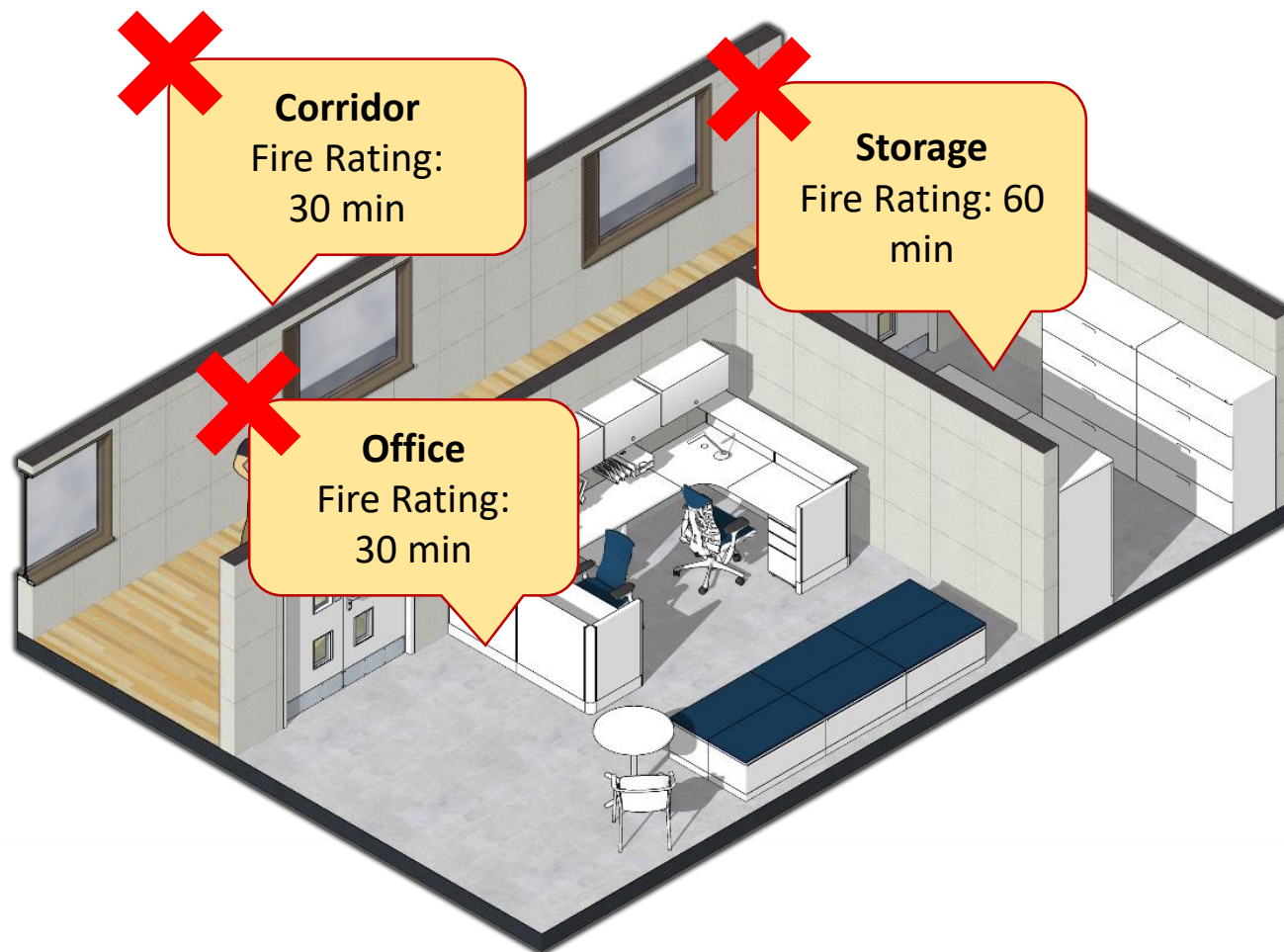
Fire resistance	Office	Storage	Corridor
With sprinklers	30	60	30
Without sprinklers	60	90	60

# Requirements Influence: Fire Rating



- Office with sprinklers
- Office without sprinklers

Fire resistance	Office	Storage	Corridor
With sprinklers	30	60	30
Without sprinklers	60	90	60

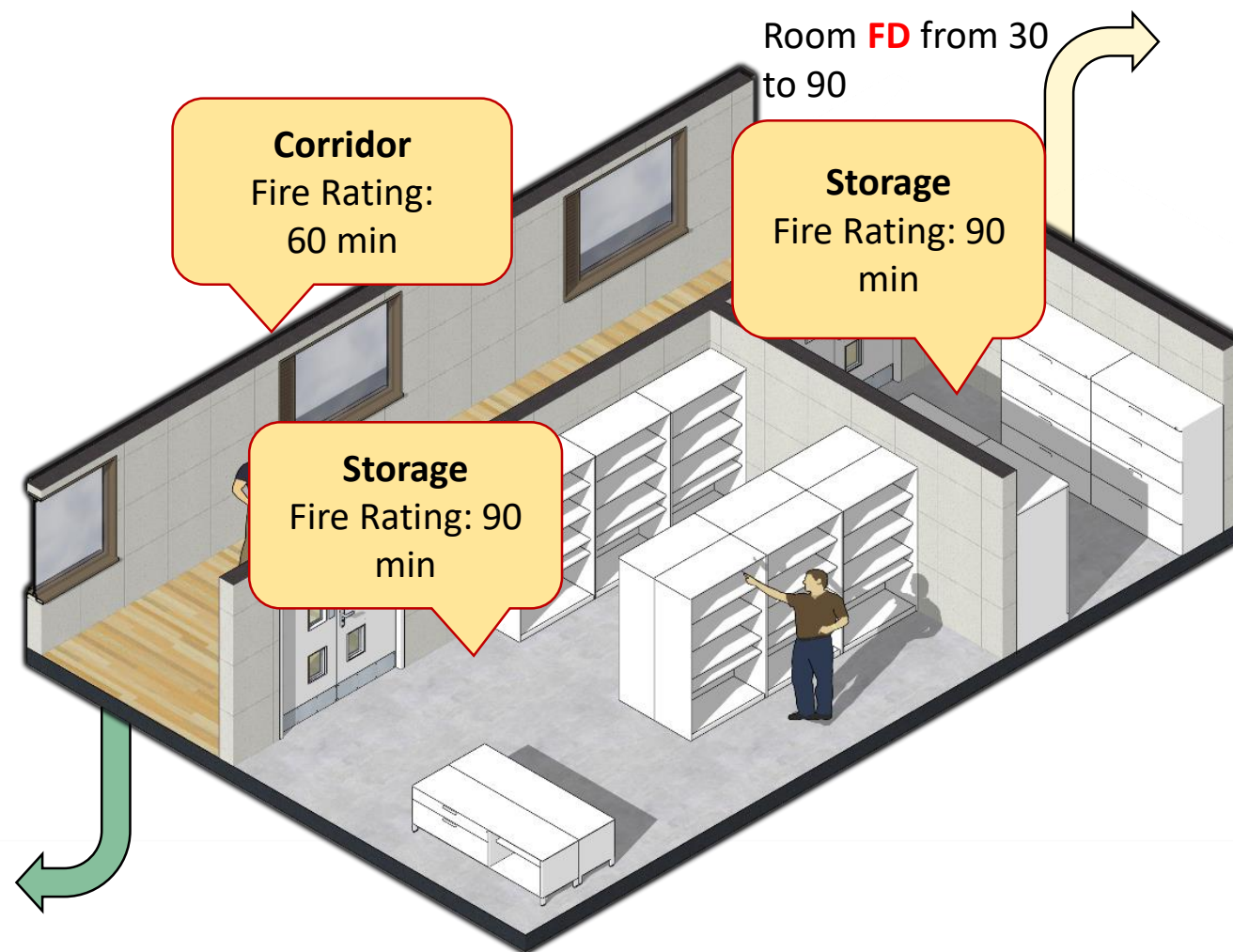


# Requirements Influence: Fire Rating



- Office with sprinklers
- Office without sprinklers
- Change the office to storage
- Change of fire requirement deliver to next stage
- Retain the reasoning and process of function change

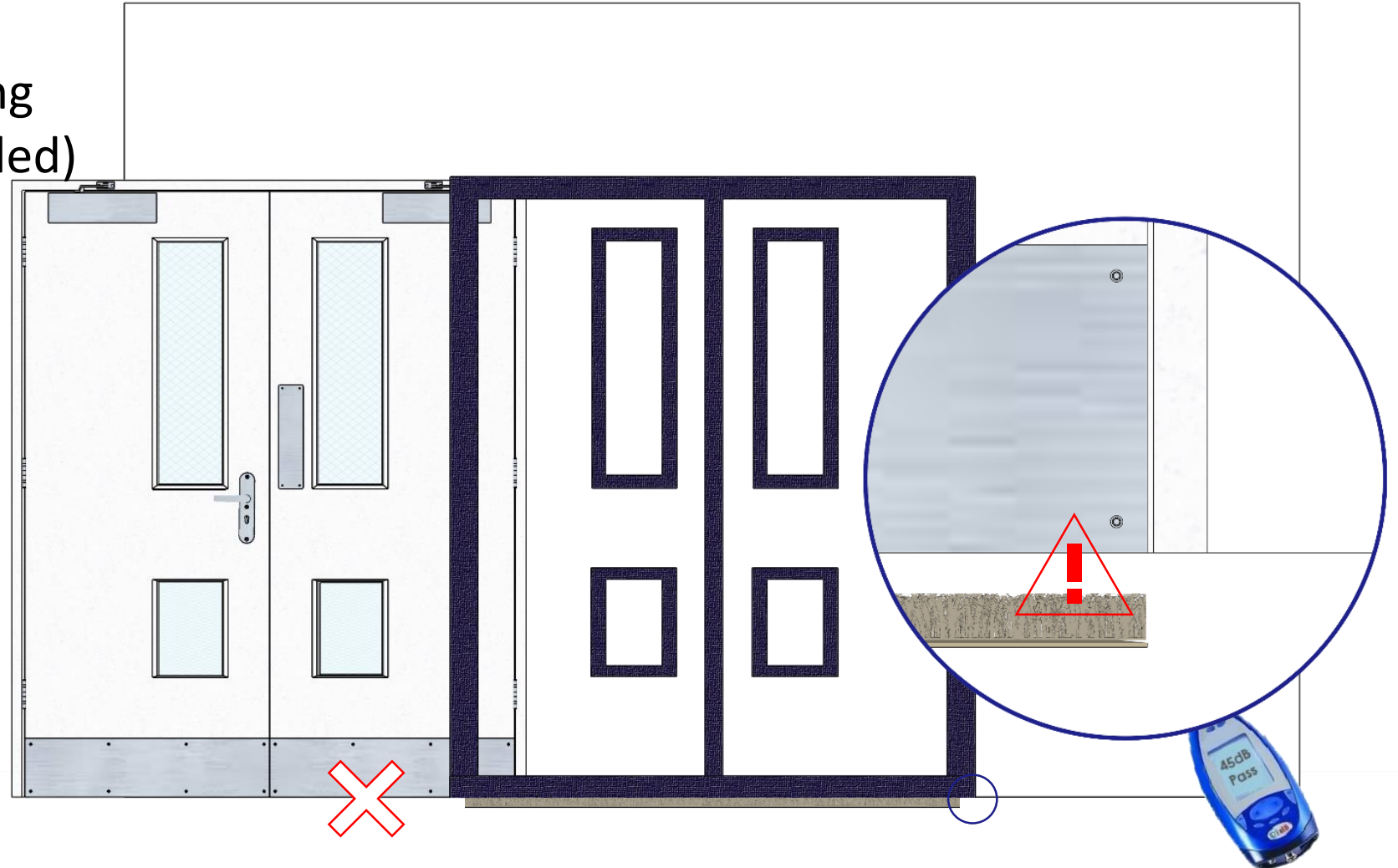
Fire resistance	Office	Storage	Corridor
With sprinklers	30	60	30
Without sprinklers	60	90	60







- Door Installation
- Sound Insulation Testing
- Carpet Installation (Failed)



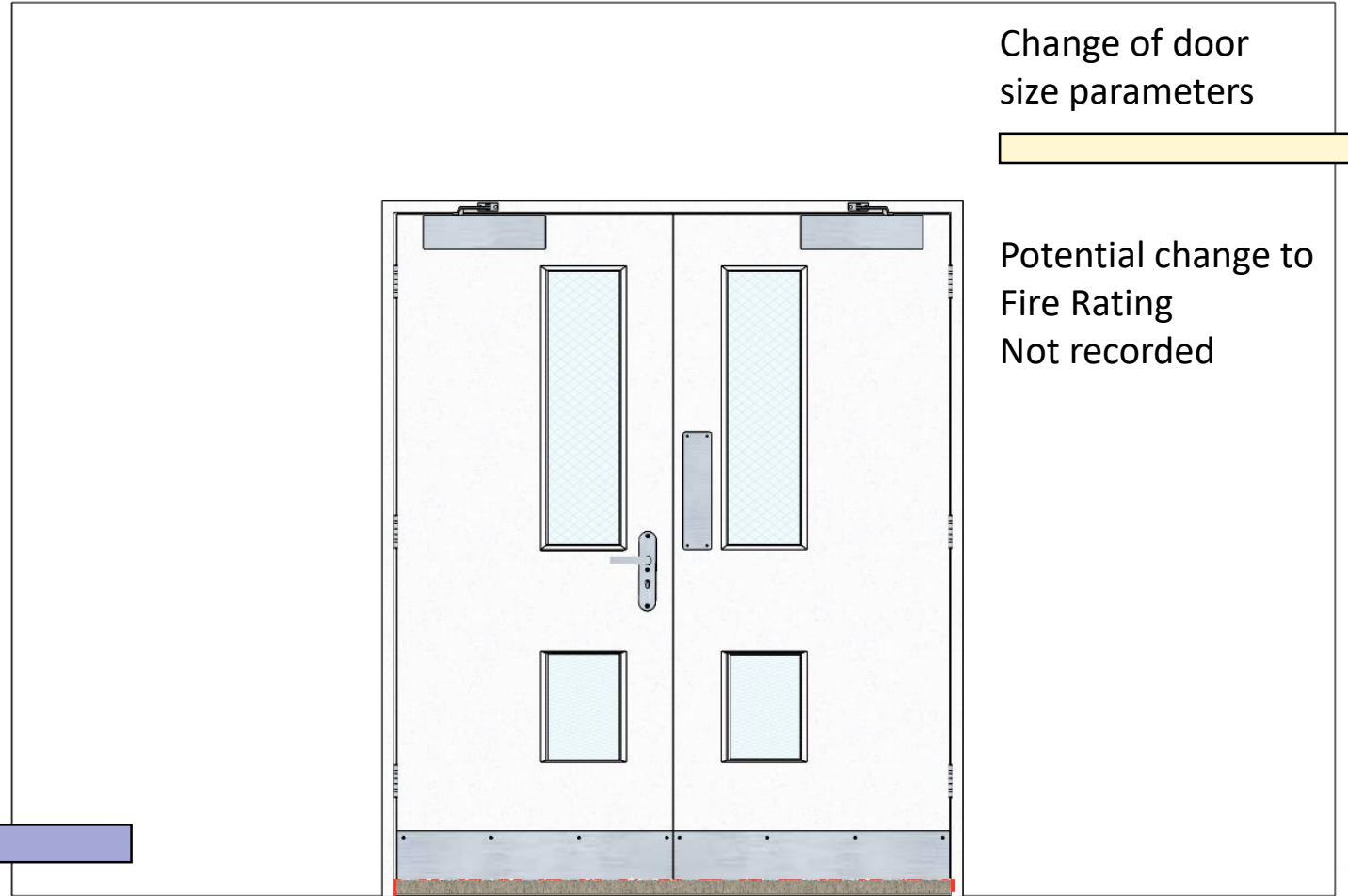




- Door Installation
- Sound Insulation Testing
- Carpet Installation (Failed)

- Resizing Door within tolerance
- Carpet Installation
- Retain the reasoning of changing the door size

Building  
information



Change of door  
size parameters

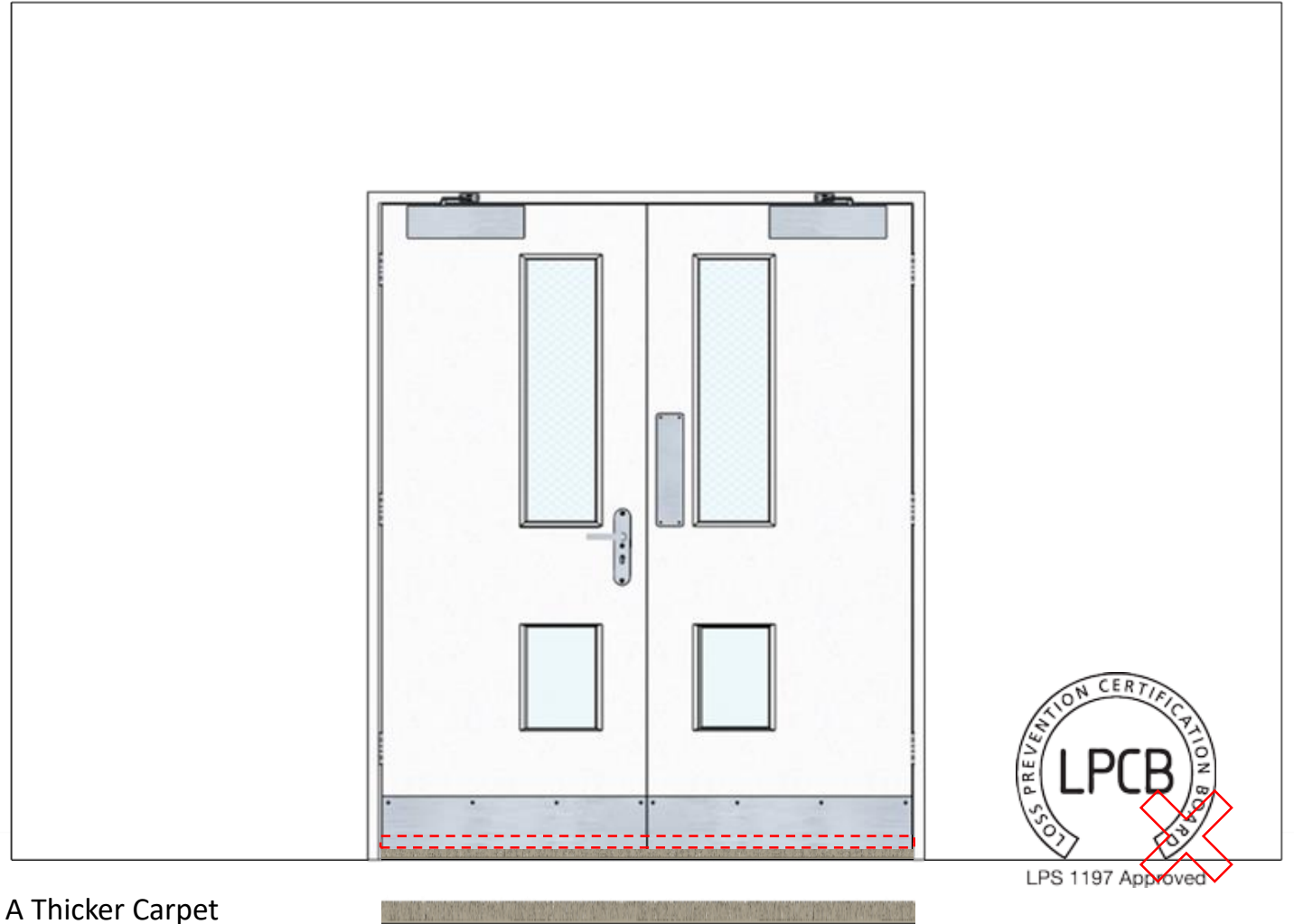
Potential change to  
Fire Rating  
Not recorded





In the operation stage:

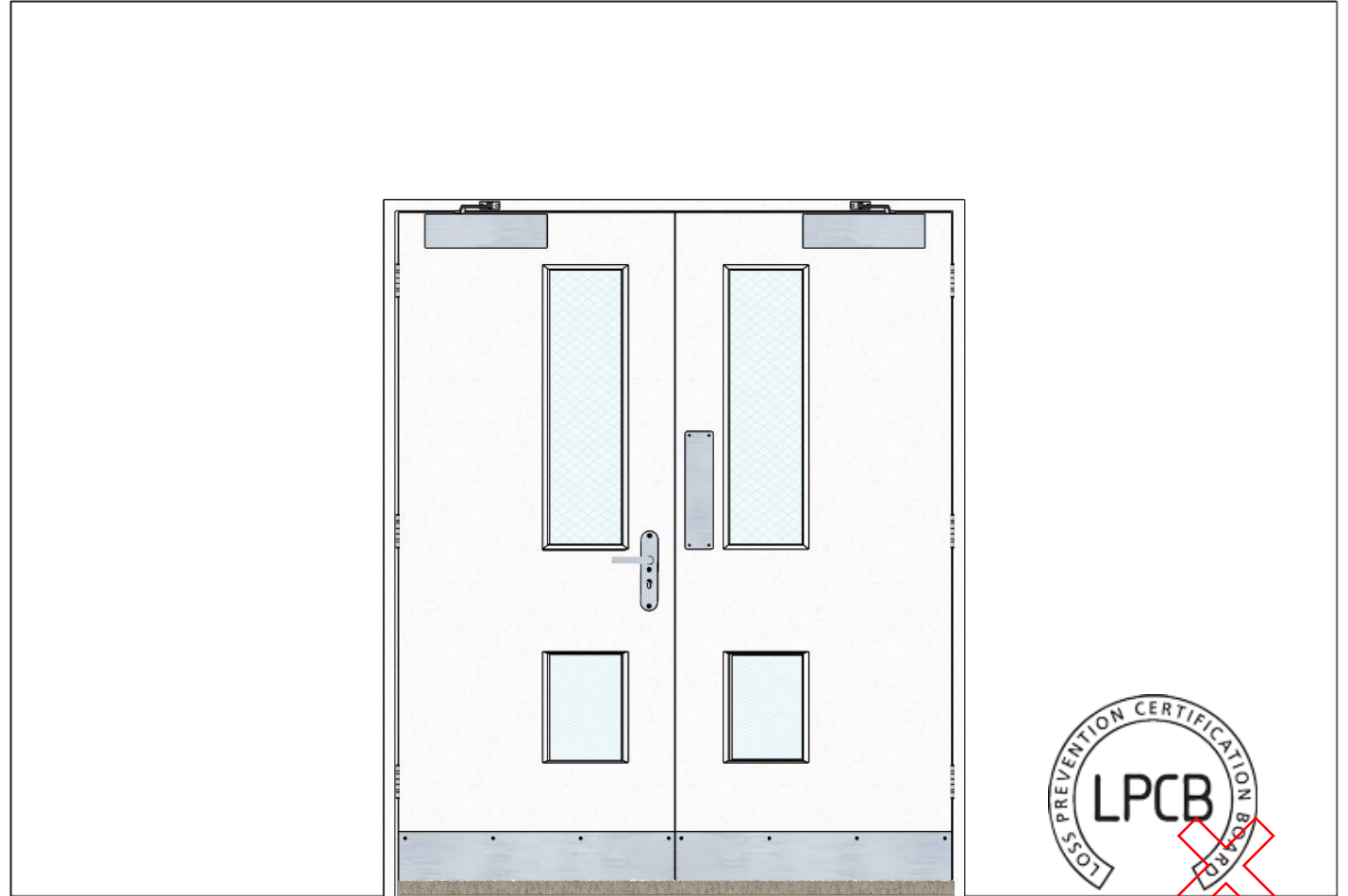
- If change to a **thicker carpet**
  - Resizing door outside tolerance (Failed)





In the operation stage:

- If change to a **thicker carpet**
  - Resizing door outside tolerance (Failed)
- Keep the door open (Failed)

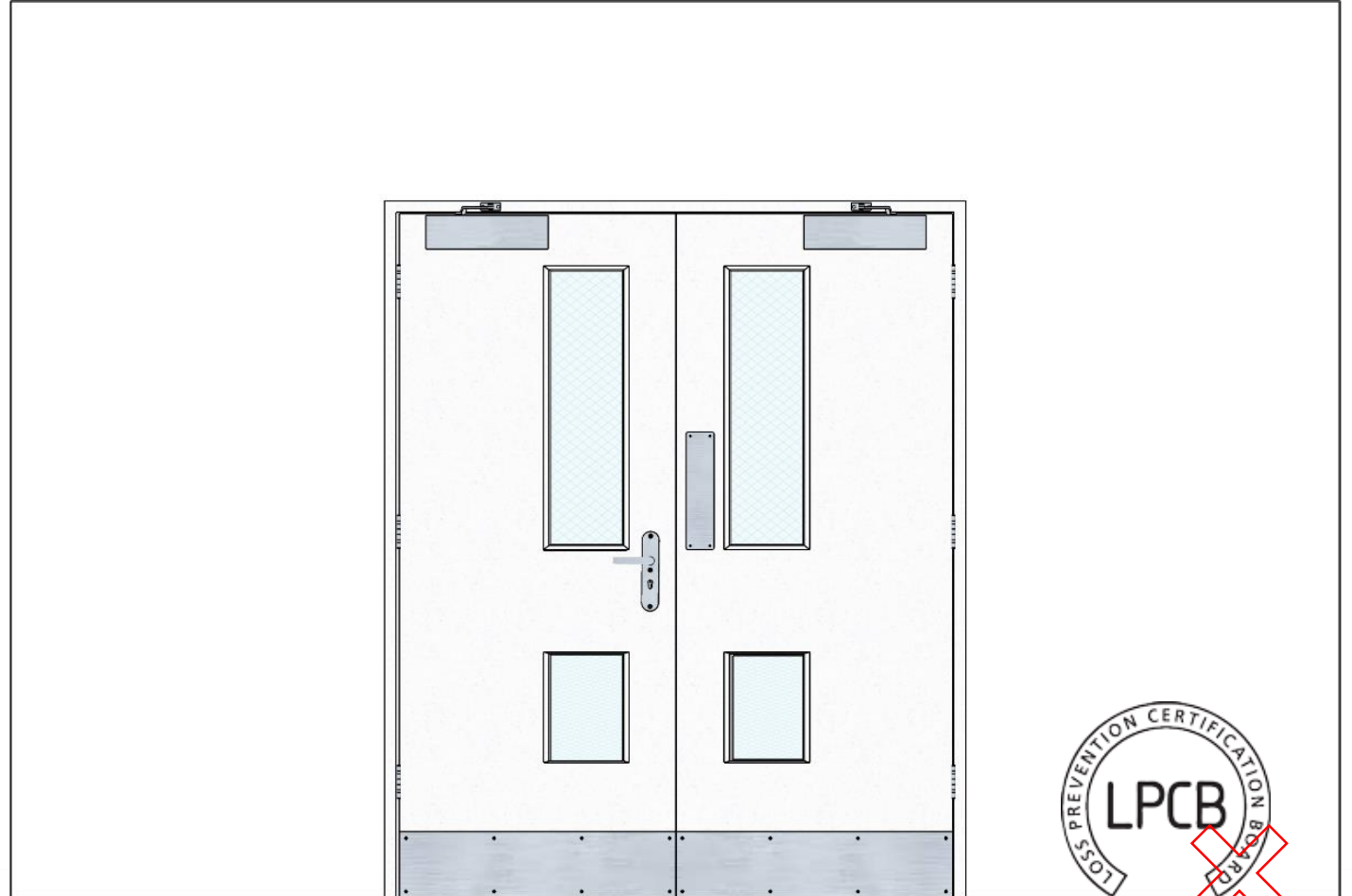


LPS 1197 Approved

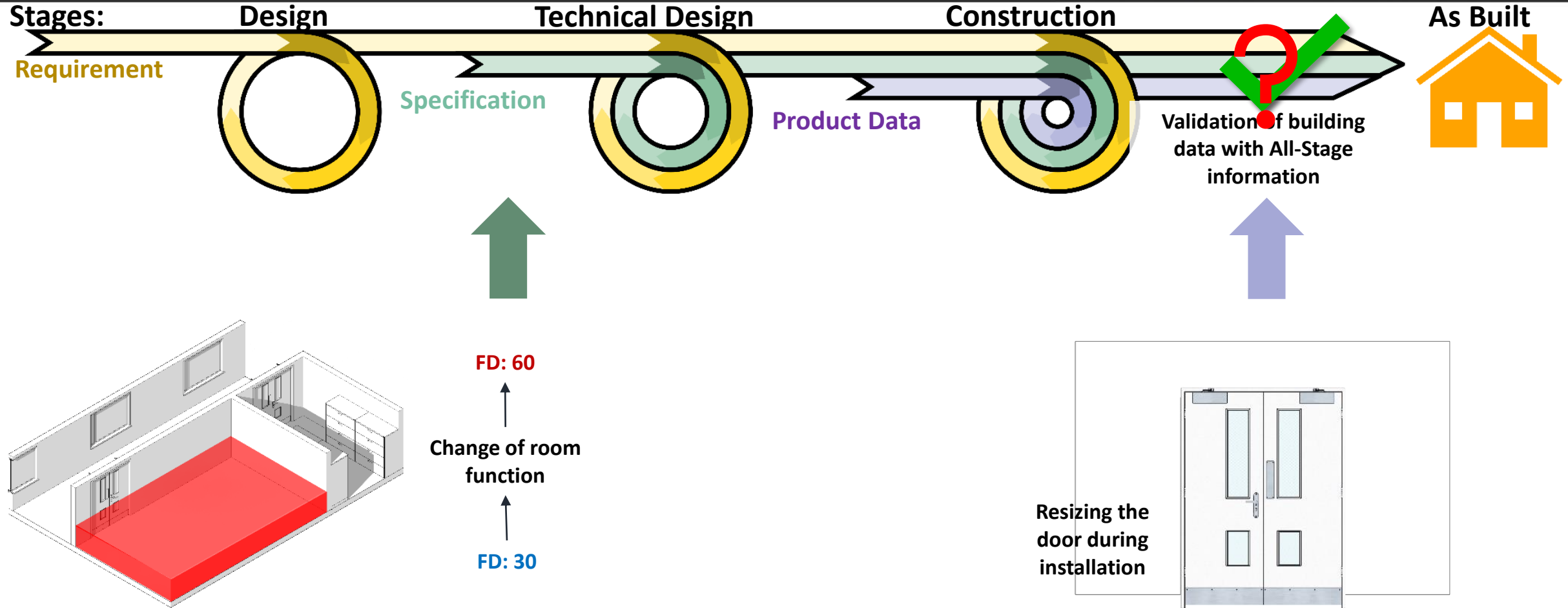


In the operation stage:

- If change to a **thicker carpet**
  - Resizing door outside tolerance (Failed)
- Keep the door open (Failed)
- Remove the door closer (Failed)



LPS 1197 Approved







Fire resistance	Office	Storage	Corridor
With sprinklers	30	60	30
Without sprinklers	60	90	60

*Approved Document B: Volume 2 – Buildings other than dwelling house  
Table A2 Minimum periods of fire resistance*

Select Case **Room.Use**

Case “Office”

If **Room.HasSprinkler** =True Then

**Room.Firerating\_requirement** = 30

Else

**Room.Firerating\_requirement** = 60

End if

Case “Storage”

If **Room.HasSprinkler** =True Then

**Room.Firerating\_requirement** = 60

Else

**Room.Firerating\_requirement** = 90

End if

Case “Corridor”

If **Room.HasSprinkler** =True Then

**Room.Firerating\_requirement** = 30

Else

**Room.Firerating\_requirement** = 60

End if

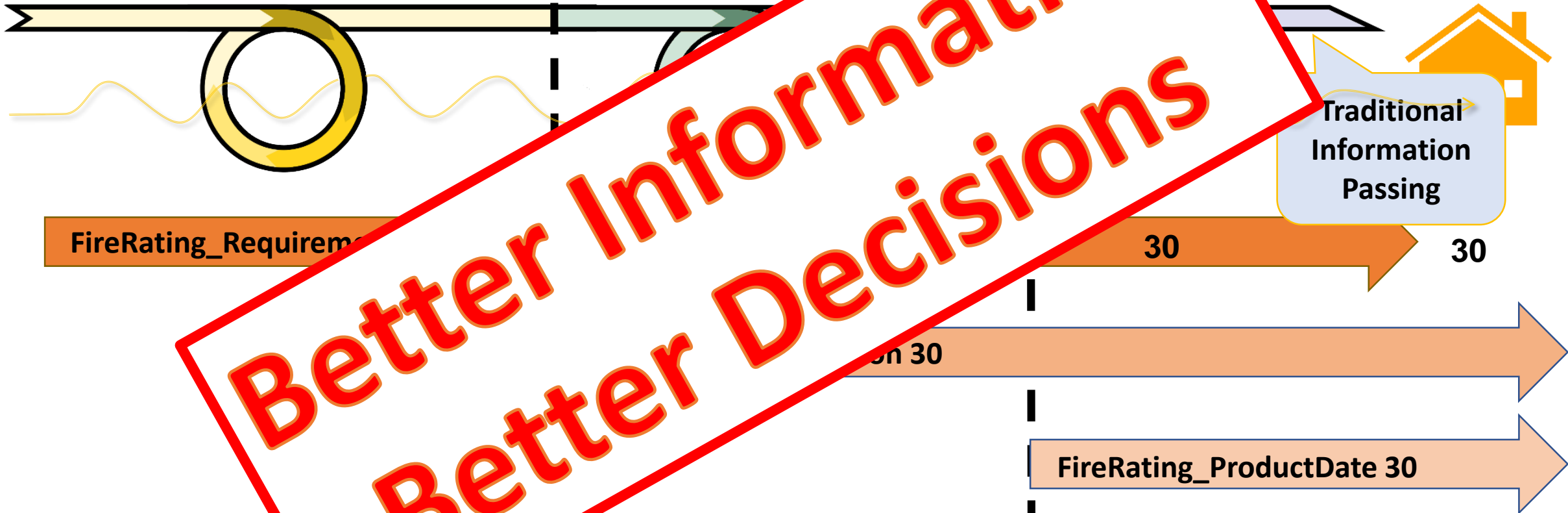
End if

Stages:

Design

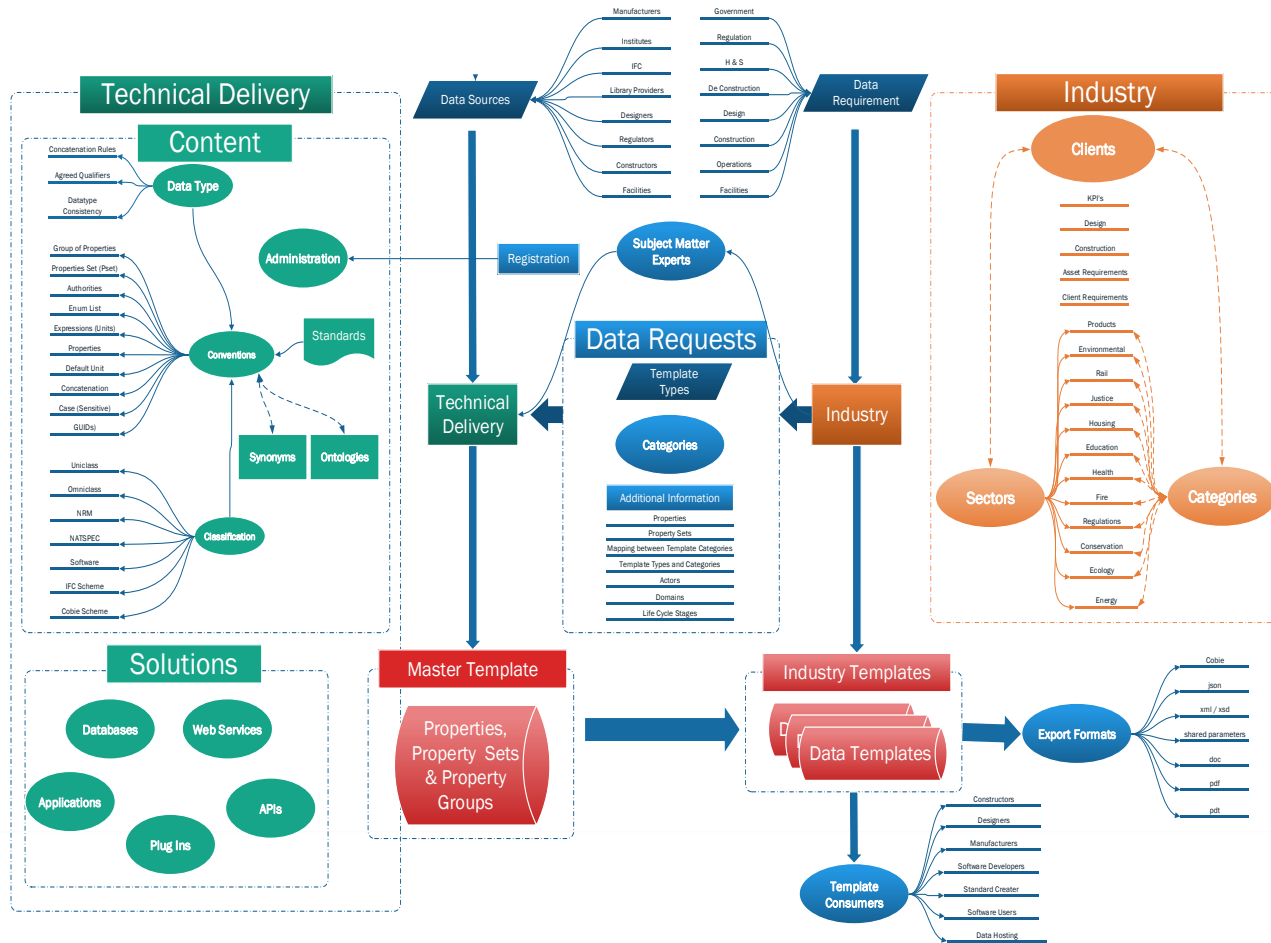
Technical Design

As Built

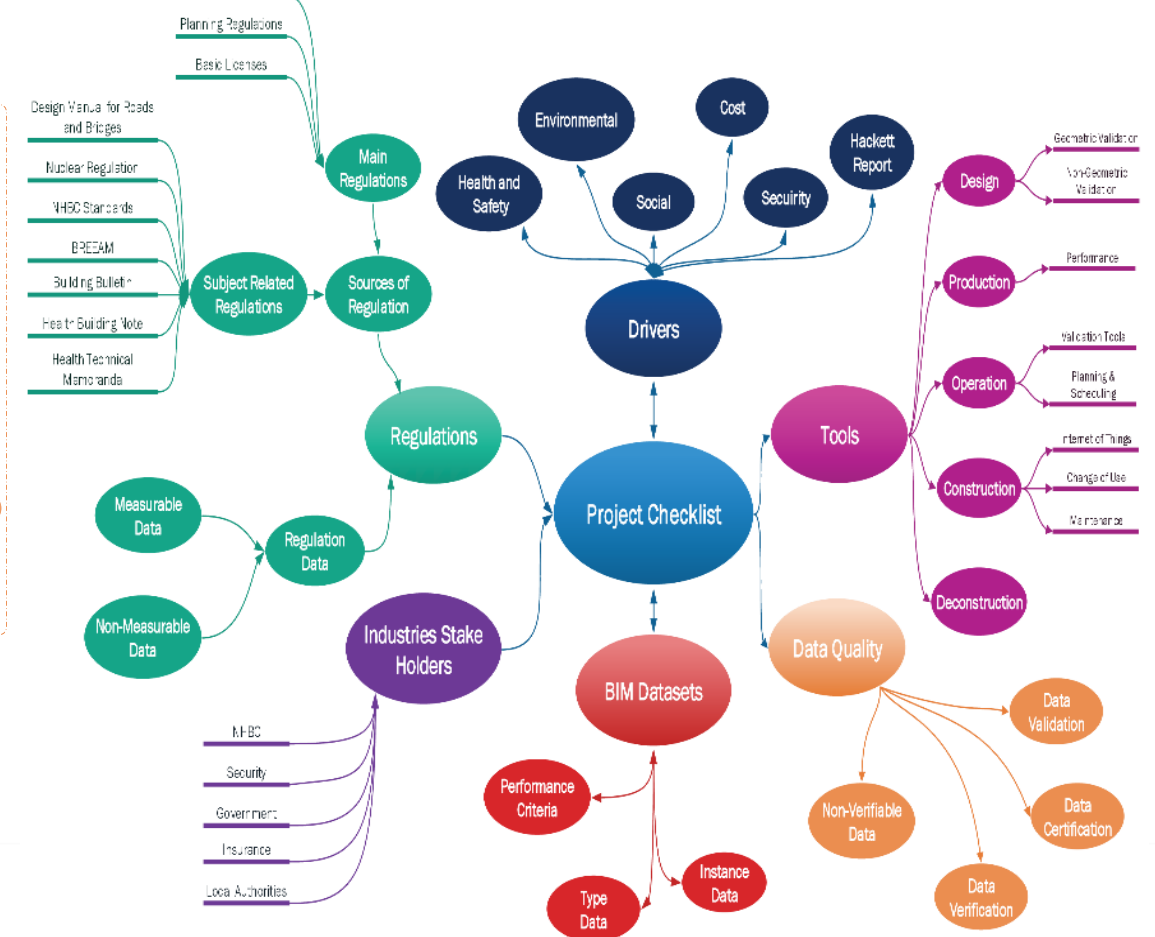




## Product Data

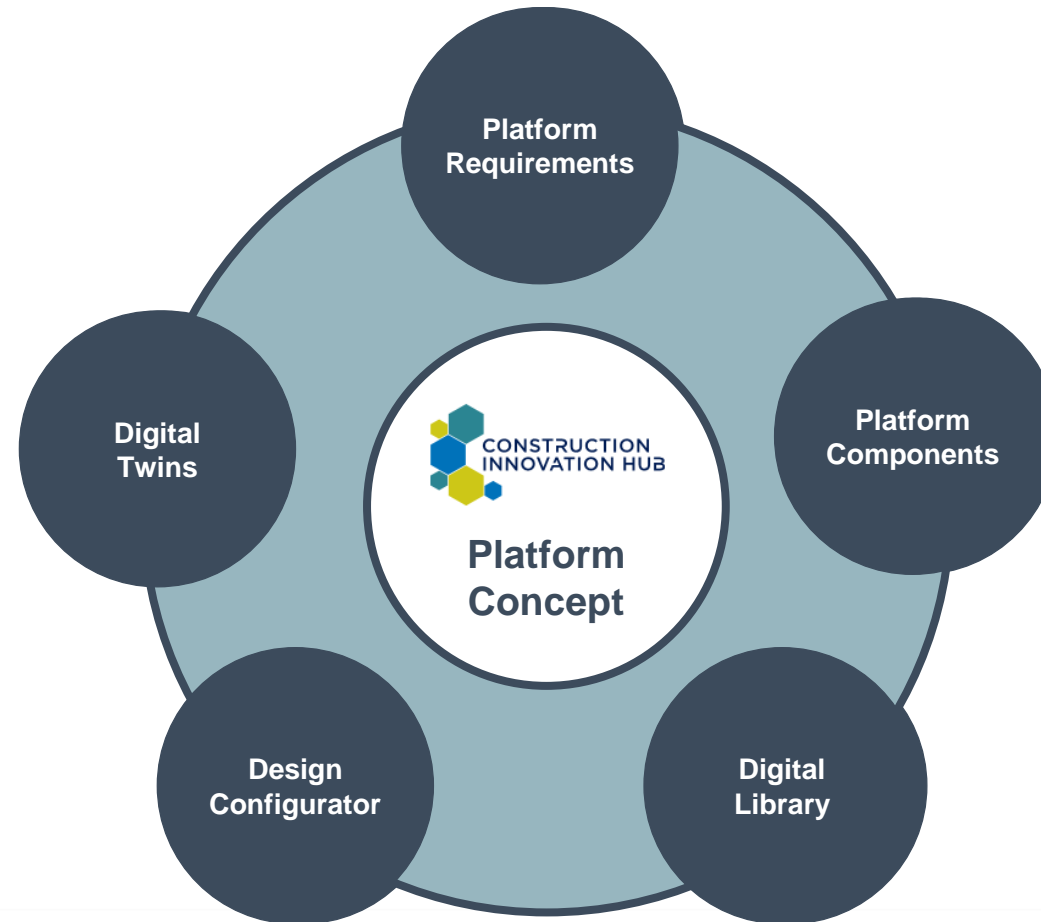


## Building Regulation Digitisation





## Proposal for a New Approach to Building: Call for Evidence



### PLATFORM DESIGN OPEN CALL OVERVIEW

The Construction Innovation Hub is running an 'Open Call' designed to engage and encourage businesses and stakeholders, both from within and outside the construction industry, to get involved in the largest ever Government-backed R&D programme in the sector.

Please note the Open Call is now open for applications and will close on 31 October 2019.

Here is all the information you need in order to apply.

#### Construction Innovation Hub Platform Design Programme

##### What is the Platform Design Programme?

Construction is changing. For the first time there is a funded Construction Sector Deal which seeks to create a more sustainable and productive sector. The Construction Innovation Hub is playing a key role in this transformation targeting a built environment with better whole life performance and exploiting digital and manufacturing technology to help achieve this.

Government too is changing its approach to how it specifies and procures construction. As a client it spends around £15 billion each year on buildings such as new schools, hospitals, social housing and much more. At Budget 2017, it announced that by 2019, five government departments would adopt a presumption in favour of offsite construction.

Furthermore, the Infrastructure and Projects Authority, who play a key role in co-ordinating construction strategy across government, launched in 2018 a call for evidence on adopting a platform approach to design for manufacture and assembly (P-DMA), saying: 'A platform approach to DMA (P-DMA) means that we will use a set of digitally designed components across multiple types of built asset and apply those components wherever possible, thereby minimising the need to design bespoke components for different types of asset. For example, a single component could be used as part of a school, hospital, prison building or station.'

The Hub's Platform Design Programme will embed these principles, helping to create new platform solutions that can be deployed across multiple projects and sectors. By working with industry through this programme we aim to identify, refine and develop solutions that can be deployed at scale.

How to get involved >>>

Questions and Answers >>>

Application Information >>>

Apply Now >>>



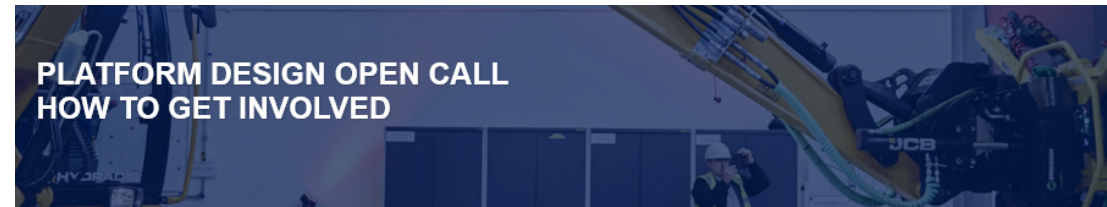
You need to be:

- a UK-based business (of any size and from any sector)
- prepared to put in time & materials

Full details and entry criteria available online:

[constructioninnovationhub.org.uk/](https://constructioninnovationhub.org.uk/)

[platform-design-open-call](https://constructioninnovationhub.org.uk/platform-design-open-call)



Before you apply for the Open Call, we recommend that you read the information on this page, [Q&As](#) and the [application information](#). Applicants are then required to respond to a [question set](#) with how their product, technology or service supports the benefit areas that the Construction Innovation Hub is targeting.

We can confirm that an independent judging panel will work alongside the Hub team to select successful applicants based on these agreed criteria. More details of the judging panel will be communicated in due course.

In due course, we will also provide more granular detail on the assessment and section criteria – both what we will be measuring and how this will be weighted. Applicants should note that our assessment and section criteria will be aligned with the ambitions of the wider Transforming Construction Challenge and the Construction Sector Deal. Applicants can expect the assessment and section criteria to include a range of measures that go beyond a simple demonstration of technical compliance and cost. They will also include whole life performance, demonstration of how the solution also supports broader social, economic and environmental ambitions. We will also seek to measure the ethical standards of products and suppliers.

The Construction Innovation Hub will manage collaborative teams, made up of industry partners, to deliver a suite of construction components that integrate on to the Construction Innovation Hub Platform. The proof-of-concept building will validate the principle of using a collaborative platform approach to deliver a range of building types capable of meeting the requirements of multiple UK Government departments.

Therefore, participating in the Open Call has the potential to unlock a strong pipeline of work for participants.

#### Why to get involved with the Platform Design Programme?

If your business currently supplies or has ambitions to supply technology, products or services to the construction sector, here is what it takes to get involved with the largest ever Government-backed construction sector R&D programme.

Overview

Questions and Answers

Application Information

Apply Now





## TRANSFORMING CONSTRUCTION SECOND ROUND CR&D AND DEMONSTRATORS COMPETITIONS

The Construction Innovation Hub is part of the [Transforming Construction Challenge](#), which aims to support industry to adopt technologies for constructing buildings 50% faster, 33% cheaper and with half the lifetime carbon emissions. Through Transforming Construction, UK government is investing £170 million, matched by £250 million from industry, to create new construction processes and techniques, such as the development of standardised modular components from which buildings can be manufactured.

Innovate UK – the government's innovation funding agency – is launching two funding competitions as part of the Challenge, to help businesses bring innovative construction solutions to market and to demonstrate them on live projects. This final round of R&D funding will open on the 28 August and cover up to £10m in an MMC, digital and whole-life performance (CR&D) programme and up to £26m in a Demonstrator programme.

The [Transforming UK Construction 2nd Round CR&D competition](#) will support the development of close-to-market products, technologies, processes or services that will improve productivity, quality and performance in the UK construction sector.

The [Transforming UK Construction Demonstrators competition](#) will apply known approaches to improving built asset lifecycle deployed at scale on real-world projects. These will include new validations of business models, digital approaches to design, construction and management, advancements in modern methods of construction and approaches to whole-life performance of a building or assets.

Prospective applicants to these competitions are advised to liaise with us at the Construction Innovation Hub or with the [Active Building Centre](#) before submitting an application. The Hub works in close partnership with the Active Building Centre as part of the wider Transforming Construction Challenge.

How we can support you

Essential information

## PLATFORM DESIGN OPEN CALL HOW TO GET INVOLVED

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Overview

Questions and Answers

Application Information

Apply Now

# Join the transformation



**[www.constructioninnovationhub.org.uk](http://www.constructioninnovationhub.org.uk)**



**@CIH\_HUB**



**Construction Innovation Hub**

**#TransformingConstruction**

**#ConstructionInnovationHub**



Thank you