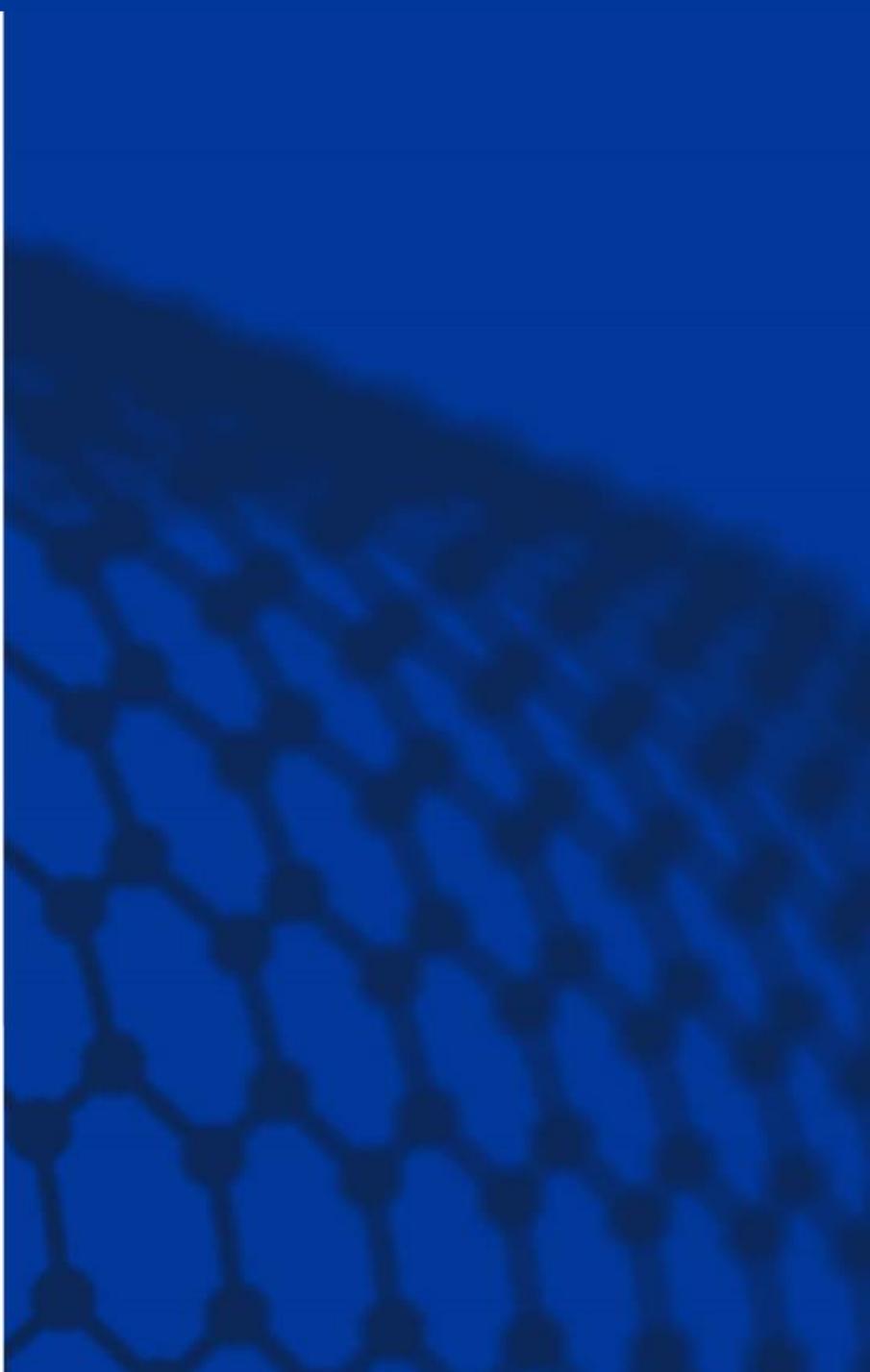
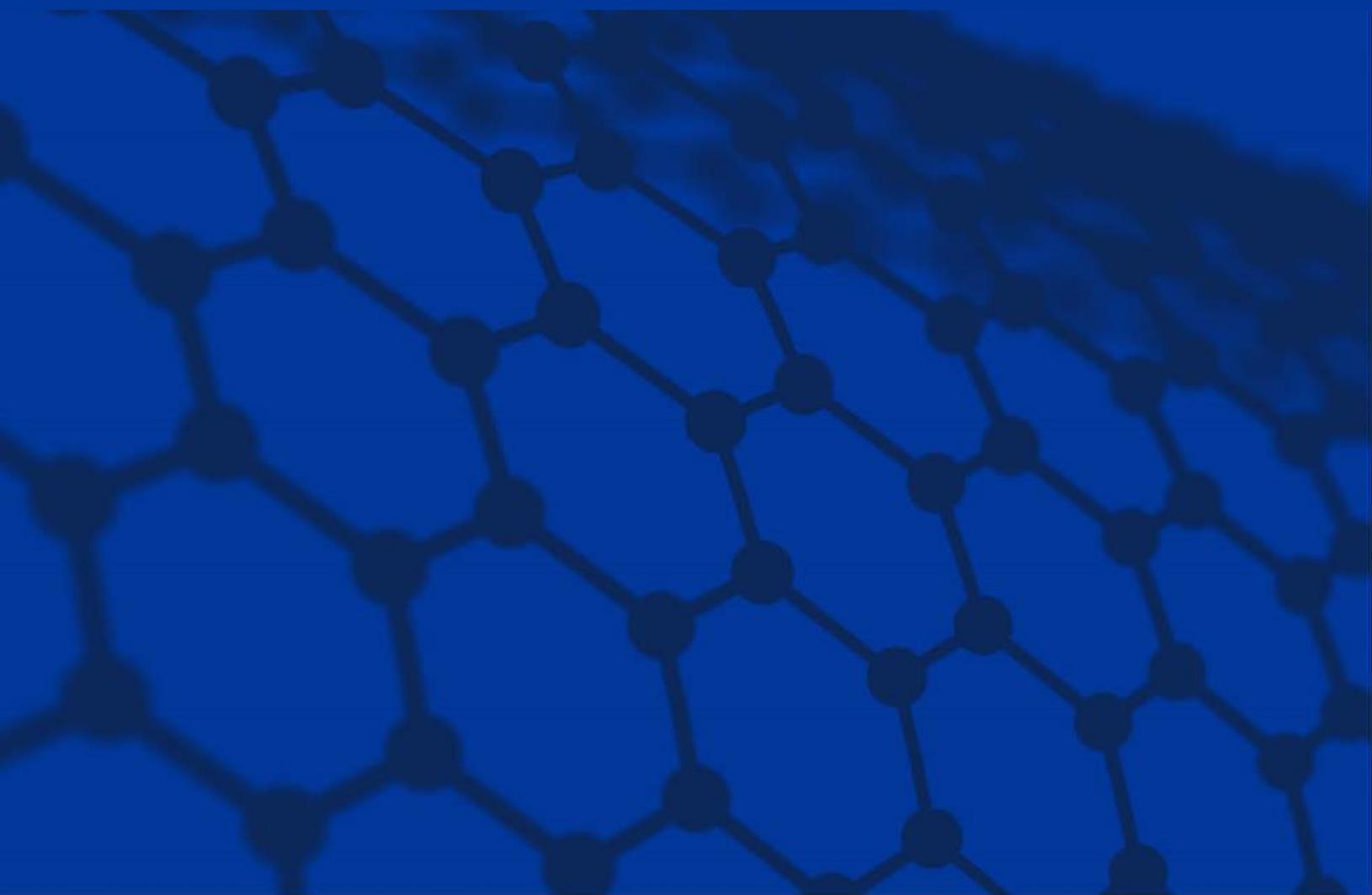


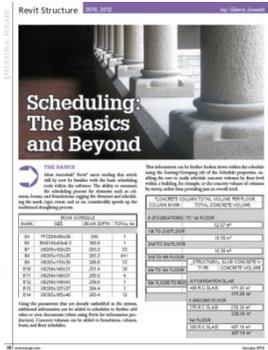
Technology to Support Safety in Design (SiD)

GLENN JOWETT, SENIOR ASSOCIATE – BIM DELIVERY LEAD



About Me

About Me



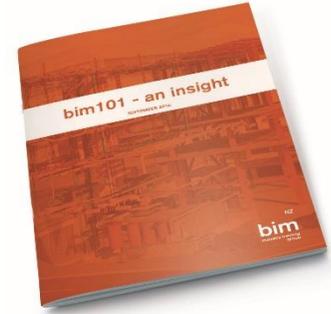
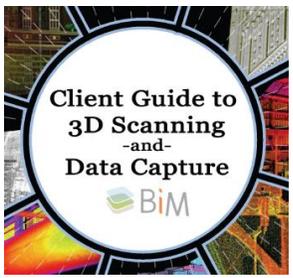
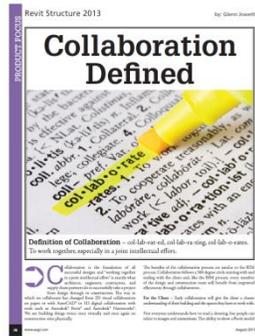
Garbage in, Garbage out: Setting the Client's Information Requirements

BILT

Glenn Jowett
Senior Associate, BIM Delivery Lead
Beca

Multi-discipline Collaboration on a Single Central File.

Glenn Jowett, National Revit Structure Leader



BILT

ACC. PRESENTS SOUTH AUSTRALIA 25-27 MAY 2017

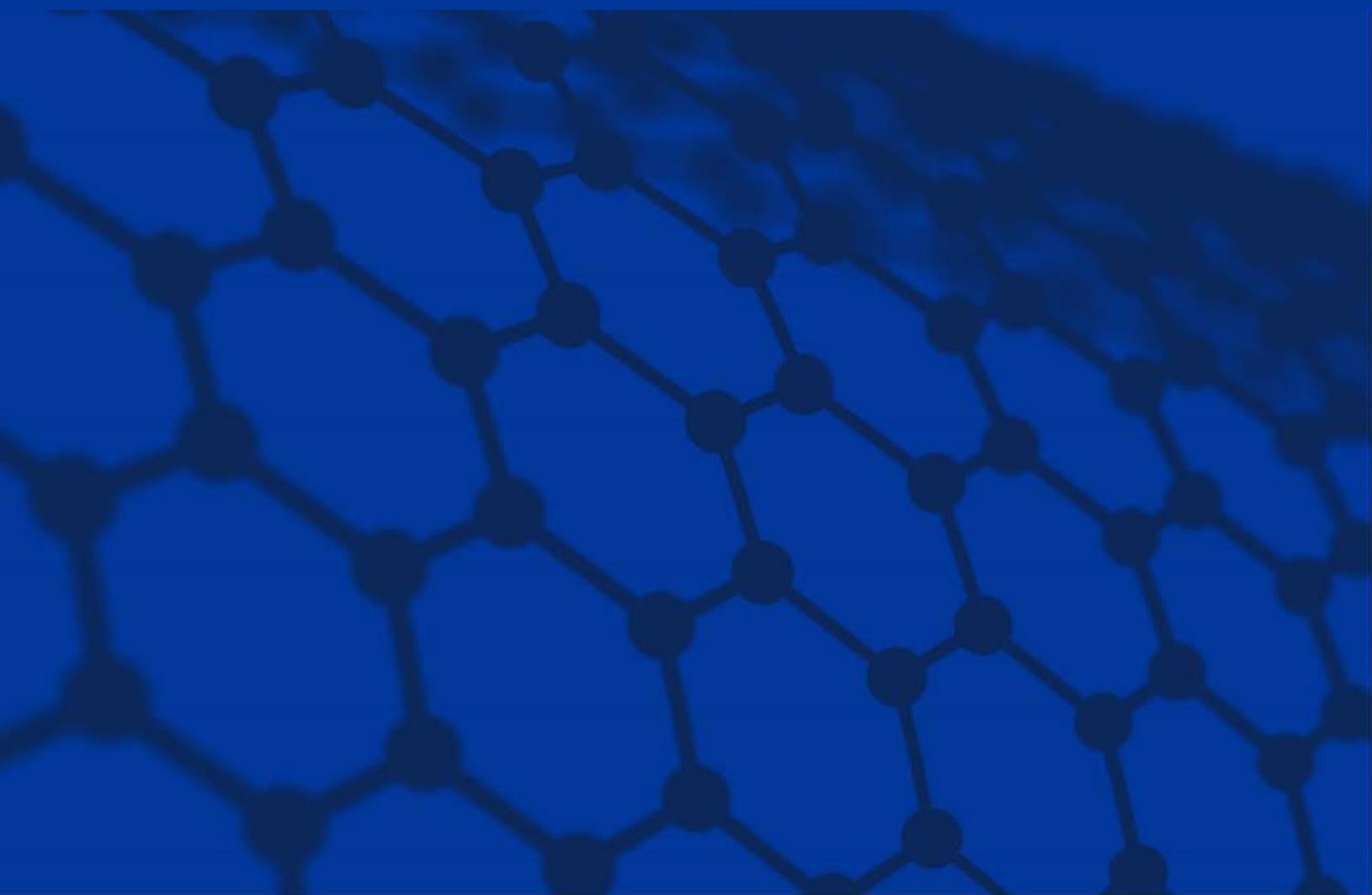
S1.2 : Educating the Educators

Glenn Jowett

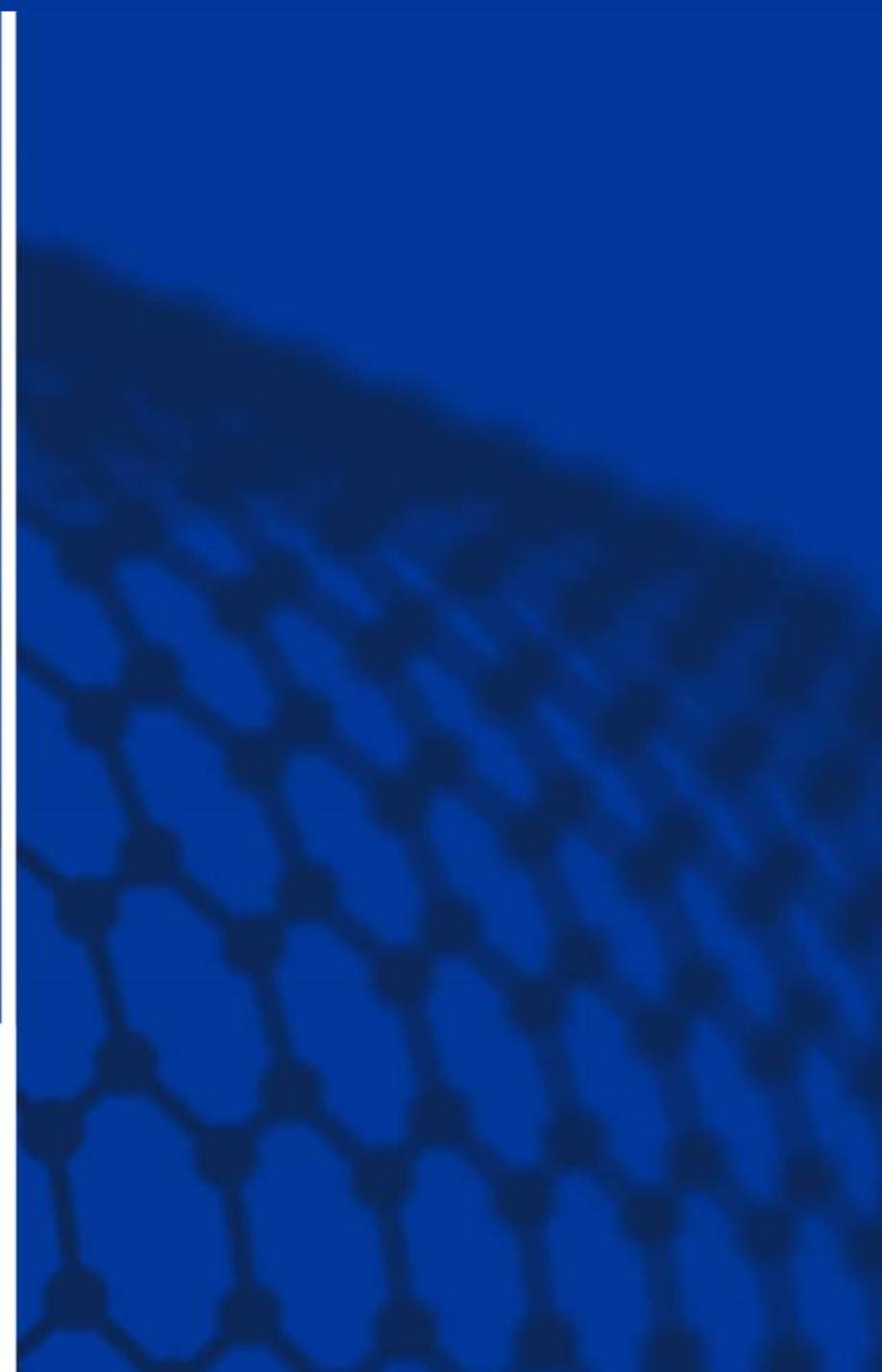


collaborate
Driving BIM, technology and innovation through collaboration....





Setting the Scene....





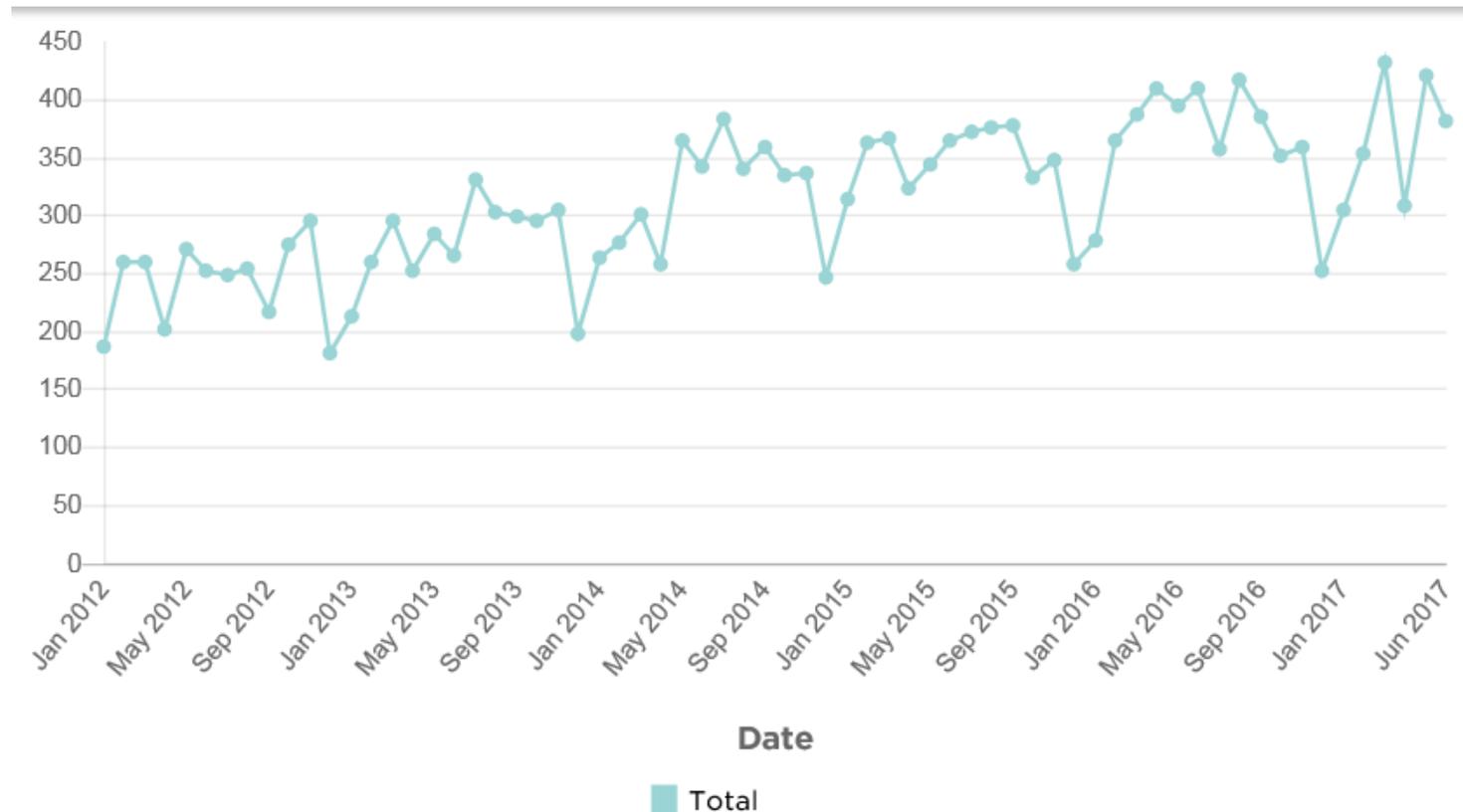
- Historically H&S poor
- 5 fatalities during Empire State Building construction
- 27 fatalities during Brooklyn Bridge construction
- 1 fatality per \$1m during US 20th century construction boom

Impact on the NZ Economy



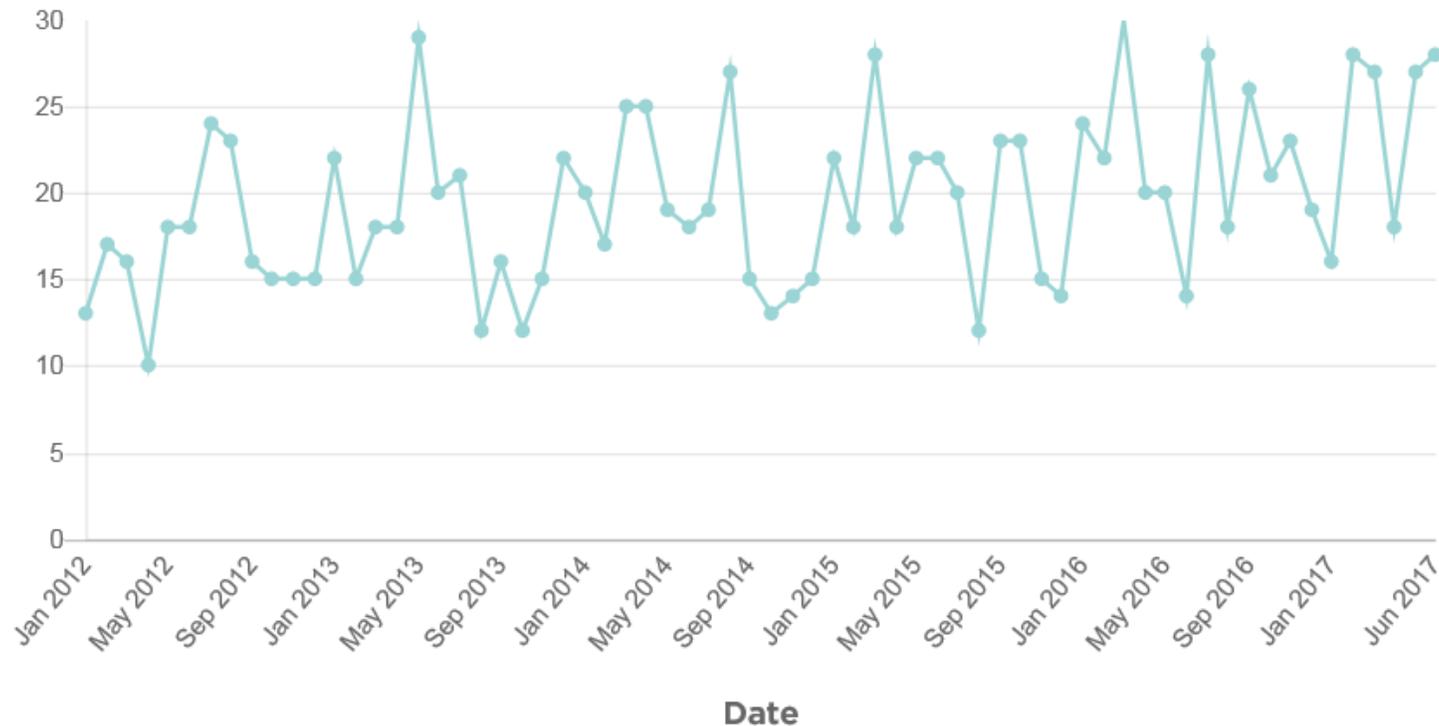
Construction vs other Sectors

- Injuries resulting in more than 1 week off work 2012 – 2017 (Construction Sector)



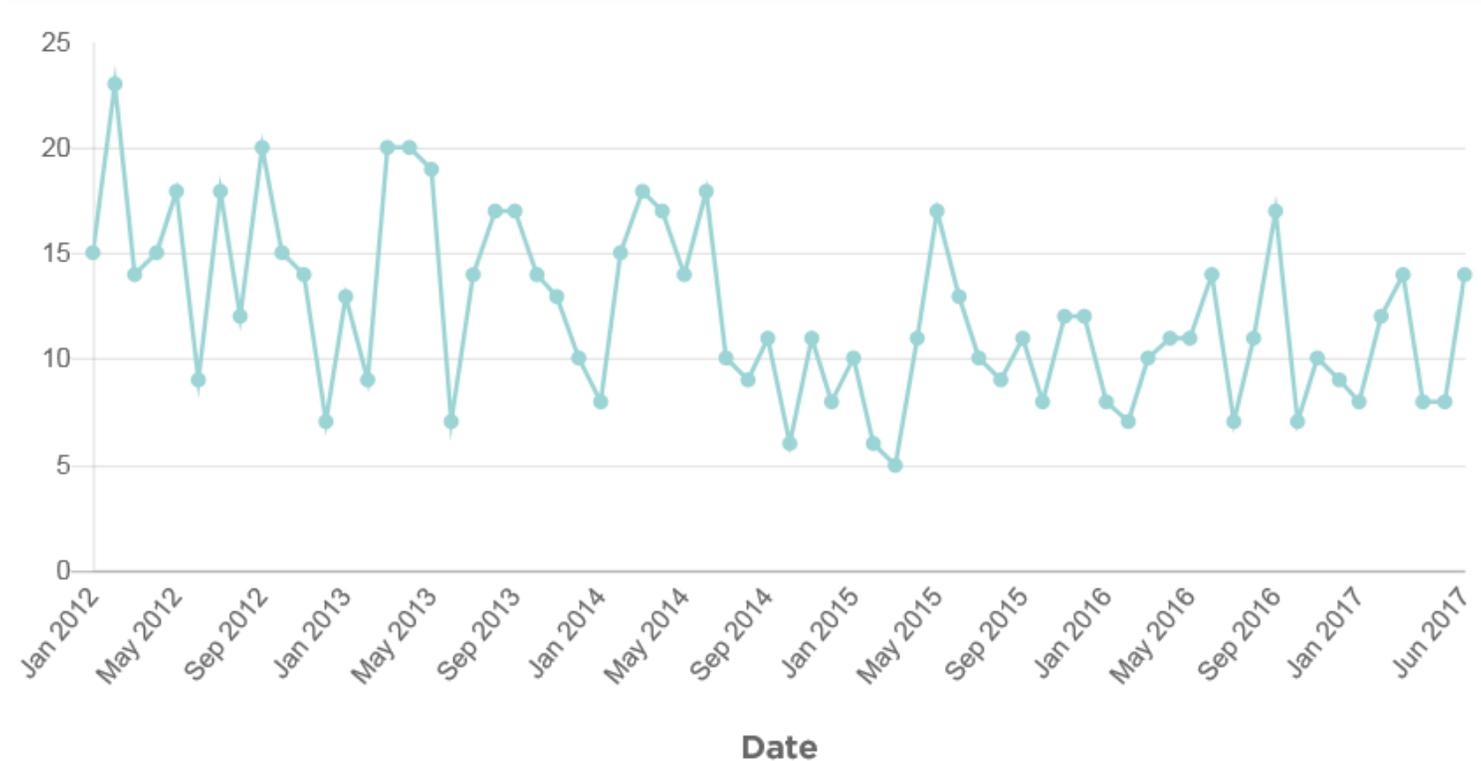
Construction vs other Sectors

- Injuries resulting in more than 1 week off work 2012 – 2017 (Electricity, Gas, Water and Waste Water Sector)



Construction vs other Sectors

- Injuries resulting in more than 1 week off work 2012 – 2017 (Forestry and Logging Sector)



Construction vs other Sectors

- Injuries resulting in more than 1 week off work 2012 – 2017

| Sector | High Point (per month) | Low Point (per month) |
|--|------------------------|-----------------------|
| Construction Sector | 431 | 181 |
| Electricity, Gas, Water and Waste Water Sector | 29 | 10 |
| Forestry and Logging Sector | 23 | 5 |

1386% higher

1710% higher

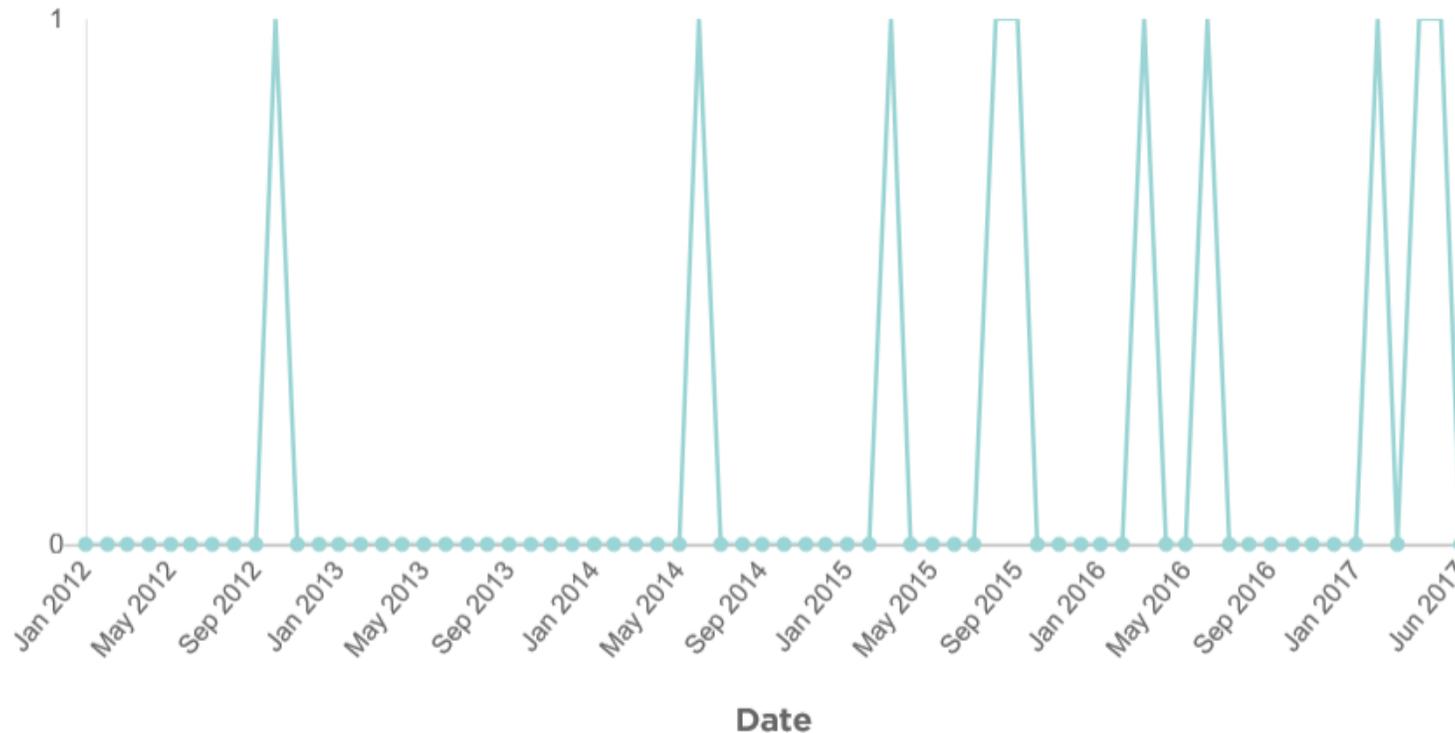
Construction vs other Sectors

- Fatalities 2012 – 2017 (Construction Sector)



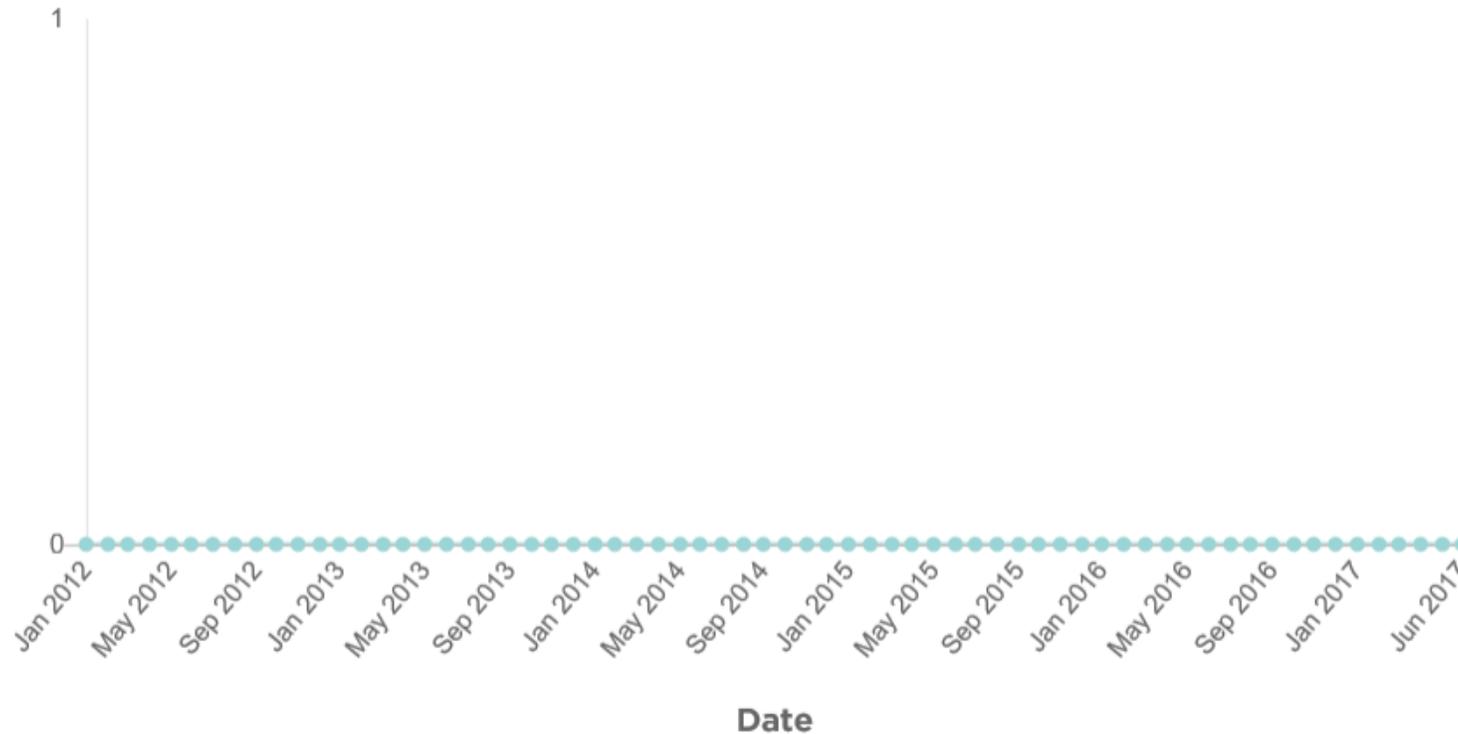
Construction vs other Sectors

- Fatalities 2012 – 2017 (Electricity, Gas, Water and Waste Water Sector)



Construction vs other Sectors

- Fatalities 2012 – 2017 (Forestry and Logging Sector)



Construction vs other Sectors

- Fatalities 2012 – 2017

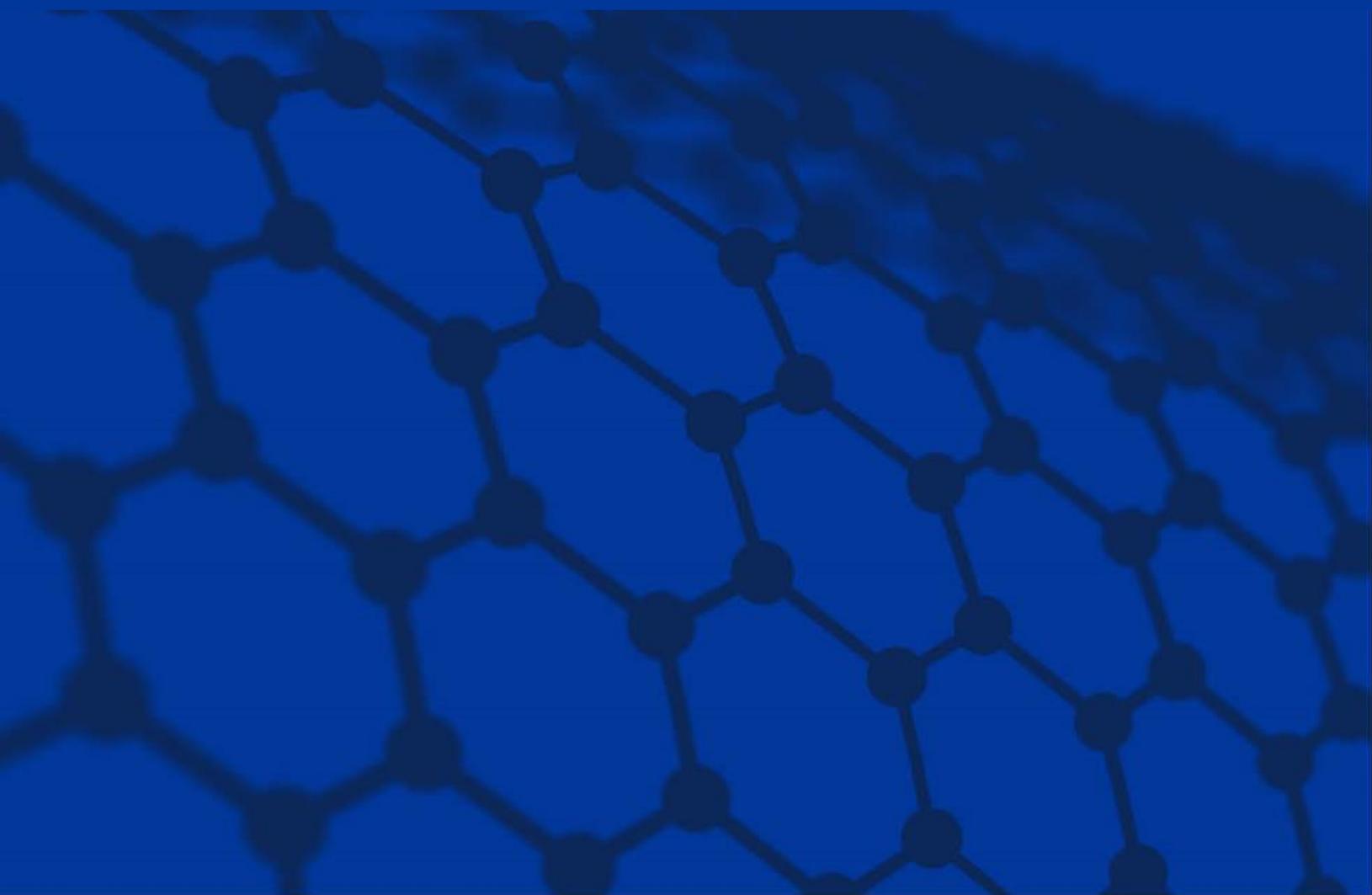
| Sector | High Point (12 month period) | Low Point (12 month period) |
|--|------------------------------|-----------------------------|
| Construction Sector | 7 | 5 |
| Electricity, Gas, Water and Waste Water Sector | 3 | 0 |
| Forestry and Logging Sector | 0 | 0 |

133% higher

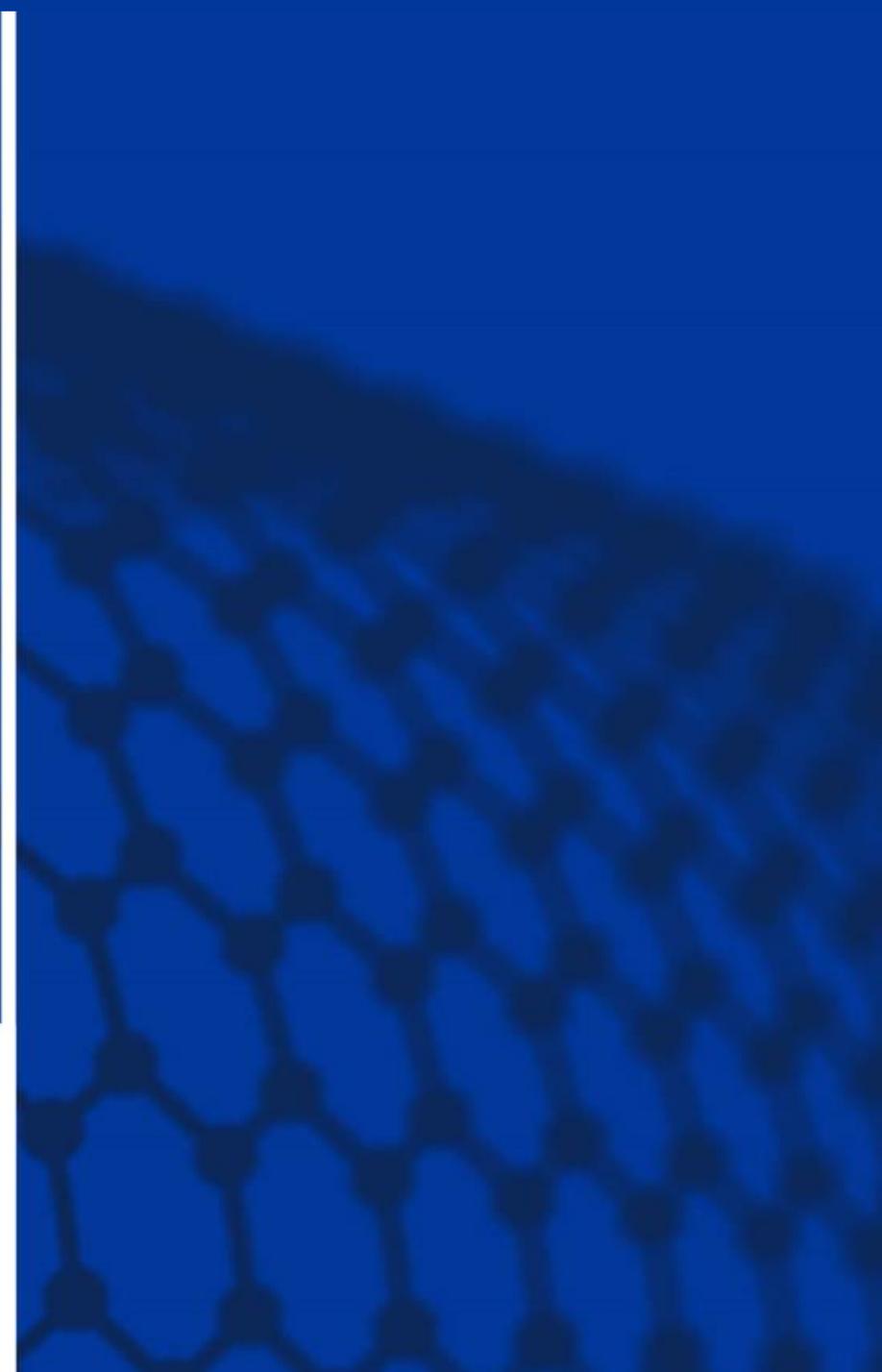
500% higher

Main Causes of Injuries / Fatalities

- Stats in NZ



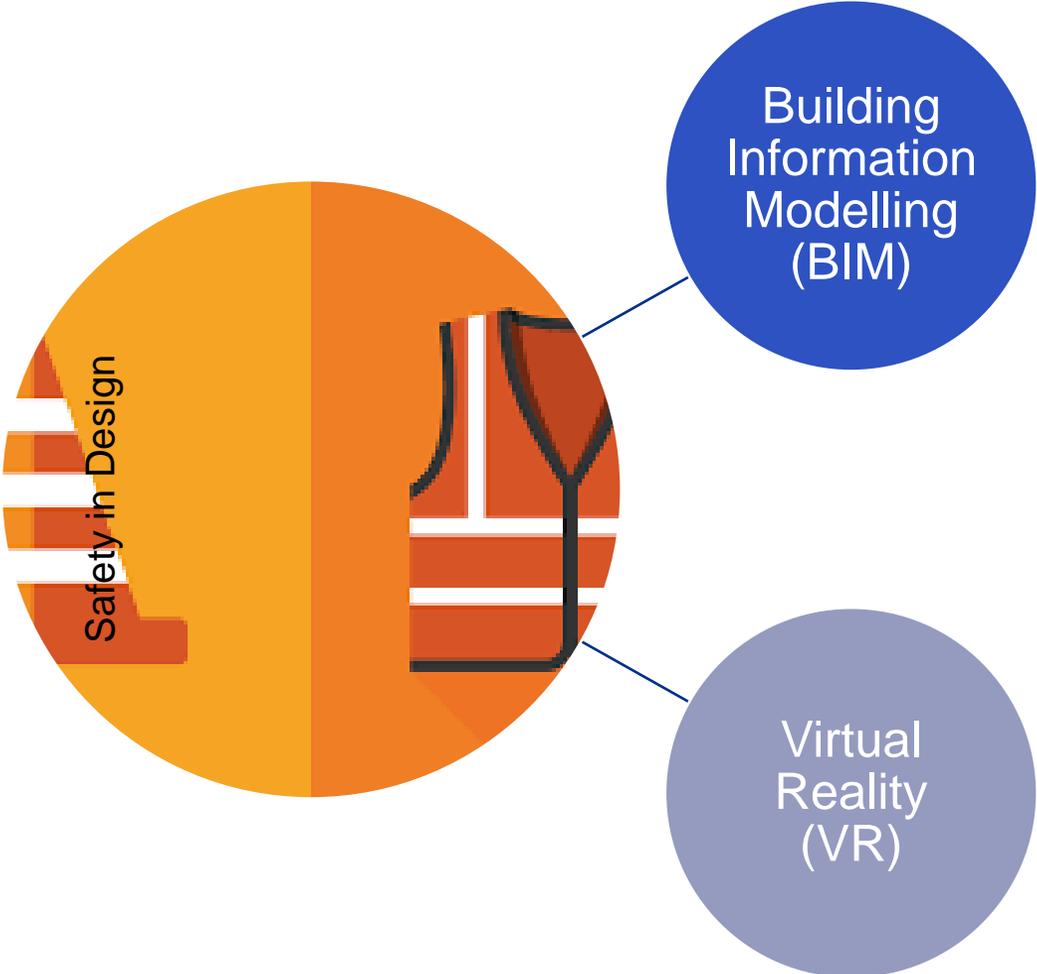
Technologies to Support SiD



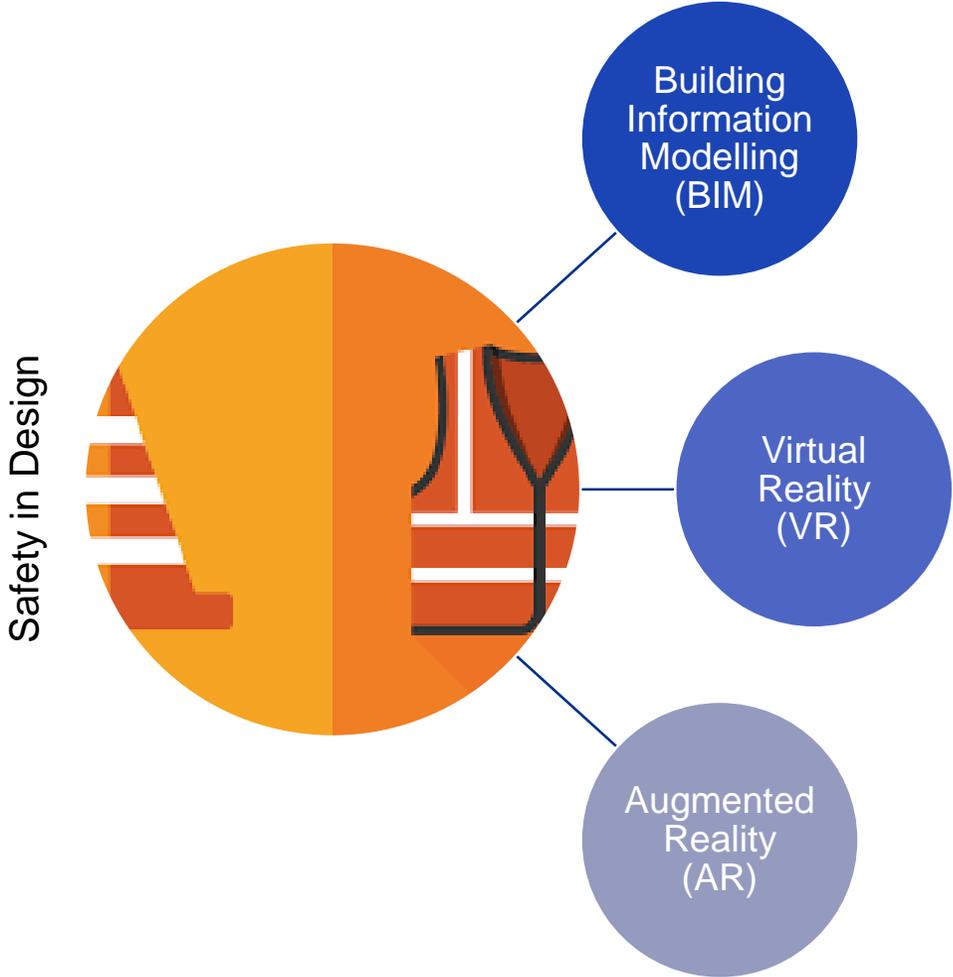
Technologies to Support SiD

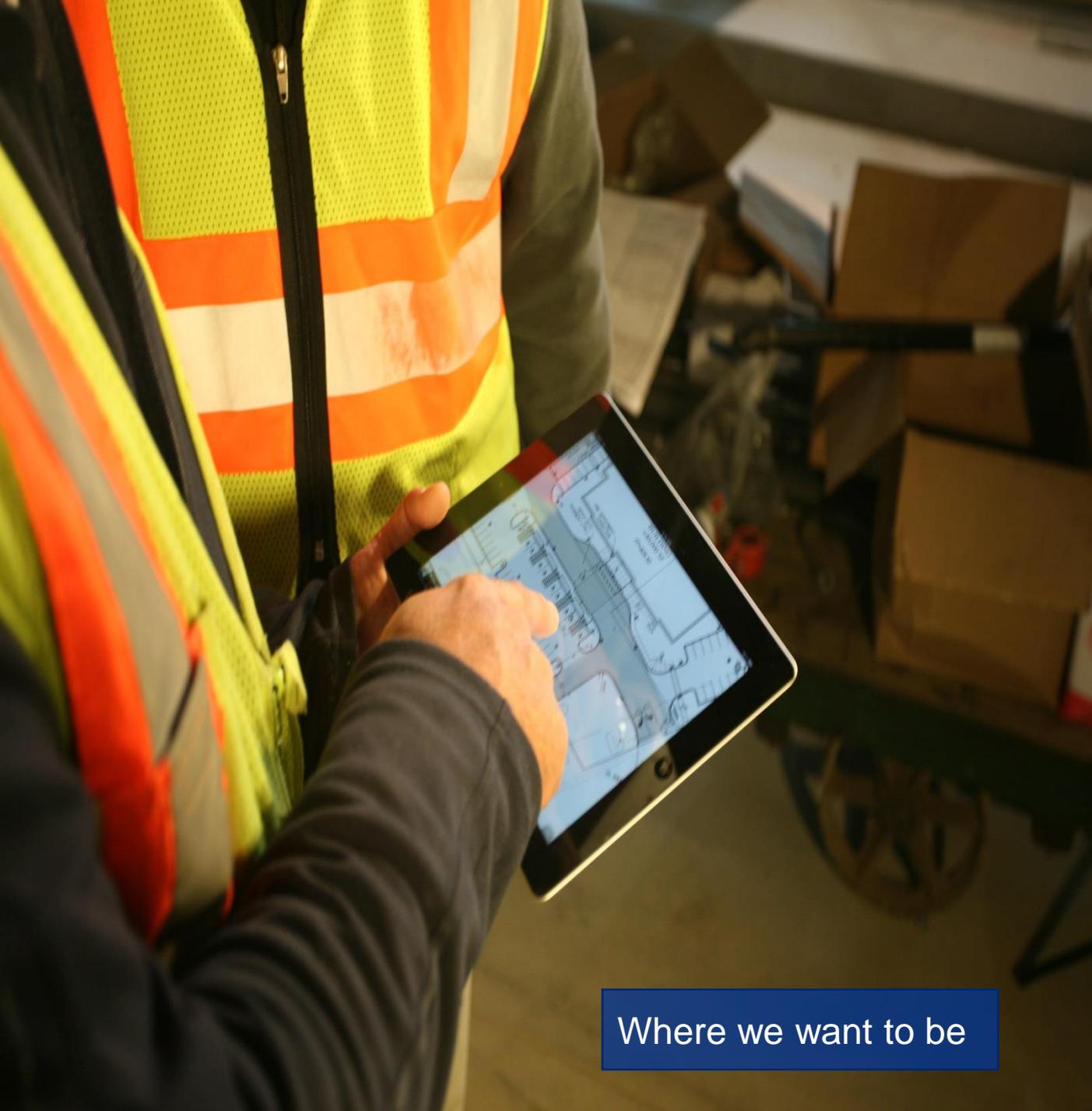


Technologies to Support SiD

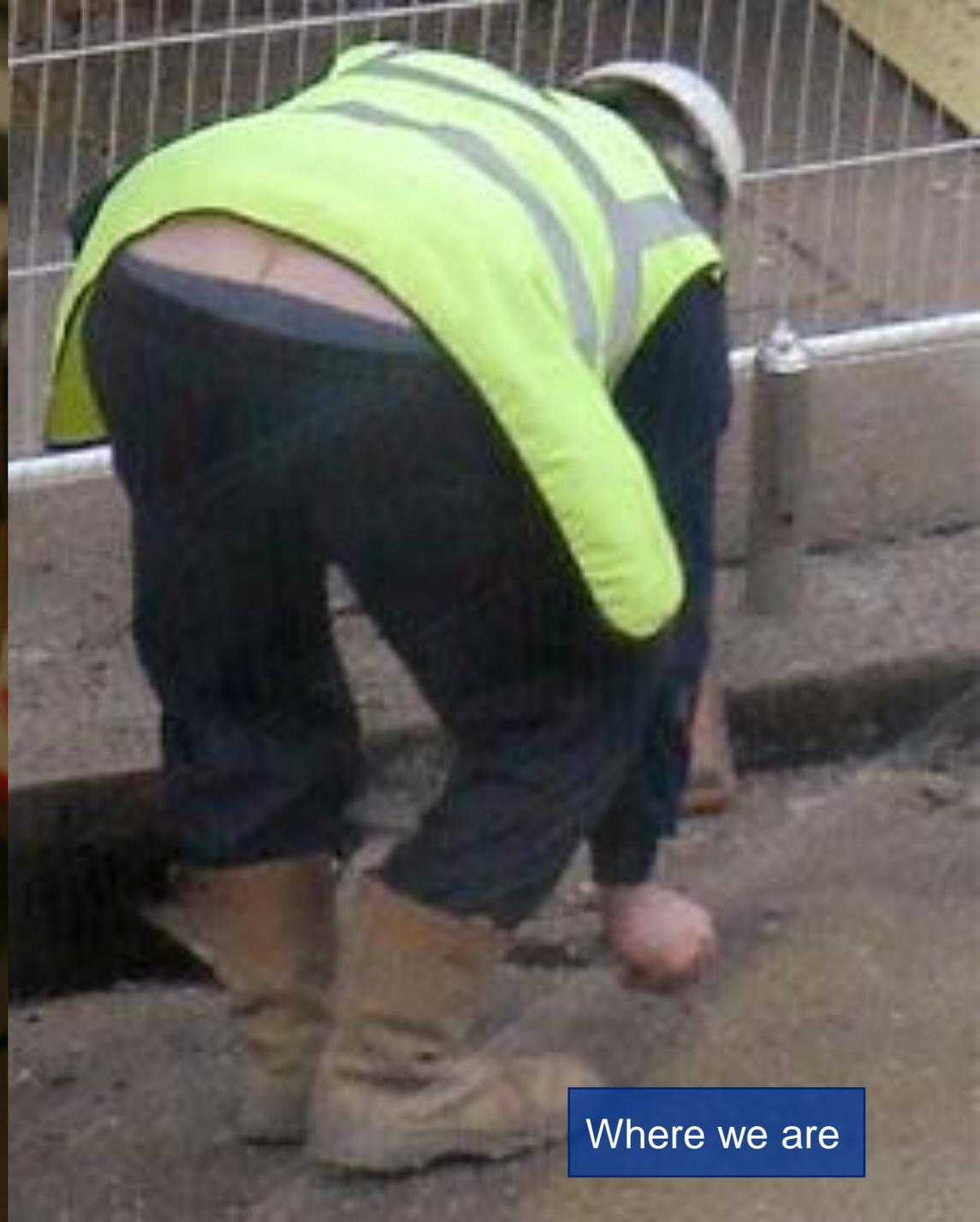


Technologies to Support SiD

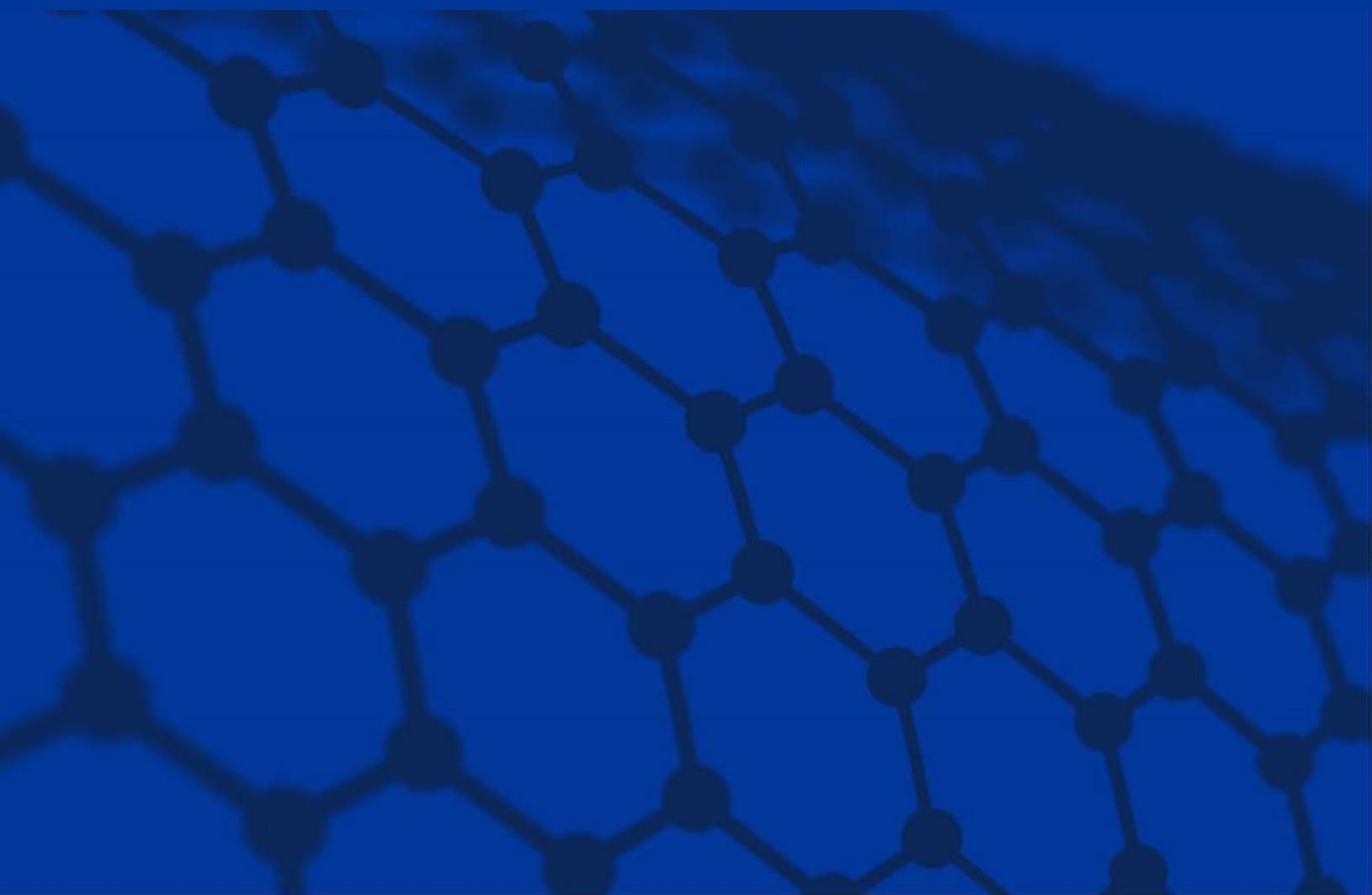




Where we want to be

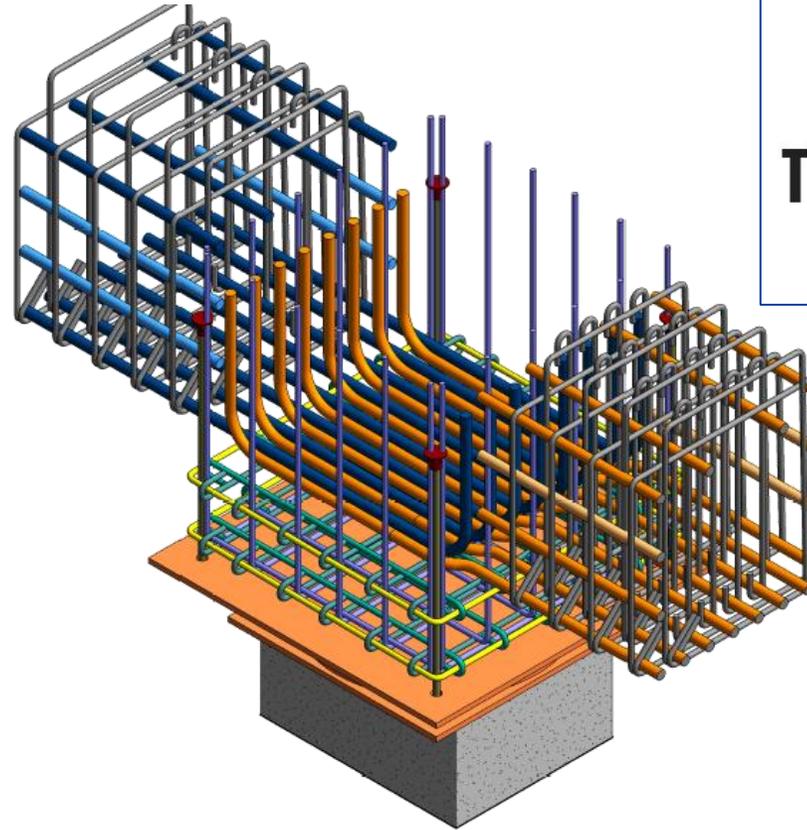
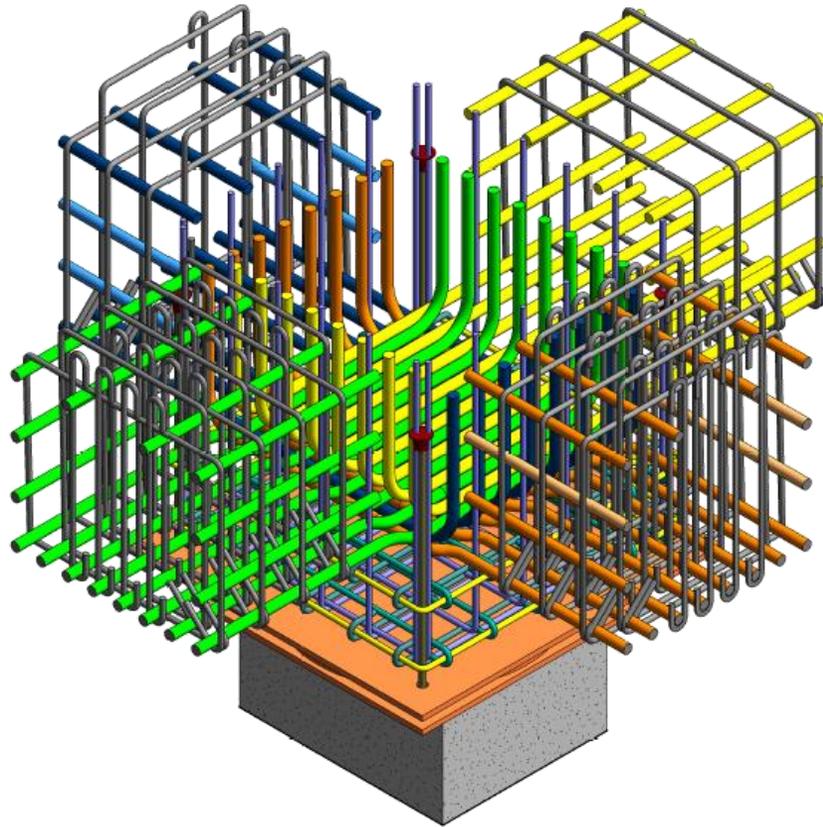


Where we are



SiD Opportunities for BIM

Improved Design Understanding



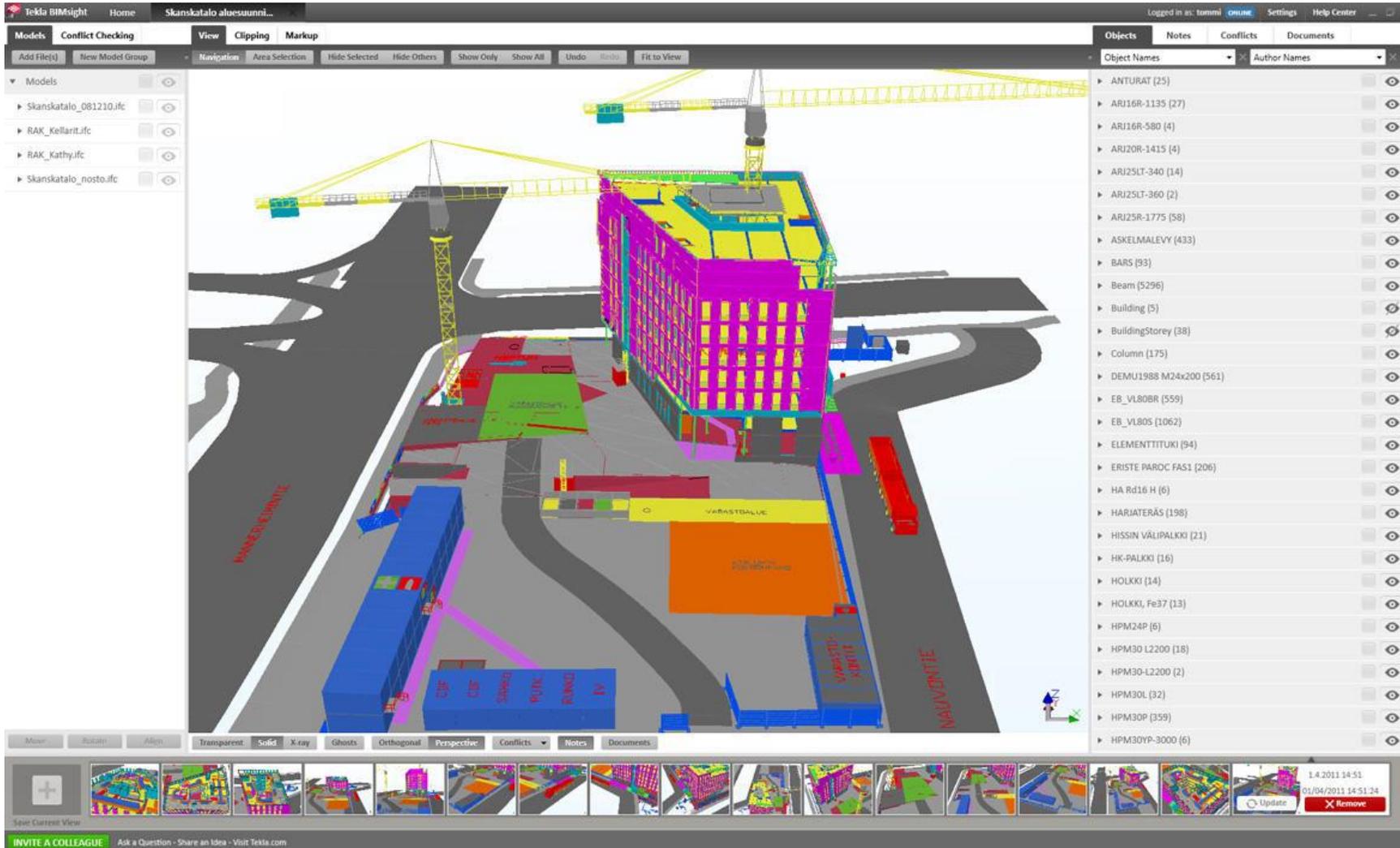
**ONE PICTURE IS
WORTH A
THOUSAND WORDS**

ALBERT EINSTEIN

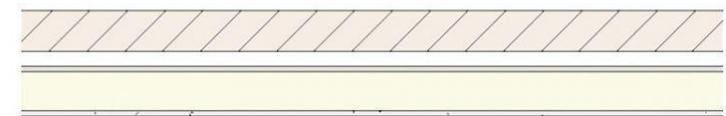
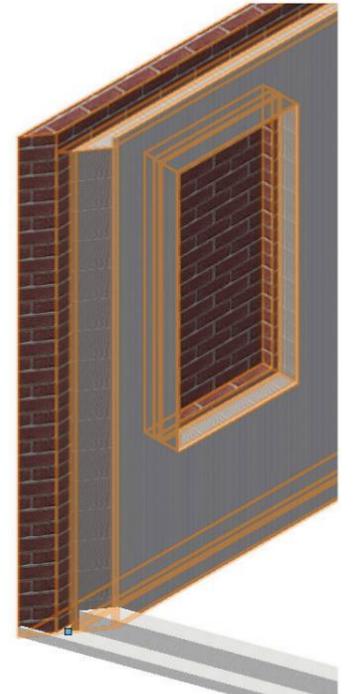
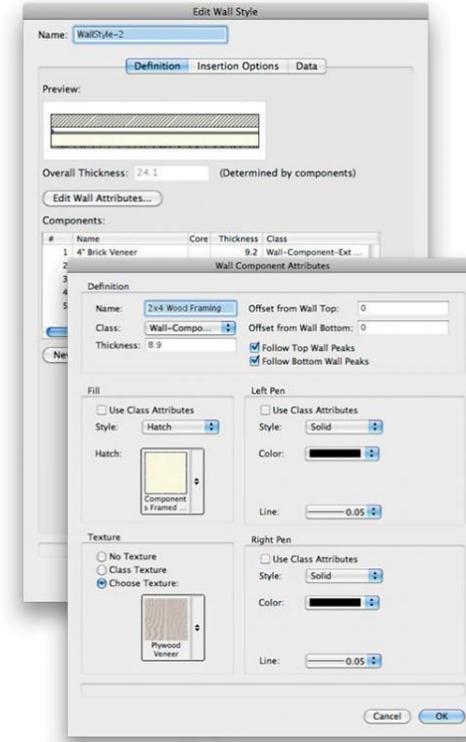
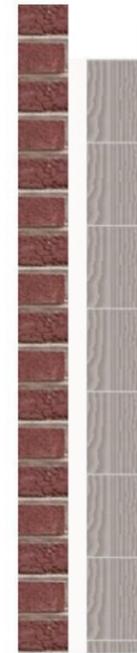
Site Inductions



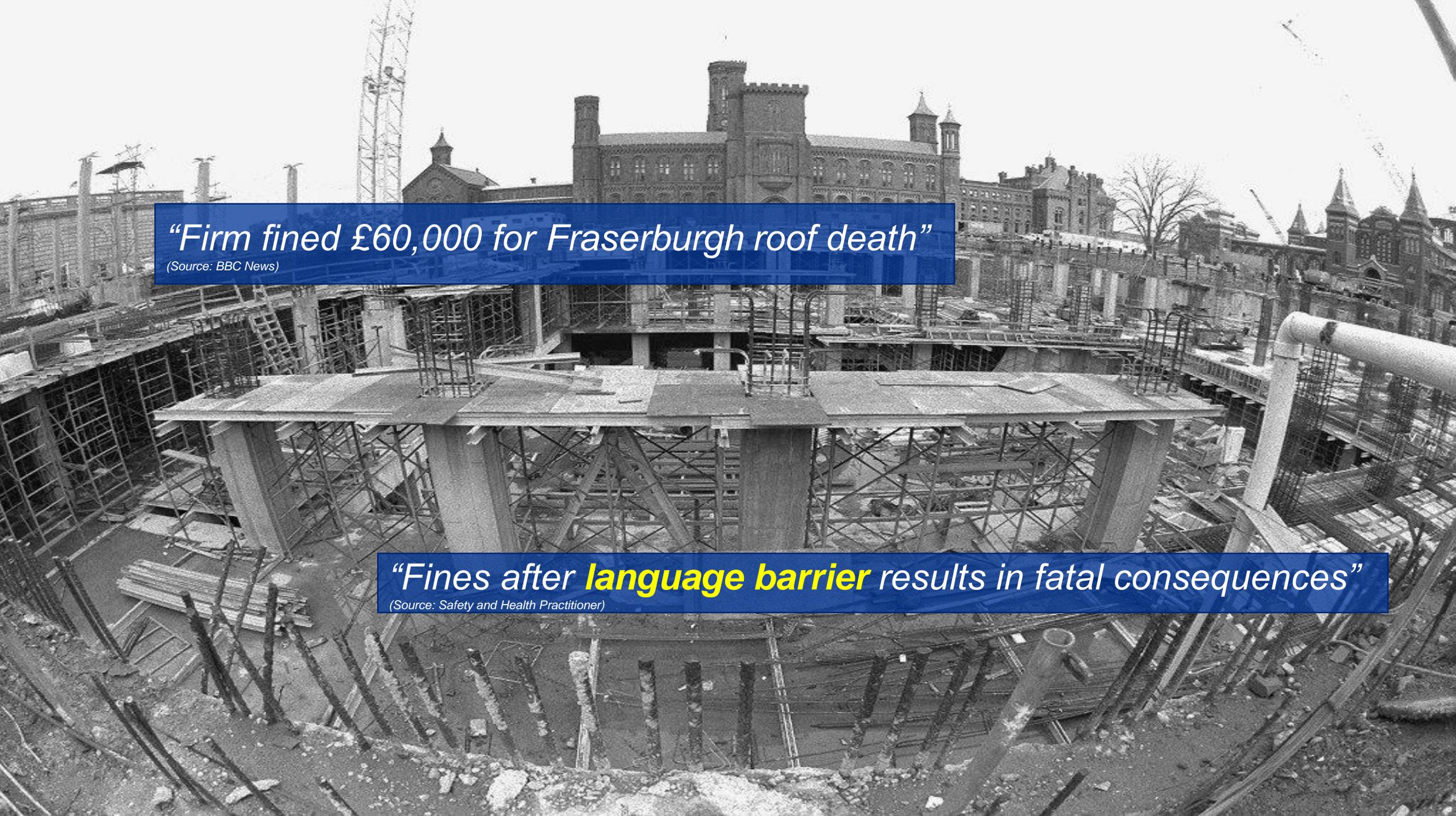
Logistics Planning



Design for Manufacture & Assembly



Visual Method Statements

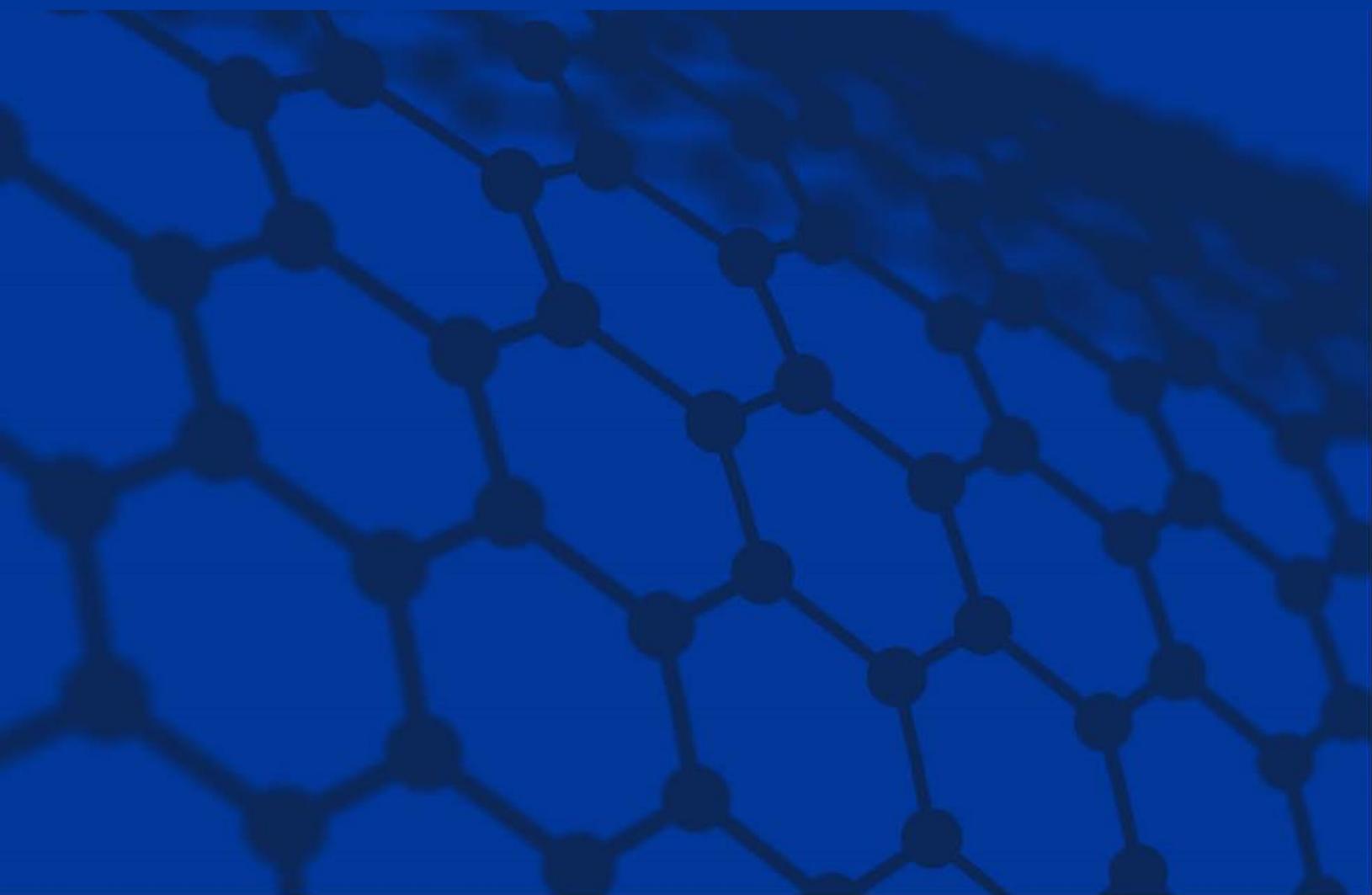


“Firm fined £60,000 for Fraserburgh roof death”

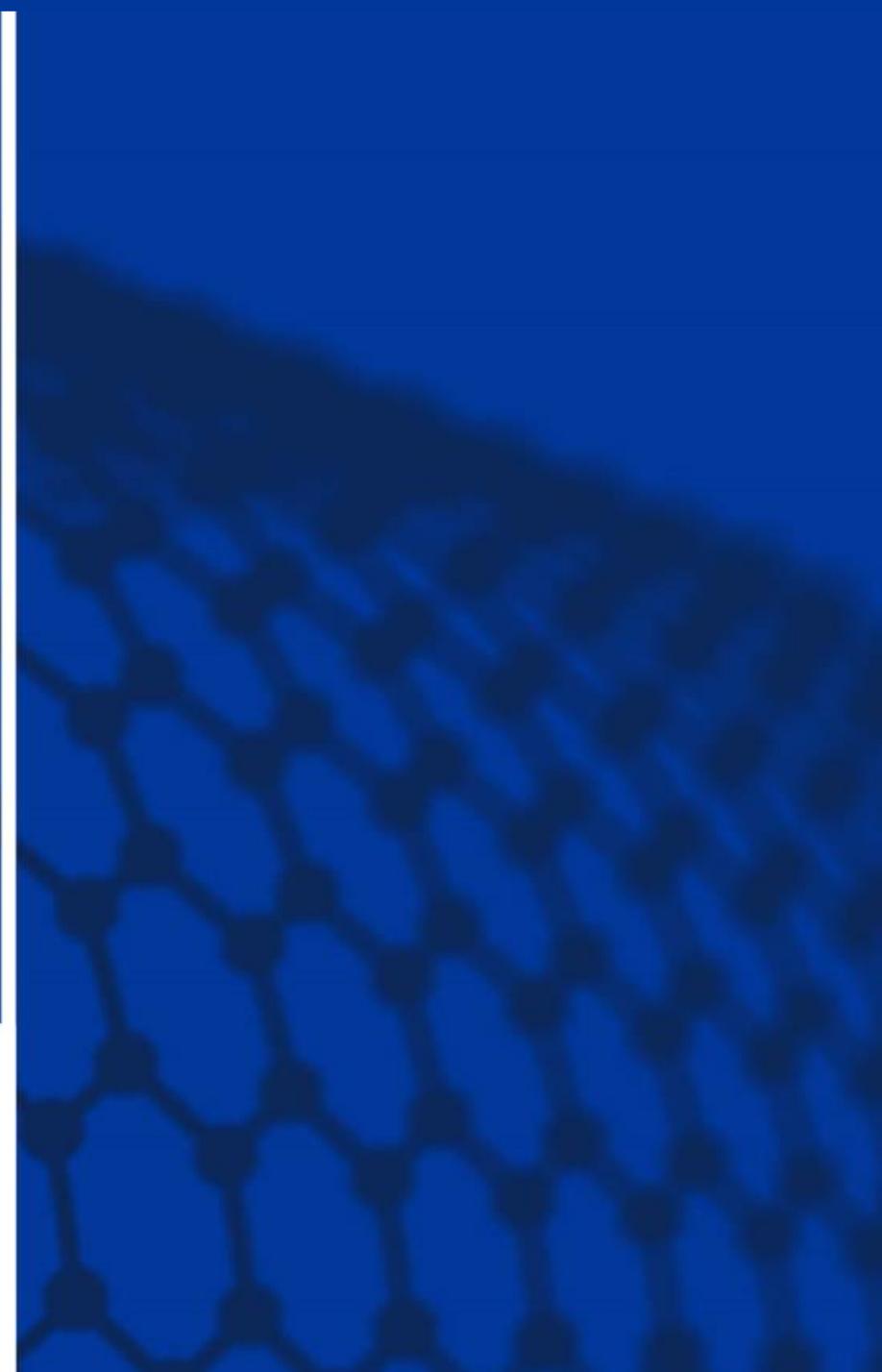
(Source: BBC News)

*“Fines after **language barrier** results in fatal consequences”*

(Source: Safety and Health Practitioner)



SiD Opportunities for VR



What is Virtual Reality?



Design Reviews



Training



What We Do

Join Our Team

Ignite Your Thinking

About Us

Contact Us

Search

Taking Care

Health and Safety

Our Leaders

News and Media

Joint Ventures

› [About Us](#)

› [News and Media](#)

› [March 2018](#)

Fonterra launches cutting edge VR health and safety training technology

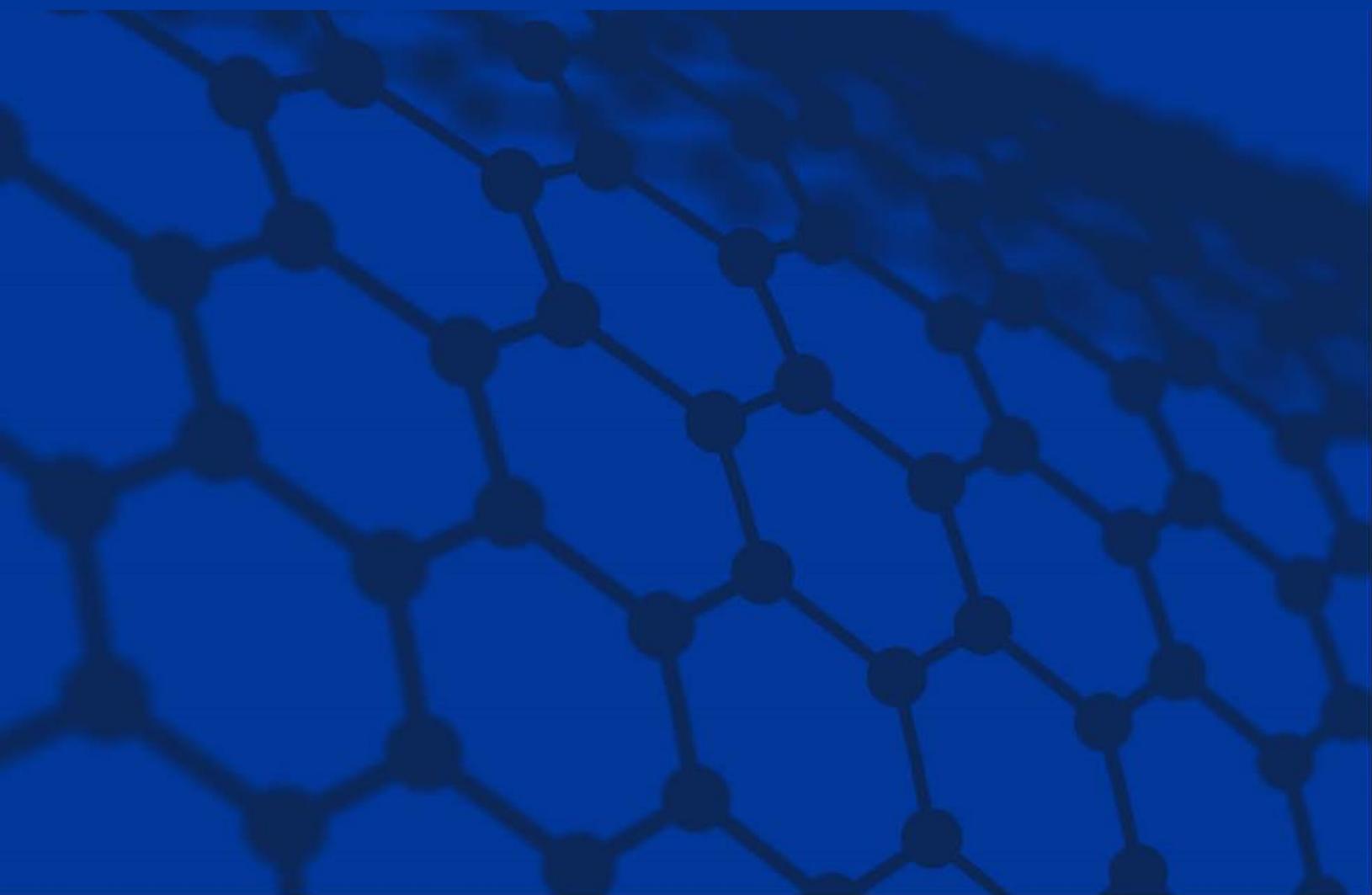
07.03.2018

Fonterra launches cutting edge VR health and safety training technology

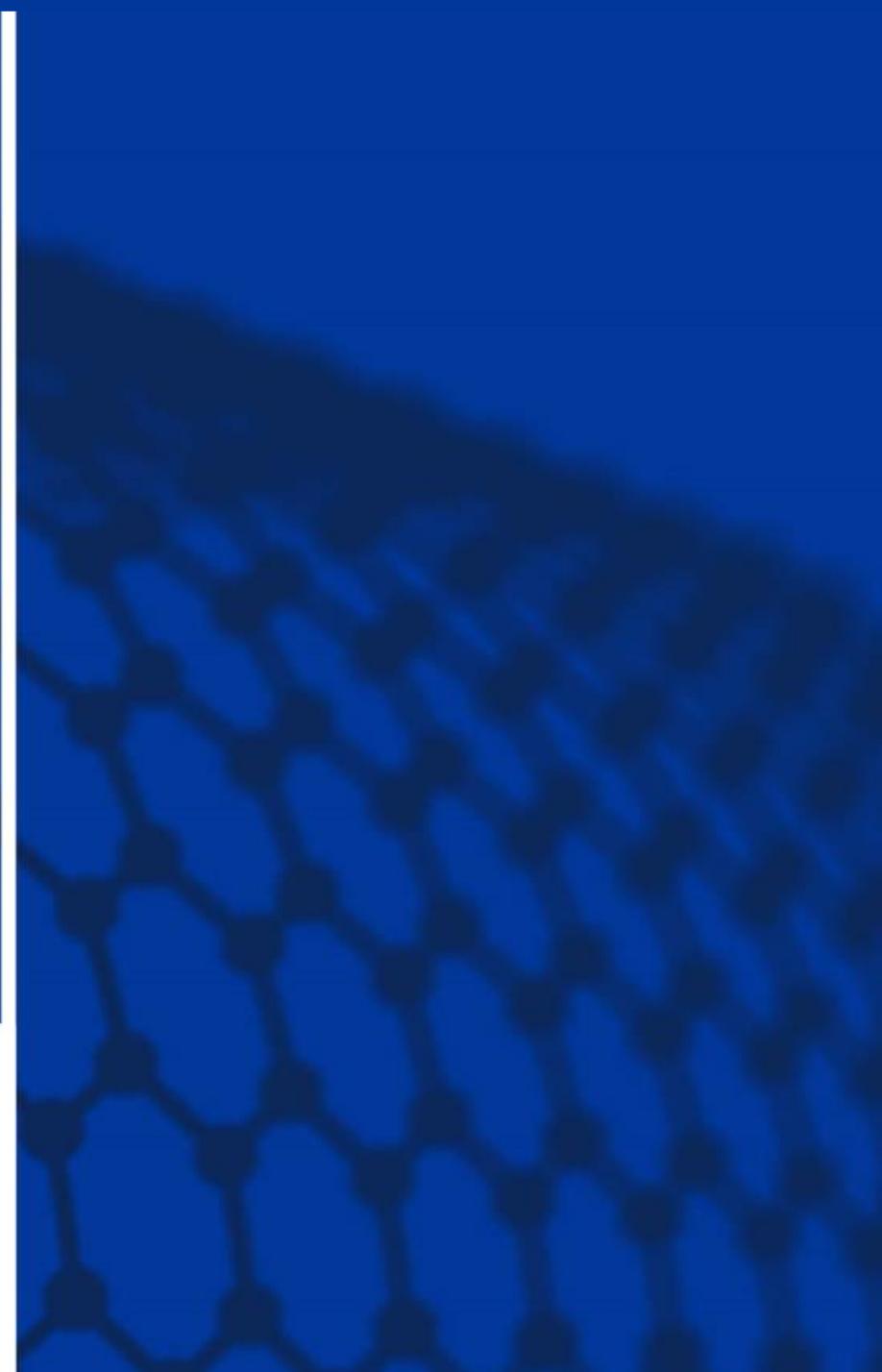
Fonterra and Beca have partnered to develop a breakthrough virtual reality health and safety training technology. The cutting-edge solution lets employees navigate the Co-operative's manufacturing and distribution sites without the need to set foot on site and will help substantially reduce onboarding times.

The new technology will place Fonterra at the forefront of global health and safety innovation and is part of a business wide commitment to become a world leader in risk mitigation.





SiD Opportunities for AR



What is Augmented Reality?

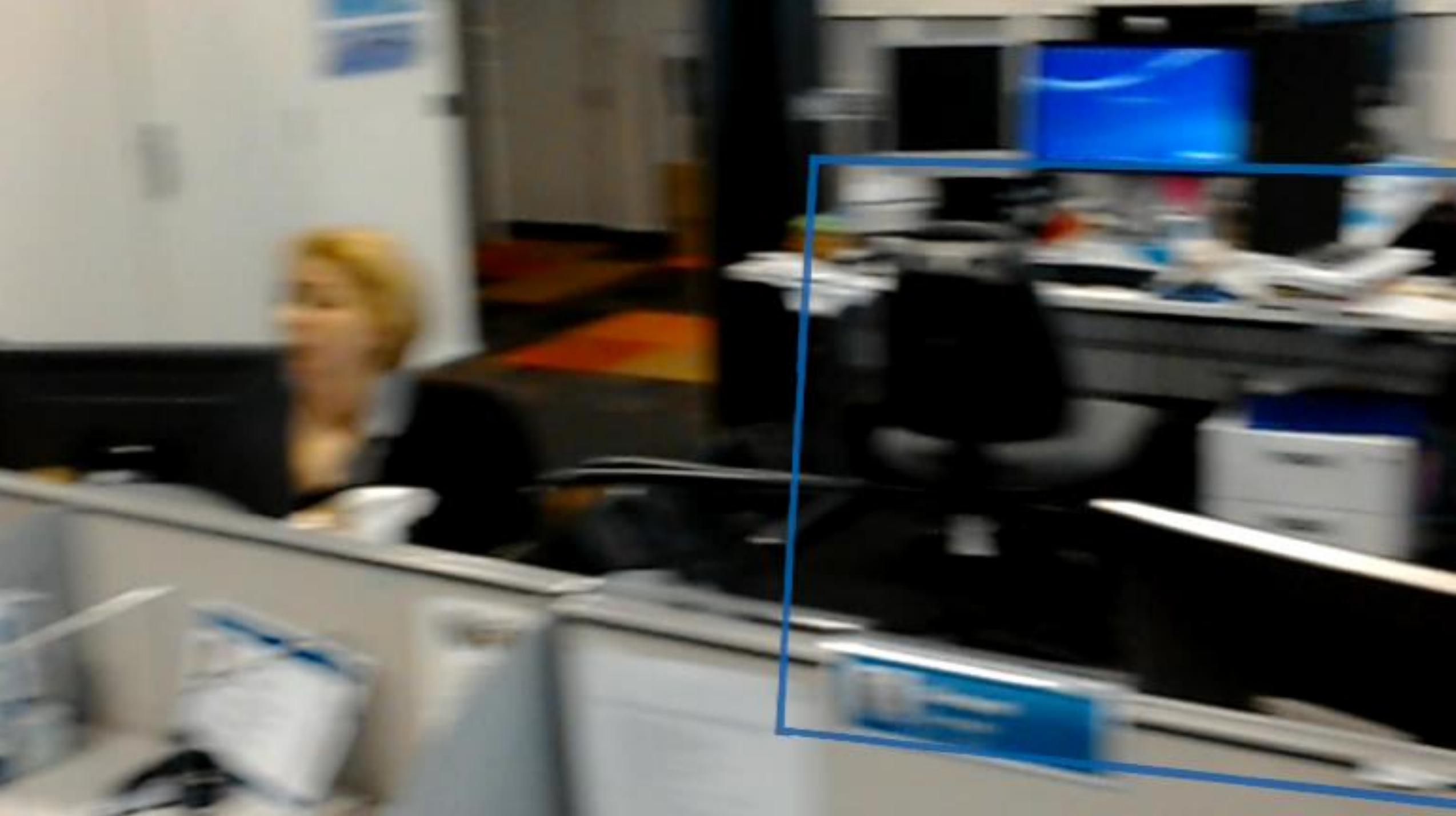


Design Reviews

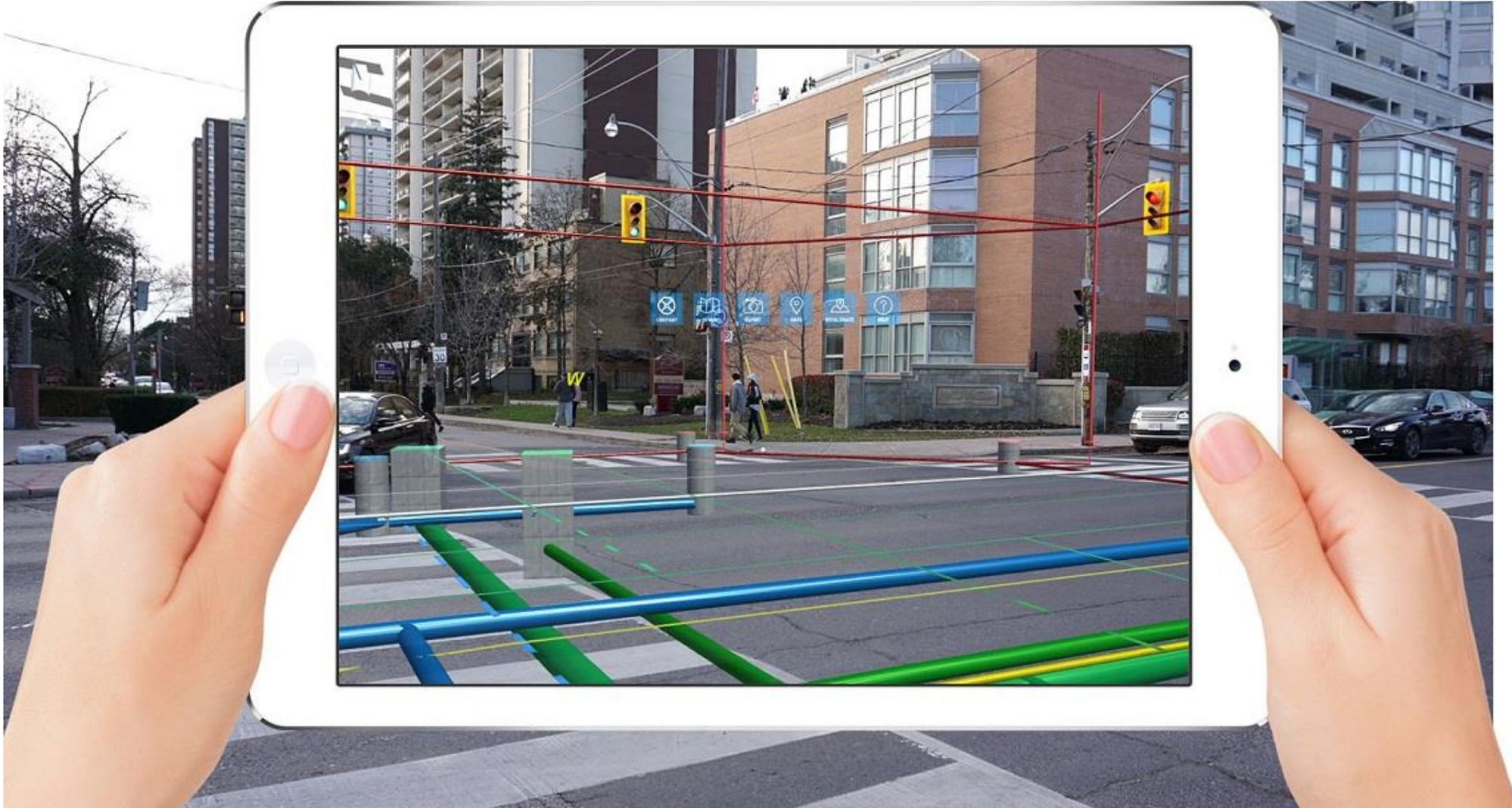


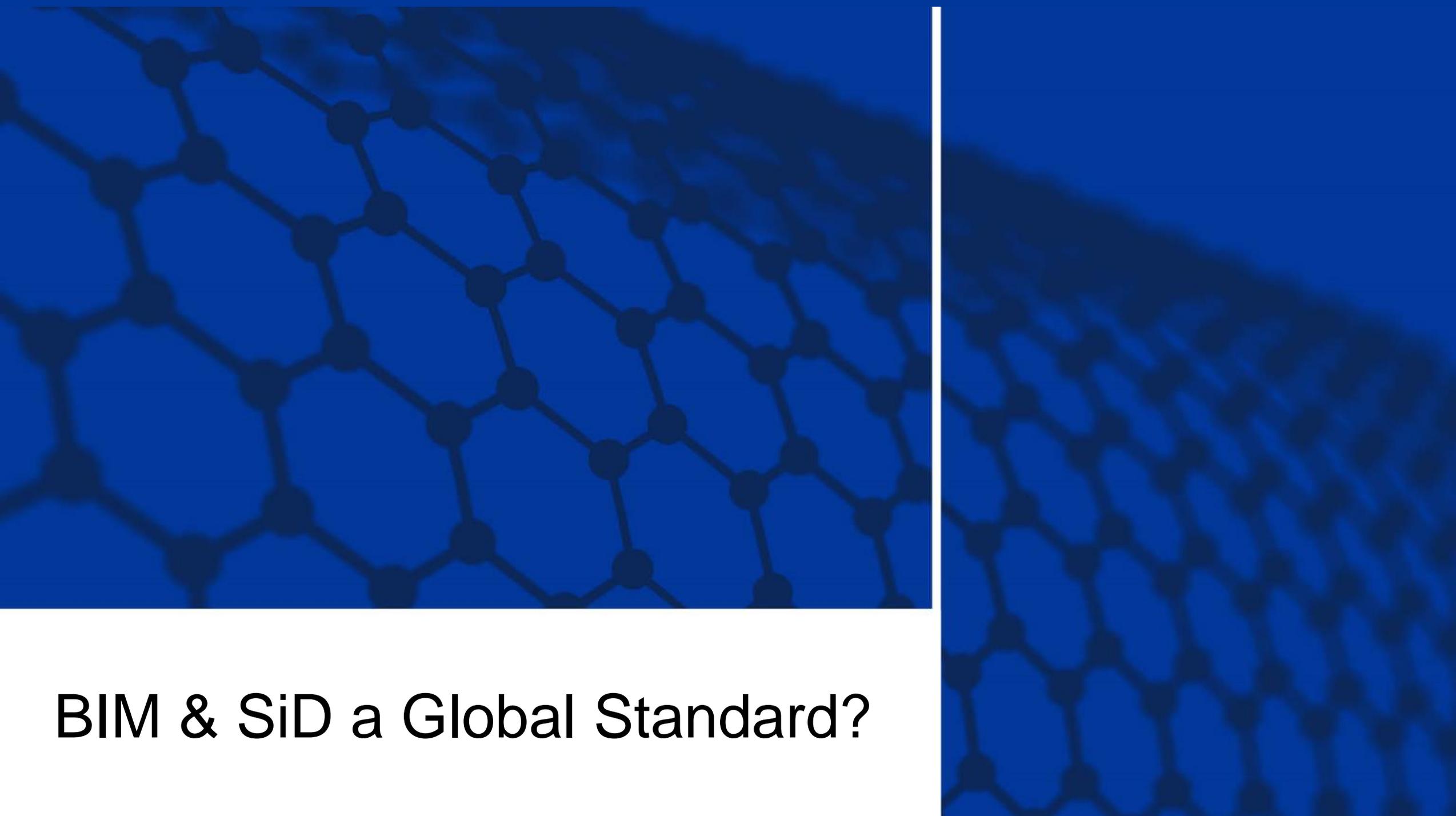
Remote Support

Training



Hazard Avoidance



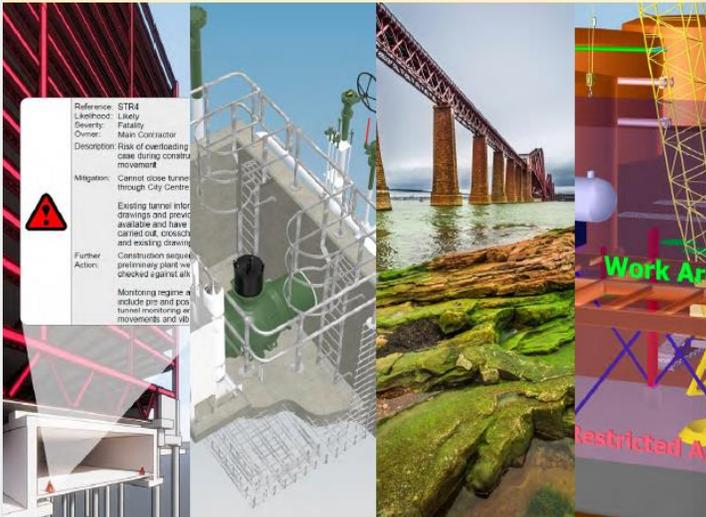


BIM & SiD a Global Standard?

PAS1192-6

PAS 1192-6:2018

Specification for collaborative sharing and use of structured Health and Safety information using BIM



Annex C (informative) Representation of risk information

PAS 1192-6:2018

Figures C.1 to C.4 illustrates the visualization of risk information in project models.

Figure C.1 – Use of component with HS_Risk_UK attached: an information model may document risks as being associated to a product (component or type) entity



Image courtesy of AEC3

Figure C.2 – Use of a space with HS_Risk_UK attached: an information model may document risks associated to a location (space or floor or region)

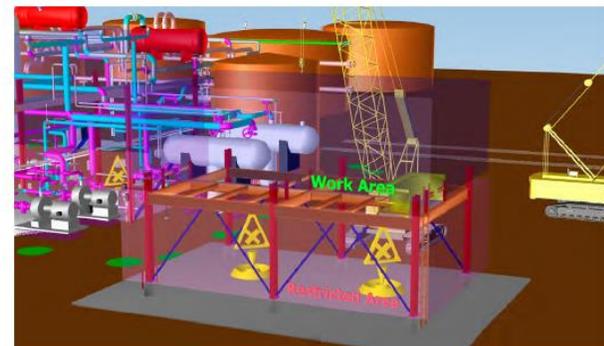


Image courtesy of Synchro Limited

PAS 1192-6:2018

Figure C.3 – Use of a project plan (Gantt chart) with a risk associated to a specific task entity

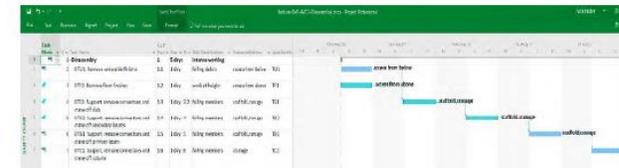


Image courtesy of AEC3

NOTE Further associations to location or to product entities may be documented as additional text attributes.

Figure C.4 – Use of risk symbol annotations used for emergency planning

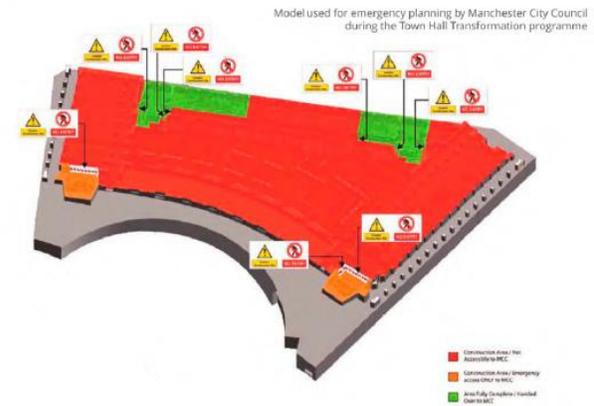


Image courtesy of Manchester City Council and Kier Group



Adoption of PAS1192-6 Principles

REVIT FAMILY

WF WE WMM

PARAMETERS

ANNOTATION TAG
Con_Risk 1.03

REVIT FAMILY

REVIT PROJECT

CONSTRUCTION PHASE

DEMOLITION PHASE

OPERATION & MAINTENANCE PHASE

3D VIEW

REVIT PROJECT

EXPORTED EXCEL FILE FROM REVIT

EXPORTED EXCEL FILE FROM REVIT

STANDARD SID FORM

Modify | Generic Models

Properties

Hazard Signs_Construction Site WarningElectricity_WE

Generic Models (1)

| | |
|-----------------------|------------------|
| Design Status | Reference Lines |
| Workset | glenn.jowett |
| Edited by | glenn.jowett |
| Phasing | |
| Phase Created | New Construction |
| Phase Demolished | None |
| IFC Parameters | |
| RiskName | Electric shock |
| Risk No | 2 |
| LevelOfRisk | Medium |
| RiskDescription | |
| RiskConsequence | |
| RiskAssessmentMeth... | |
| RiskDocumentation | |
| RiskLikelihood | |
| ProposedMitigation | |
| DateReview | |
| DateUpdated | |
| AssociatedActivity | |
| AssociatedLocation | |
| AssociatedProduct | |
| Other | |
| Beca Inst Use | |

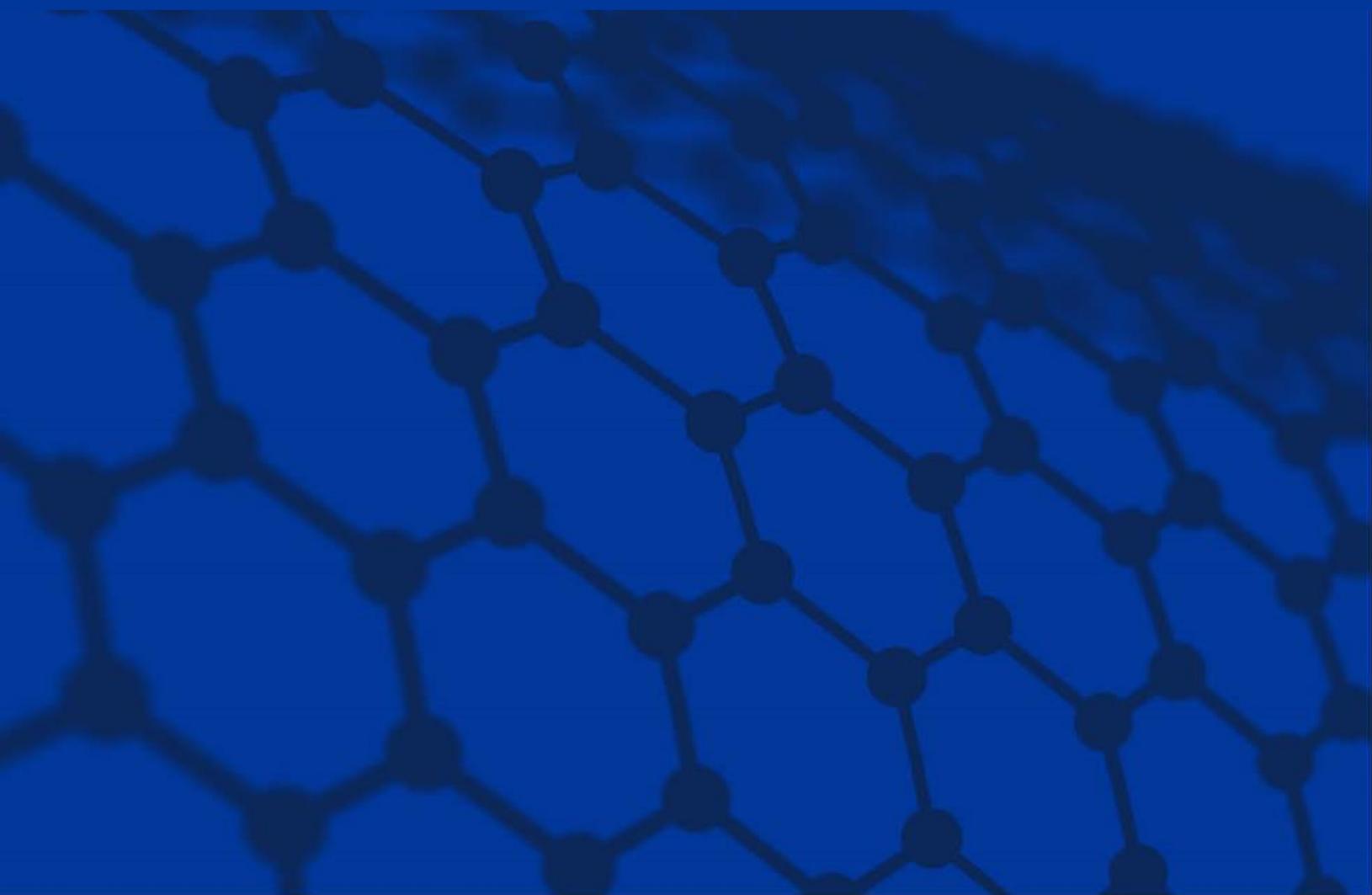
3D View: {3D - glenn.jowett} - Safety in Design Test Model.rvt

Structural Plan: LEVEL 2 - Safety in Design Test Model.rvt

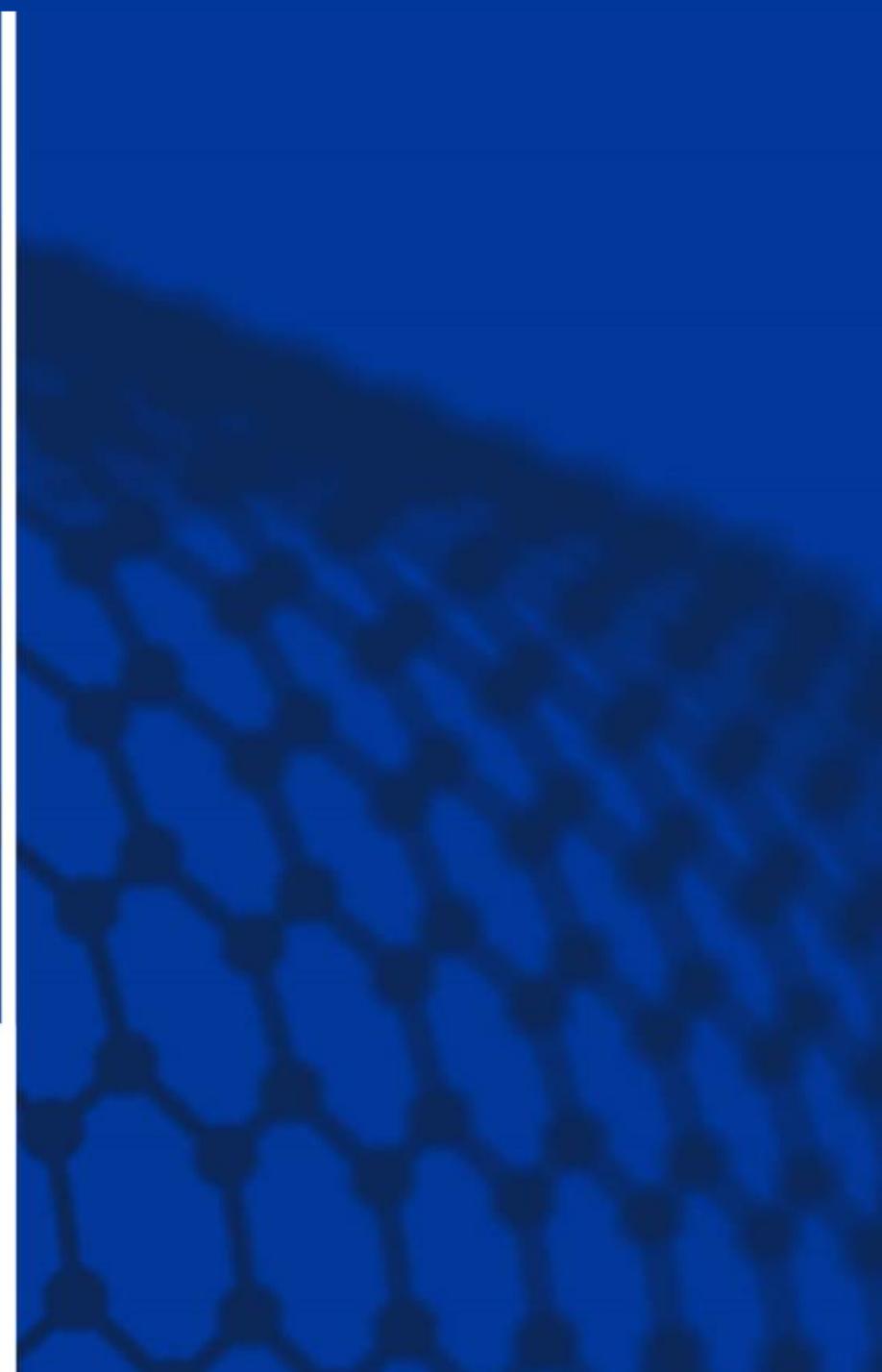
Risk 2 WE

Risk 1 WF

STANDARD SID FORM



Summary



Summary - Leightons Construction

- 2013 Excellence Awards Safety Finalist - Safety Toolbox with 3D Models
- **5 years ago.....!**

Thank You, any questions?

Glenn.Jowett@beca.com

