

# Accessibility and Communication of Structural Health Monitoring Data of Mass Timber Buildings

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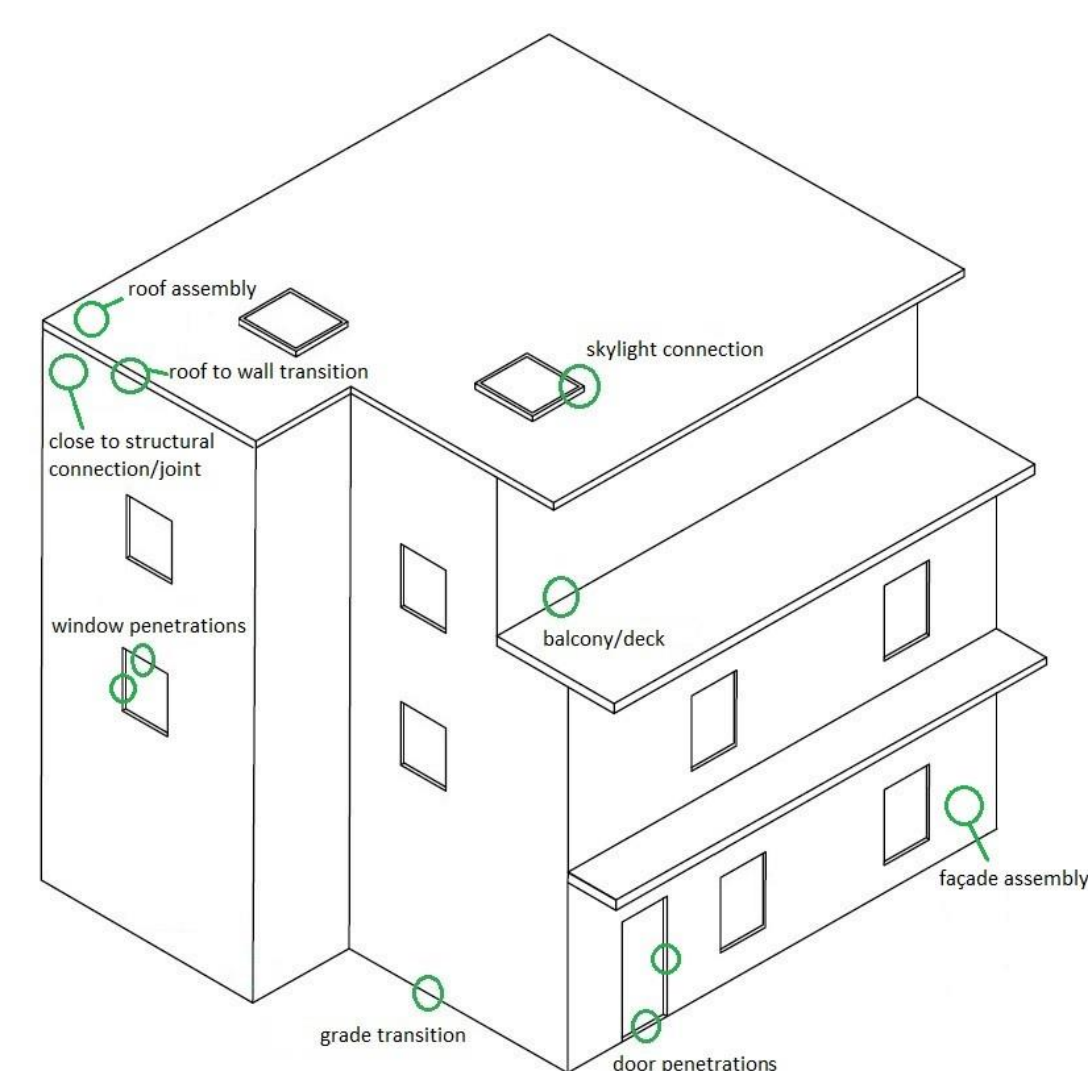
## Main Objectives

Multiple mass timber buildings have been instrumented with sensors to monitor the performance of advanced engineered wood products and novel engineering systems. However, there is a paucity of knowledge on how monitoring data support decision making of relevant stakeholders. The results of these surveys can be used to develop effective tools and strategies allowing for data-supported decision making for the design of new structures and the service life management of built facility.

## How Can Monitoring Support Your Decisions?

Access to the survey: <https://bit.ly/2zESkuP>

How critical you think it is to monitor moisture content of timber in the following locations?



How critical do you think it is to measure displacements in timber buildings in the following locations?

- Floors (deflections)
- Roofs (deflections)
- Walls (vertical movements)
- Columns (vertical movements)
- Wall to floor connections (differential movements)
- Wall to wall connections (differential movements)
- Foundation to wall connections
- Floor to beam connections
- Beam to column connections

How important do you think it is to monitor vibration/seismic movement in the following types of buildings?

- In mass timber buildings in seismic areas
- In tall wood buildings
- In large-span timber structures
- In timber buildings used for critical infrastructures (hospitals, etc.)
- In bridges

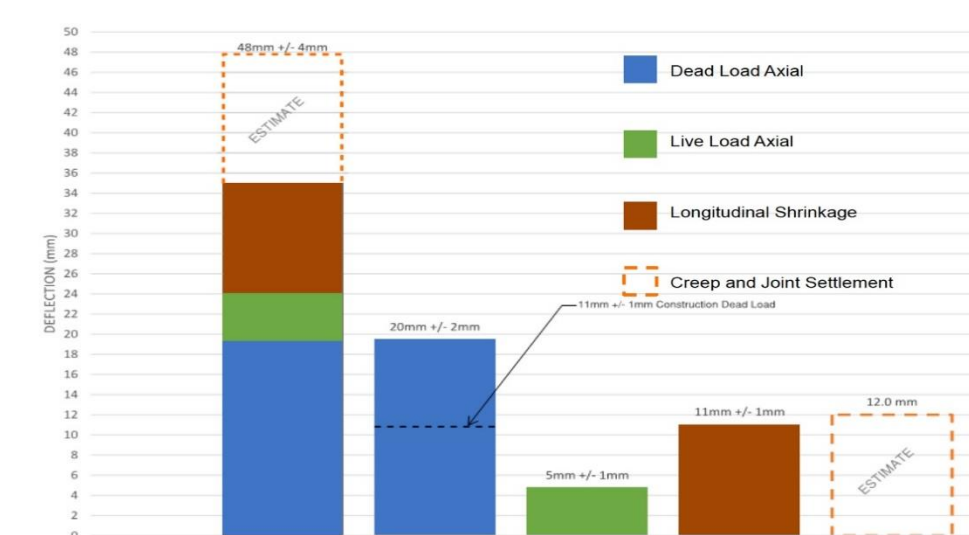


What is the degree of usefulness of the following data visualization formats?

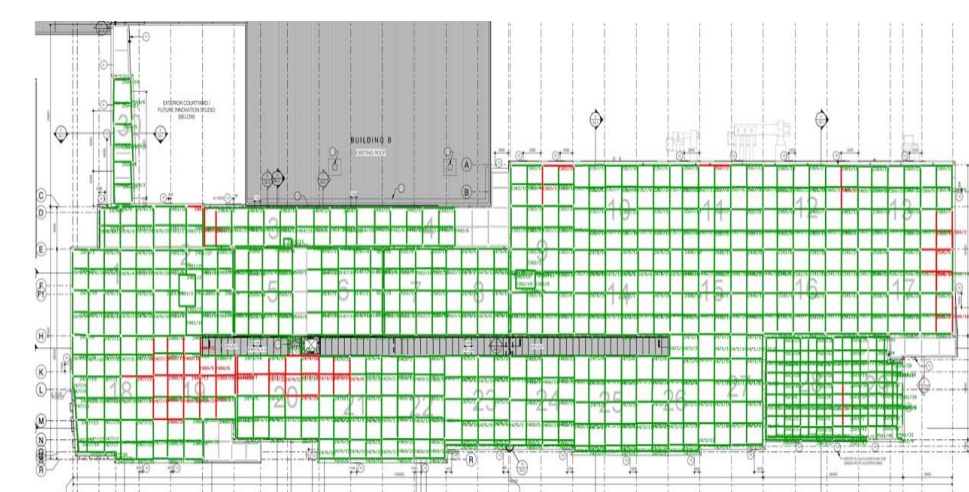
### • Tables

Floor	Displacement After Shoring Removed	Total Displacement June 2017
2 (edge)	-0.960 mm	-1.387 mm
3 (edge)	-0.567 mm	-1.077 mm
3	NA	-1.821 mm
4	-2.577 mm	-3.182 mm
5	-2.052 mm	-2.604 mm

### • Graphs



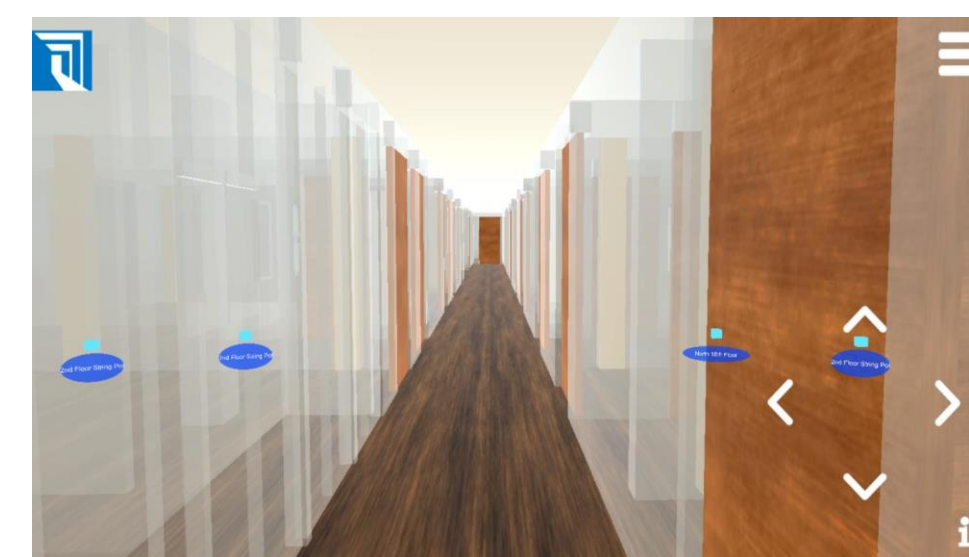
### • Sensor location colour coded value in a 2D map



### • Augmented Reality



### • Virtual Reality



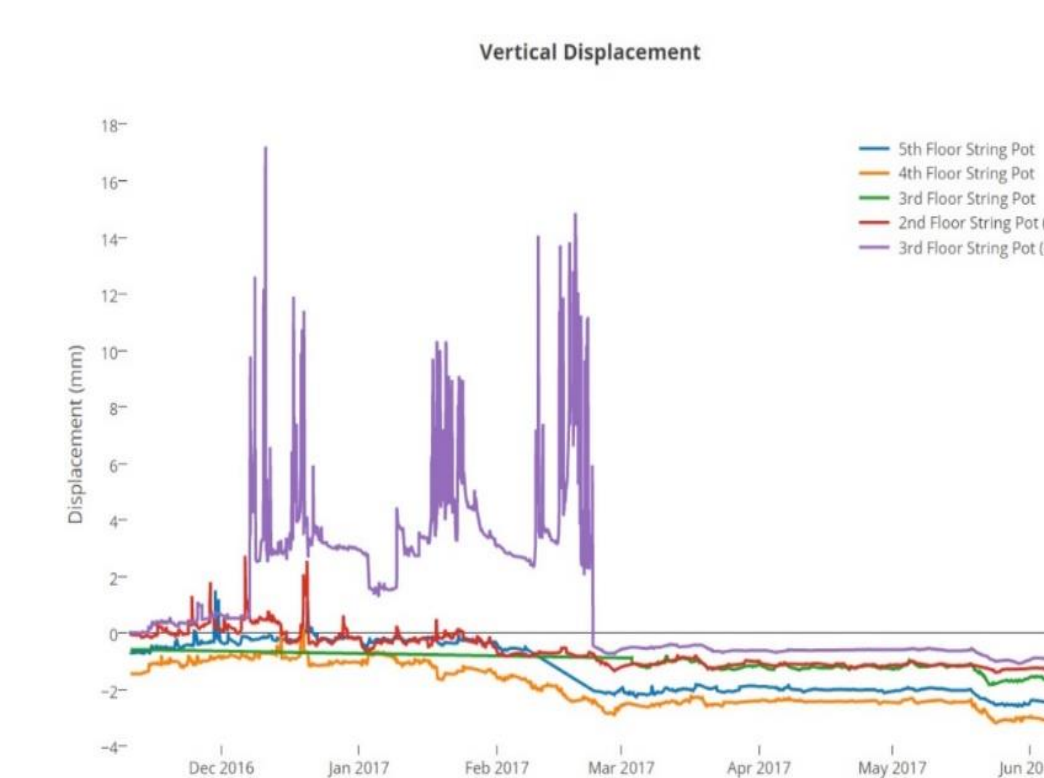
### • Projected data onto the surface of monitored physical objects



## Is This Data Really Clear?

Access to the survey: <https://bit.ly/2Cpxq5j>

Raw data of multiple relative displacements readings:



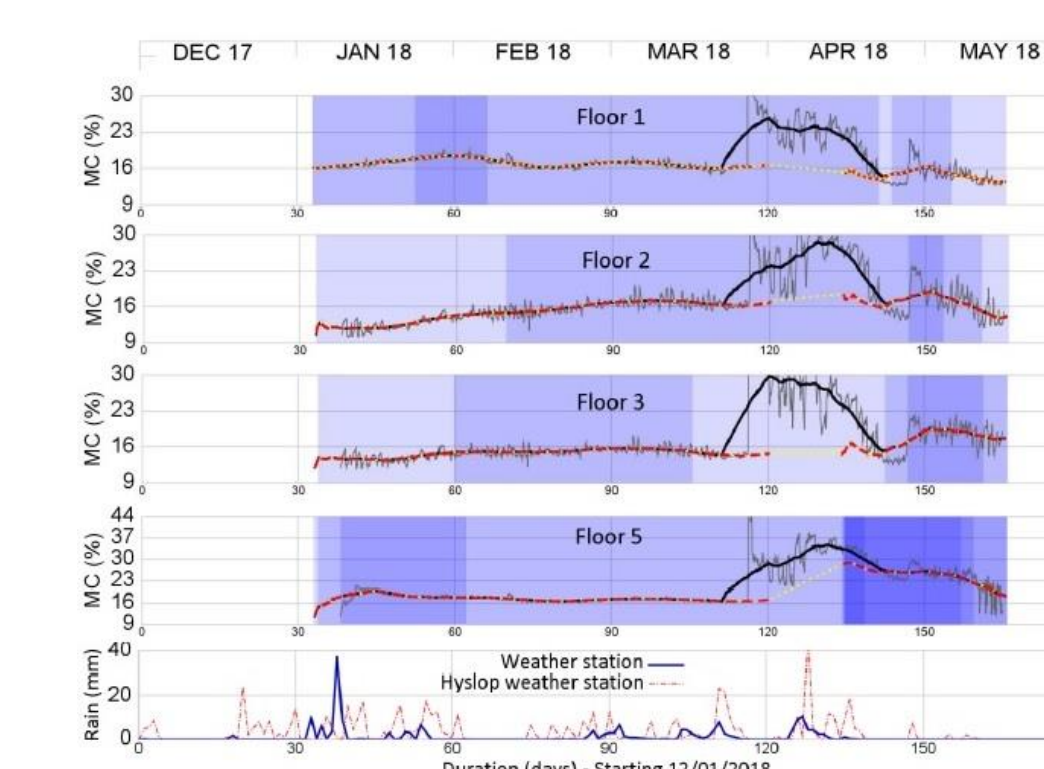
- Which column experienced the greatest vertical movement and in which period?

- If you were responsible for maintenance on this building, what action would you take?

- Which part of the graph did you use to make that decision?

- What is the reason of your response?

Raw data of multiple moisture content readings:



- Can you select the part of the graph when the highest accumulation of moisture content occurred in the panel?

- If you were responsible for maintenance on this building, what action would you take?

- Which part of the graph did you use to make that decision?

- What is the reason of your response?

## Acknowledgments

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