



“Managing fire safety during Load out”
High Rise Construction Fire Safety Conference

16.05.2023



Who are Lendlease?

- Lendlease are an Australian globally integrated real estate group
- Notable projects:
 - Sydney's Barangaroo precinct,
 - London's Elephant Park urban renewal project,
 - Google's European HQ, Kings Cross, London
 - Boston's Clippership Wharf
 - \$20b urban renewal project comprised of four districts in the San Francisco Bay area.

\$121b global development pipeline.

In the past, we've helped deliver some of the world's most recognised real estate including:

- Sydney's iconic Opera House,
- the Tate Britain in London,
- Kuala Lumpur's Petronas Towers and
- the National September 11 Memorial and Museum in New York.



Managing Fire Safety during Load out

Agenda

What is Load out?

When does it happen?

What challenges does it bring?

What hidden challenges are missed?

What solutions are there?

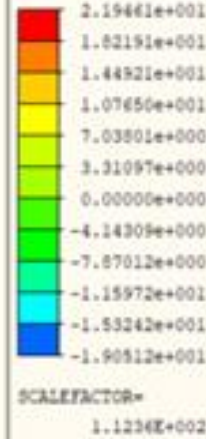
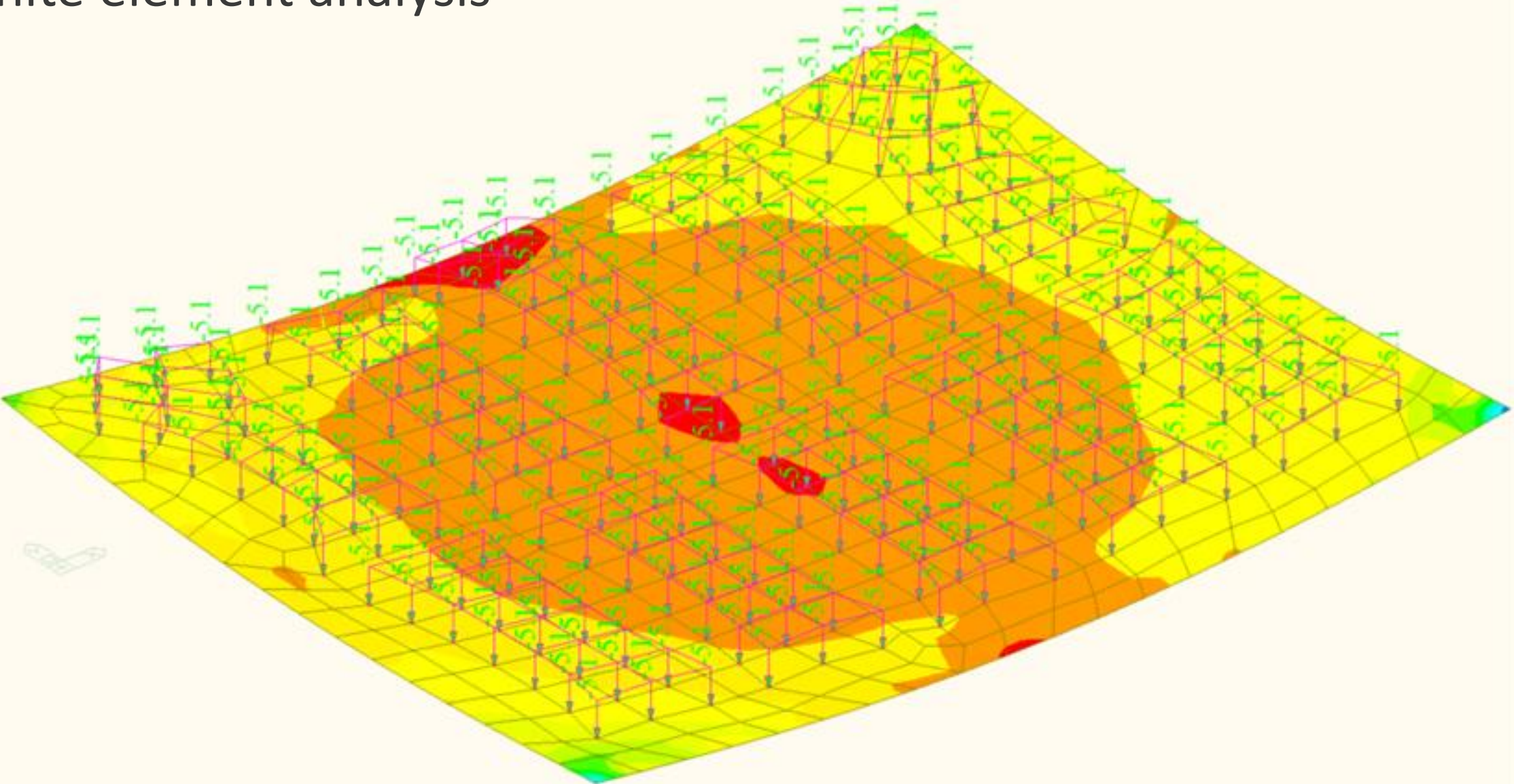
What is Load Out?

- **Load out or “loading out” is a term used to describe the safe distribution of vertical load placed on floorplates during construction.**
- **It essentially ensures that excessive stresses are not placed on the structure during construction**
- **Designed to prevent excessive deflection, bending and vertical stresses on the structure**
- **It is the link between the permanent works structural design load and the construction works load.**

What is Load Out?

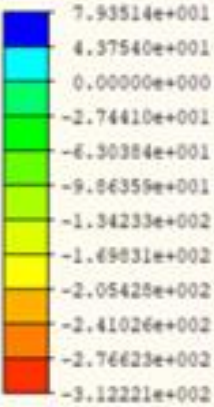
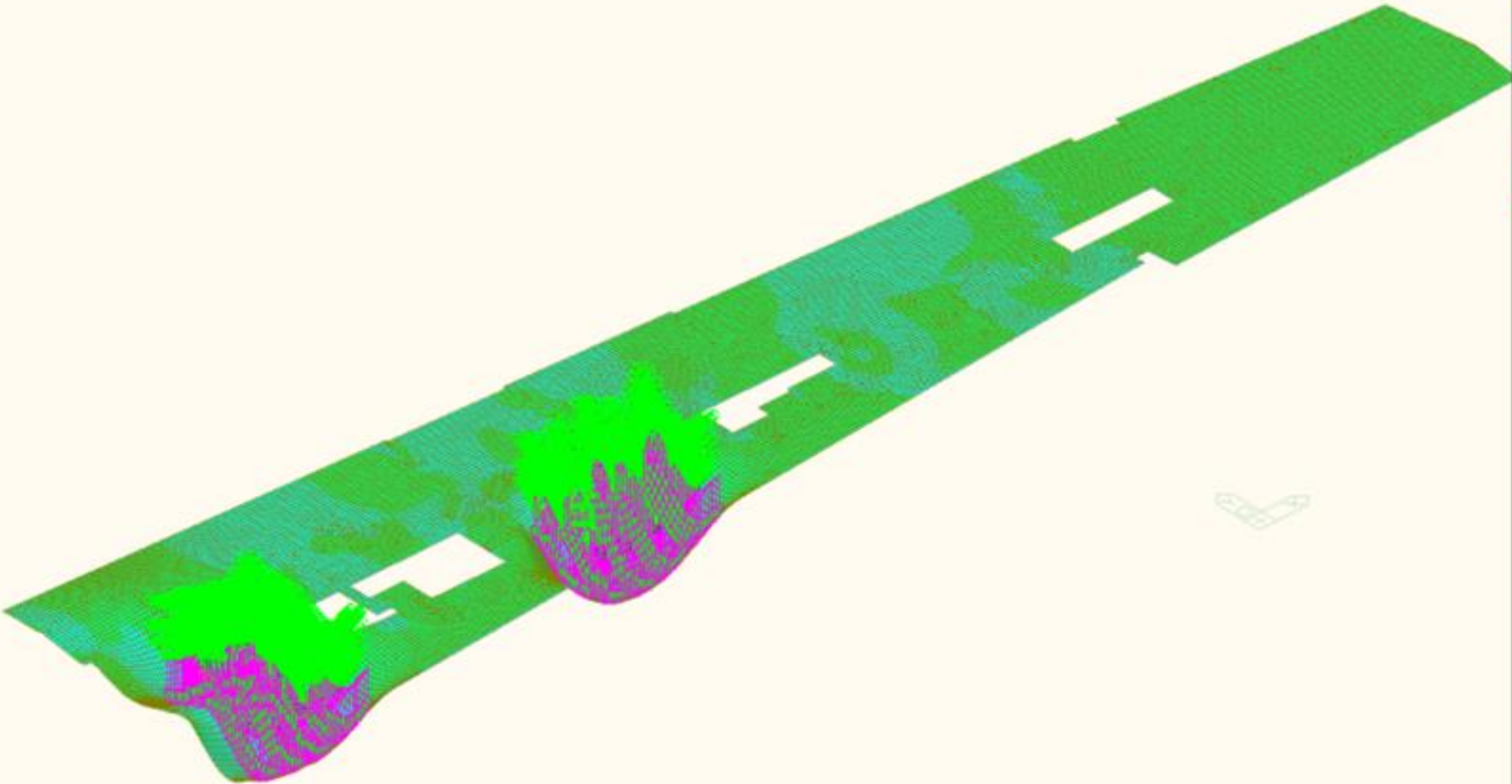
- **A well understood structural calculation and management process is undertaken to ensure safe outcomes.**
- **Generally this is delivered by the principle contractor as part of the construction phase**
- **It is generally not undertaken by the designer**

Finite element analysis

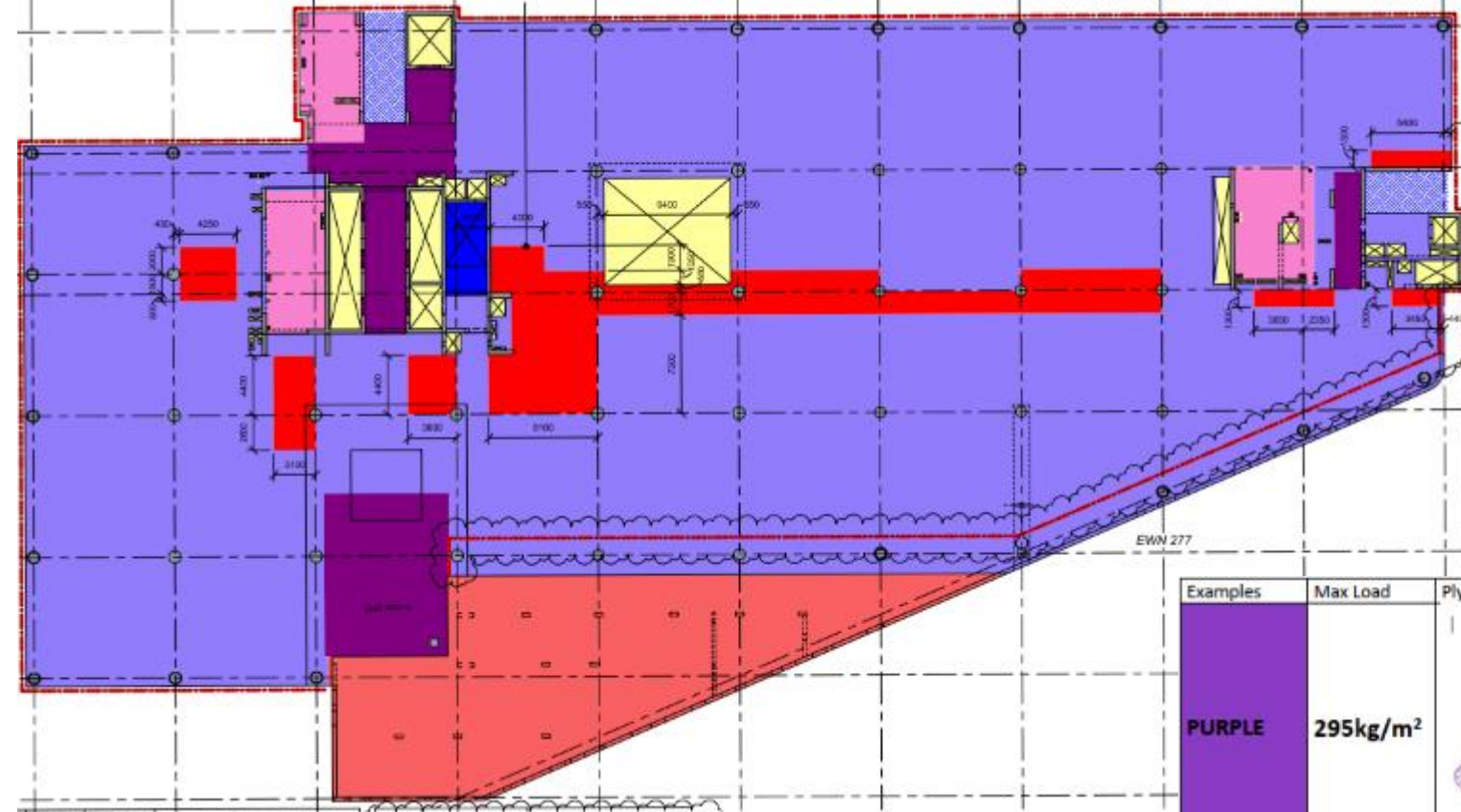




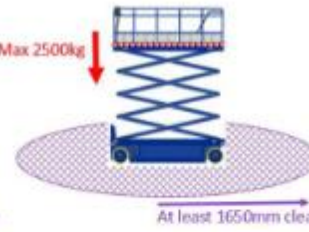


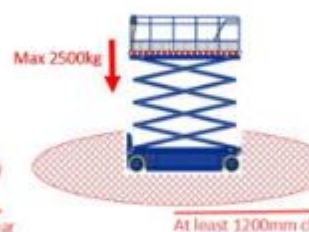


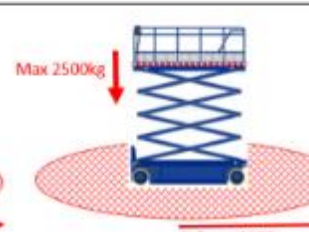
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AVG NODAL
MAX : 287
MIN : 126
FILE: SLAB COM-
UNIT: MN*m/m
DATE: 05/15/2023

Finite element analysis



SCALEFACTOR=
2.5224E+003

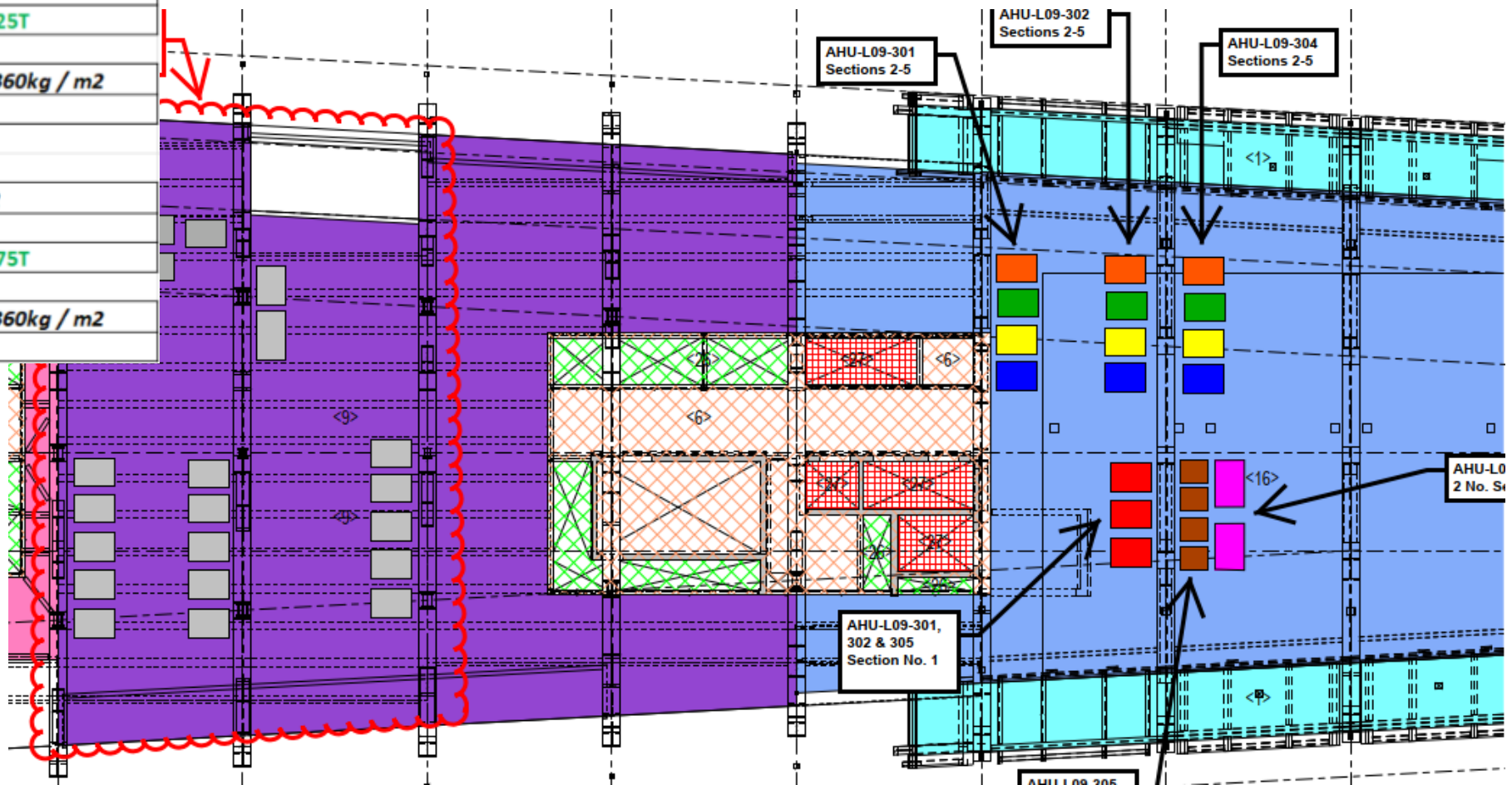


Examples	Max Load	Plywood/Plasterboard Pallet	Cladding Stillage	MEWPs
PURPLE	295kg/m²			
SALMON PINK	595kg/m²			
RED	700kg/m²			

falr707

LOADING PERMITTED = 5Kn/m² = 500kg / m²	
Total Unit Weight	7.23T
Total Unit Section Stored Area = 25m ²	25m ² x 500kg = 12.5T
MAXIMUM POINT LOADING PERMITTED = 3.6Kn/m² = 360kg / m²	
RED AHU SECTION (6 No. Supports)	POINT LOAD = 283kg
BLUE AHU SECTION	POINT LOAD = 300kg
YELLOW AHU SECTION (6 No. Supports)	POINT LOAD = 246kg
GREEN AHU SECTION	POINT LOAD = 355kg
ORANGE AHU SECTION	POINT LOAD = 358kg

LOADING PERMITTED = 5Kn/m² = 500kg / m²	
Total Unit Weight	4.380T
Total Unit Section Stored Area = 12.25m ²	12.25m ² x 500kg = 6.125T
MAXIMUM POINT LOADING PERMITTED = 3.6Kn/m² = 360kg / m²	
AHU-L09-305 Heaviest Section	POINT LOAD = 294kg
LOADING PERMITTED = 5Kn/m² = 500kg / m²	
Total Unit Weight	3.5T
Total Unit Section Stored Area = 11.55m ²	11.55m ² x 500kg = 5.775T
MAXIMUM POINT LOADING PERMITTED = 3.6Kn/m² = 360kg / m²	
AHU-L09-003 Heaviest Section	POINT LOAD = 316.6kg



When does it happen?

- **Generally it happens at all times during construction**
- **There are times when load out and the challenge it presents from a fire perspective are more pronounced.**
- **In particular:**
 - **During the façade installation**
 - **During Fit out**

What Challenges does it bring

- **Significant combustible fire loads are likely to be introduced**
- **Reduction in stillage weight will therefore drive an increase in stillage numbers which will utilise floor space**
- **Increased travel distances**
- **Signage considerations**
- **Trip hazards**
- **Egress route width**
- **Potential blocking of exits**
- **Potential exclusion zones introduced**







What people don't consider

- In very tall buildings provision of wet risers becomes necessary during construction (23.9)
- In reality, the provision and functionality of these systems will be necessary to facilitate the load out associated with facade installation or fit out and particularly when those materials are combustible
- Importantly, it could be a stakeholder mandated benchmark to continue construction and loading of materials
- The critical path to fit out should include the provision of a functioning wet riser.
- To enable fit out, wet riser delivery starts at superstructure phase commencement.









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What solutions are there

- **Load out plans shouldn't be considered purely from a structural safety perspective**
- **Safety should be a key consideration**
- **Plan logistics**
- **Think about key stages of construction and critical path**
- **Co-ordination between the Construction team, structural engineer and the construction phase fire risk assessor or fire engineer should be standard practise**
- **Neither structural safety or fire safety should be prioritised.**

Managing Fire Safety during Load out

Recap

What is Load out?

When does it happen?

What challenges does it bring?

What hidden challenges are missed?

What solutions are there?

Q&A