
# The role of BIM to support structural steel reuse.

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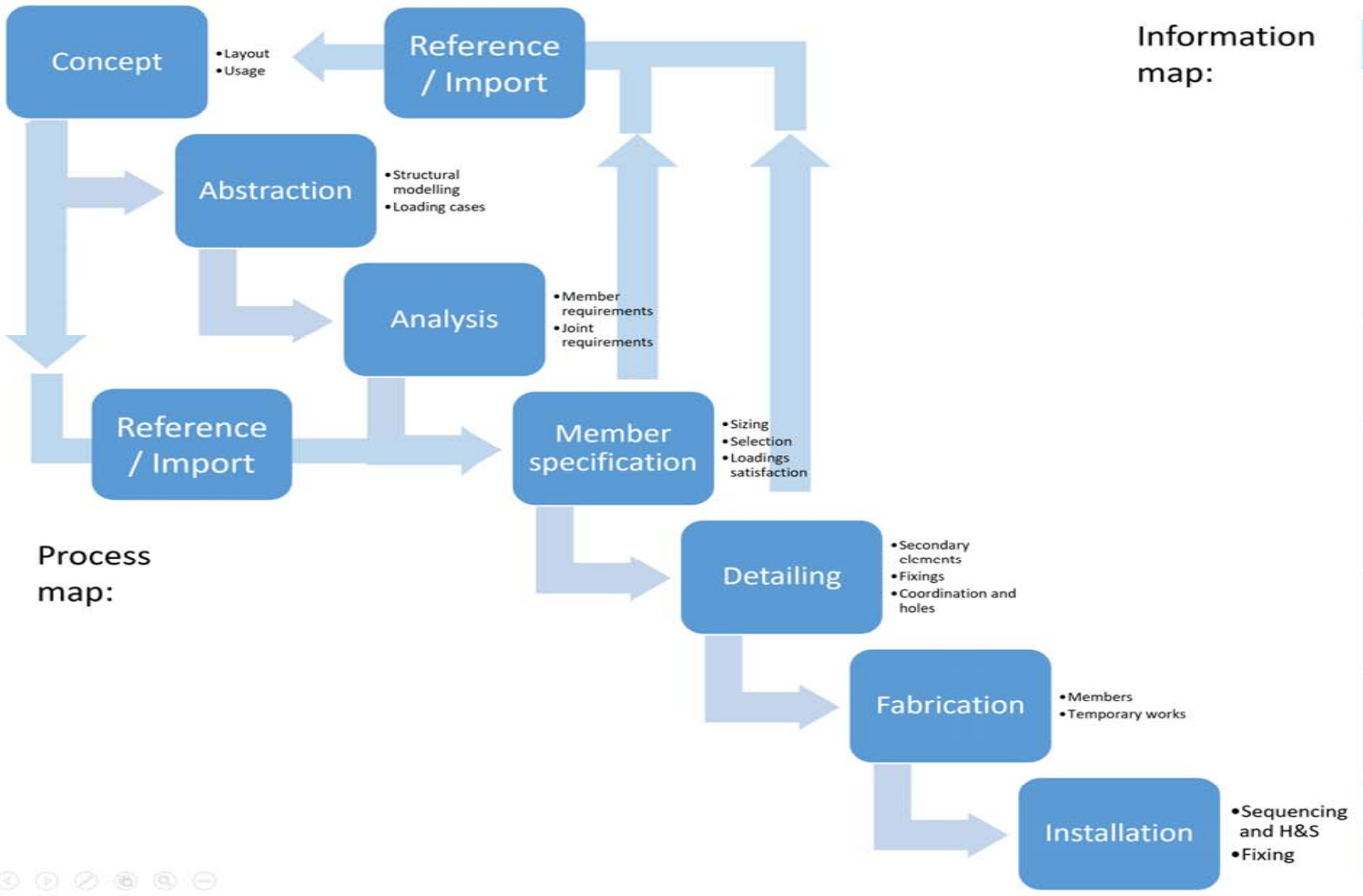
# Where do we loose information?

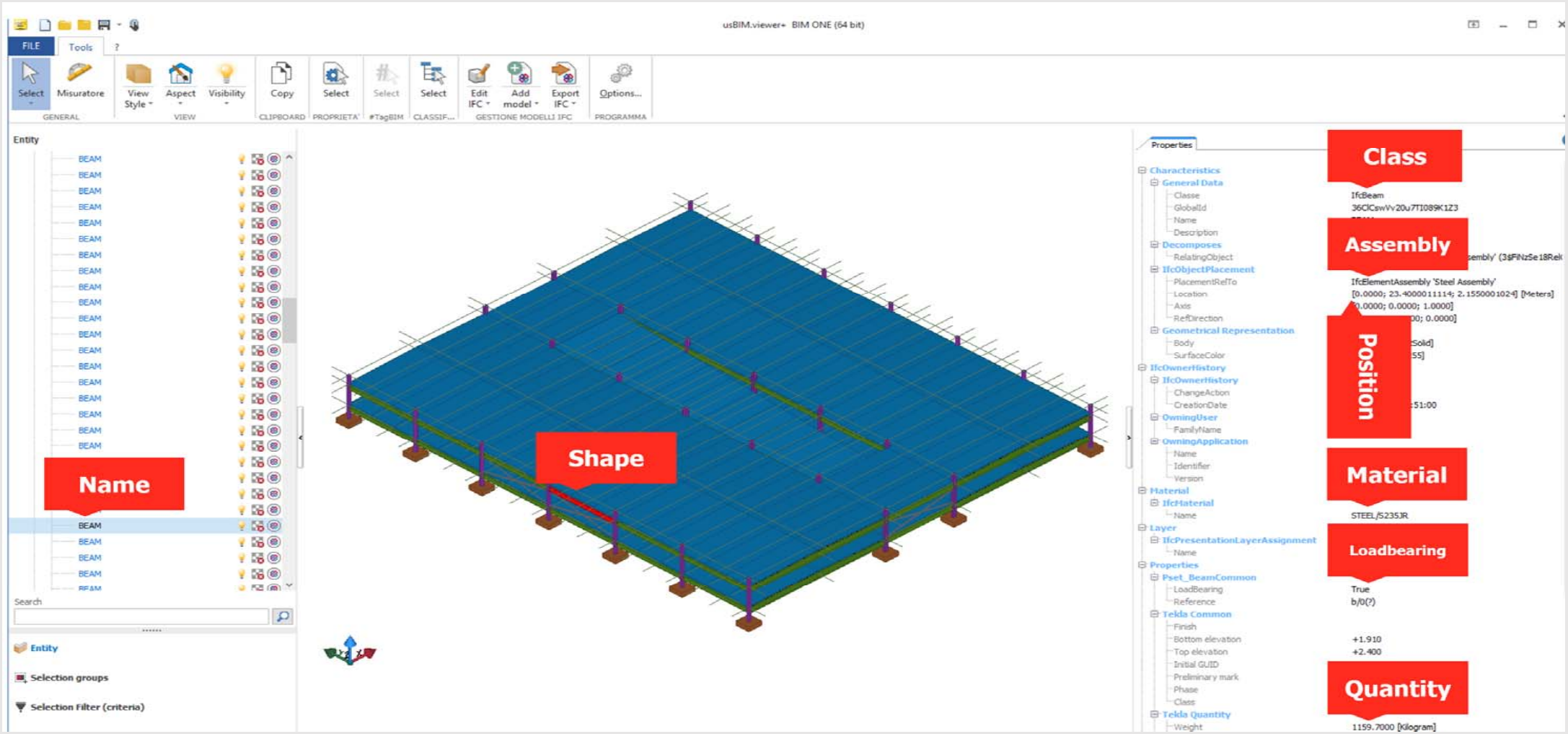



Process map:

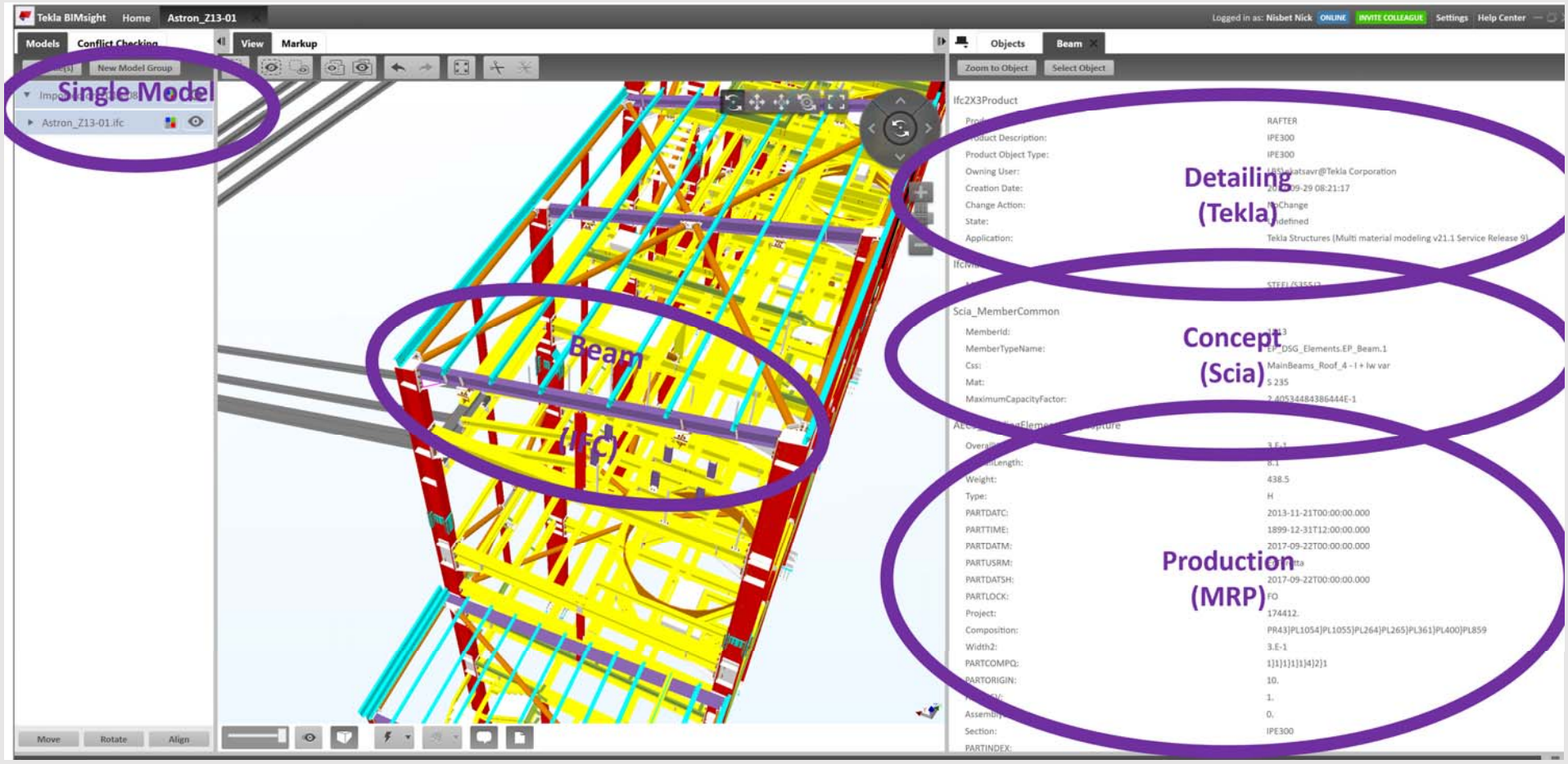
Information map:

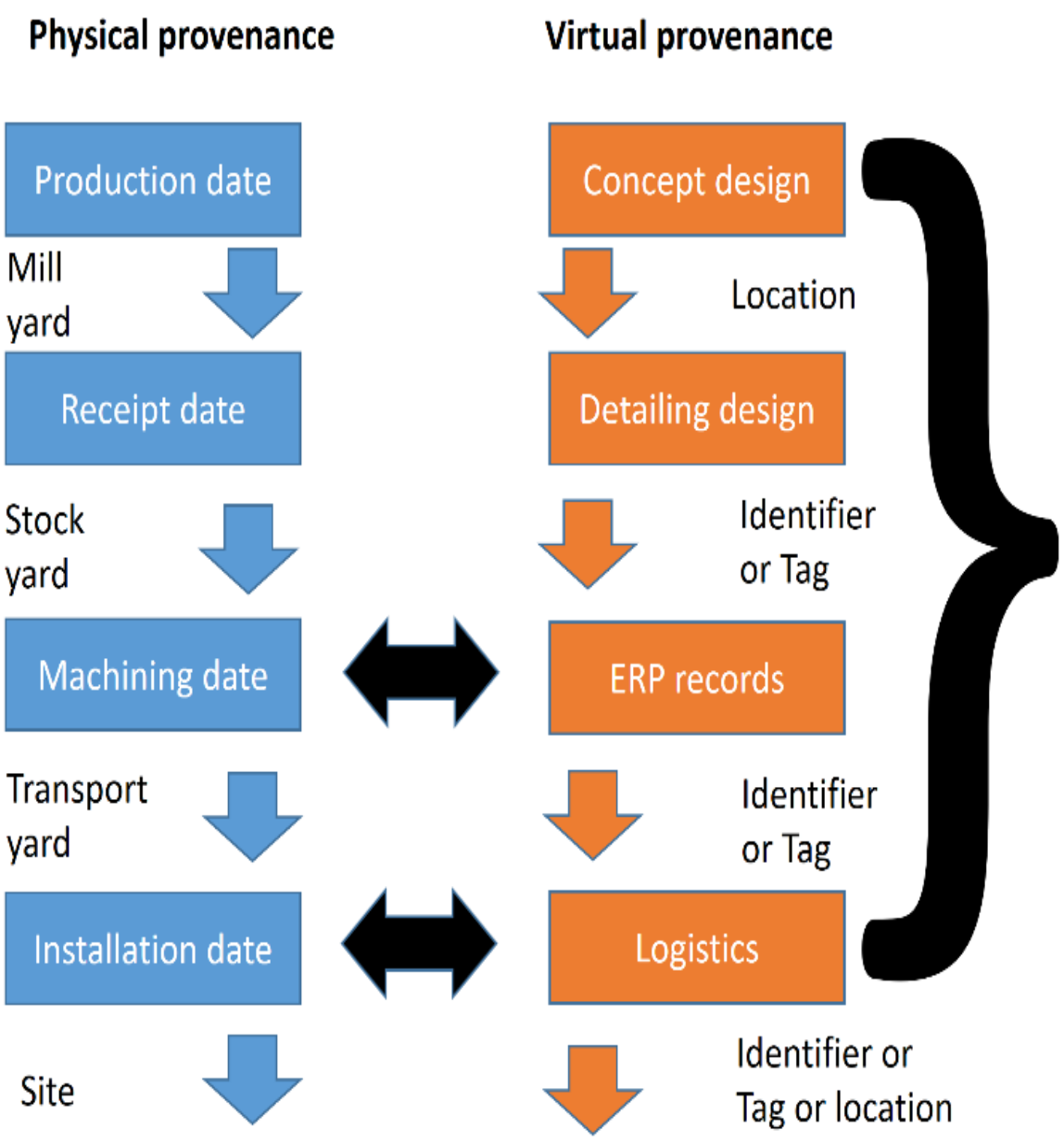
| Stage | Gained | Lost |
|---|---|---|
| Concept | identity, location, use | |
| Abstraction | loading | identity |
| Analysis | loads | use |
| Member specification | stresses, material | loads |
| Detailing | | stresses |
| Fabrication | | location |
| Installation | location | material |

# What makes BIM useful?



# What can we retain by using open BIM?






# Virtual provenance

REDUCE demonstrated

**tools to convert multiple information resources**

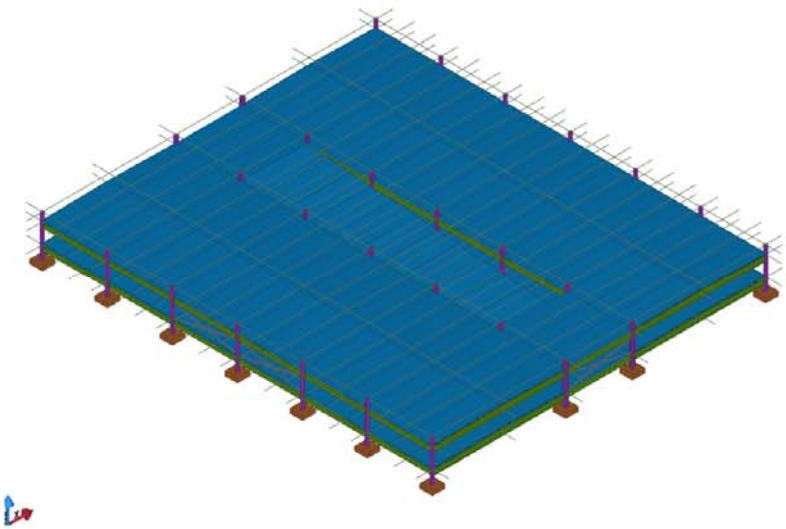
into a single information model in the ISO 16759 IFC open standard.

REDUCE proposes <u>information requirements</u> that improve:

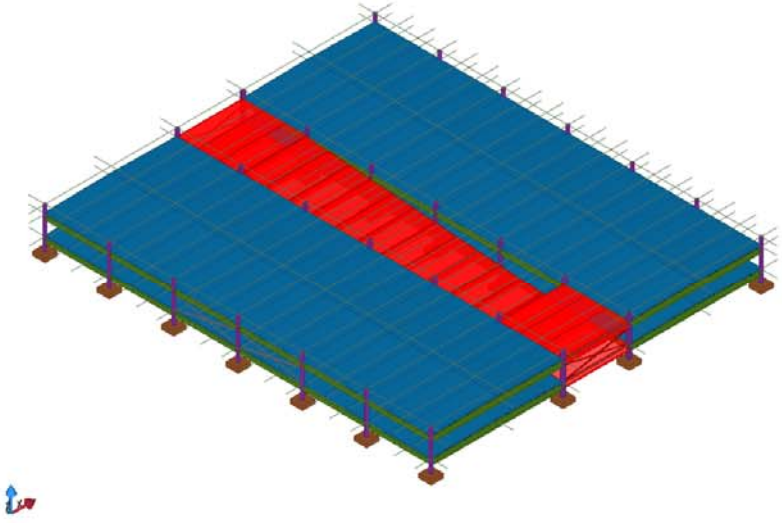
- QTO for LCA
- Serviceable Life prediction
- the probability of circularity

| Aspect | Information requirement | Used to … |
|---|---|---|
| **Context** | **Project name and description** | Confirm context where production codes are unique |
| | **Site name and address** | Confirm context where location is unique |
| | **Facility name and description** | Confirm context where any asset codes are unique |
| | **Facility classification** | - |
| **Identification** | **Member identifier** | Uniquely identify the member |
| | **Member name and description** | Recognise the member |
| | **Type mark** | Uniquely identify a set of identical members |
| | **Location and orientation** | Recognise a member in situ |
| | **Execution class** | Indicate the intended level of execution including its traceability. |
| **Provenance** | **Mill / supplier** | Confirm the origination of the material |
| | **Batch / composition** | Confirm the production characteristics and date |
| | **Receipt date** | Track the actual member |
| | **Processing date** | Track the actual member |
| | **Transport date** | Track the actual member |
| | **Installation date** | Track the actual member |
| **Capacity** | **Size and features** | Prescribe potential second use |
| | **Role** | Prescribe potential second use |
| | **Material/ strengths/grades** | Prescribe potential second use |
| | **Batch certificate** | Prescribe potential second use |
| | **Capacity factors** | Indicate the likelihood of past overstressing |
| | **Treatments and finishes** | Prescribe potential second use |

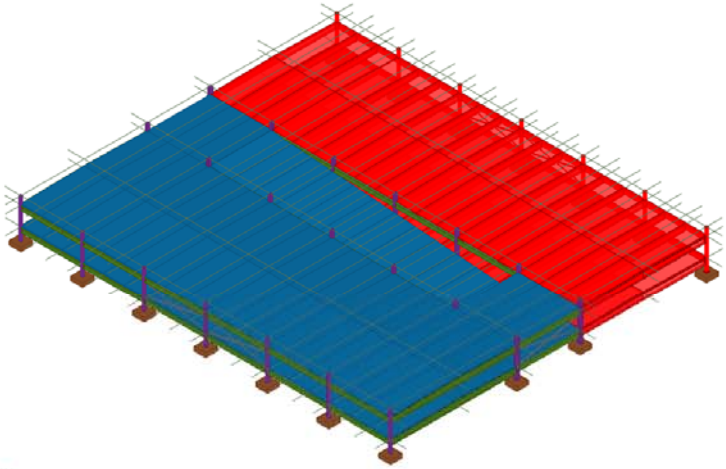
REDUCE took
<u>TuD's Car Park</u>
as a first life…



First Life configuration



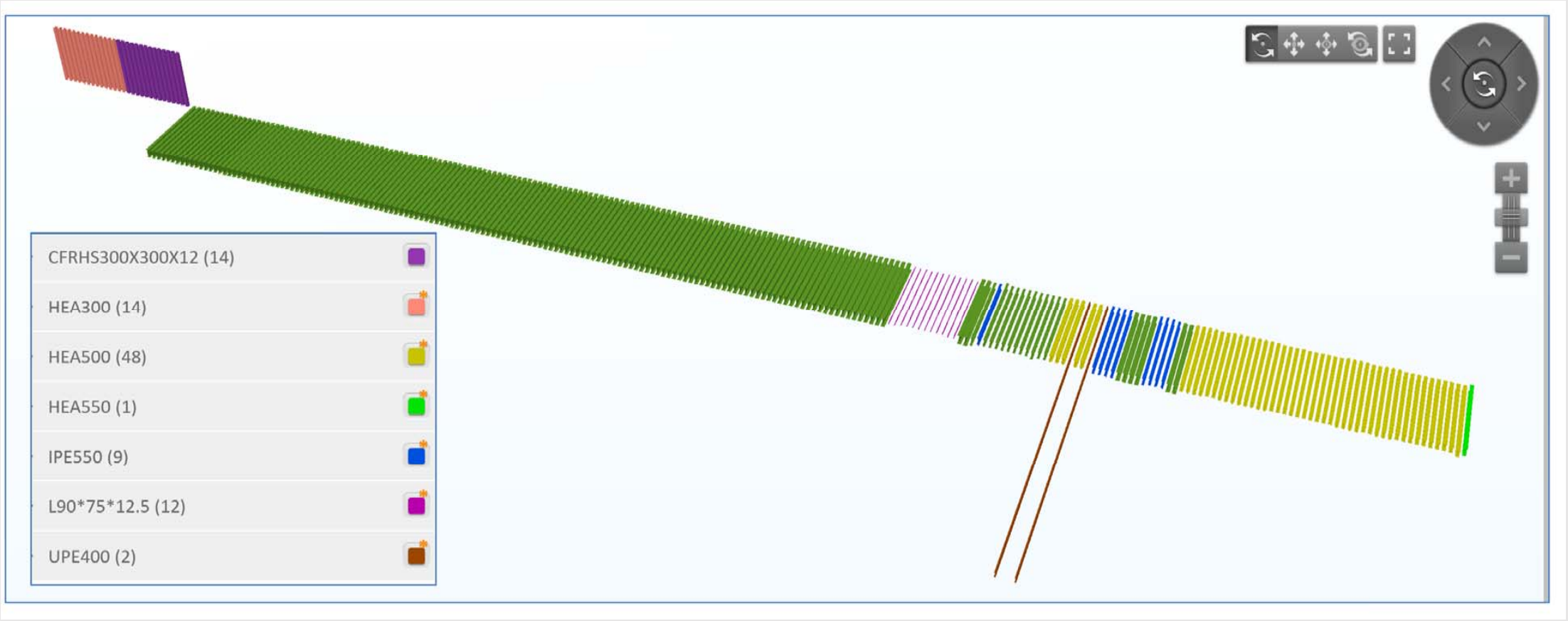
Members needing reordering (duplication) (red)



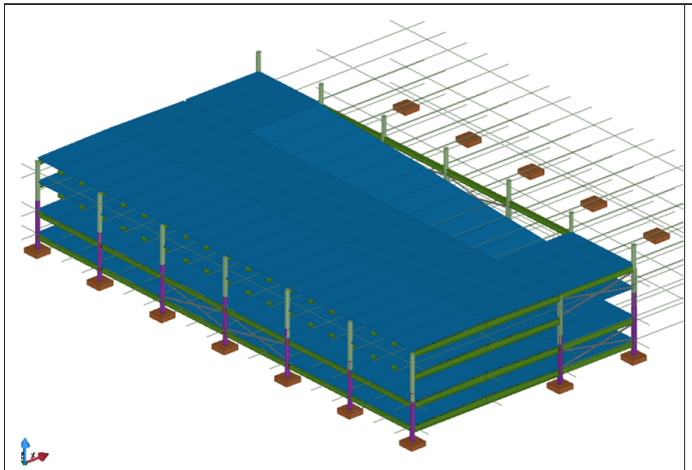
Members to be re-purposed (red)

Footings to be abandoned (red)

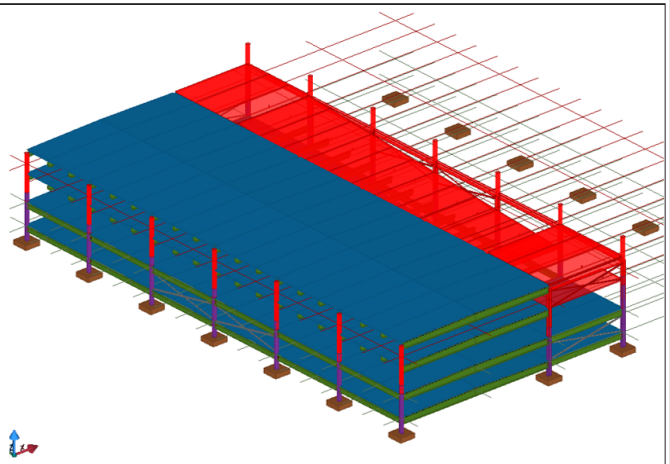
# … to show it as a material bank …



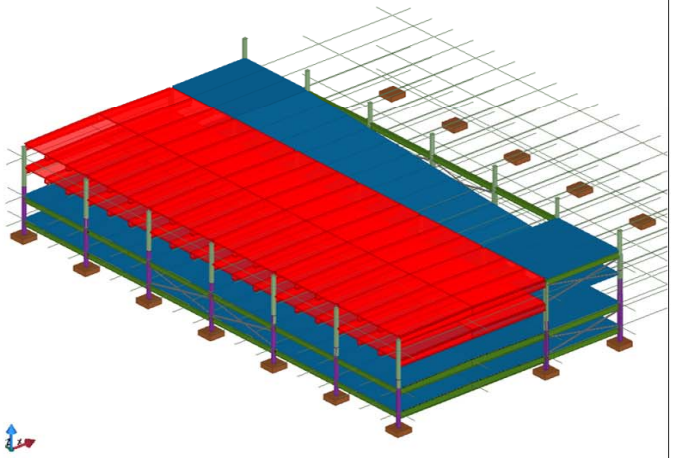
… and envisaged the car park having <u>a second life</u>.



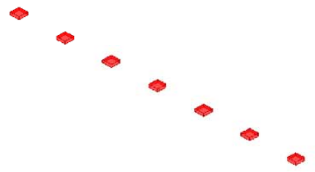
Second Life configuration – four storey car park



New members (red)



Re-purposed members (red)



Abandoned footings (red)

# The role of BIM to support structural steel reuse.

- Circular re-use depends on retaining open information about:

  **Identify, Provenance, Capacity, Context**

- REDUCE makes 18 recommendations towards creating:

  **A secure single consolidated information model using ISO16759 IFC with consistent member, grid, loading, material and section names.**

- Similar expectations are appearing elsewhere:

  - ISO 20887:2019, Annex C. Properties to support design for disassembly and adaptability.
  - EU BAMB “Building as Material Banks”