



BIM for Construction

Instructor: Paul M. Goodrum

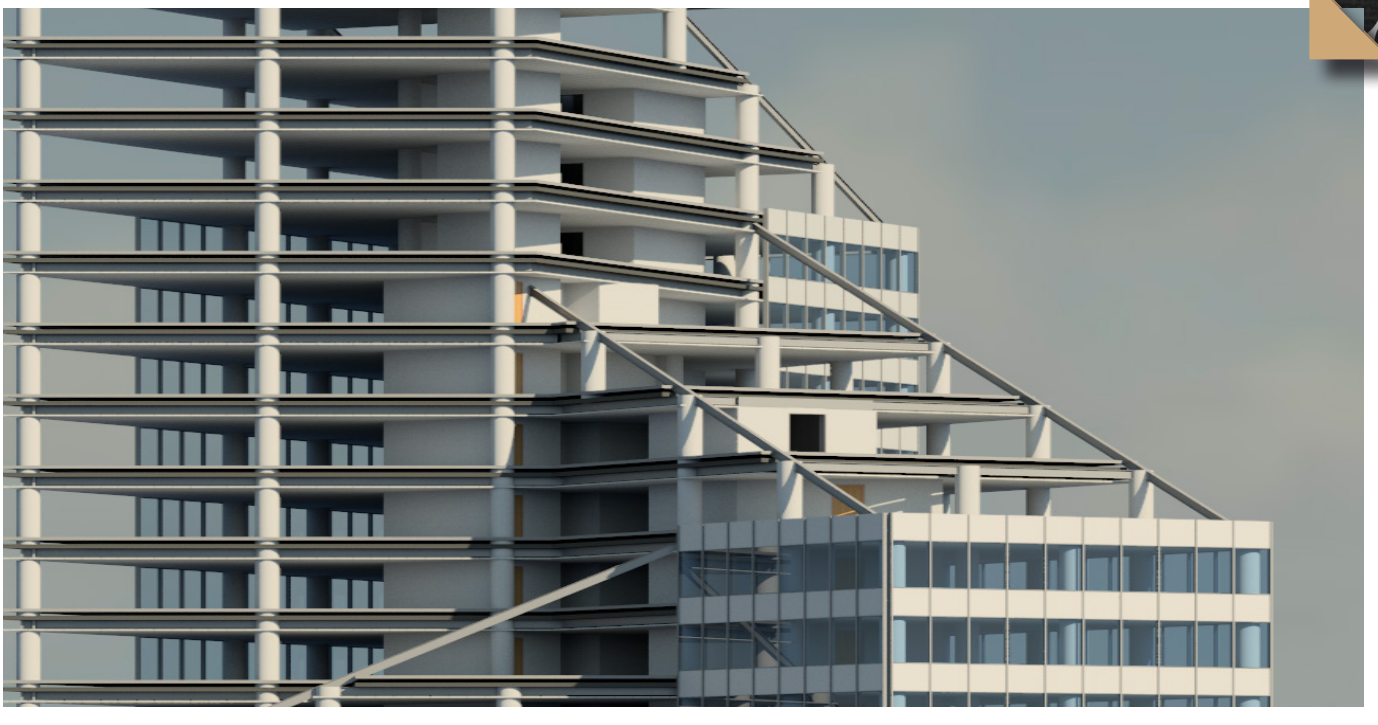
Poster: Pierre Bannier

What is BIM?

Building Information Modeling or BIM is a new process that deeply transforms the way buildings are designed, built and maintained. The basic concept is that a beam is not a simple shape on a drawing. Now, the beam is an object that has a 2D/3D representation but also tons of in-

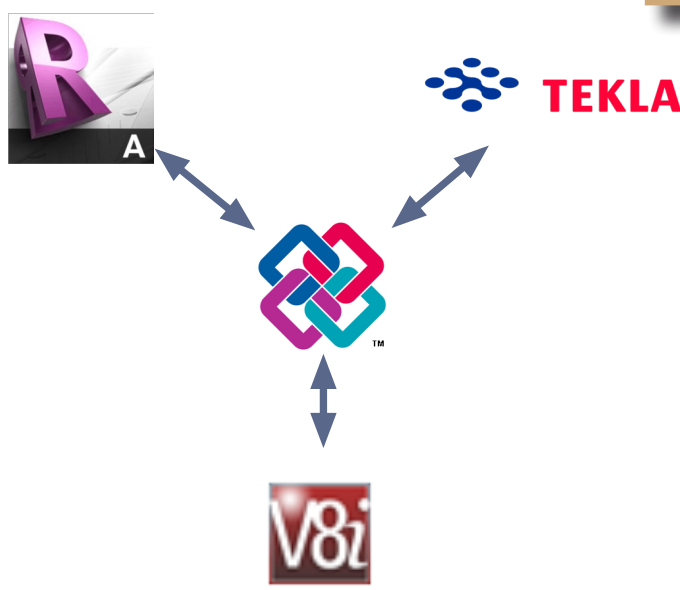
formation such as its weight, steel grade, AISC profile name, and so on.

But BIM is not only 3D design or specific software; it is a concept that can virtually be applied by anybody and any software.



Interoperability

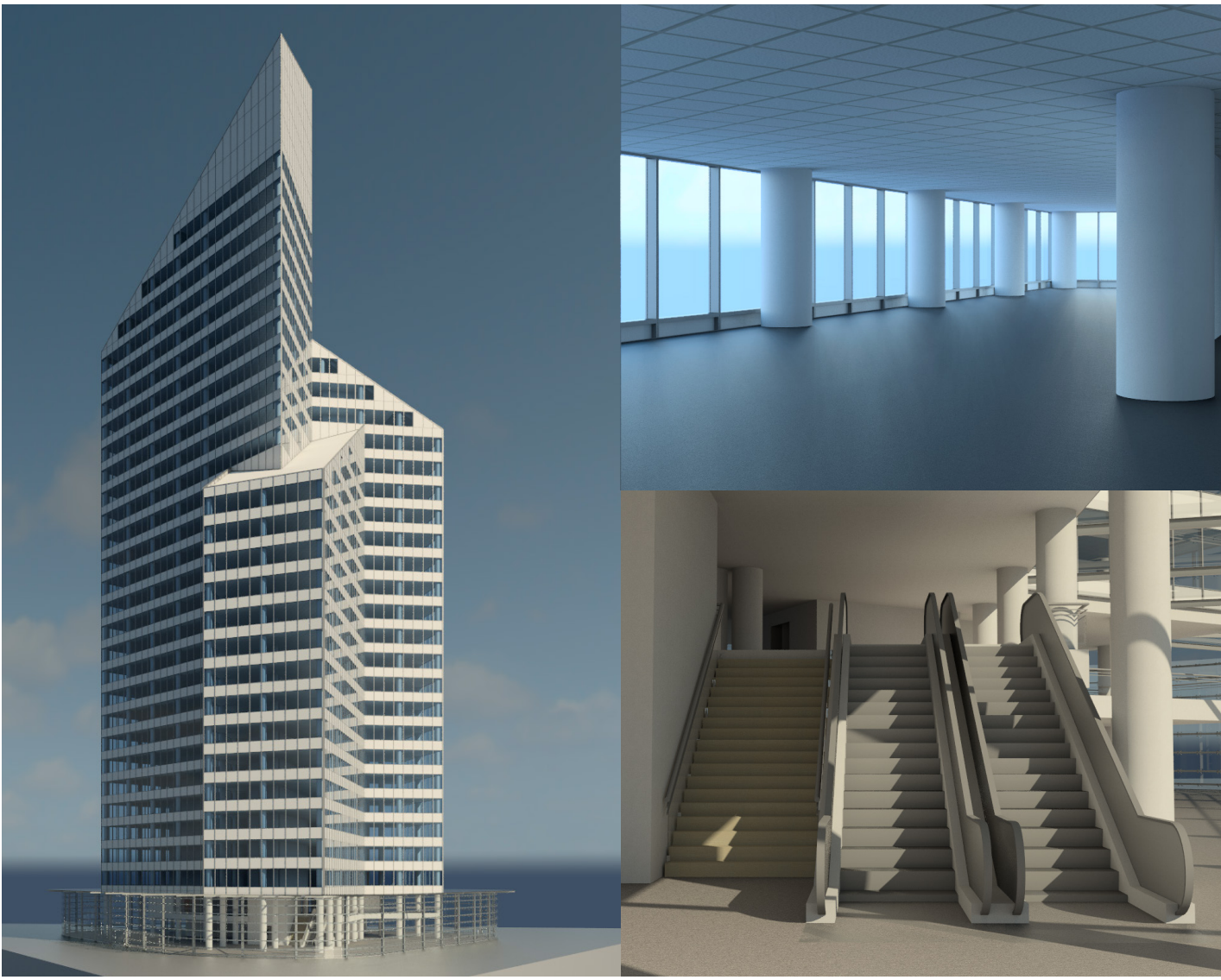
Interoperability is a key component of BIM. It enables peoples using different software packages to communicate. IFC is one of those neutral formats used to in the BIM process.



3D Modelling

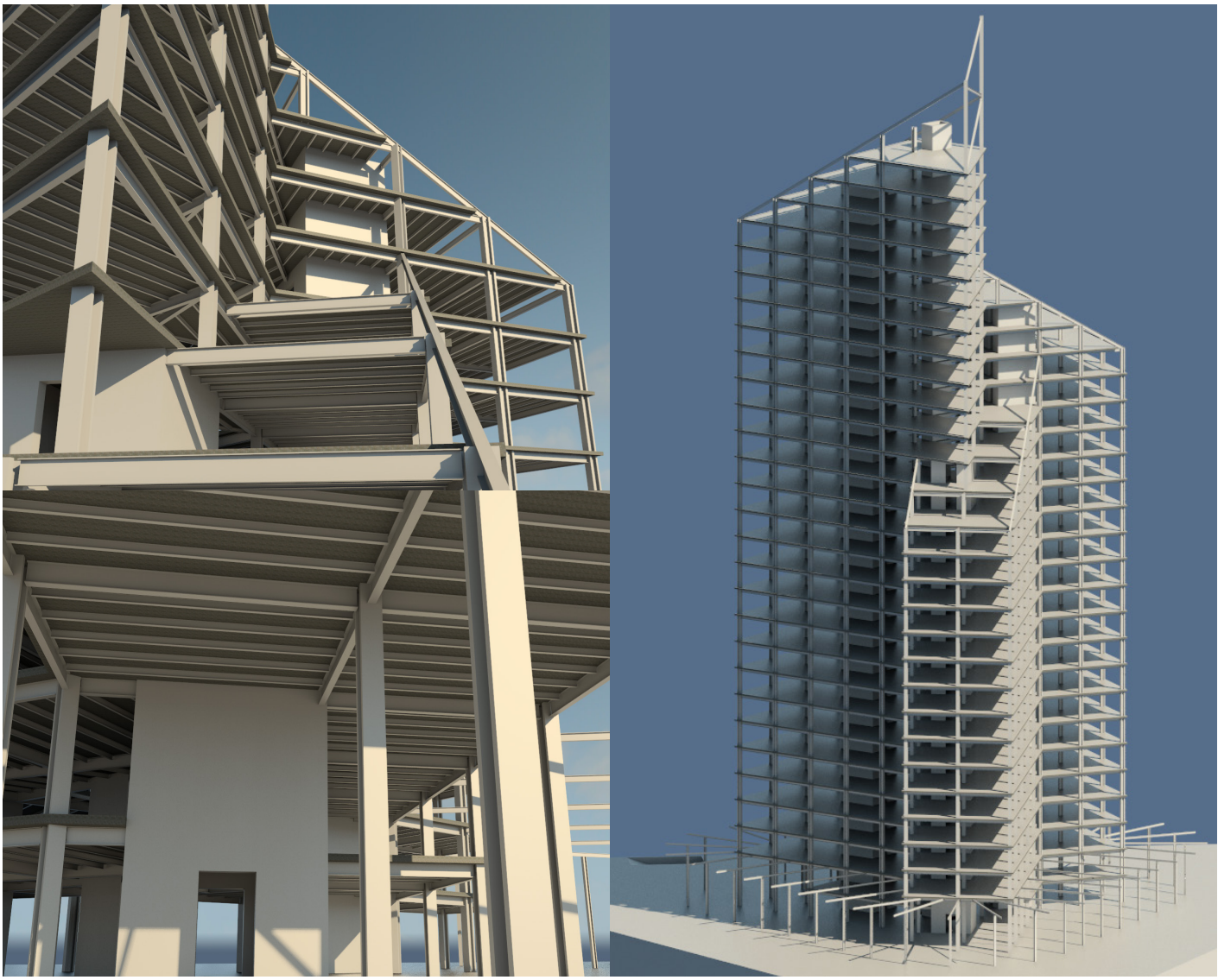
Architectural Model

The architectural model contains all the non-structural elements such as glazing or framed walls.



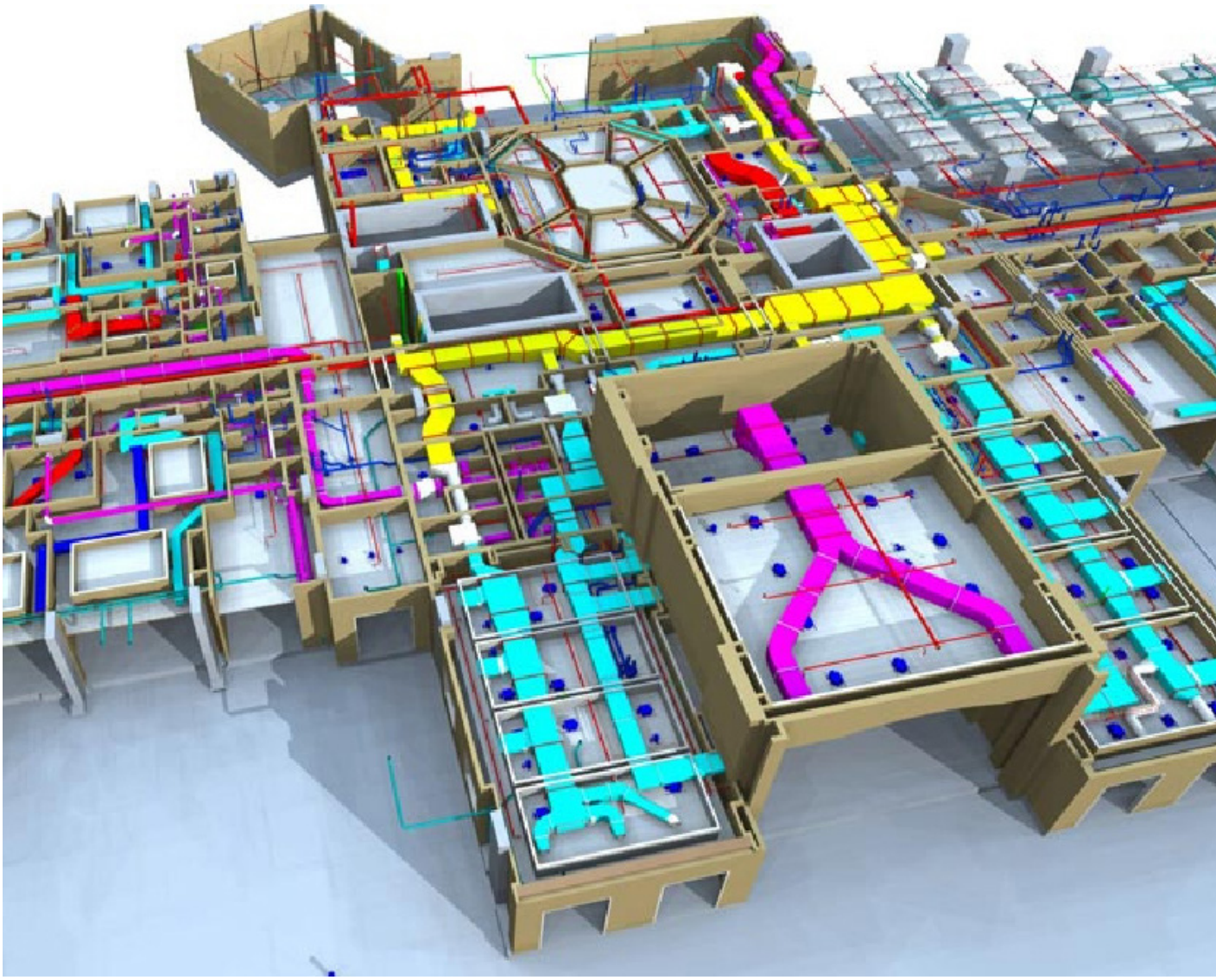
Structural Model

The structural model is the skeleton of the building and contains the steel and concrete elements.



MEP Model

The MEP model contains all the HVAC, Plumbing and electrical elements of the building.

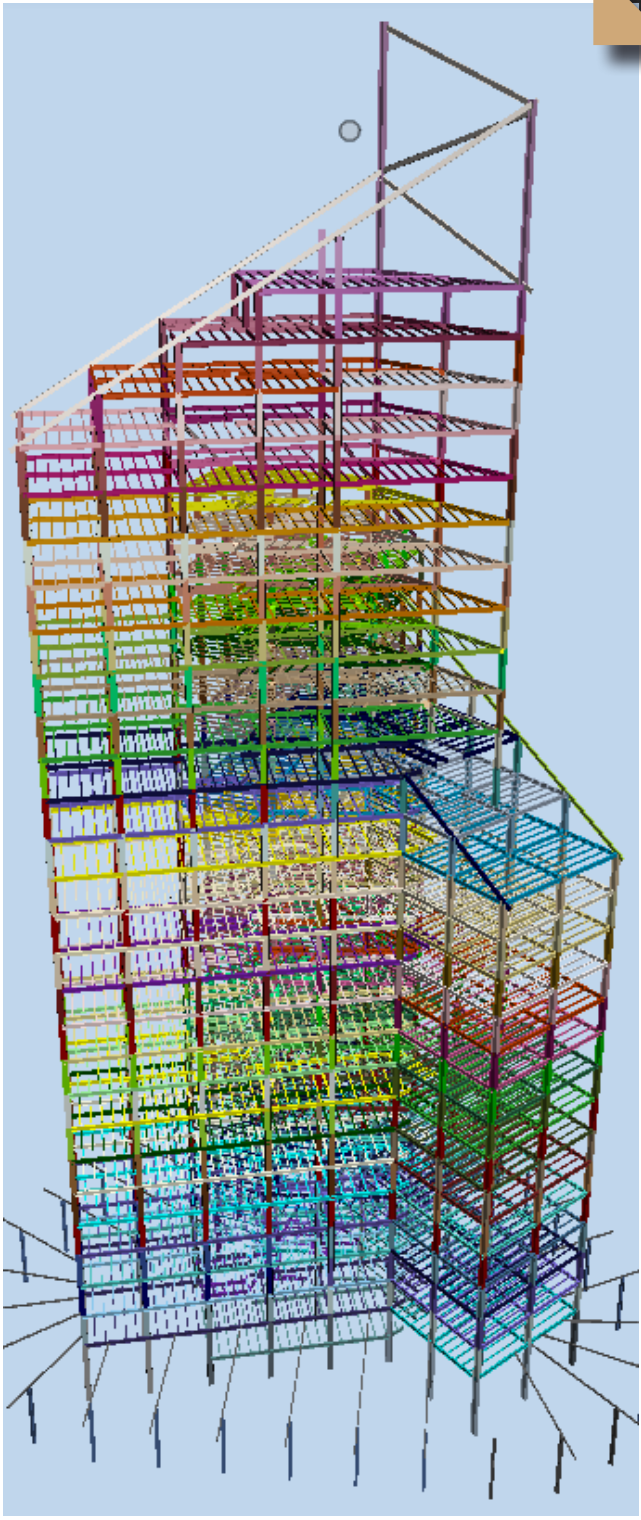


Work Packaging

Work packaging is an application of the principle that a whole can best be managed by breaking it into manageable parts. For instance, a work package can be the work that a team of workers can fulfill in a week. In the work preparation process work packages are helping check all documents and materials. But planners, who are not necessarily on site,

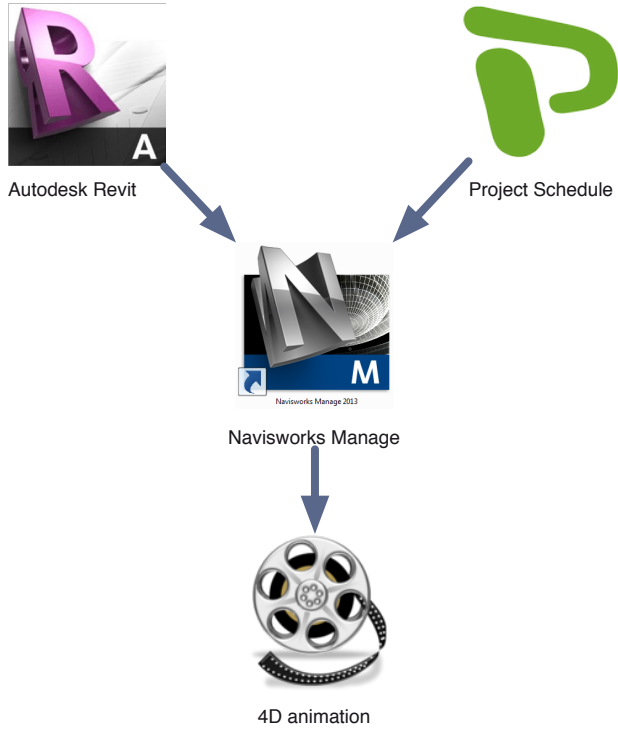
don't have enough information to determine the work package size.

The work packaging software relies on a productivity database to determine how much time is needed to install every single beam or piece of piping. On the picture each color represents a work package.



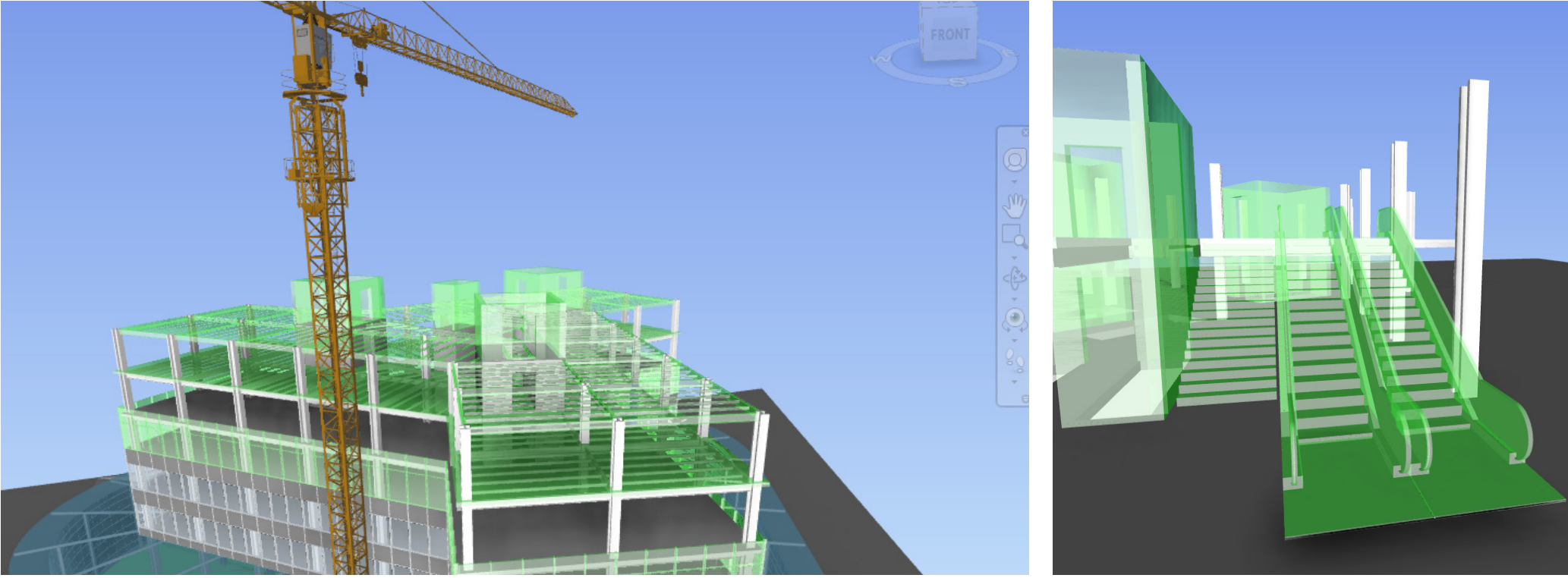
Work Pack	Bdgt Hrs	Earn Hrs	% Comp	Quantities	
				Pc Mk	Weight
L01-WP1	532.7	0.0	0.0	5	78.55
L01-WP10	527.3	0.0	0.0	36	37.28
L01-WP2	532.7	0.0	0.0	5	78.55
L01-WP3	532.7	0.0	0.0	5	78.55
L04-WP2	506.4	0.0	0.0	70	30.17
L04-WP3	491.1	0.0	0.0	81	28.57
L04-WP4	532.7	0.0	0.0	10	78.54
L04-WP5	532.7	0.0	0.0	10	78.54
Totals	78989.5	0.0	0.0%	6131	8393.27

4D Animation



Traditionally the construction industry uses bar charts to represents the schedule of a project. If bar charts can be very precise, they are hard to understand for the layman and the construction logic hard to visualize.

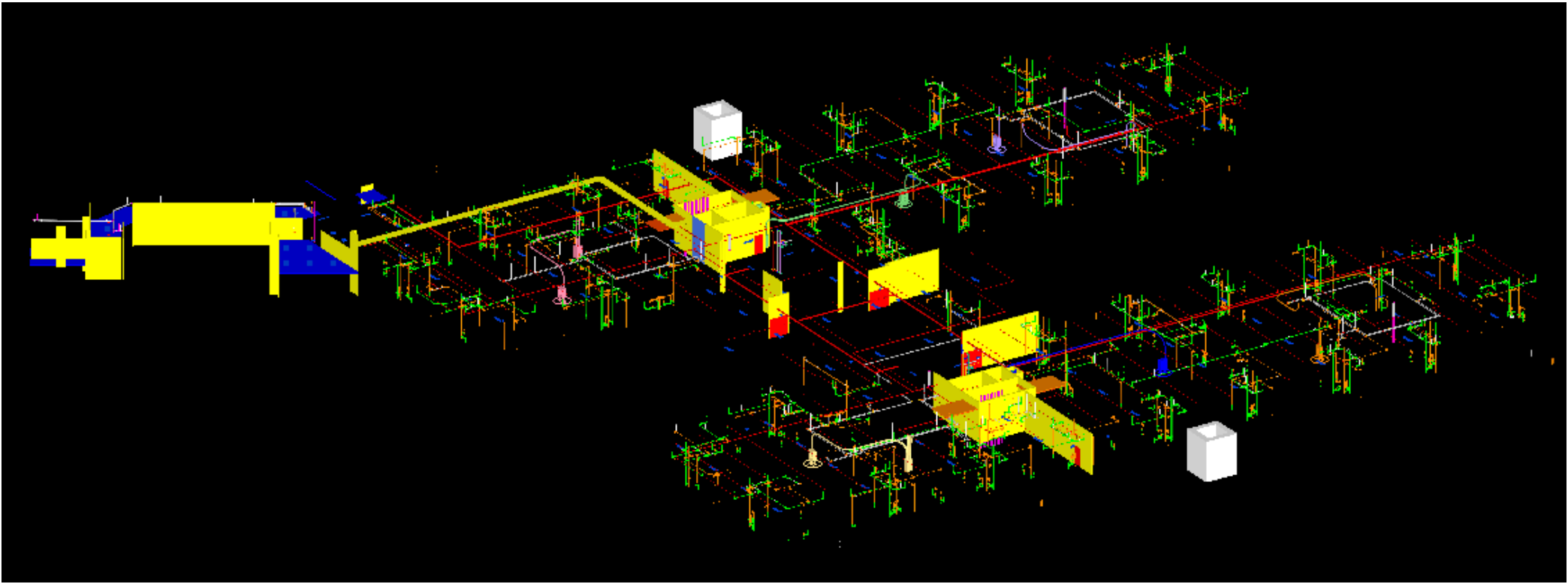
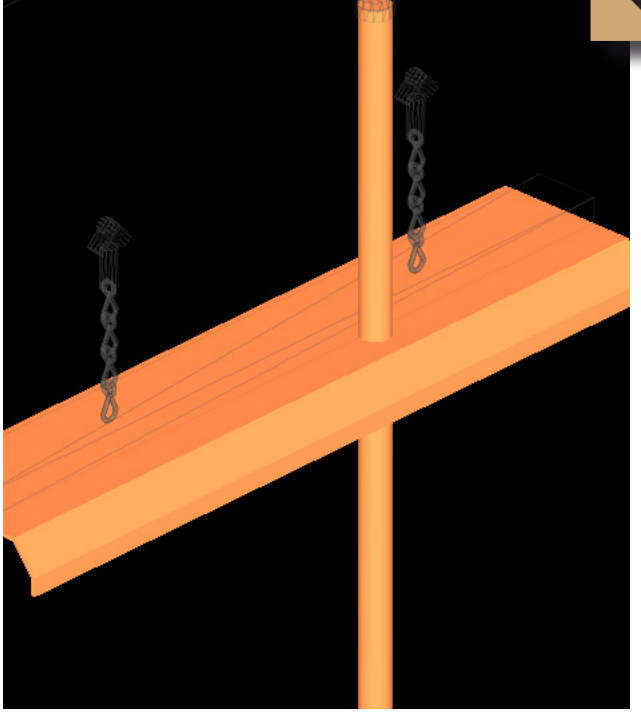
Thus, the 4D animation software uses a 3D model of the building and adds the fourth dimension by linking it to a traditional construction schedule. Now, facilities can be virtually built in front of the planner's eyes and more mistakes can be identified



Clash Detection

Nowadays Buildings are becoming more and more complex, and their design is involving a large number people working for different companies and sometime separated by thousands of miles. Thus, it is not surprising that coordination issues are looming.

Is this context clash detection is an important step forward. It gathers the 3D model of every stakeholder of the project and checks if there is no unwanted clashes. A typical example is a pipe going through a light fixture as shown on the right.



Status Visualization

Status visualization helps the project managers to quickly and visually see what is going on the field: Which beams have been installed, what is in the lay down yard, and most importantly what is missing.

Here, the steel members in green have been installed and checked; the other colors codes are indicating other status. The grey members represent the work still to be done at a specific date in the project.

